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In connection with the third mission, above, it should be remembered that the Unit Commander School had originally been established with the intent to train the Ju-88 units in offensive tactics. As it turned out, the axiom that a dive-bomber attack inevitably resulted in a direct hit was proved to be false, partly because the dive itself proved to be an extremely complex aeronautical problem and partly because, in any dive, the hitting accuracy is bound to be strongly influenced by the altitude at which bombs are released and by wind conditions at the target area. The reflector sight used by the dive-bomber forces was designed for low-altitude employment only. As a result there were a number of serious difficulties to be resolved which were beyond the powers of an average dive-bomber crew. Only very good pilots - and then only after a good deal of practice - were capable of timing their dives so that a direct hit might result. Admittedly, a long and intensive period of training was necessary to teach the bomber crews to carry out horizontal bombardment successfully; but this was no less the case with the dive-bomber forces. In an attempt to ameliorate the situation, the bomb sight B.Z.A.2¹²⁶ was developed and introduced into the front units during the winter of 1941/42. Training in the use of this very valuable electrical-optical aiming device was carried out first in the unit commander courses at Foggia, later in the Unit Commander School at Tours. The purpose of these courses was to train the Ju-88 units, by way of their commanders, in diving and bombardment in unit formation as well as in the proper use of the B.Z.A. 2 as an aiming device.

In 1942, the Unit Commander School was made a part of the Bombardment School, and as time went on training was

126 - The initials stand for "Bomben-Ziel-Anlage Nr. 2" (Bomb Aiming Device No. 2).

extended to cover all bomber units (including the He-111 units) as well. For, as a result of the change in tactics dictated by the need to operate over front areas harboring nests of strong enemy antiaircraft defenses, the Ju-88 units, too, had to be trained in horizontal bombardment with the help of the Letze 7-D.

In addition to this tactical training, a great deal of emphasis was placed on instruction in the various kinds of bombs and fuses available for use, for selection of the appropriate type for each particular mission was often a determining factor in the final outcome¹²⁷. The problem was to choose the right kind of bomb and the proper fuse (delayed-action, immediate, etc.) for each type of target (dead or living targets, ships, fortifications, vehicle parks, factories, port installations, residential areas, etc.). All possible combinations were dealt with in detailed bomb and fuse drills, and the trainees were taught to select the proper, or most effective equipment. It was not a case of "smother the enemy with explosives", but rather of achieving the highest possible degree of success with the most rational means available. The mere number of bombs released on bombardment missions flown was far less important than the requirement that the bombs released actually hit their target. In view of Allied materiel superiority, this was the only way in which the German Luftwaffe could make its operations count.

127 - This specialized aspect of training had been demanded by the Commander in Chief, Luftwaffe, in the very beginning and thus made a responsibility of every unit. See the cable message from the Reichs Air Ministry, No. 5901/41, Classified, dated 24 February 1941. Karlsruhe Document Collection.

As regards the fourth and last mission mentioned above, it should be recalled that the Luftwaffe Air Armament School, for the training of all armorer and equipment maintenance personnel, had been established at Halle at a relatively early date. The original mission of the personnel trained there was to provide the units (in peacetime as well as in wartime) with up-to-date equipment. Industry, however, in order to bring newly-developed aiming devices into use at the front as soon as possible, initiated the practice of setting up travelling staffs to convert the front units to new equipment without their having to be withdrawn temporarily from front duty. In the case of the Lotfe 7-D, whose performance opened the way to previously unexplored possibilities in offensive tactics, the Bombardment School itself organized an instructional staff to take over the task of converting the front units (at less hectic points at the front) to the new device and, at the same time, of explaining the new tactics it made possible¹²⁸.

Whenever possible, it was considered desirable that conversion to new equipment be carried out at the School, since the School had a much larger selection of training aids at its disposal and conversion, coupled with general and theoretical refresher training, could be carried out more systematically^{and} more thoroughly there.

Experience Gained

The Luftwaffe Bombardment School should have started with its training in bombardment techniques and the utilisation of the various types of bombs and fuses during peacetime; only then could it have fulfilled its most important mission -

128 - An example is the conversion to the Lotfe 7-D in the III Group, 4th Bomber Wing, in the spring of 1943 on the Crimean Peninsula. Despite the fact that conversion training was frequently interrupted by missions, the Group soon reported excellent results with the new equipment (see the War Diary of the III Group, 4th Bomber Group, Karlsruhe Document Collection).

provide the units (in practice as well as in training) with the necessary equipment. It was, however, in order to bring newly-developed training courses into use at the front as soon as possible. It is noted that the practice of setting up travelling units to convert the front units to new equipment is not their having to be withdrawn completely from front duty. In the case of the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th, 59th, 60th, 61st, 62nd, 63rd, 64th, 65th, 66th, 67th, 68th, 69th, 70th, 71st, 72nd, 73rd, 74th, 75th, 76th, 77th, 78th, 79th, 80th, 81st, 82nd, 83rd, 84th, 85th, 86th, 87th, 88th, 89th, 90th, 91st, 92nd, 93rd, 94th, 95th, 96th, 97th, 98th, 99th, 100th, 101st, 102nd, 103rd, 104th, 105th, 106th, 107th, 108th, 109th, 110th, 111th, 112th, 113th, 114th, 115th, 116th, 117th, 118th, 119th, 120th, 121st, 122nd, 123rd, 124th, 125th, 126th, 127th, 128th, 129th, 130th, 131st, 132nd, 133rd, 134th, 135th, 136th, 137th, 138th, 139th, 140th, 141st, 142nd, 143rd, 144th, 145th, 146th, 147th, 148th, 149th, 150th, 151st, 152nd, 153rd, 154th, 155th, 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to evaluate the hitting effectiveness of the bomber forces and to develop ways and means of improving it. An early start would also have served to meet the later requirement for a corps of instructors uniformly trained in their subject matter and in the methods of its dissemination. After all, it was a matter of seeing that the bombs, the chief weapon of the bomber forces, reached their intended destination.

And when the Bombardment School was finally established, in 1939, it was with insufficient personnel and equipment - a result of the prevailing lack of recognition of its importance and of the urgency of its mission. In reality, it should have been assigned a first-class instructional staff, up-to-date equipment, and a large airfield so equipped as to make it invulnerable to weather conditions and thus available for lengthy training periods (for training in high-altitude bombardment). Unfortunately, however, there were a number of policy-making agencies in which an understanding for the real importance of horizontal bombardment was sadly lacking¹²⁹.

In conclusion, it can be said that the work of the Bombardment School did have a beneficial influence on the training program as a whole in that it provided instructional personnel well-trained in bombardment techniques and in the use of the various types of bombs and fuses. Training in these subjects was carefully planned and coordinated and, as a result, the results achieved in the units grew progressively better.

The success of the instructional group, however, was possible only in the light of the work accomplished by the experimental group (theory of bombardment, design and development of bomb sights).

The School remained in existence until the end of the war¹³⁰.

129 - According to Major Taubert, commander of the instructional group, General - oberst Udet, then Quartermaster General of the Luftwaffe, directed the following statement to him on the occasion of a conference at the Reichs

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129 - (cont'd) Air Ministry during the summer of 1941: "Don't tell me you're still worrying about that funny bomb sight for horizontal bombardment - the dive-bomber is the only way to hit the target!"

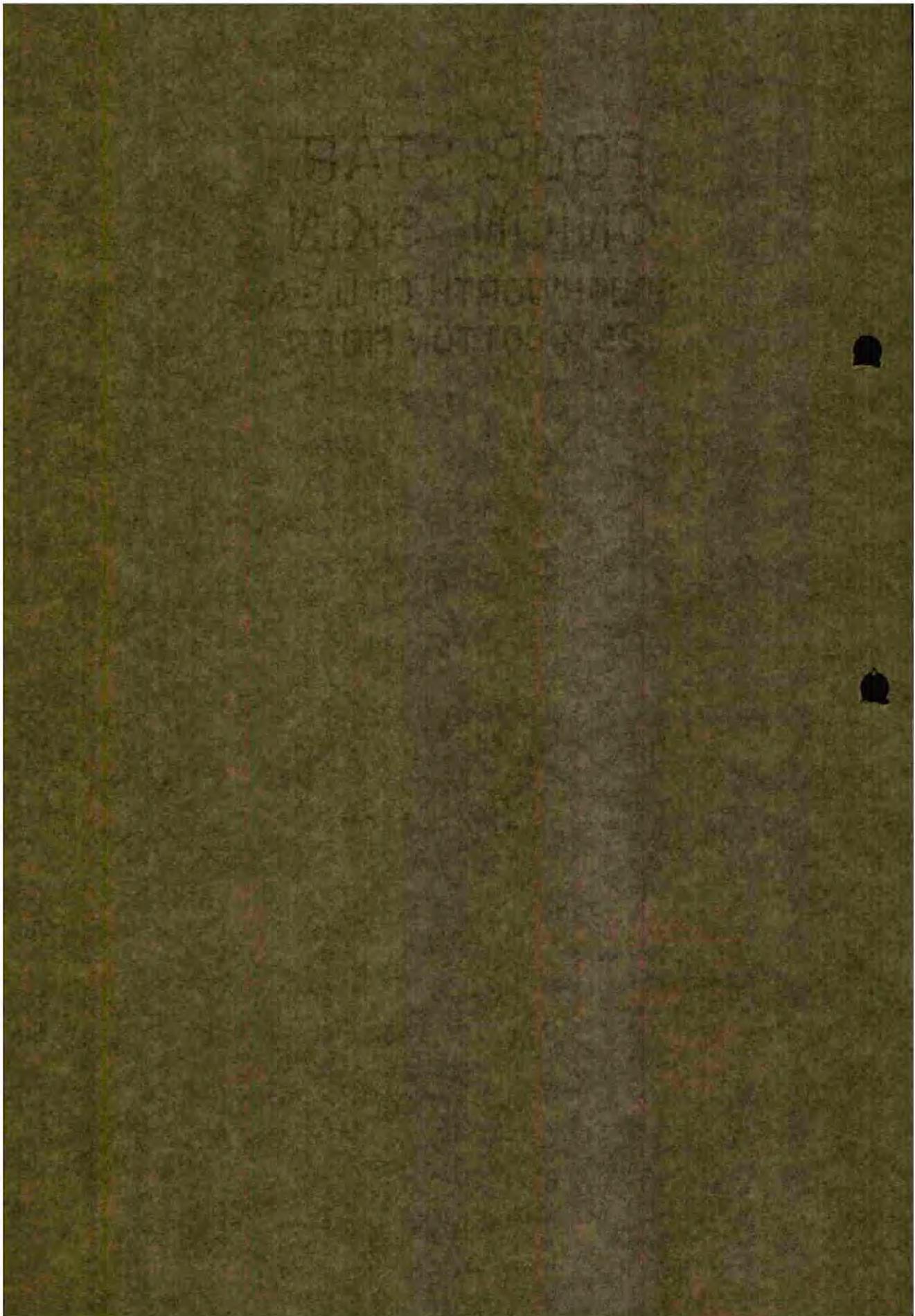
130 - See Appendix 30.

FOUR STAR

DRUM SKIN

SOUTHWORTH CIRCLE

228-01101



d. Training at the Luftwaffe Aerial Photography School (Fliegerbildschule der Luftwaffe)¹³¹

There is no need to point out the decisive importance of aerial photography in the conduct of aerial warfare. It was recognized by the German Luftwaffe from the very beginning. For this reason, the Aerial Photography School at Hildesheim was one of the first to be established, on 1 October 1935.

Its missions were the following:

- aa) Training of aerial photography personnel for the entire Luftwaffe as well as for those Army and Navy staffs which had need of such personnel;
- bb) Training of German and foreign officers in aerial photography;
- cc) Testing of photographic equipment, processing equipment, and processing methods; experimental work in connection with equipment, photochemical and technical processes;
- dd) Supervision of camouflage activities; and
- ee) Employment in enemy-occupied territory to take aerial photographs needed for terrain evaluation and artillery surveying.

The diversity of the missions facing aerial photography trainees required a diversified program of training from the very beginning. Students had to become familiar with a large number of different fields: photography, interpretation of aerial photographs, handling and storage of required equipment and materials.

131 - The data contained in this subsection are based on a report by Generalmajor a.D. Eberhard Fischer, "Fliegerbildschule Hildesheim" (Aerial Photography School at Hildesheim). Karlsruhe Document Collection.

...from the very beginning, the aerial photography ...

School of Aeronautics was one of the first to be established, on 1 October 1915.

The aircraft were the following:

(a) Training of aerial photography personnel for the entire military as well as for those Army and Navy units which had used it in the past.

(b) Training of personnel and development of aerial photography.

(c) Testing of photographic equipment, measuring equipment, and processing methods; experimental work in connection with equipment, photographic and technical processes.

(d) Organization of technical activities and

(e) Development of aerial photography for the Army and Navy.

...for aerial photography and aerial photography.

The activity of the military aerial photography schools required a diversified program of study from the very beginning. Students had to become familiar with a large number of different fields: photography, meteorology, of aerial photography, handling and storage of technical equipment and materials.

... - The data contained in this subsection are based on a report by Commander ...

... (Aerial Photography) ...

... (Aerial Photography) ...

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As regards the first of the above missions, immediately after completion of a brief introduction to photography, the students began their practical training, for this was the best way for them to learn from the mistakes they were bound to make in the beginning. Their training included work in the dark-room. The handling of films taken under risk of danger and death and frequently irreplaceable taught them the need for painstaking care in processing such material.

Interpretation and calibration were the next steps. Systematic mastery of the methods involved was necessary before the trainees could progress to evaluation in terms of strategical or tactical points of view. Effective evaluation, a science which became more and more specialized as the war continued, required not only aerial photographs of the target but photographs taken on the ground as well (in the case of industrial plants and port installations, for example). The calibration of aerial photographs required the most accurate and painstaking work; a mistake here could have devastating effects.

In addition to the personnel intimately concerned with aerial photography, the School was responsible for training the personnel whose job it was to care for the very valuable equipment and to repair minor defects and damages. Maintenance personnel of this category were also in charge of installing the photographic equipment with all its supplementary instruments and complicated electrical wiring. Perfect mastery in the installation of such equipment in front-type aircraft was unfortunately never attained, for the simple reason that the School, despite repeated requests, was never assigned a front-type aircraft for training purposes. It had to be satisfied with the sporadic loan of such aircraft for a few

being to make in the beginning. Their training included work in the laboratory.

The handling of films under water was a major and difficult task. It was possible to get them the need for maintaining care in processing such material.

Interpretation and calibration were the next steps. Systematic study of the methods involved was necessary before the training could progress to evaluation in terms of practical or tactical points of view. Missions evaluation, a balance which became more and more specialized as the war continued, required not only aerial photographs of the target but photographs taken on the ground as well (in the case of industrial plants and port facilities, for example). The calibration of aerial photographs required the most accurate and painstaking work. A mistake here could have devastating effects.

In addition to the personal initiative concerned with aerial photography, the school was responsible for training the personnel whose job it was to take for the very valuable equipment and to repair minor defects and damages. Maintenance personnel of this category were also in charge of installing the photographic equipment with all its supplementary instruments and components in aircraft wings. Further training in the installation of such equipment in front-type aircraft was unfortunately never obtained, for the simple reason that the school, despite repeated requests, was never assigned a front-type aircraft for training purposes. It had to be satisfied with the generic form of such aircraft for a few

days at a time.

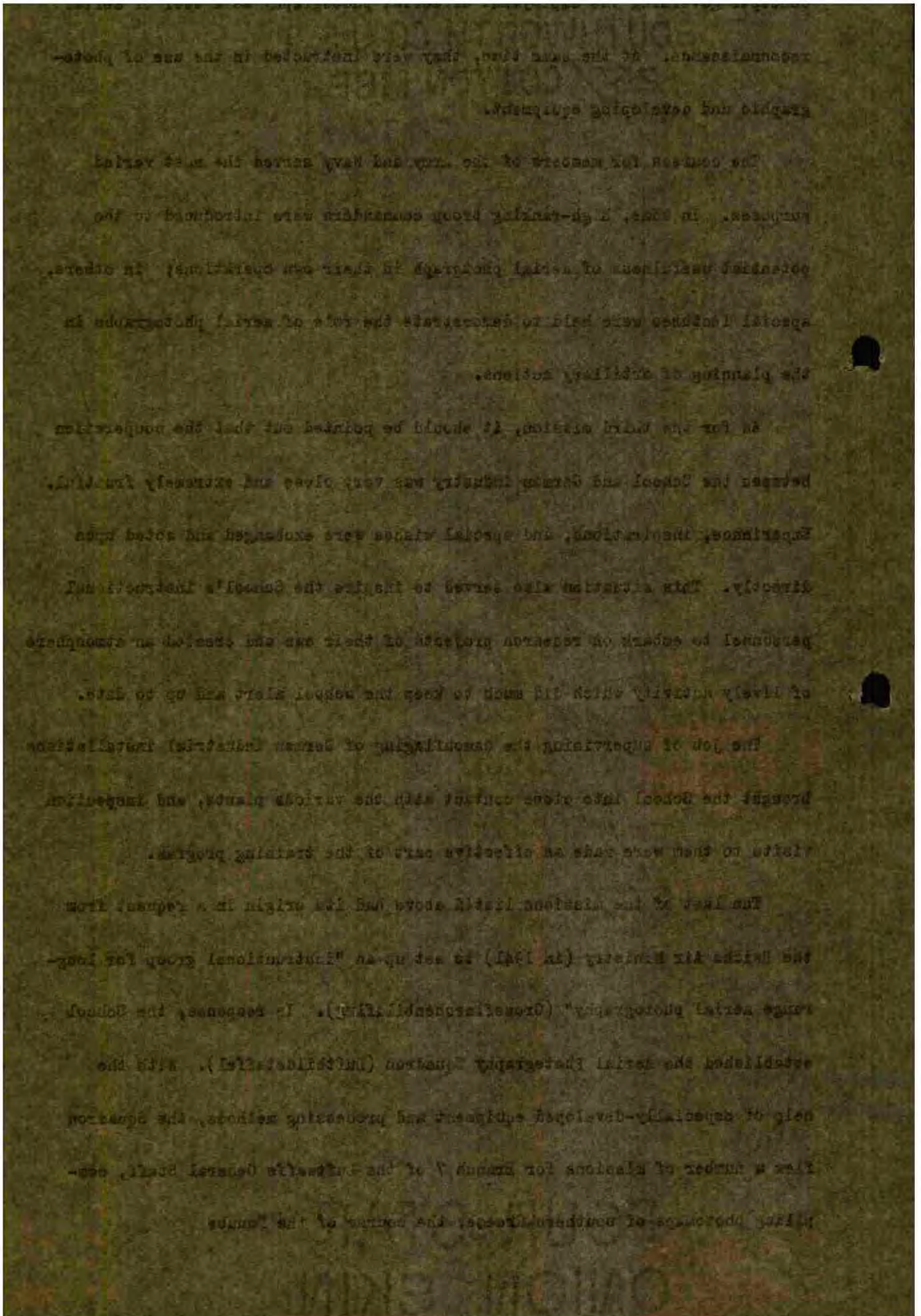
In connection with the second mission, above, foreign officer personnel were trained in short-term courses designed to familiarize them with German concepts governing the employment of aerial photography as a tool of aerial reconnaissance. At the same time, they were instructed in the use of photographic and developing equipment.

The courses for members of the Army and Navy served the most varied purposes. In some, high-ranking troop commanders were introduced to the potential usefulness of aerial photograph in their own operations; in others, special lectures were held to demonstrate the role of aerial photographs in the planning of artillery actions.

As for the third mission, it should be pointed out that the cooperation between the School and German industry was very close and extremely fruitful. Experience, inspirations, and special wishes were exchanged and acted upon directly. This situation also served to inspire the School's instructional personnel to embark on research projects of their own and created an atmosphere of lively activity which did much to keep the school alert and up to date.

The job of supervising the camouflaging of German industrial installations brought the School into close contact with the various plants, and inspection visits to them were made an effective part of the training program.

The last of the missions listed above had its origin in a request from the Reichs Air Ministry (in 1941) to set up an "instructional group for long-range aerial photography" (Grossflaechenbildflug). In response, the School established the Aerial Photography Squadron (Luftbildstaffel). With the help of especially-developed equipment and processing methods, the Squadron flew a number of missions for Branch 7 of the Luftwaffe General Staff, compiling photomaps of southern Greece, the course of the Danube



at the Iron Gate, Tripolitania and Cyrenaica (for Feldmarschall Rommel's offensive), certain areas in the East, in Finland, and along the Vistula River.

The Courses and Their Objectives

Courses For Photographers (Officer-Rank)

The ultimate goals of these courses depended in part on the participants, who might be General Staff officers, on the one hand, or officers with purely technological interests, on the other hand. The School required that a photography officer, in addition to mastering the professional aspects of his job, be sufficiently schooled in tactics to be able to grasp the thinking of his superior headquarters, for only then could he be relied upon to make the best possible use of the means at his disposal. Unfortunately, no effort was made to enforce this requirement until 1943, after a map exercise held at the School had clearly demonstrated the lack of tactical understanding on the part of some of the officers who participated.

Courses For Enlisted Personnel

The objective of these courses was to produce photography personnel capable of working quickly and accurately in accordance with specific instructions. Training in new developments and new professional requirements augmented the basic subject material as time went on, but there was no change in the original goal.

These courses were also made available to the Luftwaffe Women's Auxiliary (Luftwaffenhelferinnen), whose members proved to be invaluable in relieving male personnel on the home front for assignment elsewhere.

The primary focus of these courses is placed on the participants
 and the right to general staff officers. On the one hand, on the other hand,
 technological interests in the other hand. The intent is to have a photo-
 graphic element, in addition to preparing the professional aspects of the job,
 to efficiently absorb in order to be able to handle the training of his
 superior counterparts, but only that could be called upon to make the best
 possible use of the nature of his command. Unfortunately, no effort is made
 to ensure that participants will be able to handle a variety of situations
 that will be encountered in the line of tactical operations on the part of
 some of the officers and personnel.

Personnel for Selected Courses

The objective of these courses is to produce professional personnel of
 high caliber, and to ensure that they are equipped with the necessary
 training in new developments and new professional requirements suggested by
 the subject matter as the war on, but there was no change in the original
 goal.
 These courses were also made available to the latter part of the military
 (intermittently), those courses proved to be invaluable in training
 personnel on the part of management elements.

Courses for Non-Commissioned Officers

These courses were devoted to highly specialized training, which - in most cases - had already been begun in the units from which the participants came. Thus the emphasis here was placed on developing the student's own individual talents; the final objective was production of a non-commissioned expert capable of leading his own particular group, whatever its specialty might be (photography, interpretation, or calibration).

Courses for Technical Sergeants

The purpose of these courses was to train especially qualified non-commissioned officer personnel to assist and, if necessary, take over the work of the officer photographers. Regardless of the special aspects in which they had been trained previously, they were given comprehensive instruction in all other aspects of the over-all job.

Theoretically, both this course and the one for non-commissioned officer personnel were governed by a decree from the Reichs Air Ministry to the effect that promotion to the rank normally associated with the task to be performed was permitted only after successful completion of the training courses. During the war, unfortunately, this ruling was all too often ignored.

Selection of Trainees

The students were recruited from all branches of the Luftwaffe and, during peacetime, even from the ranks of the Army and Navy. Volunteers were given preference.

Photographer and photogrammeter candidates were required to have completed comprehensive preliminary training. Photographic experts, dark-room specialists, and qualified amateur photographers were given preference for training as photographers; surveyors, technicians, mathematicians, and draftsmen were selected for training in the evaluation and interpretation of aerial photographs.

Equipment maintenance personnel were recruited from the technical professions or from the skilled trades, particularly from among precision mechanics, opticians,

...the final objective was to determine if the non-commissioned officer...
of finding the non-commissioned officer, however it is possible that...
...interference, or withdrawal.

Course for Technical Personnel

The purpose of these courses was to train technically qualified non-com-
missioned officers personnel to assist and, if necessary, take over the work of
the other photographers. Reports of the special agents in which they had
been trained previously, they were given cover-leave instruction in all other
aspects of the over-all job.

Thereafter, both this course and the one for non-commissioned officer
personnel were governed by a course from the Bureau in which the subject
was expected to be trained normally assigned with the unit to be trained and
qualified only after successful completion of the training course. During the
war, unfortunately, this policy was not always followed.

Selection of Trainees

The students were selected from all branches of the service and...
...even from the ranks of the Army and Navy. Volunteers were given
preference.

Photographers and other technical personnel were selected to have suitable
operating and technical training. Photographic equipment, dark-room facilities,
and qualified instructors were given preference in awarding a photo-
graphic award. Technical and photographic awards were delayed for
training in the evaluation and instruction in aerial photography.

Photographic personnel were recruited from the technical schools
of the allied forces, particularly from among personnel mechanics, electricians,

and metal-workers.

Aerial photography training was by no means popular among officer personnel, since - for younger active officers especially - promotional opportunities were extremely restricted. Thus, most of them were eager to get out of the field as soon as they could.

Length of Training and Number of Students

Both of these factors were subject to constant change as a result of the exigencies of the military situation, since both were dependent upon the current personnel needs in the field. Another decisive factor was the size of the school and the adequacy of the available training facilities. Originally, a capacity of 200 trainees was planned; during the war this number was often doubled.

In general, the courses had the following duration:

- enlisted personnel - 6 months
- non-commissioned officer personnel - 4 months
- technical sergeant personnel - 3-4 months
- officer personnel - 4 months.

In each case, the duration given above represented the absolute minimum necessary if well-qualified personnel was to be placed at the disposal of the units at the front.

Course of Training and Subject-Matter Covered

There is little point in our presenting a detailed description of the training schedule followed for each individual course¹³²; only the so-called photography shop practice need be examined in greater detail, inasmuch as it represented the final phase of training.

132 - See the appendices included in the study by Generalmajor Fischer (op.cit.).

now as they exist.

Length of Training and Number of Students

Both of these factors were subject to constant change as a result of the expansion of the military situation, since both were dependent upon the current personnel needs in the field. Another decisive factor was the size of the school and the adequacy of the available training facilities. Originally, a majority of COG training was planned, during the war, to be under two or three months.

In general, the courses had the following duration:

enlisted personnel - 6 months

non-commissioned officer personnel - 4 months

technical support personnel - 7-9 months

officer personnel - 4 months.

In each case, the duration given above represented the absolute minimum necessary in well-qualified personnel was to be trained at the disposal of the unit at the front.

Course of Training and Subjects Taught

There is little point in our presenting a detailed description of the training courses followed for each individual course, since the so-called "practical" training must be carried in greater detail, inasmuch as it represents the final phase of training.

12 - See the appendixes included in the study of "Continuity of Training" (p. 12).

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into

These shop sessions were designed to put/practice (under simulated front conditions) the knowledge acquired in the classroom and laboratories. Within the framework of a given tactical situation, a squadron photography station was set up in a suitable building in the vicinity of the school, or - as was often done - the participants were housed in tents, with motor vehicles, railway cars, and dark-room tents serving as shops for the technical aspects of the mission. The exercise began with the transport of equipment and materials in strict accordance with prepared loading and unloading schedules. The temporary station then had to be integrated into the local transport and communications networks. Films intended for combat reconnaissance purposes were developed and interpreted immediately in a photo laboratory truck located near the drop point utilized by reconnaissance aircraft; those intended for long-range reconnaissance projects were processed at the local photography station.

All the tasks making up the exercise were assigned to student personnel; not even the officers participating in the officer courses were spared. The exercises, running day and night, presented a fairly accurate picture of the difficulties trainees could expect to encounter in the field and thus were of great pedagogical value. It was extremely important, of course, that the school be supplied with all applicable regulations, with instructional materials, and with equipment, and on the whole this aspect of the program was adequately carried out. Ideally, of course, the students ought to have become familiar with all the various types of equipment which they might later be called upon to operate, and in this respect the school was sometimes unable to fulfill its responsibility due to the fact that it simply did not have the most up-to-date models.

The Lesson of Experience

Luftwaffe leaders were rather unfortunate in their choice of a location for the Aerial Photography School in that Hildesheim, lying at the edge of the north

Other than - the specimens were placed in bags, with cover valves, with
 was used, and specimens were examined as they were for the chemical aspects of
 the material. The analysis began with the analysis of elements and materials
 in order to determine the presence of lead, and including conditions. The
 laboratory station used had to be investigated into the local structure and com-
 position of the material. This material was used for several experiments which were
 developed and interpreted immediately in a whole laboratory, which involved many
 the group of the laboratory of the material. These included for long
 some experimental projects and processes at the local laboratory station.
 All the data relating to the exercises were assigned to student personnel.
 not even the officers participating in the other courses were spared. The
 exercises, running day and night, presented a fairly complete picture of the
 different processes which could be encountered in the field and that was of
 great pedagogical value. It was extremely important, of course, that the subject
 be supplied with all applicable regulations, with instructional materials, and
 with equipment, and on the whole this aspect of the program was thoroughly
 carried out. In fact, of course, the students ought to have become familiar
 with all the various types of equipment which were used in a field station
 to conduct, and in this respect the school was equipped to fulfill the
 responsibility, and so the fact that it might have been a great up-to-date
 material.

The Search of Minerals

Before the lesson was given, instructions in their choice of a location for
 the local geology school in that field station, lying at the edge of the mountain

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German plain right at the foot of the mountains rising to the south, was subject to heavy fogs, especially in spring and fall, and this often interfered with the flight duty incidental to training. The officers in the photographers' course were at a particular disadvantage in this respect.

We are justified in assuming that the training program, governed by the guidelines set up in the beginning, was effective, for the performance of aerial photography personnel earned consistent praise throughout the war from both the troops and their command staffs.

There were certain delays in keeping the school supplied with material for interpretation and evaluation, since the Aerial Photography Branch (Abteilung Luftbild) of the Reichs Air Ministry refused to permit the school to receive such material directly from the front units but required its distribution through the Central Aerial Photography Office (Hauptbildstelle) of the Ministry. Consequently, reconnaissance results did not arrive at the school until weeks, and sometimes months, after the observations had been made. This was hardly in the best interests of the training program.

It would have been extremely helpful if the school had had a qualified officer at its disposal to instruct its officer trainees in tactics, but unfortunately none could be spared once the war got under way.

Aircraft Maintenance Group (Flugzeuggruppe)

In order to carry out its training program, the school had at its disposal a number of single-engine and multi-engine aircraft, among them the Ju-52, which were used as a flying classroom. Although these aircraft were adequate in number they left much to be desired in respect to type, for they included only a very few of the most modern models. As a result, the school always lagged behind the actual conditions at the front.

The first step in carrying out the program was to determine the needs of the students. This was done by conducting a survey of the students and their parents. The survey was conducted in the form of a questionnaire and was distributed to the students and their parents. The questionnaire was designed to determine the students' needs and interests in the program. The results of the survey were used to develop the program.

The program was developed to meet the needs of the students and their parents. It was designed to provide the students with a variety of activities and experiences that would be of interest to them. The program was also designed to provide the students with a variety of opportunities to learn and grow.

The program was implemented in the form of a series of activities and experiences. These activities and experiences were designed to be of interest to the students and to provide them with a variety of opportunities to learn and grow. The program was also designed to be flexible and to be able to be adapted to the needs of the students.

The program was evaluated to determine its effectiveness. This was done by conducting a survey of the students and their parents. The survey was designed to determine the students' satisfaction with the program and to determine the program's impact on the students. The results of the survey were used to evaluate the program and to make any necessary adjustments.

The program was found to be effective in meeting the needs of the students and their parents. It was found to provide the students with a variety of activities and experiences that were of interest to them. The program was also found to provide the students with a variety of opportunities to learn and grow.

The program was also found to be flexible and to be able to be adapted to the needs of the students. This was done by conducting a survey of the students and their parents. The survey was designed to determine the students' satisfaction with the program and to determine the program's impact on the students.

The program was found to be effective in meeting the needs of the students and their parents. It was found to provide the students with a variety of activities and experiences that were of interest to them. The program was also found to provide the students with a variety of opportunities to learn and grow.

The school had its own aircraft maintenance shop, where any minor repairs could be carried out by school personnel. This obviated the necessity of disrupting established flight schedules to permit the airfield to be utilized by outside repair and maintenance units.

The End of the Aerial Photography School

Enemy bombardment, growing steadily more intensive after 1943, was a continuing source of interruption for the training activity at Hildesheim.

In an attempt to improve the situation, the photographers' courses were transferred to Goslar in 1944¹³³, while all available vehicles, such as photo laboratory trucks and motorized columns, were mobilized at Hildesheim to permit continued instruction. In this way, training activity was carried on - though somewhat less than adequately at times - until Hildesheim fell into American hands.

e. Training in the Luftwaffe Navigation School (Navigationsschule der Luftwaffe)¹³⁴.

As we have already stated, the Luftwaffe Bombardment School, for the teaching of bombardment techniques and the operation of the various kinds of bombs and fuses, was not established until much too late, in 1939. It has also been suggested that the reason for this was the preponderance of Luftwaffe leaders who considered flying to be the first and most important concern of an air force; in their opinion, the problem was to reach the target - hitting it would come automatically.

133 - See Appendix 30, showing the organization of the staff of the General of Pilot Training as of 8 February 1945.

134 - In view of the lack of documentary material pertaining to this aspect of training, the subject can be dealt with here only superficially. Most of the data are based on the personal experience of the author.

The role of the Central Intelligence Agency

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... the report can be dealt with more fully approximately ...

... of the data are based on the personal experience of the author.

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This stress on flying naturally led to early recognition of the important role played by air navigation. The Luftwaffe Navigation School was established as early as 1 April 1936 at Anklam.

At this school, qualified commissioned and non-commissioned officers who had already completed training at one of the standard observer schools were given specialized advanced instruction in navigation to fit them for assignment as instructors and assistant instructors in that field.

For the most part, the instructional staff was made up of experienced navigator personnel, including a number of Navy navigators. All the latter had their captain's commission and were thoroughly familiar with the principles of terrestrial navigation, compound navigation, and radio navigation.

The Navigation School trained instructors and assistant instructors for all the Luftwaffe schools which had anything to do with flight duty, viz:

Flight training schools of the A/B, C, and instrument flight categories;

Bomber schools;

Radio Schools;

Aerial gunnery schools (after 1939);

Aerial reconnaissance schools;

Fighter schools;

Flight instructors' school (after 1939);

Air academies;

etc.

At the same time a great deal of attention was paid to continued navigational training in the active units, particularly in the bomber units. Each group appointed a navigation officer, whose task it was to supervise the navigational training given in the squadrons, to see that the crews were kept up to date, and to make sure that his group was trained in the most modern developments in the field of navigation.

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It is interesting to note that navigational training, from the very beginning, was carried out in accordance with uniform guidelines.

On 1 April 1939, the Navigation School was moved to Strausberg to make room for the new Bomber School at Anklam.

As the war progressed, the Navigation School received repeated requests for an increase in its program of instructor training. At the same time, new developments in the field and occasional shifts in training emphasis served to intensify the demands made upon it.

For missions ranging more than 620 miles, radio navigation was no longer adequate since the effective range of a radio beacon for direction-finding purposes was no more than 375 miles. Accordingly, perfect mastery of the techniques of compound navigation was emphasized as an indispensable requirement of the air navigator.

There was still another method of guiding an aircraft to its destination - celestial navigation, which had been advocated even before the beginning of the war and which was taught in theory at the Navigation School¹³⁵.

As the war progressed, the Navigation School was able to put this theoretical training into practice in long-range missions over the Atlantic (40th Bomber Group) and the Mediterranean. Unfortunately, however, the necessary observations and computations required so much space that it was practically impossible to find room for all the equipment in an aircraft designed for employment at the front, such as the Ju-88 for example¹³⁶.

135 - See Luftwaffe Service Manual 54, "Die Navigationsausbildung" (Navigational Training), Berlin, 1938. Karlsruhe Document Collection.

136 - As evidenced by a report of the 1st Training Wing, Branch I, Navigation, No. 1474/41, Classified, dated 20 September 1941. Karlsruhe Document Collection.

As the war progressed, the navigation school received requests for
 an increase in the number of instructors. At the same time, new develop-
 ments in the field and occasional crises in training suggested a transfer
 of the training from the school to the field.

The training was transferred to the field in 1942. The school was no longer
 adequate since the effective range of a radio beacon for direction-finding pur-
 poses was no more than 25 miles. Accordingly, a series of experiments
 of compound navigation was required as an independent requirement of the air
 navigator.

There was still another method of gaining an altitude for navigation -
 celestial navigation, which had been advocated even before the beginning of the
 war and which was taught in theory at the navigation school.

As the war progressed, the navigation school was able to put the theoretical
 training into practice in long-range missions over the Atlantic (40th Parallel
 Group) and the North Atlantic. Unfortunately, however, the necessary observations
 and computations required to use such a method were practically impossible to
 the crew for all the equipment in an aircraft designed for operations at the
 time, such as the B-24 for example.

1) - See "The German Navy's 'Das Navigationsschulung' (Navigation School)
 (Trinidad), Berlin, 1938. Karl's document collection.

2) - As evidenced by a report of the 1st Training Wing, Group I, Navigator,
 No. 11744, classified, dated 20 September 1941. Karl's document 501-
 14744.

In addition to these training missions which the Navigation School undertook in behalf of the entire Luftwaffe, there were also special assignments, such as target location training for certain specified units. Examples of the latter were the training of the I Group, 66th Bomber Wing, for its part in the operations of the IX Air Corps against England and the training of the II Group, 4th Bomber Wing, for the role it was scheduled to play in the operations of the IV Air Corps on the middle sector of the Eastern front in 1944. In the last instance, the Group was assigned to Straussberg for special training from 29 December 1943 until 20 January 1944. All the crews were given thorough refresher training in compound and radio navigation, as well as a brief course in celestial navigation¹³⁷.

Target location training, however, which involved practice in the use of flares and other ground illumination devices, interfered too greatly with normal training activity at the School, and at the end of 1944 the entire target location training program was moved to the Bombardment School at Greifswald¹³⁸.

The Luftwaffe Navigation School fulfilled its training responsibilities in an exemplary manner and was highly successful in its program to standardize the training of all instructional personnel in the field. It remained in existence until the end of the war¹³⁹.

f. Training in the Luftwaffe Gunnery School (Schiesschule der Luftwaffe)¹⁴⁰

Like the Luftwaffe Bombardment School, the Luftwaffe Gunnery School was set up relatively

137 - The reader is referred to "Das K.G.4 im Kriege" (The 4th Bomber Wing during the War), Karlsruhe Document Collection.

138 - See Subsection c, above.

139 - See Appendix 50, showing the organization of the staff of the General of Pilot Training as of 8 February 1945.

140 - In view of the lack of documentary material pertaining to this aspect of training, the subject can be dealt with here only superficially. Most of the data are based on the personal experience of the author.

in the operations of the IV Air Corps during the training of the
 II Group, 4th Bombardment Wing, for the role it was scheduled to play in the opera-
 tions of the IV Air Corps on the middle sector of the Western Front in 1944.
 In the last instance, the Group was assigned to demonstrate for special training
 from 29 December 1943 until 30 January 1944. All the crews were given thorough
 refresher training in compound and radio navigation, as well as a brief course
 in celestial navigation.
 Target location training, however, which involved practice in the use of
 flares and other ground illumination devices, involved too greatly with
 normal training activity at the school, and at the end of 1944 the entire target
 location training program was moved to the bombardment school at Greatswale.
 The Luftwaffe navigation school fulfilled its training responsibilities
 in an exemplary manner and was highly successful in its program to standardize
 the training of all instructional personnel in the field. It remained in
 existence until the end of the war.
 2. Training in the Luftwaffe Bombardment School, the Luftwaffe Gunnery School
 was set up relatively
 137 - The reader is referred to "The Luftwaffe in History" (The 4th Bomber Wing
 during the War), Luftwaffe Document Collection.
 138 - see subsection c, above.
 139 - see Appendix 50, showing the organization of the staff of the Gunnery
 or Pilot Training as of 6 February 1945.
 140 - In view of the lack of documentary material pertaining to this aspect
 of training, the subject can be dealt with here only superficially. Most
 of the data are based on the personal experience of the author.

late - too late in fact -, in 1941 at Vaerloese in Denmark.

Its purpose was twofold: the training of single-engine fighter pilots on the one hand and of airborne gunner personnel on the other.

In view of the growing significance of the fighter pilot's role in home air defense operations and the consequent urgent demand for more effective airborne armaments and improved gunnery methods and in consideration of the fact that the School was in charge of testing newly-developed airborne armaments and ammunition, it was placed under the jurisdiction of the Inspectorate for the Fighter Forces (General of the Fighter Forces). As far as troop welfare and administration were concerned, it was attached to the 4th Air Division (Training) (4. Flieger-Schuldivision)¹⁴¹, not a very satisfactory arrangement, since the relationship between the School and the Division was never really defined clearly and unequivocally.

The mission of the Gunnery School was to test new developments in the field of aerial gunnery, including those applicable to the fighter forces. Thus, it worked closely with the weapons and ammunition development offices of the Luftwaffe Testing Station (Erprobungsstelle der Luftwaffe) and with the industrial plants concerned.

The School also held regular two to three week courses for the fighter instructors of the 4th Air Division, in which the principles of aerial gunnery, the types of weapons and ammunition and their proper employment, the methods of offensive aerial combat, etc. were drilled, repeated, or introduced for the first time, as applicable.

The second, but no less important mission of the School was the training of instructors and assistant instructors for duty with the aerial gunnery training program.

The aerial gunners, including the airborne radio operators, had received their training at the bomber schools or at other

air defense operations and the conduct of urgent demands for more effective air
of the armaments and improved gunnery methods and in consideration of the fact
that the school was in charge of training newly-developed airplane mechanics
and ammunition, it was placed under the jurisdiction of the Inspector for
the lighter forces (General of the lighter forces). In fact as a troop warfare
and administration were concerned, it was attached to the 4th Air Division
(Training) (H. N. Inspector-Subdivision) and a very satisfactory arrangement,
since the relationship between the school and the division was never really
defined clearly and unequivocally.

The mission of the Gunnery School was to test and develop in the
field of aerial gunnery, including those aspects applicable to the lighter forces.
This, it worked closely with the weapons and ammunition development office
of the Institute for the Development of Aerial Gunnery (IAGD) and also the
Industrial plants concerned.

The school also held regular two to three week courses for the lighter
forces of the 4th Air Division, in which the principles of aerial gunnery,
the types of weapons and ammunition and their proper employment, the methods
of offensive aerial combat, etc. were drilled, repeated, or rehearsed for
the first time, as applicable.

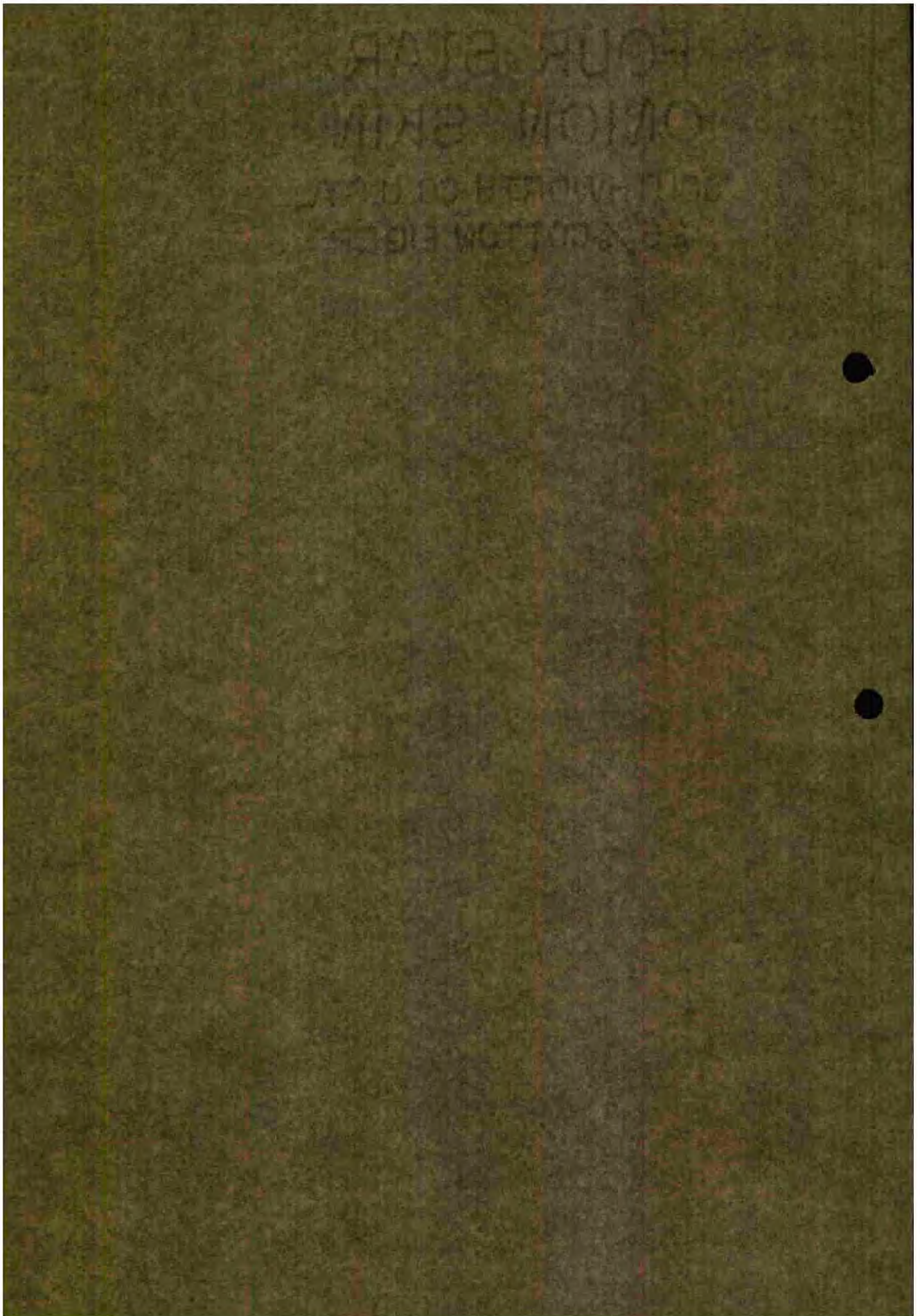
The second, but no less important mission of the school was the training
of instructors and assistant instructors for work with the aerial gunnery train-
ing program.

The central gunnery, including the airplane radio operators, had received
their training at the bomber school or at other

265-a

141 - See Generalleutnant Gerd von Massow, "Die Jagdfliegerausbildung in der ehemaligen Deutschen Luftwaffe 1925-1945" (Fighter Training in the Former German Luftwaffe, 1925-1945), Karlsruhe Document Collection.

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Luftwaffe ordnance branch schools prior to the war, and had been assigned from the schools directly to the active units.

During the course of 1939, the aerial gunnery schools (Bordschuetzen-schulen) at Bug, on the island of Ruegen, and at Rahmel were set up and successful completion of their courses made a prerequisite for all aerial gunner personnel prior to their enrollment at a special branch school (bomber school, reconnaissance school, etc.). At the special schools, they were assigned to aircraft crews and transferred to the front units, or rather to the replacement groups of the front units, where they were given advanced training prior to being employed in actual missions at the front.

The Battle of Britain had given eloquent testimony to the vulnerability of the German bomber aircraft, and this vulnerability was not only the result of inadequate airborne armaments but also of poor aerial gunnery,

Consequently, training had to be improved. One step in this direction was taken in 1941, when all gunnery instructors from the schools and from the personnel replacement groups of the active units were assembled at the Luftwaffe Gunnery School and given an intensive refresher training course. In addition to theoretical instruction, they were schooled in the proper preparation, supervision, and evaluation of gunnery practice sessions. For this purpose the School had constructed a number of models illustrating typical fighter approach positions, and these were used in the instructor training sessions with such success that most of the schools and replacement groups copied them later on on their own gunnery practice ranges¹⁴². This new and intensive training approach soon began to make itself felt in the front units in the form of steadily improving gunnery performance.

142 - The construction of practice ranges of this kind required a great deal of work. Whenever a training unit was transferred, one of its first worries was to set up its gunnery range as soon as possible so that there would be no break in training activity (based on the author's own experience).

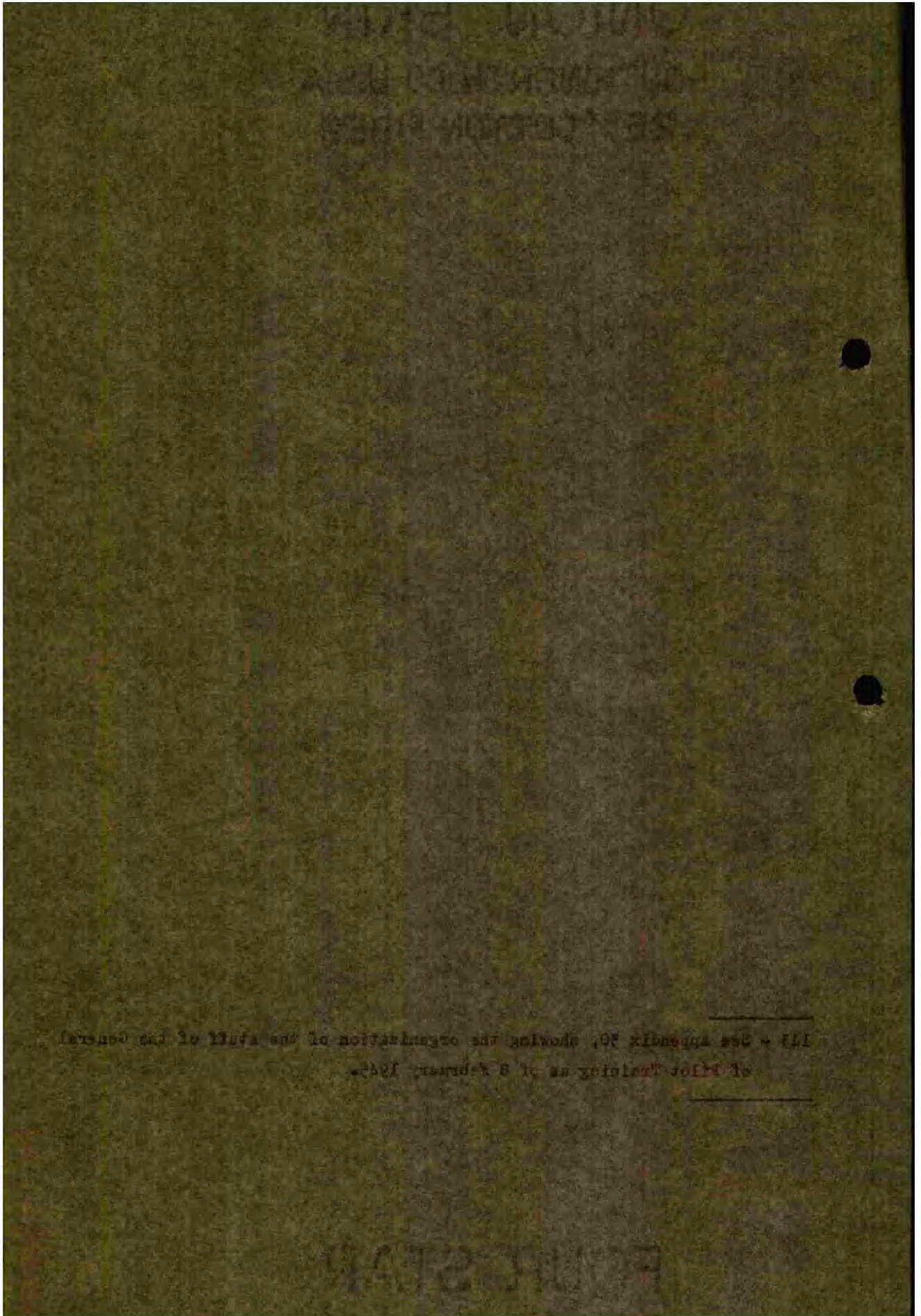
The completion of their courses made a prerequisite for all special Gunner personnel prior to their enrollment at a special branch school (number school, reconnaissance school, etc.). At the special schools, they were assigned to special groups and transferred to the front units, or rather to the replacement groups of the front units, where they were given advanced training prior to being employed in actual positions at the front.

The Battle of Britain had given abundant testimony to the vulnerability of the German bomber force, and this vulnerability was one of the results of inadequate airborne equipment and size of bomber formations. Consequently, training had to be improved. One step in this direction was taken in 1941, when all primary instructors from the schools and from the personnel replacement groups of the active units were assembled at the Luftwaffe Gunner School and given an intensive refresher training course. In addition to theoretical instruction, they were schooled in the proper presentation, observation, and evaluation of gunner practice sessions. For this purpose the school had constructed a number of models illustrating typical fighter approach positions, and these were used in the instructor training sessions with such success that most of the schools and replacement groups copied them later on in their own gunner practice courses. This was the intensive training approach soon begun to replace itself in the front units in the form of steadily improving gunner performance.

The construction of practice ranges of this kind required a great deal of work, however, and was transferred, one of the first written was to get the Gunner crews as soon as possible so that there would be no break in training activity (based on the author's own experience).

Despite its late beginning, the Luftwaffe Gunnery School was considered so vitally important that it was kept in operation until the very end of the war, whereas a number of other schools were closed prior to that time¹⁴³.

143 - See Appendix 30, showing the organization of the staff of the General of Pilot Training as of 8 February 1945.



CHAPTER IV

CRISES IN THE TRAINING PROGRAM

Section 1. Prior to the Outbreak of World War II.1. Crisis Arising During the Period of Secrecy (Training in the Reichswehr), 1925 - 1932¹⁴⁴

During the Reichswehr period, crises in the field of training in general and in connection with secret flight training in particular were, for the most part, insignificant and rarely political in character. It was up to the Army and Navy Commands to cope with crises - with the help of the Minister of the Reichswehr, if necessary.

In the event of a crisis, the military leaders involved had to proceed with great caution in order not to jeopardize the secrecy under which they were operating and in order to keep the Reichstag (Parliament) from becoming involved any more deeply than was absolutely necessary. On the other hand, they were not under pressure of time and there was no danger of war threatening, so that most crises could be faced systematically and calmly and a satisfactory solution found for them.

In any event, the entire flight training organization under the Reichswehr was highly classified, so that any difficulties arising after 1925 either had to be quietly accepted by the military agencies affected or just as quietly overcome.

144 - The data contained in this subsection are based on the study by General der Flieger a.D. Felmy, Part I: "Luftfahrtausbildung in der Reichswehr vom Versailler Diktat bis Ende 1928" (Flight Training in the Reichswehr from the Versailles Treaty until the End of 1928); Part II: "Die Luftfahrtausbildung in der Reichswehr von 1929 bis zur Aufloesung von Lipezk Herbst 1933" (Flight Training in the Reichswehr from 1929 until the Disbandment of the Lipezk Station in the Fall of 1933); Part III: "Die Ausbildung von 1934 bis 1938 (Kommando der Schulen)" (Training from 1934 until 1938 (under the School Command)).

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Wehrmacht, 1933 - 1938

During the rehearsal period, crises in the field of training in general and in connection with aerial flight training in particular were, for the most part, insignificant and rarely coincided in character. It was up to the Army and Navy Commands to meet with crises - with the help of the Director of the rehearsal, if necessary.

In the event of a crisis, the military leaders involved had to proceed with great caution in order not to jeopardize the economy under which they were operating in order to keep the rehearsal (training) from becoming involved and more costly than absolutely necessary. On the other hand, they were not under pressure of time and there was no danger of war interruption, so that these crises could be faced systematically and calmly and a satisfactory solution found for them.

In any event, the active flight training organization under the rehearsal was highly specialized, so that any difficulties arising after 1938 either had to be directly accepted by the military commandants or just as quickly overcome.

IM - The data contained in this section are based on the study by General der Flieger a.D. Wehr, "Die Luftausbildung in der Wehrmacht von Versailles bis zum Ende 1938" (Flight Training in the Wehrmacht from the Versailles Treaty until the end of 1938); Part II: "Die Luftausbildung in der Wehrmacht von 1939 bis zur Auflösung von Liepzig Herbst 1939" (Flight Training in the Wehrmacht from 1939 until the end of the Liepzig Station in the fall of 1939); Part III: "Die Ausbildung von 1934 bis 1938 (Kommando der Division)" (Training from 1934 until 1938 under the Division Command).

There are two instances of genuine crises during this period:

1) The Paris Air Agreement (1926)

Illogical as it may seem, the Agreement was a severe blow to Germany's program of training sport fliers, which had come along so well since 1925, since it required the abolition of Sport Fliers, Ltd. (see Chapter I). And it was precisely the schools sponsored by this association which were doing the most to train a new generation of pilots. According to the letter of the Treaty, however, sport flying could no longer be supported in any way by the government. The German Commercial Flight School was established to take their place, but this was of no use whatsoever to the Reichswehr, at least not in the beginning.

As a result of the Paris Agreement, the training of new pilots and the activity of those already holding licenses was completely dormant in Germany until the summer of 1927, when Aviation, Ltd. was founded. Its schools, however, were not operating at full strength and effectiveness until 1928/29.

The training vacuum created by the Paris Agreement was a good-sized one for conditions at that time; based on Chapter I, Appendix 5, it can be estimated at between 400 and 500 pilots of the A-2 category. The vacuum made itself felt in 1935, when the Luftwaffe was set up, and even more later on, during the expansion of the fighter forces (see Chapter III, section dealing with the fighter forces).

During the period of the Weimar Republic, there was no way to compensate for this first crisis in the training program. Considerations of domestic policy, foreign policy, and fiscal policy were all against it. The ultimate result, of course, was a shortage of qualified squadron captains, training supervisors, and other key personnel during the early days of Luftwaffe organization and expansion.

... it required the addition of Sport Wings, Ltd. (see Chapter I) and
 it was primarily the economic sponsored by this association which was doing
 the most to train a new generation of pilots. According to the latter of
 the treaty, however, Sport Wings could no longer be supported in any way
 by the government. The German Commercial Flight School was established to
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 however, were not operating at full strength and effectiveness until 1929.

The training vacuum created by the Paris Agreement was a good-sized one
 for conditions at that time; based on Chapter I, Appendix 2, it can be
 estimated at between 400 and 500 pilots in the A-3 category. The vacuum was
 itself felt in 1925, when the Luftwaffe was set up, and even more later on,
 during the expansion of the fighter force (see Chapter III, section dealing
 with the fighter force).

During the period of the Weimar Republic, there was no way to compensate
 for the great deficit in the training program. Considerations of economic
 policy, foreign policy, and fiscal policy were all against it. The ultimate
 result, of course, was a shortage of qualified personnel, including
 instructors, and other key personnel during the early days of Luftwaffe
 organization and expansion.

There are two instances of genuine crises during this period:

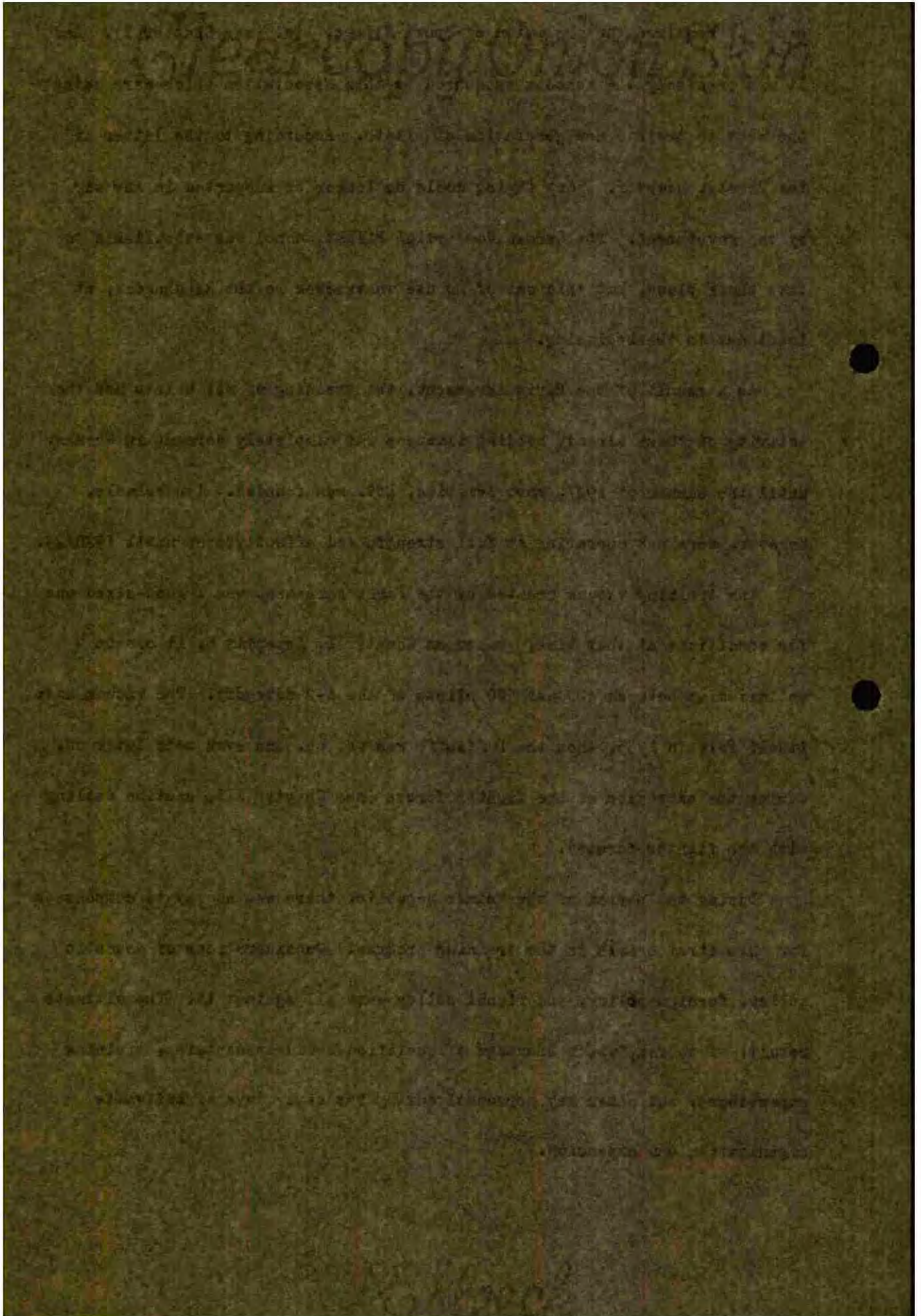
1) The Paris Air Agreement (1926)

Illogical as it may seem, the Agreement was a severe blow to Germany's program of training sport fliers, which had come along so well since 1925, since it required the abolition of Sport Fliers, Ltd. (see Chapter I). And it was precisely the schools sponsored by this association which were doing the most to train a new generation of pilots. According to the letter of the Treaty, however, sport flying would no longer be supported in any way by the government. The German Commercial Flight School was established to take their place, but this was of no use whatsoever to the Reichswehr, at least not in the beginning.

As a result of the Paris Agreement, the training of new pilots and the activity of those already holding licenses was completely dormant in Germany until the summer of 1927, when Aviation, Ltd. was founded. Its schools, however, were not operating at full strength and effectiveness until 1928/29.

The training vacuum created by the Paris Agreement was a good-sized one for conditions at that time; based on Chapter I, Appendix 5, it can be estimated at between 400 and 500 pilots of the A-2 category. The vacuum made itself felt in 1935, when the Luftwaffe was set up, and even more later on, during the expansion of the fighter forces (see Chapter III, section dealing with the fighter forces).

During the period of the Weimar Republic, there was no way to compensate for this first crisis in the training program. Considerations of domestic policy, foreign policy, and fiscal policy were all against it. The ultimate result, of course, was a shortage of qualified squadron captains, training supervisors, and other key personnel during the early days of Luftwaffe organization and expansion.



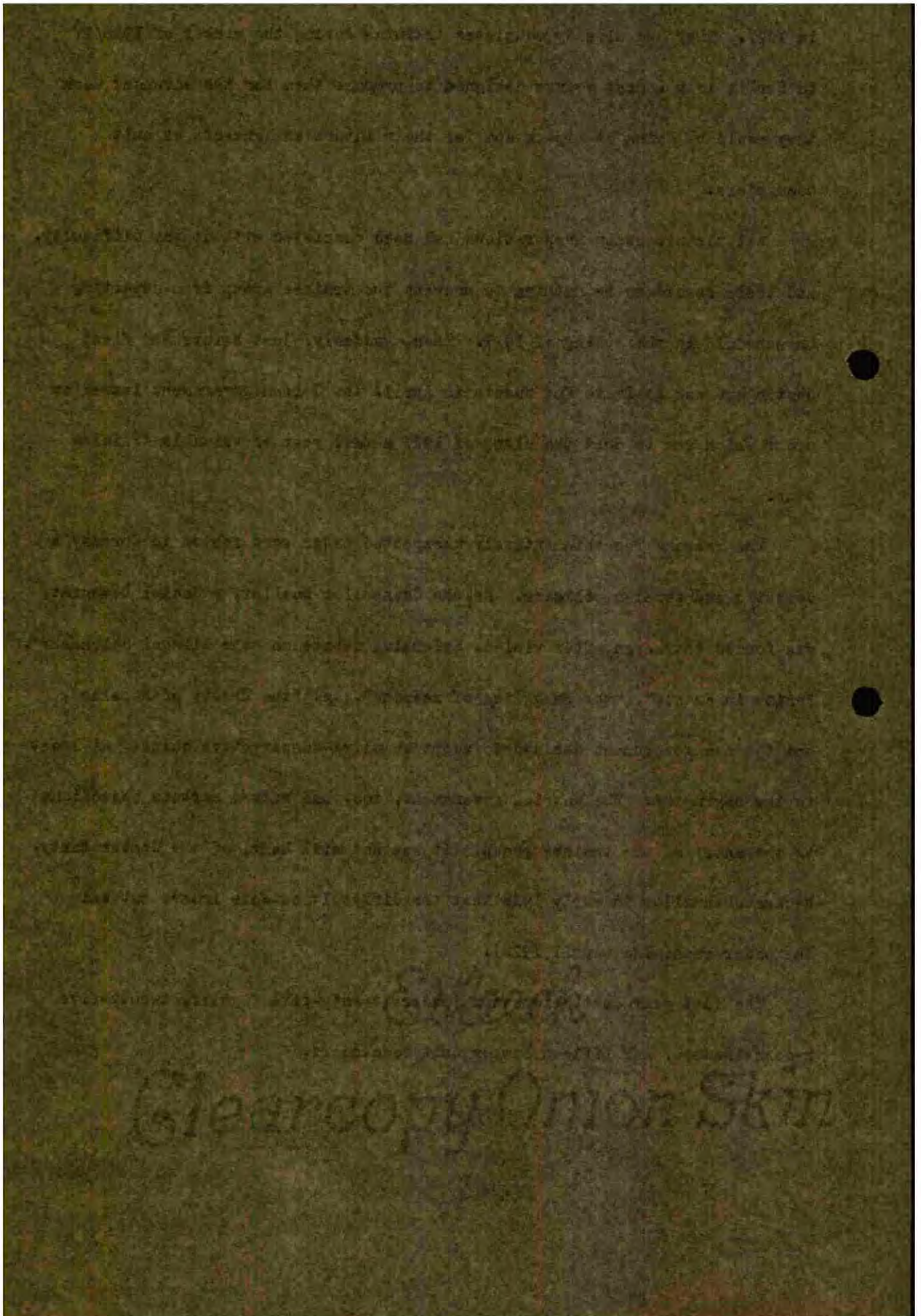
2) The Order to Stop Training at Lipsk (Class of 1927)

Approximately twenty-five fighter pilots, twenty-five reconnaissance pilots, and fifteen bomber pilots from the Officer Flight Roster (Flieger-offizierliste) were scheduled to attend the summer training course at Lipsk in 1927. They had already completed training during the winter of 1926/27 in Berlin in a secret course designed to prepare them for the advanced work they would be doing at Lipsk and for their future assignments as unit commanders.

All the necessary preparations had been completed without any difficulty, and there seemed to be nothing to prevent the trainee group from departing on schedule in the spring of 1927. Then, suddenly, just before the first contingent was to leave for Russia in April, the German government issued an order which was to cost the class of 1927 a full year of valuable training time.

The reasons for this entirely unexpected order were rooted in Germany's domestic and foreign policies. Reichs Chancellor Mueller, a Social Democrat, was forced to resign after violent Reichstag debate on "the illegal Reichswehr", "units in Russia", "the smuggling of weapons", and "the Treaty of Rapallo", and the new government decided to adopt an ultra-conservative course, at least in the beginning. The Russian government, too, had raised certain objections to the entry of the trainee group. It was not until Marx, of the Center Party, became Chancellor in early 1928 that the difficulties were ironed out and the order rescinded (April 1928).

The last year cost Reichswehr leaders twenty-five fighter, twenty-five reconnaissance, and fifteen bomber unit commanders,



all of whom could have been put to excellent use in 1935 as squadron captains, training supervisors, school commanders, etc.

The Disbandment of the Lipezk Station¹⁴⁵

The closing of the training installation at Lipezk in the fall of 1935 can be considered only a minor crisis. In the first place, it did not come as a surprise, but had been planned since 1931, and in the second place, the number of training schools in Germany was increasing steadily. Moreover, in 1931, with Germany's increasing independence in the field of aviation, the Reichswehr reached an agreement with the Reichs Ministry of Traffic whereby Reichswehr flight training could be carried out to an ever increasing degree in the Commercial Flight Schools. On the basis of this agreement, the School at Braunschweig admitted Reichswehr personnel for observer training and the one at Schleissheim for pilot training and preliminary fighter training (excluding gunnery and bombardment training, of course). These arrangements were kept secret.

Even so, the abolishment of the Lipezk Station left a certain gap in the pilot training program, a gap which cannot be expressed in terms of statistics but was there nevertheless.

2. Crises Arising During the Period of Secret Training (1933 - 1935)

With the avowed military policies of the National Socialist Party, which gained power in 1933, began a new era

145 - See Felmy, op.cit., Part II, pages 25-27, 37, and 38.

... it occurred only a minor error. In the first place, it did not come as a surprise, but had been planned since 1951, and in the second place, the number of training schools in Germany was increasing steadily. Moreover, in 1951, when Germany's increasing independence in the field of aviation, the Holstenair reached an agreement with the Federal Ministry of Traffic whereby Holstenair's training would be carried out to an ever increasing degree in the Commercial Flight Schools. On the basis of this agreement, the Federal Government admitted Holstenair personnel for conversion training and the one of Holstenair for pilot training and preliminary flight training (including theory and commercial practice, of course). These arrangements were kept secret.

Even so, the abolition of the flight section left a certain gap in pilot training courses, a gap which cannot be expressed in terms of evaluation but was there nevertheless.

3. Changes during the period of forced training (1952 - 1957)

... and the forced training period of the National Socialist Party, which began in 1933, began a new era.

of military training. The training program was now free of the politically-inspired restrictions which had trammled it in the past; the need to camouflage training activity still remained, however, for foreign policy considerations required the new government to keep its activities in the military field secret from the signatories of the Versailles Treaty.

The entire complex of schools guided by the German Commercial Flight School headquarters in Berlin, which had absorbed the training organization of the Reichswehr Ministry, as well as all their subsidiary training installations, now lay in Germany itself. Such difficulties as budget limitations, lack of room, and raw material shortages were now a thing of the past, and the way was clear for the unhindered development of the new Luftwaffe.

Occasional problems arose, of course, to block the work of development and expansion, but these were solved in amicable conference between the partners concerned or, when necessary, by intervention of Reichs Commissioner (Reichskommissar) Goering or even by Hitler himself.

The following difficulties are deserving of mention because they played such a significant role in the operation of the training program:

aa) The inevitable petty rivalries and jealousies existing among the Reichswehr Ministry (Inspectorate No. 1), the offices of the Reichs Commission for Aviation (Reichsluftfahrtkommissariat), and the German Commercial Flight School, which naturally had an adverse effect on the smooth functioning of the program;

bb) Political differences and stubborn bickering as to the limitations of each other's authority between Party agencies, on the one hand, and military agencies and command headquarters, on the other.

cc) Continual arguments concerning personnel problems, industrial competence, raw material shortages, basic differences of opinion, charges of inadequacy on the part of certain agencies, etc., all of which could be solved only by a shift to greater government control of the economy.

This report from the Directorate of the Technical Service
 The entire complex of schools included by the German Government
 school management in Berlin, which had absorbed the training organization
 of the Reichswirtschaftsministerium, as well as all their subsidiary training institutions,
 schools, now lay in Germany itself. Such difficulties as budget limitations,
 lack of room, and raw material shortages were now a thing of the past, and the
 way was clear for the unhindered development of the new Institute.
 Technical problems arose, of course, to block the work of development and
 expansion, but these were solved in various conferences between the Berlin
 Government and the Reichswirtschaftsministerium (Reichswirtschaftsministerium) concerned or, when necessary, by intervention of Reichswirtschaftsministerium (Reichswirtschaftsministerium) working on even by Hitler himself.
 The following difficulties are deserving of mention because they played
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 (a) The inevitable party rivalries and jealousies existing among the
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 for aviation (Reichswirtschaftsministerium), and the German Government itself
 school, which naturally had an adverse effect on the school functioning of the
 program;
 (b) Political differences and narrow thinking as to the limitations
 of each other's authority between party agencies on the one hand, and military
 agencies and command headquarters on the other;
 (c) Continued arguments concerning personnel expansion, industrial con-
 ditions, raw material shortages, basic differences of opinion, changes of in-
 stability on the part of certain agencies, etc. all of which could be solved
 only by a shift to greater government control of the economy.

dd) Unwelcome interference on the part of other Reichs Ministries.

The conditions detailed above were kept within bounds and prevented from doing too much damage. The crises inherent in them could be avoided only because government control was strong enough to prevent them.

One real crisis during this period, however, was the Roehm affair in 1934. This is not the place to present a detailed history of these events (there are many published accounts available), but the following brief summary may be useful:

As early as the end of 1933, a feeling of tension began to make itself noticeably felt between the flight and aerotechnical training schools scattered throughout the Reich and the SA (Sturmabteilung - Storm Battalion). The conflicts and clashes provoked by the latter organization were becoming not only more numerous but also more serious in character and, by the time the planned coup went into effect in the summer of 1943, they had reached the point where they were not only alarming but also a grave disruption of training activity.

In order that they might be prepared for a possible defensive battle, the schools were secretly supplied with weapons, additional military drill and gunnery practice was held, and time-consuming combat games for the defense of barracks and airfield were carried out. Obviously, these necessary precautionary measures seriously disrupted normal training activity, and there were inevitable postponements in the planned deadlines for the release of trained personnel.

Fortunately, an overt conflict could be avoided, but even so the preparations for battle had cost the schools valuable training time, which could no longer be made up. The biggest losers were the (at that time) largest training units at the aerotechnical schools, whose total

One real crisis during this period, however, was the school strike in 1954. This is not the place to present a detailed history of those events (there are many published accounts available), but the following brief summary may be useful:

As early as the end of 1953, a feeling of tension began to arise. It was not only felt between the left and right-wing schools scattered throughout the area but also between the left and right-wing schools. The union had changed provided by the latter organization were becoming not only more numerous but also more active in character and, by the time the school year had ended in the summer of 1954, they had reached the point where they were not only planning but also a grave situation of training activity.

In order that they might be prepared for a possible defensive battle, the schools were actively supplied with weapons, including military drill and military practice was held, and line-containing combat games for the defense of the school and fields were carried out. Obviously, these necessary preparations were necessary to insure normal training activity, and there were inevitable postponements in the planned activities for the release of trained personnel.

Fortunately, an overt conflict could be avoided, but even so the preparation for battle had cost the schools valuable training time, which could no longer be made up. The biggest losses were the (left wing) largest training units at the technological schools, whose total

capacity was over 2,000 men. The over-all loss in training time could be equated with at least ten to twelve work-days in the case of the aerotechnical schools, and with eight to ten full days of flight duty for the flight training and ordnance branch schools. Statistical data concerning the loss in training time are no longer available, but it is certain that the scheduled new activation of a number of schools and units was affected, since every training minute was decisive¹⁴⁶.

In 1934, the beginning of a new crisis, one which was to grow to frightening proportions as time went on, became apparent.

The root of this crisis lay in the lack of flight discipline, which was to give rise to high losses attributable to aircraft accidents.

Practice flights carried out under the watchful guidance of training supervisors and instructors claimed almost no losses as a result of accidents. In spite of careful prior briefing, however, the unsupervised cross-country flights often resulted in serious accidents, most of which could be traced back to undisciplined flying, the pilot's exaggerated confidence in his ability and a penchant for showing off, underestimation of the possible dangers of acting as the lead aircraft, lack of experience in flying at dusk, or the unexpected advent of bad weather.

During the early years of Luftwaffe development, as long as the reserves were comparatively inexhaustible, these personnel and materiel losses were not terribly alarming. Nevertheless, they should have sounded a warning for the still secret Luftwaffe High Command. In accordance with the principle of keeping a careful check on the beginners, a slow-down was clearly indicated.

And this slow-down came about in the winter of 1933/34, when a number of independent accident investigation commissions (Unfalluntersuchungskommissionen) were established at the Commercial Flight School headquarters in Berlin.

146 - This statement is based on the personal experience of Colonel a.d. Koester.

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These commissions, later officially supported by the Luftwaffe, were to become the extremely important Inspectorate for Air Traffic Control and Equipment. Even the Inspectorate, however, proved to be no match for the problems as time went on (more about this later on).

We no longer have statistics regarding the losses sustained during the period 1933 through 1935, but it can be stated that they remained within bearable limits.

3. Crises Arising during the Period of Luftwaffe Development, 1935 through 1939

From 1935 on, as the Luftwaffe continued to grow and the number of schools and units under its control increased, there was a corresponding increase in the difficulties faced by the training program. Experience had to be gathered, and crises had to be faced and solved, before they could serve as a basis for lessons applicable to the future. During this period prior to the war, the training program was characterized by personnel shortages and equipment bottlenecks rather than by genuine crises - although the latter were to make their appearance very soon.

In contrast to the relatively quiet decade just ended, the majority of the crises to come had their origin in the foreign policies advocated by the government.

Those events whose effects penetrated as far as the Luftwaffe training program are treated here in chronological order:

1935: The year of the Luftwaffe's official activation went by without overt difficulty. There were a number of protests on the part of the Versailles Treaty partners

as no longer have statistics regarding the losses sustained during the
 period 1953 through 1955, but it can be stated that they remained within their
 safe limits.

3. General Review of the Status of National Development, 1955
through 1958

From 1955 on, the national economy continued to grow and the number of
 schools and units under the control increased, there was a corresponding increase
 in the difficulties faced by the training program. Experience has to be gained
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 Government.

These events show effects perceived as far as the national economy
 program are treated here in chronological order.

1955: The year of the National's official activation was by without
 overt difficulties. There were a number of projects on the part of the National
 Supply program.

against Germany's rearmament activity, but no action was taken to prevent it. The government's domestic policies had found firm footing in Germany, and the newly-established Luftwaffe was too busy with its own affairs to be affected in any way. Crises were unknown.

1936: This year represented the natural drawing to a close of the period of expansion which had begun in 1933 and, at the same time, the completion of a foundation capable of supporting future expansion of the training program. (See Chapter II, Section 1). As of 1 April 1936, there were sixty-five schools in operation, offering training in all the various Luftwaffe branches as well as in certain special subjects¹⁴⁷.

As early as 1936, however, it began to be apparent that even this relatively large number of schools with their increased capacities would not be able to keep up with the demands for trained personnel made by the active units. It is only fair to point out here that the demand for the activation of new units at a doubled rate of expansion did not have its origin in unrealistic requirements set by the Luftwaffe General Staff or by the School Command. On the contrary, it was Germany's political leaders, their eyes on the coming occupation of the Rhineland, who insisted on this method of activation, which did meet the demand for a sudden increase in quantity but at the same time served to dilute quality in a way which was to avenge itself later on.

By the end of 1935, the School Command was forced to admit that it was not in a position to keep up with the demands being made upon it. In order to relieve the overburdened schools and to assure implementation of the General Staff's activation schedule for 1936, those units which had completed school training in 1935 but had not yet finished the unit training which would fit them for final assignment to a front unit were detached to training duty.

147 - See Chapter II, Section 2, the subsection dealing with training in the original units after 1935.

The year represented the actual rising to a class of the grade
of expansion which had begun in 1953 and, at the same time, the cooperation
a foundation capable of supporting future expansion of the training system.
(See Chapter II, Section 1.1.1.1, April 1956, there were fifty-five schools
in operation, including training in all the various technical branches as well
as in certain general courses.)

As early as 1956, however, it began to be apparent that even this relative
ly large number of schools and their increased capacities would not be able
to keep up with the demand for trained personnel made by the early 1950s. It
is only fair to point out here that the demand for the education of new units
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By the end of 1956, the School Command was forced to admit that it was not
in a position to keep up with the demands being made upon it. In order to re-
lieve the overcrowded schools and to ensure implementation of the General Staff's
education standards for 1956, those units which had completed school training
in 1955 but had not yet finished the unit training which would fit them for
final assignment to a front unit were detached to existing units.

147 - See Chapter II, Section 1.1.1.1, the subsection dealing with training in the
original career after 1955.

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The squadrons were turned into flight training squadrons, which meant, of course, that their own training in basic military drill, instrument flight, night flight, gunnery, bombardment, radio and radio navigation, and formation flight had to be neglected.

It was this new method of training, feasible only in times of peace, which was responsible for the critical shortage of crews whose general standard of training was sufficiently high to permit their employment under any and all conditions when the war broke out.

With the help of the newly organized training squadrons, the schools managed to meet the 1 April 1936 deadline with personnel for the planned new units quite creditably (with a small discrepancy of 10-15%) as far as quantity was concerned. As regards quality of training standard, however, neither the losing mother units nor the newly formed daughter units were anywhere near ready for actual employment under wartime conditions. And the schools themselves were in a similar predicament. Their instructional personnel, well-grounded as far as flight and aerotechnical training were concerned, were taken away from them to be assigned to the newly-formed "water^{ed}-down" units for rapid refresher training designed to fit them for all-round employment. Because of the continued new activation of units under the "doubling" system, however, this project never had time to succeed (the year 1937 was an exception, due to the let-up of new activations).

The statistics pertaining to the operational readiness of the air crews in 1936, broken down into fully operational, operational under restricted conditions, and not operational, clearly reflect the inadequacy of the training standard maintained in the active units.

It was this method of training, possibly only in times of peace, which was responsible for the critical shortage of crew whose general standard of training was sufficiently high to permit their employment under any and all conditions when the war broke out.

With the help of the newly organized training squadrons, the school managed to meet the 1 April 1945 deadline with personnel for the planes now under construction. (With a small discrepancy of 10-15%) as far as quantity was concerned. As regards quality of training standards, however, neither the training units nor the early front line squadrons were anywhere near ready for actual employment under various conditions. And the school's resources were in a similar predicament. Their motivational personnel, well-trained as far as flight and operational training was concerned, were taken out from time to time to be assigned to the newly formed "down-down" units for front line training. Assigned to the 1st Air Force units, because of the continued low motivation of units under the "down-down" system, however, this project never had time to develop. The 1st Air Force was in excellent condition to take on the new conditions.

The critical problem to the operations and readiness of the air force in 1945, broken down into three operational, motivational and training conditions, and not operational, directly reflect the inadequacy of the training standards maintained in the service units.

In 1936 the operational readiness of the bomber and long-range reconnaissance units was evaluated as follows:

fully operational - 15%

operational under restricted conditions - 45%

not operational - 40%¹⁴⁸.

In the case of the fighter and close-range reconnaissance units, the picture was more favorable, the majority of crews being rated in the first two categories.

In connection with the planned occupation of the Rhineland, which was bound to entail the risk of war, there arose a political and military crisis whose ramifications had a great deal of influence on the flight training program and on the schedule of new activations. In early March, 1936, in the realization that they had practically no air units with which to combat possible hostilities on the part of the Western Powers in case their occupation action should be contested by military force, Germany's leaders suddenly disbanded the fighter training school at Schleissheim and organized its instructors and better qualified advanced students into one fighter group and one dive-bomber group, equipped with the school's Ar-65's and He-51's. These new units were assigned to stations at Mannheim, Frankfurt, Cologne, and Duesseldorf¹⁴⁹. Their transfer into the Rhineland completed as of 7 March 1936, the new units served more as an optical deterrent than as a real striking force, for the aircraft recruited from the schools usually lacked such important items as airborne armaments, ammunition belts, etc. This precedent, carried out at the cost of the Luftwaffe's only

148 - Based on information provided by Colonel a.D. Koester, whose comments, in turn, are based on his recollection of unit reports during the years 1935 and 1936 and on his activity as a staff specialist in the Office Personnel Section of the Reichs Air Ministry.

149 - General a.D. Grabmann, "Die deutsche Luftverteidigung 1933-1945" (German Air Defense Operations, 1933-1945), Karlsruhe Document Collection, and General a.D. von Massow, "Die Jagdfliegerausbildung in der ehemaligen deutschen Luftwaffe 1925-1945" (Fighter Training in the Former German Luftwaffe, 1925-1945), Karlsruhe Document Collection.

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 - 148 -

In the case of the fighter and close-range reconnaissance units, the aircraft
 was more favorable, the majority of crews being rated in the first two categories.
 In connection with the planned expansion of the training, which was bound
 to entail the task of war, there arose a political and military crisis which
 necessitated a great deal of discussion on the right training program and
 on the methods of new organizations. In early March, 1945, in the realization
 that they had practically no air units with which to conduct practical training
 on the part of the Luftwaffe, it was decided that their operations should be
 conducted by military force, Germany's leaders and industry demanded the highest
 training school at that time and organized by aircraft and better equipped
 advanced students with one fighter group and one dive-bomber group equipped with
 the school's aircraft and the Luftwaffe. These two units were assigned to stations
 at Wehrmacht, Wehrmacht, Wehrmacht, and Wehrmacht. Their transfer into the
 Wehrmacht completed as of 1 March 1945, the two units were assigned as an official
 detachment from a real fighting force. For the aircraft recruited from the
 schools (mainly Wehrmacht) were at various stations, examination
 centers, etc. This procedure, carried out at the cost of the Luftwaffe's only
 its - based on information provided by Colonel A. L. Bauer, was completed in
 form, are based on the realization of units during the year 1945
 and 1946 and on his activity as a staff specialist in the Office General
 Section of the Reich Air Ministry.
 149 - General A. L. Bauer, "Die Wehrmacht Luftwaffe 1933-1945" (German
 Air Service Operations, 1933-1945), Karlsruhe Document Collection, and
 General A. L. Bauer, "Die Wehrmacht Luftwaffe 1933-1945" (German
 Air Service Operations, 1933-1945) (English translation in the German Luft-
 waffe, 1933-1945), Karlsruhe Document Collection.

fighter training installation, was unfortunately destined to make headway in the Luftwaffe and represented the first link in a long chain of actions resulting in an out-and-out plundering of the schools. In this particular instance, a Luftwaffe branch which was just beginning to stand on its own feet was robbed of its only training installation. Not until 1938, after a period of two years, was the loss made good by the establishment of the fighter training school at Werneuchen (the Fighter School at Oldenburg, planned as a successor to the Schleissheim installation, had never progressed beyond the planning stage). During the two-year interval, the fighter units had been forced to get along with stop-gap measures such as the establishment of training squadrons. The time lost, however, could never really be made up and it continued to make itself felt in the expansion of the fighter forces and particularly in their training program. Fighter training in the squadrons did have the admitted advantage that the units took a greater interest in their own trainees and were thorough in teaching them the tactical principles followed in the operations of their own particular wings, but from the standpoint of long-range planning it was and continued to be a stop-gap solution. Later on, in fact, it was recognized as a bad mistake, for it deprived the fighter forces of a broad reserve of personnel to draw on for new activations, unit replacement operations, and reserves.

Both the schools and the active units were in urgent need of a training period free of outside interruptions, but unfortunately this was rendered impossible by the need to convert the active units to the new aircraft models coming into use at the front. The bomber units were changing over to the Heinkel He-111-D and He-111-E and the Dornier Do-17, the long-range reconnaissance units to the Do-17, and the fighter units to the Messerschmitt Bf-109. The flight training schools

awarding the C-2 license, with their appalling shortage of even training aircraft of the Ju-52 variety, remained almost completely unaffected by the conversion action, due to inadequate planning for the distribution of front-model aircraft. As a result, the trainees released for assignment to the active units had to be trained by these units in the operation of the new aircraft models.

From the very beginning, in peacetime as well as in wartime, the failure to keep the schools adequately supplied with the aircraft models in use in the active units can be traced through the entire history of the training program.

Germany's political and military leaders could not help being aware of the dangers inherent in a weakening of the training program at a time when rearmament as a whole was going ahead at full speed. Some of the adverse effects had already been observed, and it was clear that there were more to come unless the policy was changed.

As a result, it was decided to make 1937 a "year of pause" as far as the expansion of the Luftwaffe by new unit activations was concerned. Nevertheless, a number of new schools (radio schools and other specialized training schools) and command staffs were set up, and even a few new units needed to round out the existing forces and to stabilize the organizational structure¹⁵⁰.

The advantages which might normally have accrued to the unit training program as a result of this decision, however, were seriously offset by Germany's participation in the Spanish Civil War, for at the end of 1936 volunteer crews from the bomber, dive-bomber, fighter, and reconnaissance units were assigned to temporary duty in Spain. Assuming an average tour of duty of four to six months per

150 - On 1 April 1937, for example, the II Group, Bomber Wing Boelcke, was reorganized into the II Group, 254th Bomber Wing (based on the author's personal recollection).

had to be trained by these units in the operation of the new aircraft models.

From the very beginning, it was clear that as well as in training, the failure to meet the school's objectives was due to the aircraft models in use in the active units can be traced through the entire history of the training program.

Germany's political and military leaders could not help being aware of the dangers inherent in a weakening of the training program at a time when national defense was being threatened as a whole was being threatened as well. Some of the adverse effects had already been observed, and it was clear that there were more to come unless the policy was changed.

As a result, it was decided to make 1957 a "year of crisis" as far as the expansion of the Luftwaffe by new units, activities was concerned. Everywhere a number of new schools (radio schools and other specialized training schools) and command staffs were set up, and even a few new units needed to round out the existing forces and to stabilize the organizational structure.

The advantages which might normally have accrued to the unit training program as a result of this decision, however, were seriously offset by Germany's participation in the German Air Force for the end of 1958 volunteer crews from the Bundeswehr, 1957, and 1958, and the recruitment which was required to bring the units in question an average rate of duty of 100 to 110 percent per year. On 1 April 1957, for example, the 11 Group, Bundeswehr, was re-organized into the 11 Group, 1957, and the 11 Group (based on the active personnel recruitment).

crew, this meant that each wing was continuously deprived of a number of its best crews. It is true, of course, that the crews in Spain were gaining combat experience and that both men and equipment were being tried against actual front conditions, but at the same time, they were sorely missed by their own units, where they could have been well employed in training activity, particularly in view of the continued policy of double activation of new units.

The critical lack of operational readiness of the air units at the outbreak of the war certainly can be traced in part to the effects of the intervening operations in Spain.

Nevertheless, the year 1937 cannot be spoken of as a crisis year.

The total flying strength of the Condor Legion, apart from its operations staff, amounted to one bomber group, one single-engine fighter group, one dive-bomber group, a number of close-range and long-range reconnaissance squadrons, a few Navy reconnaissance units, and a number of air transport units which had been recruited from the already low reserves of the schools. All in all, this meant the constant unavailability to German air units of some 200 to 250 fully-qualified crews, if one includes such factors as transport time, leave, sickness, and normal losses.

At the very period during which the active units and schools were most troubled by difficulties in the training field, there arose the Austrian crisis in the late winter of 1937/38, to be followed by the annexation operation in March 1938. The results were the following:

aa) A forced speed-up in the previously neglected fields of formation flight and combat training, coupled with a temporary slow-down in the

...but at the same time, they were being misled by their own...
 ...where they could have been well employed in training activities, particularly in...
 ...view of the continued policy of double-edged sword of new units.
 ...The existing lack of operational readiness of the air units at the outbreak...
 ...of the war certainly can be traced in part to the effect of the intervening...
 ...operations in Spain.
 ...Nevertheless, the year 1937 cannot be spoken of as a quiet year.
 ...The Soviet flying strength of the bomber division, which took its operations...
 ...staff, organized in one bomber group, one single-engine fighter group, one five-...
 ...engine group, a number of dive-bomber and long-range reconnaissance squadrons, a...
 ...the heavy reconnaissance units, and a number of air transport units which had been...
 ...relocated from the vicinity of the schools. All in all, this meant...
 ...the constant availability to German air units of some 200 fully-qualified...
 ...crew. It was included with reports as transport, fuel, spare parts, and...
 ...military losses.
 ...At the very period during which the active units and schools were being...
 ...of by difficulties in the Spanish field, there arose the Russian crisis in...
 ...the late winter of 1937, to be followed by the evacuation operation in March...
 ...1938. The results were the following:
 ...a) A forced dispersal in the geographically separated fields of location...
 ...flight and combat training, coupled with a temporary slow-down in the

training of personnel needed for the activation of new units;

bb) Withdrawal of those units slated to participate in the operation from their home units, thus depriving them for several weeks of the intensified flight training then being given by the wings;

cc) A definite weakening of the flight training and aerotechnical schools as a result of the commandeering of instructional personnel and aircraft (although the Ju-52 was already in short supply at the schools) for active assignments;

dd) The transfer of units and schools to new stations in Austria, which naturally cut into the time available for training; and

ee) A noticeable decrease in the number of trainees released for assignment to the ordnance branch schools and to the active units.

The adverse effects of the operations in Austria had not yet been absorbed by the training program when new political clouds made their appearance on the horizons of the Sudeten Land. Although a crisis of Pan-European proportions was avoided by the agreement reached in the autumn of 1938, Germany's peaceful occupation of the area required extensive military planning and preparations, and the Luftwaffe was intimately concerned. Once again units and schools were transferred to new stations, bringing restlessness and insecurity into the orderly accomplishment of the training program. In this instance, too, the training time lost was paid for in the form of a lower degree of operational readiness in the units.

In short, the year 1938 did much to reduce the effectiveness of the training program. And time was too short to make up for the setbacks suffered.

Thus, 1939 dawned upon a tenuously-anchored and generally inadequate training program. The lack of a central organization to take charge of training under the Luftwaffe General Staff (remedied as of 1 February 1939)

(cc) A definite weakness of the flight training and developmental schools
as a result of the downgrading of professional personnel and aircraft (airframe)
the staff necessarily in short supply at the schools for active and reserve
(55) The transfer of units and schools to other locations in the field, which
naturally resulted in the loss of personnel for training and
(56) A notable decrease in the number of students released for assignment
to the advanced branch schools and in the reserve units.
The adverse effects of the operations in the field had not yet been absorbed
by the training program when new political trends made their appearance on the
horizons of the business world. Although a crisis of post-war European negotiations
was evoked by the agreement reached in the summer of 1946, Germany's neutral
negotiation and she retained extensive military planning and preparation,
and the Luftwaffe was ultimately conserved. Once again units and schools were
transferred to one location, which necessitated and necessitated into the
orderly reorganization of the training program. In the meantime, too, the
training element was laid for in the form of a broad range of operational
readiness in the field.
In short, the year 1946 did mean to reduce the active status of the training
program, and this was not short to make up for the setbacks of the
line. 1947 dawned upon a pessimistic-economic and generally inadequate training
program. The lack of a central organization to take charge of training was
the definite result (summarized as of 1 February 1947)

had had its origin in the rapid expansion of the Luftwaffe and, as a result, the training program had never enjoyed uniform guidance and supervision¹⁵¹. The events of 1938 had proved conclusively that this situation was untenable and unsatisfactory. Thus, at the beginning of the year, the office of the Chief of Training in the Luftwaffe was created in an attempt to lend greater importance to the field of training¹⁵².

The spring of 1939 brought Germany's occupation of Bohemia/Moravia and of Slovakia, and with it the last and most far-reaching instance of disruption of the training program prior to the outbreak of the war.

Most of the air units were away from their home airfields, bombardment practice areas, and gunnery ranges for weeks at a time and the C-schools were weakened by the plundering of their personnel and aircraft for active assignment - two flagrant examples of conditions which were anything but conducive to the orderly conduct of a well-founded program of training. In May the situation finally showed signs of returning to normal once more, but this promised respite had to be utilized for the conversion of the active units to the new aircraft models in use at the front. The bomber units were in a particularly precarious position, since their present models were no longer capable of meeting the demands imposed by front conditions. The new models, the He-111-P, the Do-17-Z, and the new fighters of the Bf-109 series, all required a high degree of flying ability and perfect mastery of combat and instrument flight techniques on the part of the units.

In addition, the newly expanded training program in bombardment and aerial gunnery techniques and the training needed to convert airborne radio personnel to newly-introduced radio and direction-finding equipment (the

151 - See Chapter II, Section 2.

152 - See Chapter III, Section 3, which gives a detailed summary of the organizational structure of the new office.

of training in the ...
The spring of 1953 brought Germany's occupation of ...
the training program ...
Most of the air units were away from their home ...
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151 - See ...
152 - See ...

V-type direction finder and the X-type radio) were just as vitally important for the active units as the flight training program.

The Luftwaffe General Staff was responsible for the tactical training of Luftwaffe troops, and it provided its Branch III (Training) with detailed instructions in this field¹⁵³.

At the time he took office, the Chief of Training requested a study to determine the requirements in trained personnel needed to guard against the worst effects of a potential crisis in the training program. The conclusions drawn by this study made it clear that there were many areas of training in which the available schools and training agencies were simply not capable of producing the required number of personnel. This was chiefly true of the flight training program. Motivated by the study, the Chief of Training ordered that the training capacities of the schools be increased to the highest possible degree. His request that new schools be established to take care of the inevitable overflow was disapproved by the Luftwaffe General Staff - new activations were restricted to active units.

The training schedule drawn up on the basis of the available schools and training installations was recognized as a compromise, since the available facilities simply could not hope to meet the requirements in all training fields. The discrepancy between training capacity and training needs, soon to become apparent, was characteristic of the situation of the Luftwaffe throughout the entire period of its existence - a basically unhealthy situation made inevitable by the conditions under which it was forced to operate. The only solution would have been to adapt the schedule of new activations to the training facilities actually in existence or to expand the training facilities to such an extent as to make them capable of

153 - See Chapter II, Section 3, 1.

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At the time of the study, the Chief of Training requested a study to be conducted to determine the requirements in training personnel needed to guide against the worst effects of a potential crisis in the training program. The conclusions drawn by this study have indicated that there were many areas of training in which available resources and training facilities were simply not capable of producing the required number of personnel. This was especially true of the flight training program. Motivated by the study, the Chief of Training ordered that the training capabilities of the schools be assessed to the highest possible degree. His request had not been fulfilled by the time of the last available review which was approved by the Institute General Staff - new courses were recommended to be added.

The training programs drawn up on the basis of the available schools and training installations was recognized as a compromise, since the available facilities simply could not meet the requirements in all training fields. The discrepancy between training capacity and training needs soon became apparent, and management of the situation of the Institute throughout the entire period of its existence - a basically healthy situation was inevitable by the conditions under which it was forced to operate. The only solution would have been to limit the number of new entrants to the training facilities and to expand the training facilities to such an extent as to have been able to

157 - See Chapter II, Section 2.1

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keeping up with the personnel requirements implied in the activation schedule and of building up a certain reserve force besides - but of course this solution was unthinkable under existing conditions. For reasons of political expediency, Germany's top leaders preferred to have a large number of front units at their disposal, even if these units existed only on paper as far as their true operational readiness was concerned.

Nevertheless, the Chief of Training resorted to all manner of provisional measures in an attempt to adapt his training schedule to actual training requirements. Some of these were the following:

aa) Curtailment of theoretical instruction, with a resultant reduction in over-all training time;

bb) Assignment of additional instructional personnel and equipment, in order to increase the capacity of each training installation; and

cc) Making available additional provisionally-equipped landing fields in the vicinity of the school airfields, so that flight training could be speeded up by an increase in the number of take-off's and landings which could be practised within a given period of flight time.

Moreover, in the realm of long-range planning, the following measures were ordered:

aa) All the flying units (bomber, fighter, dive-bomber units, etc.) were instructed to set up provisional training schools, in which flight training could be given to successive groups of twenty-five men chosen from the unit's ground personnel. The goal was to qualify these men for the Luftwaffe Pilot's License (Land), which would permit them to operate all single-engine aircraft (excluding instrument flight).

The facilities available to the units did not, of course, permit advanced training similar to that given at the ordnance branch schools, the multi-engine flight schools,

disposal, even if these units related only to paper as far as their true disposal
actual business was concerned.

However, the Unit of Training reported to the Bureau of Professional
Personnel in an attempt to show his training activities to actual training
personnel, some of whom were the following:

(a) Enrollment of theoretical instruction, with a minimum retention in
overall training time;

(b) Acquisition of additional instructional personnel and equipment, in
order to increase the capacity of such training institutions; and
(c) Making available additional professional personnel training funds in

the vicinity of the school districts, so that training activities could be spread
in by an increase in the number of teachers and instructors which could be pro-
vided within a given period of time.

Moreover, in the case of long-range planning, the following activities were
envisaged:

(a) All the types units (bachelor, master, five-year master, etc.) were
indicated to set up professional training schools, in which training could
be given to successive groups of prospective and chosen from the unit's ground
personnel. The goal was to qualify them for the Institute of State License
(bachelor), which would permit them to operate all single-engine aircraft (excluding
transportation aircraft).

The facilities available to the units did not, of course, permit advanced
training similar to that given at the various civilian schools. The unit's
flight schools,

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or the instrument flight schools; particularly well-qualified trainees would be assigned to one of these schools for further training. Inasmuch as the units had been promised that they might keep the students they selected after completion of their training, barring any unforeseen circumstances, they were careful to pick out only those men who were really eager to learn to fly - the very personnel whom they had refused to release in the past for such training for fear of losing their services on the ground. The total number in training under this program was approximately 1,000. Flight instructors and instructors for the theoretical aspects of training were placed at the disposal of the units; the aircraft required for A/B training were charged to the airfield command or the unit concerned.

Since sufficient other flight schools were expected to be available after about three months to take over the advanced training of the students completing preliminary training with the units, the Chief of Training decided to separate beginning flight training from general military training altogether and to take over the unit schools for use as multi-engine flight training schools.

bb) From 1938 on, most of the private flight schools in Germany (sponsored by the various sport fliers' associations and supported by subsidies received from the state) were in the hands of the National Socialist Air Corps. The activity of this Corps was directed largely to the furtherance of sport flying; it concerned itself very little with Party and political matters.

careful to view not only those men who were really eager to learn to fly -
 the very personnel whom they had refused to release in the past for such train-
 ing for fear of losing their services on the ground. The total number in train-
 ing had in this program was approximately 1,000. Night instructors and in-
 structors for the theoretical aspects of training were placed at the disposal
 of the unit; the aircraft required for A-1 training were changed to the air-
 field command of the unit concerned.

Since excellent flight schools were expected to be available even
 about three months to take over the advanced training of the students complet-
 ing primary training with the unit, the Chief of Training decided to
 separate beginning flight training from general military training altogether
 and to take over the unit schools for use as night-engine flight training
 schools.

(b) From 1958 on, most of the private flight schools in Germany (upon
 orders by the various army corps) negotiations are supported by subsidies
 received from the state) were in the hands of the National Socialist Air Corps.
 The motive of this Corps was directed largely to the furtherance of party
 living; it concerned itself very little with party and political matters.

One of the primary activities of the Corps was the training of enthusiastic youngsters in the principles of glider flight and, later on, if they proved to be talented, in the operation of engine-driven aircraft. Recognizing the possibilities inherent in this situation, the Chief of Training planned to turn over all beginning flight training to the Corps, thus relieving the schools of a part of their burden. If successful, his plan would free the existing A/B schools for use as training schools for multi-engine aircraft, instrument flight, and specialized branch training.

The outbreak of the war hindered the realization of this plan, already in an advanced stage of preparation. The schools maintained by the Corps were militarized as a part of the general mobilization plan and incorporated into the Luftwaffe training program.

Pre-induction training for future airborne radio personnel was also made a responsibility of the National Socialist Air Corps. In a remarkably short time, the Corps set up radio training courses throughout all of Germany, in which young people could be instructed in sending and receiving and in the operation of the radio equipment actually in use in the Luftwaffe. Even after the war had gotten well under way, the Luftwaffe ^{was} still drawing on this reserve of Corps-trained youth to fill a good part of its requirements for airborne radio personnel.

Even the most intensive efforts of the Chief of Training and his staff had been unable to bring the Luftwaffe units up to their authorized strength by this time ¹⁵⁴, and the Luftwaffe entered the war with an average 10% personnel lag in all its units. The figure of 10% is accurate

154 - See Appendix 15.

to turn over all beginning flight training to the Corps, transferring the
schools of a part of their burden. It is suggested, the plan would free the
existing A/B schools for use as training schools for multi-engine aircraft
instrument flight, and specialized ground training.

The success of the war hinged on the realization of this plan, primarily
in an advanced stage of preparation. The schools mentioned by the Corps
were utilized as a part of the general mobilization plan and incorporated
into the multi-engine training program.

The inclusion of training for future Army radio personnel was also made
a responsibility of the National School of Air Corps. In a research report
made, the Corps set up radio training courses throughout all of Germany,
in which young people could be instructed in sending and receiving and in the
operation of the radio equipment actually in use in the Luftwaffe. Even after
the war had ended well under way, the Luftwaffe still drawing on this re-
serve of Corps-trained youth to fill a good part of its requirements for air-
borne radio personnel.

Even so, most intensive efforts of the Chief of Training and his staff
had been unable to bring the Luftwaffe's units up to their authorized strength
by this time, and the Luftwaffe entered the war with an average of
personnel in all its units. The figure of 100,000 soldiers

134 - see appendix 13.

as far as the bomber units were concerned; in the single-engine fighter units it was 17% and in the twin-engine units 12%. This clearly reflects a lack of urgency in furthering the fighter program.

In addition to these specific deficiencies, the outbreak of war caught the Luftwaffe at a stage in its training program in which the following fields, in particular, were below the required standard:

- aa) instrument flight and night flight;
- bb) air-based and ground-based direction finding and navigation;
- cc) tactical and flight safety training for airborne radio personnel; and
- dd) bombardment techniques utilizing the most modern equipment.

In this connection, let us return once more to the problem of inadequate flight discipline, a problem which had grown to alarming proportions in the meantime.

The "plague", as it was called by the Commander in Chief, Luftwaffe, had been spreading with frightening rapidity since 1935 and was beginning to assume forms previously unheard-of in military history.

Circumstances beyond anyone's control which ultimately led to aircraft accidents for which the pilots were in no way to blame are not included in the present discussion; they will be dealt with later on in the study.

The lack of flight discipline which concerned the experts from the Inspectorate for Air Traffic Control and Equipment, all of whom enjoyed an unusual degree of authority in the accomplishment of their jobs, and the representatives of the military justice tribunals was quite a different thing. Experience showed that it almost always originated in deliberate or careless violation of the principles of flight safety. The most common causes of accidents were the following:

- aa) Violation of written instructions as to course and route;

the following is a list of the various projects in which the following list of projects, were under the control of the

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(y) the following list of projects, were under the control of the

(z) the following list of projects, were under the control of the

- bb) Inadequate preparations for the mission;
- cc) Attempting to fly by instrument or to brave bad-weather zones in spite of inadequate training in these fields;
- dd) Showing off with acrobatics, although this was expressly forbidden;
- ee) Inadequate checking of performance certificates and flight orders on the part of flight supervisors;
- ff) Ordering of missions which exceeded student ability on the part of inexperienced squadron captains and training supervisors;
- gg) Requiring already weary crews to fly additional missions in order to complete unit quotas; and
- hh) Pilots' taking over aircraft as fully operational without adequate technical checking¹⁵⁵.

The personnel and material losses attributable to the factors listed above were so high that they represented a serious threat to the maintenance of operational readiness in the units. From this standpoint, lack of flight discipline was responsible for a genuine crisis.

In spite of warnings, briefing sessions, fines, and more drastic punishments ranging from court sentences to the death penalty¹⁵⁶, with subsequent dishonorable burial of the victims, it took a very long time before any noticeable improvement occurred.

155 - Statistics pertaining to accidents of all kinds will be given in Chapter V this study.

156 - As decreed by the Fuehrer and by the Commander in Chief, Luftwaffe, in a desperate attempt to eradicate the "plague".

(c) Immediate checking of performance certificates and flight orders on the part of flight supervisors;

(11) Ordering of missions which exceeded standard ability on the part of expert-level squadron leaders and training supervisors;

(12) Reducing already heavy crews to six additional missions in order to complete unit orders; and

(13) Immediate taking over aircraft on fully operational aircraft when technical checking.

The command and control losses attributable to the factors listed above were so high that they represented a serious threat to the maintenance of operational readiness in the unit. From this standpoint, lack of flight discipline was responsible for a genuine crisis.

In spite of warnings, briefing sessions, fines, and more drastic punishment, the unit continued to suffer from the same deficiencies, with subsequent discipline being of the victim, it took a very long time before any noticeable improvement occurred.

157 - Statistics pertaining to readiness of all kinds will be given in Chapter V - this study.

158 - As desired by the Bureau and by the Commander in Chief, the following is a separate attempt to summarize the findings.

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Section 2. Crises Arising During the Course of World War II1. The Attitude of Generaloberst Jeschonnek, Chief of the General Staff, Towards the Training Program.

According to a statement attributed to the Austrian military leader Montecuccoli, the conduct of war requires 1) money, 2) money, and 3) more money. Applied to modern conditions, of course, this would seem to indicate an unnecessary surplus in all respects, but even so it may be pertinent to ask just what was the attitude of the Luftwaffe General Staff towards the training program in general and towards the question of supplying sufficient personnel for such a program in particular.

To begin with, we must bear in mind that the Luftwaffe had entered the war with an average personnel deficit of 10% per unit, primarily the result of the stubbornly continued policy ^{of} activating new units in double-quick time, which kept the existing units in a state of continuous flux and prevented them from being ready for war when it came in September 1939¹⁵⁷.

What did the General Staff have to say about this lack of an adequate personnel reserve? Did it take steps to warn Germany's top political leaders and to point out that the Luftwaffe units, in the event of an armed conflict, would soon be no more than burned-out hulls, with no striking power whatsoever?

157 - Based on the testimony given by Feldmarschall Milch before the International Military Tribunal at Nuernberg, IMT Volume IX, pages 67-73.

In his testimony, Milch points out that air units, schools, and aircraft were all inadequate in number.

Faint, mirrored text from the reverse side of the page, including phrases like "The number of... money, 2) money, and 3) more", "of course, this would seem to indicate", "an unnecessary barrier in all respects", "and that was the attitude of the... toward the", "leading program in Germany and... of... conditions", "personnel for... in...".

At this point we encounter a difference of opinion between the General Staff, or rather its Organization Branch, and the Chief of the General Staff, Generaloberst Jeschonnek¹⁵⁸. During the course of a conversation between Generaloberst Jeschonnek and Lt Col Plocher (GSC), then chief of the Organization Branch, the latter, having presented his official report, pleaded informally for the timely establishment of an adequate reserve, not only of pilots but also of aircraft. Only through an intensified training program could the losses which a war would inevitably bring with it be made up fast enough to keep the operational readiness of the units up to the level needed for effective employment.

Jeschonnek, on the other hand, had quite a different view of the situation. Not only in his conversation with Lt Col Plocher, but also during the speech which concluded the General Staff journey to the Rhine in June 1939, he stressed the fact that the largest possible number of troops would have to be thrown into the first surprise attack - and this largest possible number, of course, would have to include all the available reserves. In Jeschonnek's opinion, Germany must concentrate on a short war, a war which might well require the commitment of all her personnel and materiel at the very beginning.

In other words, Jeschonnek was in favor of horizontal armament and against any attempt to arm for the unforeseeable future - hardly a reassuring attitude from the standpoint of long-range planning!

Jeschonnek's thinking surprises us all the more when we consider that he was one of those present at Hitler's conference of 23 May 1939¹⁵⁹ with the commanders in chief of the three Wehrmacht branches and their general staff chiefs. Thus he must have been aware of Hitler's stated opinion that it was not always possible (for example, in the case of Poland) to

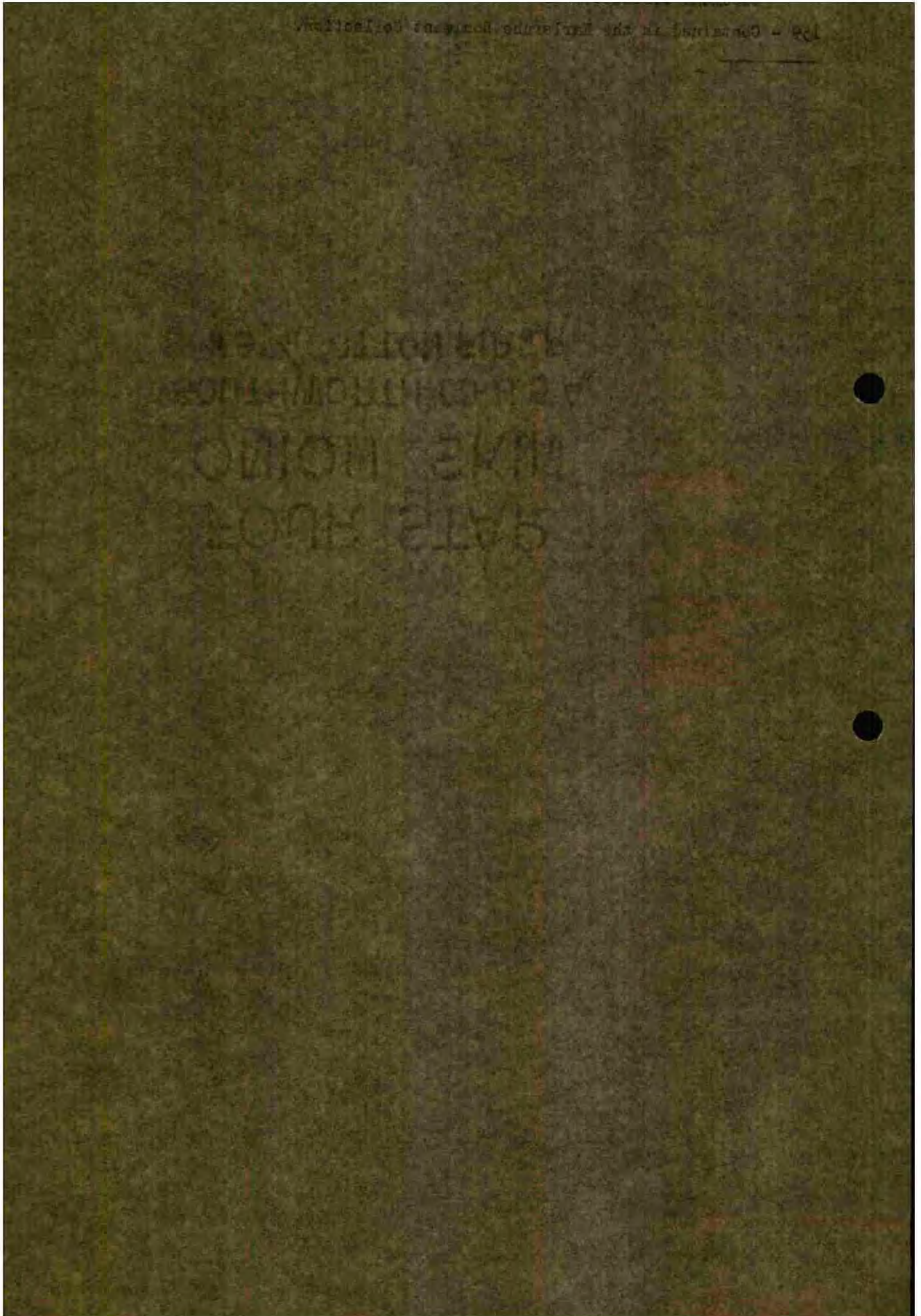
General... and Lt. Colonel... (USO) - then chief of the...
 section... the latter, having presented his official report...
 formally for the... establishment of an... reserve, not only of...
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158 - Report by Generalmajor Plocher, "Zur Organisation der Luftwaffe; Gegen-
saetzliche Auffassungen des Generals Jeschonnek zur 2. Org.Abtlg."

(Pertaining to Organization in the Luftwaffe. Differences of Opinion
between General Jeschonnek and Branch II (Organization)), Karlsruhe
Document Collection A.

159 - Contained in the Karlsruhe Document Collection.



limit operations to a blitzkrieg, and that every armed force and every government had no choice but to prepare itself for a war of ten to fifteen years' duration.

When Hitler, in his speech, referred to the possibility of a war against England and France and described such a war as a life-and-death struggle, the Chief of the Luftwaffe General Staff must certainly have thought of the studies prepared by General der Flieger Felmy, then commander of Luftwaffe Group 2 (Luftwaffengruppe 2). These studies, dated 22 September 1938 and 13 May 1939¹⁶⁰, dealt with the conduct of a potential air war against England and concluded sensibly that the air units available to the Luftwaffe were insufficient to wage a war of destruction.

Logically, then, if there were instances in which a blitzkrieg could not be carried out with any prospect of success, it was the duty of the Luftwaffe General Staff Chief to prepare his forces for a long-term war, and this meant that surplus in all respects was to be considered welcome, and this included the training program, which represented the foundation of all effective armament efforts in that it assured the availability of the personnel needed to make use of the products of armament. One wonders whether the General Staff Chief recalled the office chiefs' conference in the Reichs Air Ministry in January of 1939, called to discuss Hitler's demand for a fivefold increase in Luftwaffe strength, motivated by British reaction to the Munich Agreement. At that time, Jeschonnek stood up alone against his more cautious colleagues to insist that Hitler's demand be met¹⁶¹. But was this possible without first strengthening the existing training program?

160 - Both memoranda are contained in the Karlsruhe Document Collection.

161 - See Richard Suchenwirth, "Jeschonnek", a study in the Karlsruhe Series.

When Hitler, in his speech, referred to the possibility of a war against
 England and France and described such a war as a life-and-death struggle, the
 Chief of the Luftwaffe General Wever said that certain late reports of the Wehrmacht
 prepared by General der Flieger Weingartner, then commander of Luftwaffe Group 1
 (Luftwaffengruppe 1), these studies, dated 25 September 1938 and 12 May 1939,
 dealt with the conduct of a potential air war against England and indicated
 definitely that the air units available to the Luftwaffe were insufficient to
 wage a war of attrition.
 Logically, then, if there were a war in which a decisive battle was
 to be fought, it would be necessary to prepare, in advance, the air units of the Luftwaffe
 General Weingartner, then in charge of operations for a long-term war, and this meant
 that supplies for all weapons would be concentrated together, and this included the
 training program, which represented the foundation of all effective programs
 efforts in that it ensured the availability of the personnel needed to make use
 of the products of research. We would wish to know whether the General Staff Chief re-
 called the officer class' conference in the Reichs air Ministry in January of
 1937, called to discuss Hitler's demand for a fivefold increase in Luftwaffe
 strength, recalled by Weingartner in his report to the Reichs government. At that time,
 Weingartner stated that since training his more cautious colleagues to realize that
 Hitler's demand was not feasible, but was also possible without their strengthening
 the existing training program.

100 - Both documents are contained in the Reichsarchiv - Document Collection.
 101 - See Richard Kohn's "The Luftwaffe", a study in the Reichsarchiv.

As far as the technical side was concerned, the Luftwaffe High Command assumed that the air units would be depleted to one-fourth of their original strength after nine months of war, despite emergency mobilization measures promising a large increase in aircraft production. Thus, in the opinion of the Technical Office, Luftwaffe equipment strength could be maintained at the required level only by means of an unprecedented expansion of the aircraft industry¹⁶².

Logically, this same criterion ought to have been used in computing potential personnel losses, since in most cases the crews would be lost together with their aircraft. As early as 1935 and 1936, the General Staff had concerned itself with this matter and had reached the conclusion that an average rate of loss of 25-30% per month was to be expected for flying personnel¹⁶³.

Inasmuch as the available training capacity was already being exploited 100% during peacetime, however, the only sure way of meeting the anticipated higher requirements for flying personnel was obviously the creation of additional training capacity. And every effort should have been made to incorporate increased training capacity into the plans being made for general mobilization measures. By the time the office of the Chief of Training was established, however, it was already too late, for the mobilization schedule for 1939 had already been approved. It called only for an expanded program of recruitment and for the reorganization of the schools maintained by the National Socialist Air Corps into military schools.

Although they had been aware of Hitler's plans for solving the Polish question since the early summer of 1939, Luftwaffe leaders

162 - Based on a memo for the record intended for the Chief of the Technical Office, 13 December 1938. Karlsruhe Document Collection.

163 - General Deichmann, op.cit., page 48.

... a large number of electric production. This, in the opinion of the
 Technical Director, however, equipment strength could be maintained at the re-
 quired level by means of an accelerated expansion of the electrical industry.
 Logically, this same criterion ought to have been used in comparing potential
 personnel losses, since in most cases the ones who would be lost together with their
 aircraft, in early as 1937 and 1938, the General Staff had concerned itself
 with this matter and had reached the conclusion that an average rate of loss
 of 85-100 per month was to be expected for the personnel.
 Inasmuch as the available training capacity was already being
 100% during peacetime, however, and only some way of meeting the anticipated
 higher requirements for flying personnel and retaining the creation of additional
 training capacity, and every effort should have been made to incorporate in-
 creased training capacity into the plans being made for general mobilization
 purposes. At the time the state of the order of training was established,
 however, it was already too late, for the mobilization schedule for 1939 had
 already been approved. It failed only for the expansion program of recruitment
 and for the recruitment of the schools maintained by the National Socialist
 Air Corps (see military schools).
 Although there had been some of Hitler's plans for solving the Polish
 question since the early summer of 1937, but the latter
 100 - based on a memo for the report prepared for the Chief of the Technical
 Office of December 1938. (Reference document: 601100101)
 100 - General Staff, 1938, page 10.

had neglected to inform the office of the Chief of Training of the imminent danger of war. Thus that agency was taken completely by surprise on 1 September 1939.

Even after the war had begun, it proved to be impossible to obtain any definite figures on the projected requirements for trained personnel from the General Staff (Office of the Quartermaster General). The course of military operations, and above all their possible duration, were unforeseeable factors, and there was no body of experience on which to base an estimate of the rate of personnel loss to be anticipated. As a last resort, the Chief of Training set up a planning schedule of his own and presented it to the General Staff for comment.

The problem of estimating probable personnel losses was one of the most important of all, for if there was no way of determining such losses in advance with a fair degree of certainty, then the strength of the units already in being was of no more than temporary value - it had no meaning at all in terms of long-range planning.

The validity of this proposition became clear to German Luftwaffe leaders (and to their British counterparts, as well) during the Battle of Britain. Neither side had any reserves to speak of and, after submitting to an unprecedented bleeding of their active forces, had no choice but to call a halt to the air war. Neither the fighter nor the bomber units, the chief protagonists of aerial warfare, had any real striking power at the end. The 10-day reports of the Quartermaster General of the Luftwaffe after January 1941 make the situation painfully clear¹⁶⁴. Each of them emphasized the lack of trained crews to operate the Ju-88's, the very model which was closest to General Jeschonnek's heart and with which he hoped to carry on his tactical

164 - Office of the Commander in Chief, Luftwaffe, Quartermaster General, 10-Day Reports. Karlsruhe Document Collection.

and the fact that the proposed replacement for General [Name] was
 General [Name] of the [Department] General Staff. The [Name] of [Name]
 operations, and above all, the [Name] [Name] [Name] [Name] [Name] [Name]
 and there was no [Name] of [Name] or [Name] in which to [Name] [Name] [Name]
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air war. The recurring complaints, coming ever more frequently after 22 May, of a critical shortage in trained bomber crews must have had an even more frightening effect four short weeks before the beginning of the campaign against Soviet Russia!

It was at this point that the Luftwaffe's failure to expand its training program at the very beginning of the war and - even more - its subsequent weakening of the program by continual plundering of the schools were to avenge themselves¹⁶⁵. A single-engine fighter crew needs approximately one year before it is capable of full employment, and a good bomber crew even longer. The lack, in terms of both quantity and quality, of the trained personnel needed to fill the gap now made itself acutely felt. Admittedly it is no easy task to provide those responsible for training with requirements applicable to some time in the far future, and in the case of the Luftwaffe, this would not even have been necessary. Instead the foundations of the training program should have been developed and strengthened to make the program flexible enough to adapt itself to any situation which Germany's inconsistent and sometimes revolutionary top-level leaders might call into being. And it was precisely in this field that Luftwaffe planning was tragically deficient. One reason for this may have been the unquenchable optimism of Germany's top-level military leaders, which led them to believe - as late as the winter of 1940/41 - that a short-term war was still possible and that the training program, whose effects could not make themselves felt before the end of a year at least, could therefore be neglected. By 1941, to be sure, the Chief of Training had managed to increase the facilities available to his program to the point where twice as many students could have been trained, if the training program had been accorded the same priority as the front in respect to personnel assignment, fuel allotments, and aircraft distribution. But lulled by their illusory hopes that the war would not last long, Luftwaffe leaders were not receptive to such think-

covered the fact that the Institute's training program is designed to provide the very beginning of the war and - even more - the subsequent training of the program by continuing the numbering of the schools with no average level -

is possible (if not) assignment, and a good number of the even longer. The fact, in terms of both quantity and quality, of the trained personnel needed to fill the gap has been stated above. It is no easy task to provide those

the number of training with requirements applicable to some time in the future, and in the case of the Institute, this would not even have been necessary. Indeed, the foundations of the training program should have been developed and strengthened to make the program flexible enough to adapt itself to any situation which Germany's industrial and economic revolution may level leaders might call into being. And it was precisely in this field that Institute planning was strategically deficient. The reason for this may have been the responsibility of Germany's top-level military leaders, which they do believe - as well as the writer of this report - was also responsible for the training program, whose effectiveness could not have been maintained until the end of a year at least, could transfer be expected. In 1945, to be sure, the United States had managed to increase the facilities available to the program to the point where

could be any students could have been trained. If the training program had been

become the same priority as the front in respect to personnel assignment, the

alignment, and would distinguish. But killed by their military moves that

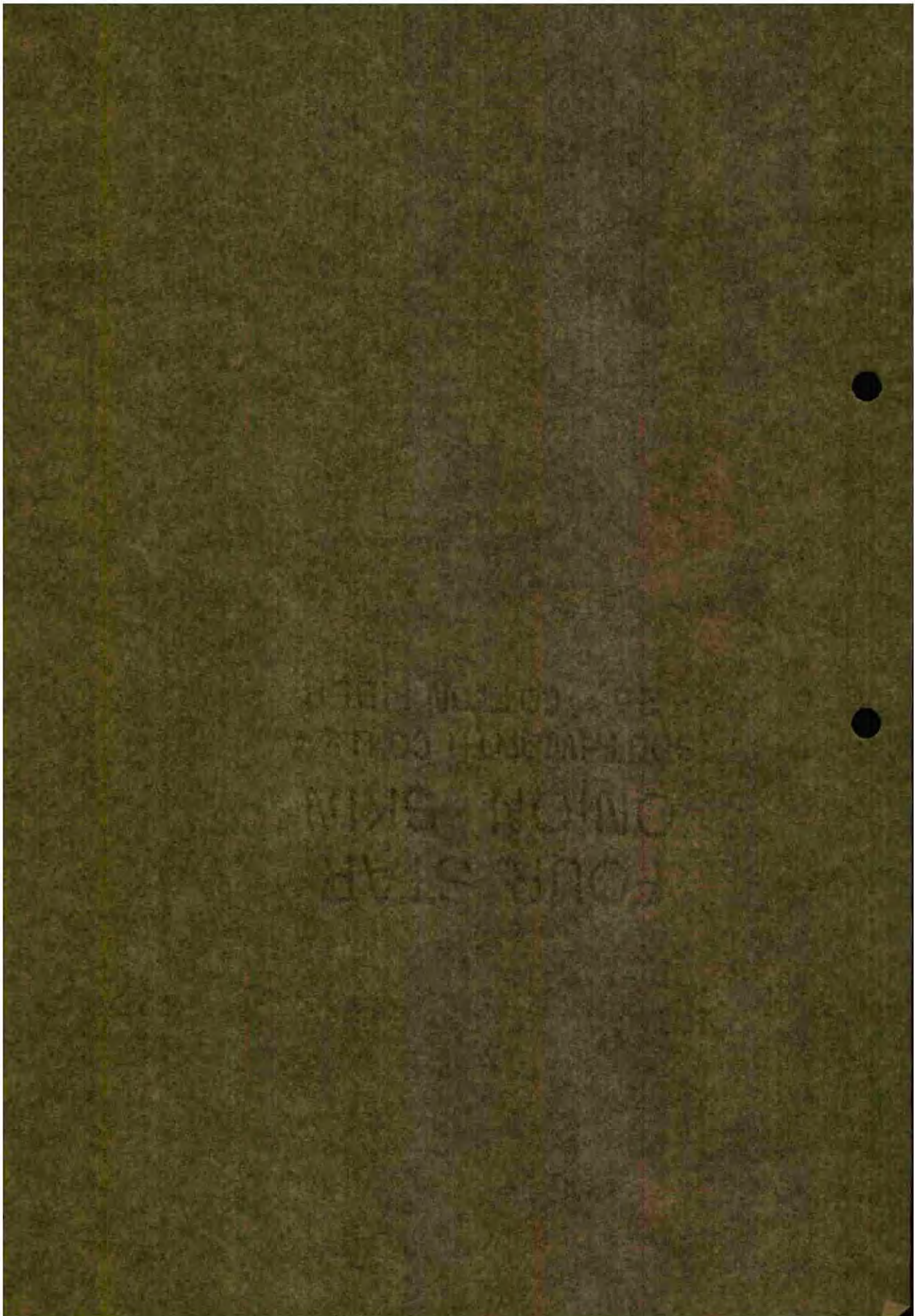
the war would not last long. Institute leaders were not progressive to such

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ing and the chance to improve the situation

165 - See Subsection 2, below.

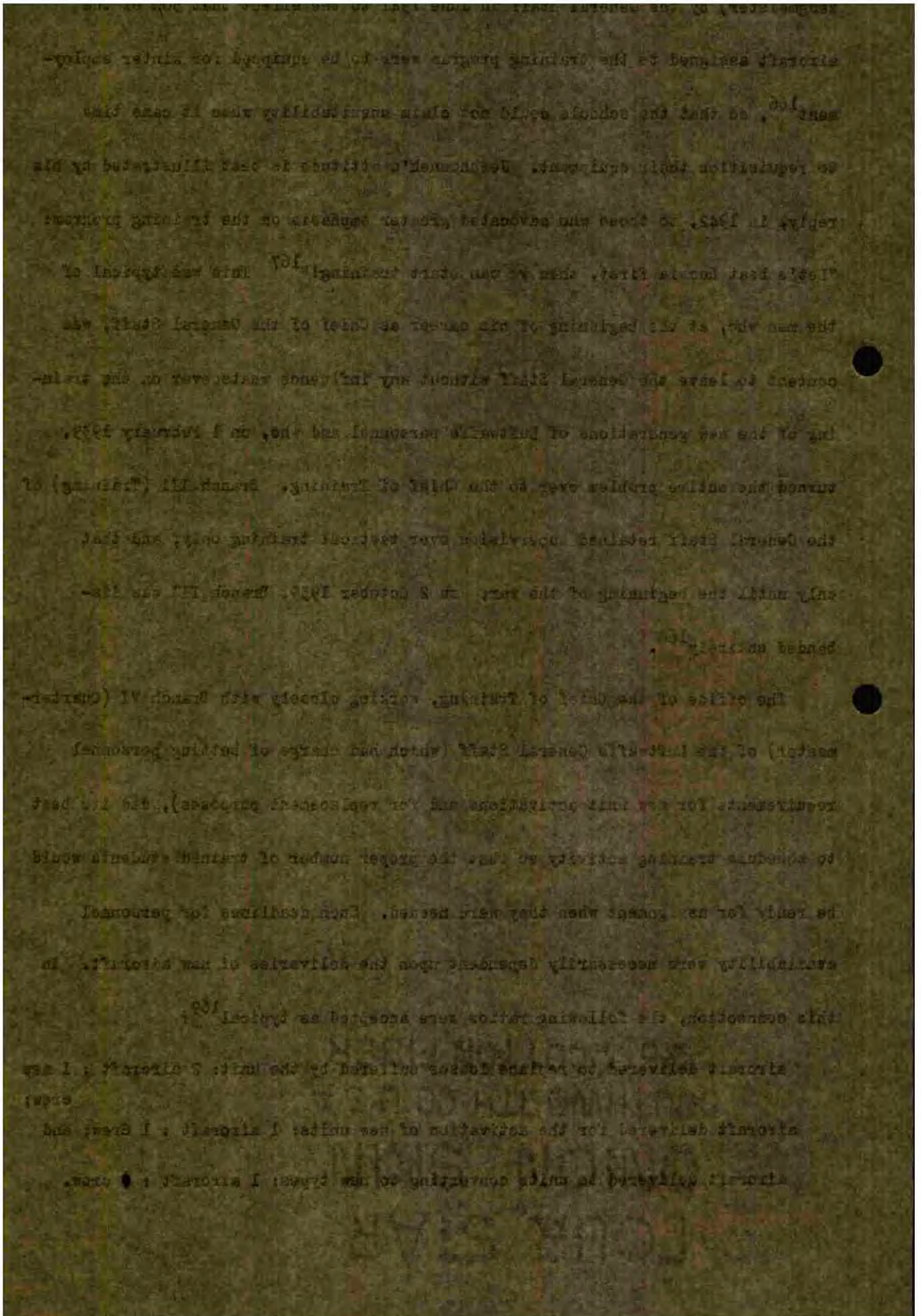
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was ignored. On the contrary, the Chief of Training was utilized as a scapegoat to salvage critical situations arising at the front. One instance of this was the order issued to the Luftwaffe Chief of Supply and Procurement (Generalluftzeugmeister) by the General Staff in June 1941 to the effect that 50% of the aircraft assigned to the training program were to be equipped for winter employment¹⁶⁶, so that the schools could not claim unsuitability when it came time to requisition their equipment. Jeschonnek's attitude is best illustrated by his reply, in 1942, to those who advocated greater emphasis on the training program: "Let's beat Russia first, then we can start training!"¹⁶⁷ This was typical of the man who, at the beginning of his career as Chief of the General Staff, was content to leave the General Staff without any influence whatsoever on the training of the new generations of Luftwaffe personnel and who, on 1 February 1939, turned the entire problem over to the Chief of Training. Branch III (Training) of the General Staff retained supervision over tactical training only, and that only until the beginning of the war; on 2 October 1939, Branch III was disbanded entirely¹⁶⁸.

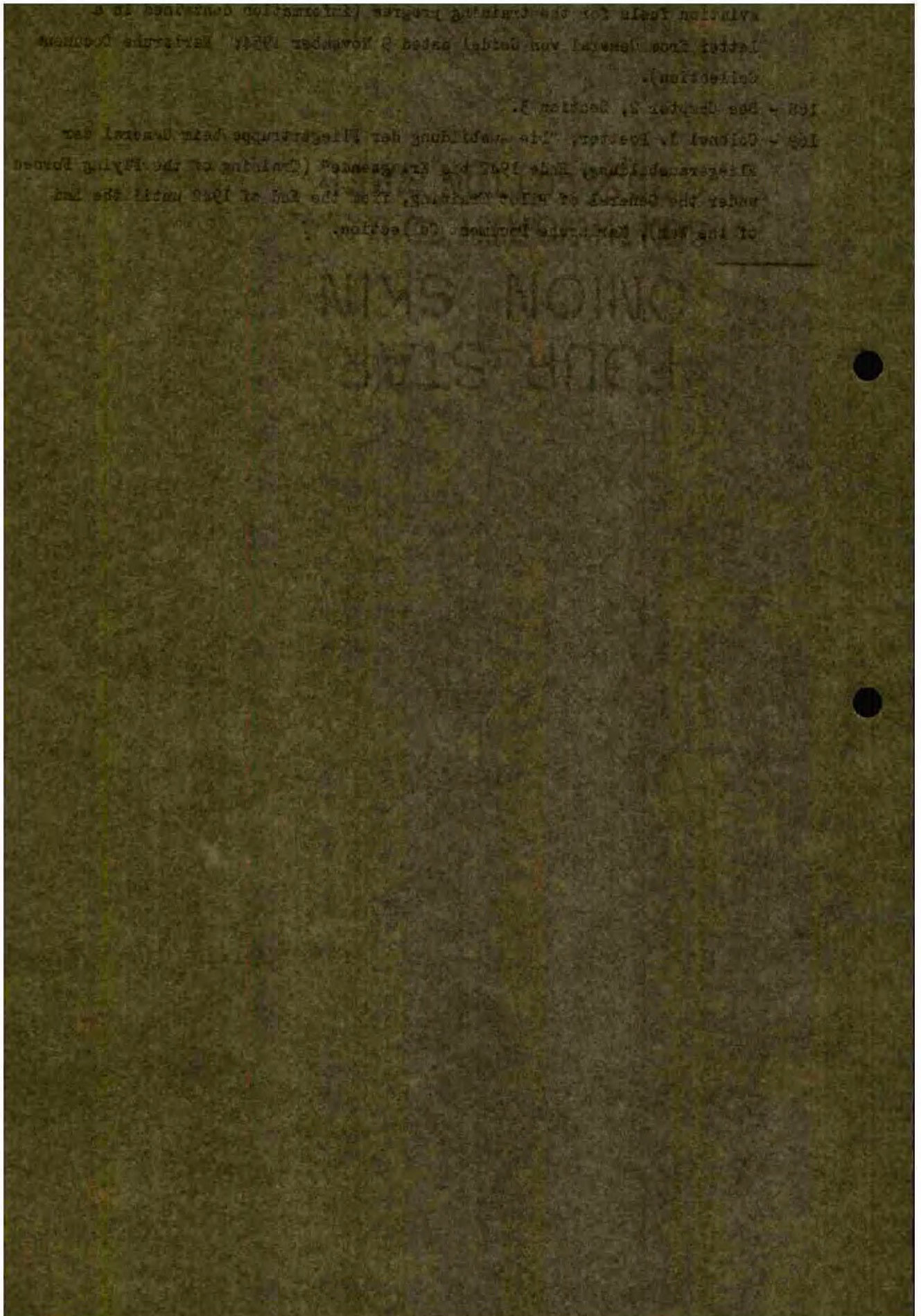
The office of the Chief of Training, working closely with Branch VI (Quartermaster) of the Luftwaffe General Staff (which had charge of setting personnel requirements for new unit activations and for replacement purposes), did its best to schedule training activity so that the proper number of trained students would be ready for assignment when they were needed. Such deadlines for personnel availability were necessarily dependent upon the deliveries of new aircraft. In this connection, the following ratios were accepted as typical¹⁶⁹:

aircraft delivered to replace losses suffered by the unit: 2 aircraft : 1 new crew;
 aircraft delivered for the activation of new units: 1 aircraft : 1 crew; and
 aircraft delivered to units converting to new types: 1 aircraft : 1 crew.



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- 166 - Based on notes made by the Luftwaffe Chief of Supply and Procurement during a conference held on 19 June 1941. Karlsruhe Document Collection.
- 167 - Jeschonnek's reply was made to the Quartermaster General of the Luftwaffe, General von Seidel, when the latter requested additional allotments of aviation fuels for the training program (information contained in a letter from General von Seidel dated 9 November 1954; Karlsruhe Document Collection).
- 168 - See Chapter 2, Section 3.
- 169 - Colonel J. Poetter, "Die Ausbildung der Fliegertruppe beim General der Fliegerausbildung, Ende 1942 bis Kriegsende" (Training of the Flying Forces under the General of Pilot Training, from the End of 1942 until the End of the War), Karlsruhe Document Collection.
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Only timely recognition of the potentialities of the armament program and of the personnel requirements inherent in it might have made it possible to plan effectively in advance and to make the necessary preparations. In addition, the training program, alerted by systematic evaluation of these factors, would have to have presented its requirements for training facilities to the Quartermaster General of the General Staff in good time to permit their being filled.

A study carried out by the General of Pilot Training in 1944 gives us an idea of the figures involved¹⁷⁰. This study indicated that there were a total of seventy separate career courses in the flight training program, and approximately eighty in the aerotechnical training program. To maintain their strength in the face of a personnel loss rate of 20% per month, the 5,000 crews engaged in active operations (a total of approximately 10,000 men, based on the average number of men per crew in the various Luftwaffe branches), required a personnel replacement rate of 1,000 crews per month. Assuming an average training period of twenty months' duration and a normal degree of attrition in the training program of 50%, this would have meant a beginning trainee class of 60,000 men, or the potential members of 30,000 crews. In this connection, it must be pointed out that the recruitment of new personnel was no problems; trainees were always available in sufficient numbers.

170 - General a.D. Scheuerlen, "Die Ausbildung 1941/42" (Training During 1941/42), Karlsruhe Document Collection.

to have conducted a research program for training facilities to the superintendent
 General of the General Staff in good time to permit their being fitted.
 A study carried out by the General of Staff training in 1944 gave an
 idea of the types of training that were needed. This study indicated that there were a total
 of twenty separate career courses in the Staff training program and approx-
 imately eight in the technological training program. To maintain high
 strength in the face of a personnel loss rate of 20% per month, the 7,000 men
 engaged in active operations (a total of approximately 10,000 men, based on the
 average number of men per year in the various Staff training courses), required a
 personnel replacement rate of 1,000 men per month. Assuming an average train-
 ing period of twenty months, duration and a normal degree of attrition in the
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 men, or the potential number of 20,000 men. In this connection, it must be
 pointed out that the recruitment of new personnel was no problem; reserves
 were always available in sufficient numbers.

179 - General A. L. Johnston, "The Staff Training Program, 1941-45"
 Kansas Historical Society

2. The Continual Plundering of the Schools

As has already been stated¹⁷¹, the accomplishment of training activity, including that carried on by the schools, was under the jurisdiction of the air fleet commands, a system which - by no means ideal - could be accepted as workable during peacetime. When the war broke out, however, the air fleets became the instruments of military action, and success at the front was understandably more important to them than the training program. Consequently, they had no qualms about arbitrarily requisitioning the personnel and materiel reserves of the schools. They robbed the latter of their instructional staffs, aerotechnical personnel, and aircraft to set up special-duty units (liaison and transport squadrons, aircraft control squadrons - a kind of flying aircraft reporting service -, etc.) which were not included in the over-all mobilization plan. Repeated protests on the part of the Chief of Training to the General Staff as well as to the air fleet commands were to no avail.

It was only after a great deal of effort that the Chief of Training finally succeeded in recovering at least a part of the personnel and aircraft taken from him by the air fleets; in the case of the Ju-52's commandeered for air transport duty, his efforts were rarely crowned by success.

And, indeed, the problem of the air transport units was by far the more important, the one which was to have the most far-reaching effects. No attempt had been made to create an independent air transport arm during peacetime, and when the war began there was only one transport wing (the 1st Special-Duty Bomber Wing), equipped with Ju-52's, available. In order to meet the rising requirements for this type of service,

171 - See Chapter II, Section 3.

...the instruments of military action, and success of the front was undoubtedly more important to them than the tactical program. Consequently, they had no doubts about the military technology in the command and essential reserves of the schools. They touched the matter of their instructional skills, pedagogical methods, and especially on the subject of tactical-technical training and transport operations, aircraft control operations - a kind of tactical-technical training service - etc.) which was not included in the overall mobilization plan. Particular attention on the part of the Chief of Training of the General Staff as well as to the air force commands was to be given.

It was only given a great deal of effort to assist the Chief of Training in his success in receiving at least a part of the personnel who already have been in the air force; in the case of one of the 10-12's commanded for air transport units, the efforts were largely unavailing.

And, indeed, the progress of the air transport units was by no means important, the one who was to have the most far-reaching interests. It is clear that there was to be an independent air transport unit which had been formed when the war began there was only one transport unit (the 10-12's) which was equipped with 10-12's, even when in order to meet the rising requirements for this type of service.

177 - See Chapter 17, Section 2.

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the reserves of the schools were scrupulously plundered. And requirements climbed steadily. For the campaign in Poland, for example, they amounted to no more than one special-duty bomber group plus a wing staff; but the demands made by the campaign in the West involved a severe blow to the training program. In the fall of 1939, the Chief of Training was ordered to establish a number of air transport groups which were utilized first during the operations of the X Air Corps in Norway and then in the West, under the command of General Student's 7th Air Division - a total of six groups, consisting of four squadrons each, and comprising a total of 378 aircraft with their crews (instructional personnel) and aerotechnical personnel. Inasmuch as all pre-assignment preparations by the schools were to be made in such a way that a transfer of forces could be accomplished within twelve hours and that each aircraft should be capable of at least 100 flight hours before its next overhauling, the personnel and aircraft involved in such preparations could not be fully utilized by the schools. Moreover, those units slated for employment with the 7th Air Division (paratroopers) were frequently called away for joint practice sessions designed to familiarize the transport^{units} and paratroopers with one another.

Interruptions of this kind were so time-consuming in the programs of the C-schools and instrument flight schools, that they were reduced to 20% of their normal effectiveness¹⁷². This situation was bound to have far-reaching effects on the crew replacement program for the active units, especially in consideration of the fact that relatively few of the aircraft requisitioned for transport duty came back to the schools in fully operable condition; most of them were either lost in action or in the repair shops for lengthy periods of time, for the latter naturally gave

172 - General Deichmann, op.cit., page 67.

In the fall of 1962, the Office of Training was directed to establish a number of air transport groups which were defined as follows: the operation of the air force in a conventional manner, and the operation of special operations. The air division - a total of six groups, consisting of four operations groups, and consisting of a total of 278 aircraft with their crews (instrumental personnel), and non-instrumental personnel. Included in all these assignments were the schools and the maintenance of such a school as a school of tactics could be established within their own and other schools. It should be possible to establish a school for tactical operations, the personnel and aircraft involved in such operations could be fully utilized in the schools. Moreover, those units which are equipped with the air division (air transport) were frequently called upon for tactical operations and were not utilized in the schools. The transport and maintenance of the aircraft.

Interpretation of this kind was so time-consuming in the program of the schools and instrument flight schools, that they were reduced to 50% of their normal effectiveness. This situation was found to have far-reaching effects on the crew replacement program for the active units, especially in consideration of the fact that relatively few of the aircraft registered for transport duty came back to the schools in their original condition, and of them were either lost in action or in the repair shops for lengthy periods of time. For the latter

materially have

172 - General Information, page 07.

preference to front aircraft over aircraft belonging to the schools¹⁷³. The return of requisitioned personnel to the schools was also a problem, for some of them - and usually the best ones - did all in their power to keep from being re-assigned to instructor duty. The front units, of course, were most eager to cooperate with them in this respect. As a result, the Chief of Training suffered considerable personnel losses not directly attributable to enemy action. It was always a matter of several months before such losses could be made up.

Unfortunately, this practice of requisitioning air transport units from the training program for commitment in the West found a considerable number of imitators, until finally the Luftwaffe General Staff began to adopt it as the line of least resistance whenever there were emergency situations to be salvaged.

The weakening of the facilities assigned to the Chief of Training continued without let-up; the following links were added to the never-ending chain of plunderings¹⁷⁴:

aa) At the end of August 1940, in connection with the planning for Operation SEA LION, all the special-duty (i.e. air transport units) units remaining under the jurisdiction of the Chief of Training were consolidated and transferred to France. When it was finally decided to postpone the Operation indefinitely, they were returned to their respective schools.

bb) In conjunction with preparations for the campaign in the Balkan countries, three air transport groups were requisitioned from the schools in January 1941, and another three in February 1941.

173 - During the air landing operations in Norway, Holland, and Belgium, for example, a total of 242 Ju-52's were lost. The production of new Ju-52's, however, was never more than thirty-six aircraft per month during the first four months of the war; in 1940, this figure dropped to thirty-two per month (or sixty-seven per month, including rebuilt and repaired aircraft returned to action). During 1941, the figure was forty-one per month (or seventy-one, including aircraft rebuilt and repaired). These figures are based on material contained in the Karlsruhe Document Collection. In this study "Der Einsatz der Luftlandetruppe im Westen 1940" (The

...in this study "Der Einsatz der Luftwaffe in Norwegen 1940" (The
 use of the Luftwaffe in Norway 1940) contained in the German document collection
 (for seventy-one, including aircraft repair and transport). These figures
 returned to action). During 1941, the figure was forty-one per cent
 month (sixty-seven per cent), including repair and transport aircraft
 four weeks of the war. In 1940, this figure dropped to thirty-two per
 cent, was never more than thirty-two per cent; per cent during the first
 campaign, a total of 602 to 650 per cent. The production of new fighters,
 113 - during the air landing operations in Norway, Holland, and Belgium, for
 January 1941, and another three in February 1941.

...aircraft, were all transport aircraft were requisitioned from the airports in
 (b) in connection with preparations for the campaign in the Balkans
 they were returned to their respective commands.

...to France. When it was finally decided to postpone the operation indefinitely,
 the transport of the units of transport were cancelled and transferred
 to the Luftwaffe, all the transport units (i.e. all transport units) which remained under
 (a) at the end of August 1940, in connection with the planning for Operation
 Phoney War.

...aircraft set-up. The following items were added to the inventory of
 The weakening of the Luftwaffe, as a result of the training continued
 line of least resistance, however, there was emergency aircraft to be salvaged.
 transport, until finally the Luftwaffe General Staff began to drop its
 the training program for transport in the Luftwaffe, a considerable number of
 unfortunately, this practice of requisitioning air transport units from
 always a matter of several months before such issues could be made up.

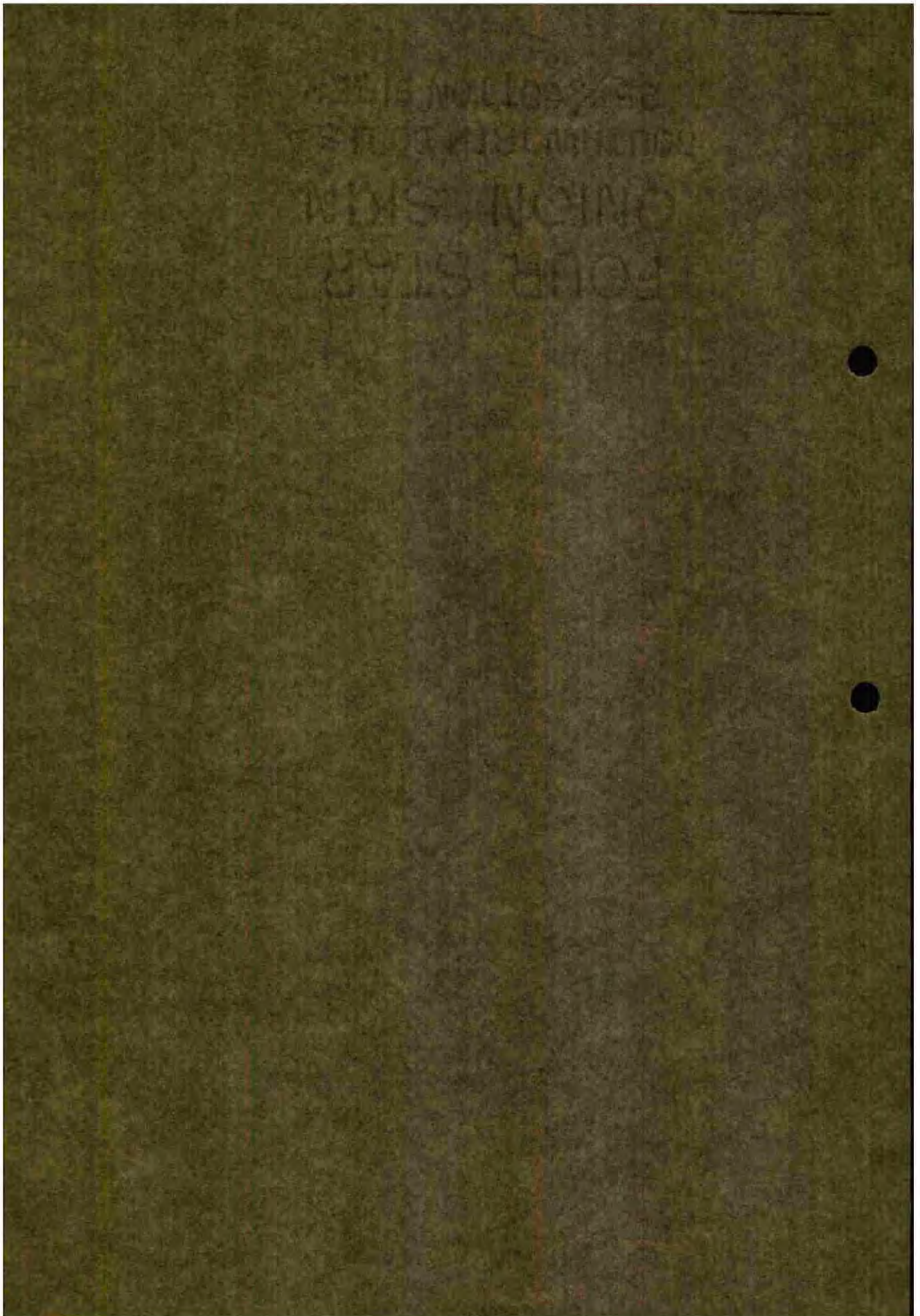
...considerable personnel losses not directly attributable to enemy action. It was
 occurred with them in such respect. As a result, the Chief of Transport continued

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173 - (cont'd) Employment of Air Landing Forces in the West during 1940), W. Pissin states that 183 Ju-52's were lost during the operations in Holland alone!

174 - Based on the study by General a.D. Morzik, "Luftbrueckenunternehmen der deutschen Luftwaffe" (Airlift Undertakings of the German Luftwaffe).

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These six groups were utilized to transport bomber and single-engine fighter units to the southeast.

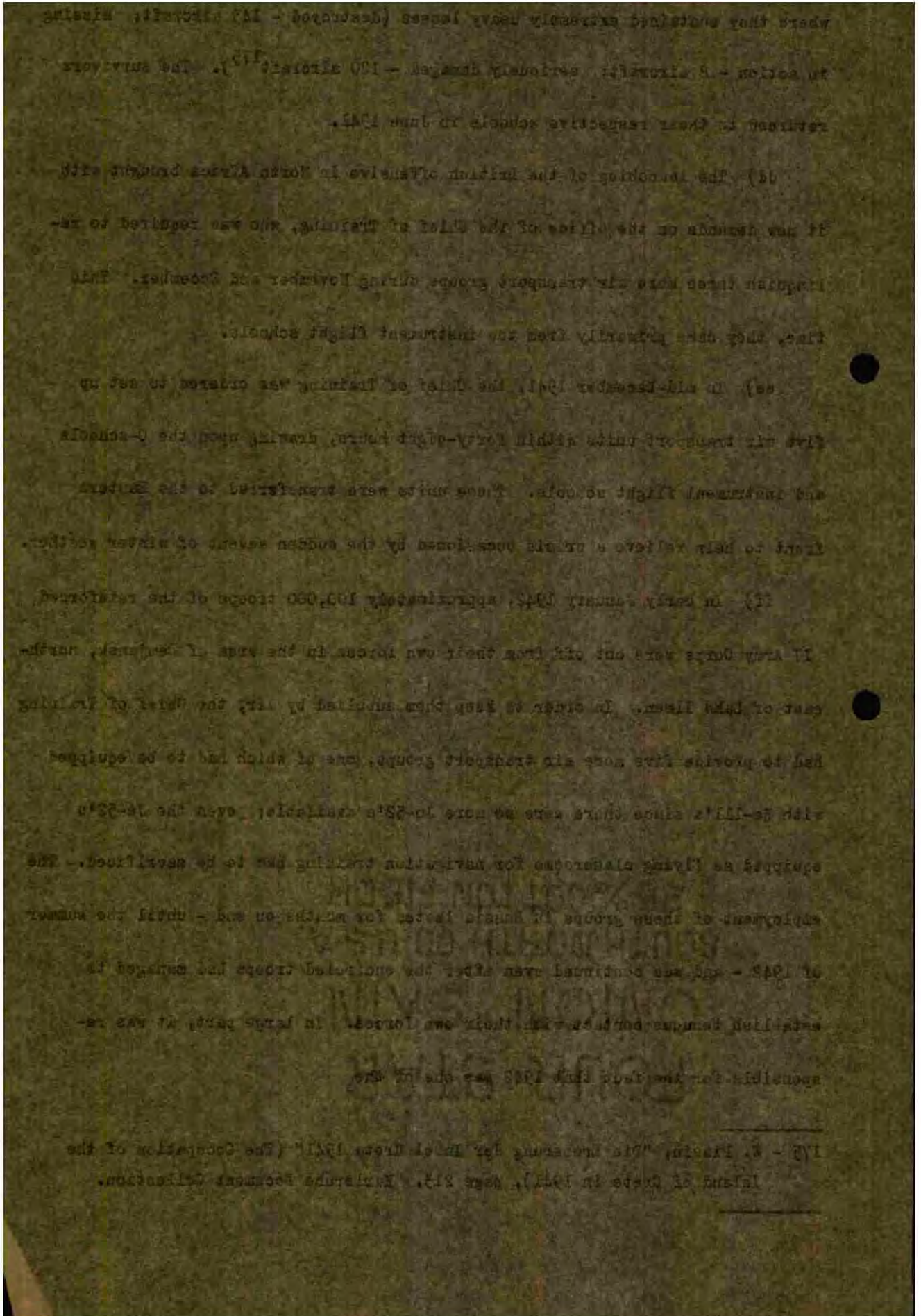
cc) Subsequently the six groups were employed in operations on Crete, where they sustained extremely heavy losses (destroyed - 143 aircraft; missing in action - 8 aircraft; seriously damaged - 120 aircraft¹⁷⁵). The survivors returned to their respective schools in June 1941.

dd) The launching of the British offensive in North Africa brought with it new demands on the office of the Chief of Training, who was required to relinquish three more air transport groups during November and December. This time, they came primarily from the instrument flight schools.

ee) In mid-December 1941, the Chief of Training was ordered to set up five air transport units within forty-eight hours, drawing upon the C-schools and instrument flight schools. These units were transferred to the Eastern front to help relieve a crisis occasioned by the sudden advent of winter weather.

ff) In early January 1942, approximately 100,000 troops of the reinforced II Army Corps were cut off from their own forces in the area of Demjansk, north-east of Lake Ilmen. In order to keep them supplied by air, the Chief of Training had to provide five more air transport groups, one of which had to be equipped with He-111's since there were no more Ju-52's available; even the Ju-52's equipped as flying classrooms for navigation training had to be sacrificed. The employment of these groups in Russia lasted for months on end - until the summer of 1942 - and was continued even after the encircled troops had managed to establish tenuous contact with their own forces. In large part, it was responsible for the fact that 1942 was one of the

175 - W. Pissin, "Die Eroberung der Insel Kreta 1941" (The Occupation of the Island of Crete in 1941), page 213. Karlsruhe Document Collection.



low-points in training.

gg) In the autumn of 1942, the Chief of Training was ordered to set up three air transport groups to be placed at the disposal of the Commander in Chief, South (Oberbefehlshaber Sued). These were incorporated into the Special Duty Bomber Wing, Sicily. In February 1943, the wing was disbanded, but its personnel and equipment were distributed among other active units. The Chief of Training, it was decided, had no further claim on them.

hh) In November 1942, air supply operations to Stalingrad were begun, in complete disregard of the tragic example set by Demjansk, and this was the last link in the chain of events which led inexorably to the ruin of the training program. The Chief of Training was ordered to furnish two special duty bomber groups, which he was forced to equip with He-111's and Ju-86's - his supply of Ju-52's had long since been exhausted.

As has already been pointed out, the loss of aircraft almost always meant the loss of the personnel manning them. Thus it is no wonder that the schools, which had suffered under a shortage of instructional personnel since the beginning of the war, were chronically understaffed - and this in the face of the fact that the schools were heavily overburdened to begin with. This situation was particularly true of the highly important instrument flight schools, whose instructors were often required to participate in operations demanding up to ten flight hours per day, after which they were expected to meet their instructional obligations.

In this emergency situation, which had become the normal state of affairs for the Chief of Training and his program, the practice of selecting the best-qualified students to participate in a brief training methods program at the Flight Instructors' School at Brandenburg-Eriest and then assigning them to flight instructor duty at a school paid welcome dividends. These instructors, most of whom were only slightly older than their students and thus better able

(b) In November 1943, six supply positions to the training were begun. In
 cognate districts of the training area in England, and this was the first
 link in the chain of events which led inexorably to the training
 process. The Chief of Training was ordered to furnish two special duty positions
 process, which he was forced to assign with the 1st and 2nd groups of
 the 2nd group had long since been exhausted.
 As has already been pointed out, the loss of aircraft almost always meant
 the loss of the personnel training them. There is a heavy burden that the schools
 which had suffered under a similar type of instruction, personnel and the training
 of the war, were essentially unimpaired - and this in the face of the fact that
 the schools were heavily overburdened to begin with. This situation was par-
 ticularly true of the highly important instrument flight schools, whose instructors
 were often required to participate in operations demanding up to ten flight hours
 per day, after which they were expected to meet their instructional obligations.
 In this emergency situation, which had become the normal state of affairs
 for the Chief of Training and his program, the practice of selecting the best-
 qualified students to participate in a dual training system program at the
 flight instructor school at Tuszingham-Down and then assigning them to
 flight instructor duty at a school, all welcome diversions. The no instructor
 most of whom were only slightly older than their students and thus better able

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to sympathize with their personal difficulties, were able to achieve a high degree of training effectiveness. Of high psychological importance, however, was that the promise of assignment to the front after a year's duty as instructors was faithfully kept. Only by means of this rather unorthodox measure could the effectiveness of the schools be maintained.

The release to the Army of some 1,500 young Luftwaffe officers fully qualified for front duty (during the winter of 1941/42), a measure dictated by the need for rapid compensation of the heavy losses in officer personnel suffered by the Army during operations on the Eastern front, deprived the aerotechnical organization of the Chief of Training, including the flight training regiments, of almost all of their combat-seasoned officers of the rank of captain and above. Needless to say, this was a severe blow to the command organization required to support the training program effectively. Although the Chief of Training had concluded an agreement with the Army High Command whereby the latter would assume responsibility for giving these officers, who after all had not had any training in the more modern principles and techniques of ground combat, immediate and adequate training in these fields, the Commander in Chief, Luftwaffe, issued explicit orders to the effect that the Chief of Training was to be responsible for such training himself. In the absence of qualified instructional personnel, this training mission had to be assigned to the paratrooper units, at that time under the command of Colonel Heidrich. Nevertheless, the Chief of Training had to assume responsibility for providing the administrative personnel needed to staff the Luftwaffe Combat School (Kampfschule der Luftwaffe) set up at Grossborn for this purpose.

The belated establishment of the Luftwaffe Field Division (Luftwaffenfelddivision) in 1942 took the last combat-seasoned personnel, both officer and enlisted, left to the Chief of Training (and, incidentally, to other Luftwaffe

The release to the Army of some of the Army's...
qualified for that...
the need for...
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branches as well). In order to get around complying with instructions requiring the release of Luftwaffe personnel to the Army, Goering offered the divisions concerned to Hitler, whose mind was occupied exclusively with the Eastern front, as the Luftwaffe's contribution to victory over Soviet Russia.



These units, composed of all combat-qualified personnel of the generations of 1906 and younger, had never had any training in ground fighting. In the East however, since they were only tactically subordinate to the Army, they were usually employed in critical sectors of the front, where they were decimated in heavy fighting. Thus, without providing any real relief for the troops fighting on the Eastern front (as they might well have done, if they had been distributed as reinforcements among the Army units), the Luftwaffe's most highly-qualified personnel were sacrificed. There can be no doubt that this sacrifice is one of the reasons for the subsequent decline in performance in all branches of the Luftwaffe, including the training program. The troops turned over to the Army included not only irreplaceable personnel, but - above all - highly-qualified key personnel. Later, even flying personnel were assigned to the Field Division. In the summer of 1944, when the majority of the bomber units were disbanded together with the training facilities serving them, not only highly-qualified aerotechnical personnel, but also instructors and advanced students were freed for further assignment. The Luftwaffe's top-level command, harried into inflexible apathy, made no attempt to absorb these personnel into the fighter training program, which implacably continued to train beginners from scratch under great difficulty and without conspicuous success.

3. Supplying the Schools with Training Aircraft

Prior to the creation of the office of the Chief of Training, the allotment and distribution of school and training aircraft lay in the hands of the Technical Office of the Reichs Air Ministry. The only exception to this rule was a concession granted to Luftwaffe Inspectorate No. 9 (Flight Training Schools), whereby the allotment of reconditioned and repaired aircraft, as well as the re-assignment

usually engaged in individual sessions of the kind, but they were also
to heavy lifting. They, without providing any real relief for the troops
standing in the front (as they might well have done, if they had been
distributed as reinforcements among the Army units), the Luftwaffe's most highly
qualified personnel were unutilized. There can be no doubt that this was
is one of the reasons for the Luftwaffe's failure in its operations
of the Luftwaffe, including the training program. The losses suffered over the
the Army included not only transportable personnel, but - above all - highly
qualified personnel. Even if the personnel were assigned to the front
Division. In the summer of 1944, when the majority of the combat units were
incorporated together with the existing Luftwaffe units, not only highly
qualified transportable personnel, but also transportable and advanced aircraft
were lost for further assignment. The Luftwaffe's top-level command, having
into tactical units, made no attempt to report these personnel into the
Luftwaffe training program, which was possibly intended to train personnel for service
under great difficulty and without conventional resources.

3. Supplying the Ground with Technical Assets

From the transfer of the office of the Chief of Staff, the aircraft
and distribution of assets and training activities in the hands of the technical
Office of the Army and Navy. The work assigned to this office was a con-
sideration granted to Luftwaffe headquarters for a (Luftwaffe Training Technical) where-
by the assignment of personnel and technical assets, as well as the re-

assignment

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of aircraft from one school to another was considered the responsibility of the Inspectorate. This arrangement applied only to the flight training schools, however.

The difficulties inherent in this system were akin to those experienced in the personnel assignment field as long as the Luftwaffe Personnel Office remained in charge of the assignment of trainee personnel.

In order to obviate these difficulties, the Chief of Training established an Aircraft and Equipment Group (Gruppe Flugzeug und Gerat) (later termed the Quartermaster Group) at the beginning of the war. Working closely with the Supply Office (Nachschubamt), this Group assumed responsibility for the issue and distribution of all aircraft within the jurisdiction of the Chief of Training. The frequent resort to provisional and stop-gap measures in the equipment field, a corollary of the rapid expansion of the Luftwaffe, had left the schools in chaotic condition as regards the aircraft types with which they were supplied. Difficulties in the aircraft maintenance program and bottlenecks in the supply of spare parts were the inevitable result.

In an attempt to ameliorate the situation, a number of standard aircraft types were developed. Naturally, this development program had to be slanted towards those types which could later be utilized effectively at the front; bi-planes and high-wing monoplanes, for example, had to be stricken from the program. The primary requirements were for: low-wing monoplanes with cabin, robustly constructed landing-gear or - even better - retractable landing-gear, seats next to one another rather than behind one another; double controls, landing flaps or supplementary wing-slots, easy maintenance, and ease in installing substitute engines and body parts.

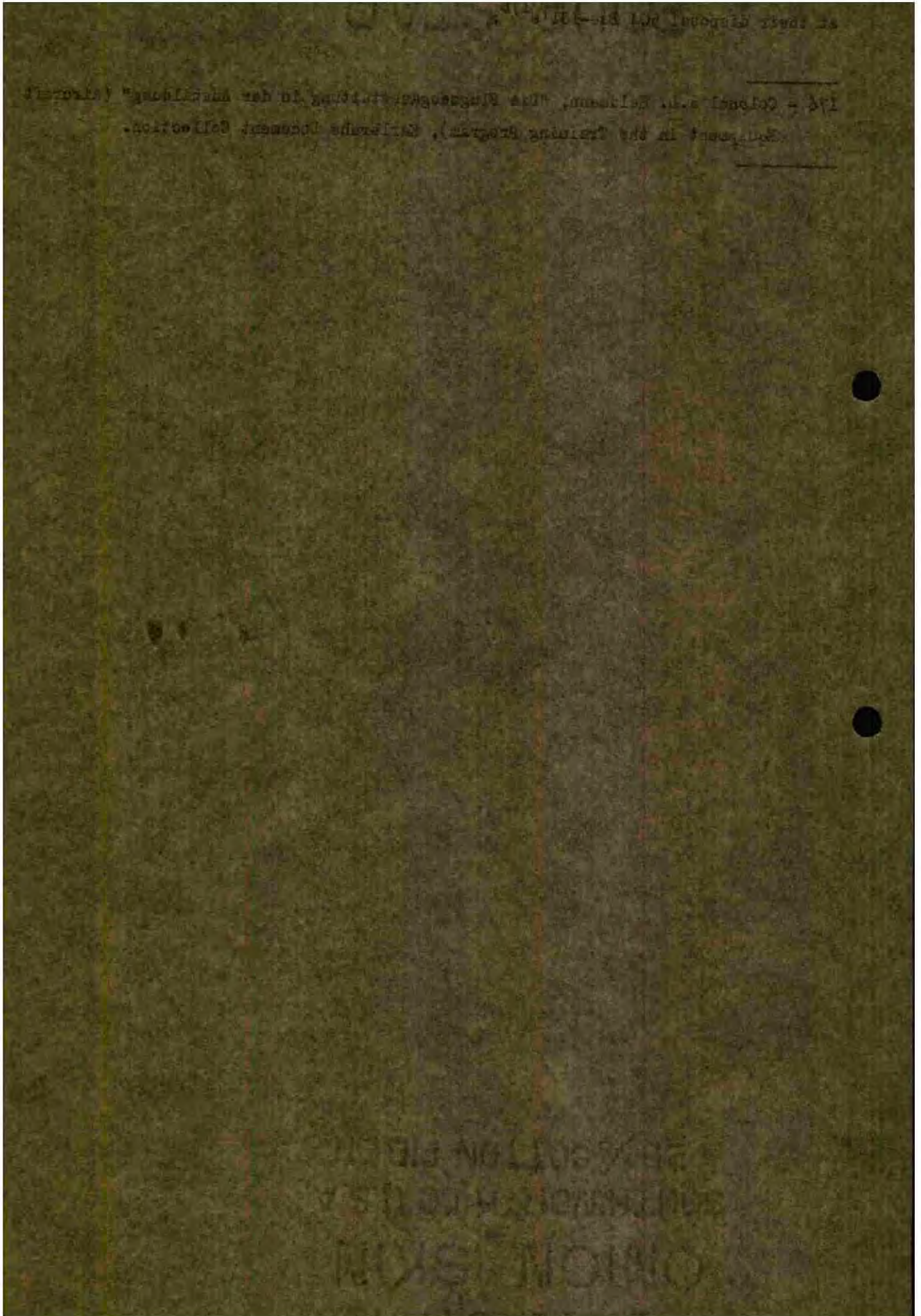
An ideal training aircraft battery for the A/B schools (later A schools) would have consisted of the Bue-181 for preliminary training, the Ar-96 for training leading to the B-1 license, and the Si-204 for training in the operation of twin-

...in charge of the assignment of training personnel...
...in order to operate these facilities, the Chief of Training established...
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...the formation group) at the beginning of the war. Working closely with the group...
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engine aircraft. Unfortunately this ideal was never attained. The preliminary flight training program was best supplied; the schools were up to authorized equipment strength from the beginning. As of 1 January 1943, they still had at their disposal 504 Bue-181's¹⁷⁶;

176 - Colonel a.D. Heldmann, "Die Flugzeugausstattung in der Ausbildung" (Aircraft Equipment in the Training Program), Karlsruhe Document Collection.



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as of 1 January 1944, this figure had increased to 1189 Bue-181's, and in addition there were still sufficient Kl-35's available in case of need.

The training program leading to the B-1 license was not nearly as well off, since the Ar-96, an excellent model designed to prepare the trainee for the operation of the front models Ju-87, Me-109, and Fw-190, was never available in sufficient quantity. As of 1 January 1943, the B-1 program had at its disposal 397 Ar-96's; as of 1 January 1944, 376¹⁷⁷. Since these supplies were inadequate, the program was forced to resort to the older Ar-66's and Go-145's, which had been intended for use in "harrassing squadrons" at the front (like the notorious Russian "sewing machines"). After the campaign in France, captured American aircraft of the NAA-57 and NAA-64 types were added to the training aircraft available to the B-1 program.

The twin-engine training program also encountered difficulty, but of a different kind; the Fw-33 and Fw-34, eminently suited for use as training aircraft, had been made obsolete by the development of more advanced models for use at the front. The Fw-58, designed as a training aircraft, represented a stop-gap solution at best but one which simply had to be put up with¹⁷⁸. Although this aircraft differed slightly from the products of German aircraft development, a number of relatively simple modifications succeeded in making it usable. During the course of the war, the models Siebel Si-204 and Caproni C-313 were brought to the stage of series production, but deliveries were not begun until 1943 and even then never in adequate quantity.

As far as the C schools and instrument flight schools (later used for B-license training) were concerned, the Ju-52 was and remained their standard training model. This serves to explain just why the continual requisition of this model

since the 1950s, an excellent model designed to provide the training for the
 operation of the firm models 10-57, 10-109, and 10-130, and never available
 in the program. In 1951, the 1-1 program had at the
 discussed 10-109, as of January 1941, 10-109, 10-130, and 10-131, some other subjects
 were designed, the program was forced to report to the class 10-57 and
 10-131, which had been intended for use in "training equipment" as the
 from (like the notorious Russian "training machines"). After the program in
 France, captured material of the 10-57 and 10-109 types were added
 to the training material available to the 1-1 program.

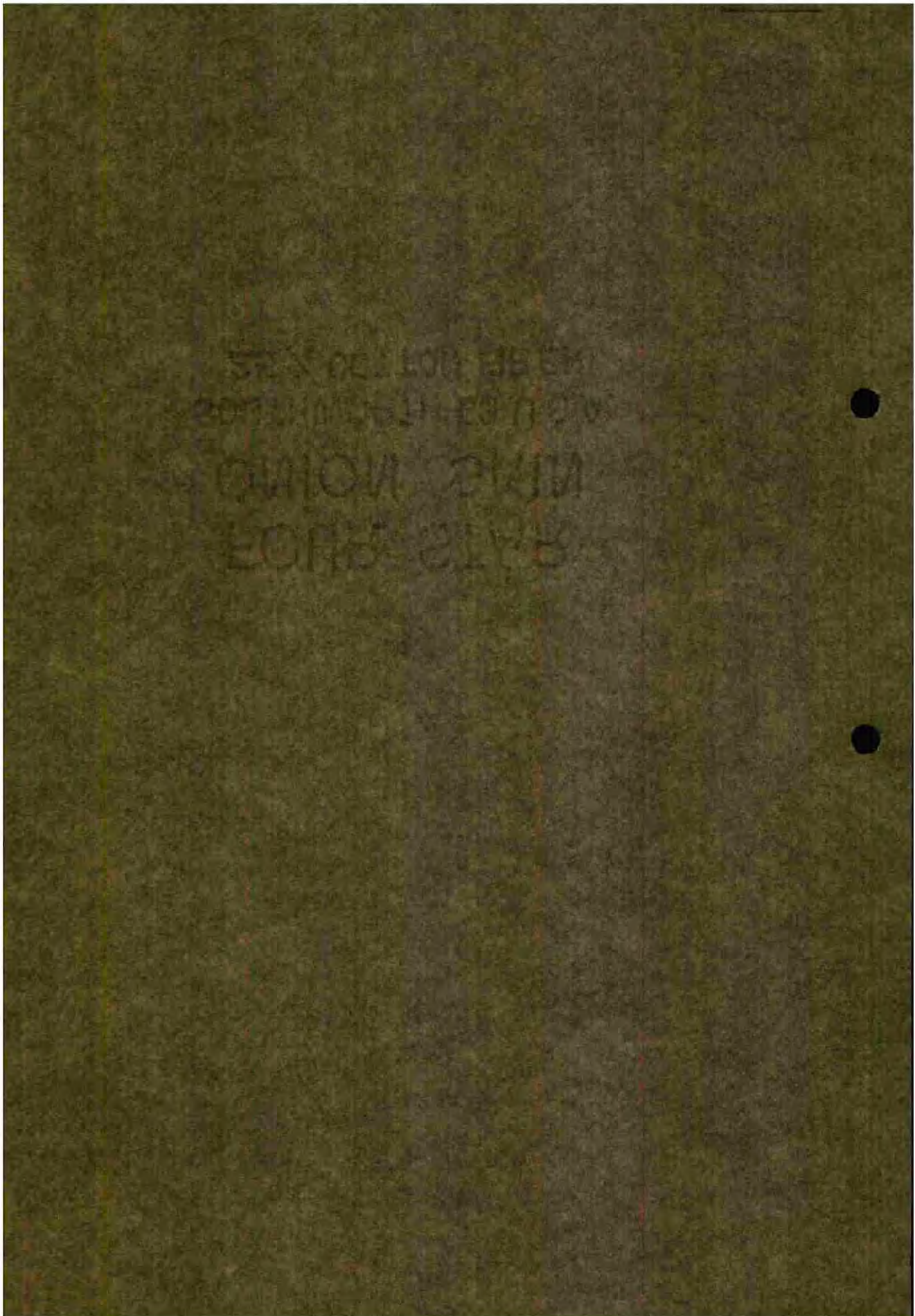
The training program also encompassed all other, but of a
 different kind: the 10-57 and 10-131, which were used as training equip-
 ment, and were made obsolete by the development of more advanced models for
 use at the front. The 10-57, designed as a training machine, represented a
 design solution that was not initially intended to be put to work. Although
 this material differed slightly from the prototype of German aircraft development,
 a number of relatively simple modifications succeeded in making it usable.
 During the course of the war, the volume of 10-57 and 10-131 were
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As far as the 10-57 and 10-131 (later used for
 10-131 training) were concerned, the 10-57 was not retained their standard
 training level. This serves to explain that the continual production of
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177 - Heldmann, op.cit.

178 - See the report of a conference between the Chief of Supply and Procurement,
General Staff Chief Jeschonnek, and Luftwaffe Chief Engineer (Ltd. Chef-Ing.)
Lucht on 1 March 1940. Karlsruhe Document Collection.



was capable of leading to the desintegration of the training program. The procurement of the Ju-52 always remained one of the most serious Luftwaffe bottlenecks¹⁷⁹. In order to mitigate its inevitably serious effects on the training program, the Chief of Training, immediately after the first inroads on school aircraft supplies, requested that the twin-engine Ju-86 be converted for use as a training aircraft. Equipped with a crude oil engine, the Ju-86 had proved to be impracticable for use at the front but, in the opinion of the Chief of Training, it was both better suited to training purposes and more economical than the three-engine Ju-52. Nevertheless, State Secretary (Staatssekretaer) Milch - with Goering's concurrence - disapproved his request¹⁸⁰. Milch claimed that the Junkers works did not have the capacity needed for the work of conversion (although the Chief of Training had previously been assured of the contrary), and that future production schedules envisioned eighty Ju-52's per month, which would be enough for both the training program and the establishment of new air transport units. As consolation prize, the Chief of Training was given control over all the Ju-52's in the Luftwaffe, with the authority to commandeer for the use of the training program all the Ju-52's assigned to "government personalities" (many state and Party bigwigs had Ju-52's at their disposal for official trips) and special duty staffs.

It is true that this concession gave the Chief of Training exclusive control of all available Ju-52's, but this did not give him the right to ignore the demands for such aircraft to relieve emergency situations at the front. In the course of time, the two models already mentioned (the Ju-52 and Ju-86) were augmented by the He-111, the Do-217, the Me-110, and Me-210, and the Ju-88, from domestic production sources, and by the captured models Bloch-200¹⁸¹ and MB-200. This bewildering variety of

179 - See the notes of a conference between Reichs Air Minister Goering and

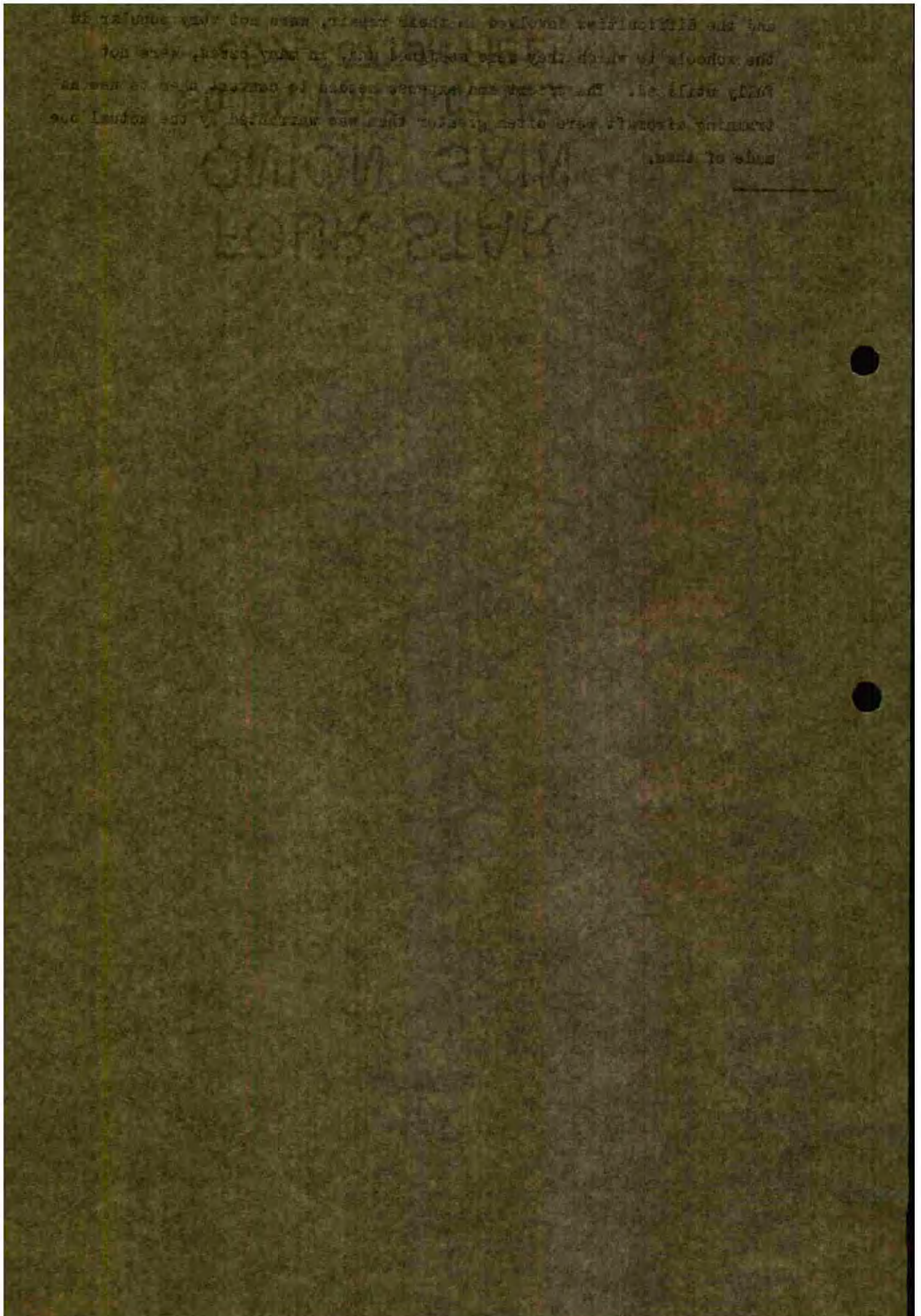
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179 - (cont'd) General Kuehl (No. 172/42, Classified, dated 11 July 1942).

180 - General Deichmann, op.cit.

181 - Despite sincere efforts to achieve the contrary, the Chief of Training was forced to admit that the captured aircraft models, because of their unfamiliar performance qualities, vastly different maintenance requirements, and the difficulties involved in their repair, were not very popular in the schools to which they were assigned and, in many cases, were not fully utilized. The effort and expense needed to convert them to use as training aircraft were often greater than was warranted by the actual use made of them.



aircraft models assigned to the schools was reduced somewhat by the reorganization of the C-schools and instrument flight schools into B-schools. The new B-schools were set up as pure Ju-88, He-111, or Do-17 schools. As a whole, the B-schools were to comprise a selection of over twenty-five front-type models, but they always had to get along with the older models.

The allotment of front-type aircraft to the schools was a problem in itself - and a most unfortunate one at that. After all, the schools were expected to release only such flying and aerotechnical personnel for assignment to front units as had actually been trained in the operation and maintenance of the aircraft they would encounter there. The distribution of front-type aircraft, however, was the prerogative of the Luftwaffe General Staff, and the Chief of Training, even with Goering's personal intervention, never succeeded in having a sufficient supply allotted to the schools. The inevitable result, abundantly substantiated by statistics, was the destruction of a frighteningly large number of front aircraft because of wrong operation attributable to a lack of adequate training. In an ingenious attempt to improve this situation, the Chief of Training established the 1st, 2nd, 3rd, and 4th Salvage Units (Bergungskommandos 1-4), whose task it was to collect front-model aircraft no longer capable of being repaired at the front repair depots. Those which could still be used were sent on to the schools, and those beyond repair were wrecked on the spot and salvageable parts returned to industry. The Salvage Units managed to save some 1,000 aircraft for the schools in this way, aircraft which helped a great deal to fill the gap created by insufficient allotment of front models.

Since conversion training to the more difficult front models such as the Ju-88 and the Me-109 required a large number of aircraft, the demand soon arose for models equipped with double controls. Although the Technical Office consistently promised to have the aircraft slated for training purposes converted immediately, it was

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The subject of this report is the school as a system in itself -

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was the perspective of the subject's general staff, and the Unit of Training,

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apply related to the school. The result was a result, generally substantial

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not until the winter of 1942/43 that the first deliveries were received. In the meantime, acting on his own initiative, the Chief of Training, had arranged to have his own repair depots and aerotechnical schools do the conversion job themselves with the help of parts requisitioned from industry. During the year 1940, the Chief of Training had the following converted models at his disposal¹⁸²:

Ju-52 - 25-30 aircraft equipped with dual control
 Ju-86 - 6-8 aircraft equipped with dual controls, and
 He-111 - 5-7 aircraft equipped with dual controls.

These numbers, of course, were very far from adequate, and the Ju-88 program, in particular, was in urgent need of improvement, especially since there prevailed an unfounded feeling of antipathy towards this model in a number of schools.

As of 1941, under these circumstances, the number of Ju-88's converted to dual controls under the auspices of the Chief of Training himself was no longer sufficient for the needs of the program, and a request for 100 aircraft of the Ju-88-A-12 (with dual controls and wider cockpits) was submitted to the Chief of Supply and Procurement, Luftwaffe General Staff. Even this increase, however, proved inadequate to guarantee the effectiveness of the conversion training program and, in November 1942, a further request was submitted, this time for the Ju-88-A-7 (with dual controls but normal cockpits)¹⁸³. The number of aircraft of these types actually available to the schools was as follows¹⁸⁴:

<u>Type</u>	<u>As of 1 Jan 43</u>	<u>As of 31 Dec 43</u>
Ju-88-A-7	41	129
Ju-88-A-12	-	137

In the active units, the following forces had been converted to the Ju-88 by the winter of 1941/42: 8 bomber wings, all long-range reconnaissance squadrons, 4 bomber groups assigned to the Navy, and most of the night fighter units; the 3rd and 6th Bomber Wings were

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182 - Heldmann, op.cit.

183 - Conference notes made by the Chief of Supply and Procurement on 2 November 1942. Karlsruhe Document Collection.

184 - Lt Colonel a.D. Poetter, "Die Ausbildung der Fliegertruppe beim General der Fliegerausbildung, Ende 1942 bis Kriegsende" (Training of the Flying Forces under the General of Pilot Training, from the End of 1942 until the End of the War). Karlsruhe Document Collection.



converted during the course of 1943. By the time bomber production was discontinued in the summer of 1944, for example, the General of Pilot Training had no more than thirty-six Ju-88's on hand to turn over to the bomber units¹⁸⁵. Even taking into consideration the fact that the distribution of these aircraft, intended for commitment at the front, was very carefully supervised, this figure is astonishingly low and gives us a revealing picture of the situation as a whole.

In view of this abysmally unfavorable ratio between existing training capacity and actual training needs, it is clear that the crews could not possibly be familiar with all the various types of air ordnance when they left the jurisdiction of the Chief of Training. The job of rounding out their education in this respect was left to the replacement groups of the active wings. In other words, the responsibility of assuring an adequate degree of operational effectiveness on the part of the younger generation of Luftwaffe personnel was postponed to echelons nearer and nearer the front; ultimately it was passed on to the last link in the chain of using agencies.

An attempt was made to compensate for the critical shortage of modern aircraft types and to intensify the effectiveness of training by consigning a growing percentage of training activity to the ground. The schools' supplies of drill models and link trainers came in very handy in this respect. Models of the Ju-88 and Do-217, obtained from the wreckage of damaged aircraft, were jacked up in the hangars or in sheltered areas and wired so that the students could practice all the manual operations required for take-offs and landings and learn to work the landing flaps and tail-gear. The cockpit could be artificially darkened, so that mastery of these operations gradually became instinctive and automatic. One simulated practice flight over the airfield with a Ju-88, for example, required forty-eight separate manual operations (including the

185 - Based on a Morning Report from the Chief of the Luftwaffe Operations Staff, No. 4532/44, Classified, dated 1 July 1944.

in view of the extremely unfavorable ratio between existing training co-
 capacity and actual training needs, it is clear that the above could not possibly
 be tantamount to all the various types of air operations when they fall into
 the jurisdiction of the Chief of Training. The job of training our own resources
 in this respect was left to the responsible group of the active wings. In other
 words, the responsibility of ensuring an adequate degree of operational effectiveness
 was on the part of the various commands of military establishments and personnel
 to schedule training and other activities in accordance with the
 last line in the plan of being organized.

In addition, the need to emphasize for the critical stage of a course and
 scale types and to intensify the effectiveness of training by concentrating
 training resources of training capacity to one ground. The essential emphasis
 of drill needs and high training came in very heavily in this respect. Needs
 of the 10-20 and 30-40, derived from the schedule of changed aircraft were
 taken up in the context of an expanded team and aimed to that the students
 could profit of all the actual operations required for low-altitude and training
 and level to work the training team and tail-end. The concept could be ex-
 tended to encompass the necessity of some operations gradually became available
 the and outcome. The emphasis placed right over the airfield with a 10-
 20, for example, required only-right against various operations (including the
 10-20) - based on a training team and Chief of the National Operations Staff.
 The 10-20 was classified as a 10-20.

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handling of the engines), which each student was made to recite from memory.

A total of ten hours' training on the model was the standard.

Beginning in 1942, the number of Link trainers allotted to the schools was increased somewhat. A total of twenty hours per student was the accepted standard. The Link trainer was a highly complex piece of electronic equipment and was an excellent device for training in instrument flight and in the techniques of course computation.

In addition to the instructional aids described above, it goes without saying that all the available aircraft were exploited to the allowable limit of flight hours permissible between overhauls. This was especially true of the Ju-52, used in instrument flight training, and of the Ju-88 and He-111, used in bomber training. Such an intensive flight program, however, presupposed the availability of a well-organized technical maintenance service, with repair depots of its own in which the pre-repair waiting time could be cut to a minimum. In order to guarantee such service, the Chief of Training, alerted to difficulties arising in connection with the engine repair jobs turned over to the aircraft industry, equipped his aerotechnical schools with so-called engine-belts (Motorenstrassen), on which the assembly-line technique was applied in the overhauling of engines belonging to the schools. An attempt was made to apply the same system to maintenance activity, but this was wholly effective only when the school concerned had only one type of aircraft to service. The maintenance troops were organized into units, each of which was responsible for carrying out the same type of service on all aircraft. One unit checked engines, a second worked on landing gear and steering system, a third was in charge of cleaning the aircraft, etc. Women were also employed in this activity on an experimental basis.

The results were gratifying - faster and better maintenance service and a saving in military personnel. Careful instructions, of course, were necessary.

The first part of the report describes the development of a...
 excellent device for training in...
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The guiding purpose of all these measures was an increase in the operational readiness of all the aircraft available to the training program, in order that the schools might have the maximum number of aircraft at their disposal at all times.

As of September 1944, the number of aircraft assigned to the schools totaled 9,738¹⁸⁶. Even in terms of quantity, this was far below the standard considered necessary by the General of Pilot Training, who maintained that the training program should have twice as many aircraft as specified by the authorized equipment strength of the front units¹⁸⁷. Even more important, however, was the fact that only a relatively small percentage of the total was made up of the most up-to-date models. Thus the student could not be expected to be "at home" in his aircraft when he reported for duty at the front.

4. Allotment of Aviation Fuels to the Schools

As we have seen, the training program did not have sufficient late-model aircraft at its disposal to fit the crews for full effectiveness with the units at the front and thus was forced to resort to all kinds of emergency measures to compensate for this lack. None of these measures was of the least use, however, once fuel allotments were cut to the point where the program was unable to put even its few available front-model aircraft into the air. On the contrary, as the course of military developments began to require frequent geographical transfer of the schools, their aircraft inventories became a liability. In the case of sudden moves out of threatened territory, aircraft for which no gasoline was available had to be deliberately wrecked or even blown up.

186 - Based on documents from the office of the Quartermaster General, Luftwaffe. Karlsruhe Document Collection.

187 - General a.D. Scheuerlan, "Die Ausbildung 1941/42" (Training during 1941/42), states: "Altogether the front units had 6,441 aircraft at that time." Karlsruhe Document Collection.

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During the years 1939 and 1940, the procurement of aviation fuels created no special problems. From 1941 on, however, it became one of the most important headaches of the Chief of Training and the organization which succeeded him.

As early as mid-1941, the requisitioning of the minimum amount of gasoline needed to operate the training program was subject to monthly battles which were usually decided against the Chief of Training. Even when he succeeded, by dint of personal interview with the Commander in Chief, Luftwaffe, in obtaining assurances that the necessary allotment would be granted, it often happened that new developments and the decisions they required rendered these assurances worthless. Any special military operation, the campaign in Yugoslavia with subsequent occupation of Greece and Crete, the campaign in Russia, the air supply operations at Demjansk, and then at Stalingrad, etc., served to reduce the supply of aviation fuel slated for the training program.

The extension of the war to Russia and North Africa had a very detrimental influence on the gasoline situation. Domestic production had started too late and, as of early 1941, amounted to no more than approximately 60,000 tons of aviation gasoline per month¹⁸⁸. This figure was raised to 120,000 tons per month by the end of 1942, and by early 1944, when the Allies began their systematic bombardment of German hydrogenation plants, to 180,000 tons per month. By September 1944, as a result of the Allied bombardments, production was down to 3,500 tons per month, only to rise again to 25,000 tons per month by December of the same year. As a result, the total supply of aviation gasoline, largely made up of imported stocks, amounted to approximately 400,000 tons in September 1939; by the end of 1940, it had been increased to some 600,000 tons, thanks to the intervening capture of French stocks.

188 - "Die Entwicklung der Flugbetriebsstofflage der deutschen Luftwaffe" (The Development of the Aviation Fuel Situation Faced by the German Luftwaffe) a study prepared by Branch VI of the Luftwaffe General Staff under date of 25 May 1945. Karlsruhe Document Collection.

