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EUROPEAN AXIS SIGNAL INTELLIGENCE IN WORLD WAR II
 AS REVEALED BY "TICOM" INVESTIGATIONS
 AND BY OTHER PRISONER OF WAR INTERROGATIONS
 AND CAPTURED MATERIAL, PRINCIPALLY GERMAN

VOLUME 5--THE GERMAN AIR FORCE SIGNAL
 INTELLIGENCE SERVICE

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VOLUME 5

The German Air Force Signal Intelligence Service

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VOLUME 5

THE GERMAN AIR FORCE SIGNAL INTELLIGENCE SERVICE

Chapter I. The Service in General: Sources of Information Concerning It

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1. Introduction:- This volume presents a discussion of the history, organization and operations of the German Air Force Signal Intelligence Service from its beginning in 1937 until the German capitulation in 1945.

The outstanding achievement of the German Air Force Signal Intelligence Service was its development of "signal intelligence without cryptanalysis."¹ The exploitation of every radio manifestation, which for the Germans included radar monitoring, the monitoring of beacons, the evaluation of tuning transmissions and chatter, highly efficient direction finding, radio telephone monitoring and traffic analysis, provided valuable strategic and tactical intelligence.

The Service was expanded from one officer and twenty civilians in 1937 to thirteen thousand persons in 1945, of which sixty-six hundred were in the West, four thousand in the East, and twenty-four hundred in the South.

2. Objectives:- The lightning advances of the Germans in 1939 had resulted in the German Air Force Signal Intelligence Service placing its main emphasis on radio telephone monitoring and tactical evaluation. During the quiet period after the fall of France, stress was placed on strategic evaluation in order to present a coherent picture of British Air Order of Battle and long range intentions. In addition, small units were located in the Balkans to provide intelligence of Russian deployment and intentions. Strategic evaluation continued throughout the war, but as allied raids were intensified in 1943 tactical evaluation again became important as a means of providing early warning of impending Allied raids. For this purpose an intricate system of reporting centers (Meldekopfe) and a central warning unit (Zentraler Gefechtsstand fuer Funkauswertung) were established in 1944. The evaluation of the traffic of tactical air force units operating in conjunction with Allied ground armies was also stressed as the Germans were forced on the defense on all fronts.

3. Detailed successes of Signal Intelligence.--The steps leading to the success of the German Air Force Signal Intelligence in their attack on Allied radio traffic will be treated in later chapters. A summary of that success will be indicated here by briefly sketching the results achieved against Russia, the United States, and Britain.

a. Russia.--Throughout the course of the war against Russia 85 per cent of the Morse ground-to-ground traffic of the Soviet Air Armies, Corps and Divisions and of the supporting ground organizations was deciphered. Ground-to-ground radio traffic (such as fighter control) consisting of simple word encodements was continuously solvable. The air-ground traffic of the Soviet long-range bomber formations, although only partially deciphered, permitted German traffic-analysts to chart Soviet air raids in time to give adequate warning. The great volume of information derived from message contents and from traffic analysis of the structure and functionings of the networks enabled the German Air Force Signal Intelligence Service in the East to present to its intelligence authorities an accurate and current listing of the Soviet Air Force order of battle on the three operational fronts, and of the deployment of the Russian ground forces to which the Soviet air forces served as an adjunct. Furthermore this information provided immediate and timely warning of air raids, route-tracking of bomber formations, as well as indicated long-range intentions of both Soviet ground and air forces, and provided information of supply and economic conditions.² Although up until the time of Stalingrad signal intelligence warnings had not been heeded, when the signal intelligence unit on the Southern Front correctly advised that the Russians had assembled 5 air armies in the Stalingrad sector, "sigint was held to be the main source of intelligence."³

b. United States.--The chief success against the United States Air Force was made possible by alert traffic analysis.

Although air-ground systems, used jointly by the Americans and British, were read in many cases (e.g. Bomber Code, REKOH, and SYKO), the effectiveness of cryptanalysis was definitely limited.

The Chief of the German Air Force Signal Intelligence Agency, Lt. Col. Friedrich, claimed that he had "no contents from ground-ground radio traffic;"⁴ and interrogations showed that whatever success was achieved with M 209 was usually too late for exploitation.

Traffic analysis, however, was able to provide A-2 with a comprehensive and continuous picture of the battle order and deployment of the United States Air Force in Britain, later on the continent, and in the Mediterranean. Numerous predictions were also made of long-range air force intentions. Tactically, traffic analysis of "all radio manifestations" (which for the Germans included everything from radio signals to beacons) gave

²I 70 p 4

³I 41 p 7

⁴I 70 p 5

immediate and timely warning of American air raids. As a result of what Friedrich called "the reliance on good encipherment and neglect of supervision of American radio traffic... the almost continuous radio traffic in the air... and radio traffic beginning regularly and uniformly, always sent by routine procedure.."⁵, the Germans were able to reconstruct in the West the organization and strength of the 8th United States Air Force (and its bomber and fighter commands), the 9th Air Force, and the Allied Expeditionary Air Force (consisting of the United States 9th Air Force, the 1st United States Tactical Air Force and the 2nd British Tactical Air Force). The United States 1st Tactical Air Force, Allied Air Transport Units and other air units were successfully monitored. Major long-range operations, such as the invasion and the break-through at Avranches were, with some degree of success, correctly forecast. Tactical monitoring of the United States air support parties "yielded much more information about Allied Army order of battle than did the regular army net works,"⁶ since the air support parties acted in conjunction with specific ground units.

In the Mediterranean and Middle East the German Air Signals Regiment 352 was able to reconstruct with minute accuracy the dispositions and strength of the Allied Air Force -- the 9th Tactical Air Command (one Combat Mapping group, 4 fighter groups, and one medium bomber group), the 57th Medium Bomber Wing, the 5th, 47th, 49th, 55th, and 304th Heavy Bomber Wings, the 15th Fighter Command and the Mediterranean Air Transport Service.

The accurate reconstruction of Allied order of battle attests to the effectiveness of the German analysts. American A-2 evaluation of German signal intelligence operations directed against the United States 9th Air Force states that the portions of the German discussions "dealing with the operations and activities of the 9th Air Force reveal a full and complete knowledge on the part of the Luftwaffe Signal Intelligence Service... The success of (their) efforts and the degree to which (their) operations had been developed was an uncomfortable surprise... The information of the enemy was thorough, complete, and accurate in its broad aspects; there were minor discrepancies, inaccuracies, confusion; ... but, in general, it may be said that the Luftwaffe Signal Intelligence Service was a most scientific, professional and able organization, performing a valuable, meticulously complete, and reliable service for the enemy."⁷ Operational strengths were in the main correctly estimated and the precision with which unit movements were followed is said to be truly impressive.

The success of the German Air Force Signal Intelligence in its analysis of American Air Force traffic was not exploited by the German operational units, which were sluggish in acting upon the information provided them. Friedrich complained that it was not his job to get the windmills (German fighters) airborne. It was up to him merely to give the warnings.

⁵I 70 p 5

⁶IF 182 p 83

⁷IF 177 p 24

In the Mediterranean, according to members of Air Signals Rgt. 352, "it was a course of bitter chagrin to the Luftwaffe Signal Intelligence Service that the German Command lacked the resources to translate its realistic intelligence into offensive action."⁸

c. Britain.-- Royal Air Force systems produced the greatest amount of intelligence on air-ground circuits. SYKO, REKOH, Slidex and the Bomber Code were currently solved. Although the RAF 4-figure code was changed in November 1942 and thereafter proved most difficult for the Germans,⁹ it had been read up to that time. Both on the strategic and tactical level, German Air Force Signal Intelligence achieved notable results on British Air Force traffic. In the West the Germans were able to reconstruct accurately the order of battle, deployment, strength, equipment, and intentions of the Royal Air Force, and through it, of the ground organization.¹⁰ In order of battle, the following RAF units were continuously followed throughout the war: The 1st, 3rd, 4th, 5th, 6th, 8th, 91st, 92nd, 93rd, Bomber Groups; the 100th Group, the 9th, 10th, 11th, 12th, 13th, and 32nd Fighter Groups; the 15th, 16th, 17th, 18th, 19th Reconnaissance Groups of the Coastal Command; and units of the 2nd Tactical Air Force, and of the RAF Transport Command.

On the tactical level the monitoring of RAF VHF and centimeter radar transmission and navigational aids permitted the German Air Force Signal Intelligence Service "to accomplish the following:

(1) To give accurate, long and short interval, early warning of both daylight and night raids of heavy bomber formations;

(2) By continuously tracking heavy bomber formations to present to the fighter defense a lucid picture of the air situation, from the time of take-off to the landing of enemy formations; further,

(3) To interpret the picture of the air situation in such a manner as to predict the enemy's strength in formation, depth of penetration, targets, and deceptive tactics.¹¹

In the Mediterranean area, German Air Force Signal Intelligence was able to chart RAF operations throughout the war. In the first years of the war German Air Force Signal Intelligence Service succeeded, by breaking "the most frequently used cryptographic systems ... to read the bulk of the messages intercepted."¹² The extensive use of radio communications (occasioned both by the geographical extent of the Mediterranean theater, and an insufficiency of wire communication facilities)¹³

⁸IF 185 p 24

⁹I 70 p 5

¹⁰IF 182 p 42

¹¹IF 183 p 2

¹²IF 185 p 2

¹³IF 185 p 2

permitted a minutely accurate reconstruction of RAF order of battle, strength, equipment and intentions. German Air Force Signal Intelligence was able to follow RAF operations down to squadron level. The following units were monitored: the 206th and 225th Reconnaissance Squadrons, the 414th and 416th Night Fighter Squadrons, the 8th Fighter Group of the South African Air Force, the various units of the RAF Desert Air Force (MASAF), elements of the 90th Mediterranean Allied Photo Reconnaissance Wing, the RAF Mediterranean Allied Coastal Air Force (MACAF) and the various components of RAF Middle East, including the RAF Balkan Air Force, RAF Air Headquarters, Greece, Eastern Mediterranean, and Air Transport Command.

4. Administrative Difficulties.--The success of the Air Force analytic effort seems to have been achieved in spite of rather than because of the administration of the organization. Interminable disputes prevented the smooth functioning of the service. One of the issues frequently disputed was whether it was better for the Signal Intelligence Agency to be subordinated to the Chief Signal Officer (General Nachrichten Fuehrer, abb. Gen. Nafue), or to the A-2. Another subject of controversy was the separation of administrative from operational control, set out at least on paper, between the Senior Signal Intelligence Officer (Hoeherer Kommandeur der Funkaufklaerung, abb. Hoe Kmdr d Funkaufkrlg) and the Signal Intelligence Agency. There were arguments over the exercise of the various types of control (administrative, tactical-operational, strategic-operational, etc.) over the units in the field, that is the Air Signal Regiments and the Air Signal Battalions (Luftnachrichten Regiments, abb. LN Regt, and Luftnachrichten Abteilungen, abb. LN Abt). The latter disputes involved the rival claims for the control of the Air Force Signal Intelligence, the centralized Signal Intelligence Agency, the decentralized local Air Forces (Luftflotten), the Senior Signal Intelligence Officer, and in the latter stages of the war, the Chief of the Air Raid Warning Service for Germany (Funkaufklaerungsfuehrer Reich, abb. FAF).

These claims, when they were settled at all, were resolved by compromise and appeasement. In general, the Signal Intelligence Service was subordinated to the Chief Signal Officer and not to the A-2, although the latter was the chief consumer of the intelligence product.

The control over the field regiments and battalions may be outlined as follows:

a. Administrative or service matters: Control was exercised by the Senior Air Signal Intelligence Officer (Hoe Kmdr d Lu FA) to whom the Commanders of the Air Signal Regiments and Battalions were subordinated.

b. Tactical matters (strategic movements and deployment): Control was exercised by the Signal Officer of the local air force (Luftflotte) to which the field unit was attached.

c. Operational matters: Control was exercised by the Signal Intelligence Agency (LN Abt-350 in the 1944 reorganization) of the Air Force (Oberbefehlshaber der luftwaffe, abb. Ob d L).

5. Sources of Information-- Several sources of information were used for this volume:

a. The TICOM interrogations of prisoners. (The I Reports)
 b. A 13-volume report entitled "The Signal Intelligence Service of the German Luftwaffe" compiled by Col. J. G. Seabourne, chief of the Air Technical Intelligence Team of the USAAF. (IF 175 through IF 187)

c. Report of the British Air Ministry (A.D.I.(K)),¹⁴ entitled "German Air Force Signals Intelligence in the War."

d. German documents captured by TICOM teams consisting of minutes of Signal Intelligence meetings, reports, etc., including filmed excerpts from the Supplementary Volume B to War Diary 2 (Division 1) (Anlagenband B. Zu Kriegstagebuch II [1 Abt]).

(1) TICOM, through its interrogations of prisoners, obtained a working picture of the German Air Force Signal Intelligence Service. Traffic analysts and cryptanalysts active in the Chi-Stelle and in the various field units explained the details of their operations. Chief among these were Lt. Col. Friedrich, head of the 3rd Division of the Office of the Chief Signal Officer (Gen. Nafue III) which dealt with signal intelligence, and at the same time Chief of Air Signal Battalion 350 (LN Abt. 350, The Signal Intelligence Agency). Specialist (Regierungsrat) Dr. Voegele, Chief Cryptanalyst of the German Air Force Signal Intelligence Service and specialist on Anglo-American systems, made a number of reports. Lt. Ludwig, chief evaluator on the Western front; Major Feichtner, Commanding Officer of Air Signals Regiment 352, which operated on the Mediterranean front; Captains Herold and Scheidl, 1st Lt. Werther and Chlubek; 2nd Lieutenants, Smolin and Rasch, all active on the Eastern front against Russia, and Major Oeljeschlaeger, of Friedrich's staff, provided reports of their respective activities.

(2) The 13-volume report prepared under the direction of Col. J. G. Seabourne, Chief of the Air Technical Team contains minutely detailed discussions by German Air Force Signal Intelligence Service personnel of the history and functions of their service. Col. Seabourne, who was "charged with the mission of securing and compiling data relative to the operations of the Luftwaffe Signal Intelligence Service in the course of World War II,"¹⁵ was successful in obtaining elaborately illustrated expositions from German Air Force Signal Intelligence personnel. The reports are generally thorough, careful, and reflect the knowledge of the expert. The main subjects covered and the names of the chief reporters follow:

(a) History in General

Evolution of the Signal Intelligence Service 1914 - 1939

Major Feichtner

Origin of the German Air Force Signal Intelligence Service:

T/Sgt Jering

The history and operations of the Chi-Stelle and of its various sections (Referate) which operated

¹⁴IF 189

¹⁵IF 177

with the Central Party at first but were later co-located with the field evaluation companies.

(b) Operations West

History of operations	T/Sgt. Jering
Fighter warnings of Allied Strategic Bombings	T/Sgts. Watkinson and Jering
American Aircraft Warning Service and intelligence derived from Allied navigational aides, captured documents, and equipment.	Lt. Ludwig
Technical operations: Ludwig's studies consist of a detailed and documented account of the methods used to produce strategic intelligence on Allied order of battle and long-range intentions, and to give tactical intelligence on the operations of the American Air Support Parties and the British and Canadian tentacles (networks by which ground troops requested air support against German ground concentrations.)	Lt. Ludwig
Cryptanalysis of Western systems	Lt. Ludwig

(c) Operations East

Organization and history in general from 1936-and particularly the story of the 1st Bn LN Regt 353	Col. Eick
Central Front operations Windels was CO of 2nd Bn, LN Regt 353	Major Windels
Southern Russian Front Herold was CO of the 3rd Bn, LN Regt 353	Capt. Herold
Strategic evaluation of Soviet Air Force traffic	Lt. Chlubek
Tactical Evaluation of traffic of Russian Long Range Bomber Force	Lt. Rasch
Russian Radio Procedure	Lt. von Lackum
Air Force R/T traffic	Lt. Mucke
Cryptanalysis of Soviet Systems	Lt. Chlubek

(d) Operations South

History

Technical operations of
Ln Regt 352Major Feichtner
and T/Sgt. Jering,
Lt. Lier, Major,
Schultze, and
Feldwebel Schlott-
man

- (e) Organization of the Central Air Warning Service. Forster was Chief of the Reich Defense Signals Intelligence Service (Funkaufklaerungsfuehrer Reich, abb. FAF) Col. Forster

In addition, miscellaneous studies and detailed biographies of various German Air Force Signal Intelligence Service personalities were included.

The TICOM and the Seabourne reports taken together present a comprehensive picture of the German Air Force Signal Intelligence Service. The many details and carefully executed diagrams contained in the Seabourne reports provide a wealth of material for further study. Liberal quotations from it will be found throughout this paper.

(3) The Air Ministry Report¹⁶ consists of a series of reports comprising an account of the German Air Force Signals Intelligence Service from its beginnings, and describing the development of intercept, advance warning, route tracking and forecasting of air offenses, the breaking of Allied cryptographic systems in the West and in the North. It is pointed out, however, that further evidence from captured German Air Force documents has been helpful in supporting these interrogations. In general, the material is organized on the lines of the Seabourne report. A detailed description of the organization and operation of the unit operating in Norway (LN Abt. 355) is contained in the final portion of the Air Ministry Report.

(4) The above reports of German prisoners of war, obtained after the capitulation of Germany, are supplemented by various documents written during the course of the war. The most important of these, the War Diary, gives a complete Table of Organization for the Chief Signal Officer, (General Nachrichten Fuehrer, abbreviated Gen Nafue) and a description of duties for all offices under his control: particularly relevant for this paper are the sections on Gen Nafue I (allocation and employment of Signal Troops), Gen Nafue II (communications and cryptography), and Gen Nafue III (Signal Intelligence Service).

Minutes of various Supreme Commander of Armed Forces meetings which were attended by German Air Force Signals Intelligence Service personnel and copies of actual operational reports rendered from time to time prove a useful supplement to the interrogations and monographs.

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Chapter II. Development of the German Air Force
Signal Intelligence Service

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b. Chief of Staff, Office of the Chief Signal Officer	
c. Divisions of the Office of the Chief Signal Officer	

6. January 1937 - September 1939.--On January 1, 1937 a Signal Intelligence Agency was established under the Air Ministry for the Commander in Chief of the German Air Force. It was called Chiffrier Stelle, Oberbefehlshaber der Luftwaffe (abbreviated Chi Stelle, OB d L). The Air Force was a new branch of the Armed Forces (Wehrmacht), legally in existence slightly more than a year. The Signal Intelligence Agency of the Commander in Chief of the Air Force (Chi Stelle OB d L) was the Air Force's first official entry into signal intelligence and consisted of but one officer and twenty civilians. Prior to the Chi Stelle's establishment, all intercept and evaluation of foreign air force traffic had been done by German Army signal intelligence units.

Fixed intercept stations were established during 1937 according to German Army prototypes and given the cover name of "Weather Radio Receiving Stations" (Wetterfunkempfangsstellen, abbreviated W-Stellen).²¹ The intercept stations were supplemented by direction-finding stations which were called "Weather Research Stations" (Wetterforschungsstellen, abbreviated Wo-Stellen). In addition, mobile intercept platoons were established to operate in the field.²² The platoons' original mission was the monitoring of German Air Force traffic for security purposes, but late in 1937 they were expanded into mobile Radio Intercept Companies (Luftnachrichten Funkhorchkompanin Mot) which collaborated with the fixed stations in the intercept of foreign air force traffic.²³

²¹ IF 181 p 14; IF 189, 403, p 2

²² IF 189, 403 p 2

²³ IF 189, 403, p 3

The intercepted material was passed to the Signal Intelligence Agency for analysis and evaluation after preliminary traffic analysis and cryptanalysis had been performed. The Agency completed the processing of the traffic and transmitted any intelligence derived from cryptanalysis or traffic analysis to the Commander in Chief of the Air Force, the Army, the Navy, and back down to local air force (Luftflotte) commanders. The Agency had the further duty of assigning broad intercept missions to the field units and publishing general orders for signal intelligence activities in general. ²⁴

It soon became evident that the intelligence needs of local air force commanders could be more quickly satisfied by having evaluation performed at lower levels than at the Signal Intelligence Agency. As a result field evaluation centers of company strength were established and given the cover name of "Weather Control Stations" (Wetterleitstellen, abbreviated W-Leit). ²⁵

In 1939, after several experiments at reorganization, the fixed and mobile signal intelligence units were combined into signal intelligence battalions, removed from the administrative control of Chi Stelle, and attached to Local Air Force Signal Regiments, in each case as the third battalion of what was primarily a communications regiment. Each signal intelligence battalion was composed of an evaluation unit, two mobile intercept companies and three fixed intercept stations. ²⁶

As a result of the above Signal Intelligence activities, it can be said that prior to the outbreak of war in September 1939 the German Air Force High Command had "a quite accurate picture of the air armament, deployment, and strength of foreign air forces, as well as their organization and expansion." ²⁷

7. September 1939 to November 1944.---The quick successes of the German Armed Forces in overrunning Poland in eighteen days in 1939, and France in a few weeks in the spring of 1940 denied the German Air Force Signal Intelligence Service an opportunity to distinguish itself. ²⁸ As the British Air Ministry Summary states:

"It is almost a truism that signal intelligence has its greatest value when the war is going badly and is of least importance when all is going well. Thus Germany's early lightning successes were a great handicap to the future development of its signals intelligence, for they rendered almost superfluous the help which it could have given if duly appreciated and developed. All that seemed necessary

²⁴ IF 181

²⁵ IF 181 p 16

²⁶ IF 189, 403, p 4; IF 181 p 16

²⁷ IF 180 p 4

was to listen to enemy R/T traffic while the German armies and the German Air Force were hammering their way forward..." 29

However, in December 1939 the German Air Force Signal Intelligence Service demonstrated its value when it enabled German fighters to destroy a large Wellington formation over northern Germany by supplying the fighter command with the location, height, speed and size of the raiding force.³⁰ The result of this signal intelligence success was the realization that signal intelligence had an important place in Germany's air raid defenses.

With the stabilization of the Western front in 1940 and the opening of a campaign on the Eastern front in 1941, a great expansion of the German Air Force Signal Intelligence Service ensued. Because of the diverse fronts covered and the fundamental differences in their problems, the German Air Force Signal Intelligence Service field units operated as self-contained entities in the Western, Eastern, and Mediterranean sectors. Technical coordination existed between the individual specialist sections (Referate) of the Chi-Stelle, discussed in the next chapter, and the evaluation units (W-Leit) in the field.³¹ The Chi-Stelle exercised operational control over the Evaluation Companies (W-Leit), handled field units' requests for personnel and special signal equipment, remained in constant touch with all signal intelligence problems in the field and was "accustomed to maintaining direct contact with the Leitstellen as well as with each individual outstation. This achieved the purpose of assuring a rapid exchange of fundamental intelligence within the Signal Intelligence domain. On the other hand, the General Staff was kept in the picture through the reports furnished by the Referate."³²

As allied air raids became more frequent in 1942 and 1943 the tactical air raid warning aspect of signal intelligence was exploited. The evaluation centers with the field units flashed advance warning of allied heavy bomber raids to civilian and military authorities and carried on route tracking of the bombers for the benefit of German fighter control.³³ This tactical warning activity developed into an intricate system of tactical air raid warning centers which are described in detail in Chapter IV of this paper.

29 IF 189, 402, p 2

30 I 109 p 7

31 IF 180 p 6

32 IF 180 p 6

33 I 109 p 7

The development of airborne and navigational radar by the allies made necessary the creation of a radar observation service (Funkmessbeobachtungsdienst), and the radar jamming service (Funkstoerdienst). "Radar observation and jamming units were accordingly added to the existing wireless intelligence units in the West and South (in the summer of 1943). The radar control post (Funkleitstand) of the OB d L was created to correspond with the Chi-Stelle OB d L..."³⁴

From the outbreak of war until the middle of 1944, operations of both the central and field units were sufficiently developed to provide a continuous flow of information to the Air Force High Command A-2. However, the many channels of tactical and operational command to which these units were subject and the growth and development of their work compelled a reorganization in the last stages of the war. This reorganization constitutes the most coherent form of the German Air Force Signal Intelligence Service, and is described immediately below (paragraphs 8 and 9) as the norm.

8. Reorganization on the Staff level in November 1944.-- The dynamics of signal intelligence operations make it difficult to find any point of rest at which an accurate statement of organization is possible. However, the several reorganizations of the entire service that occurred in 1944 to fill the needs arising throughout previous operations gave the service its final form.

In the spring of 1944, the first of these reorganizations took place. All signal intelligence units, including the Chi-Stelle which heretofore had been under the German Air Ministry (i.e., Chi-Stelle OB d L) were placed under the tactical command of the Chief Signal Officer, 3rd Division (Gen. Nafue III) in order to unify operations under a central command.³⁵

This centralization in tactical matters and the decentralization in administrative affairs to the field command units, led to difficulties in guidance and supply. As a result, in the fall of 1944, after an abortive order by Goering to unify all German Air Force Signal Intelligence units through combining all listening, jamming, and radio traffic units as part of Air Signal Regiments³⁷, a new comprehensive organization was finally created. This new organization unified all home and field units into independent air signals regiments and battalions with numbers ranging from 350 to 359. Administration was centralized in a so-called Senior Signal Intelligence Officer (Hoehoerer kommandeur der Funkaufklaerung, abbreviated Hoehr Kdr d Funkaufklrg).

³⁴ IF 189, 403 p 5

³⁵ IF 180 p 5

³⁶ IF 189, 403 p 6

³⁷ No. 180-186 D 4 I 42

This final organization provided for centralized control in the Chief Signal Officer (General Nachrichten Fuehrer) instead of the A-2, or Air Ministry. Under the Chief of Staff of the Chief Signal Officer were three divisions: the first (Gen Nafue/I) supervised the assignment of air signals troops; the second (Gen Nafue/II) directed communications and German Air Force cryptography; and the third (Gen Nafue/III) directed signal intelligence, cryptanalysis, and security.

Gen Nafue/III had administrative control over the Chi-Stelle or Signal Intelligence Agency, and the commanding officer of Gen Nafue/III, Lt. Col. Friedrich, was also the commanding officer of the Chi-Stelle. Under the reorganization of November 1944 the Chi-Stelle was redesignated Air Signals Battalion 350 (Oberkommando der Luftwaffe, Luftnachrichten Abteilung 350, abbreviated "OKL/LN Abt 350").³⁸ Friedrich, in his position of dual command, regulated the planning for the entire German Air Force Signals Intelligence Service and "as the representative of the Chief Signal Officer remained the supreme authority until the very end on all Signal Intelligence Service matters of decisive importance" (Gen Nafue I, II, and III are described more fully in paragraph 5).³⁹ Nominally, however, the administration of the Signal Intelligence Service was placed in the hands of the old Signal Corps retainer, General Klemme, who was named Senior Signal Intelligence Officer (Hoehr Kmdr d Funkaufklrg). All signal intelligence matters pertaining to the defense of the Reich were placed in the hands of an Oberst Forster, who was named Chief of the Reich Signal Intelligence Air Radio Warning Agency (Funkaufklaerungsfuehrer Reich, FAF).

³⁸This is designated "Signal Intelligence Agency of the Airforce High Command (OKL/LN Abt 350)" throughout other volumes of this report, as it was actually such an agency.

³⁹IF 180 p 23

9. Reorganization of the Field Units in November 1944.--
The disposition and designation of the field units after the reorganization was as follows:

West: Air Signals Regiment 351 (LN Regt 351). This Regiment consisted of three battalions, and operated in conjunction with local Air Force 3.

Mediterranean and Middle East:

Air Signals Regiment 352 (LN Regt 352). This Regiment consisted of two battalions and operated with local Air Force 2.

East: Air Signal Regiment 353 (LN Regt 353). This Regiment consisted of three battalions. The first battalion operated with local Air Force 1 on the Northern Russian Front, the second, with local Air Force 6 on the Central Russian Front, and the third, with local Air Force 4 on the Southern Russian Front.

Scandinavia:

Air Signal Battalion 355 (LN Abt 355). This Battalion operated with local Air Force 5.

With the Reich:

Air Signal Battalions 356 and 357 were limited to advance warning and tactical operations, the former deriving its evaluations from "enemy" signals, the latter from the use of radar and navigational aids.

Air Signal Battalion 358 was concerned with training.

Air Signal Battalion 359 engaged in radar jamming and operated in conjunction with the Luftflotte Reich.

10. Staff Offices of the German Air Force Signal Intelligence Service and their Functions. --The information on the description of the T/O which follow are derived from Supplement B to War Diary #4, Division 1 of the Air Force High Command (Anlagenband B zum Kriegstagebuch 4 (I. ABT) vol 1.1. 45 bis 15.3.45) 40

40. Translation of this document is known as T-2553.

It should be emphasized that actual practice did not always reflect the T/O description of function.

a. Office of the Chief Signal Officer.--The responsibilities of the Chief Signal Officer, General Martini, included the following:

"Regulation and direction of use of men and equipment in the Air Signals Troops; direction of operations and maintenance of signal communications of the Air Force; direction of use and operations of Air Security and Ground Installations for the Radio Navigation, Air Reporting (including Radar and Fighter-Control Service), Signals Intelligence, Radar Observation and Jamming Services..." The Chief Signal Officer "is responsible personally to the Reich Minister for Aviation and the Commander-in-Chief of the Air forces; organizationally and operationally to the Chief of General Staff of the Air Forces."

b. Chief of Staff, Office of the Chief Signal Officer.--Among the subordinates of the Chief Signal Officer was the Chief of Staff (Chef des Stabes) Obslt. Morgenstern, who was charged with carrying into effect the duties of the Chief Signal Officer noted above. The execution of these duties followed three main lines of action:

- "(1) Review of Air Signals Troops allocation and employment.
- "(2) Preparation, construction, maintenance, and operation of all signals communications of the Air Force.
- "(3) Operational planning and direction of the Air Security, Air Reporting (including radar), Signal Intelligence, Radar Observation and Jamming Service."

c. Divisions of the Office of the Chief Signal Officer.--The three duties of the Chief of Staff noted above were performed by three divisions (abteilungen) of the Office of the Chief Signal Officer. The organizational pattern consisted in a separation of each division into four or five functional groups, each of which was in turn subdivided into sections.

(1) Gen Nafue/I.

The first division, commanded by Major Franze, is described as a "specialist section of the Air Force, working over the allocations and employment of men and equipment..." and "therefore to be informed by the 2nd and 3rd Divisions on basic problems of allocation, employment of men and equipment,

of operations, of signal intelligence and of jamming services.⁴¹

This division was organized into four groups. Group I directed Troop Allocation and Employment, supervised the General Signals Service, and published Organizational and Operational Regulation. Group II supervised Radio Navigation and the Air Security Service. Group III supervised Air Reporting (including radar) and the fighter-control service. Group IV was occupied with "Navy Liaison," which meant the review of signal questions arising between the Navy and the Air Force and cooperation between the two services in settling such questions. The specific duties of the various sections into which these groups were divided are set forth in detail in the War Diary.⁴²

(2) The second division (Gen Nafue/II) controlled German Air Force signal communications and cryptography. The exact nature of the control is now known, but it was probably both operational and administrative. The second division was headed by Lt. Col. Dr. Schulze, and was divided into four groups (Gruppen). Group I did control planning for the second division. Group II supervised telephone service. Group III supervised teletype service. Group IV supervised communications and cryptography. By this is meant that it supervised the issue of cipher machines, cryptographic systems, and compiled and distributed keys. It did not make cryptographic security studies, which was the duty of Group IV of the third division.

The War Diary passage describing the work of Group IV illustrates the scope of Signal Intelligence activity of Gen Nafue/II. Pertinent excerpts from this description are therefore printed below.⁴³

The areas of signal activity over which Group IV had supervision are of interest for their diversity. All the administrative functions are listed in full in the War Diary⁴⁴, and simply those pertinent are noted below. The largest of these sections, with the exception of the "Special Office," consisted of only four persons.

a. Section A.

Radio Operations and Cryptography

Direction and surveillance of all radio air security operations of the Air Force.

⁴¹ T 2558 p 17

⁴² T 2558

⁴³ T 2558 pp 28-31

⁴⁴ T 2558

Review of regulations affecting radio and air security and air reporting operations, and review of Air Force enciphering regulations (the latter carried out in cooperation with the units concerned in the Supreme Command Armed Forces, the Army High Command, and the Navy High Command).

Surveillance of tactical radio operations and radio deception measures.

Allocation of cryptographic systems under control of the Air Force.

Execution of radio practice and radio testing.

Publishing of operational directives for radio-operations-offices, and radio-control-offices of the Commander-in-Chief of the Air Forces.

(b) Distribution of literature on radio operations.

Section B.

Review of all operational codes of the Air Force, including the setting up of distribution lists, and review of requisitions necessary for the coordination of radio operations within the Armed Forces (effected in cooperation with the other branches of the Service).

Allocation and employment of flares and other signal devices (both ground and airborne) used in connection with Air Force activities (carried out in cooperation with the other branches and the Axis powers).

Section C.

Compilation and preparation of secret writing methods of all types, in cooperation with the agencies of other branches, and compilation of operational codes.

Distribution, shipping, and control of all secret writing devices and of operational codes.

Distribution and control of all cipher machines, with the exception of the enciphered teletype machine. Carried out in cooperation with Air Signal Ordnance Department.

Development of new enciphering procedures.

It should be emphasized that Section C's function was purely administrative and that the actual work outlined above, except for development of new enciphering procedures, was carried out by a "Special Office" having at least T/O parity with the other sections.

Section D.

Review of operational literature for Air Security Radio Operations.

Supervision of the setting up of radio beacons, plane recognition, and the allocation of call signs.

(3) Gen Nafue/III

The third division was the Signal Intelligence Service (Funkaufklaerung) of the Office of the Chief Signal Officer. As such, its primary function was the direction of all the analytic operations of the service, which were carried on by the Signal Intelligence Agency or Chi-Stelle (Chiffrier Stelle, Oberbefehshaber der Luftwaffe). In general, other matters, particularly those of organization, equipment, security, and personnel of this division were carried on by five different groups. Group I directed the total allocation, employment, and operations of signal intelligence and of the jamming services. Group II supervised the equipment and technical administration for intercept. Group III supervised equipment and technical administration for enemy radar monitoring and jamming (funkmessbeobachtungs und Funkstoerdienst). Group IV conducted security studies on German Air Force systems, issued security directives, and assisted in the development of new systems. Its duties, as described in the War Diary,⁴⁵ were performed by three sections:

(a) "Section A. Control of Cipher Systems and cipher equipment

Testing of keying-procedures in use in wire and wireless signal communications of the whole Air Force.

- (i) for possible decipherment.
- (ii) for areas of use and volume, density, and distribution of traffic.
- (iii) for message form and content.

Requisitions for sampling check-up on German signal communications and evaluation of observations, in collaboration with the 2nd Division (i.e., Gen Nafue/II).

Directives for execution of camouflage and radio-deception measures in German communications operations (in cooperation with the 2nd Division).

Evaluation of decipherment results of German and enemy intercept services and working out of counter-measures.

Examination and testing of keying methods of Allied Powers' Air Force.

Cooperation with agencies of other branches.

(b) "Section B. Development of Keying Means and Keying Methods

Development of new keying means and procedures, in cooperation with the 2nd Division (Gen Nafue/II).

Working out of directives for special keys according to demands of the 2nd Division.

Cooperation on tactical-technical demands in development of keying equipment.

Use of enemy results for own development.

Cooperation with agencies of other branches.

(c) "Section C. Keying Directives

Cooperation on publication of Signal Operations instruction in cooperation with 2nd Division.

Cooperation on publication of keying directives for new encipherments, in cooperation with the 2nd Division."

Group V was concerned with Personnel.

(4) General Comments

Both by the above paper description and in actual practice, Group IV (Security) of the Third Division and Group IV (Cryptography) of the Second Division worked in close liaison. The frequent repetition of the phrase "in cooperation with the Second Division," appearing in the duties of the security section attest to this coordination of effort. Minutes of high-level meetings of OKW/Chi show the repeated attendance of both Lt. Col. Dr. Schulze, head

of the Second Division and of Captain Porth, head of Group IV of the Third Division. ⁴⁶ At these meetings, it was determined that OKW work "in close collaboration with the appropriate departments of the ... Air Force" in developing enciphering systems, but with respect to security, OKW/Chi is responsible for making "a security check" on all Air Force codes. ⁴⁷

It is frequently averred that the "production of keys is the affair of the separate branches of the Armed Forces" ⁴⁸ and that guidance, alone, was furnished by OKW/Chi in devising keys. However, there appears to be some dispute about OKW's right to test Air Force systems. Practicing cryptanalysts of other services (Fricke and Huettenhain) declared ⁴⁹ that there was no coordination of key testing, that each organization did its own and was under no obligation to submit its systems to OKW. However, Gen. Lt. Gimmeler, Chief of Armed Forces Communications Branch, at a conference in November 1944 stated:

"OKW/Chi is appointed as the only organization of the Wehrmacht for testing and checking all cipher systems used and proposed for use in the Reich."

In the description of the duties of both the cryptographic and security groups appear the phrases "radio disguise," "false transmissions," "directives for execution of camouflage and radio-deception measures in German communications operations." Friedrich had always forbidden wireless deception on the ground that "deception is worse than useless and inevitably betrays what it is meant to conceal." ⁵⁰

46 D 57

47 D 57 pp 7 8

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11. Organization and Development, - This Chapter concerns the organization and development of the Signal Intelligence Agency of the Commander in Chief of the Air Force (Chiffrier Stelle, Oberbefehlshaber der Luftwaffe, abbreviated Chi-Stelle/OBdL, as of November 1944 Air Force High Command, Air Signal Battalion 350, Oberkommando der Luftwaffe, Luftnachrichten Abteilung 350, abbreviated OKL/LN ABF 350 and referred to throughout this volume as Chi-Stelle).

The Chi-Stelle of the Air Force was the most important of the units under the third Division of the Office of the Chief Signal Officer, (Gen Nafue/III) from a signal intelligence point of view. It was the highest authority for the German Air Force Signal Intelligence Service. Its functions are summarized by one German as follows: "It directed the activities of the listening service in accordance with the demands of the German Air Force Operations Staff and was responsible for the long-term evaluation of results and reporting to the latter; it also provided the means of collaboration with the other services."⁵¹ From its origin in 1937 until 1940 it was located in Berlin; but right after "the start of the Polish campaign, the Chi-Stelle moved from Berlin to the Marstall, the riding academy of Frederick the Great in Potsdam-Wildpark. 'The Marstall' became a sort of second name for the Chi-Stelle, since it remained there until just before the German collapse."⁵² It was divided into specialist sections (Referate), which reflected the geographical diversity of its interests. At the time of the collapse the principal sections were as follows: A. Staffing, allocation and employment of intercept sets; B. Evaluation West; B5. Evaluation of Allied transport and Ferry traffic; C. Evaluation Mediterranean; D. Evaluation East; E. Cryptanalysis.

⁵¹IF 190 No. 404 p 1

⁵²IF 180 p 5

The bulk of the evaluation sections acted in close collaboration with the field evaluation companies attached to the Air Signals Regiments and Battalions and ultimately were co-located with them, since "it was considered more effective to have the long-term evaluation center close to the intercept units rather than close to the staffs which they have to feed."⁵³ For example, after the fall of France (1940),⁵⁴ Ref. B moved from Potsdam-Marstall to Asnieres near Paris,⁵⁴ Section B5 moved in 1943 to Munich/Oberhaching (near an intercept station devoted to ferry traffic),⁵⁵ ⁵⁶ Section C, after a long stay at central headquarters, ultimately in early 1945 moved to Premstaetten, to join the evaluation company of Air Signals Regiment 352;⁵⁷ and Section D, directly after the beginning of the campaign against Russia, followed the General Staff to Zhitomir, then to Warsaw, and finally to Cottbus.⁵⁸ In every instance these sections were finally merged with evaluation companies of the field units, Section B with 25 Co of LN Regt 351, when both were co-located at

⁵³IF 189 No. 404 p 1; I 109 p 27

⁵⁴I 109 p 27

⁵⁵IF 180 p 33

⁵⁶B₅ appears to have achieved the status of an independent section on a parity with B. (See IF 189 404 p1, paragraph 1, and Ibid p 2 paragraph 6.) The other sections of Section B were:

- Liaison Officer with Army
- Liaison Detachment at PW camp
- Liaison Officer with Operations Staff
- B Immediate Evaluation
- B₁ RAF Bomber Command
- B₂ 8th U.S. Bomber Command
- B₃ Captured Material
- B₄ Fighter Formations
- B₆ RAF Coastal Command
- B₇ Master Index
- B₈ Combined Army and Air Force

⁵⁷IF 180 p 35

⁵⁸IF 180 p 14

Limburg after the Allied breakthrough at Avranches;⁵⁹ Section C with the 25 Co of LN Regt 352 at Premstaetten, after many delays;⁶⁰ and Section D with the 25 Co of LN Regt 353 at Cottbus.⁶¹

The cryptanalytic Section (Referat E) maintained a certain amount of centrality of operation with respect to Anglo-American solution, although the various field units were entrusted with the solution of lower grade systems, such as Bomber Codes, the Mediterranean U.S. M-209, SYKO etc.⁶² All Soviet solution was shifted as far forward as possible because of the ease with which 85% of the systems were read, and even the sub-section of Section E. engaged on Russian Air Force Cryptanalysis (Section F.1) moved with the Eastern evaluation section (Section D) to the front. This decentralization is criticized in the Air Ministry Report⁶³ as follows: "...the crypto service should have been centralized; the output of a large centralized crypto service exceeds the sum total of the contributions of its individual members and is higher in quality." However, the operational needs for speedy solution made it mandatory for solution on the spot, where and when, it was needed. Moreover, the lack of homogeneity of traffic on both the Russian and Western fronts made it wise to decentralize the cryptanalytic operations.

a. Some opinions of the Chi-Stelle-- The evidence in the interrogations indicates that all did not run smoothly within the Chi-Stelle. According to the witnesses, who may well have been using the opportunity for their personal gripes as well as to impart information, there existed within the organization the familiar conflicts between the incompetence of favored officers and the unrecognized ability of progressive officers aware of the potentialities of signal intelligence. They indicate further that all the usual symptoms of an organization at odds with itself were manifest. Few of the personnel respected the ability of the others, these on the working level decried the weakness and indecisiveness of the commanding officers, commanding officers complained because of the division of responsibility and low morale continually hampered operations.

The Chi-Stelle, at the Marstall was said to have a "ministerial" aspect and a "relatively extravagant manner of existence."⁶⁴ Although Lt. Col. Friedrich, head of the service, was said to be a good replacement for the previous leaders, none of whom had "fully measured up to requirements,"⁶⁵ it later became clear, at least to Tech Sgt. Jering, a cryptanalyst of Chi-Stelle who had occasion to observe Friedrich

⁵⁹I 109 p 27

⁶⁰IF 184 p 53

⁶¹I 121 p 12

⁶²I 112

⁶³IF 189 No. 402 p 2

⁶⁴IF 180 p 5

⁶⁵IF 180 p 19

at work, that "the choice of an officer with no signal or intelligence training as chief of so highly specialized a service was not exactly a fortunate one." In describing one of the Sections, he commented upon "...the spirit of mental prostitution pervading the halls of the Marstall since the beginning of the war, nurturing a large class of privileged indolents who assiduously opposed any change or innovation."⁶⁶ Of the same section Jering observed "the overall complexion of inefficiency...became worse during the last two years of the war as duty hours were lengthened, rations became slimmer, and air raids regularly interfered with the night's repose. Political sycophants, the threat of being sent to the front, which... would have been relished by no one, and the fear of transfer by way of disciplinary action, all served to suppress and curb men and women working twelve hours and more at a stretch..."⁶⁷ It should be observed that Jering himself may well have suffered the bitterness which frequently grows in a brilliant subordinate working under officers less acute than himself, and that therefore his remarks in no sense constitute a reliably objective account of this aspect of the organization.

The description of Lt. Col. Friedrich's personality and administration written by Major Ferdinand Feichtner, a man of outstanding reputation,⁶⁸ is a more objective appreciation:

"When the then Major Friedrich of the General Staff took over command of the Chi-Stelle Ob. d. L. after a succession of predecessors as corrupt as they were incapable, everyone had for a time the impression that at last the right man was in the right place. By virtue of his close relation with the Luftwaffe High Command...the Chi-Stelle became for the first time a central and authoritative organism of command, over which no Luftwaffe A-2 could set himself any longer. Friedrich brought along new ideas and points of view to signal intelligence operations from his General Staff experience. He deserves most of the credit for the close liaison we enjoyed with the High Command. He gave the ideas and experiences of the specialists a hearing, backed them up without considering himself and accepted and acted on good suggestions that were offered to him. Unfortunately he failed to continue his high promise. I have the feeling that after 1942 the highly specialized departments of the signal intelligence service grew too much for him to keep up with, technically as well as from the view point of personnel. He often admitted that technical matters were fundamentally incompatible with his being, and as a General Staff Officer he had no Signal Corps training. But the worse

⁶⁶ IF 180 p 34

⁶⁷ IF 180 p 35

⁶⁸ IF 179 Foreward

feature of all was that he was unable to introduce any rational policy into the Signal Intelligence Service methods of assigning personnel. He never understood the situation enough to relieve the tension at the beginning of the war between the old civil servants, who had been in for years, and had become mostly parasitic growths, and the young blood which had just come in, and had proved itself worthy. The old guard had built an impregnable political stronghold for itself in the Marstall, and taken care of its own by giving them all the key positions. Another shortcoming was his failure to bring it about that this service, becoming ever more specialized, should be commanded by men who were familiar with these specialities. He was much more likely to depend on commanders who knew less of the actual interests of the radio intelligence service than he himself, but who had no idea whatever of the purpose and mission of the service which of course they, themselves, should have been duty-bound to represent and stand up for. Moreover he filled his staff with his own grave-diggers, advisers who did not measure up to the responsibilities they held, either as people or specialists, but who nevertheless knew how to play up to their chief, whose mind was always on a thousand different things and who was fundamentally too good natured.

"A branch of the service which included the cream of German intelligence and which called for the highest degree of mental sharpness, technical ability, and knowledge of the world and the people in it, should have had a chief who was made differently from this professional soldier, whose horizon and ability never rose above the level of a good company clerk.

"Friedrich knew himself well enough to turn down the command of the signal intelligence division which was offered to him. His inability to make up his mind was at times most paralyzing to the dispatch of business. ...He always insisted in particular upon clear thinking and decision on the part of his subordinates, but whenever one sent him a teletype for an order, one would come back which was as cautious as the Delphic oracle, and always placed all responsibility on the recipient."⁶⁹

The problem of the control of the Chi-Stelle by either the A-2 or the Chief Signal Officer was resolved by a four-sided organization: The Chief Signal Officer "was regarded as the supreme authority on all technical signal matters," A-2 was to provide "guidance of the intelligence activities of the Chi-Stelle," the newly-created Senior Air Signals Intelligence Service Officer (Gen. Klemme) had supreme administrative control over the Chi-Stelle and the field units, and

the Signals Intelligence Service Chief for the Reich (RAF--Col. Forster) was given top authority in all matters relating to the defense of the Reich.

b. Relations with A-2 and the Chief Signal Officer:--
As seen in Chapter I the question of whether the Signal Intelligence Service should be subordinated to the Office of the Chief Signal Officer or to the A-2 was often debated.⁷⁰

The main advantage of subordination to the Chief Signal Officer was "the increased facility with which signal communication could be provided and radio equipment allocated." The excellence of the communication system, which existed to the very end, was undoubtedly the result of this signal control. On the other hand, the close liaison between signal intelligence and signal security, which the Chief Signal Officer's control was also supposed to produce, "failed of realization, since in spite of the accurate knowledge of Allied mistakes in the field of radio and cryptographic procedure, as revealed by the work of Signals Intelligence Service, delinquencies of the same nature were either not corrected at all, or only partially so, by the Germans. There was an apparent lack of a qualified expert who might have evaluated the results of the Signals Intelligence Service with the end in view of improving the security of Luftwaffe radio communications."⁷¹

The chief argument in favor of subordination of the Chi-Stelle to A-2 was that all intelligence agencies would then be under a central administrative control. Actually, however, subordination to the Signal Officer rather than to the A-2, proved no bar to effective work, and relationships between the real specialist personnel of the Chi-Stelle and the higher intelligence authority which they served were good.⁷² In the Chi-Stelle's work with A-2 the familiar difficulty was at first encountered that A-2, on the one hand, did not always recognize the value of signal intelligence; and, on the other, that Chi-Stelle's reports were written in Signal Intelligence terms, call signs, frequencies, etc., with A-2 being left to draw its own conclusions. In time however, "the evaluators learned to transform signal intelligence into an operational intelligence picture."⁷³ Once the evaluators were "imbued with tactical concepts, they sometimes turned to the other extreme, wishing to perform the A-2 function themselves, and arbitrarily mixing signal intelligence with intelligence from other sources... Only in the course of time was the happy medium found." The appointment of a liaison officer did not cure the dilemma, since, according to wont, a young man was chosen "well indoctrinated with drill regulations, but possessing very little signal intelligence experience. Unfortunately he became no more adept with time, had but slight tactical knowledge, and, in brief, did more harm than good. Although the specialist personnel of the Chi-Stelle became immediately aware of his deficiencies, nevertheless more than a year elapsed before a change took place."⁷⁴

⁷⁰IF 183 p 78

⁷¹Lt. Martin Ludwig of Chi-Stelle in IF 183 pp 78 - 79

⁷²IF 183 p 80

⁷³IF 183 p 80

⁷⁴IF 183 p 81

c. Relations with the Field units:-- The creation in the Fall of 1944 of the post of Senior Signal Intelligence Officer (Hoehrer Kommandeur der Funkaufklaerung abbreviated Hoehr Kdr d Funkaufklrg) was intended to centralize the administration of the affairs of the Chi-Stelle and the field units. This centralization continued the "obscure relationships" at the highest headquarters and was the antithesis of what the field units required.

The centralization of administrative control "of the Signals Intelligence Service... in the hands of one of the many supernumerary Luftwaffe Signal Corps generals"⁷⁵ made the administrative problem of the field units more acute than ever. "In this case, also, the Chi-Stelle failed completely; since it had planned and supervised all Signals Intelligence Service operations from the beginning, it might easily have been the central administrative authority also."⁷⁶ The difficult situation confronting the Field units was eased by the cooperation of the local Air Forces. The local commanders of these often furnished quarters, rations and other services when the field units own supply service broke down.⁷⁷

The various Sections of the Chi-Stelle exercised control of the Field units according to their location, ultimately working on the spot with these units. The organization and functioning of these sections will be treated below in the following paragraphs of this chapter.

d. Relations with the ZAF and FAF:-- As the strength of Allied air raids increased, tactical evaluation assumed an ever greater importance, and it became necessary to establish an agency which would summarize and integrate all the reports and information made available by the outlying tactical evaluation centers. This need was met by the creation of the Air Raid Warning Agency for the Reich (Zentraler Gefechtsstand fur Funkauswertung, abbreviated ZAF) Treuenbrietzen. This unit, headed by Colonel Forster, was under the operational direction of the Chi-Stelle but administratively subordinate directly to Gen Nafue/III. In order to facilitate coordination between the all important ZAF and the other agencies affected by the information it disseminated a new position was created, and designated Chief of the Air Raid Warning Service for Germany (Funkaufklaerungsfuehrer Reich, abbreviated FAF) Col. Forster, head of the ZAF, filled this position also. In this capacity he was still under the Chi-Stelle for operational purposes, and acted as adviser to the Commanding General of Fighter Corps I.⁷⁸

⁷⁵IF 180 p 22

⁷⁶IF 180 p 22

⁷⁷I 130 p 4

⁷⁸IF 181 p 62

12. Section A-- Staffing, Allocation and Employment--
 This Section, which was closely connected with the office of the commanding officer, was divided into the following sub-sections: Operational Planning (planning for monitoring operations on all fronts, preparation of Tables of Organization and equipment and allocation of personnel to Signal Intelligence units); Personnel (routine personnel matters for entire Signal Intelligence); War Diary (a writing of detailed diary of the Signal Intelligence activities); Procurement (procurement of all special signal equipment for the Signal Intelligence Service); and Research (examination and repair of captured equipment).⁷⁹

13. Section B--Evaluation West--⁸⁰ Section B was one of the best operational evaluation sections of the Chi-Stelle. Able personnel and intelligent administration permitted it to make significant contributions to German Air Force intelligence. Before the outbreak of the war, Section B was able to provide a comprehensive picture of RAF organization, locations, strengths, aircraft types, personnel and supply.⁸¹ Its move to the Western front after the conquest of France served to intensify its activities.

The staff of Section B consisted initially of civil service personnel who had performed the same type of work in peace-time. A large number of soldiers--mostly university men, or business men versed in languages--were transferred to the section. As the civilians were drafted, despite their strenuous objections (since they usually received low ranks), distinctions between civilian and soldier tended to disappear. The soldiers became acquainted with their work and in many cases obtained better results than the civilians.

The wise policies of limiting personnel changes, training in signal intelligence and cutting down military duties to an absolute minimum promoted enthusiastic work.⁸²

⁷⁹IF 180 p 8

⁸⁰This account is virtually a word-for-word repetition of the materials on Section B. See TICOM, I 109 pp 26 - 33, the Air Ministry Report, IF 189, No 404 and Volume V. of the Seabourne Report, IF 180 pp 27 - 32

⁸¹IF 180 p 9

⁸²This was in sharp distinction to almost every other unit of German Air Force Signal Intelligence Service.

At the end of 1942 some of the male clerks and statisticians were replaced by women's auxiliaries (the Luftnachtrichten Helferinnen). The consensus is that although "these female auxiliaries were better than the soldiers, in work as assistants, on the other hand, attempts to employ women on independent work in evaluation, apart from a few exceptions were not successful."⁸³

a. Organization-- "There were two diametrically opposed theories on the subject of the organization of the evaluation section. The first claimed that organization should be made to conform to the sources being covered; i.e. W/T evaluation, R/T activity evaluation, and D/F activity evaluation, and that all results should be combined in a final evaluation."⁸⁴ This plan, which was not adopted for the Sections of the Chi-Stelle, was actually used in the evaluation companies in the field.⁸⁵

"The second theory, which was proved superior for long-term evaluation in the West (and also in the South), favored an organization covering the setup of the enemy air force formations, i.e. RAF Bomber Command, VIIIth U.S. Bomber Command, AEAFF, etc." Accordingly, Section B consisted of the following sub-sections:

B-1----Immediate Evaluation, Reception, Distribution, and routing of messages.

B-2----RAF Bomber Command, Strategic Evaluation

B-22---US. 8th Bomber Command, Strategic Evaluation

B-3----Captured equipment, material and navigational evaluation

B-4----Fighter Formations (RAF and 8th A.F. Fighter Commands, AEAFF Fighters and Night Fighters). This unit was engaged in the evaluation of Tactical Air Force radio traffic.⁸⁶

B-5----Originally USAAF outside Europe, and later ferry and transport traffic. [This sub-section became independent at the end of 1943, and is discussed below as a separate Section).

⁸³I 109 p 27; IF 189 No 404 p 2

⁸⁴IF 189 No 404 p 2

⁸⁵The organization of the evaluation companies of the 1st, 2nd and 3rd Battalions of LN Regt 353 on the Russian front provides a good illustration of this type of organization. It is described later in this volume.

⁸⁶IF 180 p 28

B-6----RAF Coastal Command, Strategic evaluation.

B-7----Master Index of Units and Locations.

B-8----Combined Army and Air Force. Traffic of the Air Support Parties and the tentacles; the 2nd Tactical Air Force, the U.S. 9th A.F., RAF ACC.

In addition a liaison detachment was stationed at the Air Prisoner of War Transit Camp (Durchgangslager Luft, abbreviated Dulag) at Oberursel.

Relations were also maintained between the head of Section B and a liaison officer of Army Signal Intelligence Regiment 5 (KONA 5) and a liaison officer of German Air Force Operations Staff I c (Intelligence).

b. Operations-- The chief tasks of Section B were the evaluation of "enemy" transmissions, control of intercept, and evaluation of captured material, equipment and navigational aids.

(1) Evaluation: Section B, in fulfilling its task of providing a long-term evaluation for the West, had to collate, evaluate, and check the results of the intercept units in the West and North. These units were in the West, Signal Intelligence Regiment West (later LN Regt 351) and LN Abt. 357 after its withdrawal from LN Regt 351; and in the North, 3rd Battalion of LN Regt 5 (later LN Abt 355).

Section B based its evaluation judgments partly on the worked-out results of the Evaluation and Intercept companies and partly on the original operators' logs (day reports), especially for R/T traffic.

The principal materials at its disposal were:

"1. The daily radio situation reports of the intercept or evaluation companies, which were mostly sent in by teletype, but sometimes also by radio or by courier.

"2. The detailed composite reports of the intercept companies (appearing monthly), or the previously evaluated reports produced monthly by the Evaluation Companies.

"3. Sometimes, especially for R/T evaluation, the original intercepts of the operators (day reports).

"4. Other sources of information: P/W's statements, captured material, press and wireless (especially BBC) etc. These sources served to supplement or elucidate the section's own findings. Great care was taken to see that no Sigint information was mixed in with this. If recourse was had to other sources, these had to be named."⁸⁷

The following description of function appears:

"With the division of labor largely clarified, the specialists of section B had only to keep up to date and to clear up in cooperation with the Dulag and the relevant intercept unit any changes which occurred.

*If there appeared any new fields (e.g. appearance of the USAAF in Great Britain, setting up of 2nd TAF etc.) it was the task of Section B to encourage its advancement by using the best evaluators and to keep giving encouragement to the sigint units.

"In this connection, it proved advantageous not to have the personnel subordinated to LN. Regt West and thus to Luftflotte 3. In this way it was possible to announce all findings, and also to raise any necessary complaints, without regard for rank or appointment. On the other hand much duplication of work was caused by this peculiar position of Section B, and for this reason many people held the view, personnel of Section B included, that the best solution would be to incorporate the Section in the Regimental evaluation section (25/351). Quite a satisfactory solution of these questions was reached by their being later brought together in the same area at Limburg."⁸⁸

(2) Control of intercept. "One of the most important functions of Section B was the control of listening activities. It was the Signal Intelligence Agency's practice for Evaluation to assign missions, and this was true of all the echelons of command. At the lower levels, the Evaluation Companies assigned missions to the intercept stations. The various Referate, in turn, controlled the intercept in their respective sectors. In such case "the necessary instructions were not issued directly by the Referat to the Companies but via the higher formation, for example, LN Regt West."⁸⁹

Such supervision was necessary since all the intercept stations tried to cover the frequencies which produced the greatest number of messages and therefore offered, at least superficially, the opportunity to produce the best results.

Section B had to see that not only the most productive frequencies but all frequencies important for obtaining a complete picture were monitored. In some instances pressure had to be put on intercept companies to keep them monitoring the many ground networks of the RAF and the USAAF because these frequencies were not productive of the sort of immediate action intelligence which it pleased the companies to pass to the flying units. None the less monitoring of these networks was demanded because they clearly showed the order of battle.

⁸⁸I 109 p 29

⁸⁹I 109 p 30

When a new line of traffic appeared, the intercept units often tried to keep to their accustomed monitoring program and to pass off new tasks to other intercept units. In these cases Section B always had to control interception according to the exigencies of the situation and often do the evaluation itself at first, and then pass it on to the evaluation company.

As will be seen in a later chapter the German theory of signal intelligence, which placed the prime emphasis on evaluation of "all enemy signals" and therefore imposed the exercise of intercept control in the evaluation sections, resulted in difficulties for the cryptanalysts.

(3) Evaluation of captured material, equipment and navigational aids (Section B-3).

All the sub-sections of Section B, with the exception of B-3, were engaged in long term evaluation. B-3 was organized to evaluate captured documents and material, including navigational aids, obtained from aircraft shot down. The increased Allied aircraft losses up to the period of the decline of the German air defense produced more and more of this captured material for signal intelligence.

The following were the main tasks of B-2:

"a. Clarification of Allied navigational aids through the evaluation of captured documents and equipment;

"b. Directing the monitoring of the radar intercept stations;

"c. Instruction of the intercept stations of the Signal Intelligence Service regarding information obtained from captured documents (frequencies, call-signs, codes, etc.);

"d. Examination of captured radio and navigational equipment, and informing signal intelligence units of the results of this examination."⁹⁰

Accordingly, this sub-section was especially interested in the following secret and confidential documents and apparatus:

- "1. X- or Q- group lists.
- "2. Call-sign lists (R/T and W/T).
- "3. Frequency lists (chiefly W/T).
- "4. Bomber codes.
- "5. Airfield lists giving exact data on station call-signs and frequencies, position of airfields, radio-beacons, etc. (especially frequently found in aircraft of VIII Bomber Command shot down).
- "6. Note-books with important entries.
- "7. Lists of radio-beacons and other navigational aids.

- "8. Descriptions of apparatuses.
- "9. Maps.
- "10. Radio and navigational sets.
- "11. Crystals from VHF-sets."⁹¹

As it came in, captured material was forwarded by those salvaging it to Dulag Oberurung. If aircraft were shot down near Signal Intelligence offices or stations, the officers and officials of the Signal Intelligence Service had the right to examine those things that interested them. In the Fall of 1944, this sub-section was withdrawn from Section B and subordinated to the Radar Control Post (Funkleitstand) at Potsdam-Eiche.⁹²

The evaluation of captured documents relating to navigational aids, and the examination of equipment such as airborne search receivers, recognition devices and the navigational aids, was intended to suggest new procedures, determine whether a navigational aid would be useful to the German Air Force flying units, and whether the Allies were using German transmitters as navigational aids. Because these navigational devices were continually monitored by the Germans, intense interest was displayed in any of them that became available from capture.⁹³ The results of research into these navigational aids were published approximately each month in the Navigation Reports and passed to all interested units.

⁹¹IF 183 p 30

⁹²IF 183 p 30

⁹³The following pieces of equipment were listed: Group Radio Beacons; "Splasher" beacons (cover name "Orchestersessel"); J-Beams (cover-name "Rodelbahn"), the locations, frequencies, and recognition signals of which were all learned from captured documents; Circular Beacons (including "SE" beacons, airfield beacons, "Eureka" beacons, etc.); Hyperbole Navigation (G-Box); "Boomerang" procedure; "GH" procedure (cover name "Diskus"); Micro-H Systems (cover name "Schleuderball"); H2S or "Magic Box" (British airborne search radar; cover name "Rotterdam", later "Laubfrosch", 2 cm. band); "H2X" ("Mickey", American airborne search radar; cover name "Meddo", 3 cm. band); IFF (airborne recognition devices; cover name "Flamme"); ASV apparatus (cover name "Eule"); "Weapon" (night fighter search radar; cover name "Grille"); night fighter warning devices ("Monica"), and Infra-red recognition devices.

Another task of B-3, in collaboration with salvage detachments, especially those of the Luftgau, was to provide for the investigation of captured radio sets and crystals. Through many personal contacts with B-3, the salvage detachments were convinced of the importance of their work and cooperated whole-heartedly with the Signal Intelligence. After every investigation of a shot-down Allied aircraft, the salvage units teletyped the most significant results to the Signal Intelligence Service.

This type of report led to the following results:

"1. Comparison with existing documents, to see if R/T traffic from the approaching or shot-down aircraft had been picked up. If possible the squadron number was established from the call-signs. Comparison with squadron recognition markings.

"2. If the frequency-range of the formation in question was known, the gaps in that range could be filled in. An accurate knowledge of all frequency ranges is most important to long-term intelligence for setting up chains of subordination.

"3. Whenever questions were raised, Dulag Luft was informed, all briefing being passed via the Referat B liaison detachment at Dulag to the interrogating officers at Oberursel."

(4) Liaison with PW Transit Camp (Dulag Luft). The Liaison Detachment of Section B at the PW Transit Camp (Dulag Luft) at Oberursel was responsible for providing close cooperation between Signal Intelligence Service and PW interrogation. PW interrogation resulted in valuable information, particularly upon the numerical designation of units, details concerning enemy equipment, and the changes in enemy tactics.⁹⁴ It also expedited the evaluation of all captured material dealing with radio. Important findings such as new call-signs or frequencies were immediately reported by direct telephone line to Section B. The operations are described by Lt. Martin Ludwig in his article on liaison between Dulag Luft and Signal Intelligence Service⁹⁵ as follows:

"Signal Intelligence Service derived great benefits from the evaluation of captured material. All documents salvaged from Allied aircraft which had been shot down, crashed, or made emergency landings, were passed on directly to Dulag Luft by the salvaging unit (usually an air base headquarters). As long as communications within Germany remained relatively unimpaired (until the fall of 1944), captured material reached Dulag comparatively quickly. There it was assorted according to

⁹⁴IF 183 p 84

⁹⁵IF 183 pp 87 - 88

topic, and all documents pertaining to radio or radio navigation placed immediately at the disposal of the Signals Intelligence Service Liaison team. This team had on hand all lists of frequencies, call-signs, Q-groups, etc., and determined whether the captured documents contained any new intelligence, such as the call-signs and frequency of a newly occupied airfield. Any such new discoveries were immediately telephoned to Referat B. Later, the originals of all captured documents were sent to Referat B for detailed examination."

c. Reports.-- The most important units to which Section B had to report were:

- (1) German Air Force, Operations Staff Intelligence
- (2) Chief Signal Officer, Army High Command
- (3) Naval High Command
- (4) Army High Command
- (5) Local Air Force
- (6) Chi-Stelle Section C (for information of listening units in the South).
- (7) Interrogation Centre (Oberursel).

In many cases (the Commander in Chief West, Local Air Force Command) and the evaluation unit of Signal Intelligence Regiment 5 at St. Germain received reports from Section B. The following reports were issued by Section B:

Immediate reports (teletype or telephone) for important new facts, intentions to attack, changes of location, etc.

Radio Situation Reports, daily consolidated survey of the events of the preceding 24 hours.

10-Day Reports, concise reports on the long-term intelligence of the last ten days.

Monthly Consolidated Reports, detailed report with maps and diagrams, usually 50 to 60 typed pages in length.

Special reports, e.g. 'Army-Air Co-operation', 'Control of British Night Fighters', etc.

A chart of these routings shows the many headquarters serviced by the Section. (Chart 5-2)

14. Section B-5-- Allied Ferry and Transport Traffic--⁹⁶

In 1941 a section within Section B⁹⁷ was established to monitor America. This in turn, was divided into two sub-sections. One analyzed traffic which was concerned with the

⁹⁶The text for the discussions on Section B-5 is taken, without change, from Tech Sergeant Jering's discussion of the Chi-Stelle contained in volume 5 of the Seabourne Report - IF 180 pp 32 - 34

⁹⁷IF 180 pp 32 - 34

Army and Naval Air Forces of the United States which were then being built up hastily. This traffic was monitored insofar as it could be heard by Signals Intelligence Service stations in Germany, France, and Norway. This sub-section reached its peak at the turn of the year 1942-1943, when the fundamentally changed war situation dictated a more conservative use of radio receivers. The second sub-section worked on ferry service traffic on the North Atlantic route at first in connection with Atlantic reconnaissance traffic (Coastal Command). The South Atlantic route, as well as Pan-American Airways traffic in South America, was taken care of until 1942 by Section C. When the coverage of traffic from the United States proper was reduced, the afore-mentioned sub-section of Section B took over the monitoring of this South Atlantic commitment from Section C.

The American ferry service increased in importance, and in the Middle of 1943 this "American" section was taken away from Section B. Reinforced with certain specialist personnel from Section C it was installed in Munich/Oberhaching as a separate Section (B5), in which the analysis of all ferry traffic was now combined. At the same time the large W/T intercept platoon located in Oberhaching, which administratively belonged to the Marstall battalion, took over the monitoring of all ferry traffic with the exception of that on the North Atlantic routes, which as previously, continued to be covered by the 16th Company of LNR 3 in Angers. The new Section evaluated all traffic and had the following responsibilities:

"a) The monitoring of the United States proper, which although it only touched the surface, still furnished an insight into the principal networks of the Army and Naval Air Forces, into training activity, air transport, defense zones, and the activation of new combat aviation units.

"b) The monitoring of the Atlantic ferry service. The Middle and Central Atlantic routes were monitored by the W/T platoon in Oberhaching and by Luftwaffe Signals Intelligence Service outstations in Spain, which operated under the cover name of "Purchasing Agencies"; the North Atlantic route was monitored by the 16th Co., LNR 3 and reports furnished to the Section.

"c) The monitoring of the American Air Transport Command by the platoon in Oberhaching.

"d) The monitoring of the RAF Transport Command, and of both American and RAF troop carrier commands. The greater part of this interception was also done in Oberhaching."

Airfield radio tower traffic (R/T on 6440 kcs.) was intercepted in Madrid, Montpellier and at various Signals Intelligence Service out-stations in the Balkans and Italy. This traffic was evaluated by Section B5, with the aid of extensive files.

The Section also had a small cryptanalytic team of its own, which deciphered intercepted messages on the spot.

Section B5 remained operational until the last weeks of the war, and was thus in a position to cover the British airborne landing at Bocholt. One week before the capture of Munich by the Americans its male personnel withdrew to the Alps, while its women auxiliaries were discharged.

15. Section C -- Evaluation South-- Section C has been described as the least capable of all the specialist units of the Chi-Stelle. Its commitment, the evaluation of Mediterranean traffic, was largely handled by the Air Signals Regiment in the South (LN Regt 352). Jering, apparently a chronically sour critic, observes of Section C. "During its entire career Section C produced not one special report; this in spite of the fact that activity in the South provided fertile material for such appreciations. ... The members of the Section buried themselves in the details of a highly specialized daily routine without anyone in the Marstall becoming much acquainted with the real problems facing the Signals Intelligence Service battalions in the South... In general, as clumsiness, distrust, and dodging of responsibility characterized the Chi-Stelle Command, so they marked the leadership of Section C. In order to keep its surplus of personnel occupied, ridiculous and unnecessary tasks, involving a labyrinth of paper work, were invented. As a result, all feeling for straight-forwardness and conscientiousness was lost. The majority of members of the Section, in spite of years of service in the Chi-Stelle, had never even seen a Signals Intelligence Service out-station. This reluctance to face realities naturally weakened the influence of the Section. In consequence its opinion in organizational matters carried but little weight, and for the most part it was limited to special problems of evaluation."⁹⁸

a. Organization--⁹⁹ Section C, similarly to Section B, was organized into sections which corresponded to Allied units or activities (MATAF, 15th USAAF and 205 Group RAF, long range reconnaissance, radar reporting networks, transport and ferry service, and airfield radio tower traffic). In addition, two other sections, one devoted to press reports and prisoner of war intelligence, and the other to point-to-point networks, were especially successful. The two sections, in close cooperation with the other sections dealing with air-to-ground traffic, and making use of all collateral intelligence, collaborated in producing and maintaining a detailed organizational picture of MAAF which the Luftwaffe A-2 used to include in his monthly reports.

The following "sub-sections" were attached to Section C:

(1) Turkey

Three men revised and edited the material intercepted and evaluated by W-Leit Southeast, and prepared weekly and quarter-annual reports for the A-2.

(2) Sweden and Free France

Even the air forces of these countries were monitored in sketchy form by several out-stations and they provided the "raison d'etre" of several evaluators. Here also, reports were prepared for the A-2, sometimes monthly, sometimes less frequently. After the German withdrawal from France this section was united with Section B.

⁹⁸IF 180 pp 34, 35, 36

⁹⁹quoted from IF 180 pp 35-37

(3) Section C 2. This "sub-Section" was created in 1942, and was engaged in preparing a text-book on the radio and navigational procedures of the British, American and Russian Air Forces. This opus was given wide distribution, and all the larger Signals Intelligence Service units were given copies for the edification of Signals Intelligence Service personnel. Current supplements kept the work up to date. In the middle of 1944 the project was abandoned and the personnel transferred to Signals Intelligence Service out-stations.

b. Operations-- Each morning the teletyped material which had come in during the night from the two Signals Intelligence Service battalions in Italy and the Balkans, from the company in Montpellier, the Signals Intelligence Service stations in Spain, and later from the ZAF, as well as from those out-stations which were authorized direct communication with the Section, was assorted by the Chief of the Section and distributed to the appropriate sub-sections. Assembling and checking these reports with any data of their own, the sub-sections, in the course of the forenoon, prepared the daily report of the Section. After being edited by the evaluation officer, it formed the basis for the daily situation conference at which all controversial points were discussed. It was then mimeographed and around noon was ready for distribution. One copy was sent by courier to the General Staff, the others were mailed to the recipients.

The afternoon as a rule was devoted to the study of incoming reports and a review of the log sheets sent in from the units in the field; maps were prepared, and preliminary work done on the monthly report, the distribution of which corresponded in principle to that of Section B's reports. Correspondence with the regiments and battalions was taken care of, comments from the General Staff were studied and those relevant were passed on to the field units concerned.

16. Section D -- Evaluation East--¹⁰⁰ In peace-time this Section evaluated traffic intercepted from Russia, Czechoslovakia, Poland and the Balkan States, and kept the General Staff briefed on air activity in these countries through current reports. After the subjugation of these smaller countries, it concentrated entirely on the Soviet Union which had been considered of prime importance from the beginning. Owing to the different structure of the Signals Intelligence Service in the East, the growth and development of this Section varied essentially from that of Section B and C. Whereas in the West and South cryptanalysis had to be abandoned to a certain extent, and the main emphasis from the beginning of the war was on traffic analysis and R/T evaluation, in the East the majority of enciphered messages could be read, which placed Signals Intelligence Service work on this Front in a quite different aspect. A further fundamental distinction was that in the West the enemy emerged

¹⁰⁰ quoted from IF 180 pp 13 - 16

practically each month with a new and revolutionary radio or radar technique, while the four years' struggle in the East brought relatively few technical innovations. To this was added the fact that during the course of the war each of the Russian air armies developed its own particular radio procedure, the individual evaluation of which, of necessity, had to be left to the Signals Intelligence Service battalions located on the various sectors of the Front which were specialists on this subject.

Thus Section D, more than any other Section, had to limit itself to a compilatory career. It began its activity in the Marstall, in the wake of German advances at the beginning of the campaign in the East (end of 1941) it moved to Niedersee in East Prussia. From here, in view of the large-scale operations planned on the southern sector for the spring of 1942, it followed the General Staff to Zhitomir, where it remained until May, 1943. The Russian advance caused its retreat to Warsaw, where, at the beginning of 1944 it set up a Meldekopf¹⁰¹ which was incorporated into the Signals Intelligence Service defense system of the ZAF, (Central Air Raid Warning Unit). When, after the breakthrough at Minsk, the Russians began to threaten Warsaw, it moved again to Cottbus, south of Berlin. There, toward the end of 1944, it was merged with the regimental evaluation company of Signals Intelligence Service Regiment, East, which was formed at about that time.

a. Organization and Operations-- Only during the first two years of the war did the Section send its daily and fortnightly reports directly to the General Staff. At the end of 1942 a Signals Intelligence Service liaison team was established in the office of the A-2 to deal with signal intelligence originating in the East. The reports of Section D were almost unintelligible to a non-specialist, since they were crammed with technical data and terminology; hence they were edited and rewritten by this liaison team. Owing to the uncomplicated aspect of the work, the Section comprised only a few highly qualified men; in all there were only ten members. A rather large cryptanalysis platoon was attached to the Section. At its height the platoon consisted of about ninety men, but its importance dwindled appreciably in the last years of the war. The reason for this was that Russian cryptographic systems became ever more individual in character, and central treatment of them was found to be impractical.

There was also attached to the Section a large intercept platoon which monitored the point-to-point networks of the Russian rear defense zones. A Signals Intelligence Service company in Rzeszov, later Wamslau, sent material intercepted to the Section by teletype; it was deciphered by the cryptanalysis platoon and the intelligence therein incorporated into the daily report. The second main source

¹⁰¹"Reporting Center", further described in Chapter IV

of material for these reports were teletyped summaries from the three Signals Intelligence Service battalions in the East. From 1943 on, R/T traffic from Russian tactical aviation units increased in significance, even being important to final evaluation. During the latter years of the war it was particularly important on the northern sector where good land-line communication limited the use of W/T.

"Meldekopf Warsaw" consisted of a team of about ten men. Since Russian long-range bombers were active only at night, its personnel, radio operators and evaluators alike, was only occupied during the evening hours. If traffic was intercepted on any of the known bomber frequencies it was reported immediately to the ZAF as an early warning. Neither the radio discipline nor navigational ability of the Russian bomber crews was comparable to that of Allied crews in the West. Therefore, as a rule, the Meldekopf was able to report to the ZAF and to other appropriate headquarters, the exact strength, composition, and probable target of an enemy bomber formation. This information was usually determined, at the latest, while the Russian bombers were crossing the front lines.¹⁰²

17. Section E -- Cryptanalysis-- The cryptanalytic Section (Section E) was formed within the Chi-Stelle after the creation of the German Air Force Signal Intelligence Service in 1938. At the outbreak of the war there were only 15 to 18 cryptanalysts. Fifty newly inducted enlisted men without the remotest training in cryptanalysis were then assigned to Section E by the Chief Signal Officer. The Section "expanded continuously, and toward the end of 1942 reached its peak strength of approximately 400 men." The subsequent release of physically-fit men to combat units and their replacement by women auxiliaries "caused cryptanalysis to suffer many a set-back."¹⁰³ Nevertheless, it is claimed that "even in January 1945 the Section could boast of having broken 35,000 messages in the West and 15,000 in the East..."¹⁰⁴

a. Organization-- Section E was divided into two main units: E-1, which worked on Eastern systems, particularly Russia; and E-2 and E-3, which worked on Western systems, particularly British and American. Sub-section E-6 was engaged in IBM work.

The decentralization of cryptanalytic work, discussed above¹⁰⁵ was occasioned by the necessity of placing low-grade solution as far front as possible and the failure of the Air Force cryptanalysts to solve such high grade systems as SIGABA or the Russian one-time pads. It is stated that "new

¹⁰²IF 180 pp 13 - 16

¹⁰³IF 180 p 17

¹⁰⁴IF 180 p 17

¹⁰⁵Chapter II

difficult cryptanalytic problems were first explored by Section E in the Marstall. Later if the deciphering procedure was established in detail, a team of cryptanalysts familiar with the system, was sent to that Signals Intelligence Service battalion or company where the greatest amount of traffic in that particular system was being intercepted. Thus, eventually the personnel of Section E was scattered all over Europe." Cryptanalysis is discussed in more detail in Chapter V of this volume.¹⁰⁶

18. The Radar Control Post (Funkleitstand)-- The Radar intercept control post (Funkleitstand), although an independent unit originally under the control of the Radar Service, finally was placed under the undivided jurisdiction of Gen Nafue III. In practice, "it was a Section for radar intercept"¹⁰⁷ and a type of Chi-Stelle for radar evaluation. The inter-relations between the Funkleitstand, Section B-3 (navigational aid evaluation), and the Central Command Post for Air-Raid Warning (ZAF) are difficult to ascertain. It has been stated that "the whole manner in which the radar intercept problem was treated is indicative of the confusion, bumpiness and lack of coordination which prevailed in all higher headquarters in Germany during the last two years of the war."¹⁰⁸

Friedrich stated that from pure traffic analysis of British radar service, the German radar monitoring service was enabled to ascertain or to establish:

- "1. The mode of operation of ground sets. In cooperation with the listening service, it was possible to ascertain the areas in which interception by (or of) the enemy was not possible.
- "2. Clarification of navigational aids to the extent that the English control systems became known (advance warning).
- "3. Data for our own jamming service and technical hints for our own development of similar sets.
- "4. Carrying out of route-tracking of formations in the air; in most cases from take-off until landing."¹⁰⁹

The German Air Force Signals Intelligence Service early realized the potentialities of radar intercept evaluation and created radar intercept centers (Funkbefehlsstaende) at the individual field Signals Intelligence Service battalions, which "were intended to perform locally the same functions as the Radar Control Center (Funkleitstand) at Potsdam."¹¹⁰

¹⁰⁶IF 180 p 17

¹⁰⁷IF 180 p 39

¹⁰⁸IF 180 pp 40, 41

¹⁰⁹I 70 pp 6, 7

¹¹⁰IF 180 p 40

In 1944 the radar intercept centers were incorporated into the evaluation companies of their respective Signals Intelligence Service battalions, and radar intercept flash messages were sent directly to the reporting centers (Meldeköpfe), which were agencies collating all types of signal intelligence data relating to impending air-raids.

Volume 5

Chapter IV. Organization and Operation of the Field Units

Section A. Operations in the West

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19. Organization of Field Units in the West-- The final German Air Force Signal Intelligence Service unit in the West, Air Signal Regiment 351, was the result of four years of continuous operation against Britain and eventually, the Western Allies. By the time the November 1944 reorganization took place, its activities had become mainly centered upon the tactical evaluation of Allied bombing operations. As a result of this emphasis, two "independent" battalions, Air Signals Battalion 356 (concerned with radar intercept in the Reich) and Air Signals Battalion 357 (concerned with intercept and evaluation of Allied bomber communications) were organized. To some degree, these two battalions were created from units which had been part of Air Signals Regiment West from which Air Signals Regiment 351 had been earlier derived.

Air Signals Regiment 351, also derived originally from Air Signals Regiment West, was organized into three battalions each of which had four to five companies. The first battalion (I/LN Regt 351) contained the regimental Evaluation company (25th Co LN Regt 351), the communications company (26th Co Regt 351) and two other service companies, the tactical reconnaissance company (1 Co Regt 351) and the signal repair company (2nd Co Regt 351). The second battalion (II/LN Regt 351) had a VHF (very high frequency, i.e. radio telephone) intercept and D/F company (7th Co Regt 351), which operated against the Tactical Air Force Fighter Command; two HF (high frequency, i.e., usual Morse channels) intercept companies (8th and 9th Cos, Regt 351), which operated against the French Air Force and the 1st U. S. Tactical Air Force; and a radar intercept company (10th Co, Regt 351).

The third battalion (III/LN Regt 351) had three HF intercept companies (12th, 13th, and 15th Cos Regt 351) which operated respectively against Allied transport units, Tactical Air Force and naval air raid warning service; a VHF (Very High Frequency) R/T intercept company (14th Co Regt 351), which operated against the Tactical Air Force Fighter Command; and a radar intercept company (16th Co Regt 351).

20. Intercept Missions of Field Units-- Intercept missions were assigned in the West by Section B of the Signal Intelligence Agency, which made the assignments to the Regiment (LN Regt 351) or to the evaluation company (originally W-Leit, later 25th Co. LN Regt 351).¹¹¹ Section B also directed search cover, including the employment of the search receivers and the identification of new traffic.¹¹² Search missions were allocated by assigning specific portions of the frequency spectrum to different sets. An operator with records of known and identified traffic could determine immediately whether traffic he intercepted was known. New traffic also appeared directly on or near frequencies regularly covered by the intercept companies. Whether picked up on search, or on fixed assignments, the newly discovered traffic was re-examined by the evaluation sections, identified, where possible, and put on further cover, where unidentified. Further monitoring disclosed whether it was practice or bona fide tactical traffic.¹¹³

21. Distribution of Reports by Field Units in the West-- Evaluation was performed at all possible levels: at the intercept stations by intercept platoons; at the battalions and regiment by evaluation companies; and finally, at the Chi-Stelle level by Section B, which worked with the field units. The intercept companies issued daily radio situation reports, which were transmitted to interested headquarters (including Section B) either by teletype, radio, or courier. Every month a detailed composite report was made by the intercept companies, and an evaluation report by the Evaluation companies.¹¹⁴

According to Jering,

"Each SIS station and SIS company analyzed its allotted material with much flourish... Two reports went daily to the W-Leitstelle (the regimental evaluation unit) and to the pertinent Referat. The daily logs were sent by courier to the W-Leitstelle and to the Referat concerned, and there examined and evaluated. In spite of this duplication of work, the individual companies were allowed to operate independently, their independence varying with the ability of the company commander and the evaluators."¹¹⁵

¹¹¹IF 181 p 28

¹¹²IF 183 p 60

¹¹³IF 183 p 61

¹¹⁴I 109

¹¹⁵IF 181 p 26

The development of tactical evaluation resulted in the routing of reports directly from the intercept stations and the intercept companies to the operational headquarters concerned.¹¹⁶ The daily and monthly reports were then divided into "tactical and technical sections. The tactical included a description of enemy air activity from the Signal Intelligence point of view, while the technical part was a systematic compilation and identification of all intercepted traffic."¹¹⁷

The distribution of a typical report gives some clue to the recipients of the intelligence produced in the West. For instance, a report made by Evaluation Company 14/LN Regt 3, dated 28 April 1944, discussing "American Fighter and Fighter-Bomber Formations in England," covering the period from 8-18 April has a cover sheet reading as follows: ¹¹⁸

"Distribution

I/GAF Listening Rgt, West.....	1
I/(Evaluation Co) GAF Listening Rgt. West.....	3
5/('Funkempfangs' Co.) " " "	2
3/('Interception Co) " " "	1
3/" " "	1
9/" " "	2
Listening Liaison Officer, Luftflotte 3, lc for	
attn Lt. Reser.....	1
JK.II for atten Oblt.	
Z. Nieden.....	1
Jd. 4 for atten	
Feld. Roeckerath.....	1
Jd. 5 for atten	
Lt. Schwietzke.....	1
Jafue 4 for atten	
Lt. Roschger.....	1
Jafue 5 for atten	
Oblt Gruendl.....	1
Jafue Brittany for	
atten Feldw. Ziemer.....	1
14/('Evaluation Co.) GAF Listening Rgt 3	
(3 copies for VHF Platoon (mobile)).....	7
Copy for information to Main Crypt. Office,	
GAF Sec. B.....	25"

116 IF 181 p 35

117 IF 181 p 34

118 DF 10 pp 1 2

In the final stages of the Signal Intelligence operation in the West, when tactical evaluation was all important, reports were routed by the various intercept and evaluation companies to the Reporting Centers (Meldeköpfe). These centers were the collating agencies for tactical intelligence concerning air raids, and functioned as instruments of liaison between Signal Intelligence Service and the Combat units. (They are described more fully in Paragraph 6, of this Chapter.) The units of the LN Regt 351 routed their reports to Reporting Center 2, the companies of LN Abt 357 (Bomber Intercept) routed theirs to Reporting Center 1, and the companies of LN Abt 356 (Radar Intercept) fed Reporting Center 3. In turn the Reporting Centers broadcast their evaluation and warning summaries to the Central Air Raid Warning Unit (the ZAF) and to various Army, Navy, and Air Force operational Commands.

22. Signal Communications of Field Units in the West--
 In the middle of 1940 the wire channel system was in general as follows: Telephone or teletype lines connected each Signal Intelligence Service company and station with the Regimental Evaluation Company (W-Leit), and in turn linked the latter unit with the pertinent Chi-Stelle Section, the local Air Force (Luftflotte) headquarters, and the neighboring evaluation companies. Telephone or teletype lines also connected the Signal Intelligence companies and the Regimental Evaluation Companies with the German Air Force exchanges. The various Signal Intelligence companies and stations were linked to each other and to their outstations and D/F's by telephone. 119

As Germany's position deteriorated the communications systems were enlarged to accommodate the ever increasing flow of intelligence. In general, the communications channels between intercept station, D/F station, Evaluation Company, Chi-Stelle Section, and Air Force operational commands underwent continuous expansion. "The whole construction of the communications network was founded on the principle of passing on intercepted traffic as quickly as possible. A delay of more than two minutes could not be tolerated." 120 Major Ferdinand Feichtner's report describes the expansion of wire communications in the middle of 1942 as follows:

In addition to the individual teletype lines with the companies, several telephone lines were available, most of them running from the switchboards of the evaluation companies to the intercept companies. Likewise there were one or two lines to the SIS liaison officers as headquarters.... (and) various direct lines from the companies to the SIS-liasion officers, the purpose of which was

119 IF 181 pp 27 28

120 IF 181 p. 44

to achieve a minimum of delay.... This considerable expansion made necessary the building of large telephone centrals:

- Exchange "Pirate"-----Meldekopf 1 of the 1st Battalion
- Exchange "Breakwater"---Radar Intercept Center West of the 2nd Battalion
- Exchange "Clairvoyant"--Evaluation Company of the 3rd Battalion, and also the regimental exchange

The regimental exchange finally comprised 5-7 FD 16's (switchboards) with about 150 trunk lines and 250-300 local drops.

In addition to the normal telephone centrals, in the case of the 3th Company and the 5th Company, D/F control communications had to be installed. The regimental teletype central had 6-8 lines to the Luftwaffe exchanges, in addition to lines to the companies and SIS-liaison officers. There were three teletype-cipher machines for top secret messages; and 8-10 for secret communications. Altogether, about 500-700 teletype messages were handled daily." 121

The continued expansion of the Signal Intelligence Service and its orientation in the direction of preserving the Reich from air raids led to the formation of a Signal Intelligence Battalion attached to the German Home Defense Air Force. This, plus the assignment of Signal Intelligence liaison officers to the components of Fighter Wing (Jagdkorps) I "made numerous circuits necessary, both within Germany, and from Germany to the occupied territories. These wire requirements increased when the ZAF obtained an additional wire system." 122

Major Feichtner describes an interesting practice made necessary by the intensified operations:

"The extensive construction of D/F and radar intercept stations, both in Germany proper and in occupied territories, made it impossible for each of the Regiment's 176 out-stations and the 60 out-stations of the SIS-battalion Reich to have its own direct lines. For this reason the "Dante," or operational connection was introduced for the SIS. Upon use of the code-word "Dante" any conversation taking place over normal Luftwaffe circuits would be terminated and the line used for passing tactical reports for the duration of an air raid or other engagement." 123

121 IF 181 pp 44 45

122 IF 181 p 54

123 IF 181 p 55

As for Radio Communications, Major Feichtner reports as follows:

"In the beginning of 1944 radio stations were set up by the regiment at out-stations, command posts and companies. Each company had:

- a) A D/F Control network, or a radio link with its out-stations;
- b) A radio link with its battalion;
- c) A radio link with the pertinent Meldekopf.

The Meldeköpfe were included, either in the D/F control networks, or in the radio links between companies and out-stations. In this way it was provided that, in case of line trouble, all tactical reports would reach the Meldekopf as quickly as possible, and from there would be broadcast as signal intelligence flash reports to interested headquarters. The code used by the Meldekopf for these flash reports consisted of a code book of 1000 meanings. These encoded messages were deciphered with the appropriate cipher table and sent out on both long wave and short wave as 5-figure groups. The cipher systems of Meldekopf 2 were held by the Army as far down as division.¹²⁴

23. Strategic Evaluation by Field Units in the West--
In the description of actual operations it is frequently difficult to distinguish clearly between strategic and tactical evaluation, as some overlapping was inevitable. However, the two types of evaluation may be differentiated in terms of their objectives. The objectives of strategic evaluation for the Air Force Signal Intelligence were to establish the order of battle for the opposing Air Forces, to determine the order of battle and intentions of the Ground Forces as revealed through Air Force Communications, and to predict long-range intentions of the opposing Air Forces.

Each of these objectives was most carefully pursued, but the success was most remarkable in the establishment of the Allied Air order of battle. Through their thorough and highly skilled traffic analysis, the Germans obtained a continuous and highly accurate picture of the strength and disposition of the Allied Air Forces in Britain, in the Mediterranean, the Near East, and later, on the Continent. Frequently, the reconstruction was precise to the most minute detail, and call signs, frequencies and networks were in the vast majority of cases absolutely accurate.

A great amount of material is available in the TICOM interrogations and in the Seabourne Report (especially Volume VII) documented by charts and diagrams showing the reconstructed order of battle of the RAF and the USAAF. Examples of these are annexed to show the meticulously careful work of the traffic analysts. (Charts 5-3, 5-4, 5-5, 5-6)

The establishment of the Ground Forces order of battle through analysis of Allied air traffic was of course more difficult. In the West, Air Force traffic ordinarily did not reveal the ground force organization. However, after the Invasion, when the Air Force was acting in direct support of ground operations, much information was disclosed of value to the Germans.

As for the prediction of long-range intentions of the opposing Air Forces, indications of coming events were frequently derived from strategic evaluation. The extent to which German Air Force Signal Intelligence was able to forecast the Dieppe raid, and the Invasion etc., has already been noted attention in the first chapter of this volume.

The degree to which information vital to the defense of the Reich was obtained through the Signal Intelligence activities in the West is illustrated by the following passage from an R/T report dated 4 April 1944 originated by the 5th ("Funkempfang") Company, 3rd Battalion of Wireless I Intercept Regt West (later LN Regt 351):

"Operations on the part of the USAAF against Reich territory, and operations against Western occupied territory during the period under review, were picked up again as from the first appearance of flying activity over England.

"By thorough observation of, for the most part, very strong fighter protection, the direction of the attack may be ascertained, in spite of the deceptive course taken by the waves of bombers.

"The change in call signs effected by the USAAF at the beginning of the month under review did not interfere with intelligence, and even within a few days it was possible to bring documents here completely up-to-date.

"The D/F base line was again particularly effective. By endeavoring to follow all three bomber divisions very closely, it was possible, in addition to incursion into Reich territory, likewise to D/F the diversionary attacks against the occupied territory at the same time. It was, therefore, again possible to place the information available here at the disposal of the tactically important positions for the air defence of the Reich, up to three hours before the enemy formations crossed the coast of the Continent." 125

24. Tactical Evaluation by Field Units in the West-- Tactical evaluation was far more important than strategic in the operations in the West. The primary purpose of tactical evaluation was to provide a prompt and efficient service warning of Allied air-raid incursions. The operational necessities of such a service demanded alert interception of all possible signal manifestations (signals, radar, beacons, noises and silences, inter alia), prompt and reliable evaluation, and immediate dissemination of the intelligence derived to the operational units and the defense organizations concerned.

The mass of available data regarding the organization and operations of this service and the results it achieved shows the outstanding success of this undertaking. If Germany was not able to counteract the attacks it was not the fault of signal intelligence which gave the warnings. So efficient was the operation that it won the attention of the very highest commands, and Goering was proud of the listening service.¹²⁶

¹²⁶The Germans tell a story, probably apocryphal but nevertheless significant, to this effect:

Goering at first deprecated the possibility of deriving air raid warnings from traffic. However, on the occasion of one of the visits the Luftwaffe Chief made in the West, a master-sergeant (who wears two stars as his insignia--zwei Sterne) pleaded with Goering to listen in himself: "Please, Herr Reichsmarschall, if you would have the kindness yourself to listen..." Goering listened for half an hour, was astonished at the amount of talking that went on. Thereupon Goering turned to his officers and directed that the master-sergeant be promoted. However, there was no further enlisted rank he could receive. When the officers told Goering that, he said: "Make him a sergeant with three stars" ("Feldwebel mit drei Sternen"). New tables of organization, pay scales, allotments, etc., had to be devised to comply with the Reichsmarschall's request.

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At his interrogation 127, he stated that Capt. Rueckheim (who commanded LN Abt 357 and who was instrumental in activating the Meldekopf organization) passed "him situation reports every evening at about 6 P.M. over a direct private line...even in the middle of the night, if operations were on, he could ring up Rueckheim and obtain the very latest information on the position; this enabled Goering to break in personally on the conduct of any operation at any time; for example, when his staff said that the raiders were going for Berlin, he might have more up to date intelligence direct from Rueckheim and could say 'No, they are going for Stettin.'"128

The realization that air force signal intelligence could produce tactical intelligence came as the result of a successful prediction of a Wellington raid in December 1939.129 Anti-aircraft (flak) units had been relying on "ground observer service of the old type (visual and acoustic). It supplemented that service with its own troop units of ground observers, and later with its own radar."130

a. Organization:--As a unified command for route-tracking purposes became necessary, a new office was created, that of Chief of the Air Raid Warning Service for Germany (Funkaufklaerungsfuehrer Reich, abbreviated FAF). He was put under the Chi-Stelle for operational purposes, and acted as advisor to the Commanding General of the Fighter Corps (Jagdkorps), entrusted with the defense of Germany. The duties of the FAF are described by Col. Forster:

"a) He was responsible for the tracking of the enemy's strategic air forces. He was directly under the Chief Signal Officer of the Luftwaffe (OKL, General Martini), who gave his commands and orders through the Chi-Stelle (Col. Friedrich). In the matter of military decisions the Funkaufklaerungsfuehrer Reich was subordinate to the Chief of the Signal Intelligence Service (General Klemme).

"b) He was adviser to the Commanding General of Jagdkorps I, which was responsible for the Reich's defense. His command post (ZAF) was therefore near the command post of Jagdkorps I.

"c) He was responsible for the functioning of the Signal Intelligence Service in the West; and

"d) He was responsible for the direction of the entire jamming service within the area of Germany.) 131

127 I 143

128 I 143 pp 15.16

129 I 109 p 7

130 Col. Forster, head of FAF, IF 181 p 60

131 IF 181 p 63

b. The ZAF-- The central Reporting Center (Meldekopf) for Germany was known as the Central Air Raid Warning Unit (Zentraler Gefechtsstand Fuer Funkauswertung, abbreviated "ZAF"). It was located in Treuenbrietzen, near Berlin, and was the control and evaluation center for all tactical warnings significant in the defense of the Reich. It controlled for purposes of tactical operations all the Reporting Centers on all the fronts, but was most important in the German defense against British and American strategic long-range bombers. The ZAF was serviced by excellent signal communication from the field Reporting Centers. Circuits carrying tactical intelligence from the ZAF led to radar sites, Signal Intelligence liaison officers at tactical headquarters, field Reporting Centers and even out-stations.¹³²

(1) Evaluation within ZAF

Evaluation within the ZAF meant primarily the tracking of enemy aircraft. All information from Signal Intelligence Service and collateral sources was plotted on special wall maps within the operations room, from which the minute-to-minute position of enemy bombers with their fighter cover could be determined at a glance. If a raid were being followed in the west, specialists on that area manned the operations room. (See chart 5-7) Ordinarily, this specialist personnel worked in the evaluation section¹³³, which, though of key importance, was small. Its work was mainly the collation of reports from the field. On the basis of these it issued a report on the air situation over Germany every twelve hours. A conference to brief all evaluators on the intentions and operations of the tactical units was held every evening at 1800 hours and was usually attended by Col. Forster, FAF.¹³⁴

The command post for the jamming of all allied transmitters was located in the ZAF. This arrangement avoided the jamming of allied transmitters that were currently producing intelligence for the Germans.¹³⁵

It must be emphasized that the ZAF did not reduce the importance of other Signal Intelligence activities. The combatting of heavy bomber incursions was such an important problem the Germans were simply forced to centralize tactical warnings in a special unit.

¹³²IF 181 p 71

¹³³IF 181 p 72

¹³⁴IF 181 p 73

¹³⁵IF 181 p 74

c. Reporting Center (Meldekopf) 1 -- Reporting Center 1, the oldest and most efficient of the tactical warning centers, operated against the Western allies.¹³⁶ Its operating technique served as a model for the Reporting Centers on all fronts, and this center will be briefly described as it is characteristic of all the others.

It was created originally in the summer of 1942 as a preparatory defense measure against the RAF, and was made up of officers, evaluators, and W/T operators from Signal Intelligence units in the West.¹³⁷ In its final form Reporting Center 1 exercised local tactical operational control of the Signal Intelligence units operating against strategic bombers based in Great Britain and later on the continent. This central was limited to tactical operations; and for administration the Signal Intelligence field units still were subordinated to local Signal Intelligence units.¹³⁸

The tactical mission of Reporting Center 1 may be summed up as follows:

- a. to give accurate early warning of the raids by heavy bombers;
- b. by continuously tracking the heavy bombers, to present to German fighter units a clear picture of the air situation;
- c. to interpret the air situation in such a way as to predict the strength and probable targets and tactics of allied bombers.¹³⁹

In the final year of the war, Reporting Center 1 at Heiligenstadt¹⁴⁰ was part of the 1st Company of the Signal Intelligence field battalion, LN Abt-357. From this Battalion Reporting Center 1 received reports. It sent its own reports to the Air Force operational headquarters concerned, and to such naval units as Admiralty Deutsche Bucht, "E" Boat Command, Small Naval Forces Command and Naval D/F section Deutsche Bucht. (See chart 5-8)

The center developed into a War Room, with its own telephone exchange and radio station. Current tactical information was instantly plotted, and immediate reports flashed to ZAF and tactical units in the area. (See chart 5-9)¹⁴¹

136 IF 183 p 1

137 IF 183 p 1

138 IF 183 p 3

139 IF 183 p 2

140 IF 183 p 9

141 IF 183 p 9

During this time the 2nd Company of LN Abt-357 was committed to monitoring RAF training units, the 3rd Company to the bomber divisions of the Eighth USAAF, and the 4th Company to RAF Bomber Command. The battalion was augmented by a radar intercept company and a VHF R/T company as well as a D/F base line covering Western Germany.¹⁴² The stations in the D/F base line were coordinated from the Reporting Center, a necessary measure if it was to supervise route tracking.¹⁴³

Tactical evaluation sections were created within each intercept company. These sections maintained close contact with the Morse operators and passed the slightest sign of a bomber incursion back to the Reporting Center.¹⁴⁴

d. Reporting Centers 2 and 3-- In the West there were two other Reporting Centers in addition to that just discussed. Reporting Center 2 was part of the 25th Company 1st Battalion of LN Regt 351, and number 3 was part of the 1st Company of LN Abt 356. The operations within these units resembled those within Reporting Center 1, with overall coordination exercised by the ZAF, and it would serve little purpose to detail activities within those units. Attention should be called, however, to the wide dissemination of reports made by Reporting Center 2. The reports sent by the various companies of the three battalions of LN Regt 351 which were sent to Reporting Center 2 besides being broadcast to the ZAF, were radioed to the following units:

Air Force: Air Staff West
 14th, 15th, and 16th F (Fliegerdivisionen)
 2, 28, 57, and 72 JG (Jagdkorps)
 3rd and 4th Flak Korps.

(These fighter and anti-aircraft units could take operational counter-measures to the ensuing raid)

Army: Commander-in-Chief West
 Army Groups H, B, and D
 25th, 7th, and 19th Armies
 87th Army Corps (and five or six others)
 5th Panzer Army
 11th Panzer Division
 1st Parachute Army

¹⁴² IF 183 p 7

¹⁴³ IF 183 p 9

¹⁴⁴ IF 183 p 8

Civilian Gauleiters of Wurzburg and Karlsruhe
Defense: Air Warning Services of INNSbruck, Munich,
Nuernberg, Darmstadt, Halle
Navy "E" Boat Commander

Reporting Center 3, which received reports from LN Regt 356 (radar evaluation), reported to the Air Force operational units concerned with the defense of the Reich. (See chart 5-10)

In the final days of the war, the reports of the Reporting Centers regulated life within Germany as far as air raid precautions were concerned. The complete charts which follow picture in detail the routing and recipients of the information derived at the Reporting Centers. Technical Sergeant Gerd Watkinson of Reporting Center 1 writes that "never, once a report had been released to the effect that a night would be free of enemy aerial intrusion, did the personnel of the Meldekopf need to blush for a mistake in its calculation."¹⁴⁵

VOLUME 5

Chapter IV Organization and Operations of the Field Units.

Section B. Operations in the East.

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25. Development and geographical disposition of the field units-- The activation of LN Regt 353, the final signal intelligence unit in the East, was the last step in an evolution that had its beginning in 1936.¹⁵⁰

In 1936, a fixed Radio Intercept Station was erected in Glindow, near Berlin. In 1937-1938, five more stations were erected at Breslau, Pilsnitz, Bromberg, Kobbelbude, and Hirschstaetten near Vienna. These field units were responsible for preliminary analysis and evaluation of Russian Air Force traffic, the final evaluation being done by the Chi-Stelle. The Chi-Stelle had operational control of the outstations though administratively these were subordinated to the Signal Regiments of the Air Forces in whose area they operated. Stations at Hirschstaetten and Breslau were assigned to LN Regt 4, the rest to LN Regt 1. Signal Intelligence personnel considered this a bad arrangement as they were bound to two masters, and were constantly involved in jurisdictional disputes.

The monitoring of Russian radio traffic was extensive and complicated. Not only did each Russian Air Army have its own signal procedures and cryptographic systems, but the method used in the assignment of call signs and frequencies became ever more complex. This situation, added to the fact that the Air Forces resented the extra channel represented by the Chi-Stelle and were eager to obtain intelligence directly from the operating units, led to a reorganization in the summer of 1938. This reorganization saw the formation of collecting and evaluation agencies known as Wetter-Leitstellen (W-Leit), whose function was to issue interim reports to

the local Air Forces and to expedite the flow of material to the Chi-Stelle. Cryptanalytic and evaluation personnel were drawn mainly from the fixed Radio Intercept stations and to a lesser degree from Chi-Stelle. A further step in organization was taken during the summer of 1939 when these collecting and evaluation centers (W-Leit) and the fixed and mobile Radio Intercept companies were formed administratively into Battalions. Each of these battalions was the third battalion in its respective Air Force Signal Regiment. Formerly the Signal Regiments had not dealt with intelligence matters.

At the outbreak of war with Poland, Section D of the Chi-Stelle exercised operational control over two groups of units administratively organized under two Air Signal Regiments. Under 3rd Battalion LN Regt 1, W-Leit-1 in Bernau controlled operationally the Signal Intelligence stations at Kobbelbude and Bromberg. (Later moved to Pilsnitz) Under the 3rd Battalion LN Regt 4, W-Leit-4 in Vienna controlled the fixed Radio Intercept stations at Breslau, Premstaetten (latter at Hirschstaetten) and Budapest plus the 10th Company, LN Regt 4. 151

The years 1940 through 1942 saw modifications in the organization of Signal Intelligence units concerned with Russian traffic. There was of course a general shift in geographical disposition towards the East and accompanying changes of administrative control. The organization in the East remained fairly stable through 1943, but in 1944 an important reorganization of German Air Force Signal Intelligence units was effected. This took place in November of that year and consisted chiefly in the activation of LN Regt 353 to encompass all Signal Intelligence activities on the Eastern Front. The division of operational and administrative control was maintained. Section D of the Chi-Stelle still exercised operational control throughout the structure, while the Chief Signal Officer was administrative head through General Klemme, a purely administrative officer. At this time also, a Signal Intelligence regimental headquarters, with the 25th Co (evaluation), and the 12th Co (Intercept) was activated in Cottbus. The balance of LNR-353 included three battalions as follows: 152

- "a. 1st Bn, LN Regt 353 (formerly 3rd Bn LN Regt 1) of four companies in East Prussia.
- "b. 2nd Bn, LN Regt 353 (Signal Intelligence Bn East) of five companies in Poland.
- "c. 3rd Bn, LN Regt 353 (3rd Bn LN Regt 4) of five companies in Austria.

151 IF 136 p 2 5

152 IF 136 p 6a

As the campaign in the East degenerated for the Germans, the Regimental Headquarters and its two companies retreated, arriving in Dresden in February 1945. From Dresden, the headquarters moved on into the "Alpine Redoubt" where it was joined by the 2nd and 3rd Battalions in Wagrien. A 70-man platoon operated during the move. The 1st Battalion stayed in the North.

After Germany's capitulation the Regiment moved via Zell am See and Lake Chiem to the Luftwaffe concentration area in Aschbach in southern Bavaria. All personnel of the Headquarters, its companies and the 2nd and 3rd Battalions were discharged from there. The 1st Battalion fell into British hands at Luebeck in April 1945.¹⁵³

26. Operations within the Battalions--The operations of LN Regt 353 in the East differed greatly from the operations of its sister units in the West. This difference in operating technique reflected the capabilities of the Soviet Union as compared with those of the Western Allies in the business of signal communication. German Air Force Signal Intelligence was designed to exploit Russian weaknesses as Soviet cryptographic and radio development was behind that of Britain and the United States. The Western Front was the sphere of the traffic analyst, but the Eastern units emphasized the cryptanalysis of Soviet ciphers.

The administrative and geographic changes of LN Regt 353 have been discussed. An examination of the three battalions (Abteilungen) and the organization of the four or five companies within each battalion follows.

The heart of the battalion was the evaluation company and its seven sections. In addition, the battalion included an operating and out-station company and two intercept companies. (See chart 5-11) In order to clarify the operation of a unit as complex as the battalion, this discussion will "start with the traffic" in the intercept company and out-station company and trace the course of the intercepted message until it emerges from Evaluation as intelligence.

a. Intercept Company-- Liaison between evaluation and intercept was very close. Operationally, the intercept company was subordinated to the T/A section of the evaluation company. The T/A section assigned the missions and reserved the right of direction over the watch officers in the intercept room. The CO of the intercept company was responsible for all intercept of Morse traffic, which was copied in the more or less permanent installation of the Battalion.¹⁵⁴ As far as possible, each intercept operator specialized in a particular circuit and learned the peculiarities of its operators.

¹⁵³ IF 186 p 14

¹⁵⁴ I 182 p 12

A D/F control station was located in the intercept room to take bearings on unknown stations, while the D/F section of the evaluation company stood ready to perform immediate plotting to assist intercept.¹⁵⁵

b. Operating and Out-station Company-- The CO was responsible for the Battalion's signal communication and for the technical operation of the out-stations and D/F sites. Out-stations were usually maintained at fighter strips and were responsible for R/T intercept. Each R/T intercept operator had direct communication with the nearest D/F site and could switch over and have a fix taken.

Telephone and teletype circuits to higher headquarters, other battalions, and subordinate units were maintained where wire lines were possible. The company operated radio circuits to the out-stations, D/F sites, other battalions, and higher headquarters. The Germans never reached the ideal situation of having land lines between all D/F and intercept units, and radio was extensively used for D/F control.¹⁵⁶

c. Evaluation Company-- The CO as head of all evaluation arranged a daily situation conference attended by the battalion commander and the heads of the seven evaluation sections. The conference coordinated the work of the entire unit based on the requests of the local Air Force (Luftflotte) and Wing (Fliegerkorps) serviced.¹⁵⁷ Evaluation was regional and only loosely aligned with the other battalions because of the large distances involved.¹⁵⁸

How the Germans controlled the intercept units and processed the raw traffic into intelligence can best be made clear by brief comments on each of the seven evaluating sections.

(1) R/T (Radio Telephone) Evaluation--The R/T evaluation subsection was the final resting place for the R/T intercept copied in the out-stations. The out-stations had already issued immediate intelligence to flying formations, but it was the function of R/T evaluation to extract order of battle in the form of pilots' names, Russian unit designations, map grid information and all the miscellaneous bits and pieces to be gleaned from R/T.

On the technical side, the section worked out the relationship between frequency and call sign changes and checked this information with the traffic analysis subsection, as R/T and Morse circuits were often superimposed.¹⁵⁹

¹⁵⁵I 182 p 13

¹⁵⁶I 182 p 9

¹⁵⁷I 182 p 4

¹⁵⁸I 42 p 2

¹⁵⁹I 182 p. 5

(2) Long Range Bombers--This subsection was manned only when alerted by Soviet recce or weather aircraft or by the receipt of a Russian operational message. It was an integral part of the tactical warning system that will be described in the section on tactical operations against Soviet long range bombers. 160

(3) Traffic Analysis-- The traffic analysis subsection exercised operational control over the Morse intercept companies and assisted their operation by reconstructing Russian radio networks, schedules and call signs. Each evaluator specialized in a particular Soviet air army. T/A passed a large amount of order of battle of Russian air armies to final evaluation. The section kept its own situation maps and records and through inference added to the overall intelligence picture. 161

(4) D/F (Direction Finding) Evaluation-- The results of the field D/F sites were received by the D/F evaluation subsection daily. The results in the form of station locations were passed to the T/A section as an aid to T/A's reconstruction of Russian networks. Another function of the D/F Evaluation subsection should be noted here. In addition to its other tasks, it evaluated the results of radar monitoring done by two radar monitoring units (WIM-Truppe) attached to the 1st Battalion of LN Regt 353. 162 Soviet use of radar was never extensive, though it was used in the Leningrad area. The fact that the radar sites in this area communicated by R/T made it possible for German Signal Intelligence to warn German fighters that they had been apprehended by Russian radar.

(5) Cryptanalysis-- Incoming messages were registered and sorted according to whether or not they were currently readable. Traffic in systems as yet unbroken was referred to a research party. The balance was immediately decoded and the results passed to final evaluation.

The importance of the cryptanalytic subsection is illustrated by the number of persons it contained. Twice as many people worked in the cryptanalytic section as were in the other combined six sections of the evaluation company. Roughly 35 per cent of Russian traffic was readable. This weakness in Soviet cipher retarded the development of more advanced T/A methods in LN Regt 353. Evaluation received a wealth of message content material that made inference unnecessary. 163

160 I 182 pp 5-6

161 I 182 p 6

162 I 163 p 3

163 I 182 p 7

(6) Weather Evaluation-- Meteorological messages went directly from the intercept operator to weather evaluation. Results of solved messages went directly to flying units and to the weather center at the Air Force High Command.¹⁶⁴

(7) Final Evaluation-- The discussion of Final Evaluation has been purposely placed at the end of the break-down of the evaluation company as it was here that all the battalion's functions were brought together. Decoded messages from the cryptanalytic section were translated. Formations, names of people and units and their location and all other O B material were card indexed and coordinated with the results of E/A and R/T evaluation. Items of immediate importance were dispatched immediately, and a daily report to the local Air Force and the Wing was rendered that dealt with new orders of battle, construction of new air fields, strength returns, fuel supplies, and new operational targets.¹⁶⁵

The daily report to these two units followed roughly a 5-paragraph estimate of the situation as follows:

- (a) Few information on order of battle, airfield location, supply dump activity and RR activity. This section was teletyped in advance.
- (b) Consideration of the air armies as to flying and ground units.
- (c) Order of battle of the long-range bomber formations.
- (d) Review of Black Sea or Baltic coastal units.
- (e) Estimate of Russian home defense formations.

Semi-monthly reports followed the same form, but were much more detailed. Distribution was made to Air Force High Command, the Signal Intelligence Agency, Army Signal Intelligence, Air Force, Wing, and to subordinate units within LNR-353.¹⁶⁶

27. The deployment of the Battalions-- LN Regt 353 was an Air Force unit, but its activities were often of tremendous help to the German Army. The Russians attached one air army to each army group in line with their conception of the use of air force.¹⁶⁷ Strategic moves of the Russian army groups were compromised by German signal intelligence activities against the accompanying air armies. The ground units would move up under radio silence, but it is extremely difficult to move aircraft without using transmitters, hence the radio activities of the aircraft would betray them.

164 I 132 p 8

165 I 132 p 5

166 I 107 pp 3 4

167. IF 187

The following order of battle will show how LN Regt 353 was deployed against the Russians:

- a. 1st Battalion Northern Section in East Prussia monitored:
 - Baltic Red Banner Fleet
 - 15th Air Army (2nd Baltic Front)
 - 2nd Air Army (1st Baltic Front)
 - 1st Air Army (3rd White Russian Front)
 - 4th Air Army
 - 16th Air Army (1st White Russian Front)
 - 13th Air Army (2nd White Russian Front)
 - 14th Air Army (2nd White Russian Front)
- b. 2nd Battalion Central sector in Poland monitored:
 - 2nd Air Army (1st Ukrainian Front)
 - All Russian radio beacons
- c. 3rd Battalion, southern sector in Austria:
 - 3th Air Army
 - 17th Air Army
 - 5th Air Army
 - Russian Command networks
 - 18th Air Army (long range bombers)

The Germans were quick to improvise on all fronts. For instance, when the 1st Battalion found that the Russian 1st, 3rd, and 15th Air Armies and the Baltic Fleet Air Arm were using a disproportionate amount of R/T, its operations were adjusted to capitalize on this fact.¹⁶⁸ A detachment was put aboard the cruiser "Prinz Eugen" to monitor the Fleet Air Arm. Communication from the out-stations was speeded up to immediately exploit "hot" items. The R/T in this sector often uncovered armored and troop concentrations.

28. Strategic Results of LN Regt 353-- LN Regt 353 was a highly successful signal intelligence organization. Russian backwardness in communication technique was, of course, a significant factor in this success. The Soviets used their radios extensively, and they seemed to have difficulty constructing adequate wire lines. Furthermore, Russian R/T offered no great problem to the Germans as very little effort was made to disguise important information. As for Russian enciphered Morse traffic, as has been seen eighty-five per cent of this was read.

The networks of the flying formations, both air/ground and ground/ground, were most important for short time tactical intelligence, but the evaluation of this intercept did give some important strategic order of battle information, especially the deployment of units and personnel. Similarly, though long-range bomber circuits were studied mainly for tactical information, strategic moves and large air offensives were predicted sometimes days in advance. But networks of the ground organization of the Red Air Force were the most prolific sources of strategic intelligence, and solution of this traffic disclosed the deployment and intentions of the Red Air Force, its logistic set up, the condition of air fields and aircraft and provided a complete personality order of battle.¹⁶⁹

Signal intelligence had much influence over the way in which the Germans used their air force. Because of the scarcity of fuel, the flying commands would not send up planes until intelligence gave them a target, as good intelligence cut out fuel consuming routine patrols.¹⁷⁰ In fact, the highest strategic intelligence levels were assisted by the insight into Russian economic, political, and morale conditions given to them by LN Regt 353.¹⁷¹

29. Operations against Long-range Bomber Force-- The Russian Long-range Bomber Force was independent of the Air Armies. Prior to 1945, it consisted of nine Corps directly controlled by the staff at Moscow. Early in this year, however, the force was reorganized as the 18th Air Army consisting of four corps.¹⁷² Though a few four-engine PE-3's appeared at the end of the war as part of the Force, Soviet long-range bombers were strictly medium bombers by United States standards, consisting chiefly of IL-4's, IL-2's, B-25's, and A-20's. The 18th Air Army (the Long-Range Bomber Force) numbered about 1500 planes.¹⁷³

The record of this long-range bomber force was not very impressive. Crews were poorly trained for large scale night operations, and the Soviets did not attempt daylight raids until just before Germany's collapse, when her resistance was broken. In general, the Moscow Command used its bomber force conservatively to preserve aircraft and crews. Sixty Russian bombers needed one hour under favorable weather conditions to take off and assemble for an operation. Take-off was scheduled for late afternoon and the lines were crossed at night-fall. R/P and Morse traffic was plentiful during take-off, assembly, and during the bombing run. Moreover, poor Russian navigation resulted in numerous requests for bearings and D/F fixes.¹⁷⁴

¹⁶⁹I 134 pp 3 4

¹⁷⁰I 163 p 6

¹⁷¹I 70 p 4

¹⁷²I 107 p 5

¹⁷³IF 187 p 33

¹⁷⁴IF 187 pp 35 36

IX Rgt 353's activities against the long-range bomber force was regional in its organization. As the raiding aircraft passed from one battalion region to another it was picked up and monitored until the mission was completed or until it passed into a third battalion's zone. Within the battalion, the long-range evaluation section coordinated the activities of D/F sites, out-stations and Morse receivers at the parent unit. The section was purposely located in the same room with the intercept operators at the battalion. (See chart 5-12)

The personnel of the long-range bomber evaluation section was alerted when advance warning of impending bomber operations was received. This advance warning could come from crypt-analysis of long-range bomber ground traffic, from the interception of a pre-operational "winds-aloft" weather message, or when Soviet weather or reconnaissance planes were sighted.¹⁷⁵ Upon being alerted, the section warned all out-stations of the impending Russian operation. The 20 or 25 known frequencies were passed out to all intercept units. As soon as activity was heard on a frequency, D/F was informed and a fix taken.¹⁷⁶

Soviet bombers were usually first heard upon take-off. R/T and Morse air-ground traffic was plentiful on the Soviet side of the lines, which allowed D/F route tracking until radio silence was clamped down over German territory. The monitoring of ground control stations also helped in locating the bomber force.

Within the battalion evaluation section, the current location of the raiders was plotted on an illuminated map within sight of the intercept operators. Upon this map, all D/F results, reports from out-stations, and local intercept were plotted. There was no dearth of information to be posted. The Soviets gave away their position at times through careless use of R/T. Their air-ground Morse traffic was partially readable, and their D/F bearing activities furnished valuable data. The radar service was kept informed from minute to minute and as soon as the Soviets shut down radio silence, radar was in a position to take over.¹⁷⁷

175 D 8 p 7, I 82 p 6

176 I 82 p 6

177 IF 137

The Central Air Raid Warning Unit, last located at Treuenbrietzen, received current reports from each individual intercept unit on the eastern front. After evaluation, the information was flashed to the flying and flak units and to the Home Defense Air Force. 178

30. Operations against the Air Armies-- The discussion of strategic intelligence activities emphasized the battalion's importance in the production of order of battle and other long-range intelligence. Very often the cryptanalysis and traffic analysis of the Morse traffic copied at the battalion accounted for immediate tactical warnings, but it was in the out-stations that the tactical R/R and D/F activities were carried on.

The out-stations were co-located with fighter and reconnaissance squadrons and groups, often in the same building as the aircraft reporting center of the headquarters of the formation they were serving. The procurement of personnel for these out-stations with the intelligence and language ability to be good R/T intercept operators was a serious problem. In spite of this difficulty, the Germans did very well with those they had. 179

Ordinarily, fixed intercept schedules were not observed. Search receivers were employed and the tactical networks were scanned constantly. Only if the aircraft of the formation to which the out-station was attached took off on a mission, or enemy aircraft were heard in its sector, were particular frequencies covered. As soon as hostile aircraft were heard, D/F was informed and constant route tracking began, and as soon as the Russian bombers or fighter bombers were accurately located, German fighters were airborne. The results of German Radar served to amplify the findings of Signal Intelligence. 180

The R/T networks of ground support liaison officers and even the R/T of armored units helped identify and locate targets for German fighter bombers.

178 I 182 p 6

179 I 182 pp 9-10

180 I 182 p 11

31. Immediate Reports issued by LN Regt 353--
Immediate reports were issued whenever information was received on which direct action might be taken by German forces. They may be considered under three main subject headings:

- a. Information on the activity of Long-range Bombers. This included warnings that bombers had taken off and D/F fixes on the aircraft in flight.
- b. Information about railway activity, such as the arrival of trains with important freight at particular railway stations.
- c. Requests for air support from liaison officers with the Red Army.

The most important recipient of these reports was the local Air Force. There were two direct land-lines between the Battalion and local Air Force headquarters, which were maintained throughout the many changes in location necessitated by the fluctuations in the land finding. Thus, it was never necessary to fall back on stand-by radio channels. Immediate reports were also passed to the regimental headquarters, which in turn was in close touch with the Air Force High Command and all the flying units. 181

32 Results of the Operations of LN Regt 353-- The chief contribution made by LN Regt 353 to tactical operations on the Eastern Front was the constant supply of intelligence that made possible the economic and efficient use of German aircraft. With the shortage of aircraft capable of operating and with the shortage of fuel in particular, missions were usually flown by the formations in accordance with the decisions of the intercept service. Once German aircraft were airborne on a mission the ground control kept them constantly informed of the intentions and disposition of Russian fighters and bombers.

181
I 107 p 3

Chapter IV. Organization and Operation of the Field Units.

Section C. Operations in the South.

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Communications within LN Regt 352.....	38
Results of LN Regt 352.....	39

33. History from 1938 to August 1943-- The last Signal Intelligence unit operating in the southern sector, LN Regt 352, began in 1938 as a fixed station, W-Leit 13, in Oberhaching. This unit monitored French and English traffic from Africa. Section C of the Chi-Stelle (France) exercised complete control over W-Leit 13.

The war in the Mediterranean was well under way when a more or less comprehensive Signal Intelligence Service was created in the South under Section C, which was moved from France back to the Marstall. Signal Intelligence South included 9th Co, LN Regt 40 at Athens, and Signal Intelligence platoon from W-13 at Palermo, and a fixed station, W-Leit 14, at Vouglamend near Athens.¹⁸⁵

During this early period, evaluation meant the deciphering and translation of allied traffic, and each Signal Intelligence unit did its own independent evaluation. The deciphered messages were sent immediately¹⁸⁶ to Section C, other Signal Intelligence organizations, and flying units. The A-2 of the flying unit did the actual evaluation.¹⁸⁷

By the middle of 1941, the RAF had been reinforced and to offset the added British strength, local Air Force 2 was withdrawn from the eastern front and sent to Sicily. Within Air Force 2 were Wing 2 (Fliegerkorps II) in Messina, Wing 10 (Fliegerkorps X) in Haraklian, and the African Air Command. Each Wing, or Fliegerkorps, had a Signal Intelligence company and the Command had a platoon. W-Leit 2, an evaluation company, was attached to the local Air Force and became the center of Signal Intelligence activity within the local Air Force.¹⁸⁸

185 IF 184 p 1-5

186 IF 184 p 6

187 IF 184 p 6-7

188 IF 184 p 8

Meanwhile, the 9th Company at Athens had become very active. This unit and its satellites were formed into one battalion and the W-Leit 2 and its subordinates into another. The new unit (the old 9th Company) became W-Leit 2, Southeast. Zones of operations were separated by a line drawn through Cape Passero, Malta and Tripoli. W-Leit 2 took everything west of the line and W-Leit 2 Southeast everything east. Lack of foresight and drive was responsible for the two units not being formed into a Regiment.¹⁸⁹

The two W-Leit reserved the right of final evaluation. Their material came mainly from subordinate units that favored the interception of air-ground traffic and that had been successful in their cryptanalysis of point-to-point traffic, especially in the case of the RAF 4-figure code. W-Leit 2 organized its evaluation on the basis of fighter R/T, recce and bomber R/T, and air support traffic, while W-Leit Southeast's evaluation was based upon enemy units monitored (201 N C Group, 205 Group, 9th USAAF and Desert Air Force).¹⁹⁰ All units in the Mediterranean area overlapped as to the Allied units they monitored in order to service their own local headquarters with flash reports. The Signal Intelligence Agency failed miserably in coordinating their efforts.¹⁹¹

The steady degeneration of the war situation in the South for the Germans in 1943 made unification of the two units into a Regiment more and more urgent. The High Command's solution was the activation of a short-lived liaison unit at local Air Force (Luftflotte 2). This unit was intended to link the two Evaluation Centers (W-Leit) and the Chi-Stelle Section with the Air Force command in Italy and Greece. It was withdrawn after six months.

Section C of the Chi-Stelle began its most efficient operations in 1943. It had strengthened its control over the field battalions and acted as a final judge on policy matters. Technical experts were sent to the field whenever the field units needed help. Section C's best performance was on log analysis and T/A.¹⁹²

During 1943 many radar and VHF intercept out-stations were erected. The VHF stations were under W-Leit 2. These outstations carried the brunt of the operations, and thoroughly monitored the allied units operating against the German supply line from Sicily to the Africa Corps holed up in Tunisia.¹⁹³ During the same period, W-Leit Southeast began to concentrate more and more on T/A, route tracking, R/T, and radar evaluation. The RAF 4-figure cipher, which had been read continuously since March 1940, had become unreadable, entailing the shift in operational emphasis.

189 IF-184 p 8

190 IF 184 pp 16 17

191 IF 184 p 15

192 IF 184 p 26

193 IF 184 p 27

34 History August 1943 - October 1944-- The two Signal Intelligence units in the South continued to expand, but in different directions. W-Leit 2 was charged with monitoring the units operating against the Germans in Italy, while W-Leit Southeast covered the Adriatic coast, which was under threat of invasion. Both units were engaged in flight-tracking the missions flown by allied bombers which by now were based in Foggia.

Three days before the landing on Sicily, the evaluation company W-Leit 2 was flown from Taormina to Frascati, near Rome, and the rest of the unit followed close behind. While the unit was at Frascati, Italy's surrender caught it unaware. Just before it moved to Padua, it was so badly mauled in a raid by 170 B-24's that for a time the German Command could learn of the ground situation in Italy only through Allied air support messages, intercepted in Southern France. 194

At Padua most of the key officers were relieved and replaced. After two months of moving and of being inoperative, W-Leit 2 set up shop, mainly as a tactical warning service. Among the tasks performed by this unit was the interception of the traffic of the medium bombers, which were engaged at this time in giving the roads and bridges in the German zone a going over. W-Leit 2 exceeded its commitments by contributing to the route-tracking of heavy bombers heading for Germany. 195

W-Leit Southeast had for its mission the cover of frequencies heard in the Adriatic Area in general and the route-tracking of heavy bombers heading into the Balkans. Owing to the reverses in the fighting, the local Air Force in the Southeastern area moved from Athens to Salonika, taking the Signal Intelligence units along. In January 1944 W-Leit Southeast moved with the local Air Force near Belgrade. The unit set up a central Reporting Center for the Southeast connected to all units by direct land line. The outpost covered an area from Crimea to Crete and from Munich to Styria. There were seven companies in all. 196

During this period W-Leit Southeast monitored R/T and Morse of the heavy bombers, but it became especially proficient in D/P'ing the IFF and panoramic devices aboard allied bombers.

The Reporting Centers and all units of W-Leit Southeast were of necessity highly mobile, and when the Russians broke through, the unit was moved and reestablished at Premstaetten. 197

194 IF 184 p 42

195 IF 184 p 43

196 IF 184 p 49

197 IF 184 p 50

35. History October 1944-German Collapse-- After the retreats and reverses experienced in Italy, the Signal Intelligence units had to be rebuilt from the ground up. A new regiment, LN Regt 352, (See chart 5-13) was created, and this resulted in the combining of the two evaluation companies of the battalions (W-Leit 2 and W-Leit 2 Southeast) into a single regimental evaluation company (25th Company). Reporting Center (Meldekopf) 4 was immediately subordinated to regimental headquarters as the 26th Company. Furthermore, each of the two battalions comprised three radio intercept companies and one radar intercept company. All evaluation and technical direction was centrally located in the Evaluation Company at regimental headquarters. 198

Although the final activation of LN Regt 352 was a good move, it resulted in no marked increase in signal intelligence efficiency in the South. Germany's battle lines were collapsing and communications within the country were in a sorry state. Early in 1945, the regimental staff, the evaluation company, and one intercept company moved to Attersee ahead of the Russians. When Vienna fell they were joined by Reporting Center 4 and the intercept companies from that area. Out-stations were withdrawn and the 2nd Battalion moved to Steinach-Puergg. All units under local Air Force 6 moved to the internment camp at Aschbach when Germany surrendered. The 1st Battalion was captured by the British at Canazei.

36. Intercept within LN Regt 352-- The receivers on hand and task assignments within LN Regt 352 illustrate the Regiment's deployment against the Allies in the South. The allocation was as follows: 199

Allied air support units	65 receivers
Allied Radar Networks	30 receivers
Command Networks; Eastern Mediterranean and Balkans; transport and supply traffic	50 receivers
15th USAAF, 205 Group-RAF	25 receivers
VHF Air ground	35 receivers
HF D/F - sets	23 D/F's
Radar in 15 out-stations	100 receivers

198 IF-184 pp 69 70

199 IF-184 p 70

37. Evaluation within LN Regt 352-- A sharp distinction between tactical and strategic operations would be very difficult to draw in discussing evaluation in the South. In the early days, when German fortunes were ascendant, the emphasis in the Evaluation Companies (W-Leit) was upon crypt-analysis and the reconstruction of Allied order of battle. Gradually, as allied ciphers became more difficult and as Germany changed over to the defensive, tactical, short time warnings became the main Signal Intelligence commitment.

While during the early stages of the war German evaluation was limited to message content and elementary T/A, allied use of better cipher and more complex means of communication forced the Germans to adjust their evaluation methods accordingly.

By October 1944, when LN Regt 352 was activated, the Germans were using every signal manifestation to extract intelligence. The Morse point-to-point and air/ground traffic was D/F'd and evaluated, R/T in both HF and VHF ranges accounted for tactical warnings, the radio links between allied radar sites showed their activity against German aircraft, the actual monitoring of allied radar disclosed those areas not being covered, and the D/F'ing of IFF and airborne radar was used to route-track allied bombers. 200

The Germans in the South had more success against the US 15th AAF than against the RAF's 205 Group. British use of W/T, R/T and radiating devices was much more careful. 201 Major Ferdinand Feichtner, CO of LN Regt 352, summarized the operations against the 15th USAAF as follows:

a. Air Ground Morse

Prewarning of bomber flights was given by the tuning traffic. During the flight to the target the bombers sent short messages on a half hour schedule that could be D/F'd.

b. Air-Ground R/T

Interception of this traffic provided information concerning the flying units involved and their approximate strength during the take-off on an operation.

c. VHF Air/Air R/T

This traffic provided valuable information regarding the fighters accompanying the bombers. Continuous D/F'ing was possible.

d. Meddo-Equipment

The D/F'ing of Meddo was of assistance in locating bomber forces scattered over a large area.

e. IFF Device

The Americans did not shut off their IFF over German territory. The Germans used their radar unit Freya-D to make the device radiate. Measurements and tracking were possible up to 280 miles.

f. Meteorological Observation Planes

The cipher system used by the met recce planes could be read and their transmissions D/F'd. The interception of this traffic gave many advanced warnings of US bomber incursions. 202

200 IF 126 p 17

201 IF 126 p 17

202 I 126 p 17-18

Reporting Center 4 was one and the same with 26th Company of LN Regt 352. In this unit, the tactical warnings from signal intelligence were coordinated with reports from the German radar and observation services. Immediate warnings were flashed to fighter units, Air Forces, and to civilian air raid defense officials. (See chart 5-14)

38. Communications within LN Regt 352-- LN Regt 352 maintained excellent signal communications despite frequent moves and general military reverses. Direct telephone lines were maintained between the Regiment and its units and to the local Air Forces and tactical units in its vicinity.²⁰³ (See chart 5-15) Moreover, the regiment had its own private teletype system to all headquarters, the equipment being both plain text and enciphered (G-Schreiber) variety.²⁰⁴ (See chart 5-16) A radio network was superimposed on the other means of communication, within which the Enigma was used for security.²⁰⁵ (See chart 5-17)

39. Results of LN Regt 352-- The strategic importance of LN Regt 352 and the units that preceded it may be illustrated by the accompanying diagram from the Seabourne report. (See chart 5-18) The signal intelligence units in the South reconstructed the complete allied air order of battle from signal intelligence enemy traffic and kept it up to date.

On the tactical side the Signal Intelligence Service did a superb job of keeping the tactical units and civilian defense agencies informed of allied bomber attacks. Col. Hans Forster, PAF, Chief of the Air Raid Warning Service for Germany, stated that "surprises out of the South rarely occurred."²⁰⁶

203 IF 184 p 71

204 IF 184 p 72

205 IF 184 p 73

206 IF 181 p 69

Volume 5

Chapter IV. Organization and Operation of Field Units.

Section D. Operations in the North

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40. History from 1940 to 1943-- In May 1940, soon after Norway was invaded, a group of signal intelligence personnel was sent from Husum to Oslo, Norway to set up the nucleus of signal intelligence activity in the North. The new unit, W-Leit 5, had as its mission evaluation and the supervision of any intercept units assigned to Norway. Its commitments were all Morse and R/T circuits of the RAF Coastal Command operating against the West Coast of Norway and all traffic originating in the North Sea area. The first intercept and D/F unit W-Stelle-25 was set up at Trondheim-Skatval during the same month.²¹⁰ W-Stelle 25 covered mainly the Morse and R/T of 18 Group Coastal Command. W-Stelle 25 moved to Stavanger at the end of August.

By the end of 1940, 3rd Battalion Air Signals Regiment 5 had been formed and included W-Leit 5 (an intercept unit), 9 LN Regt 5 at Noerland and W-Stelle 22 at Husum in Schleswig Holstein. The 3rd Battalion of LN Regt 5 covered 15 and 18 Groups Coastal Command and the high frequency R/T of fighters based in Northern U.K. Beacons and Meteorological traffic were intercepted and Coastal Command Syko was read at Husum.²¹¹

When the fighter units of the RAF converted from HF to VHF R/T in April 1941, a very fruitful source of intelligence dried up on the Germans until they could be equipped with proper receivers. It developed that they never were.

By the end of the year all Signal Intelligence units were subordinated to LN Regt 5 and included 4 Adcock D/F's and 5 intercept installations.

Teletype lines were laid to Naval and German Air Force exchanges at Oslo as well as to Berlin, Husum, and Noerland.²¹²

An important development during 1942 was the organization of D/F Base Atlantic, a series of D/F stations at Bodo, Orlandet, Noerland, Husum in Germany, and Brest in France. The main function of the D/F base was the D/F ing of the aircraft of 15 Group Coastal Command on convoy escort and other units on anti-submarine patrol.

210 I 183 410/1945

211 I 183 410/1945 p 3

212 I 183 410/1945 p 4

The 3rd battalion of LN Regt 5 added the 3th intercept company in the fall of 1942. W-Leit 5 was redesignated 14/LN Regt 5 and W-22 became 15/LN Regt 2.

Intercept coverage was expanded to include all Morse and R/T in the North Sea, the Iceland bases and North Sea convoys, but operations in general were hampered by bad atmosphere.

The listening service in the North remained fairly stable throughout 1943. Excellent results were gained from D/F Base Atlantic, and coverage was extended to include the traffic of courier planes operating between Sweden and England.²¹³

41. History from 1944 to 1945-- The year 1944 brought about a general reorganization of the entire German Air Force Signal Intelligence Service. The units in Norway were renamed as follows:

- 14/LN Regt 5 became 1/LN Abt 355
- 3/LN Regt 5 became 2/LN Abt 355
- 9/LN Regt 5 became 3/LN Abt 355
- 15/LN Regt 2 became 5/LN Abt 357

W-Stelle 10, the control station within Germany for Norwegian units was renamed Leitstelle der Funkaufklärung. A mobile radio intelligence unit was set up in Norway as an anti-invasion measure.²¹⁴

2/LN Abt 355 was moved from Bardufoss to Holden because of poor reception.

D/F Base Atlantic lost its left wing when Brest fell to the allies, and its Svanik base when Northern Norway was evacuated.²¹⁵

The VHF experiments that dated from 1941 were finally dropped for technical reasons. Good intelligence was gleaned from the Morse traffic of Coastal Command and US and British bomber units. R/T traffic was picked up when allied units approached the Norwegian coast.

An important source of intelligence on the North Sea convoys was the traffic of long range recce and carrier aircraft.²¹⁶

42. Summation of activity in the North-- The German Air Force Signal Intelligence Service in Norway was a fairly successful organization when one considers the bad atmospheric conditions in the region and the difficulty experienced by the units in the North in obtaining proper equipment.

No major land action or air offensive was ever carried out by the Allies in the North, so the German Signal Intelligence effort in the North was a side show in comparison with German signal intelligence operations on the Western and Eastern fronts.

213 I 183 410/1945 p 6

214 I 183 410/1945 p 7

215 I 183 410/1945 p 8

216 I 183 410/1945 p 8

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Chapter V. Cryptanalysis

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43. Introduction-- The central cryptanalytic bureau of the Air Force which both directed and carried on the cryptanalysis for that organization was Section E of the Signal Intelligence Agency (Chi-Stelle). The organization and functions of that section have already been described in Chapter III and will not be further treated here. This chapter describes rather the systems studied by the German Air Force cryptanalysts. It is divided into sections according to the countries whose systems are discussed. In each section, the systems studied will be listed, and briefly commented upon.

In general, the cryptanalysts appeared to feel their efforts did not receive the consideration they deserved. For instance, Specialist (Regierungs Rat Dr.) Voegelé, Chief of the Cryptanalytic Section (Section E), declared that the primary object of intercept was traffic analysis and evaluation and that cryptanalysis was considered of secondary importance. He complained that he never was allowed any say in the allocation of the intercept tasks. He further found fault with the traffic which he did receive, pointing out that he frequently was passed eight or nine versions of the same message.²²⁰ The denial to the cryptanalysts of a voice in directing coverage is noted by Technical Sergeant Jering of the Signal Intelligence Agency as well:

"A great difficulty which existed was that the Referat could exercise no definite influence on the number or location of intercept receivers covering

traffic in which it was interested."²²¹

In choosing the location of cryptanalytic units the Germans followed the principle of going as far forward as possible. On the Western Front and in the Mediterranean area immediately exploitable Allied systems such as the bomber code, the aircraft reporting code, SYKO and REKOH were worked on in the field battalions. On the Eastern Front the Battalions of Air Signals Regiment 353 carried on the current analysis of Russian 2, 3, and 4 figure systems.

All material impossible of solution in the field was returned to the Chi-Stelle for research. Thus, the Chi-Stelle carried on the analysis of United States strip systems, M-209 research, the recovery of the War Department Telegraph Code and research on the AM-2 (SIGABA). Russian 5-figure material which was incapable of solution in the field was studied by the Chi-Stelle.

44. Successes with U. S. Systems--
M-209 According to Voegele, the M-209 was first read in March or April 1944. The Germans averaged 6-8 days of currency each month on the Western Front, 1-2 days in the Mediterranean area. A "key chart" was captured in October 1944, giving the Germans 26-27 days of currency.

Voegele claimed 22 hours as his organization's best time on the complete solution of an M-209 system. The average time lag was 8-10 days due to the delay in receiving traffic. Eventually, the Air Force dropped the M-209 job, which was performed by the Army.²²²

Ludwig claimed that the M-209 traffic of the U. S. 8th Fighter Command (65th, 66th, and 67th wings), which carried administrative information and particulars about the Mustang fighter, was broken in February 1944 by the Army Signal Evaluation Center of Signal Intelligence Regiment 5 (NAAS 5) at St. Germaine, France. After the invasion, battle losses of the 101st Airborne Division were read. Ludwig also named the 9th Air Defense Command and 9th

²²¹IF 180 p 17

²²²I 117 p 4

Engineer Command as units whose traffic was read. The reading of a XXIX TAC M-209 message helped tip-off an offensive in the Aachen area.²²³

The analysis of the M-209 was made more difficult when each army and command began using separate settings. Voegele's discussion on the German analysis of the M-209 included the following requisites for solution of the daily machine settings:

- a. Two messages where part of the plain text could be assumed and superimposed.
- b. Message with mistakes later re-enciphered in correct system and key. 50 or 60 letters of decipherment were necessary to obtain a 12-hour setting.

The German Air Force's traffic totals for M-209 solution were about 100 per day in the West. The Mediterranean Area averaged 40 messages per day.²²⁴

Strip
Systems

Section E west of the Chi-Stelle²²⁵ read the Southern Route Strip System (indicator CENEB) as early as May 1942. Voegele described this as a 30 strip system. The introduction of a device increasing the security and a gradual reduction in traffic volume forced the discontinuance of work on this system. The Germans estimated 200 messages per day as the minimum requisite for solution of a strip cipher with channel elimination.²²⁶ Voegele said it required two months to break a strip system using hand methods, but the eventual use of IBM machinery cut the time to from two to four weeks.²²⁷

The German solution of the CENEB strip cipher was very straightforward. They first found the 15 letter period and machined the traffic on this basis. A depth of 80 passages of parallel construction was needed to reconstruct the 100 strips, of which 30 were used each day.

223I 109 p 37

224IF 175 p 16

225See Chapter III

226IF 175 p 15, I 112 p 5

227I 119 p 3

A few messages were read 6 weeks after channel elimination was introduced in 1943, but the traffic fell off.²²⁸

A system with indicators XOCIB on the Southern Route could not be read.²²⁹

M-94

Section E West read an M-94 system with the indicator URSAL from the summer of 1942 until December 1943.²³⁰

REKOH

One day's Atlantic-Ferry-Route traffic of 60 messages was deciphered by the 16th Company, LN Regt 3 (later part of 3rd Battalion LN Regt 351). The evaluation section considered it unimportant and the project was dropped.²³¹

Aircraft Reporting Code

In February 1944, the Aircraft Reporting Code was broken by 16th Company LN Regt 3 in Angers due to the large volume of traffic. Partial decipherment was possible with 150 messages per day.²³²

Aircraft Movement Code

The Aircraft Movement Code was solved and read currently after the fall of 1942. Variants, changes every 12 hours, and separate British and U.S. editions of systems made the problem increasingly difficult. When the code refused to yield to machine methods during the summer of 1944, the solution was considered no longer possible.²³³

8th Air Force and IX Bomber Command Codes

Lt. Ludwig of Chi-Stelle Section B (Evaluation West) claimed that the Bomber Code was nearly always solved by cryptanalysis when necessary. Very often the Chi-Stelle Section received copies from aircraft shot down at night and applied them to the next day's traffic. The fact that the codes were good from 1800 hours of one day until 1800 hours of the next day made for an ideal compromise situation.²³⁴

228 IF 175 p 15

229 I 119 p 5

230 I 112 p 5, IF 175 p 14, I 119 p 5

231 IF 175 p 16

232 IF 175 p 11

233 IF 175 p 12

234 I 109 p 38

War Department Telegraph Code The one-part code feature of the War Department Telegraph code (indicator TELWA) greatly facilitated solution. The edition introduced in October 1943 had yielded 12,000 groups by May 1944 and was absolutely current after February 1945.²³⁵

DFC (Division Field Code) DFC-17 was captured in the Mediterranean area and helped in the eventual solution of DFC's 19, 23, 28, and 29.²³⁶

US AAF "Q" Groups The Germans placed no importance to the security of the "Q" groups. As with the Bomber Code, copies were recovered from shot down aircraft.²³⁷

Radio Teletype Voegele spoke of a "6 letter indicator" teletype system between the USA and Africa from April to October 1944. The system was never read.²³⁸

Jones Template The Germans never succeeded in solving the US Jones Template map grid system.²³⁹

Converter M-134-C (SIGABA) Voegele of Section E and German Air Force Signal Intelligence Agency states categorically that the ABA was not broken.²⁴⁰ Lt. Ludwig, Section B, whose knowledge was mainly hearsay, claimed army experts considered AM 2 (German designation for the ABA) breakable up to the end of the war, but he never heard of any success.

45. Successes with British Systems--

RAF Four-Figure The RAF four figure system was an enciphered two part code used by the RAF for point-to-point communication between units and airfields. The descriptions of this code in the TICOM documents are given in much greater detail than for other

235I 112 p 5

236IF 175 p 16

237I 109 p 40

238I 112 p 5

239I 109 p 39

240I 112 p 4

systems; hence the code is more fully discussed here. The Germans began work on the system late in 1939 and were in a position to read the system with increasing ease from March 1940 until 1 November 1942, when a code book change resulted in reducing the amount of traffic read to fragments. Interception was stopped in the summer of 1944.²⁴¹

Four figure traffic originating in Great Britain was worked on at Potsdam-Marstall without any success.²⁴² It was in the Mediterranean area that a small amount of work was done in September 1940 at Taormina, Sicily, and later at Athens. The German Air Force surmounted many difficulties during this period, going through two code book changes and encipherment changes at times every three to seven days. Traffic totals varied from 600 per day during the heaviest to 100 per day immediately before the Germans discontinued work on the problem. The knowledge gained from the four figure enciphered code formed the basis for evaluation for the rest of the war.²⁴³

The basic book of the RAF's enciphered code system was a one part code of 10,000 groups. The key "table" was a book of 100 pages, 20 lines on a page, and 5 four-digit key groups on a line. Each line had a four digit indicator and as there was no column coordinates, the encipherment always began at the beginning of the line. The line indicators were enciphered by a separate table of 100 groups and appeared as the second group of the enciphered message. The first two digits of the first group made up the control for the indicator encipherment; the third and fourth were nulls. The conversion from plain code to cipher was made by subtracting the code from the key.²⁴⁴

²⁴¹IF 175 p 19

²⁴²I 109 p 35

²⁴³I 109 p 35

²⁴⁴I 112 p 10

Given sufficient traffic, the inherent weakness of this key system soon manifested itself. During the early stages of analysis, when the line indicators were not enciphered, overlapping messages could be identified.

On the 24th and 31st of December 1941, unenciphered messages were transmitted, compromising many groups in the basic book.

After the indicators were enciphered, stereotyped traffic made possible overlapping by external cipher "hits." The beginning groups of the overlapping messages were always some multiple of five apart, and setting up of the overlaps were facilitated by the fact that encipherment always began at the beginning of the line. The "hits" were indexed by machine, and their validity tested by the use of known high frequency differences in the code.²⁴⁵

Once the messages were overlapped, the highly stereotyped context made stripping the messages easy.

The reconstruction of the indicator key had to wait until overlaps were set up. Every message that directly overlapped had the same underlying indicator. Therefore, by arbitrarily assigning 0000 as the value for the first plain indicator, all others that followed could be stripped on a relative basis and reduced to the same terms. The German relative table of indicator key was just as good for practical purposes as the British prime table.²⁴⁶

The delay between interception and deciphering was between two and fourteen days.²⁴⁷

Syko
Cards

The Royal Air Force Naval Code was the basic book of an enciphered code system of which the Syko Card was the encipherment. A copy of the basic code was recovered from a Wellington shot down over Welhemshaven in September 1939. The British did not seriously alter the code for the duration of the war.

245I 112 p 10

246I 152

247IF 175 p 20



The daily reciprocal enciphering table was being reconstructed by February 1940. Messages on the daily table could be read by 1600-1700 hours. The introduction of several cards a day complicated the solution slightly, but 40 messages sufficed to solve a single card.

The traffic, which contained information concerning British and Axis convoys, submarines, naval vessels, and meteorological reports, averaged between 80 and 300 messages a day.²⁴⁸

Rekoh

Rekoh first appeared in 1942-1943 and was simply a non-reciprocal Syko. Slightly more traffic was necessary to accomplish solution than with Syko.²⁴⁹

Aircraft Reporting Code and UCO

The Aircraft Reporting Code replaced Syko and Rekoh in July 1943 and was used by reconnaissance planes in the West. 16th Company LN Regt 3 in Angers solved the system in February 1944.

ETA messages, frequency changes, and hourly barometric pressure broadcasts assisted the initial break-in.

The Aircraft Reporting Code had a particular importance in that it afforded a crib into UCO (the ground/air meteorological code). It was broken by cribbing the pressure reports from the Aircraft Reporting Code. The fixed Signal Intelligence station at Husum carried on this work. Lack of intercept in the last days confined solution to the net crib.²⁵⁰

Aircraft Movement Code

The Aircraft Movement Code was used on ferry flights from Tokoradi to India and totalled about 500 messages per day. The system was composed of pronounceable 5-letter code words, which were changed every 24 hours at first and later every 12 hours. W-Leit, Southeast, in Athens began work on it in the fall of 1942, and reading stopped in February 1944 when too many variants made solution impossible.²⁵¹

²⁴⁸IF 175 p 18, I 109 p 36

²⁴⁹IF 175 p 19

²⁵⁰IF 175 p 22, I 112 p 3

²⁵¹IF 175 p 21

Aircraft
Movement
Code (UK)

A three letter code with serial numbers in clear and repeated indicators passed between the UK and stations on the Belgian-French border. The Germans never solved it and assumed it to be an administrative or supply system.²⁵²

RAF 2-
Letter
Bomber
Code

Pages of the Bomber Code, used jointly by RAF and USAAF, were obtained from a crashed aircraft in November or December 1942. Two weeks later the Germans were reading the system cryptanalytically. Traffic averaged 150-200 messages per day with 600 per day as high. 300 messages yielded 50-60% of the values. Letters and numbers from messages containing spellers or frequency information afforded the daily break-in.

The code changed daily at 0300 and could be broken during the US day raids and used to decode RAF traffic during the night operations. This conflicts with Lt. Ludwig's account.²⁵³ Ludwig gives 1800 hours as the time the code was changed. The members of the US 8th Air Force were the day time unfortunates who had their traffic decoded on the basis of code values recovered during the RAF raid the previous night.²⁵⁴

Slidex

Slidex was a digraphic substitution system used in the army and air support networks. The coordinates of the substitution table changed daily, but offered no great problem to the German Air Force cryptanalysts.

The 3rd Battalion, Signal Intelligence Regiment West (later LN Regt 351) began work on Slidex in May 1943 at Bougival, near Paris. Much progress was made during the pre-invasion "Spartan" exercises in Britain, and by the time the Allies invaded, the Signal Intelligence Evaluation Center (NAAS 5 of the Army) of the Signal Intelligence Regiment 5 (Kona 5 of the Army) and 14/3 (W-Leit 3) had had sufficient experience to break the system operationally. The daily strips were recovered by 0700-0900 hours.²⁵⁵ The traffic averaged 15-40 messages per day.

252I 112 p 3

253I 109 p 38

254IF 175 p 22

255I 109 p 38, IF 175 p 22

Government
Telegraphic
Code

Work upon this system was begun by the Signal Intelligence Agency of the Supreme Command Armed Forces (OKW/Chi) in May 1939 and given to the Luftwaffe in August 1939. The traffic, containing mainly casualty and administrative information, averaged 200 messages per month. The Germans considered the system of small importance in the last years of the war.²⁵⁶

India
Code

The India Code was an unenciphered 4-letter code transmitted in 5-letter groups. Section E at least partially read this traffic until the end of the war.²⁵⁷

Inter-
Depart-
mental
Cipher

The basic book of this 4-digit enciphered code system was captured in Bergen, Norway in June 1940. Air attaches in the Near East, Portugal, Sweden and Switzerland used the system. Switzerland was always one table behind the others. Voegele, of Chi-Stelle Section E, received a photostat copy and began work on the system. Traffic was exchanged with OKM and OKW, the total volume being about 100 messages per month.

Two tables with indicator patterns CVCVC and VCVCV (where V = vowel and C = consonant) were used, and both were broken most successfully in 1940-41 when the tables changed quarterly. The date breaks occurred at intervals of between six weeks to two months.

Work on the Inter-Departmental Cipher was stopped in 1943 because the decodes were useless to evaluation.²⁵⁸

Bentley
Code

The Bentley Code was used by British Overseas Airways and was copied from South Africa, Southeast Africa, Egypt and Syria. During the war, about five hundred 5-letter groups beginning with Y were added. One encipherment for confidential administrative traffic was added during the winter of 1942-43. The solution was so simple that Voegele used it to train beginners in cryptanalysis, and the whole project was dropped in

256 IF 175 p 18

257 IF 175 p 18

258 I 119 p 4, IF 175 p 21

Weather
Systems

1944 because Evaluation was no longer interested.²⁵⁹

The solution of enciphered meteorological messages was not the responsibility of the Chi-Stelle, but was undertaken to assist the weather service (the Signal Weather Monitoring Service or WENUERB). The Chi-Stelle solved the British Main Weather Code in April, 1940 and turned the keys over to WENUERB at Glindow, near Potsdam. In April 1942, the Signal Weather Monitoring Service received the solution of a five-figure Middle East weather cipher from W-Laist Southeast. Systems in the Atlantic Area carrying the indicators "Whist" and "Tooth" were worked on by the Signal Weather Monitoring Service without success.²⁶⁰

Miscel-
laneous

Lt. Ludwig, of Chi-Stelle Section E, recalled the solution of a British single transposition cipher, involving a ten column rectangle. The system changed every Thursday at 2400 hours when the new key word was transmitted in the previous system;

The Germans had no success with double transposition despite notebooks captured at Laras and during the early days of the Normandy invasion. They did not find any messages of the same length in the same key.²⁶¹

TypeX

Many attempts were made to get into this system, but work was discontinued as the Germans considered the TYPEX machine unbreakable.²⁶²

46. Cryptography of Soviet Systems-- Code in various forms with the transmitted text appearing as numbers was used almost exclusively by the Soviet Air Force.²⁶³ Each Air Army did its own code compilation and had its own rules for use. Therefore, the following definitions of Soviet codes are extremely general and attempt only to describe types of codes, not specific systems:

259 I 119 pp 4-5, IF 175 p 21

260 I 112, 4(0) p 11; IF 175 p 23

261 IF 175 p 24

262 IF 175 p 24, I 119 p 5

263 I 120 p 7

a. The table was a cryptographic device comprised of letters and words in a predetermined form, usually a square or rectangle with number coordinates. Security was enhanced by using variable coordinates that could be changed by the use of sliding strips or by the use of digraphic substitution enciphering tables.²⁶⁴

b. The code table (Signaltafel)

The code table was a highly specialized medium for use in air/ground communication. The vocabulary was highly stereotyped and limited to met reports, landing and take-off data, etc.

c. The code book was the principal cryptographic medium of the Soviet Air Force, especially in the ground organization. The Russians used all variations from small one-part books to two-part books with up to 30,000 values. Extra security could be gained with an additive encipherment of the basic code.²⁶⁵

47. Successes with Soviet Systems-- During the period 1937-1939, the Germans gained valuable experience during Soviet maneuvers. The traffic passed was mainly practice and dummy, but formed a foundation for later analysis. During the Soviet Occupation of Poland in September 1939 the Germans had almost 100 percent success with "OKK-5," a code system with a digraphic substitution encipherment, the most common Soviet Air system.

During the Finnish Campaign (1939 and 1940) the Germans concentrated their best cryptanalysts in Chi-Stelle Section E 1 (Russian cryptanalysis) and unbroken material went to the Chi-Stelle via teleprinter. During this period two and three figure Soviet traffic was completely broken, "OKK-5" was 95 per cent read, and considerable success was attained on the additive enciphered code system used by higher headquarters.²⁶⁶

The Soviets revamped their cryptographic setup after the Finnish Campaign. The Germans captured working directions to Soviet code and cipher officers that made only the barest reference to codes and ciphers being solved. The directions called for a general increase in cryptographic security.²⁶⁷

264 I 120 p 10

265 I 120 p 13

266 I 120 p 38

267 I 120 p 40

The "High Command of Soviet Cryptography" may not have admitted their compilation errors to subordinate code and cipher officers, but they did take strong measures to correct their mistakes. Regional methods of distribution instead of widely held systems, the shortening of effective periods, the abolition of one-part books, and the complication of enciphering technique were all introduced.

These changes did not bother the Germans too much. They were able to follow step by step the Russian modifications; as the changes were not too radical they "kept pace."²⁶⁸

1st Lt. W. Werther claims that a captured Soviet cipher machine was examined by the Signal Intelligence Agency in 1941-42. He did not, however, expand upon this.²⁶⁹

48. Standard operating procedure in dealing with Soviet Systems.--In the case of Soviet systems based on some form of the table, "statistical pictures" or frequency counts were first made. This procedure would usually reveal the size of the cipher unit (2, 3, or 4 figure). The next step was to deduce the number of tables involved and reduce the statistical picture down to the actual size of the table. This involved the elimination of indicator groups, "dummy" elements, and any clear numbers that appeared in the cipher text.

In the event a simple code table with coordinates was used, a simple book reconstruction job was in order.

The more complicated table systems, in which use was made of several tables with coordinates that were cyclically shifted or chosen from a 10 by 10 square, unique in its rows and columns (latin square), through the use of indicators, were solved by concentrating on each table as a separate entity. Naturally, those that stood out in the original frequency distributions were attacked first. Then, as solution of the tables progressed with relative page and row column designations, the designations were equated and the entire indicator, page and coordinate system could be reconstructed.

Some traffic could be read with these relative coordinates, but the reduction to prime values was very important. The shifting coordinates were often based on a latin square, or upon the cyclic variation of the same sequence or sequences.

268 I 120 p 40

269 I 120 p 43

The sooner this pattern could be isolated the sooner the entire system fell apart.²⁷⁰

The Soviets used 5-figure additive systems on high echelon circuits including some one time pads upon which the Germans did not waste any time. In the case of non-one time additives ("universal blocknotes"), however, the situation was quite different. 1st Lt. Werther's account shows that the indicators were not enciphered. Overlaps were easily thrown together, flags of differences made up, columns equated, additive stripped and basic code recovered whenever sufficient traffic was available.²⁷¹

49. Successes with systems of other nations.--

a. Lithuania: The Lithuanians used a grid system which was very insecure. Lithuanian traffic was read by Section E of the Chi-Stelle from 1938 until the Red Army entered Lithuania in the summer of 1939.

The Lithuanians used a ten by ten square in which the text was written out from left to right. A ten by ten grid with 25 cut-out cells was superimposed and the letters in the cells read off from left to right as cipher text. The grid was shifted four times to encompass the 100 letters in the underlying square. In the event a message was less than a hundred letters it was padded out by repeating the signature.²⁷²

b. Rumania: (1) 1st Lt. Werther worked on Rumanian Air Force Cipher material in Budapest in the Spring of 1939. He described it as a simple transposition system. A few days after he submitted a report that the system was about to break, he was recalled to the Chi-Stelle. Werther believes that the interference was deliberate and political. It is significant that the Hungarians later bought the system.²⁷³ (2) Werther claimed that the Rumanian Police Cipher was so simple that the Germans considered it camouflaged treason. Exact information on German troop movements was transmitted in this system.²⁷⁴

²⁷⁰I 120 p 43

²⁷¹I 120 p 53

²⁷²I 121 p 46

²⁷³I 121 p 8

²⁷⁴I 121 p 9

c. Yugoslavia: The Germans had no difficulty solving the Yugoslav Air Cipher and had currency on the system when the campaign against Yugoslavia started. The system was composed of lexicographic tables with 30 columns and 60 lines. The line and column coordinates were at first non-random and later random.²⁷⁵

d. France: Werther recalled a French code book enciphered with short periodic additives. Though it yielded very slowly to solution, the Germans read the system.²⁷⁶

e. Carpatho-Ukraine: Five letter monoalphabetic substitution messages were read in Budapest. The security of the cipher was nil.²⁷⁷

f. Poland: The German Air Force started work on Polish traffic a few weeks before Poland was invaded. A few take-off and landing reports were the only messages read.

1st Lt. Werther of LN Regt 353 saw a captured Polish two-part code book, which was made up of some 2000 values and was non-alphabetic.²⁷⁸

g. Czechoslovakia: Voegele began work on Czech material in 1937. Five letter air messages, of which a good bit were practice traffic, were read. A few tactical transposition messages were solved. Voegele believed the bulk of unsolved Czech material to be machine cipher.²⁷⁹

h. Spain: To the best of 1st Lt. Werther's knowledge the Spanish Reds transmitted their traffic almost exclusively in the clear.²⁸⁰

275I 121 p 9
276I 121 p 9
277I 121 p 8
278I 121 p 6
279I 121 p 7
280I 121 p 110



1. Turkish Air Force: Turkish systems fell in three categories: (1) Periodic substitution system which changed monthly and was broken in two hours. (2) Unenciphered alphabetic code book. (3) Single transposition enciphered weather reports.

Voegle considered Turkish material extremely simple. He never bothered with it but turned it over to subordinates. 281

281I 119 p 5

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Chapter VI Liaison

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50. Introduction.-- The liaison of the German Air Force Signal Intelligence Service with other agencies engaged in signal intelligence activities was effective. The overall allocation of problems and spheres of activity was divergent and each service concentrated on its own commitments. At the high levels of command, the Supreme Command of the Armed Forces, the OKW, exercised a control over German security measures, but permitted each service of the Wehrmacht to work out its own techniques and policy in its signal intelligence work against foreign countries. Whenever problems overlapped between the services further down the chain of command, full technical information and intelligence was exchanged.

51 Relations with the Supreme Command of the Armed Forces, OKW.-- The relationship between OKW and the Air Force High Command, the OKL, was decided upon at a series of conferences held in Berlin in October and November 1944, presided over by the head of OKW/Chi and attended by representatives of the four services (OKW, OKH, and OKL).²⁸⁵ The German Air Force operated independently of the Wehrmacht in matters of its intelligence activities against the Allies.

285

D 57 p 10 p 15

Liaison was carried on at lower levels where necessary. Close cooperation existed between Gen Nafue II and security Group IV, Gen Nafue III of the Air Force and OKW in regard to German security and cryptography. On the upper level the head of cryptographic development at the Chi-Stelle of OKW worked in collaboration with the compilation departments of Army, Navy and Air Force. To test its own systems the Air Force maintained its own cryptanalytic security section in Gen Nafue III, but submitted its cryptographic materials to OKW/Chi for review.²⁸⁶

It is significant that Lt. Col. Friedrich, head of the Air Force Chi-Stelle, said during interrogation that he had never read one "activity report of OKW/Chi." In regard to any "very important signal materials" from OKW, Friedrich said he stopped reading them as they were of no interest to him.²⁸⁷

52. Relations with the Army High Command, OKH.-- Relations between OKL Signal Intelligence Service and the Army were on the whole quite good. The actual problems worked on by the two organizations were distinct, but results, reports and information were exchanged, and periodic meetings were held in order to discuss techniques and experience. Collaboration before suspected large Allied moves was especially close.

The 3rd Battalion of LN Regt 353 on Southern sector of Russian front collaborated with Signal Intelligence Regiments 1 and 8 (KONA 1 and 8) of the Army. Liaison officers were exchanged and evaluation closely coordinated. German Air Force Signal Intelligence Service often helped fill in the gaps through their work on the air armies when the Soviet land army observed radio silence.

286^D 57 pp 7-8

287^I 13 p 6

288^I 126 p 14

The army employed a large number of search receivers. Any air frequencies were immediately passed to the Air Force, thereby saving the Air Force time-wasting search work.²⁸⁹ In the West, LN Regt 351 fed its results to Commander-in-Chief of Army Group West.

53. Relations with the Navy High Command, OKM.-- In contrast to its relations with the army, the German Air Force Signal Intelligence Service had many actual problems in common with the signal intelligence service of the German navy. Both services attached a liaison officer to the Wing (Fliegerkorps) in Athens to coordinate the daily situation reports for the meetings of the general staff. Owing to his lack of experts, the admiral commanding German Naval Forces in the area turned over to the Air Force personnel and equipment for radar monitoring.²⁹⁰

The Navy was very much interested in the work 3rd Battalion of LN Regt 353 did on the air arm of the Soviet Black Sea Fleet. Accordingly, the Battalion kept the Navy informed on everything it received concerning the Red Navy. The Air Force Signal Intelligence was able to give the navy intelligence on the disposition of the some 180 planes of the Black Sea seaplane force. Of special importance was Russian air recce traffic, which when intercepted, constituted a warning of impending Soviet action against German convoys in the area.

Much the same situation existed in the northern sector. The 1st Battalion of LN Regt 353 put an R/T unit aboard the Prinz Eugen to monitor Soviet air units of the Baltic Fleet.

LN Abt 355 in Norway had direct wire lines to Naval Headquarters in Oslo, over which intercept information concerning RAF Coastal Command and Atlantic convoys was passed.²⁹¹

289 I 130 p 15

290 I 126 p 14

291 I 187, #410

54. Relations with Weather Service (WENU EB).-- The monitoring of allied weather networks was not a primary commitment of German Air Force Signal Intelligence Service as the weather service (WENU EB) maintained its own intercept and analytic facilities. The German Air Force was, however, able to augment the weather service's coverage and analysis, and Signal Intelligence sources of weather information became increasingly important as Allied pressure cut down the activities of German weather recon aircraft.

A liaison officer (a technical sergeant) from the weather service was attached to Section B of the Chi-Stelle. This ~~non-com~~ made regular trips to the intercept units, instructing them in the significance of weather messages. He reported to the Chief Weather Officer on all weather frequencies not being covered by Signal Intelligence Service and any incidental weather intelligence.²⁹²

55. Relations with Goering's Research Bureau (Forschungsamt, abbreviated FA).-- The only contact between FA and the German Air Force Signal Intelligence Service seemed to be at periodic general meetings attended by representatives of all branches, although there was an occasional exchange of raw traffic between the two agencies.²⁹³ Friedrich said that Voegelé met with representatives of other agencies (FA included) to discuss cryptanalytics.

56. Relations with other Axis powers.--

a. Japan.-- Voegelé, principal cryptanalyst of the German Air Force, visited Berlin twice in 1942 in an attempt to meet with Japanese Colonel Hayashi of the Japanese Military Mission in Berlin and discuss cryptographic matters. The meetings were prevented by Lt. Col. Kempf, of OKW/Chi.²⁹⁴

b. Finland.-- Lt. Col. Friedrich of German Air Force Signal Intelligence Service said that there was liaison with the Finns on Russian traffic and T/A. There was no liaison on matters of cryptanalysis. Detachments from German Air Force signal intelligence worked with the Finns at Mikkeli and Sortavala.²⁹⁵

²⁹²IF 183 p 90

²⁹³I 29 p 3

²⁹⁴I 119 p 17

²⁹⁵I 120 p 3

c. Italy.-- A very loose contact existed with the Italian Army Signal Intelligence Service. Unimportant frequencies of allied and Turkish air forces were exchanged. Personnel of German Air Force Signal Intelligence had a very low opinion of the Italian service.²⁹⁶

d. Hungary.-- Collaboration had existed with the Hungarians since before the war. The liaison consisted mainly in the exchange of radio intercept. The Hungarians had no capable cryptanalytic brains and lacked "reliability" in the eyes of the Germans.

The Hungarians attached an intercept company to the Eastern front in the Spring of 1942, but this was withdrawn after a year. In April 1944 a Hungarian intercept company was again attached within the framework of III Abt LN Regt 353. This company lasted until 5 January 1945, when it was withdrawn to a Hungarian collecting camp. The Germans considered it a good intercept unit.²⁹⁷

²⁹⁶ I 126 p 14

²⁹⁷ I 130 p 15

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Chapter VII Critique of the Organization and Operations of the German Air Force Signal Intelligence Service.

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57. Subordination to Chief Signal Officer rather than to A-2.-- The German Air Force Signal Intelligence Service was confronted with the same organization problems that the USA faced in the formation of a cohesive, efficient organization. It took five years of war, until October 1944, before the fairly unified service discussed in this paper as the norm emerged.

Both the A-2 and the Chief Signal Officer of the German Air Force desired control over signal intelligence. The German High Command subordinated the service to the Chief Signal Officer for operational reasons, although the A-2 was the chief recipient of its product. The High Command reasoned that the Signal Corps could better furnish personnel, equipment, and signal communication, and thought the A-2 lacked the technical know-how necessary to control the actual operations of signal intelligence units. Thus, the A-2 advised on intelligence matters but had no control over Signal Intelligence operations. Signal Intelligence reports to the A-2 had evolved gradually from technical discussions of circuits, new call signs, and such technicalities, to evaluated intelligence. German Air Force A-2's did not understand the purely Signal Corps technicalities, and this fact influenced the final decision in subordinating the signal intelligence service to the Chief Signal Officer. The decision to keep the signal intelligence service independent of the A-2 was a good one for them. Good intercept is all-important for the operations of any signal intelligence service. The effectiveness of the intercept service is determined by whether the

enemy's transmitters can be heard, whether his operators are careless, and by many other strictly technical factors. Since all such technical questions of intercept are the province of the Office of the Chief Signal Officer, it would appear wise to subordinate the Signal Intelligence Service to that Office, rather than to the A-2. Signal Intelligence produces what is technically possible and not, except in a very general way, what the A-2 desires.

58. Centralization of operational and administrative control.--The final organization unified operational and administrative control within the signal intelligence structure at all levels of command. Lt. Col. Friedrich's dual capacity as head of Gen Nafue III and of the Signal Intelligence Agency (LN Abt 350) was the basis of this unification. Friedrich could bargain for equipment and other necessities from the Signal Corps while at the same time exercising operational control over the entire signal intelligence organization, although he did have a nominal superior in Gen. Klemme, Senior Signal Intelligence Officer. Col. Forster, Chief of the Air Raid Warning Service in Germany (FAF Reich) was head of tactical air raid warning operations, but he was subordinate to and received his orders through the Signal Intelligence Agency.

The experience of the German Air Force shows that its signal intelligence service had to be independent of outside control, equal and not subordinated to other intelligence agencies. This unity under Lt. Col. Friedrich, although not specifically provided for on paper, did in fact exist and was absolutely necessary for operating efficiency.

59. Organization of the Field Units.--In the final organization, all the field units were under the operational control of the Signal Intelligence Agency, which did not delegate its authority but moved its various sections to the field. On the Russian Front the ease with which the codes could be read, the large distances involved, and the difference in operating procedure within each Russian Air Army made it more practical to control the Battalions of LN Regt 353 locally. Sections E₁ and D split up and moved out to the headquarters of the three battalions, leaving a very small party at Chi-Stelle. On the fronts operating against the western allies the German Air Force decentralized T/A evaluation by putting Section B's evaluation personnel at the headquarters of the field units. A certain amount of centrality was maintained in the cryptanalysis of higher grade allied systems, due to the technical difficulties they presented.

The Germans found tactical evaluation to be a low echelon problem, to be attacked mainly by the field units. The individual intercept operator and field evaluator were in a position to supply much short time intelligence that would have been lost had traffic been immediately passed to higher echelons for evaluation. The production of strategic intelligence and the coordination of the intercept missions of the field units were performed by the personnel remaining at the Chi-Stelle at Potsdam, the traffic and operators' logs eventually found their way to this agency.

The distribution of control discussed in the three paragraphs above was the German Air Force solution to the problem of signal intelligence control, arrived at in the light of its particular experience. It would be wrong, however, to apply this organization uncritically to our own setup. Each country confronts different difficulties; each war presents a different geographical and communication problem.

60. Advantages of a separate Air Force Signal Intelligence-- The advantages or disadvantages of a distinct Air Force Signal Intelligence Service must be reviewed in any evaluation of the German Service. The organizations of the Wehrmacht called for a separate air arm, so when the Air Force found it needed signal intelligence it built up its own service without bothering with the details of signal intelligence control being centered in a single unit. It has been seen (Chapter I) that in the formation of its organization the Air Force followed the pattern already set by the Army.

There were good reasons for a separate Air Force service. Some of the problems of signal intelligence were strictly Air Force commitments. The most clear cut example of such a commitment is found in the operations against Allied strategic bombers. However, a similarly clear cut line of demarcation between Air Force and Army commitments could not be drawn in operations against tactical Air Forces which operated in conjunction with land forces. For example, in the case of Russia, the Air Armies were subordinated to Army Groups with which they had common communications channels. Furthermore, ground support units were linked with ground combat units by radio circuits. Again, in the West, the land forces and tactical Air Forces communicated on both air/ground and point-to-point circuits, and the commitments were not exclusively those of the Air Force.

These facts point to the wisdom in establishing a separate Air Force service to handle the problems which are of a

peculiarly Air Force nature and indicate the necessity for signal intelligence units tailor-made for the intelligence needs of the Air Force. On the other hand, all the evidence underlines the necessity for a central, coordinating agency having overall control of signal intelligence matters, and making clear cut assignments on problems which inevitably overlap. The Germans in fact had machinery set up in OKW to answer this very need, but they did not use it, and cooperation between the branches of the Wehrmacht was difficult to achieve. Instead of overall control the Germans relied upon liaison at various working levels between the signal intelligence services of the Army, Navy, and Air Force. OKW, instead of functioning as an agency of overall coordination, restricted itself to the supervision of Wehrmacht cryptographic security and the ideal of the separate Air Force Signal Intelligence Service, subordinate to a central Signal Intelligence Agency controlling all the branches was never achieved.

61. Evaluation of German Air Force signal intelligence operations.--The Signal Intelligence Service of the Air Force achieved marked success in its operations in spite of the difficulties of organization. In the exploitation of every signal manifestation, the scrutiny of every phenomenon, the members of the service showed their advanced conception of signal intelligence.

On the Russian Front, methods remained rather elementary due to poor Soviet code and cipher security and primitive radio methods. In the west advanced cipher, communication, radio navigational and radar technique forced the Germans to rely on advanced T/A methods instead of cryptanalysis, and these they developed brilliantly.

The Germans exploited American mistakes to the utmost. Our heavy bomber raids were compromised by the tremendous volume of radio traffic that started before the raid and continued through take off and assembly, by the regularity with which routine reports were sent, and by the lax R/T discipline of the flying units. Even radio silence was significant, for if units remained absolutely quiet the Germans were alerted for an impending operation. Furthermore, American laxity in failing to switch off IFF over German territory made route tracking possible even when radio silence was observed, and Allied radar, both fixed and airborne, was carefully monitored. It is not surprising that the German estimate of U. S. security was that Americans relied too much on good cipher and did not practice sound radio discipline.

62. Recommendations-- The most important lesson to be learned from a study of the German Air Force Signal Intelligence Service is that we in the USA have been confronted with relatively simple signal intelligence problems. Cryptanalysis and T/A as we have known them, are not sufficient in tactical operations against an opponent as advanced or more advanced than the USA in radio and cryptographic technique. The operational use by foreign countries of better codes and ciphers, better radio methods, and electronic devices of all kinds will make necessary our revising our conception of signal intelligence.

American security would benefit from an intense study of German Air Force ^{has} signal intelligence operations, which have been reviewed only in outline in this volume. The successes claimed by POW's should be checked against our SOI's and operational records. Provision should be made to incorporate the lessons learned from these studies into the training programs of all units using radio and electronic equipment. From the examination of the materials upon which this volume is based, one fact stands out above all others: The German Air Force Signal Intelligence Service could not have been so successful in the West had American personnel been more security conscious.

APPENDIX

EARLY WARNING

By

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[From IF-133 pp 12-32]

The problem of early warning became acute when the RAF began its heavy raids on Germany proper. It became even more urgent when the 8th USAAF joined the RAF Bomber Command in unrestricted aerial warfare against Germany, and the Luftwaffe limited itself for the most part to a defensive role. Reliable and timely early warning was to be one of the most important tasks of the Luftwaffe SIS.

The first attempts to obtain clues for advance warnings from enemy radio traffic hark back to bomber R/T traffic on 6440 kcs. ("Darky" frequency). From tuning traffic between ground stations and aircraft, and from early messages, the strength of RAF night intruder formations had been determined. In those days the number of bombers involved was no more than 80-100. Evaluation of this traffic was made easier by the separation of operational airfields and OTU bases. After 1943 the HF R/T traffic of combat units continually decreased, while that of the OTU's increased. For this reason, monitoring of the RAF Bomber Command R/T traffic yielded no fruitful results.

On the other hand, ever since 1943 the monitoring of American bomber R/T on HF frequencies gave very lucrative indications of impending air activity. During a later period, advanced warning had been given as early as the evening before daylight attacks of the 8th USAAF, simply on the basis of this R/T traffic. If, after normal daytime R/T traffic had come to an end, tuning and readability traffic, and W/T activity were resumed, then these observations were sent out by Meldekopf 1 as an early warning.

This type of advanced warning was facilitated by the fact that, at the end of 1943, the 8th USAAF introduced the use of special airfield frequencies in addition to the regular HF frequency of 6440 kcs. It remained, therefore, to determine the call-signs of the ground stations; the intercept operator needed only to have his receiver properly calibrated in order to identify the airfield in question. In the final period the efforts of the combat wings to give

instructions to their formations on HF instead of VHF were realized. Perhaps it was due to reception conditions over England, which changed daily; at any rate, it was surprising how open and voluminous the HF traffic over England was, both during the assembly, and the approach flights to the target.

In the beginning of 1943, the first basic attempts were made to find possibilities for early warning in the air-to-ground W/T traffic. At that time a scrutiny of the radio traffic from the "Regional Control Stations" was begun. England was divided into fixed safety areas; the radio traffic for each zone was handled by a specified radio station, which was often a bomber airfield radio station as well. During the early afternoon hours a large number of unidentified call-signs would be heard in tuning traffic with those Regional Control Stations serving southern England; this would be followed, at night, by a rather large-scale raid on France, or over France into Germany. However, the experiment was a failure in the sense that the strength of an expected night attack could not be predicted from the number of call-signs heard communicating with these Regional Control Stations.

On the other hand, around this time a special phenomenon was noted by good SIS operators engaged in monitoring the enemy airfield D/F sections. Approximately one hour before the first enemy aircraft was plotted over the sea, certain, short whistling tones were heard, in varying intensity. In the case of a raid by approximately 250 bombers, 12-25 of these whistling tones were heard in short, chronological sequence. Specialists explained this phenomenon as the tuning of aircraft transmitters to zero beat. Thanks to these whistling signals, remarkable good advance warnings could be given from April to June, 1943. According to the D/F section, not only the strength, but also the probable area of attack could be predicted.

In addition short-interval early warning was guaranteed at all times through the interception of British E2S. The period in which the Meldekopf was able most accurately to predict raids was the summer and fall of 1943. When the whistling signals no longer occurred frequently enough to be reliable, monitoring of the radio station at Gravelley Airfield (8 Pathfinder Group) furnished accurate clues. Gravelley, one of the newer satellites of Wyton, was seldom heard by day. The radio station at every other bomber airfield sent its call-sign and the time, every 15 minutes for check purposes. Gravelley was the only bomber airfield which sent its check signals only until noon, and then went off the air. If a mission were to be flown in the evening, the radio station would renew its checking transmissions in the late afternoon, or at least long before take-off time.

Research conducted by the final evaluation section of Meldekopf 1 indicated that aircraft from Gravelsey took part in every enemy raid. Therefore, without incurring any risk, or considering the daily signal intelligence picture, an advance warning could be given on the basis of the resumption of quarter-hourly procedure at Gravelsey.

In the summer, new possibilities for early warning were explored, since it was known that the enemy was fond of changing his tactics suddenly. In addition to the continuous search for traffic on medium frequency, an effort was made to obtain a signal intelligence picture of all active squadrons, and to arrange the information according to the following pattern, in order to decide whether night attacks were impending or not:

Airfield	Number of aircraft heard	Number of tuning messages inter- cepted	Landings and peculiar messages
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However, the evaluation of these tables was performed too superficially, and as a result no valuable intelligence was really gleaned from them. For this reason a small, select group of specialists was continually on the lookout for new methods of obtaining early warning.

First of all they proposed examining all the daytime radio traffic of the Pathfinder Group (8 Group). The reason for this was that no large-scale missions over Germany or the western occupied areas were flown without Pathfinders, which represented the brain of such an attack. If the radio traffic of this group yielded hints of an operation, then the method developed could be applied in the same way to the main body of the bombers. It so happened that the entire signal intelligence picture of 8 Group over the period of a month could be reconstructed relatively quickly, and hence the real work of evaluation could be started. The research proceeded on the theory that daytime radio traffic on non-operational days must be noticeably different in certain characteristics from traffic on days when no attacks followed. Thus, the radio traffic of all airfields of 8 Group was separated into different periods of the day, and subjected to a detailed examination. From this the following was determined:

On non-operational days, daytime radio traffic between aircraft and their airfields had no special peak. During the forenoon there was mostly identification and tuning traffic, with no special indication of haste on the part of

the ground station. During the noon hours there was almost a complete lull in activity; the British partook generously of their noontime ease. In the afternoon tuning traffic began again, and now and then D/F traffic was heard. In scrutinizing the traffic of the airfield D/F sections, special attention was paid to those aircraft performing cross-country flights. Moreover, the W/T intercept companies which were entrusted with the monitoring of Bomber Command reported those Pathfinder aircraft call-signs which appeared in the traffic of other groups. After the traffic of the Conversion Unit at Wyton, which was quite voluminous, had been eliminated, there remained a good picture of the activity of the Pathfinders. The signal intelligence picture of this unit, on a day immediately preceding a night raid, looked approximately as follows:

In the morning there was lively tuning and recognition traffic, the peak being reached between 1000 and 1130 hours. The small amount of D/F traffic, appearing during the noontime hours was ascribed to ferry flights to and from the repair-shops. At noon came the "briefing-pause", and therefore very few Pathfinder aircraft were heard. To properly evaluate the noontime radio silence, an exact knowledge of weather conditions over the take-off areas was important. Therefore a weather map was made, and no source of information was ignored in building up the truest possible picture of the weather over the 8 Bomber Group bases (radio traffic between the ground stations of 8 Group and aircraft from other airfields; weather reports from training units flying over England, from deciphered bomber code messages, and from naval radio stations). The recall of British training units around noontime would be an unquestionable indication of an expected deterioration in the weather. Very frequently the signal intelligence picture would definitely indicate a raid, and then the sudden appearance of a bad-weather front would cause the mission to be cancelled.

In December practical utilization of the intelligence gained from the study of Pathfinder traffic was begun. Every evening an air situation report, such as the following, was broadcast:

Appreciation of the Air Situation, 1730 hours

In the forenoon, there was tuning activity on the part of all groups (both bomber and Pathfinder), but with no noticeable peak period. From noon on, cross-country flights by units of the Halifax Groups were observed, over the middle and western sectors of England, and over the Irish Sea.

In some instances flights of Pathfinder aircraft over the northern bases (6 Bomber Group) were observed. Pathfinder tuning traffic also came to a stop at noon. Training operations by the OTU's were carried out all day long, in all areas. Tuning traffic on medium frequency is normal, and shows no point of concentration.

Conclusion: No large-scale raid is intended.

This research was the impetus for a reorganization of the W/T intercept companies. In the same way as with the Pathfinders, a study was begun of the radio characteristics of the other groups. Daytime radio traffic was visually presented on large, glass blackboards by the use of appropriate symbols, and was posted hourly. On these blackboards were shown:

Air activity at a given airfield;
Tuning traffic from this airfield;
Volume of radio traffic with aircraft from other airfields.

When later the RAF also flew daylight missions, there was also included information as to which units had completed their missions.

A digest of this information, together with a record of the missions which followed, was kept in a diary, in order that every radio characteristic which seemed important to certain intercept problems could be referred to. This saved loss of time in thumbing through log sheets. To the blackboard picture was added a new board on which was noted those radio characteristics which could only be observed by the intercept operator (change of transmitter, increasing of signal strength, tuning to zero beat, change of radio operators, continuous notes, sending of V's, etc.). These characteristics were also tabulated and compared with those on the other blackboards.

This tiresome work was not done in vain. There emerged the facts that the Pathfinders of the mimatory 5 Group tuned to the zero beat of their frequency long before their radio traffic over the target was heard, and that the same whistling tones could be heard from jamming aircraft of 100 Group, shortly after they took off from Foulsham. Also that the radio operators of 5 Bomber Group were changed frequently on non-operational days, while during a mission the same operator remained on the key.

The ever more frequent daylight raids of the RAF were predicted without difficulty. If, for example, 3 Bomber Group was to fly at noon, there was no tuning traffic during the morning. In short, an alerted group maintained radio silence.

Tuning traffic probably originated with the ground personnel rather than with the airborne radio operators. Perhaps it was also sent during repair-shop flights over an airfield, but this was not absolutely necessary. Perhaps it represented a certain playfulness on the part of radio repair sergeants who also wished to send a little radio traffic. The non-appearance of this tuning traffic became one of the most important clues for the Luftwaffe SIS in predicting a coming attack.

The following depicts the sequence of events in a night raid, showing how, in the latter years of the war, it could be identified by SIS, and advance warning given:

- 1700 hours: Lancaster units have been alerted for operations during the first half of the night. Whether Halifax squadrons are to be used also is not yet known. 5 Group commands special attention.
- 1800 hours: 100 Group has already taken off.
- 1825 hours: The first aircraft of 100 Group has been plotted; it reported damage. By means of many bearings its course is learned; it is flying over Dunkirk on a southeast course toward the Charleville area.
- 1825 hours: A bomber code message in the new setting, which is only valid for one night, is sent by an airfield of 1 Group; this means that the aircraft of 1 Group are already airborne, but their course is still unknown.
- 1900 hours: The monitoring of Allied aircraft reporting networks, carried out by Meldekopf 2, indicates a large enemy (British) formation in the Somme-Muendung area. At this point an advance warning is broadcast to all parties concerned.
- 1910 hours: An OTU aircraft attempts to home on an airfield of 5 Group and is turned away by the airfield D/F section (certain "Q"-signals). Therefore, the participation of 5 Group must be reckoned with. The HF and VHF D/F networks are alerted to monitor the frequencies of 5 Group.
- 1920 hours: An aircraft with a known operational call-sign requests a check bearing from the airfield D/F section of the Halifax units. Therefore, the Halifax units also warrant attention.
- 1935 hours: The Allied Air Raid-Reporting Service reports a second wave of aircraft. It is probable that on this night all groups are taking part in the raid.

- 1945 hours: The first line bearing on a "Magic Box" (H2S) is reported. Since radar intercept is now bringing results, the course of the enemy units can now be checked, depending on the number of bearings. Once the course is accurately determined, night-fighters can be brought into play.
- 1950 hours: A "Magic Box" is plotted over the Deutsche Bucht. Since no jamming aircraft fly into this area, it can only be a Mosquito flight or a mine-laying aircraft.
- 2000 hours: The control stations of 4 and 6 Groups transmit "winds aloft" messages on a CQ call-up. From this it is known that the first wave consists of Halifax squadrons of 4 and 6 Groups, led by Pathfinders of 8 Group. The bomb-release signal can be expected within 20-30 minutes of the "winds aloft" messages, and therefore the formation will probably not intrude deep into Germany proper. Attention must now be given to the Boomerang-controlled Mosquitos of 100 Group.
- 2010 hours: The first wave is plotted by radar intercept; course is toward the Rhine-Westphalia industrial district. The second wave is plotted for the first time in the Rheims area.
- 2020 hours: A "winds aloft" message is heard on the 1 Group frequency; this time it is sent by the aircraft to the control station. 1 Group, therefore has penetrated deeper than the Halifax formation. This information allows identification to be given to previous "Magic Box" plots on this unit.
Note: 100 Group usually flies in a wide formation, veiling the movements of other groups, and making it difficult to determine the course of individual units.
- 2025 hours: The identification of all jamming aircraft which have been plotted is successfully completed, and their relative positions with respect to the individual units clarified; points of concentration of the jamming aircraft can now be reported.
- 2030 hours: Zero beat tuning on the headquarters frequency of 5 Group is heard. Accordingly, fresh warning is given of activity on the part of this dangerous group whose course is still unknown.

- 2035 hours: The Boomerang-controlled target-markers for the Halifax formation are plotted. Special local warning is given to the area in which the attack is expected.
- 2037 hours: Interception of Pathfinder R/T traffic (VHF) on the "C" frequency of 8 Group; the aircraft are identified as Boomerang-controlled Mosquitos. A report to the ZAF states: Halifax formation will release bombs in few minutes.
- 2039 hours: "Winds aloft" messages are now sent by Pathfinders of 8 Group also. The contents are identical with those sent by 1 Group; thus, 8 Group are the Pathfinders for 1 Group. To what extent 8 Group is a part of the main bomber stream is, for the present, still not clear.
- The report on the strength of the intruding formations states:
- aa) Halifax formation approximately 380-450 aircraft (Lancasters of 6 Group have probably not accompanied them), led by Mosquitos.
 - bb) Lancaster formation heading toward Southwestern Germany with about 300 aircraft (to what extent 8 Group, except for its Pathfinders, is represented in the formation remains uncertain).
 - cc) 5 Group is active in undetermined strength; area of operations for the present unknown.
 - dd) Mosquito formation of 60-80 aircraft toward Berlin (target is only presumed, since Mosquitos regularly attack Berlin at this time of night).
- 2040 hours: 3 Group will probably not operate, since training activity is taking place on their airfields.
- 2050 hours: A small amount of training flight activity begins on two airfields of 5 Group. It is therefore presumed that specialized squadrons are carrying out a special mission.
- 2055 hours: OTU aircraft of 93 Group are recalled to their bases. Consequently there is probably a bad-weather front moving toward their airfields. The W/T companies are instructed to pay special attention to rerouting orders from the control stations of this group.

- 2115 hours: The control station of 8 Group sends a CQ message giving a report of winds aloft over the target. This indicates that the Lancaster formation will drop its bombs within the next half hour. The target area can then be determined by computing the distance that the Lancasters fly in the next half hour (their course being already known), and advance warning given.
- 2135 hours: The control station of 5 Group resumes its zero beat tuning. It might be for D/F purposes and 5 Group might be in the vicinity of the target.
- 2140 hours: Report from Jagddivision 7 target-markers over city X.
- 2140 hours: Aircraft of 1 Group send "winds aloft" messages for a section already flown through (for return flight purposes). The result is an SIS message stating: Lancaster formation has reached the target; no further penetration to the east.
- 2145 hours: The control station of 3 Group sends an order to a squadron from Waterbeach, diverting it to another airfield. Either the bad weather front has already reached the 3 Group bases, or Waterbeach must be kept open for aircraft returning from operations.
- 2145 hours: W/T Pathfinder traffic from the control station of 5 Group is intercepted. Accordingly, the special squadrons of the Group are in an area directly in front of the target. At the Haldekopf great excitement prevails; where are the aircraft? The possibility that they are over Germany is slight, because no flights were reported which have not been identified by SIS. After much telephoning to various tactical headquarters it is finally learned that a rather small bomber formation is approaching Bergen. Immediately an identification is made: these are the special squadrons of 5 Group. The first plot on a "master of ceremonies" of 5 Group confirms this assumption; the special squadron from Coningsby is flying over Southern Norway.
- 2150 hours: An aircraft of 8 Bomber Group sends the first report of results; it is plotted on its return flight from the area of city X in southwestern Germany. The return flight of the main bomber stream has therefore begun.

- 2150 hours: The Halifax airfields begin sending reports of weather over base. Landing conditions seem to be favorable in their area.
- 2153 hours: The first report of results is intercepted on the Coningsby airfield frequency; it is immediately repeated on the Group frequency.

Note: The Pathfinder traffic of this group was especially interesting. The "masters of ceremonies" for the most part did not avail themselves of the three-letter code, and used plain text. 5 Bomber Group, which in other matters was generally acknowledged to be a well-trained unit, often employed new types of radio procedure carelessly. The introduction of "winds aloft" messages in December 1943 can be cited as an example. Instead of using the well-compiled code provided, messages were sent practically unencoded, or at least those parts were left unencoded which were most important to SIS. After several aircraft had measured the velocity of winds aloft on a certain section of the route, and passed this information on to their airfield, the headquarters then computed the probable wind velocity for that section of the route still to be flown, and transmitted this intelligence to its aircraft in flight. Since the code letters used for this purpose were easily broken, the headquarters actually revealed the intended depth of penetration of its bombers, and gave SIS an opportunity to determine the target in advance, to inform the Command between which degrees of longitude the bombers would change course, when they would drop their bombs, how many main waves there would be, etc. It was especially easy in the case of 6 Group to determine its division into various waves, because the Group headquarters sent a "winds aloft" message to each separate wave. The Pathfinders of 5 Group also used plain language when H/T traffic was first introduced; only later did they go over to the use of a special three-letter code which changed daily.

2155 hours: A bomber code message from the headquarters of 1 Group is deciphered and is found to contain re-routing instructions.

Note: Several times it happened that the bombers were called back by their control stations, shortly after passing over the English coast; in such a case certain aircraft receipted for the message. It was not determined to what extent the British had to authenticate unusual messages. Under certain circumstances the Luftwaffe SIS might have been able to send decoy orders to the bomber groups. However, such an attempt was forbidden by the Chi-Stelle, because it was afraid, by such a practice, of causing all Bomber Command W/T traffic to dry up.

Whatever further traffic was intercepted from the bomber formations on their outward flight could no longer be used tactically. Individual QDM's and reports of weather over bases pointed to landings; as a rule, flight-control traffic from the airfield D/F sections was of a minimum. Emergency calls from damaged aircraft served for purposes of statistics. Only if German long-range night fighters pursued the bombers on their return flight, did these messages have any tactical value.

By far the greater part of the effort was consciously directed to producing possibilities for early warning from the traffic of the RAF Bomber Command. All the possibilities uncovered were similarly applied to the monitoring of the 8th USAAF. However, in this case no such exertion, as following the British bombers required, was needed. The Americans were much more massive and primitive in their tactics, and can scarcely be said to have practiced restraint in their voluminous W/T and R/T traffic.

Long-interval advance warnings of raids by American bomber formations could usually be given as early as 2300 hours on the night before a daylight attack. The first indication of the raid proper was the interception of traffic from weather reconnaissance aircraft. The weather ships sent their reports to their home bases, as well as to certain prescribed headquarters. In this way they could be D/F'ed, and then it could be stated quite definitely into which areas the 8th USAAF would fly. Zero beat tuning was heard on the bomber division frequencies in the early morning hours preceding a raid. Next, the take-off

of the individual units was monitored. During the assembly, which continued for as long as two hours, depending on the size of the raid, an exact picture of the composition and strength of the formations was obtained from VHF R/T traffic. A certain code-word then indicated that the bomber division was setting its course. Research work, as in the case of the RAF, was really not necessary; the Americans spoke of whatever they were doing quite openly.

The following is a description of the course of a typical American heavy bomber raid, and, as in the case of the example of an RAF raid, represents tactics during the latter years of the war:

- 2300 hours: Since R/T and W/T tuning traffic is being sent from 8th USAAF airfields, a raid must be intended for the next day.
- 0330 hours: A weather reconnaissance aircraft from Molesworth sends a message. A fix cannot be obtained from this one message.
- 0430 hours: Now weather ships of the 2nd and 3rd Bomber Divisions send messages; they are plotted over the assembly area in England.
- 0515 hours: A light jamming-screen appears over the southern portion of the North Sea, and off the eastern coast of England. At the same time the first take-off messages are intercepted on W/T frequencies. The first operational call-signs are sent on the airfield W/T frequencies, an indication that no training flight, but rather a raid, is taking place.
- 0520 hours: A second weather reconnaissance aircraft of the 3rd Bomber Division is plotted while sending a message from a position over France. Inference: the 3rd Bomber Division, at least in part, will assemble over the continent (their assembly areas are learned from D/F-ing the radio beacons, as well as from captured documents).
- 0600 hours: Although it is known from the preceding W/T traffic, as well as from HF R/T messages, that the assembly is taking place, it is curious that still no VHF traffic is heard.
- 0620 hours: Individual aircraft are heard in tuning traffic with their ground stations (these tuning messages are especially frequent in the case of the 2nd

and 3rd Bomber Divisions). Bearings indicate that they are heading toward the continent. A few formation leaders of the 2nd Bomber Division are now heard on VHF R/T, still over the assembly area in England, approximately over Cromer. With the exception of reconnaissance aircraft, there is still no sign of the 1st Bomber Division (the 1st Bomber Division, especially in the last period of the war, exercised exemplary restraint in its use of radio). A picture of the situation is now passed on to the people concerned: the 2nd and 3rd Bomber Divisions are assembling over the continent in considerable strength; of the 1st Bomber Division, which will also probably take part in this operation, nothing can yet be said as to when and where it will assemble.

0700 hours:

A jamming screen is reported over the Belgium-Holland border area. It is not a reliable indication of a four-engined raid; it can just as well be a screen for a Marauder attack.

At the same time the first VHF traffic from the assembly area over France is intercepted. Call-signs of formation leaders and squadron colors are learned. The SAC is given a preliminary picture of the expected strength while the division is still assembling. During the assembly, answers to questions concerning the stage of assembly are being given to interested headquarters; at the same time, the signal intelligence picture is being completed by calls to the SIS out-stations.

0730 hours:

All the combat wings have now been D/F'ed; while, up to now, orders have been given principally on the wing frequencies, now the messages are sent on the division frequency. Therefore the assembly is nearing its final stage. Meanwhile the 1st Bomber Division has been heard in its assembly area over France, so that a comprehensive picture of the air situation can now be given; only the stage of assembly in the case of the 1st Bomber Division is still not known.

0740 hours:

The first R/T traffic on the frequency of the fighter escort is heard; the approach flight must begin in the next few minutes.

0745 hours: The first message during the flight to the target is intercepted. It reads as follows: on time minus eight, on course, visibility three, too (time of origin) 0740.

At this point the defense is alerted. By D/F-ing these obligatory messages the exact position of the formation is learned. In the case of the 3rd Bomber Division, each combat wing commander has to send one of these messages; thus the Luftwaffe SIS can determine the strength of this division. Generally, its strength can be reported quite accurately to German tactical headquarters during the flight from the assembly area.

Early in 1944, some unit commanders of the 1st and 3rd Bomber Divisions even availed themselves of the MF D/F network, in order to orient themselves while still over the sea on their outward flight. It was quite obvious that practically nothing was being done to conceal the intentions of an attack.

Henceforth, continuous tracking is guaranteed by D/F-ing the abundant R/T and W/T traffic. A third prolific source is bearing on the "Mickey" equipment.

0800 hours: The first weather ships, reconnoitering the outward flight course, are heard on R/T, and appropriate D/F stations are detailed to monitor them continuously. By following them, the route of the bombers can be accurately predicted.

There were days on which these weather reconnaissance aircraft could be plotted enroute to the target, two hours before the bomber formations left the assembly area. In the last period there was an increase in the number of cases where their messages were not sent through relaying aircraft on VHF, but on W/T. Special mention should be made of those weather ships of the 15th USAAF which revealed targets to the Luftwaffe SIS many hours before the raids actually began.

0900 hours: The first German fighters are mentioned in the bomber R/T traffic. Large-scale aerial battles were not frequently revealed in the signal intelligence picture; only in the case of several heavy raids on Berlin was there a plethora of reports

- of attacks, of comments on the aggressiveness of German fighters, of curses from the unit commanders, and reprimands to their disorganized formations. The signal intelligence picture was not a very fruitful source of intelligence on Allied losses.
- 0930 hours: The reconnaissance aircraft report weather over the target (as a rule for several targets), and advise the bomber formation as to whether the bombing should be done visually, or by instrument.
- 0945 hours: The switching on of "Mickey" equipment indicates that the bombers are pivoting toward the target.
- 0950 hours: The formation leader of the first wave gives the order: "Bomb bays open" (clear text or code-word).
- 0953 hours: Wing after wing gives its bomb-release signal. Code-words occasionally used for this order varied according to the division.
- 1000 hours: The first reports of results are intercepted.
- 1100 hours: The first reports of weather over base are heard.

Note : Deciphering of bomber code messages presented no difficulties. They could be read with a depth of only three or four messages. The deciphering was facilitated by the fact that the most of the enciphered messages had been previously heard in plain language on R/T. Therefore it was only a problem of organization to collect this abundant material, and to concentrate it in the hands of the duty officer without any delay.

VOLUME 5

Tab A

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 Commander in Chief of the Air Force.--Oberbefehlshaber der Luftwaffe (OBdL).
 D-8. Selected documents from War Diary #2 on Division 3 of Chief Signal Office.
 Direction-Finding Stations (cover name: weather research stations).--Wetterforschungsstellen (Wo-Stellen).
 Dulag (Durchgangslager Luft). See Air Prisoner of War Transit Camp.
 Durchgangslager Luft (Dulag). See Air Prisoner of War Transit Camp.
 Durr, _____, General. Inspector General of the German Air Force Signal Equipment.
 Eick, Hans, Colonel. CO of LN Regt 353.
 Etzer, _____, Specialist. Member of Group II, Division III of Chief Signal Office.
 Evaluation Centers (cover name: Weather Control Stations).--Wetterleitstellen (W-Leit).
 FAF (Funkaufklaerungsfuehrer Reich). See Chief of the Air Raid Warning Service for Germany.
 Feichtner, Ferdinand, Major. CO of LN Regt 352.
 Fighter Wing (in USAAF).--Jagdkorps.
 Fischer, _____, Captain. Air Intelligence officer on Eastern Front. Specialist on Russian Air O/B.
 Flakkorps. See Anti-Aircraft Command (in USAAF).
 Fliegerkorps. See Wing (in USAAF).
 Flight (in USAAF).--Staffel.
 FMBSt (Funkmessbeobachtung-und Stoerdienst). See Radar Observation and Jamming Services.
 Forster, _____, Colonel. Chief of Radio Air Warning Service.
 Franz, _____, Major. Chief of Division I of the Chief Signal Office.
 Friedrich, _____, Lt. Col. Chief of Division III of the Chief Signal Office (Signal Intelligence Service) and of the Chi-Stelle (Signal Intelligence Agency).
 Friese, _____, 1st Lieutenant. Member of LN Regt 351.
 Funkaufklaerungsfuehrer Reich (FAF). See Chief of the Air Raid Warning Service for Germany.
 Funkbefehtsstand. See Radar Intercept Center.
 Funkleitstand. See Radar Control Post.
 Funkmessbeobachtung-und Stoerdienst (FMBSt). See Radar Observation and Jamming Services.

- GAF SIS.--Oberkommando der Luftwaffe, Generalnachrichtenfuehrer/
III Abteilung (OKL/Gen Nafue/III).
- Generalnachrichten Fuehrer (Gen Nafue). See Chief Signal Officer
of the Air Force.
- Generalnachrichten Fuehrer, Abteilung I, II, III (Gen Nafue/
I, II, III). See Chief Signal Office, Divisions I, II, III.
- Gen Nafue (Generalnachrichten Fuehrer). See Chief Signal Officer
of the Air Force.
- Gen Nafue/I, II, III (Generalnachrichten Fuehrer I, II, III).
See Chief Signal Office, Divisions I, II, III.
- German Air Force High Command.--Oberkommando der Luftwaffe (OKL).
- German Home Defense Air Force.--Luftflotte Reich.
- Geschwader. See Group (in USAAF).
- Goerner, _____, Corporal. Member of LN Regt 350.
- Gosewisch, _____, Major General. Inspector General of the Luft-
waffe Signal Corps.
- Gromall, _____, Major. Worked on development of German Air Force
signal equipment.
- Group (in USAAF).--Geschwader.
- Group of the Signal Intelligence Agency.--Gruppe.
- Gruppe. See Group of the Signal Intelligence Agency.
- Gruppe. See Squadron (in USAAF).
- Henschke, _____, Lt. Gen. Director of Air Signal Replacement
and Training Units.
- Herold, Wadim, Captain. CO of III/LN Regt 353.
- Hoeherer Kommandeur der Funkaufklaerung (Hoehr Kdr d Funkaufklrg).
See Senior Signal Intelligence Officer.
- Hoehr Kdr Funkaufklrg (Hoeherer Kommandeur der Funkaufklaerung).
See Senior Signal Intelligence Officer.
- Holetzke, _____, Captain. Member of I/LN Regt 353.
- Horchabteilung. See Signal Intelligence Battalion.
- Huebner, Erich, Captain. Chief of Section C of the Signal
Intelligence Agency.
- I-13. Composite Report on Two Interrogations of Oberstlt.
Friedrich, Chief of the GAF Sigint Service. A TICOM pub-
lication.
- I-41. Report on First Interrogation of Major Oeljeschlaeger.
Addendum: Interrogation of Major Beulmann. A TICOM pub-
lication.
- I-65. Interrogations of Capt. Herold, LN Regt 353; 1st Lt.
Werther, LN Regt 353; Lt. Ludwig, Chi-Stelle; and 1st Lt.
Leichtle, LN Regt 351. A TICOM publication.
- I-70. Paper on the German Air Force Signal Intelligence Service
by Lt. Col. Friedrich, Chief of 3rd Division of Chief Signal
Office and Chief of Chi-Stelle.

- I-107. Preliminary interrogation of Obltn. Chlubek and Lt. Rasel both of III/LN Regt 353.
- I-109. Translation of a Report by Lt. Ludwig of Chi Stelle Ob.d.L. (Bef.B) based on questions set for him at A.D.I.(K). A TICOM Publication.
- I-112. Preliminary Interrogation of Specialist Dr. Ferdinand Voegele (Chi Stelle, Ob.d.L) and Major Ferdinand Feichtner (O.C. of LN Regt 352, etc.). A TICOM publication.
- I-119. Further Interrogation of Reg. Rat. Voegele and Major Feichtner of GAF Sigint. A TICOM publication.
- I-120. Translation of Homework by Obltn. W. Werther, Company Commander of 7/LN Rgt. 353, written on 12th August 1945 at A.D.I.(K). A TICOM publication.
- I-121. Translation of Homework by Obltn. W. Werther, Company Commander of 7/LN Rgt. 353, written on 12th August 1945 at A.D.I.(K). A TICOM publication.
- I-126. Homework by Major Feichtner, C.O. LN Regt. 352. A TICOM publication.
- I-130. Homework by Hauptmann Herold, OC of LN Regt III/353. A TICOM publication.
- I-133. Homework by Lt. Rasch of III/LN Regt-353. A TICOM publication.
- I-134. Homework by 1st Lt. Chlubek of III/LN Regt 353. A TICOM publication.
- I-135. Homework by Lt. Ludwig of the Chi Stelle Ob.D.L. A TICOM publication.
- IF-175. Seabourne report, Vol. XIII. "Cryptanalysis within the Luftwaffe SIS." From Commanding General, 9th Air Force.
- IF-176. Seabourne report, Vol. III. "Operations and Techniques of the Radio Defense Corps, German Wehrmacht." From Commanding General, 9th Air Force.
- IF-177. Seabourne report, Vol. I. "Introduction and Report." From Commanding General, 9th Air Force.
- IF-178. Seabourne report, Vol. II. "Biographies of Contributors." From Commanding General, 9th Air Force.
- IF-179. Seabourne report, Vol. IV. "Biography of Major Ferdinand Feichtner." From Commanding General, 9th Air Force.
- IF-180. Seabourne report, Vol. V. "The Chi-Stelle." From Commanding General, 9th Air Force.
- IF-181. Seabourne report, Vol. VI. "Origins of the Luftwaffe SIS and History of Operations in the West." From Commanding General, 9th Air Force.

- IF-182. Seabourne report, Vol. VII. "Technical Operations in the West." From Commanding General, 9th Air Force.
- IF-183. Seabourne report, Vol. VIII. "Miscellaneous Studies." From Commanding General, 9th Air Force.
- IF-184. Seabourne report, Vol. IX. "History of Operations in the South." From Commanding General, 9th Air Force.
- IF-185. Seabourne report, Vol. X. "Technical Operations in the South Luftwaffe SIS." From Commanding General, 9th Air Force.
- IF-186. Seabourne report, Vol. XI. "History of Operations in the East Luftwaffe SIS." From Commanding General, 9th Air Force.
- IF-187. Seabourne report, Vol. XII. "Technical Operations in the East." From Commanding General, 9th Air Force.
- IF-189. "GAF Signals Intelligence in the War." ADI (K). Report #402/1945.
- Jagdkorps. See Fighter Wing (in USAAF).
- Jering, Karl, T/Sgt. Member of Section C of the Signal Intelligence Agency.
- Jordens, _____, Captain. Administrative CO of LN ABT 350 (Chi-Stelle as of the 1944 reorganization).
- Kienitz, _____, Colonel. Air Force Intelligence Officer. No other information available through TICOM.
- Klemme, _____, General. Senior Signal Intelligence officer.
- Klocke, _____, Dr. German Air Force Intelligence expert on Russian Air O.B.
- Kriegstagebuch (KTB). See War Diary.
- KTB (Kriegstagebuch). See War Diary.
- Kupffer, _____, Major. Liaison officer to German Air Force Headquarters from Section D of the Signal Intelligence Agency. Outstanding authority on Russian Air O.B.
- Kullman, _____, Major. Chief of Group III, Division III Chief Signal Office (radar monitoring and jamming.)
- Leichtle, Georg, 1st Lieutenant. Member of Section A of the Signal Intelligence Agency.
- Lier, Guenther, Lt. Member of LN Regt 352.
- Ln Abt (Luftnachrichten Abteilung). See Air Signal Battalion.
- Ln Helf (Luftnachrichten HelferIn). See Women's Auxiliary (WA) (technical).
- Ln Regt (Luftnachrichten Regiment). See Air Signal Regiment.
- Loebell, _____, Major General. CO of Air Service Area (Luftgou) I. Local Air Force.--Luftflotte.

1

Ludwig, Martin, Lt. Member of Section B of the Signal Intelligence Agency.

Luftlotte. See Local Air Force.

Luftflotte Reich.--German Home Defense Air Force.

Luftgau.--Air Force Administrative Area.

Luftnachrichten Abteilung (Ln Abt). See Air Signal Battalion.

Luftnachrichten Helferin (Ln Helf). See Women's Auxiliary (WA) (technical).

Luftnachrichten Regiment (Ln Regt). See Air Signal Regiment.

Majer, Karl, _____. Member of LN Regt 352.

Marks, _____, Lt. Once assigned to Signal Intelligence Agency.

Martini, _____, General. Chief Signal Officer of the German Air Force.

Meldekopf.--Air Warning Reporting Center.

Mooshake, Otto, Lt. Member of LN Regt 351.

Morgenstern, _____, Colonel. Chief of Staff to the Chief Signal Officer of the German Air Force.

Mucke, Helmut, Lt. Member of Regt. 353.

Naumann, _____, Senior Specialist. Chief of German Air Force Weather Service.

Nonnast, _____, Specialist. Chief of Group V, Division III of the Chief Signal Office (personnel).

Novopashni, _____, Prof. Member of Signal Intelligence Agency.

Oeljeschlaeger, Franz, Major. Chief of Group II, Division III of the Chief Signal Office.

OBdL (Oberbefehlshaber der Luftwaffe). See Commander in Chief of the Air Force.

Oberbefehlshaber der Luftwaffe (OBdL). See Commander in Chief of the Air Force.

Oberkommando der Luftwaffe (OKL). See High Command of the Air Force.

Oberkommando der Luftwaffe, Generalnachrichtenfuehrer, Abteilung III (OKL/Gen Nafue/III). See GAF SIS (German Air Force High Command, Signal Intelligence Service).

OKL (Oberkommando der Luftwaffe). See German Air Force High Command.

OKL/Gen Nafue/III (Oberkommando der Luftwaffe, Generalnachrichtenfuehrer Abteilung III). See GAF SIS (German Air Force High Command, Signal Intelligence Service).

Oberkommando der Wehrmacht Chiffrierabteilung (OKW/Chi). See Signal Intelligence Agency of the Supreme Command, Armed Forces.

OKW/Chi (Oberkommando der Wehrmacht Chiffrierabteilung). See Signal Intelligence Agency of the Supreme Command, Armed Forces.

Pick, Berthold, Lt. Asst. Chief, Section E of the Signal Intelligence Agency.

Porth, _____, Captain. Chief of Group IV, Division III of Chief Signal Office (cryptographic security).

Radar Control Post.--Funkleitstand.

Radar Intercept Center.--Funkbefehtsstand.

Radar Observation and Jamming Services.--Funkmessbeobachtung- und Stoerdienst (FMEST).

Radio Intercept Stations (cover name: Weather Radio Receiving Stations).--Wetterfunkempfangstellen (W-Stellen).

Rasch, Werner, Lt. Attached to 3rd Battalion, LN Regt 353.

Referat. See Section of the Signal Intelligence Agency.

Ristau, _____, Major, CO of LN Regt. 351.

Rueckheim, _____, Captain. CO of LN Abt 357.

Ruhling, _____, Captain. German Air Force Intelligence Specialist on Russian Air. O. B.

Sann, _____, Lt. Attached to LN Regt 353.

Schatz, _____, Corporal. Attached to LN Abt 350.

Scheidl, _____, Captain. CO of 1st Battalion of LN Regt 353.

Scheppelmann, _____, Corporal. Attached to LN Abt 350.

Schenerle, Erwin, Lt. Attached to LN Regt 351.

Schieferdecker, _____, Specialist. Member of Group IV, Division III of Chief Signal Office.

Schieran, _____, Specialist. Member of Group II, Division III of Chief Signal Office.

Schlottman, Gert, C/Sgt. Attached to LNR 352.

Schnippering, _____, Major. In charge of research on allied methods of communication.

Schulz, _____, Lt. Member of Group III, Division III of Chief Signal Office.

Schulz, Heinz, Lt. Attached to LN Regt 352.

Schulze, _____, Dr. Lt. Col. Chief of Division II of Chief Signal Office (communications and cryptography).

Section of the Signal Intelligence Agency.--Referat.

Senior Signal Intelligence Officer.--Hoeherer Kommandeur der Funkaufklaerung (Hoehr KDR d Funkaufklrg).

Sless, _____, Captain. Attached to LN Abt 350.

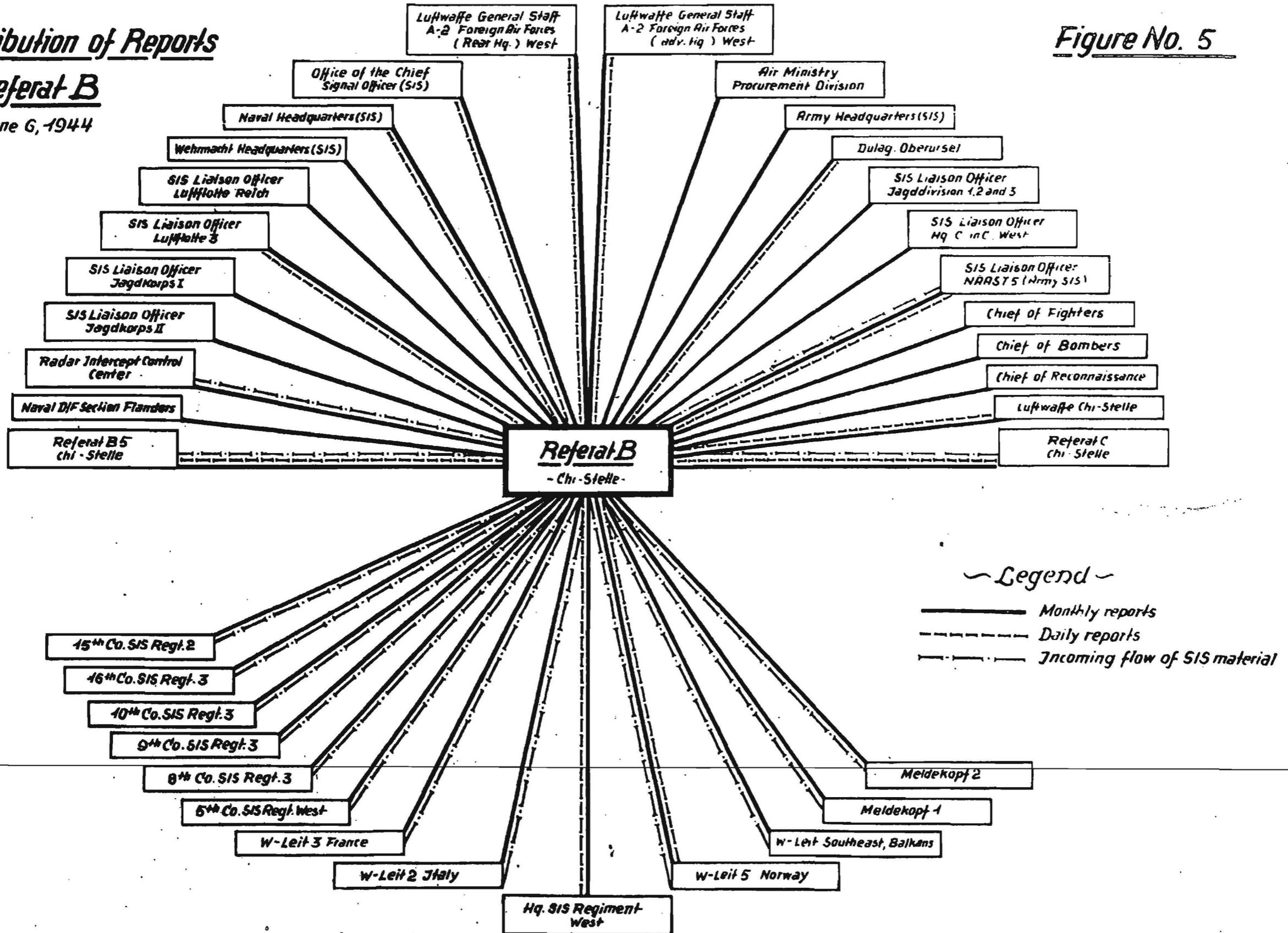
Signal Intelligence Agency of the Commander in Chief of the Air Force.--Chiffrier Stelle, Oberbefehlshaber der Luftwaffe (Chi-Stelle/OBdL).

Signal Intelligence Agency of the Supreme Command, Armed Forces.--Oberkommando der Wehrmacht Chiffrierabteilung (OKW/Chi).

Signal Intelligence Battalion.--Horchabteilung.
 Squadron (in USAAF).--Gruppe.
 Staffel. See Flight (in USAAF).
 Stamm, Werner, T/Sgt. Attached to LN Regt 352.
 Supplementary Volume F of War Diary No. 4 (Division I) from
 1 Jan.-15 Mar 45.--Anlagenband B zu Kriegstagebuch Nr. 4
 (1. Abteilung) vom 1.1.45 bis 15.3.45.
 Trattner, _____, Captain. CO of LN Abt 356.
 Truemena, Wilhelm, Sgt. Attached to LN Regt 353.
 Voegele, Ferdinand, Specialist. Chief of Section E of the
 Signal Intelligence Agency and Principal cryptanalyst of
 the GAF.
 Von Lackum, _____, Lt. Attached to LN Regt 353.
 Von Linger, _____, Lt. Cryptanalyst in Section E of the Signal
 Intelligence Agency.
 War Diary.--Kriegstagebuch (KTB).
 Watkinson, Gerd T/Sgt. Attached to LN Regt 351.
 Werther, Waldemar, 1st Lt. Attached to the 7th Company, 2nd
 Battalion, LN Regt. 353. The most capable cryptanalyst
 on Russian Air Force cryptographic systems on the Eastern
 Front.
 Wetterforschungsstellen (Wo-Stellen). See Direction-Finding
 Stations (cover name: weather research stations).
 Wetterleitstellen (W-Leit). See Evaluation Centers (cover name:
 Weather Control Stations).
 Wetterfunkempfangstellen (W-Stellen). See Radio Intercept Sta-
 tions (cover name: Weather Radio Receiving Stations).
 Windels, Hans, Major. CO of 2nd Battalion, LN Regt 353.
 Wing (in USAAF).--Fliegerkorps.
 Wisnikow, _____, Lt. Attached to Section E of the Signal Intelli-
 gence Agency.
 W-Leit (Wetterleitstellen). See Evaluation Centers (cover name:
 Weather Control Stations).
 Women's Auxiliary (WA) (technical).--Luftnachrichten (Ln Helf).
 Wo-Stellen (Wetterforschungsstellen). See Direction-Finding
 Stations (cover name: weather research stations).
 W-Stellen (Wetterfunkempfangstellen). See Radio Intercept
 Stations (cover name: Weather Radio Receiving Stations).
 ZAF (Zentraler Gefechtsstand fuer Funkauswertung). See Central
 Air Raid Warning Unit.
 Zentraler Gefechtsstand fuer Funkauswertung (ZAF). See Central
 Air Raid Warning Unit.
 Zuerr, _____, Major General. Inspector General of German Air
 Force Signal Equipment.

Distribution of Reports
of Referat B
as of June 6, 1944

Figure No. 5



GERMAN AIR FORCE SIGNAL INTELLIGENCE SERVICE

CHAIN OF COMMAND - ADMINISTRATIVE AND OPERATIONAL

JANUARY 1945

AIR FORCE HIGH COMMAND [OKL]
CHIEF SIGNAL OFFICER
GEN MARTINI
[GEN NAFUE]

CHIEF OF STAFF OFFICE OF THE CHIEF SIGNAL OFFICER
LT COL MORGENSTERN
[CHEF DES STABES]

DIVISION I
ASSIGNMENT OF AIR SIGNAL TROOPS
MAJ FRANZ
[GEN NAFUE/I]

DIVISION III
SIGNAL INTELLIGENCE AND CRYPTANALYSIS
ADMINISTRATION
GEN KLEMM
[HOEHR KDR D. FUNKAUFKLRG]
OPERATIONS
LT COL FRIEDRICH
[GEN NAFUE/III]

DIVISION II
COMMUNICATIONS AND CRYPTOGRAPHY
LT COL SCHULZE
[GEN NAFUE/II]

GROUP I
PUBLISHED DIRECTIVES FOR USE OF TROOPS AND EQUIPMENT

GROUP II
RADIO NAVIGATION & "AIR SECURITY" SERVICE

GROUP III
AIR-REPORTING RADAR & FIGHTER CONTROL

GROUP IV
NAVY LIAISON

SIGNAL INTELLIGENCE AGENCY
LT COL FRIEDRICH
[OKL/LN ABT 350]
FORMERLY "CHI-STELLE/OB dL"

GROUP I
ADMINISTRATION OF SIGNAL INTELLIGENCE & JAMMING SERVICES
MAJ BEULMANN

GROUP II
EQUIPMENT AND TECHNICAL ADMINISTRATION FOR INTERCEPT
[HORCH DIENST]
MAJ OELJESCH
LAEGER

GROUP III
EQUIPMENT AND TECHNICAL ADMINISTRATION FOR ENEMY RADAR MONITORING AND JAMMING
[Fu MBSI]
MAJ KULLMAN

GROUP IV
CRYPTANALYTIC SECURITY STUDIES, DIRECTIVES & NEW SYSTEMS
CAPT PORTH

GROUP V
PERSONNEL
MR. NONNAST

GROUP I
COMMUNICATIONS: PLANNING

GROUP II
COMMUNICATIONS: TELEPHONE

GROUP III
COMMUNICATIONS: TELETYPE

GROUP IV
COMMUNICATIONS: RADIO, COMPILATION & DISTRIBUTION OF CALL SIGNS & PROCEDURE, KEY COMPILATION, DISTRIBUTION OF CIPHER MACHINES & SYSTEMS, SECRET WRITING & SIGNAL TABLES

AIR FORCE 3 WEST
[LUFTFLOTTE - 33]

AIR FORCE 5 NORWAY
[LUFTFLOTTE - 53]

AIR FORCE 2 MEDITERRANEAN
[LUFTFLOTTE - 23]

REICH AIR RAID WARNING AGENCY
COL FORSTER
[FUNKAUFKLRG FUE REICH]
CENTRAL AIR RAID WARNING UNIT
[ZAF]

AIR FORCE 1 NORTH RUSSIA
[LUFTFLOTTE - 13]

AIR FORCE 6 CENTRAL RUSSIA
[LUFTFLOTTE - 63]

AIR FORCE 4 SOUTH RUSSIA
[LUFTFLOTTE - 43]

AIR FORCE REICH
[LUFTFLOTTE - REICH]

AIR SIGNALS REGIMENT 351
MAJ RISTOW
[LN REGT 351]

AIR SIGNALS BATTALION 356
CAPT TRATTNER
[LN ABT 356]

AIR SIGNALS BATTALION 357
CAPT RUECKHEIM
[LN ABT 357]

AIR SIGNALS BATTALION 355
MAJ GAMERLANDER
[LN ABT 355]

AIR SIGNALS REGIMENT 352
MAJ FEICHTNER
[LN REGT 352]

AIR SIGNALS REGIMENT 353
COL EICK
[LN REGT 353]

AIR SIGNALS BATTALION 358
[TRAINING - PERSONNEL]
[LN ABT 358]

AIR SIGNALS BATTALION 359
[RADAR - JAMMING]
CAPT DEWILDE
[LN ABT 359]

1 CO. REPORTING CENTER - 3
[1/LN ABT 356]

1 CO. REPORTING CENTER - 1
[1/LN ABT 357]

1 CO. EVALUATION
[1/LN ABT 355]

25 CO. EVALUATION
[25/LN REGT 352]

26 CO. REPORTING CENTER - 4
[26/LN REGT 352]

25 CO. EVALUATION & REPORTING CENTER - 5
[25/LN REGT 353]

1st BATTALION
[I ABT]

2nd BATTALION
[II ABT]

3rd BATTALION
[III ABT]

1st BATTALION
[I ABT]

2nd BATTALION
[II ABT]

1st BATTALION (NORTH RUSSIA)
CAPT SCHEIDL
[I ABT]

2nd BATTALION (CENTRAL RUSSIA)
MAJ WINDELS
[II ABT]

3rd BATTALION (SOUTH RUSSIA)
CAPT HEROLD
[III ABT]

1 CO. EVALUATION
[1/LN REGT 353]

2 CO. OPERATING & OUTSTATIONS
[2/LN REGT 353]

3 CO. INTERCEPT
[3/LN REGT 353]

4 CO. INTERCEPT
[4/LN REGT 353]

7 CO. EVALUATION
[7/LN REGT 353]

8 CO.

9 CO.

10 CO.

11 CO.

13 CO. EVALUATION
[13/LN REGT 353]

14 CO.

15 CO.

16 CO.

17 CO.

1 PLATOON OPERATING

2 PLATOON OUTSTATIONS

3 PLATOON OUTSTATIONS

1 PLATOON 12 INTERCEPT POSITIONS

2 PLATOON 12 INTERCEPT POSITIONS

3 PLATOON 12 INTERCEPT POSITIONS

RADIO OPERATING STATION

TELEPHONE OPERATING STATION

TELETYPE OPERATING STATION

D/F STATION

OUTSTATION 10

OUTSTATION 11

OUTSTATION 12

OUTSTATION 13

OUTSTATION 14

OUTSTATION 15

SEC 1 FINAL EVALUATION

SEC 2 R/T EVALUATION

SEC 3 LONG RANGE BOMBERS

SEC 4 TRAFFIC ANALYSIS

SEC 5 D/F EVALUATION

SEC 6 CRYPTANALYSIS

SEC 7 WEATHER EVALUATION

LEGEND

- OPERATIONAL CONTROL
- ADMINISTRATIVE CONTROL
- LOCAL AIR FORCE COMMANDER IN WHOSE AREA THE FIELD UNIT OPERATED
- * SIMILAR TO LN. REGT. 353
- ** SIMILAR TO 13/LN REGT. 353
- *** SIMILAR TO 2/LN REGT. 353
- **** SIMILAR TO 4/LN REGT. 353
- ABT - ABTEILUNG (BATTALION)
- CHI - STELLE - CHIFFRIER STELLE
- FUNKAUFKLRG. FUE REICH - FUNKAUFKLAERUNGS FUEHRER REICH
- GEN NAFUE - GENERAL NACHRICHTEN FUEHRER
- HOEHR KDR D. FUNKAUFKLRG - HOEHERER KOMMANDEUR DER FUNKAUFKLAERUNG
- Fu MBSI - FUNKMESSBEOBACHTUNG UND STOERDIENST
- LN ABT - LUFTNACHRICHTEN ABTEILUNG
- LN REGT - LUFTNACHRICHTEN REGIMENT
- OB dL - OBERBEFEHLSHABER DER LUFTWAFFE
- OKL - OBERKOMMANDO DER LUFTWAFFE
- ZAF - ZENTRALER GEFECHTSSTAND FUER FUNKAUSWERTUNG

TOTAL PERSONNEL - 13,000

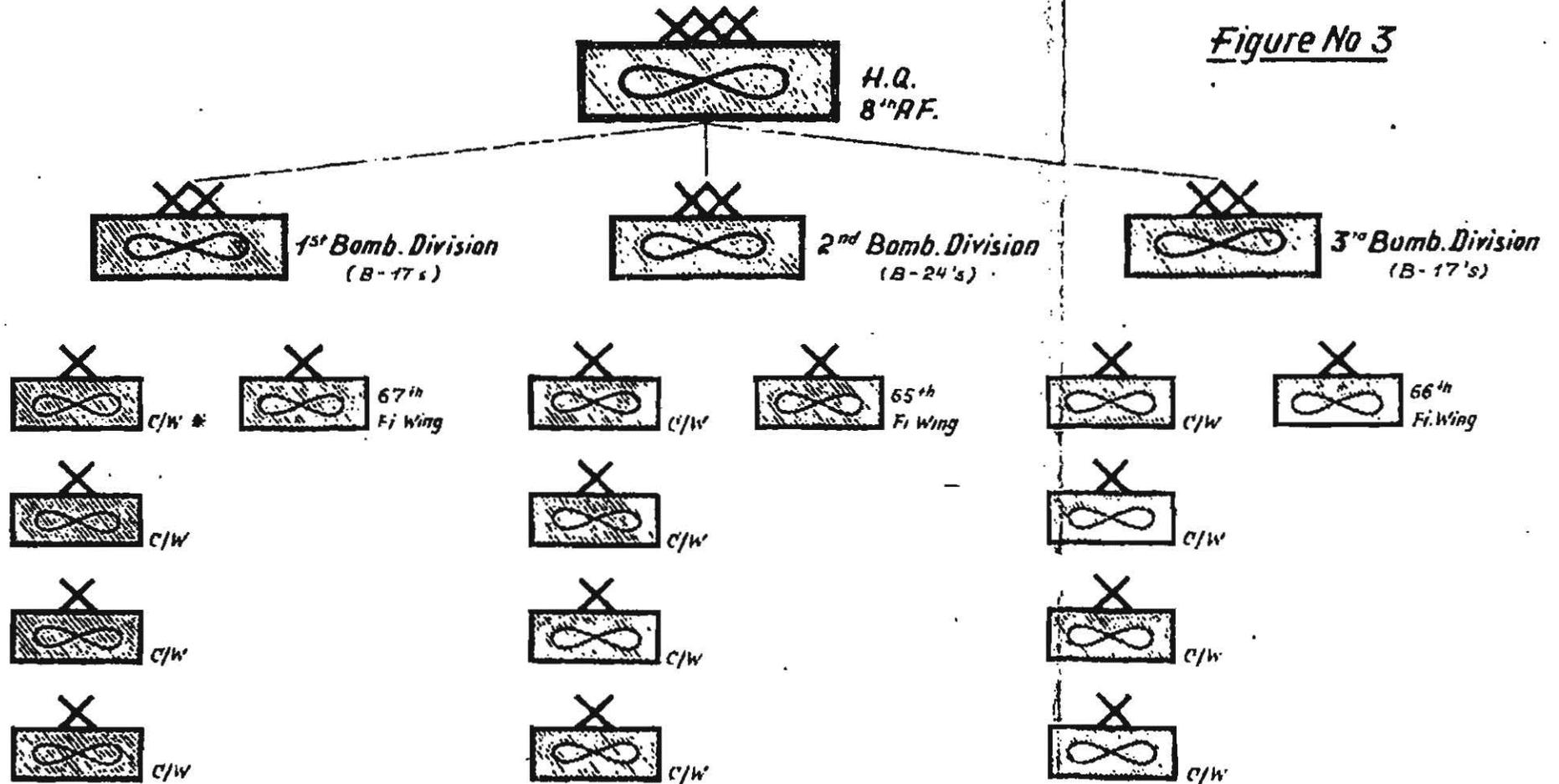
TOP SECRET

CHART No 5-1

Organization and Strength of the 8th US Air Force

As of March 1945

Figure No 3



Total about 3300 Bombers (B-17's and B-24's) and 1250 Fighters (P-51's and some P-47's)

* C/W = Combat Wing

(CHART No. 5-4. From IF-182)

- 57a -

Royal Air Force

Organization and Strength

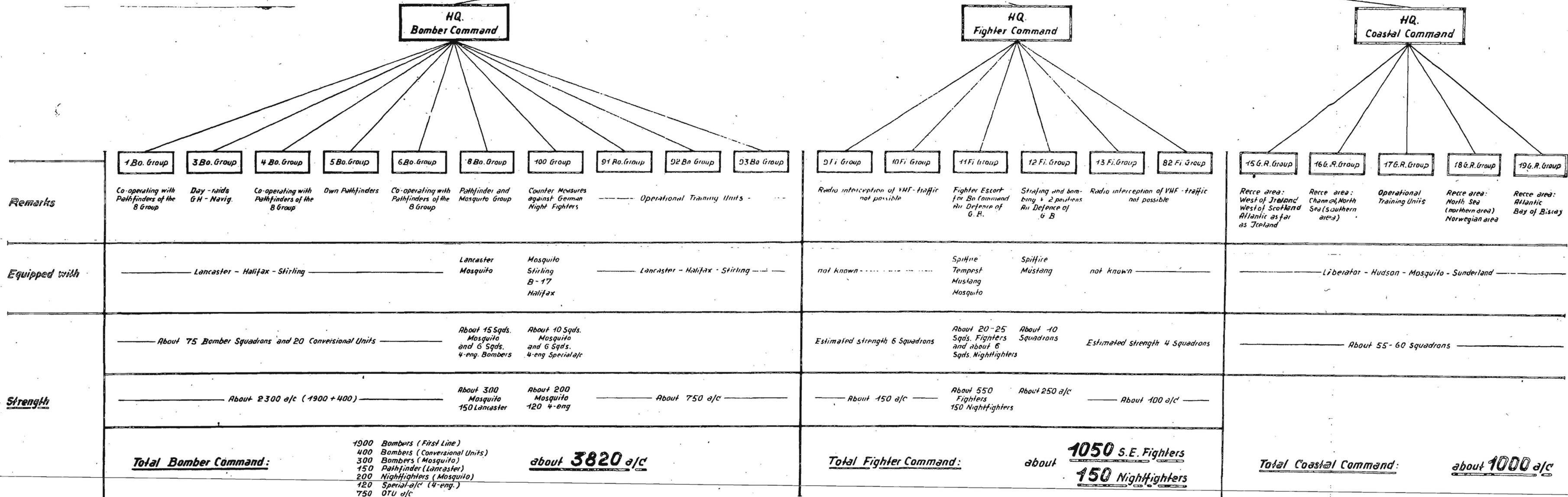
(Front-Units only, excluding 2nd TAF)

As of March 1945

(CHART No. 5-3. From IF-182)

Figure No 1

Air Ministry

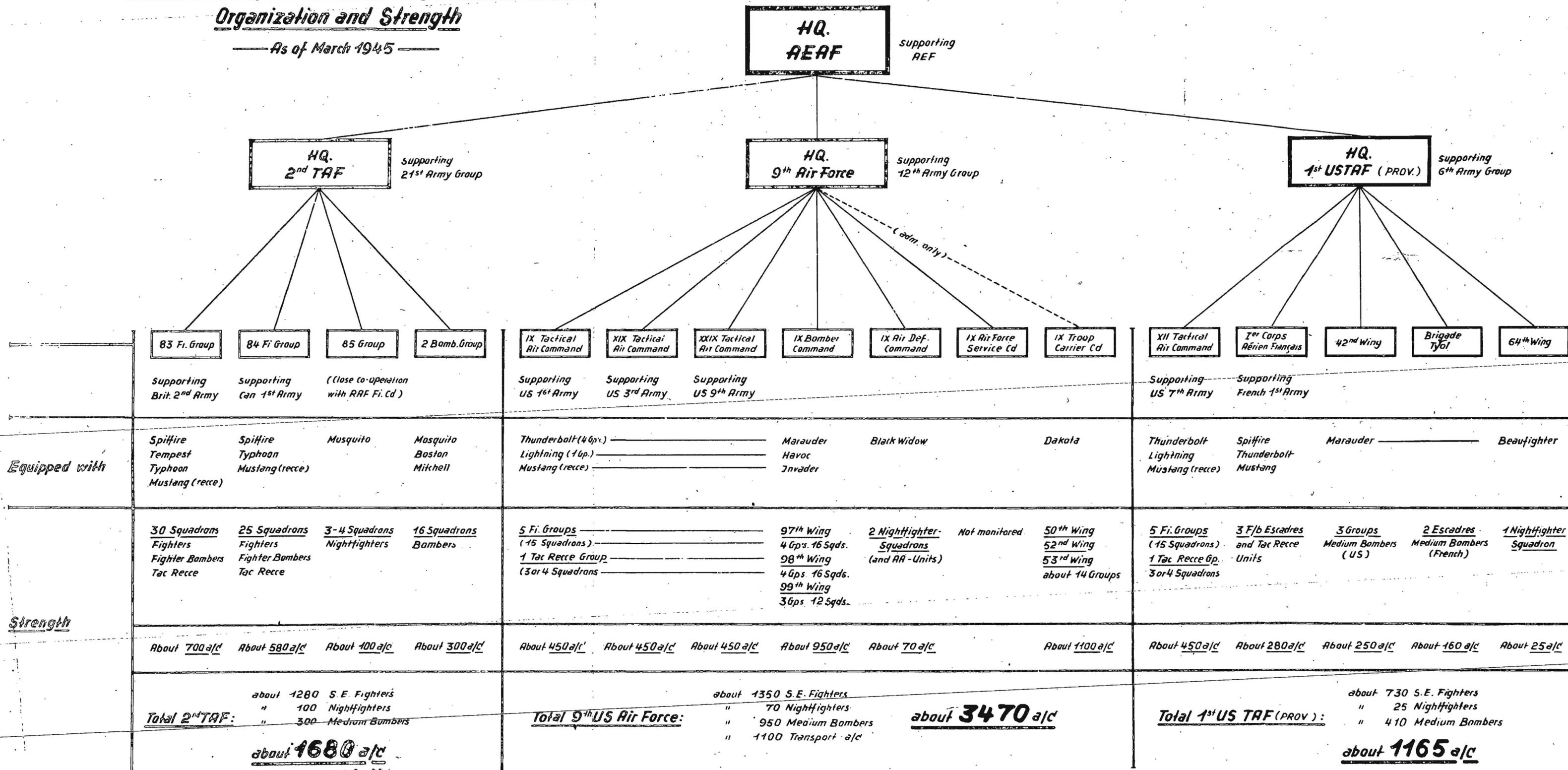


Allied Expeditionary Air Force

Organization and Strength

As of March 1945

Figure No 4

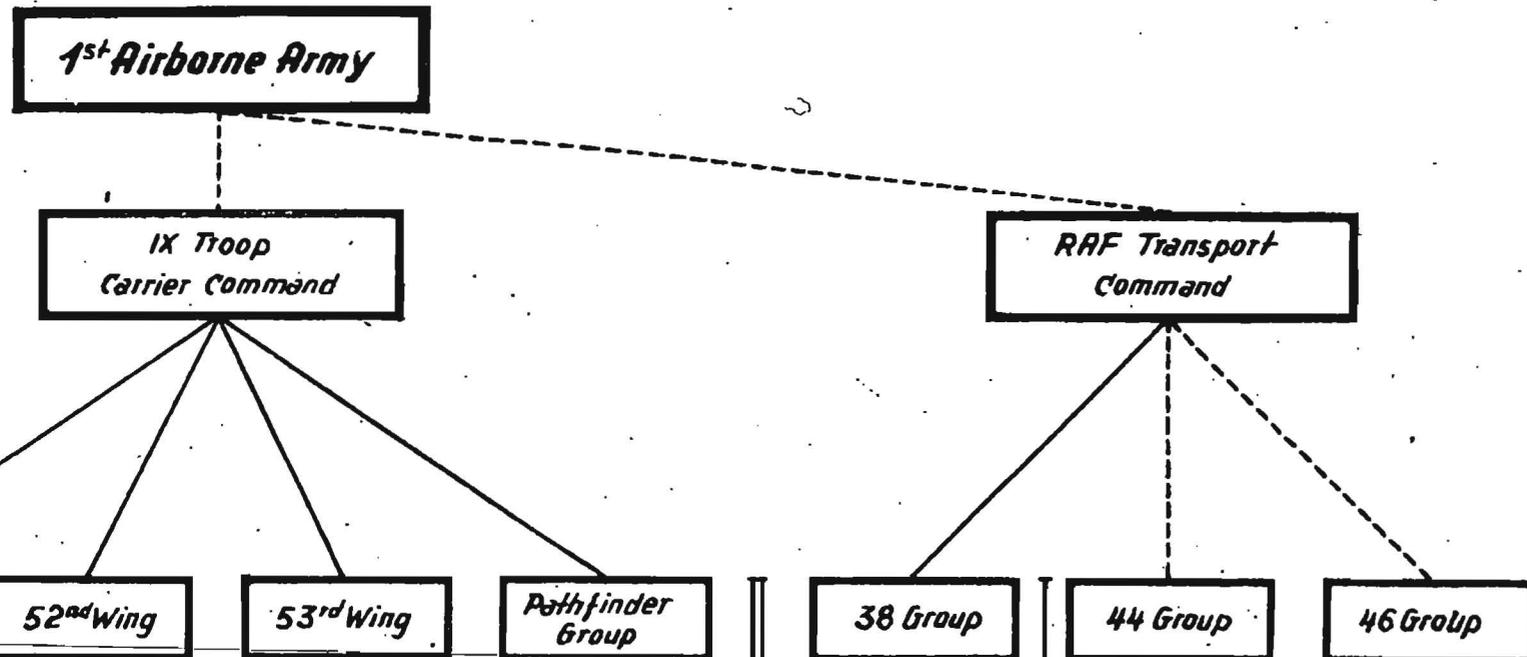


Allied Air Transport Units

(CHART No. 5-6. From IF-182)

Organization and Strength

— As of March 1945 —



Tasks

Air supply for USAAF in ETO (Western Area)

*Air lifts for airborne divisions.
Air transportation for 9th Air Force,
1st USTAF (PROV.) 12th and 6th Army groups.*

*Air supply for French and Norwegian underground movements.
Air lifts for British airborne divisions.
Air transportation.*

Air transportation mostly for 2nd TAF and 21st Army group.

Equipped with

Dakota

Dakota

*Dakota
Whitley
Stirling
Halifax*

unknown

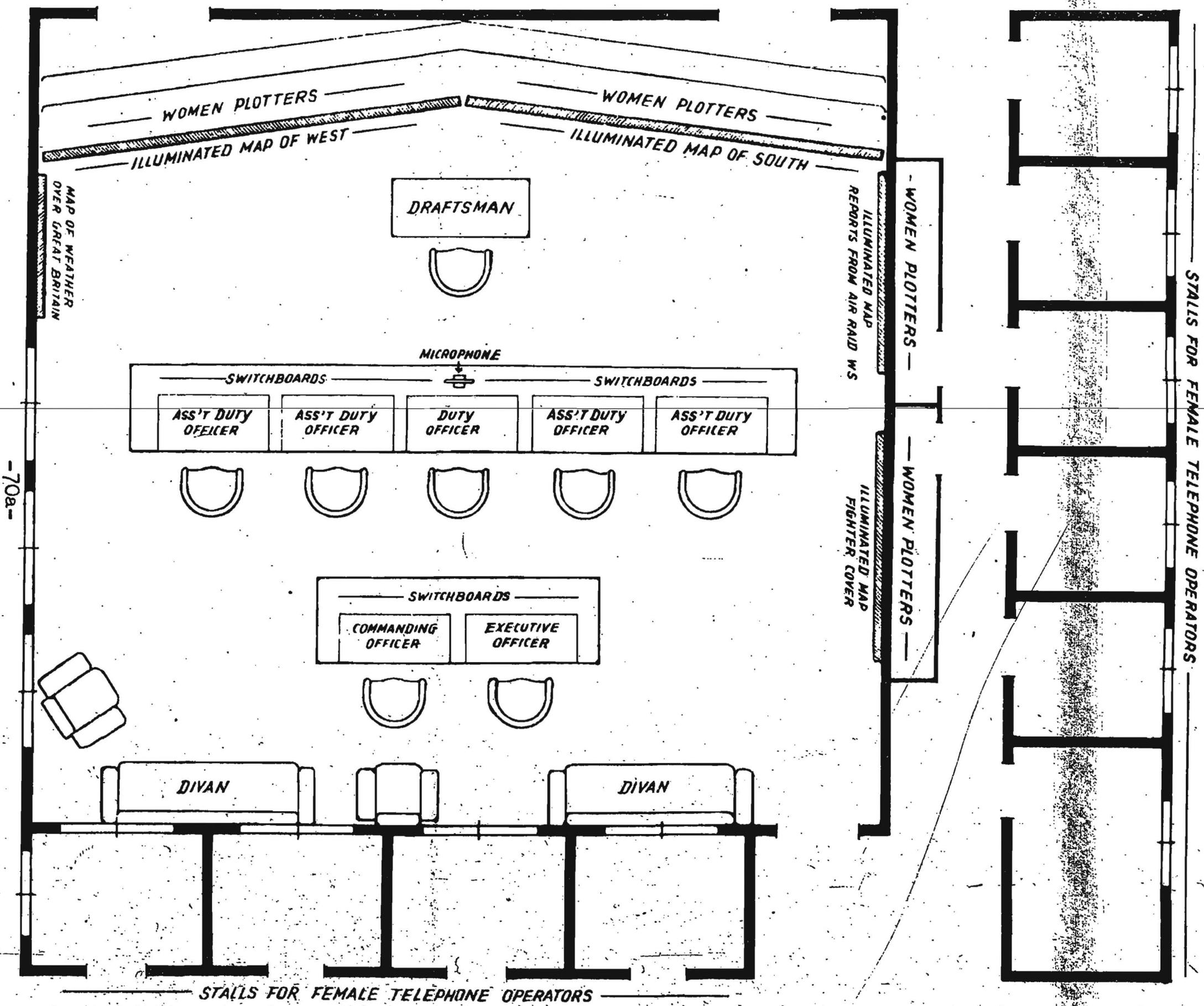
Strength

about 250 a/c

*about 14 Groups
about 1100 a/c*

*about 15 Squadrons
about 300 a/c*

*about 15 Squadrons
about 300 a/c*



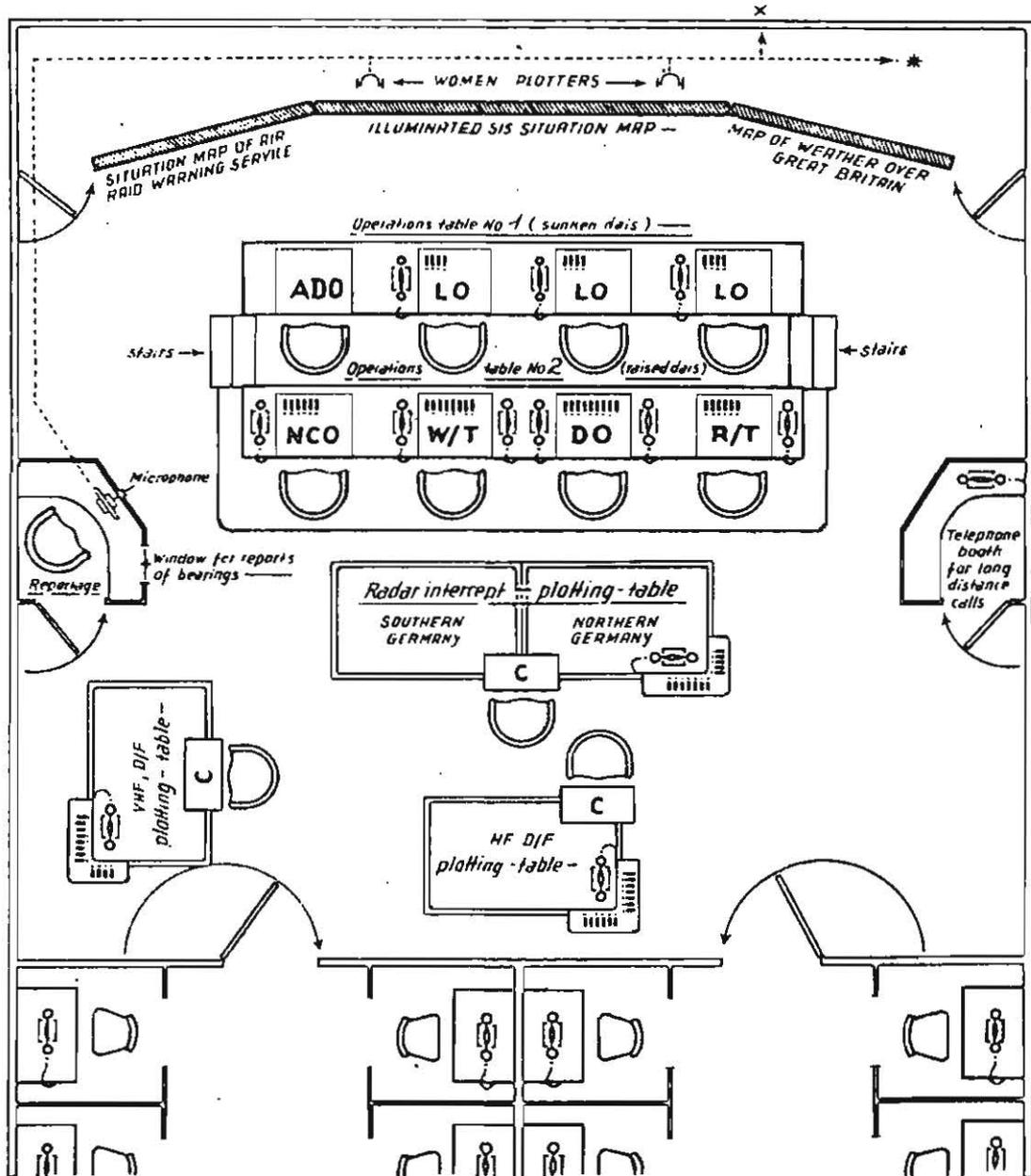
Operations Room of the ZAF

(CHART No. 5-7. From IF-181)

-70a-

Operations Room of Meldekopf 1— Heiligenstadt

~ November 1944 - March 1945 ~



— STALLS FOR FEMALE TELEPHONE OPERATORS —

~ Legend ~

SYMBOLS:

- Switchboard
- Telephone
- Female Clerk
- * — SIS broadcast, W/T
- X — SIS broadcast, telephone

ABBREVIATIONS:

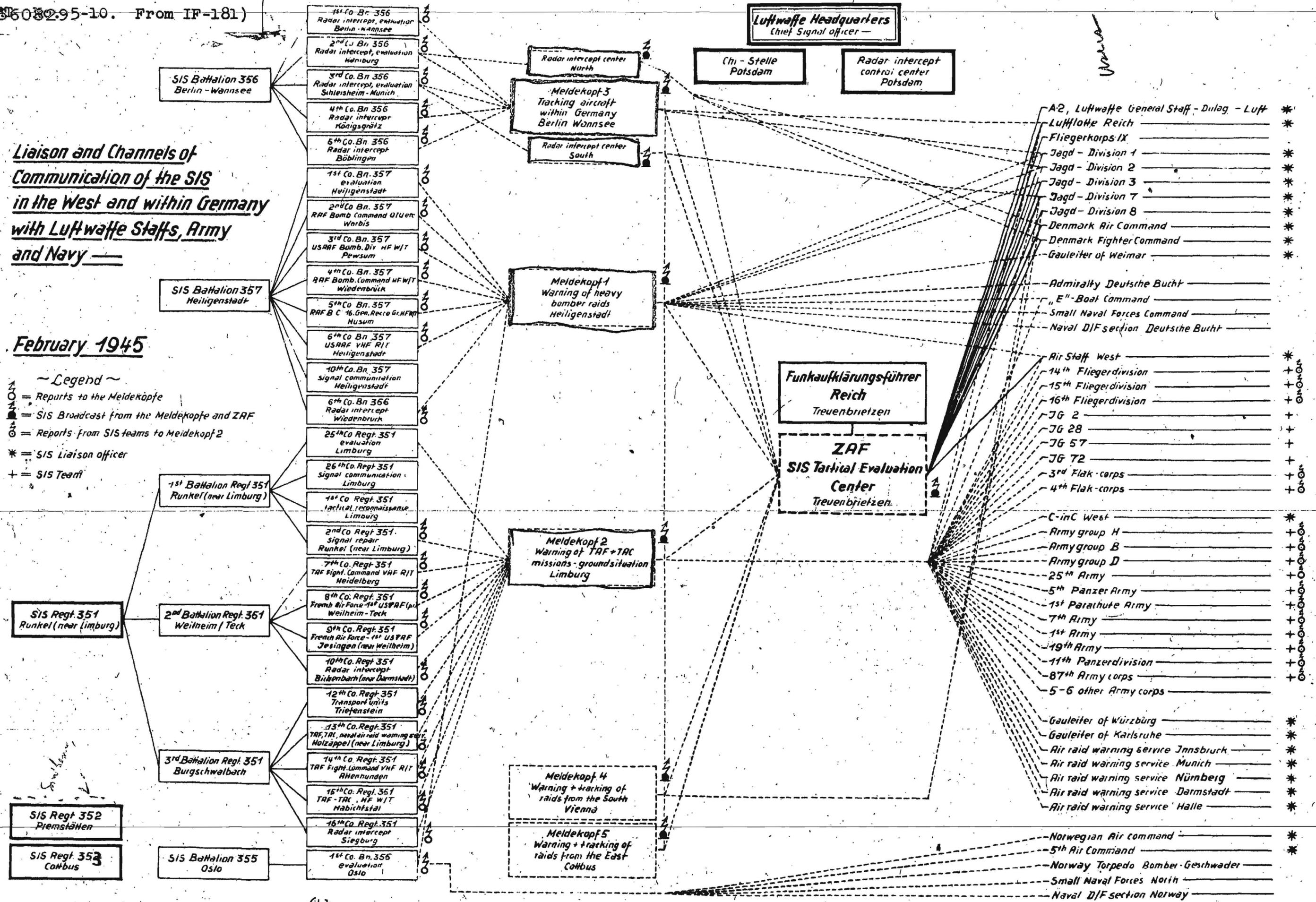
- ADO** Ass't duty officer
- NCO** NCO in charge of wall maps
- W/T** W/T specialist
- R/T** R/T specialist
- DO** Duty officer
- LO** Liaison officers for various Hqs

(CHART No. 5-9. From IF-183)

Liaison and Channels of Communication of the SIS in the West and within Germany with Luftwaffe Staffs, Army and Navy

February 1945

- Legend**
- = Reports to the Meldeköpfe
 - ⊙ = SIS Broadcast from the Meldeköpfe and ZAF
 - ⊕ = Reports from SIS teams to Meldekopf 2
 - * = SIS Liaison officer
 - + = SIS Team

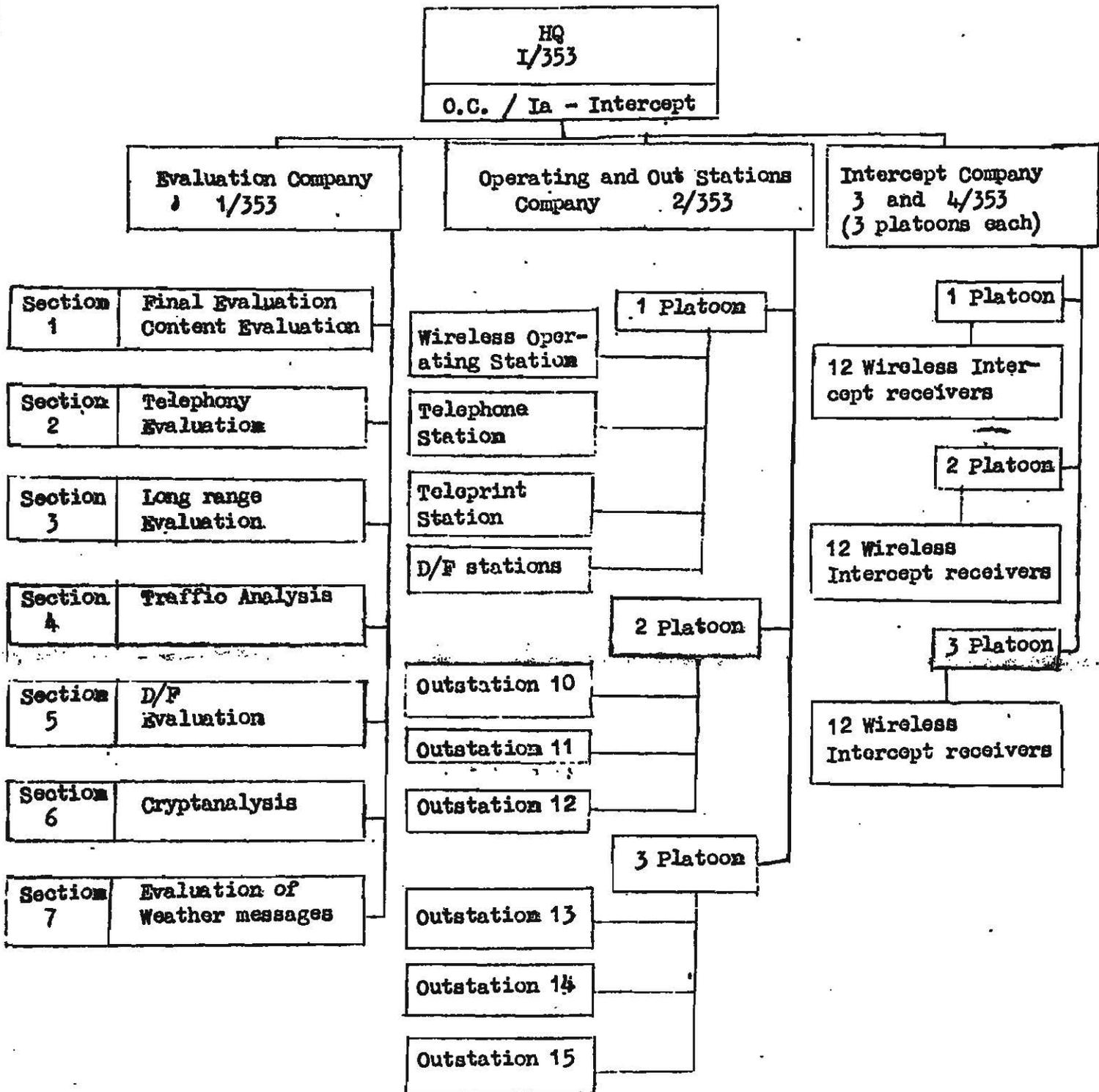


~~TOP SECRET~~ uun

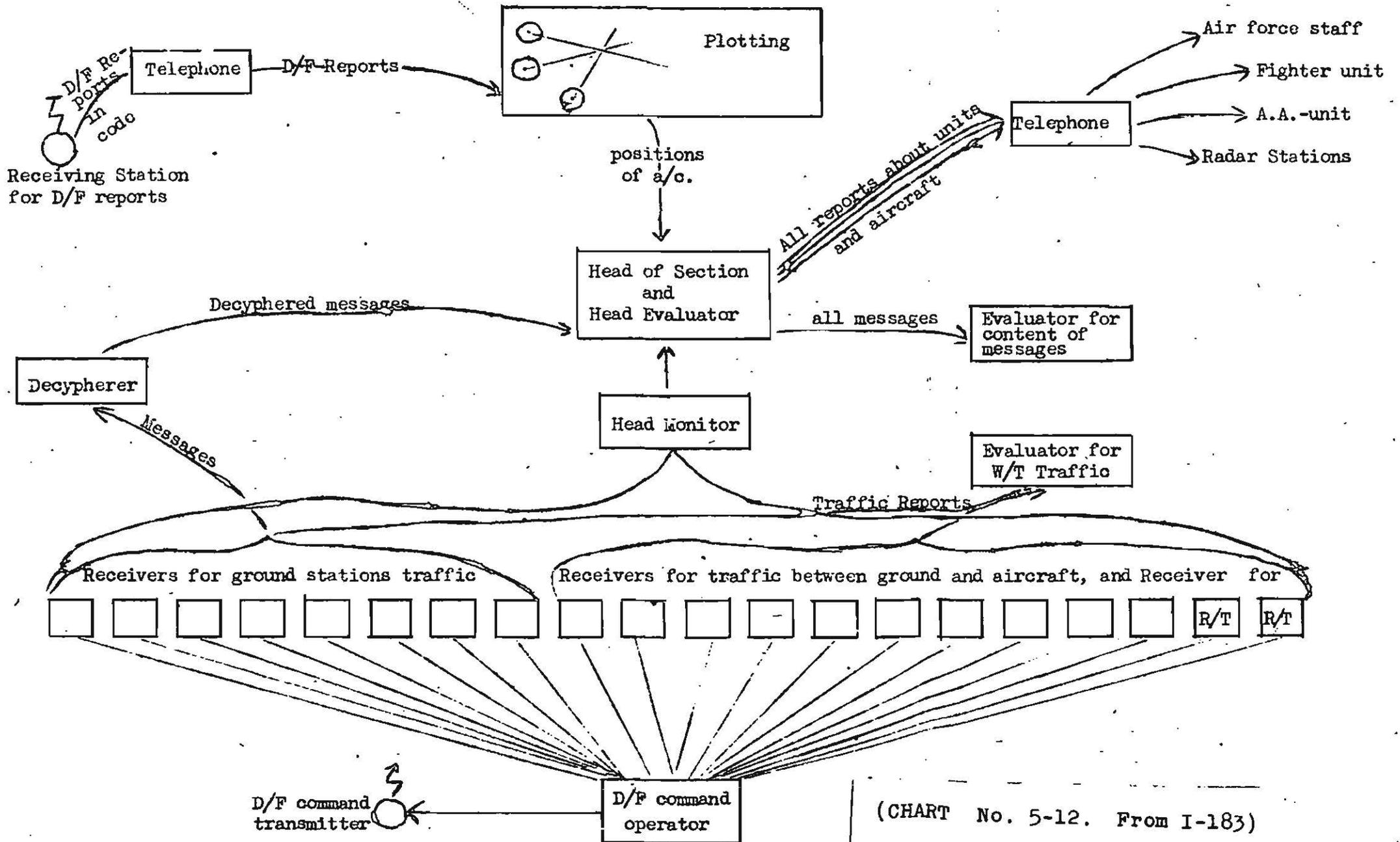
TICOM/I-182

(CHART No. 5-11. From I-182)

Organisation of the Sigint Unit "I/353"



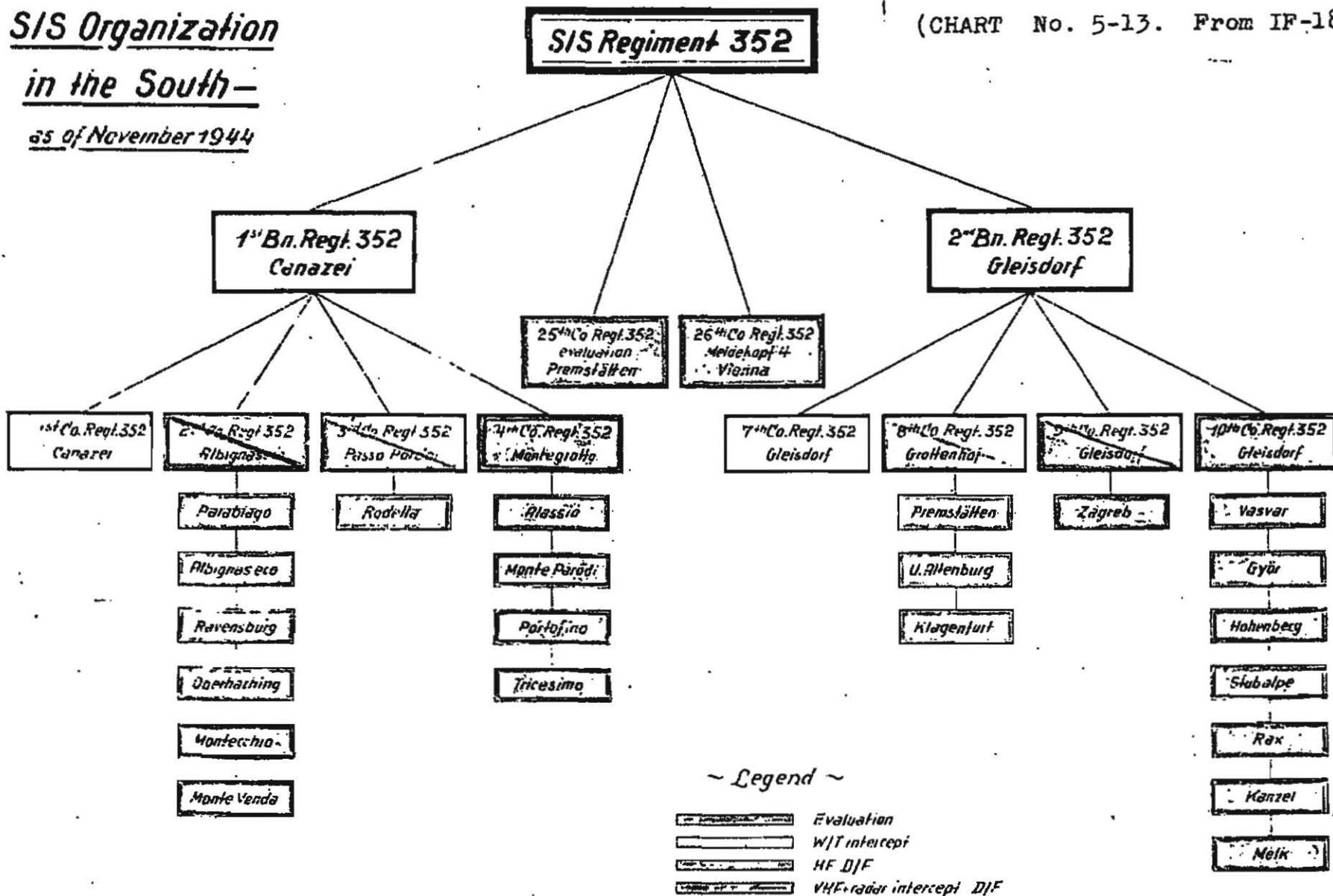
ORGANISATION OF A LONG RANGE BOMBER EVALUATION SECTION



(CHART No. 5-12. From I-183)

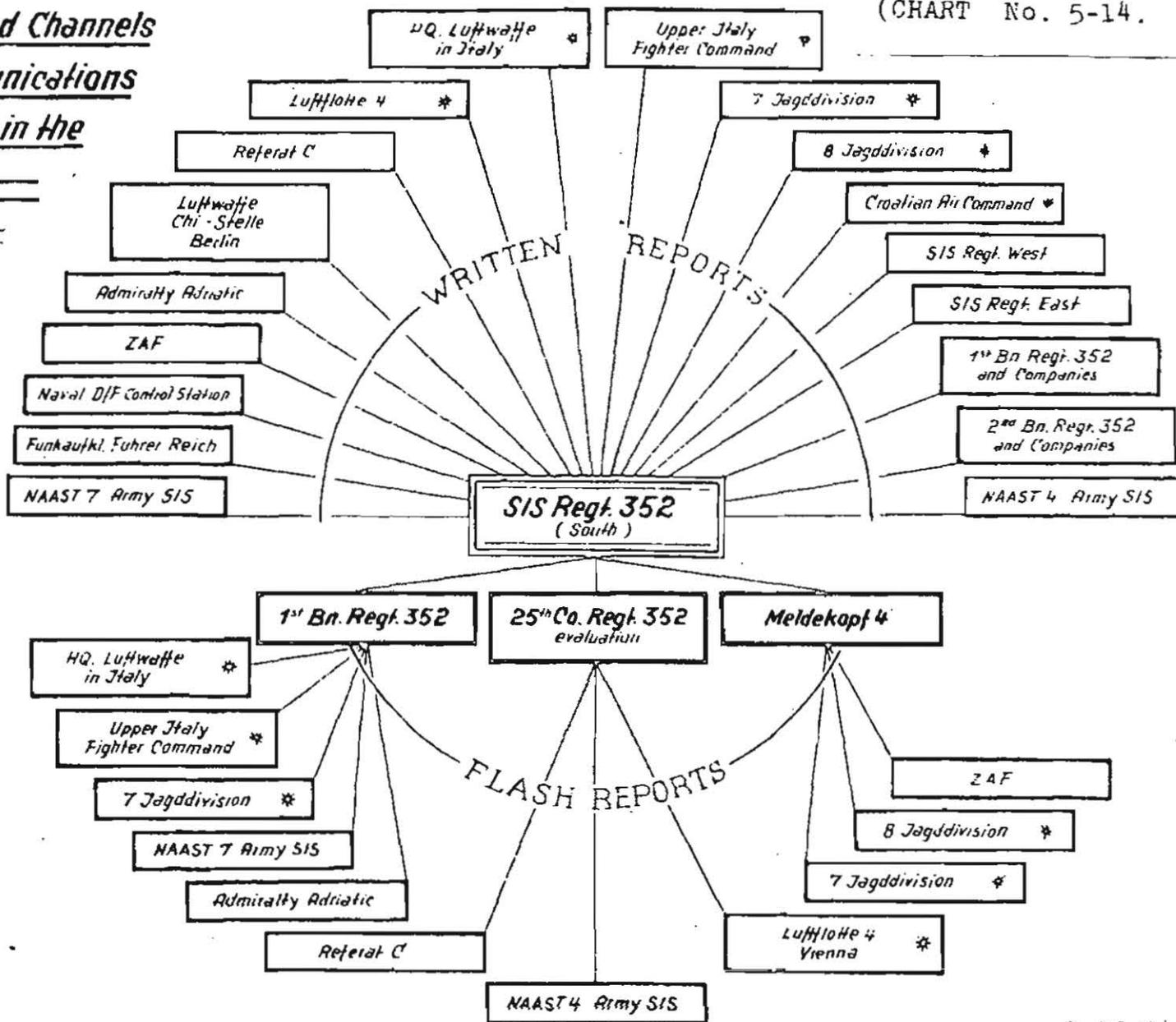
SIS Organization
in the South—
as of November 1944

(CHART No. 5-13. From IF-184)



Liaison and Channels
of Communications
of the SIS in the
South
Fall of 1944 -

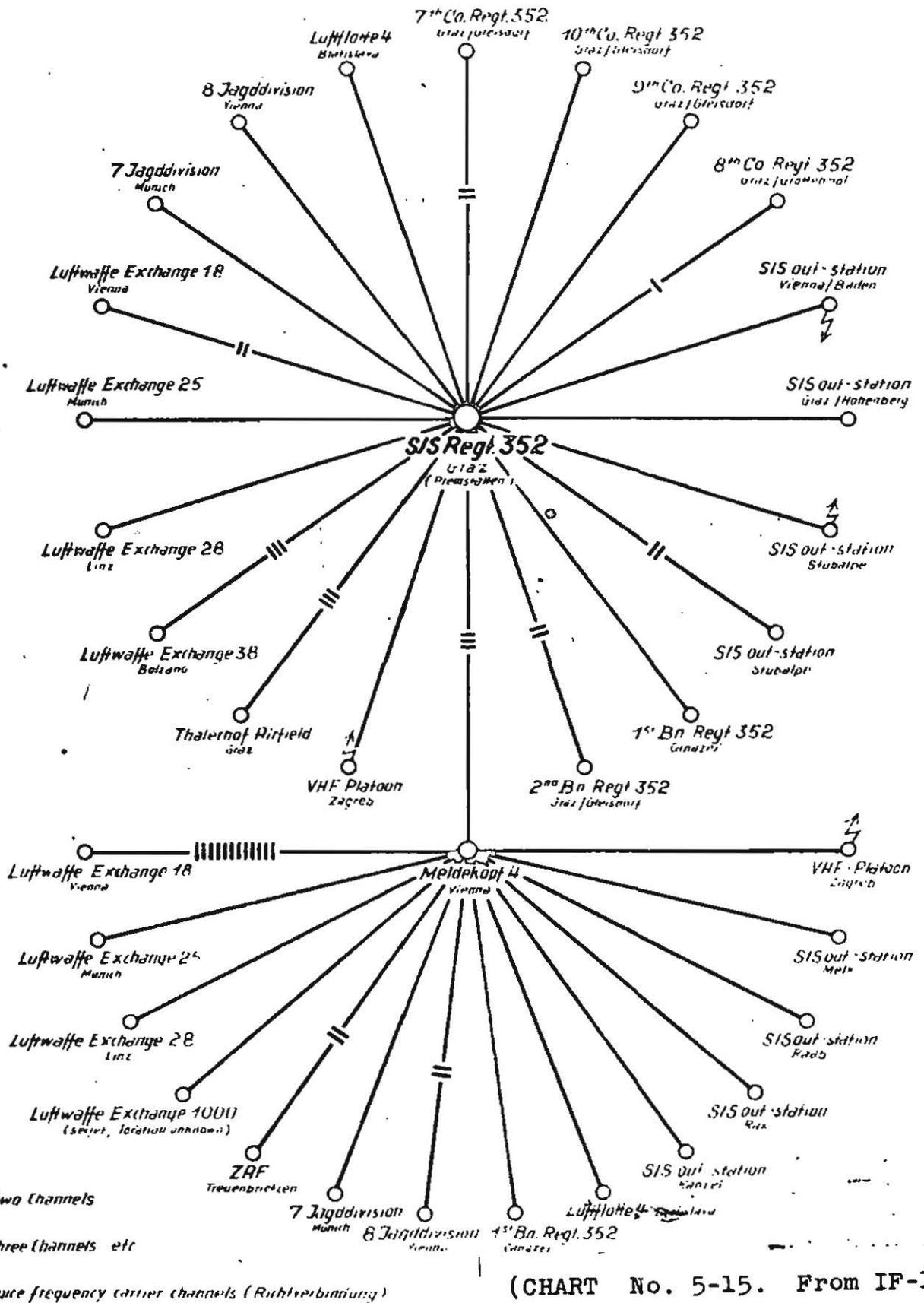
(CHART No. 5-14. From IF-184)



* SIS Liaison Officer

Telephone Lines of SIS Regt. South

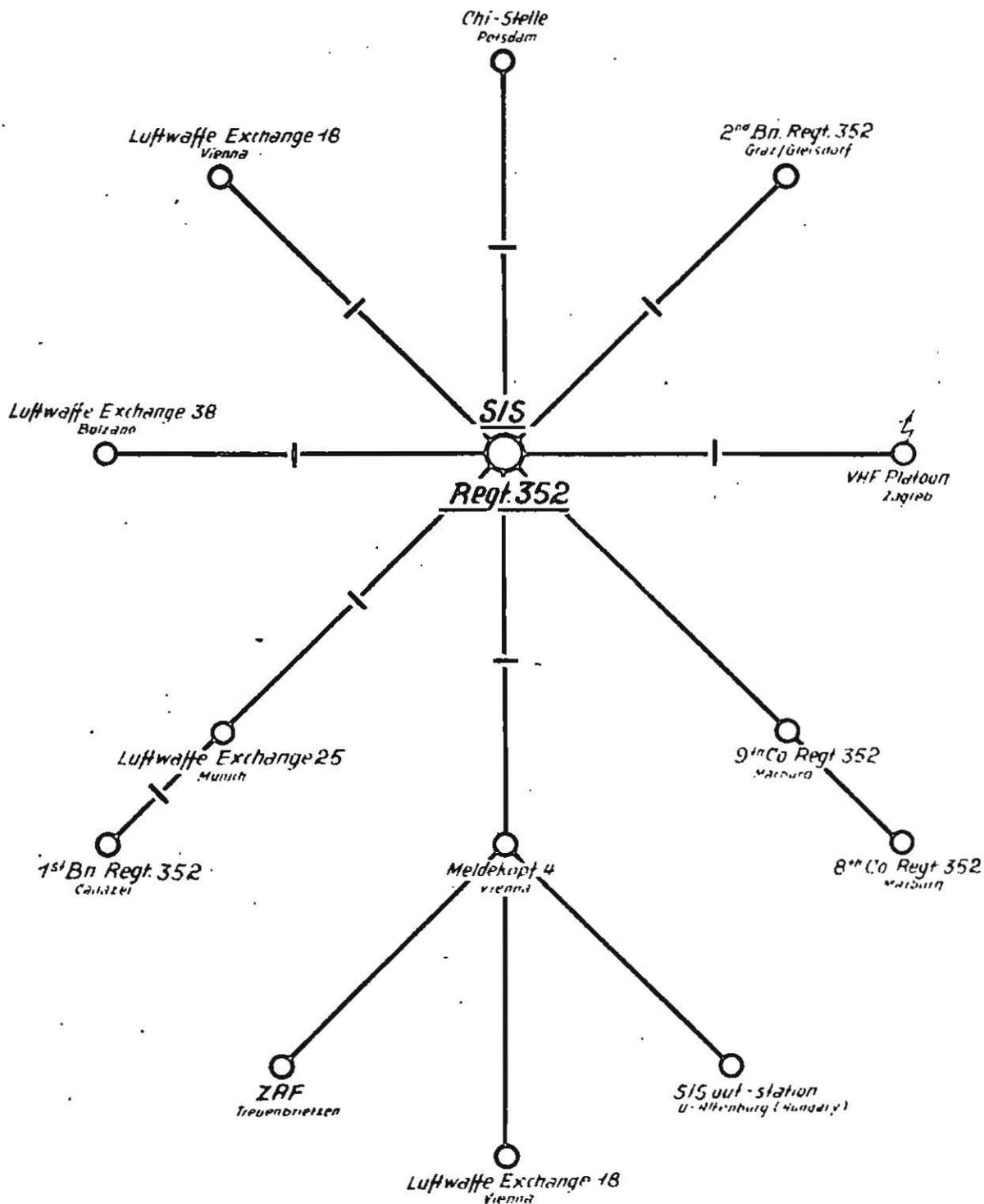
Beginning of 1945



(CHART No. 5-15. From IF-184)

Teletype Network of SIS Regt. South

~ Beginning of 1945 ~



-  - Radio Teletype Carrier Channel (Richtverbindung)
-  - Teletype-Cipher Machine („G“Schreiber)

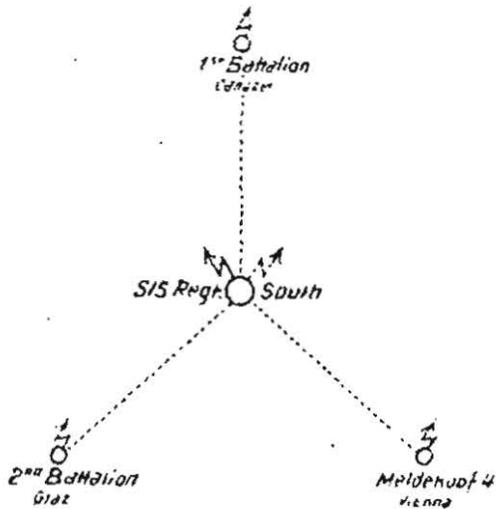
(CHART No. 5-16. From IF-184)

SIS Radio Networks in the South

— Beginning of 1945 —

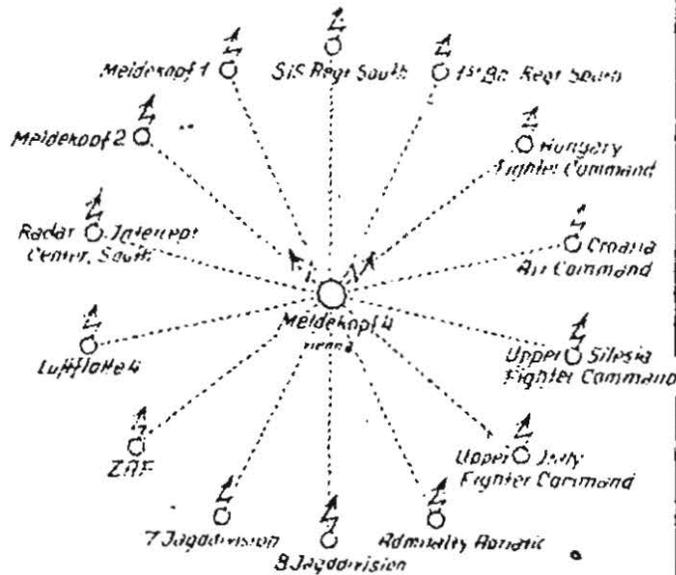
Regimental Command Network

— SIS Regt South —

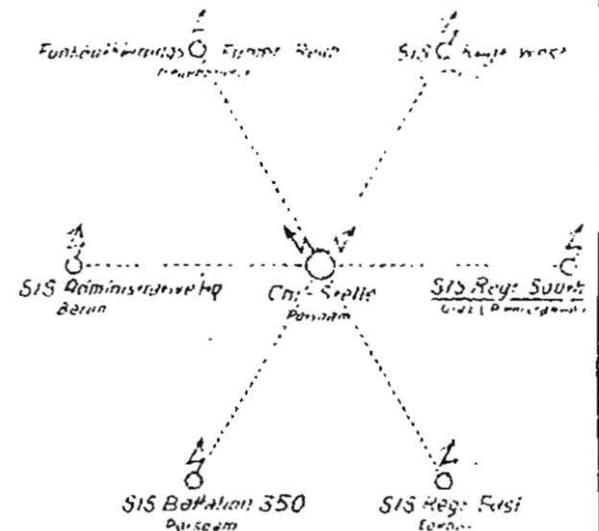


SIS Broadcast

(Radio Network Meldekopf 4)



Chi-Stelle Command Network



Disposition of the Allied Air Forces in the Mediterranean and Middle East

~ April 1945 ~

(CHART No. 5-18. From IF-184)

Totals
SEF 1040
TEF 135
MB 615
1790

MATAF
FLORENCE

Totals
SEF 515
TEF 25
MB 235
775

RAF
Desert Air Force
Forli

Totals
SEF 5
MB 300
305

57th M.B.
Fano

5th H.B.
Foggia

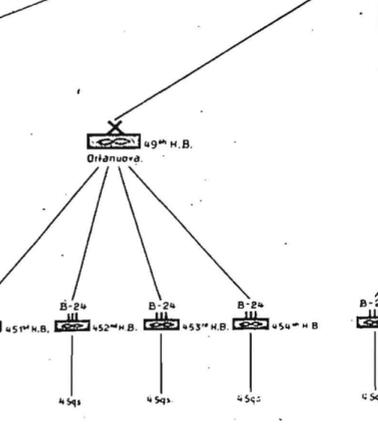
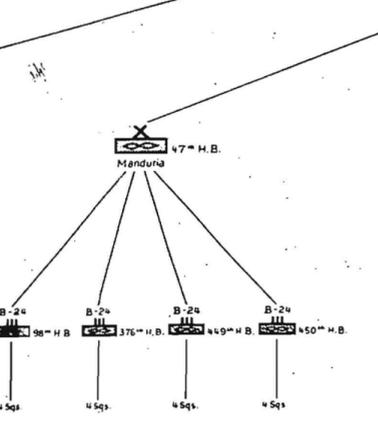
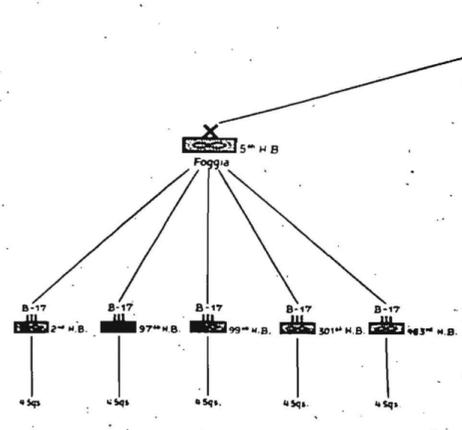
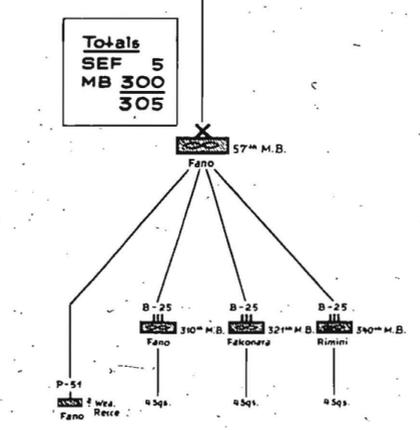
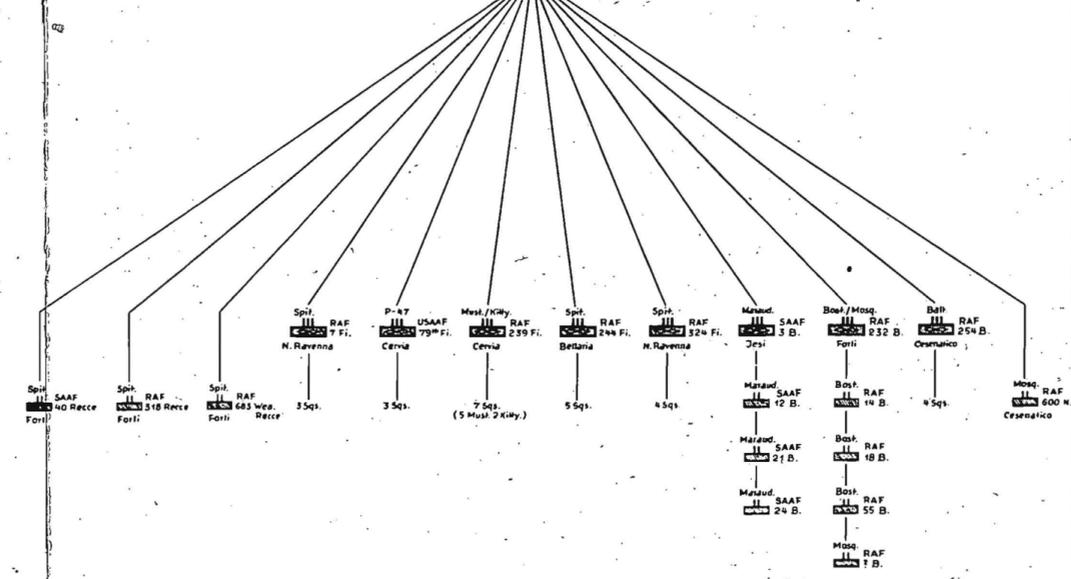
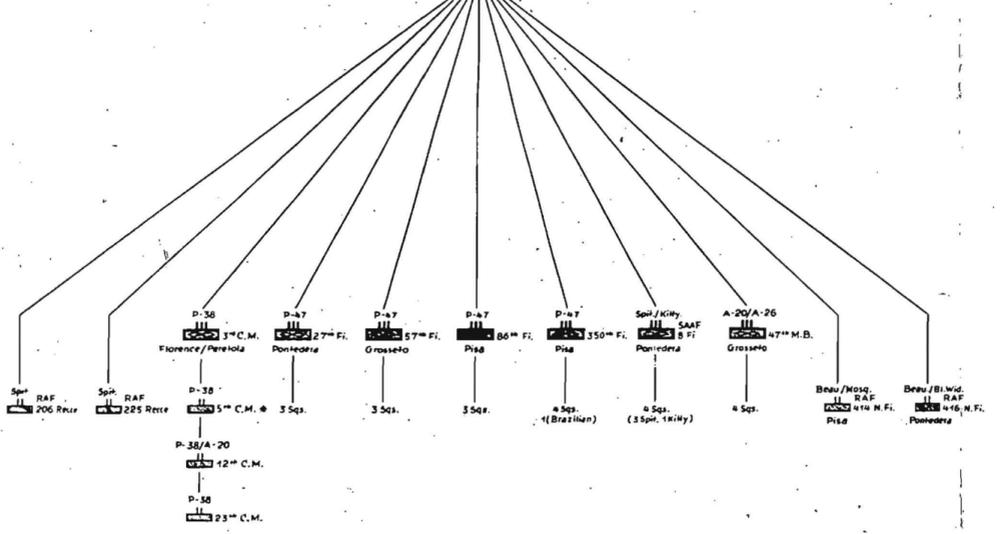
47th H.B.
Manduria

49th H.B.
Ortanova

48th H.B.
Spinardo

Totals
SEF 520
TEF 110
MB 80
710

XXII Tactical Air Command
Borgo San Lorenzo



* Combat Mapping ** Med. Allied Photo-Recce Wing *** Sea Rescue Unit

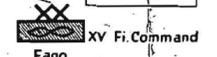
Totals
SEF 1830
TEF 685
MB 750
HB 1700
SRU 30
Trans. 605
5600



Totals
SEF 400
TEF 400
HB(USAAF) 1460
HB(RAF) 180
2440



Totals
SEF 400
TEF 320
720



Totals
HB 180



Totals
SEF 90
TEF 100
MB 60
SRU 30
280



Totals
SEF 130
TEF 50
MB 60
HB 60
300



Totals
SEF 240
TEF 50
MB 75
HB 60
Trans. 380
805



Totals
SEF 80
MB 15
95



Totals
SEF 30



Totals
380 Trans.



Totals
225 Trans.

