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ARMY SECURITY AGENCY

Washington, D. C.

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 8--MISCELLANEOUS

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Chapter I Italian Signal Intelligence Organizations

1. Italian cryptology was centered in the Army and Navy Intelligence Services.--Two organizations, which were primarily intelligence and not cryptologic bureaus, performed the major cryptological work for Italy before September 1943. These were:

a. Army Intelligence Service (Servizio Informazioni Militari, abbreviated S I M.)[1]

[1] S I M was subdivided into "offensive" and "defensive" branches. On November 1, 1941 the "offensive" branch which was concerned with all phases of intelligence against foreign powers, was detached, set up as an autonomous organization and called Servizio Informazioni Esercito (abbreviated S I E) (IF 1500, p 1) On June 15, 1943 S I E was absorbed back into S I M (IF 1500, p 9).

b. Navy Intelligence Service (Servizio Informazioni Speciali, abbreviated S I S.)

Each of the above had a cryptographic section, and each had a cryptanalytic section.[2]

There were also nine small signal intelligence field units attached to Italian Armies.[3]

Two ministries had minor cryptologic bureaus. The Ministry of Foreign Affairs Cryptographic Office (Ufficio Crittografico) prepared Italian diplomatic codes and ciphers. The Ministry of Interior Inspector General of the Political Police (Publica Sicurezza) scrutinized "communist" and "foreign agent" codes and ciphers.[4]

The Air Force Intelligence Service (Servicio Informazioni Aeronautica, abbreviated S I A) had no cryptanalytic section. It is not known whether it had any cryptographic section.

2. Army Intelligence Service had eight sections. Army Intelligence was under the Italian General Staff, and was commanded at one time by a Brigadier General Ame. It had eight main sections, of which three were directly concerned with cryptology, and only two were concerned with gathering military intelligence in the usual sense. The other three were evaluation, administration, and secretariat. On paper, therefore, cryptanalysis and cryptography were major functions of Army Intelligence.[5] The eight main branches and their functions were as follows:

a. The Secretariat Section operated the message center. It was first commanded by a Col. Nasta, who was later replaced by Col. Aldo Canale.[6]

b. The Organization of Agents and Army Intelligence section was responsible for espionage and the evaluation of intelligence produced by reconnaissance, interrogation of prisoners of war, and examination of captured documents. The

[2] IF-1500, p 1.

[3] IF-1520, p 2.

[4] IF-1502, p 2.

[5] See chart No. 8- 1.

[6] IF-1500, p 2.

Espionage Sub-section maintained field offices in occupied and neutral countries. Of particular interest is existence of an Argentine office whose activities were espionage against the United States.

The Army Intelligence Sub-section (also known as the I Sub-section) handled operational intelligence and its sections were attached to each Corps and Divisional Command. It was commanded successively by a Col. Pasquale and a Col. Gastaldi.[7]

c. The Evaluation Section collected and analyzed information gathered by the other sections and military attachés, and issued such information in the form of daily bulletins, weekly and monthly reports. Distribution was to the Minister of Foreign Affairs, the Minister of the Armed Forces and his Chiefs of Staff, and to the commanders of "main army units." The Evaluation Section also issued predictions on the political conduct of the war. The command officer was a Col. Pacinotti.[8]

d. The Monograph Section produced treatises relating to foreign nations and the general conduct of the war. The personnel consisted of young college professors who had an accurate historical knowledge of foreign countries.[9]

e. The Cryptography Section compiled and allocated ciphers to all army units. It also supervised printing of the most secret documents of the Army Intelligence Service, and provided linguists for all commands and units that required interpreters. This Branch was commanded by a Col. Piccinocchi.[10]

f. The Intercept Section was responsible for the interception of all commercial, military, and diplomatic traffic. It maintained its principal station at Forte Braschi, near Rome, and allotted one or two intercept companies to each army. It was under the command of a Col. Petrella.[11]

g. The Administration Section administered SIM personnel. It was also responsible for the securing and disbursement of funds.[12]

[7] IF-1500.

[8] IF-1500, p 4.

[9] IF-1500, p 5.

[10] IF-1500, p 5.

[11] IF-1500, p 5 - 6.

[12] IF-1500, p 6.

h. The Cryptanalytic Section attempted to break Allied Diplomatic, Army, and Commercial codes and ciphers.[13]

3. Cryptanalytic Section totaled approximately fifty persons. At the base only 25 cryptanalysts and 25 linguists and clerks made up the Army Intelligence Service Cryptanalytic Section.[14]

General Vittorio Gamba was in command from World War I to the Armistice. He experienced difficulty in procuring cryptanalysts after World War I[15] and the handicap was never overcome.[16]

The Section's other difficulties included a lack of funds and a lack of IBM equipment. At first IBM machines were used only at the office of the Watson Corporation (Italian IBM) in Rome. Another complication was the poor liaison with the Intercept Branch. All negotiations had to go through SIM headquarters.[17]

The Section never had Chinese and Japanese translators, and it always experienced difficulty in obtaining Russian, Turkish, and Arabic linguists.[18] All personnel, including the guards, wore civilian clothes.

Generally, the Section read only those diplomatic systems which had been in use for a long time. All statistical operations were accomplished by hand; it was not until the last stage of the war that IBM machines were used regularly. At the time of the Armistice, no general success had been achieved in breaking American and British diplomatic and military systems. Exceptions to this were: American military attaché systems involving traffic from Cairo, Basra, and Teheran in 1942; Berne, Madrid, and Lisbon traffic after November 1942; and the State Department "Brown" Code which had been compromised.[20]

[13] IF-1500, p 6.

[14] IF-1517, p 2.

[15] IF-1500.

[16] IF-1518.

[17] IF-1517, IF-1518, p 1.

[18] IF-1517, p 5.

[19] IF-1517, p 2.

[20] IF-1524, p 5; IF-1517, p 5.

The Cryptanalytic Section had three Sub-sections: Diplomatic, Military and Research, and Commercial. The allotment of personnel among the sections varied with the work load and current priorities; translators and typists were pooled.[21]

The Diplomatic Sub-section was subdivided into nine groups. Great Britain, Dominions, America, and Sweden were the responsibility of only one group, consisting of two cryptanalysts.[22]

The Military and Research Sub-section, consisting of five cryptanalysts, was divided into Military and Research units. The Military unit forwarded its results (via unknown channels) to the field cryptanalytic units and to those in Italian possessions. The Research unit was non-operational and was assigned the mission of making the initial break into systems. When the work reached an operational stage, the system was transferred to the Military unit. There was excellent liaison between them.[23]

The Research unit was handicapped by its late adoption of IBM methods. It did not have possession of any machines until late in the war. Until that time, such work as was done was processed at the offices of the Watson Corporation by employees of Watson who worked under the orders of SIM. With the acquisition of IBM machines, more ambitious projects were tackled.[24]

The Commercial unit, consisting of one cryptanalyst, was concerned with Italian commercial codes and ciphers. Its function was to censor Italian commercial traffic and to detect deviations from ordinary commercial code procedures. It was not concerned with foreign commercial codes.[25]

The Cryptanalytic Section received its traffic from the Intercept Section's four stationary intercept stations in Italy, and from its seven mobile units located in Italy, possessions, and occupied territory.[26]

[21] IF-1517, p 1-2.

[22] IF-1517, p 2.

[23] IF-1517, p 2, 6.

[24] IF-1518, p 1; IF-1519, p 1.

[25] IF-1517, p 2.

[26] IF-1517, p 2-3.

The final evaluation of the Cryptanalytic Section might be made in the words of General Gamba, the commanding officer. It was said to be of a "dilettante nature."[27]

4. Italian Army Field Signal Intelligence "Groups" combined cryptanalysis and interception. Evidently there existed in the Italian Army before June 1942 separate cryptanalytic field units and separate intercept units, assigned to the various Italian armies by the Army Intelligence Service (SIM). The organization and missions of these early units is not known. However, in June 1942 at Stalino Russia the Italian Eighth Army combined its cryptanalytic unit of ten officers and six non-commissioned officers with its intercept company, which had a strength of three hundred officers and men. Intercept functions were placed under the control of the cryptanalytic unit; heretofore, each group had been separately responsible to Eighth Army headquarters.

This so-called "Cryptanalytic Group" of the Eighth Army was directly responsible to the Eighth Army, and had no direct connection with the Army Intelligence Service (SIM) in Rome. The Germans later tried unsuccessfully to have this group placed under their authority.[28]

The intercept unit of the Group maintained twenty-four receivers of which nine were fitted into mobile vans. Two mobile vans contained German direction finding sets. Difficulty was experienced in the operation of these units, due to poor instruction by the Germans.

The main contribution of the Cryptanalytic Group was intelligence derived from traffic analysis. Cryptanalysis was hampered by the inexperience of the cryptanalysts, ignorance of the Russian language, and lack of cooperation from the Germans, whereas intercept personnel were highly efficient and were able to identify individual Russian operators and discover changes of frequency. The result was an excellent evaluation of the Russian Order of Battle in that area. The Germans appear to have been surprised at the Italian ability to produce this intelligence.[29]

[27] IF-1518, p 1.

[28] IF-1520, p 2.

[29] IF-1520, p 2.

The success of the Eighth Army Group led to the formation of similar units. In June 1943, Lt. Col. Guido Emer, officer in charge of the Eighth Army Cryptanalytic Group, was ordered by the Army Intelligence Service (SIM) to organize a similar Group for each field army. The Groups were to be patterned after British and American units with special reference to the experience gained by the Eighth Army. Eight new Groups in all were set up for the 2nd, 4th, 5th, 6th, 7th, 10th and 11th Armies, and for the Italians in Rhodes.[30] The cryptanalytic element of a Group, "nucleo", contained from one to fifteen cryptanalytic officers assisted by non-commissioned officers who acted as translators and typists. The intercept unit varied in strength from a section to a company and a half. The resulting Groups never measured up to expectations, however, the 6th Army's Group was able to predict the landing in Sicily and there must have been minor successes.[31]

5. Italian Naval Intelligence was streamlined. Italian Naval Intelligence, (Servizio Informazioni Speciali della Royal Marina, abbreviated SIS) was located in Rome and was directly responsible to the General Staff. It was organized into four branches, all of which had the common mission of discovering the enemy's power, organization, location, activities, and future plans. The four branches were set up on the basis of function and were as follows:

a. Intelligence Based on Radio Intercept - Branch B
b. Evaluation of Intelligence - Branch C
c. Intelligence Based on Espionage - Branch D
d. Counter-Intelligence - Branch E[32]

Branch B was subdivided into four subsections: Cryptanalytic, Intercept and Direction Finding, Security, and Clandestine Radio Intercept.

The Cryptanalytic Sub-section, located in Rome, was under the command of a Commandante De Monte.[33] It directed its efforts

[30] IF-1523

[31] IF-1520, p 3-5.

[32] IF-209

[33] IF-1527, p 1.

against British Naval and Air operational codes. Naval tactical codes and Air code enciphering tables were considered to be simple problems, despite the daily change in the case of the latter.[34] The Sub-section was also successful with a four-figure British Naval Code in 1941 and 1942. This system was not read after the landings in North Africa. A four-figure "Anglo-American Naval Code" was also read.[35]

The Intercept and Direction Finding Sub-section maintained seven principal intercept stations in Italy and its possessions. Six of these were linked together by teletype to facilitate operations particularly with respect to direction finding. The maintenance of one hundred and fifty watches daily, along with the traffic received from German intercept stations located outside of the Mediterranean, produced a daily average of three thousand messages.[36] This Sub-section also controlled intercept groups which were located on the flagships of all commands. These groups were under the command of a Navy Intelligence Service (SIS) officer who was supplied with material for the immediate decoding and interpretation of enemy traffic.[37]

The Security Sub-section had as its mission the cryptanalysis of Italian Naval Codes, Ciphers, and call signs. To maintain the inquiry on a purely cryptanalytic level, the Subsection was kept in complete ignorance of Italian naval activity. If it was suspected that a system could be read, information was forwarded to the Communications Department of the General Staff. This information often contained suggestions for eliminating the danger.[38]

The Clandestine Radio Intercept Sub-section organized and controlled stations for Branch D. It is said that messages were relayed promptly to the Navy Intelligence Service (SIS).[39]

[34] IF 209

[35] IF-1527, p 2; See Chart 1 - 2.

[36] IF-209, p 6.

[37] IF-209, p 5.

[38] IF-209, p 10.

[39] IF-209, p 11.

Branch C evaluated all the intelligence produced by Branches B and D, except those of an immediate operational nature. It was organized on the basis of countries or groups of countries. It circulated translations among higher authorities and served as an information section for the other Branches.[40]

Branch D produced intelligence based on espionage. Initially, Branch D depended on ship captains and informers for information that was of doubtful value. Gradually it built up its own espionage centers in Europe, North Africa, and Asia Minor which were highly effective. Attempts at espionage in enemy countries failed. The main mission of these centers was to collect information of a naval nature. The secondary mission was to collect information of a political nature. Reports were relayed back to the Branch by means of clandestine stations set up by the Clandestine Radio Intercept Sub-section of Branch B. Aircraft flights were reported by fishing boats in the Mediterranean and Atlantic. Toward the end of the war, the Branch was given the task of sabotage.[41]

Branch E was responsible for counter-espionage. Branch E was originally divided into two sections; one dealt with military police functions; the other with counter-espionage. These activities were later combined in the form of centers. Eleven centers were set up in Italy. Five centers were maintained in occupied areas and North Africa. Branch E coordinated all activities relative to naval espionage and sabotage. It was reported that there was no successful act of sabotage against the Italian Navy.[42]

The Italian Air Force Intelligence Service (Servicio Informazioni Aeronautica, abbreviated SIA) relied on the Navy for cryptanalytic work during the whole war. The Navy carried out the intercept function as well, until 1941 when the Air Force set up its own intercept station. Intercepts from this station were sent to the Navy for solution.[43]

[40] IF-209, p 19.

[41] IF-209, p 17.

[42] IF-209, p 20.

[43] IF-209.

6. Italian-German liaison was marked by mutual distrust. Major De Witt, an Italian cryptanalyst, was of the opinion that poor liaison with the German Army Signal Intelligence Agency (OKH/GdNA and predecessors) was based on the German doctrine of taking a lot and giving nothing. This is a moot point when one considers what the Italians had to offer. In actuality, neither side ever expressed a willingness for complete cooperation.

Liaison on military traffic began in 1939 with an emphasis on French traffic. Major De Witt reported that the Italians and Germans were supposed to collaborate on the recovery of an enciphered code system which had a forty day period. There was great rivalry and no interchange of information was permitted by either side until the recovery had been completed.[44]

In 1942, the Italians learned from the Germans that certain Italian cipher systems (not named) were insecure. The Germans recommended the adoption of a Playfair cipher using ten tables. The Italian Army adopted the German suggestion for a short time and then dropped it. The Italian Cryptanalytic Section stated that it had found the recommended system to be insecure and expressed the fear that the Germans favored the system because they could read it.[45]

In January 1942, Capt. Augusto Bigi, a cryptanalyst, was sent to Berlin to investigate German cryptanalytic procedures, with special emphasis on IBM techniques. As a result of the mission's report to Army Intelligence Service (SIM), it was decided to undertake small scale experiments with IBM machines. With a view toward expansion of the use of IBM equipment, should the experiments prove successful, Capt. Bigi was again sent to Berlin in December 1942. The Germans did not allow Capt. Bigi to re-examine their installations and expressed a preference for sending a technician to consult with the Italians. This instance of non-cooperation is considered typical of the whole Italian-German relationship.[46]

Italians gave German liaison officers what purported to be true copies of their weekly summaries. But, in fact, these were edited and abridged documents, which contained nothing which was

[44] IF-1524, p 3.

[45] IF-1519, p 4; IF-1524, p 2.

[46] IF-1517, Appendix A, p 2.

contrary to the German view of the political and military situation. This was especially true with respect to reports dealing with Russia. The reason given by the Italians was that they wished to avoid an argument with the Germans.[47]

Further evidence of mutual distrust in the field of Italian-German liaison appears in the relationship between the Signal Intelligence Agency of the Navy High Command (OKM/4 Skl III) and the Italian Naval Intelligence Service (SIS).[48] Liaison began in 1933 on French systems, but was very slight from 1934 to 1937, at which time opinions were exchanged in regard to the security of Italian systems. In 1938, the Italians failed to elicit information regarding British Naval operational systems. The Germans did give information on the administrative system, but did not provide any information on the operational system until 1940. The Italians had made slight progress by that date and the subsequent exchange of information was mutually beneficial.

The lack of confidence in Italian cipher security influenced the Germans in their reluctance to provide the Italians with British Naval Cypher No. 3 (for convoys) until 1942. Collaboration on this system continued until the Badoglio revolution in July 1943. From that time on, liaison came to a gradual standstill, and all liaison ended in Sept. 1943.

The prevailing opinion among the Germans seemed to be that the Italians were temperamentally unsuited to cryptanalysis, and the German analysts appear to have been unwilling to initiate any action with the Italians without direct orders from above.[49]

7. Enemy Italian Cryptologic Activities did not terminate with the Armistice. The Military Intelligence service terminated its existence as a de jure organization with the signing of the Armistice. The personnel was subject to various pressures and fears which resulted in their scattering to the Allies, to Mussolini, to the Germans, or into hiding. The Germans took command of any remaining intelligence functions.[50]

[47] IF-1500, p 7.

[48] I-12.

[49] I-12.

[50] IF-1527, p 3.

The documents of the Cryptanalytic Branch of the Army Intelligence Service (SIM) were in part destroyed, but a great many were turned over to the Germans or taken into hiding against the day when the organization might be recreated. Capt. Figi, a cryptanalyst, stated that he destroyed only old and obsolete documents.[51]

The successor to the Military Intelligence Service was the Defense Intelligence Service (Servizio Informazioni Difesa, abbreviated SID). It was under the direction of a Dr. Foschini. Organized in October 1943, it was successively located in Rome, Volta Mantovano, and Castiglioni delle Stivieri. Its organization paralleled that of the old Army Intelligence Service, and it was, in fact, a continuation of the previous organization.[52] It had available only twelve cryptanalysts for the task which had been too great for double that number. A further difficulty was its lack of intercept facilities. The Germans discouraged the development of intercept and are reported to have placed Dr. Foschini in a concentration camp because of his efforts to obtain intercept equipment. The only systems that were generally worked on were some of those that had previously been read by the Army Intelligence Service (SIM); namely, Turkish, Spanish, and Rumanian diplomatic codes and ciphers.[53] Occasionally a new system was broken.[54]

The cryptanalytic and intercept functions of the Defense Intelligence Service (SID) were reorganized in June 1944. All cryptanalytic and intercept activities were combined into the Intercept Section (Intercettazione Sezione) which was known as IN. The IN was subdivided into three "bureaus."[55]

a. The First Bureau consisted of naval personnel whose mission was to deal with tactical enemy air traffic and, to a small degree, naval traffic. This group had a short existence

[51] IF-1526, p 2-3; IF-1517, p 7; IF-1501.

[52] IF-1517, p 7.

[53] IF-1524, p 9; IF-1517,

[54] IF-1526.

[55] See Chart 8 - 1, IF-1524, p 8-9.

which terminated with the incorporation of its personnel into the Second Bureau in November 1944.[56]

b. The Second Bureau worked on diplomatic and military attaché codes and ciphers. The work was limited to systems already broken.

c. The Third Bureau confined its activities to the monitoring of press reports, particularly Reuters.[57]

8. TICOM has recovered Italian translations of decrypted traffic. TICOM has obtained the Italian translations of traffic decrypted by the Italian Defense Intelligence Service (SID) from late 1943 to early 1945. Notations indicated that the Republican Fascist Government had a particular interest in intelligence relating to conditions in liberated Italy; secondary importance was attached to messages dealing with conditions in its own territory. The decrypted traffic also revealed that messages of general intelligence value were read. Below are summaries of a few of the representative messages:

Worksheet 1111-Vatican to Lisbon 30 Dec. 1944-597 groups Portuguese message number 1.

Liberated Italy is economically devastated, expecially with regard to raw materials. It is at the mercy of the initiative of the liberators. Italians believe that the British are sincere in their desire actively to aid reconsturction. The public debt is 676 billion liras, three times national income, but the government is optimistic.

Worksheet 2925-Moscow to Paris 20 Feb. 1945-88 groups French message number 85.

Fourteen Frenchmen who escaped from German camps at Bleichhammer and Heydebreck report that they worked with 70,000 others on the production of synthetic benzine at plants in these localities. Annual production is estimated at 3,500,000 tons.

Worksheet 4525-Tokyo to Berne 23 Feb. 1945-266 groups Swiss message number 503.

The situation is critical in Japan. There is great popular apathy and misery. The Government would like to

[56] IF-1524, p 9.

[57] IF-1527, p 3; IF-1526, p 2; IF-1524, p 9.

evacuate Tokio, but it is unable to provide transport and lodging. The military fear the loss of Formosa and an invasion of Kyushu. A German defeat is believed inevitable, but it is hoped that the Germans will delay to the point of extermination. The press is very hostile to Russia, but the official attitude is very correct.

Worksheet 3330-Paris to Rio de Janeiro 1 March 1945-71 groups French message number 26.

It is reported from Montevideo that the Argentine is uncertain about entering the war. The militarists oppose this move and the United States has indicated that a mere declaration would be insufficient.

Worksheets 3333 and 3334-Washington to Paris 1 March 1945-74 and 57 groups French message numbers 94 and 191.

Argentina is suspected of being sympathetic not only to the German Government, but also to the Nazi ideology. Nazi technicians have been infiltrating into Argentina and now occupy prominent positions in the army and industry. It appears that the American Government, backed by the majority of public opinion, will not change its attitude toward Argentina unless the Argentine radically modifies its approving attitude toward Nazism.

Worksheet 2946-Paris to Rio de Janeiro 21 Feb. 1945-107 groups French message number 279, circular 22.

It is reported from Berne that Germany is suffering from a transportation crisis. The Reichsbahnen are no longer useful. Communications are generally destroyed. There is a coal shortage in Bohemia and Moravia and the Skoda works may have to shut down. Fuel oil is very limited in supply, and air raids and Russian advances have destroyed synthetic gasoline production. 200,000 workers are required to finish 15 synthetic gasoline plants by August 1945. It is believed that the construction plans are merely intended to give the impression of a will for indefinite resistance.

Worksheet 1513-Stockholm to Paris 17 Jan. 1945-89 groups French message number 9145

The Soviet Embassy is optimistic about the coming offensive against Berlin. Despite 200 German divisions in the East, the Red Army has numerical superiority and expects a decision early in 1945.

Worksheet 4535-Stockholm to Paris 28 March 1945-61 groups
French message number 149

In Switzerland it is estimated that Germany will fall in two weeks. The Nazi Government will not give up, but the armies will surrender.

Worksheet 3192-Stockholm to Paris 27 Feb. 1945-72 groups
French message number 71

Swedish correspondents in Berlin report a fatalistic attitude on the part of the populace. The people no longer mention Hitler. The executions of party officials, who deserted their posts, have been greeted with public satisfaction. The press has taken clever advantage of the mistakes in Allied propaganda. There is little probability of a popular revolt. It is believed that a revolution, if any, will have to come from the army.

Worksheet 933-Borovec to Zagreb 23 Aug. 1944-276 groups
Jugoslavian (Croatian) message number 1

The Bulgarian foreign minister has stated that Bulgaria joined the Axis to keep peace in the Balkans. Thrace and Macedonia were occupied because they were essentially Bulgarian areas and because foreigners would have occupied if Bulgaria hadn't. Bulgaria claims that she never made active war against the Allies, and that she wishes to keep good relations with Russia and the Balkans. In the case of Russia, the burden is on the Soviet to remain friendly with Bulgaria.

Worksheet 762-Bucharest to Moscow 5 Sept. 1944-206 groups
Rumanian message number 365

Rumania protests the treatment of her fleet by the Russians. The Red Navy has taken over Constanza and the Danube fleet. Serious incidents have occurred. Rumania asks that Russia be more cooperative and follow Molotov's stated policy of cooperation. Rumania disclaims any responsibility for U-boat activity in the Black Sea, placing the onus on Germany. Rumania wants peaceful cooperation.

Worksheet 1018-Tokyo to Lisbon 3 Dec. 1944-78 groups
Portuguese message number 47

Japan expects early Russian entry into the Asiatic war. This is considered inevitable due to Russia's interests in the Far East.

Worksheet 816-Vatican to Madrid 18 June 1944-179 groups Portuguese Message number . .

It is expected that Kesselring will give up soon. German collapse is attributable to destruction of communications and transportation. The zones of occupation of the Allies are predicted to be: 1) Great Britian-France, Belgium. Holland, Norway and Rhineland. 2) Russia-Germany, bounded by the Baltic, the Danube and Balkan areas. 3) United States- Central Germany, (Bavaria and Austria).[58]

9. Italian cryptanalytic results. Brigadier General Vittorio Gamba, the Director of SIM Cryptographic Section, had a very low opinion of Italian signal intelligence activities. Gamba attributes the Italians' poor showing to a lack of capable personnel and a lack of sufficient funds.[59] Gamba sums up successes against the USA and Britain as follows, "It is a fact that at the time of the Armistice no results had been attained in breaking the cypher systems of military and diplomatic traffic from England and the United States."[60] Gamba does claim that photostats of the US State Department's "Brown" Code[61] were available to the Italians and that SIM succeeded in solving a British diplomatic five figure code and an unenciphered two-part four-letter code.[62] More detailed information regarding Italian cryptanalytic successes may be found in Chart 1 - 2.

[58] T766-T772; T1546-T1581.

[59] IF-1518, p 1.

[60] IF-1500, p 6.

[61] IF-1518, p 4.

[62] IF-1518, p 2.

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CHAPTER II

Hungarian Cryptologic Activities

1. Hungary's cryptanalytic bureau was organized for large scale efforts. The Hungarian cryptanalytic bureau (exact name not available from TICOM sources although it is called Abteilung X in I 193) was directly under the command of the Chief of the Hungarian General Staff. Until Russian advances in 1944 endangered the group, it was located in the Honved (Ministry of Defense) in Budapest.[68] Under the direction of General von Petrikovics,[69] the cryptanalytic bureau was organized into ten sections with a total of about fifty personnel:

a. Turkish Section
b. English and American Section (England, North and South America, and Egypt)
c. French Section (France and Colonies, Switzerland, Greece, Belgium, and Netherlands)
d. Russian Section (Bulgaria, Yugoslavia, Czechoslovakia, and Russia)
e. Rumanian Section
f. Swedish Section (Sweden and Norway)
g. Italian Section (Italy and Vatican City)
h. Spanish Section (Spain and Portugal)
i. ?
j. Japanese Section (Japan and China)[70]

[68] I-21, p 2; I-193, p 2.

[69] I-21, p 3.

[70] I-193, p 3.

The cryptanalytic bureau averaged 4 or 5 persons to each section.[71] The key section was the Turkish section, in which Lt. Titus Vass, called "the ace Hungarian cryptanalyst," worked. Emphasis was placed on Turkish traffic because of the intelligence derived concerning Allied affairs.[72] The Russian and French sections were considered the next most valuable, and it is reported that the main Russian diplomatic system was also read until it changed near the end of the war.[73] Another report indicates that the emphasis was on Italian, Rumanian, and Polish systems.[74]

From 40 to 100 messages were decoded each day. They were sent to a representative of Office Six of Reich Main Security Office (RSHA VI), to Regent Horthy, to the Chief of the General Staff, the Foreign Minister, and to the "Minister President."[75]

Conflicting estimates of the success of Hungarian cryptanalysis are reported in TICOM sources. It is stated that the Hungarians depended on the Germans for the solution of many systems.[76] However, the Reich Main Security Office's (RSHA) liaison officer in Hungary states that the most important cryptanalytic intelligence available to his group came from the Hungarians.[77] It has also been stated that the Germans received a great volume of results from the Hungarians, and this is attributed to the influence of Ronge who had been intelligence chief of the Austro-Hungarian Empire.[78] A total of approximately 90 code books belonging to the Hungarian cryptanalytic bureau have been captured, indicating that they successfully broke codes of the following twelve countries: Belgium, Bulgaria, Denmark, France, Greece, Italy, Netherlands, Portugal, Rumania, Croatia, Sweden, and the Vatican.[79]

[72] I-193, p 3.

[73] I-193, p 3.

[74] I-21, p 2.

[75] I-193, p 4.

[76] I-21, p 2.

[77] I-193, p 2.

[78] IF-141, p 2.

[79] A-27.

Among the documented failures of the Hungarians are the Secret and Confidential codes of American Military Attachés. Although these codes were compromised 100% by the Hungarians they were turned over to the Italian Army Intelligence Service (SIM) because the encipherment could not be broken by the Hungarians.[80] The Italians were successful in breaking it. A German officer of Section E 1 of the Signal Intelligence Agency of the Commander in Chief of the Air Force (Chi-Stelle, Ob d L, Section E) was assigned on the request of the Hungarians to break a Rumanian Air Force cipher. Just as this officer announced that he was on the threshold of solution, he was returned to his German unit because of political reasons, and the Hungarians were forced to buy this system from parties not stated, instead of solving it.[81]

2. Germans considered the Hungarian intercept organization inferior. Personnel of the S ignal Intelligence Agency of the Commander in Chief of the Air Force (Chi-Stelle Ob d L), which maintained intercept stations in Hungary, reported that the Hungarian intercept service was worthless and that the Hungarian traffic analysis reports were useless. They also stated that the Hungarians were "cagey."[82]

3. Hungarian-German liaison began in the 1920's. In the 1920's, liaison on cryptanalytic matters began between the Hungarians and the predecessors of the Signal Intelligence Agency of the Supreme Command, Armed Forces (OKW/Chi).[83] This early liaison was close[84] and the Germans worked on systems

[80] IF-1524, p 4.

[81] I-121, p 8.

[82] I-130, I-65, I-29.

[83] I-21, p 2.

[84] Wheels for the Hungarian Enigma were wired by the firm of Konski and Krueger in Berlin. The Signal Intelligence Agency of the Supreme Command, Armed Forces(OKW/Chi) was unable to copy the wirings because Hungarian employees of the firm changed the wirings at night so that they would not conform to the records kept of the wiring. I-84.

requested by the Hungarians.[85] There was never an actual exchange of liaison officers by the German agency and the Hungarians. This was true even during the war. Communications were through the Hungarian Embassy and through occasional social visits.[86]

Liaison with other German agencies began at the start of the war when the Reich Main Security Office (RSHA) and the Signal Intelligence Agency of the Commander in Chief of the Air Force (Chi Stelle, Ob d L) set up offices in Budapest.[87]

The German Air Force set up a socalled "Weather Station" (cover name) in Budapest in 1938. This station intercepted and cryptanalyzed Rumanian and Jugoslav traffic. Initially, its personnel were in civilian clothes.[88] Liaison with the Hungarian intercept service was always poor and the Hungarians were always considered inferior.[89]

Liaison with the Reich Main Security Office (RSHA)[90] was marked by great respect for Hungarian cryptanalytic ability. The Hungarians passed all decodes on to this group, and the more urgent messages were radioed back to Berlin by the Reich Main Security Office (RSHA). When the Hungarian intelligence units retreated to Eastern Bavaria in 1944 with the approach of the Russians, their retreat was aided by the liaison officers of the Reich Main Security Office (RSHA). It is believed that the Hungarian records were hidden in Eastern Bavaria.[91] It is possible that the documents recovered by TICOM at Eggenfeld are the ones referred to.[92]

[85] I-21, p 2.

[86] I-21, p 2.

[87] I-193, p 2; I-130; I-65; I-29.

[88] I-130, I-65.

[89] I-29, I-130.

[90] In 1944 the Reich Main Security Office (RSHA) purchased a Turkish code from the Hungarians. Examination showed that it had originally been broken by the Signal Intelligence Agency of the Supreme Command Armed Forces (OKW/Chi) in 1943 and then had been turned over to the Hungarians. I-132.

[91] I-193, p 4.

[92] A-27.

Liaison with the Italians on cryptanalytic matters appears to have been very good. The Hungarians maintained liaison officers in Rome and made the results of their work available to the Italians.[93]

[93] IF-1500, p 7.

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CHAPTER III

Finnish Signal Intelligence Organization

13. Finnish "Radio Intelligence Company" cryptanalyzed military, naval and diplomatic traffic. Finnish signal intelligence activities were a function of a Radio Intelligence Company (called Radio Telegraph Kompanie, abbreviated "RTK," by the Germans; Finnish name not given by TICOM sources) which was subordinate to the Finnish General Staff's military intelligence organization (name not known).[98] This Radio Intelligence Company apparently concerned itself with military, naval, and diplomatic traffic.[99] TICOM sources make no reference to any other cryptanalytic organization, or to any organization which dealt with Finnish cryptography.

The Radio Intelligence Company (RTK) consisted of a cryptanalytic unit, an intercept unit, and an evaluation unit. It was of battalion strength.[100] Its headquarters were at Sortavala. The cryptanalytic unit, under the command of Captain Erkki Pale, had a strength which was estimated to be of from 20 to 70

[98] I-106, p 3; I-31.

[99] I-31, I-12, I-16, I-142, I-78, I-120 and I-106.

[100] I-106, p 3.

cryptanalysts.[101] A Col. Hallama has been reported as head of the Finnish cipher section.[102]

Germans, interrogated by TICOM on the subject of Finnish cryptanalysis, unanimously agreed that the Finnish cryptanalysts were of the highest calibre and considered them an even match for their own analysts.[103]

14. Finnish cryptanalysts were successful within the narrow definition of their mission. The emphasis of Finnish cryptanalysis was placed on Russian traffic, particularly of a military and naval nature; secondary consideration was given to Polish, Swedish, Rumanian, and American traffic.[104]

The Finns succeeded in reconstructing the Russian five-figure code used during the first Russo-Finnish War. This book was given to the Germans by the Finnish General Staff.[105] The Russians were aware of the Finnish ability and issued instructions to their cipher officers which attributed Finnish successes to violations of security. It is interesting to note that the Russians did not admit the possibility of cryptanalysis of their systems, but they did emphasize the traffic analysis and monitoring aspects.[106] Other achievements against the Russians were the identification of the additive for a four-figure naval system[107] and the solution of a five figure "double substitution"[108] and the solution of three-figure and four-figure codes, especially Russian Secret Police Codes.[109]

[101] I-31, I-106 p 3, I-116.

[102] I-96.

[103] I-106 p 3, I-16, I-111, I-31, I-116.

[104] I-31, I-106 p 3.

[105] I-78.

[106] I-120 p 40.

[107] I-12 pp 14-15.

[108] I-16 p 2.

[109] I-106 pp 4-5, I-21 p 2.

Other instances of Finnish successes were: Reading of the American strip system, which the Germans called AM 10, and the reading of a Swedish diplomatic system which disclosed the fact that the M-94 was readable.[110]

15. Finnish intercept was well done, but the evaluation unit was not very competent. The intercept unit of the Radio Intelligence Company (RTK) consisted of a fixed station at company headquarters (approximately 200 men), four other fixed stations, and one motorized company.[111] Despite the age and variety of Finnish intercept and direction finding equipment, the Germans considered the Finnish intercept work to be of good quality and depended on the Finns for interception in the Baltic area and for long range direction finding.[112] The Russian security instructions, discussed in Paragraph 2 above, emphasized the ability of the Finnish intercept unit.[113]

The Germans considered the Finnish evaluation unit to be disorganized and attributed its incompetence to the emphasis placed on cryptanalysis. This unit consisted of about 20 persons.[114]

16. Finnish-German liaison was well organized and effective. Finnish-German liaison existed prior to 1939 and continued until Finland's final capitulation to Russia. The following German Signal Intelligence organizations maintained liaison with the Finns: Signal Intelligence Battalion 11 (NAA 11),[115] Control Station for Signal Intelligence (LNA),[116]

[110] I-31, I-142.

[111] I-106, p 3.

[112] I-16, I-106 p 4.

[113] I-120 p 40.

[114] I-116 p 10, I-106 p 3.

[115] I-106.

[116] I-106 p 3.

Signal Intelligence Agency of Army High Command (OKH/ G d NA),[117] Signal Intelligence Agency of Navy High Command (OKM/ 4 SKL/ III),[118] Signal Intelligence Agency of Supreme Command Armed Forces (OKW/Chi),[119] and the Reich Main Security Office (RSHA).[120]

Not only was there direct and large scale interchange of work on Russian systems,[121] but there was also interchange on such matters as the American strip system AM 10,[122] general intercept and direction finding problems,[123] and there is an instance where Finland turned over a translation of a Swedish message which stated that the M 94 was readable.[124]

Liaison consisted of courier service, regular meetings[125] and interchanges arranged by the Finnish General Staff.[126] For such purposes, Germany maintained headquarters (not named) at Tallinn, Esthonia; and there were also Germans in Finland at Kirkenes, Mikkeli, and Sortavala.[127]

At the conclusion of the Finnish-Russian War, the Signal Intelligence Agency of the Supreme Command Armed Forces (OKW/ Chi) invited the Finns to join it. No word was heard from the Finns after they crossed the Finnish-Swedish border.[128]

[117] I-21, I-111.

[118] I-12.

[119] I-12, I-31.

[120] I-193.

[121] I-12, I-31, I-16, I-106.

[122] I-31.

[123] I-106.

[124] I-142.

[125] It is observed that the Finns had one female representative at all these meetings I-31.

[126] I-31, I-78, I-12.

[127] I-12, I-106.

[128] I-96.

Liaison between Finland and Hungary is reported to have been close. The Germans assumed that the Hungarians who came to Berlin were on their way to Finland.[129]

17 Friendly Finnish-German relations did not preclude German cryptanalysis of Finnish systems. Although Senior Specialist Dr. Erich Huettenhain of the Signal Intelligence Agency of the Supreme Command Armed Forces (OKW/Chi) stated that no Finnish systems were read,[130] Abteilungen 9 and 6 of Hauptabteilung IV (Entzifferung) worked on Finnish traffic[131] and Abteilung 6 read at least one Finnish Hagelin message that was 4000 letters long.[132] It is also indicated that Goering's Research Bureau (FA) broke into "Finnish or Swedish" Hagelin messages several times on the basis of cribs.[133]

[129] I-21.

[130] I-31.

[131] I-31.

[132] I-54.

[133] I-25.

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CHAPTER IV

Bulgarian Signal Intelligence

18. Bulgarian cryptanalytic ability is an unknown quantity. TICOM sources provide only a single reference to the Bulgarian cryptanalytic agency. In 1944, Group IV of the Signal Intelligence Agency of the Supreme Command Armed Forces (OKW/Chi) trained Bulgarians in a special course in cryptanalysis. Lt. Col. Mettig of that agency stated that General Staff Major Gentscheff, head of the Bulgarian cryptanalytic agency, was not enthusiastic about this course.[138]

19. Bulgarian-German liaison hardly existed. In or about 1940, the Signal Intelligence Agency of the Supreme Command Armed Forces (OKW/Chi) projected plans for the setting up of intercept stations in Bulgaria. Only one such station was completed. It is not known whether Bulgaria knew of this station. This station, which was located at Varna, was for the German Air Force. Under the cover name of "Kommando Nordland", this station employed 22 persons in civilian clothes. Five receivers were used to cover Syrian, Greek, and Mediterranean ferry flight traffic. No cryptanalysis was done; all enciphered traffic was sent back to the Signal Intelligence Agency of the Supreme Command, Armed Forces (OKW/Chi)[139]

[138] I-96, p 5.

[139] I-65, p 3.

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CHAPTER V

Austrian Cipher Bureau

20. Austrian Cipher Bureau was small but active. The "Austrian Cipher Bureau"[144] was under the direction of Dr. Otto Klob until October 1935, when he was succeeded by Dr. Seifert. Its size and its relationship to other government bureaus is not known from TICOM reports.[145] The Cipher Bureau appeared to suffer from a shortage of personnel and from the many vacations provided by Austrian Civil Service. It must have been small, because a "catastrophic personnel shortage" was averted when three new members joined the organization in November 1935.[146]

The Austrian Cipher Bureau actively cryptanalyzed or intercepted the diplomatic traffic of the following countries: Belgium, Bulgaria, Czechoslovakia, France, Greece, Hungary, Italy, Jugoslavia, Poland, Rumania, Russia, Serbia (sic), Spain, Turkey, United Kingdom, and United States.[147] There is no evidence of cryptanalysis in naval or military traffic.

Although the major effort was expended on codes, there is some evidence of ability in the cryptanalysis of the Enigma Cipher Machine. The Austrians were asked by the Netherlands Government for an opinion on the security of the Enigma Cipher Machine. The Austrian Cipher Bureau rated it insecure on the

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[144] so called in T 3614.

[145] T 84 I 118 T 3614.

[146] T 3614.

[147] T 3614 I 118, p 3.

basis of having read German messages enciphered by the Enigma.[148] The Enigma involved was probably the commercial type (without plugboard) as the incident occurred prior to 1938.[149]

21. Austrian Cipher Bureau was in close liaison with Germany. The closest possible liaison existed between the Austrian Cipher Bureau and the Signal Intelligence Agency of the Supreme Command, Armed Forces (OKW/Chi) and its predecessor, the Cipher Bureau of the German War Ministry.[150] This relationship was a secret held by only the highest officials. There was a constant interchange of traffic and results of cryptanalysis. The interchange was through the German Embassy in Vienna and a cipher system was used for secret messages between the two agencies. Social relationships were maintained. Secret assistance was given by the Germans to the Austrian Cipher Bureau in collecting evidence for treason trials. All of this took place at a time (1935, 1936, and 1937) when the world believed antagonism was apparent in the official relationships of Germany and Austria.[151]

When Anschluss was effected in 1938, four of the outstanding cryptanalysts of the Austrian Cipher Bureau, including its head, Dr. Seifert, became members of the German Signal Intelligence Agency of the Supreme Command, Armed Forces (OKW/Chi).[152]

Austrian liaison was not confined to the Germans. There is some evidence of liaison with the Dutch[153] and with the Hungarians regarding Serbian traffic.[154]

[148] I-142, p 4.

[149] I-78.

[150] I-118, p 3; T-3614.

[151] T-3614.

[152] T-3614; I-118, p 3; I-84.

[153] I-142, p 4.

[154] T-3614.

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CHAPTER VI

Army Ordnance, Development and Testing Group, Signal Branch

22. Ordnance group developed German Army signal equipment. German Army signal equipment was developed and tested by the Army Ordnance, Development and Testing Group, Signal Branch (Chef der Heeresruestung und Befehlshaber des Ersatzheeres, Amtsgruppe fuer Entwicklung und Pruefung des Heereswaffenamts, Waffenpruefung, Abteilung 7, abbreviated Wa Pruef 7). This was one of twelve such branches for ordnance testing and development. It was itself broken down into seven groups, as follows:

Group I (Wa Pruef 7/I) procured raw materials and small equipment;
Group II (Wa Pruef 7/II) developed telephone and telegraph equipment and ciphony (ciphony was transferred to III in 1942).
Group III (Wa Pruef 7/III) developed radio communication equipment, teleprinter, facsimile and television equipment, ciphony and cipher devices.
Group IV (Wa Pruef 7/IV) developed radio intercept, direction finding and ciphony deciphering equipment.
Group V (Wa Pruef 7/V) developed permanent communications equipment for permanent installations.
Section VI (Wa Pruef 7, Referat VI) developed chemical and flare signal equipment.
Group VII (Wa Pruef 7/VII) developed radio remote control devices for rockets.[159]

[159] I-82, I-131.

23. Signal Branch was active in the engineering development of manual cipher machines.[160] The Development and Testing Group, Signal Branch (Wa Pruef 7) was entrusted with the engineering and development of many of the improvements on the Army Enigma. One of these was the variable notch rotor (Luecken-fuellerwalze) which was suggested by the Signal Intelligence Agency of the Supreme Command, Armed Forces (OKW/Chi).[161] To accommodate the new rotor, the Signal Branch (Wa Pruef 7) suggested that several positions of the "on-off" switch be omitted and that the keying pressure be changed to 1000 grams.[162] Signal Branch also developed printing attachments for both the Army and Navy Enigmas.[163]

The proposed new Enigma, SG 39, which was to combine motion features of the Hagelin machine with the Enigma cipher maze, was also engineered by the Signal Branch.[164]

Another of the Signal Branch's engineering and development problems was the SG 41, a keyboard Hagelin with interlocking motion. This device was suggested by Senior Inspector Menzer of the Signal Intelligence Agency, Supreme Command Armed Forces (OKW/Chi). The machine had two forms: the standard keyboard and the ten value keyboard for enciphering weather synoptics.[165]

Signal Branch (Wa Pruef 7) engineered other ideas of Senior Inspector Menzer. Among these were: production of an aluminum cipher grille ("Raster"),[166] which was abandoned in that form before being placed into use; the engineering and development of the "cipher box" (Schluesselkasten); and the "cipher disc" (Schluesselscheibe).[167] These last two items were developed

[160] Cipher and ciphony devices described in this and following paragraphs are more fully explained in Volume 2.

[161] I-57, p 7; D-59.

[162] D-59, p 22.

[163] D-59.

[164] D-59, p 22 p 26.

[165] I-72; D-59, p 16; I-57.

[166] D-59.

[167] I-96, 157.

simultaneously for the Reich Main Security Office (RSHA) as well as for the Army.[168]

There is no statement in the TICOM interrogations that the Signal Branch (Wa Pruef 7) had exclusive engineering control over the above developments, but indications are that it was perhaps the co-ordinator and controller wherever it joined with commercial firms in its work.

The same condition applies to teleprinters and ciphony, which are described below.

24. Signal Branch engineered teleprinter cipher devices. The teleprinter cipher attachments (Schluesselzusaetze) and the secret teleprinters (Schluesselfernschreibmaschinen)[169] were worked on by Signal Branch (Wa Pruef 7) for the Army. The major portion of this developmental work was under the direction of Dr. Werner Liebknecht.

A synchronizing device (Gleichlauf) to be used on teleprinter circuits to permit them to operate uninterruptedly for 24-hour periods, was also being considered by the Signal Branch (Wa Pruef 7)[170] in closest cooperation with Dr. Vierling of the Feuerstein laboratories.

25. Signal Branch was active in the development of ciphony. Signal Branch (Wa Pruef 7) was also engaged in development of German Army ciphony and the development of equipment for the interception and decipherment of enemy ciphony transmissions. This latter function was carried on mainly at its permanent intercept development station at Staats.[171] This installation was in a cave.

Work on German ciphony devices was carried on in cooperation with Dr. Oskar Vierling who directed the Feuerstein laboratory.[172]

[168] I-96.

[169] I-57, D-59.

[170] I-57, D-59.

[171] I-58.

[172] IF-15, See Volume 2, Chapter V.

None of the experiments reached the stage where complete security was believed to have been achieved. Types worked on included frequency inversion, which was abandoned in 1942, Time-Delay ("Tigerstedt"); the "Stepping Stones" (Bausteine), which were frequency scramblers;[173] and noise superimposition devices. For noise superimposition tests, a ciphony link was set up by direction of the Signal Branch between Athens, Crete, and Derna.[174] This link failed to produce satisfactory results.[175]

26. Signal Branch tested Non-Morse intercept equipment. Intercept equipment for Russian three-and nine-channel transmissions was designed.[176] Success was achieved in intercepting the Baudot link between Paris and Moscow.[177] Equipment was also designed for the intercept of American Baudot transmissions.[178] Study of captured French three-channel equipment was carried on at German stations at Berlin and Bordeaux, with an attempt to improve the equipment by the introduction of frequency modulation, but the design proved to be faulty. Some of the French equipment was later found stored by the Signal Branch at the Feuerstein Laboratory.[179]

[173] I-57, I-96.

[174] I-57.

[175] I-57.

[176] I-58, I-64.

[177] I-131, I-58.

[178] I-64.

[179] I-110.

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CHAPTER VII

The Radio Defense Corps of the Armed Forces.

27. Radio Defense Corps attempted to locate Allied agents' radio transmitters. The Radio Defense Corps of the Armed Forces (Oberkommando der Wehrmacht, Wehrmacht Nachrichtenverbindung, Funkueberwachung, abbreviated OKW/WNV/Fu) had as its mission the following tasks:

a. To locate, primarily by direction finding, all high frequency and very high frequency transmitters of illicit traffic within Axis Europe.

b. To evaluate illicit transmissions in regard to their nationality, their relation to net or control stations, their schedules, their probable missions and their potential value as a source of intelligence or counter-intelligence.

c. To intercept illicit traffic where valuable to Inspectorate 7/VI (In 7/VI); or

d. To capture and destroy agents and their transmitters when the Reich Main Security Office (RSHA) did not do so; or

e. To capture and employ such agents and their transmitters for counter-intelligence.

Approximately 2500 persons were engaged in these activities. During World War II the Radio Defense Corps was successful in the following instances:

a. It predicted and spotted all attacks on the German "Colmar bridgehead", in January 1945, by traffic analysis of French agent traffic in that locality.

[184] This chapter is based on IF-176, IF-140-B and I-115.

b. It located and captured a large Russian spy net which was known as the "Schulze-Boysen" net.

c. It located, intercepted, and furnished information for the capture of a net carrying illicit Czechoslovakian traffic.

d. It located, intercepted, and occasionally broke up traffic nets of Marshal Tito's agents.

e. It located an Italian test transmitter said by the Italians to be proof against direction finding.

f. It provided men, equipment, and information to Luftwaffe night fighters for locating and destroying Allied airborne agent control stations.

g. It set up an IBM section for recording and traffic analysis of unknown traffic.

The Radio Defense Corps failed as follows:

a. It could not maintain effective control over illicit traffic originating in France.

b. It could not control the Mihailovitch-Cairo traffic.

c. It could not control illicit transmissions in Warsaw.

d. It did not maintain effective liaison with the Reich Main Security Office (RSHA).

e. It had almost no liaison with the Italians.

The Radio Defense Corps was of the opinion that it could have performed more effectively if the Supreme Command had allocated more personnel to it.

28. Radio Defense Corps easily located American agents' transmitters at the beginning of the war. The Radio Defense Corps held the following opinions of the ability of Allied agents:

a. United States: initially poor with marked improvement toward the end of the war.

b. Great Britain: generally one of the best and unbreakable at the end of the war due to new procedures and the general breakdown of the Radio Defense Corps.

c. France: medium quality but with a tremendous advantage derived from the cooperation of a great portion of the French population.

d. Poland: very good especially in respectto mobility of transmitters.

e. Russia: technically poor but with a massive organization that precluded all but superficial German counter measures.

According to the Radio Defense Corps, measures that could have been taken by agents to make the location and recognition of their transmitters most difficult were:

a. The camouflage of agent traffic as authorized traffic of the country in which the agent was operating.

b. The camouflage of the agent control station traffic as regular traffic normally issuing from the country of origin.

c. The frequent change of frequency and time of transmission.

d. The frequent change of the position of the transmitter.

Measures that could have made locating of very high frequency transmitters difficult and ineffectual include:

a. The operation of transmitters on 6 to 12 meters, only at locations close to the front.

b. The use in each net of two separate frequencies by control station and the agent.

c. The elimination of transmissions in clear.

d. The use of very low power outputs.

e. The instruction of agents in the proper use of equipment so that messages would be copied completely on the first transmission.

29. Radio Defense Corps was not alone in its field. There were other organizations whose work paralleled or interlocked with the Radio Defense Corps:

a. The Military Intelligence Radio Supervising Office (Abwehr, Abteilung III Funkueberwachung 3) did direction finding for military intelligence purposes.

b. The 3rd Battalion Air Signals Regiment 352 (LN Regt 352) and its predecessors cooperated in direction finding.

c. The Reich Main Security Office (RSHA) and the Secret Field Police (Sicherheitsdienst Kommando, abbreviated S D Kommando and Sicherheits Polizei, abbreviated SIPO) normally handled the arrest and interrogation of agents in such a way that the work of the Radio Defense Corps in counter-intelligence was hindered.

d. Cryptanalysis for the Radio Defense Corps was done by Inspectorate 7/VI (In 7/VI).

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CHAPTER VIII

Laboratorium Feuerstein

30. History of Feuerstein Laboratory. One of the more fully exploited TICOM targets was the Laboratory Feuerstein which was located on a small mountain near Ebermannstadt in Upper Franconia some 15 miles from Bamberg and was owned and operated by Dr. Oskar Vierling. Since the laboratory and many of its projects have been described in considerable detail in special reports (In particular: I-43; E-7 to E-19)[189] and since evaluation and exploitation of the technical data in these reports is a matter for electronic engineers, the present chapter attempts merely a résumé of the history of the laboratory and a brief account of projects undertaken.

Essential to an understanding of the whole is the personality of the owner-director, Dr. Vierling. He was born in 1904 in Straubing and raised in a small town near Ebermannstadt. His parents were poor and after his local schooling he attended a school for mechanics in Nuernberg 1923/25. He then obtained a job as laboratory assistant in the National Office of Telegraph Technology in Berlin and after three years there joined the Heinrich Hertz Institute in 1928 to do oscillator research. During his ten years at the Institute he obtained his doctorate at the University of Berlin and contributed a number of papers on acoustics to reputable scientific journals. He also carried on private research for several concerns and was allowed to keep the income from his work.

In 1938 Dr. Vierling went to Hannover as director of high frequency and electro-acoustic research at the Technische Hochschule (graduate school of technology) there. Since the opportunities for advancement were slight, he proposed in 1939

joining the Siemens staff but was advised to start a private laboratory instead. This he did and Siemens paid a monthly retainer fee of 2000 marks for an option on all inventions. When this laboratory was bombed out, the site near Ebermannstadt was purchased, and Laboratorium Feuerstein (named for the mountain on which it sat) constructed. As Dr. Vierling's funds were inadequate he sought a loan from the German Army, but since the terms would have deprived him of real control, he sought and secured a bank loan which enabled him to complete the work. A small group remained in the vicinity of Hannover in charge of Dr. Sennheiser,[190] an associate who had purchased a part interest in that laboratory. From the time it opened in 1942 to the end of the war, the new laboratory at Feuerstein was subject to the usual "party" supervision.

For reasons of expediency, Dr. Vierling joined the "party" but seems to have been conspicuous by his failure to attend meetings and take any active part in party activities.[191] Close liaison was maintained with large manufacturing concerns which were to take over projects as soon as they reached production stage. Dr. Vierling claimed that his success in keeping his laboratory open was chiefly due to the fact that the larger concerns did not care to spend their time doing research on problems of a military nature with no peace-time applications. By standing well with the armed forces, Dr. Vierling seems to have been able to get high priorities despite his poor standing in the Party and even to have succeeded in doing a little work on the side on pet longrange projects not associated with the war.[192]

Shortly before the German collapse, Dr. Vierling was ordered to remove the speech privacy projects to the Bavarian Alps. Eventually a small laboratory was fitted up near Lofer in the Berchtesgaden area with Dr. Wilhem Göing[193] in charge but little was accomplished there. Dr. Vierling took the

[190] M-12.

[191] M-12, p 4.

[192] E-7.

[193] Göing was the Party representative at Feuerstein and documents were found showing that he was out for Vierling's scalp. M-12, p 4.

opportunity to rid himself of his ardent Nazis using the good excuse that they would be the most reliable persons to accompany the equipment south. He had also been ordered to destroy all other projects and equipment, but once the Nazis were gone he concealed much of his best equipment in the bombproof vault, screening it from inspectors by putting up a false wall, and hid a number of parts at various places in the vicinity. This done, he awaited developments.

When the laboratory was found by TICOM Team #4, it was being used as a German military hospital. When Dr. Vierling and some of his collaborators were found, they proved quite willing to tell about their work and to cooperate in restoring the laboratory to working condition and in reassembling dismantled projects. Under the direction of the TICOM investigators the available force of some 30 persons rushed work on selected projects and made new drawings to replace those destroyed. Dr. Vierling hoped this might help him keep his organization going during the transition period, feeling sure that he would later be able to employ his people on non-military research in acoustics.

The laboratory, consisting of a main building, two small special laboratories, Dr. Vierling's house, and some storage facilities, has been described in detail and photographed.[194] It is said to have been well built and admirably equipped.[195] Dr. Vierling said the investment in land, buildings, equipment and supplies amounted to 1,285,000 marks, equal in prewar exchange to $480,000.

As of Aug. 15, 1945, some 30 persons were engaged in work under TICOM direction. These included 10 engineers and physicists, 4 technicians, 6 mechanics, and 10 miscellaneous workers.[196] Apparently during the war a peak of 150 - 200 was

[194] E-7, E-17.

[195] Some notion of the adequacy of its equipment may be gained from the Appendices to E-7: App. b - instruments; App. c - sheet metal and forge shop tools; App. D - machine shop turning tools; App. E - 23 German scientific periodicals regularly received by the library; App. F - a list of Foreign periodicals Dr. Vierling would like to receive.

[196] See block diagram of Figure 5 apperded to E-7, and for some notes on five key men see E-7 App. G.

reached with many workers either over age or just out of school. Rules governing employment are interesting.[197] Wages seem to have been those usual for comparable work elsewhere in Germany while working conditions were superior. The staff seems to have worked in tolerable harmony.[198] A list of personnel is available in one of the TICOM publications.[199]

31. Special TICOM engineering team studied signal projects. When the hospital had been evacuated, and a special TICOM engineering team had assembled at Feuerstein late in July, the preliminary lists of projects were discussed, and certain groups of related projects were selected for intensive study. Dr. Vierling, who was quite willing to cooperate, started to clear out debris, recall key men, and reassemble equipment. The selected projects were set up, missing diagrams redrawn, and descriptions written. A decision by higher authority resulted on 16 August in the arrest of Dr. Vierling, the dispersal of his staff, and the dismantling of the laboratory, but in the time available much was accomplished. In the following paragraphs the major projects studied are enumerated without technical details.

a. Filter Design. Inasmuch as much of the work at Feuerstein depended for success upon accurate filters, and since Dr. Glubrecht, the expert in this field, seemed to have a knack with such designs, he was asked to design filters to meet difficult, though not impossible specifications, and to explain both his computations and his reasons for the selections he made. In this way the TICOM engineering team hoped to arrive at a reasonable estimate of the efficiency of his methods.[200] Standard type toroid coils and commercial condensers were used.

b. High Speed transmitters for agent's use. Four separate projects were involved:

[197] E-18.

[198] An exception was the case of Zappe who had been arrested for irregularities and disliked Dr. Vierling, cf. E-19, pp 5 and 10.

[199] M-6.

[200] E-12; E-7, p 43; M-4a m.

(1) an automatic high speed signal generator,
(2) a light weight transmitter,
(3) a carrier regenerator on the receiver, and
(4) a single side band demodulator.

When the dial of the signal generator was turned to any given letter a signal was generated and recorded on a steel wire or tape. This wire was run at high speed through the head of the transmitter (Taube) to make interception difficult, if not impossible. The carrier regenerator (Spitz) was originally designed to restore the suppressed carrier, while the single side band demodulator (Kaethe) received the intermediate frequency signal from an ordinary receiver (two instruments could be connected to demodulate two side bands independently). An interesting departure from American and British practice was that all filtering of carrier and side bands was at about 15 kc rather than at 100 kc.

Aside from the high speed, this equipment was intended to reduce tuning to a minimum, so that short messages might be sent with little risk of detection. It was said to be rather good.[201]

c. Speech Scramblers and associated equipment. The major speech scrambling project still under development at the end of the war was treated under three heads:

(1) A converter of the "Dudley" type consisting of an analyser and a synthesizer. The former measured certain features of speech and reported these measurements in the form of a small number of smoothly varying voltages which together constituted a running description of what was spoken into the microphone. The synthesizer used such a set of signal voltages to control an artificial speech reconstruction process resulting in a fair imitation of the original.

(2) Three fold wobbling the actual scrambling process, was the second step. As projected, the device would provide three stages of re-entrant band shifting, however, the device was only partially constructed.

(3) The wobbling called for a wobbling generator. A modified version of teleprinter cipher attachment SZ 42 was to supply the necessary key to render the whole secure.

[201] M-4a; E-8 pp. 8, 2 and 6; E-7 pp. 46, 48, 50.

Particular features proved of interest, but doubt was expressed by American engineers as to the practicability of the apparatus as a whole.[202]

d. Crystal controlled synchronization of cipher teleprinters (Gleichlauf).

Next to the speech scrambling devices, this seems to have attracted most attention. A quartz crystal 'mechanical' frequency generator [203] represented the first stage in this development. The synchronizating of two stations would be cut to a minimum since, once synchronized, both would run synchronously for 24 hours without resetting and send out enciphered space signals when no message was being transmitted. Such continuous transmission with adequate length of key would render it almost impossible for intercepters to determine where a message began or ended. The controlled synchronization would also overcome difficulties from interference and fading of signals and minimize the need for repetition of long parts of a message.

Intended for use with teleprinter cipher attachments of the SZ 42 type, the Gleichlauf project included, not merely development of the synchronizer, but also improvement in the cipher device itself, so that considerable information was obtained at Feuerstein respecting proposed changes in the Lorenz SZ machines.[204] Moreover, as above suggested, Dr. Vierling had visions of incorporating this principle in his speech scrambler. Rather full details were obtained.[205]

e. Teleprinter cipher attachments. In connection with the Gleichlauf problem several Lorenz cipher machines (SZ 38 and SZ 42) were turned over to Feuerstein for study. Vierling was to adapt them to the use of his synchronizer and also to improve the cipher mechanism and hence all Lorenz ideas in this connection were passed on to him. In consequence a fair picture of all contemplated changes could be secured.[206]

[202] Vocoder: E-10; E-7 p. 21; M-4a p. Three fold wobbler: E-11; E-7, p. 26; M-4a p. Gleichlauf: E-13; E-7, p. 37; M-4a n; I-43.

[203] M-4a h.

[204] E-14.

[205] I-43; E-13; E-14; E-7, p. 37; M-4a n.

[206] E-14.

32. Other Feuerstein projects were varied in nature. Feuerstein Laboratory projects of secondary importance to the TICOM engineering team were:

a. Acoustic torpedo: Feuerstein engineers (were used to) designed acoustic and filter components, AEG manufactured the torpedo.[207]

b. Schornsteinfeger, an anti-radar coating for submarines: depended on quarter (later eighth) wave length absorption.[208]

c. Nachtfee, a night fighter control system: based on phase modulation.[209]

d. Block circuit (wave trap) for intercept purposes. About the size of a matchbox, cheap and very efficient. Eliminated powerful, fixed stations thus permitting reception of weak signals. None found although produced in some number.[210]

e. Multiple frequency generation from one crystal: specially designed multi-vibrator circuits gave fully stable frequencies which were not harmonics of the basic crystal frequency. The model covered 80 spot frequencies with output of some 80 watts. Important to the Germans whose supply of crystals was limited.

f. Commercial radio receiver. High selectivity and sensitivity, used untuned IF and RF cirucits and replaced tuned circuits by filters. Sole tuning control was a tuned oscillator circuit. Essentially an efficient electrical band spread eliminating difficulty of HF tuning.

g. Voice frequency spectrograph. Two constructed for the laboratory with accuracy of 10-7.

h. Speech stretcher. Device permits recording on steel tape and reproducing at half (or double) speed without change of pitch. Valuable in increasing intelligibility of speech obscured by noise or high speed and where unknown dialects were involved.[211]

[207] Partial description in E-7, p. 54.

[208] Vierling stated that the only good protection was produced by IG Farben. E-7, p. 55.

[209] See E-7, p. 54. USN got two complete sets.

[210] M-2.

[211] E-7, p. 36.

i. High output centimetric transmitter. Work was done at Hannover on a high output Magnetron transmitter and a continuous output of 2 kw had been attained. Vierling told of work at Erlangen on a Klystron transmitter giving a much higher output.

j. Electronic calculator. Would solve equations up to and including N^6; resolve equations to sine and cosine functions where N^0 is represented by a fundamental frequency whose amplitude is proportionate to the coefficient and the second and third harmonics, etc. The result was to be obtained instantaneously both as an Elysian figure and as a spot on a cathode ray tube.[212]

[212] E-7, p 50.

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Chapter IX

Cryptologic Activities of the German Meteorological Service

33. German Meteorological Service was located in Berlin. The German Meteorological Service (Reich Wetterdienst) was located near Berlin at Glindow, Potsdam.[217] The Berlin headquarters, known as the Central Weather Service Group (Zentralwetterdienstgruppe), expanded during the war to include a secondary headquarters in Athens.[218] Little is reported in TICOM sources concerning the formal organization and size of the Service. It is reported that a cryptanalytic section was headed by a Senior Inspector Naumann who directed 10 specialists and 20 to 30 helpers.[219] The intercept and other functions of the Service were carried out by the Meteorological Intercept Control (Wetternachrictenueberwachung, abbreviated Wenueb) which was located at Glindow.[220] This group covered transmissions of German, German allied, and enemy weather reports.

An outstanding feature of the German Meteorological Service's organization was its close cooperation with the

[217] I-84, p 7.

[218] I-102, p 2.

[219] I-84, p 7.

[220] I-194, p 8.

German Air Force. Liaison extended down to the individual Luftflotten and to the various Signal Units of the German Air Force.[222] All German Air Force Signal Intelligence Units had standing orders to pass all weather information to the nearest weather station. This information was derived primarily from enemy planes in the area.[223] A weather evaluator was placed in Section B of the Chi/Stelle to expedite the handling of all weather data and messages and to see that the German Meteorological Service received all captured material relating to weather.[224] Cooperation with the German Air Force was hampered by poor communications during the early phases of the German campaigns in the Balkans and Russia.

Communications within the German Meteorological Service were normally by teleprinter networks in clear. This applied to communications within the occupied area in Russia. However, within German-allied areas such as Rumania, teleprinter traffic was enciphered.[225]

It may be inferred that weather reporting within the German framework was generally carried on in the usual manner. An example of the occasional unusual method is the dropping of parachutists behind the Russian lines for the purpose of sending back weather reports.[226]

34. Cryptographic Machines of the German Meteorological Service were those used by the German Army. For transmission of synoptics the German Meteorological Service originally used the international five-figure code with encipherment by means of substitution tables for the initial digraph and the final trigraph of each group. The period for each table was three hours. This system was dropped because the operators could not distinguish between clear code and the enciphered version;

[222] I-194.

[223] I-109.

[224] I-109.

[225] I-194, p 8.

[226] I-194, pp 10-11.

this resulted in security violations. To circumvent this difficulty, the five-figure group was represented as a six-figure group. The final digit of the first trigraph and the initial digit of the second trigraph represented the third digit of the original five-figure group. The six figures were then enciphered in the form of two trigraphs and transmitted as a six-figure group.

The substitution tables for the six-figure traffic were known as Siegfried tables. From 1943 on, Rumania, Hungary, and Bulgaria used the German six-figure system with a special set of substitution tables. Previous to this, an additive was used for the reports. Stations located at operational headquarters at the front used the six-figure system with a special set of tables. Earlier these front stations had used a "hand key" to obviate the need for distribution of tables.[227] Eventually, on the Eastern front the plugboard Enigma was used to encipher weather reports and cipher instructions of the German Meteorological Service.[228]

In 1943 and 1944, when the Germans became very active in Hungary, the reports (statements of general weather conditions, e. g., Fair and Warmer) were enciphered by use of a rectangle containing a limited vocabulary and three sets of sliding strips. The strips were used for a 3 or 4 month period. Regular synoptics were enciphered on the plugboard Enigma. This rectangle system was also used in 1943 by small airfields in the Crimea.[229]

One of the most common weather reporting systems was the Zenit Code. The Zenit Code was used originally in its form, but later its letter groups, and still later its figure groups, were enciphered. The Zenit Code was used by reconnaissance planes to report weather conditions over enemy territory. Allied air superiority forced the discontinuance of reports made while over enemy territory, and a time lag resulted when reports had to be delayed until the reconnaissance plans were again over German territory. As a supplement to the Zenit Code another code known as the Astra Figures was introduced.[230]

[227] I-194, pp 10-11.

[228] I-194, p 11.

[229] I-194, p 6.

[230] I-194, p 7.

Two other common systems for the encipherment of meteorological data were the Barbara Key, which was known to the Allies from 1939 on, but was not replaced until 1945, and the Raster, which was introduced in 1944. The Barbara Key is supposed to have been replaced by a new, and undescribed system prepared by Referat II B of Signal Intelligence Agency of the Supreme Command of the Armed Forces (OKW/Chi).[231]

The other machine beside the Enigma which has been mentioned for weather use was the Cipher Machine 41 a, Hagelin with interlocking motion, which was to have been used either with the standard keyboard or as a special model with 10 keys.[232] This may be the machine referred to as the replacement for the Enigma in January 1945 which gave the plain and cipher text on printed tapes.[233]

For telephonic communication of secret weather reports, cipher elements were limited to the cover name "FASAN", which indicated that the reports were weather, and the Group WIDDER, which preceded two 5 element groups which designated the station source. Encipherment of such reports took place only if the reports later went on the air.[234]

In regard to the German attitude toward the security of their own systems, the following statement of Dr. Walter Regula is of particular interest. "Russian military operations were faultlessly based on many years experience of climatic and weather conditions (it is thought) so that they did not need the current synoptics."[235] This statement was made relative to the question of whether the Russians worked on German weather systems.

35. <u>German Meteorological Service successfully cryptanalyzed Russian Weather Systems</u>. In 1939 and 1940, Germany stopped the circulation of reports and synoptics in clear.

[231] I-96, p 12.

[232] I-96.

[233] I-194.

[234] I-194.

[235] I-196.

This prompted similar action by the Russians. However, the Russians exchanged information concerning European Russia with Germany until the Germans discontinued because of the discovery that the Russians were giving the German information to the Allies.[236] Early Russian encipherment was by means of the "Copenhagen Cipher" with the later addition of additive tables.[237] In 1944 this system was worked on by the German Meteorological Service and by Regiment 353 using meteorological personnel.[238] Russian enciphering tables were captured early in the war and presented little difficulty.[239] Prior to the capture the Germans read only 2 or 3 days of each 3-week period.[240] The reconstructed and captured tables were used to read messages in Berlin, and then the messages were reenciphered and sent to all interested parties by radio. This sometimes resulted in a considerable time lag.[241] It soon became noticeable that the quality and quantity of Russian reports deteriorated. This gave rise to the belief that the Russians knew of the compromise.[242] The quality improved when the Russian front reached Hungary, but the cipher was so simple that front line units read the reports easily.[243]

The other major missions of the German Meteorological Service were concerned with British weather reports and reports from the Mediterranean area.[244] Although it has been stated that the British weather could be read once in a while,

[236] I-194, p 8.

[237] I-120.

[238] I-120.

[239] I-102.

[240] I-194.

[241] I-194.

[242] I-194.

[243] I-194.

[244] I-84.

the Signal Intelligence Agency of the Supreme Command of the Armed Forces (OKW/Chi) as a consultant was not able to break the British system introduced early in the war and the German Meteorological Service had no greater success.[245]

The fact that Canada, the United States, and Asiatic Russia did not encipher weather at the beginning of the war was of inestimable aid to Germany.[246] The Athens group was aided considerably by the fact that reports from Egypt and Sudan were not enciphered.[247] Further, the fact that reports from the Azores continued to be unenciphered for many months after the Allied occupation was of great assistance.[248]

It would appear that there was little interest in the United States reports. Little, if any, work was done on American systems, and most of the necessary information was obtained from the reports in clear sent by the Air Force.[249]

In 1941 and 1942, the Turkish weather systems were easily broken, but later changes made solution impossible.[250] It has been categorically stated that no attempts was made to read Japanese systems.[251]

The German Meteorological Service's success may be measured in part by the fact that in winter of 1942-1943 it had available almost all of the European and many non-European secret weather reports and synoptics in greater volume than all the data normally available in peacetime.[252] The intercept facilities of the German Meteorological Service were of added value in that they were able to predict the Allied air attacks from Southern Italy on Rumania and Hungary by evaluating the turning traffic over the various airfields.[253]

[245] I-102, I-84.

[246] I-194.

[247] I-102.

[248] I-194.

[249] I-84, I-102.

[250] I-194.

[251] I-84.

[252] I-194.

[253] I-194.

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Chapter X Origin and Operations of TICOM

36. Origin of "TICOM".-- "TICOM" is the cover name for a joint combined "Target Intelligence Committee." This committee, formed in October, 1944, acted under the authority and on behalf of the Chairman, London Sigint Board (British), the Chief of Staff, ETOUSA, and the European Commander in Chief of the U. S. Navy (COMNAVEU).[258] As constituted, the Committee's operations were limited to the European Theater of Operations. TICOM was purely an Anglo-American organization[259] to exploit specifically the main German signal intelligence installations and organizations.

Four main general considerations were involved. First, in order to improve allied code and cipher security, it was essential for the Anglo-Americans to get data on German cryptanalytic successes with British and American systems. Second, it was also essential to capitalize on the German knowledge of Japanese systems. Third, it was desirable to exploit the research and planning undertaken by the Germans to improve their own cryptographic security. Lastly, it was imperative, after exploitation, to disperse personnel and destroy installations, thus preventing a re-emergence of the German cryptanalytic effort after the cessation of hostilities.

37. Mission and operations of "TICOM".-- The initial planning was done chiefly at Government Code and Cypher School in England. Detailed briefs were compiled covering the locations

[258] See directives attached as Appendices # 1-5 of this chapter; War Department, Chief of Staff, ltr of August 7, 1944; U. S. Navy, COMINCH, ltr 002577 of Sept. 5, 1944; GG, ETOUSA, ltr of October 9, 1944. (SHAEF/ISC/41); U. S. Navy, OP-20-G, Memo of September 15, 1944; SHAEF, Message S-84149, dated 15, 1945.

[259] I-1, dated October 14, 1944.

and personnel of the principal German cryptanalytic organizations. All available sources were used, including Ultra. Initial consideration was given to six targets, all of them then located in the Berlin area.[260] Priority I was given to the Signal Intelligence Agency of the Supreme Command of the Armed Forces (OKW/Chi), thought to be the principal diplomatic cryptanalytic agency. Priority II was assigned to three agencies: (1) Army Inspectorate 7/VI (OKH/In 7/VI), tentatively located in the Jueterbog area; (2) The Signal Intelligence Agency of the Air Force High Command (OKL/LN ABT/350), pinpointed at Potsdam-Wildpark and (3) The Signal Intelligence Agency of the Navy High Command (OKM/4 SKL/III), then located at Eberswalde. Priority III was assigned to two other targets: (1) The Army High Command Signal Intelligence Control Station (OKH/Chef HNW/LNA), located at Zossen; and (2) the German Admiralty Headquarters ("Koralle") located in the Lanke area. It is notable that Goering's "Research Bureau" (FA) and the Foreign Office Cryptanalytic Section (Pers Z S) were either not known or not listed at the time. Neither were the changes in German army signal intelligence organization after October, 1944, properly outlined and evaluated.

All of the six priority organizations listed above were designated as Class B targets, that is, large Sigint installations to be exploited by TICOM specialists. The smaller sigint organizations which had operated with tactical commands (Class A Targets) were to be exploited in the same manner as other captured personnel and installations, with TICOM specialists available if requested.

Since the Class "B" targets listed above were located in the Berlin area, an area eventually to be occupied by Russian forces, initial consideration was given to a plan worked out in conjunction with T(arget)-Force, Berlin. This plan contemplated a simultaneous seizure and exploitation of the chief sigint centers through an air-borne action. Plans for this action were nearly completed in December, 1944. By February, 1945, it was clear that the proposed action was no longer feasible. The rapid Allied advances, the tactical, administrative and diplomatic problems involved, and the fact that most of the chief centers had either decentralized their activities, moved, or were preparing to move, were the decisive factors in the decision.

[260] I-1, Appendix .

The ultimate action which TICOM took in regard to exploitation was based largely upon expediency. The exploitation plan, as revised in March, 1945, provided for six U. S.-British target exploitation teams. In the actual exploitation, team assignments were largely disregarded. Administrative questions and availability of personnel were the principal criteria used for assignments. Teams were dispatched to targets as they were overrun, notice being channeled back through the British Intelligence 21 Army Group, through Signal Intelligence Division (SID), ETOUSA, or through General Staff - Intelligence (GSI(s)), SHAEF. All six teams were eventually dispatched to targets.

Only two major German sigint centers were found reasonably intact and controlling the majority of their assigned personnel. Team #6, the first team sent out, left the United Kingdom in April, 1945, and operated in the Neumuenster-Ploen-Flensburg area. It succeeded in apprehending and isolating most of the key personnel in the Signal Intelligence Agency of the Navy High Command (OKM/4 SKL/III). Team #3 operated in the Halle-Weimar-Leipzig area from the end of April, 1945, until May 15, 1945. It succeeded in apprehending and evacuating most of the personnel and some of the documents belonging to the German Foreign Office Cryptanalytic Section (Pers Z S).

Due to circumstances beyond their control the other teams did not achieve similar success. Goering's "Research" Bureau (FA), the Signal Intelligence Agency of the Supreme Command of the Armed Forces (OKW/Chi), the army installations, and the Signal Intelligence Agency of the Air Force High Command (OKL/LN Abt-350) had all been partially dispersed out of Berlin due to the bombings. In March and April, 1945, these agencies had attempted to move southwards into the Munich-Salzburg area. As transportation became more and more chaotic, and as place after place was overrun by the Allied armies, most of the organizations seem to have disintegrated. Equipment and records were lost or destroyed, and personnel returned to their homes, or simply scattered at the approach of the allied armies.

Team #1, dispatched to the Berchtesgaden area to search for traces of the Signal Intelligence Agency of the Supreme Command of the Armed Forces (OKW/Chi), turned up the former headquarters of Goering's "Research" Bureau (FA and a handful of its personnel, secured the radio teleprinter communications train which had been attached to Field Marshal Kesselring's headquarters, and located a German unit designed to intercept Russian non-Morse (Baudot) traffic. Team #2, sent to the same general area with no specific mission, searched the Innsbruck area, and was eventually dispatched to the Pilsen area, where

it took charge of and evacuated the key personnel in the Army Signal Intelligence Regiment (KONA #1) attached to Army Group Center. Team #4 left the United Kingdom in June, 1945, and proceeded to the vicinity of Ebermannstadt, where it exploited the Vierling Laboratory (speech scrambling development) at Unterstein. It also made an unsuccessful search for documents of the Signal Intelligence Agency of the Supreme Command of the Armed Forces (OKW/Chi) in the Schliersee area. Team #5, consisting of two officers only, supervised the diving operations in Schliersee which recovered many of the Cryptanalytic records belonging to the Signal Intelligence Agency of the Supreme Command of the Armed Forces (OKW/Chi).

38. Appraisal of the TICOM operation.--In appraising the TICOM operations, then, it can be said that the effort achieved partial success in its principal objective--the exploitation of all the principal German Sigint centers. Through the efforts of Teams #3 and #6, detailed information was secured on the organization and successes of the Naval and Foreign Office cryptanalytic organizations. The Signal Intelligence Agency of the Supreme Command of the Armed Forces (OKW/Chi) personnel who gave themselves up at Flensburg or were fished out of prisoner of war channels, together with the Schliersee documents, have produced a reasonably complete picture of the OKW/Chi organization, operations, and successes. Dr. Voegele, the chief cryptanalyst of the Signal Intelligence Agency of the Air Force High Command (OKL/LN ABT/350), was captured in the French area. His information, with that supplied by senior German Air Force signal officers and technical personnel at forward units, produced a good picture of the German Air Force Signal Intelligence Service and its cryptanalytic achievements (although much of the information was secured by agencies other than TICOM). The first definite information on Goering's "Research" Bureau came with the discovery of its former headquarters at Kaufbeuren A few of its personnel were taken, but its records and machinery were never located. The army organizations, with the notable exceptions of Nachrichten Aufklaerungs Abteilung 11 (NAA 11), in Norway, the German Signal Intelligence Regiment #1, Kommandeur der Nachrichten Aufklaerung #1 (KONA #1), and a handful of specialists, seem to have dissolved neatly into prisoner of war camps or the German countryside.

The TICOM organization continued to function until November 25, 1945, in order to register and distribute the documents captured.

WAR DEPARTMENT
THE CHIEF OF STAFF
WASHINGTON

August 7, 1944

Dear Eisenhower:

Following up my radio to you of August 7th concerning the organization of an American team to participate with the British Government Code and Cipher School in an investigation of German Signal Intelligence activities, I am enclosing a list of subjects for inquiry. The attached tab sets forth in itemized form the matters which we believe should receive primary attention. This schedule should be considered merely as a preliminary guide for the nature of the material uncovered in the early stages and in a large extent govern the course of the investigation.

Faithfully yours,

/s/ G. Marshall

G. Marshall

General D. D. Eisenhower,
Supreme Headquarters
Allied Expeditionary Force
London, England

Certified a true copy,

T. J. BETTS
Brigadier General

SCHEDULE OF SUBJECTS FOR INVESTIGATION

1. Complete cryptographic and cryptanalytic data on file at German centers, as well as equipment and operating instructions pertaining to the same.

2. Information as to the exchange of technical cryptographic and cryptanalytic knowledge between the Germans and other Axis powers, together with information on the cryptographic and cryptanalytic methods used by the latter so far as is known to the Germans.

3. Equipment used for intercept and direction finding purposes; special methods and apparatus for the rapid forwarding of raw material to cryptanalytic centers.

4. Methods and procedures employed in traffic analysis.

5. Methods and procedures employed in correlating and fusing information from traffic analysis and cryptanalysis.

6. Speech secrecy equipment, cryptographic facsimile encipherment, and all non-Morse cryptographic equipment as used both on wire lines and on radio circuits.

7. The chemical names as well as the military designations of all secret inks, the formula of the developers, details of the manufacture of micro-photographs, and all details of all methods, film and paper.

8. Radio and radar-jamming and anti-jamming equipment and techniques.

9. Complete information on the HS-293 and FX-1400 guided missiles, together with complete details of other similar remote control equipment.

Certified a true copy.

T. J. BETTS,
Brigadier General.

UNITED STATES FLEET
HQ OF THE COMMANDER IN CHIEF
NAVY DEPARTMENT
WASHINGTON, DC

FFI/A8

Serial: 002577 6 Sept. 44

TOP SECRET

From : Commander in Chief, U. S. Fleet

To : Commander, TWELFTH Fleet ,

Subj : Plan for Examination of German Radio Intelligence Organization

1. A combined British-United States plan is being evolved for the examination of the German radio intelligence organization immediately following the cessation of hostilities. The participation of the U. S. Navy in this project is to be conducted jointly with the U. S. Army.

2. Colonel George A. Bicher, AUS, now on duty at Supreme Headquarters, Allied Expeditionary Forces, has been directed by the Chief of Staff, U. S. Army, to assume direction of the U. S. Army participation in this project. Lieutenant Commander Robert B. Ely, III, USNR, now on duty in the Office of the Chief of Naval Operations, is being ordered to report to Commander, TWELFTH Fleet in order to assume direction of the U. S. Navy participation. Additional naval personnel will be assigned as necessary. It is the present intention not to order any naval officers senior to rank of commander to this project; therefore, all naval personnel will be under the immediate direction of Colonel Bicher.

3. Detailed instructions will be issued to Lieutenant Commander Ely prior to his departure from Washington.

4. It is desired that the naval party engaged in this project be afforded all facilities that will assist it in the accomplishment of its mission.

/s/ R. S. EDWARDS
Chief of Staff.

Copy to: CoS, U.S. Army (G-2)
Op-20-G

HEADQUARTERS
EUROPEAN THEATER OF OPERATIONS
OFFICE OF THE COMMANDING GENERAL

SHAEF/ISC/41 9 October, 1944

SUBJECT: Investigation of German Signal Intelligence Centers, Personnel and Equipment.

TO : Colonel George A BICHER,
Signal Intelligence Division,
OCSIGO, ETOUSA, APO 887.

1. The Chief of Staff, U. S. Army, in a letter to the Supreme Commander, Allied Expeditionary Force dated 7 August 1944, directed that an American organization participate jointly with the British in plans for a complete investigation of German Signal Intelligence Centers, personnel and equipment prior to and after cessation of hostilities.

2. As Director, Signal Intelligence Division, Office of the Chief Signal Officer, ETOUSA, you are directed by authority of the above mentioned letter, to effect the necessary liaison with the British authorities on this matter and to formulate plans to carry out the wishes of the Chief of Staff, U. S. Army, for presentation to this Haedquarters.

3. In this connection you are further advised that by letter of 6 September 1944, the Chief of Staff, U. S. Navy directed that the U. S. Navy join with the U. S. Army in this mission, and appointed Lieutenant Commander Robert B. Ely III, USNR, to assume direction of the U. S. Navy participation. By the terms of this letter Lieutenant Commander Ely and all other naval personnel will be under your immediate direction.

By command of General EISENHOWER:

T. J. BETTS,
Brigadier General.

CONFIDENTIAL
Op-20-G/ar

15 September 1944

MEMORANDUM

From: Assistant Director Naval Communications (OP-20-G).
TO : Lt. Comdr. R. B. Ely, USNR.

Subj: Instructions Concerning Special Duty.

Ref: (a) Letter of General Marshall to General Eisenhower of August 7, and enclosed list of subjects.
(b) COMINCH Serial 002577 of 6 Sept 1944.

1. In accordance with reference (b), you will be in charge of the naval participation in the plan covered by references (a) and (b), under the immediate direction of Colonel G. A. Bicher, AUS.

2. Op-20-G's interests in the plan include all of the items set out in the enclosure to reference (a), except paragraphs 8 and 9, with the following additions:

Item 2 We are likewise interested in any collaboration with neutral or non-belligerent powers.

Item 10 (new) Complete information as to devices, methods and procedures in handling transmitter and operator identification.

3. As soon as possible after arrival in U. K., confer with Colonel Bicher to cover the following points:

(a) the estimated number, location, and nature of targets.
(b) the anticipated changes in these targets.
(c) the existing arrangements for personnel and material to cover these targets.
(d) the kind and number of additional personnel which it appears should be provided by the U. S. Navy to assist in the conduct of this mission.

4. Upon conclusion, and, if necessary, during these conferences, full reports and recommendations should be sent to Op-20-G, employing CSP 1803 held by Commander TWELFTH Fleet.

5. Reports and recommendations thereafter will be made upon any changes in the basic plan being proposed which require the concurrence of the Director of Naval Communications, and upon such changes being made.

/s/ P. R. Kinney

P. R. KINNEY
Captain, U. S. Navy

S H A E F

Staff Message Control

OUTGOING MESSAGE

p r i o r i t y

TO: SIXTH ARMY GROUP FOR G-2, TWELFTH ARMY GROUP FOR G-2, EXFOR FOR GSI

FROM: SHAEF MAIN SIGNED SCAEF CITE: SHGBI

REF NO: S-84149 TOO: 051500B

1. Particularly desirable is special handling of German signal intelligence targets which may be overrun and captured with or without previous knowledge of their location. A signal intelligence target consists of:

(A) A center at which German codes and ciphers are produced or at which research is done on them, or

(B) A center at which cryptanalysis, interception and traffic analysis, or other activity to gain intelligence from non-German signals is carried out.

2. TICOM is a joint combined target intelligence committee organized to implement the desires of the Chief of Staff, US Army, the Commander in Chief, US Fleet, and the Chairman LONDON Sigint Board, and made responsible for the complete exploitation of German signal intelligence centers.

3. Upon location of such a target, it is desired that the custody of the target be released to the nearest Sigint Unit, who will seal it and establish a guard, notifying by fastest possible means thru Sigint channels the Director, SID, ETOUSA or Director War Station of the nature and extent of the target.

4. TICOM experts will be dispatched at the discretion of the Director, SID, ETOUSA or Director War Station for the purpose of exploiting the target, and they are hereby authorized

to take exclusive custody of the target, and to return any or all of its contents direct to such places as may be designated by them. On completion of their investigations the target will be released to the occupying force.

5. Instructions contained herein are to be applied to special targets as defined above and do not conflict with existing instructions for the passing back of captured Sigint documents and equipment from normal enemy message centers through Sigint channels.

6. It is desired that all units down to and including divisions and all Sigint units be notified of these instructions.

ORIGINATOR: G-2 AUTHENTICATION: T. J. BETTS, BRIG. GENERAL

INFORMATION: SGS
G-3
G-4
SIGNALS
OM ZONE
G-2 WAR DIARY
SHAEF FWD
SUMMARY
AG RECORDS

VOLUME 8

Chapter XI

The Chief Signal Officer of the Supreme Command of the Armed Forces and the Armed Forces Signal Communications Group

39. The Armed Forces Signal Communications Group as a subject of interest to TICOM. Determination of the authority or authorities responsible for direction and coordination of all Signal intelligence matters in the German Armed Forces is pertinent for an understanding of the relationships between the various service agencies studied by TICOM, the Signal Intelligence Agency of the Supreme Command of the Armed Forces (OKW/WFSt/AgWNV/Chi), the Radio Defense Corps (OKW/WFSt/AgWNV/Fu III), the Signal Intelligence Agency of the Army High Command (OKH/GdNA), the Signal Intelligence Agency of the Air Force High Command (OKL/LN Abt 350), and the Signal Intelligence Agency of the Navy High Command (OKM 4 SKL/III). The TICOM Interrogations only afford general statements that liaison did or did not exist (the implication generally is that liaison left much to be desired) although investigation of the work records and reconstruction of the operations of

the various agencies have indicated considerable exchange and cooperation. (In some instances better relations existed between individual service agencies and the two known non-service agencies, the Foreign Office Cryptanalytic Section (Pers ZS) and Goering's "Research" Bureau (FA)the Nazi Party radio intelligence and cryptanalytic agency) than existed among the service agencies themselves. An original German document giving the organization of the Armed Forces Signal Communications Group and indication of the duties and responsibilities of its components is available dated 28 September 1944.[270] The picture presented by this document is valid only for this date. Additional documents are available and have been used in the TICOM report on the Signal Intelligence Agency of the Supreme Command of the Armed Forces which shows the changes which were effected up to the end of the war.[271]

40. Provenance of Ticom information on the Armed Forces Signal Communications Group. This document was obtained from Lt. Col. Arntz, the aide of General Praun, the Chief Signal Officer (Chef WNV). Arntz had been the aide of Praun's predecessor, General Fellgiebel, who was executed for his part in the 20th of July plot. Arntz stated that Fellgiebel had informed him of the plot prior to the attempt on Hitler's life and for this reason Arntz, although undetected by the Gestapo, availed himself of an opportunity to inspect front-line divisions and surrendered near Remagen. He brought with him the documents cited and volunteered additional information in his various interrogations.[272]

[270] IF 163-C, "Anlage zu AgWNV/Z Ia Nr 2109/44 geh 28 Sept 44." IF 163-D, Appendix to Armed Forces Signal Communication, Operations Section Nr. 2109/44 Confidential dated 28 September 1944 is the translation.

[271] See Volume III Chart 1 showing the organization of the Signal Intelligence Agency of the Supreme Command of the Armed Forces. Cf. I 3 9, DF 8, 9, and 12.

[272] IF 163, parts A-E and IF 108. IF 163 is the field interrogation of Arntz and photostats of the documents he brought with him. IF 108 is the CSDIC (Combined Service Detailed Interrogation Center) interrogation.

41. Position of the Chief Signal Officer of the Supreme Command of the Armed Forces for coordinating signal and signal intelligence matters. One of the departmental divisions of the Armed Forces Operations Staff of the Supreme Command of the Armed Forces (Oberkommando der Wehrmacht/Wehrmacht Fuehrungsstab, abbreviated OKW/WFSt) was the Armed Forces Signal Communications Group (Amtsgruppe Wehrmacht Nachrichten Verbindung, abbreviated AgWNV). The Chief Signal Officer (Chef WNV) was the head of this department and at the same time held the office of Chief Signal Officer of the Army High Command (Chef des Heeres Nachrichtenwesens, abbreviated Chef HNW):

Chief Signal Officer, Supreme Command
of the Armed Forces
(Chef WNV)
and
Chief Signal Officer of the Army
High Command
(Chef HNW)
Lieutenant General Praun
(formerly Fellgiebel)

- Armed Forces Signal Communication Group (OKW/AgWNV) Lieutenant General Gimmler (formerly Thiele)
  - Armed Forces Radio Security Section (OKW/AgWNV/Fu) Colonel Rosenkranz
  - Armed Forces Wire Communications (OKW/AgWNV/KFA) Colonel v. Knobelsdorff-Brenkerhoff
  - Armed Forces Signal Equipment (OKW/AgWNV/GBN) Colonel Dr. Inge. Grube
  - Signal Intelligence Agency of the Supreme Command of the Armed Forces (OKW/AgWNV/Chi) Colonel Kettler (See Volume III Chart 17)
- Army High Command Signal Communications Troops (OKH/Kdr.FNT) Colonel Ahrens
  - Signal Intelligence Agency of Army High Command (OKH/GdNA) Colonel Boetzel (See Volume IV Chart 2)

It is apparent that Praun was in a position to effect any necessary liaison between the Supreme Command of the Armed Forces Communications Group and the related Army High Command agencies. Keitel stated that Praun, in addition to his double function of working for both the Supreme Command of the Armed Forces and for the Army High Command, was also in close contact with the Navy High Command and with the Luftwaffe and drew personnel from them.[273] This presumably applies to Signals personnel in general rather than to Signal Intelligence personnel or even cryptanalysts. Arntz testified to the efforts of Praun, based on personal liaison, to improve relations with the Navy, Air Force, and Reserve Army in Signal Equipment matters and infers that the high position of Doenitz, Goering, and Himmler, the heads of these organizations, made any cooperation extremely difficult.[274]

42. Detailed description of the duties of the component sections of the Armed Forces Signal Communication Group based on a translated German document. The following description of the Armed Forces Signal Communications Group is based on translations of the organization order of 28 September 1944. The available translations have been checked against the German original and where necessary the German terms will be indicated.[275] The actual telephone numbers of the various agencies and even the home telephones of the departmental heads are given on the order but have not been reproduced here. All but the Radio Security Section were reached through the headquarters switchboard of the Supreme Command of the Armed Forces, it was reached through the switchboard "Dietrich". The order reads:

> Appendix to Armed Forces Signal Communications, Operations Section Nr 2109/44 Confidential (Geheime). 28 September 1944.
>
> Extract from the directives and work schedules for the Chief Signal Officer of the Supreme Command of the Armed Forces and the Chief of the Armed Forces Signal Communications Group and subordinate departments.

[273] Keitel, Chief of Armed Forces High Command, I 143.

[274] IF 108 p 2, paragraphs 10, 11, and 12.

[275] The German original is IF 163-D, the document brought in by Arntz. This is translated verbatim in IF 163-C. Another version, which omits some of the Teutonic details, is IF 108, the CSDIC interrogation report on Lt. Col. Arntz circulated by the British.

Chef WNV 1). The Chief Signal Officer of the Supreme Command of the Armed Forces controls Armed Force Signal Commands. His permanent deputy is the Chief of the Armed Forces Signal Communication Group. . . . . .
Lt. Gen. Praun
Outer Office, Registry of Top Secret Correspondence.

AgWNV 2). Chief of the Armed Forces Signal Communications Group.
Lt. Gen. Gimmler
Outer Office, Duty Officer.

The Armed Forces Signal Communications Group includes:

Central Group	(Z-Zentral Gruppe)
Military Wire Communications	(KFA-Kriegsfernmeldeabteilung)
Chief of Signal Equipment	(GBN-Generalbevollmaechtigter Für Techn. Nachrichtenmittel)
Radio Security Section	(Fu-Abteilung Funkwesen)
Signal Intelligence Agency	(Chi-Chiffrier Abteilung)

The Armed Forces Signal Communication Group is the agency through which the Chief Signal Officer controls the Armed Force Signals Commands. The Signal Commands are authorized to carry on correspondence with the Armed Forces Signal Communications Group by virtue of their position in the chain of command.

AgWNV/Z 3) Central Group is the agency through which the Chief Signal Officer of the Supreme Command of the Armed Forces coordinates the control of the Armed Forces Signal Administration Group. Lt. Col. Trosken

Z Ia: Employment and Organization, Directives, Journal, Mobilization and Demobilization.
Major Adler

Z Ib: Personnel, Travel, Assignments, Transfers, peace-time and war-time T/O's and T/E's, furloughs, billets, alternate offices, regulations, gas and air defense. Major Proebster

Z Id: Administration, business, finance, transfer of foreign currency, pay classifications, illnesses and accidents of employees, group festivities,

papers for official trips, ration cards for clothing and equipment, subsidies and assistance, furlough control. Civil Official (Amtsrat) Waak

Z Ie: Liaison office in the Post Office Department (RPM), business dealings with the Post Office by the Armed Forces in nonsignal technical matters, deferments from military service, special wire-communication personnel. Lt. Col. Neumann

Registry Office. Secretariat of Central Group, unclassified and Confidential letter registers. Neitzel (civilian)

AgWN V/KFA 4) Military Wire Communications Section, responsible for Armed Forces Wire Communications, organized into sub-sections (Stabs-referate). Col. v. Knobelsdorff-Brinkerhoff.
Outer Office-Secret Letter Register

St/O: Internal department matters, personnel matters, correspondence concerning specialist personnel of the Post Office Department, procurement and employing personnel for special missions, motor vehicles and motor fuel. Major Brueggen

St/P: Planning and construction of channels for long and very long distance traffic (long distance cables, carrier frequencies, decimeter and radio teletype lines), large signal installations, installations and equipment for field headquarters, spare parts and supplies for carrier frequency and decimeter lines, employment of specialist personnel of the Post Office Department and the Long Distance Cable Company, Technical advice. KVR (War Official?) Pippart

St/F: Armed Forces Signal Officer at Hitler's Headquarters. Major Lohse

KFA I: Network layout according to tactical situation, gaurding of signal installations against air raid damage (jointly with St/P), arrangements for communications for special trains, special missions, agencies served outside the Armed Forces and allied (Axis) nations, employment of special units, basic problems of signal communications, traffic monitoring, priorities in signal traffic, official extensions in residences, administration of equipment. Major Magnussen

KFA II: Raw material control, procurement and supply, priorities for procurement and special construction projects, Long Distance Cable Planning Committee, financial planning for construction projects with government funds, depots for apparatus and technical installations ("LATE"), depots for telegraph construction material ("LYBZ").
Civil Official (Amtsrat) Keutel

KFA III: Wiring plans for all agencies served, card indexes and plans of special net works.
Lt. Col. Dr. Bethge

Secretariat: Confidential and Unclassified Register.
Civilian Schack

AgWNV/Fu 5) Radio Security Section. Col. Rosenkranz

Fu I: Organization and employment, basic radio regulations for Armed Forces and government Agencies, special radio connections, T/O's.
Major v. Laffert

Fu Ia: Radio traffic at field head quarters, officer personnel, detachments, journal, reports on activities, section orders, special certificates.
Capt. Pohmer

Fu Ia^{1}: Employment and distribution of codes, Armed Forces code regulations, enlisted and civilian personnel, internal department matters.
Capt. Mushake

Fu Ib: Radio traffic control for Armed Forces and government agencies, general frequency distribution, control of broadcasting and sections, identification of hostile propaganda stations, wartime radio transmitting permits.
Civilian Mohr

Fu II: Procurement of equipment for Radio Counter-Intelligence, for OKW and government agencies, priorities, raw material allotments, procurement of motor vehicles, evaluation of equipment of agents.
Col. Fuchs

Fu III: THE RADIO DEFENSE CORPS. Supervision of Radio counter-intelligence cooperation with

other counter-intelligence (Abwehr) organizations.[276]
Major v. Barry

Secretariat: Secret, Confidential, and unclassified letter register, conducting of business transaction.
Secretary Reinhardt

AgWNV/GBN 6) Chief of signal Equipment. Securing of signal equipment for Armed Forces and government agencies, control over development and manufacture, special missions.[277]
Col. Dr. Inge Grube
Outer Office, Secret Register.

GBN/A: Staff Specialist, internal department matters.
Major Zellien.

GBN/B: Special Supply problems, particularly spare parts supply, equipment repair.
Capt. Gorn

GBN/St: (Officer for special assignments), special missions, export, in-short-supply metals.
Major Tuexen

GBN/I: Wire Communication equipment.
Major Henkel

GBN/II: Radio and special communication equipment.
Major Dipl. Ing. Gloeckner

GBN/III: Military economy and general economic matters (industrial matters, labor, raw materials, priorities).
Major Doelitzsch

GBN/IV: Tube Office (wire and radio).
Col. Baldus

[276]For a full discussion of the Radio Defense Corps see the write up of that organization. The field organization, its operations, liaison with the Abwehr and Reich Main Security Office and Italian Counter-Intelligence, and an evaluation of its techniques is available from the written report of a field commander of a counter-intelligence regiment in the West, Captain Wilhelm Kelch (IF 176) Discussion of the history of the Radio Defense Corps, personalities, cryptanalytic liaison, etcetera may be found in the interrogations of Arntz (IF 108 and IF 163) and of Mettig of the Signal Intelligence Agency of the Supreme Command of the Armed Forces, I 115. Also see I 21, 26, 162.

[277]It should be noted that a separate organization for development and supply of signal equipment existed in the Reserve Army under Himmler, the Army Ordnance Developing and Testing Group, Signal Branch. Arntz testified to Praun's difficulties in securing cooperation at so high a level.

GBN/Secretariat: Registry of Confidential and unclassified letters. Civilian Triphan ("Min. Reg.")

AgWNV/Chi 7) THE SIGNAL INTELLIGENCE AGENCY OF THE SUPREME COMMAND OF THE ARMED FORCES. Col. Kettler

Chi/Z: Personnel, internal department matters. Major Lober Secretariat

Chi/I: Organization, employment. Major Mettig

Chi/II: Evaluation of Radio messages. Lt. Col. Seyfarth

Chi/III: Reception of radio messages. Lt. Col. Kaehler

Technical radio specialist. Civilian Official (Reg Baurat) Salzbrunn

Chi/IV: Decoding (Cryptanalytic) Group. Principal Specialist Fenner

Chi/V: Wire Communications. Technical Inspector ("Techn.Obinsp.") (N) Buck

Chi/X: Special problems "X" in accordance with special instructions. Lt. Col. v. Kalchstein

43. Relation of the Armed Forces Signal Communications Group to the Amt Ausland und Abwehr of the Supreme Command of the Armed Forces and to the Reich Main Security Office. From the duties assigned to the various departments of the Armed Forces Signal Communications Group it will be seen that the Armed Forces Signal Communications Group was concerned with the signal communication phase of general censorship. The primary responsibility for wartime censorship was given to a separate division of the Supreme Command of the Armed Forces, the Amt Auslandnachrichten und Abwehr (Foreign Intelligence and Defense-the last specifically involving the employment of agents by the Germans and counter-intelligence measures against agents).[278]

[278] TF29, Die Ueberwachung des Nachrichtenverkehrs im Kriege, is the Secret regulations and duties of the German censorship organization. The issuing authority is not given nor is the date but the Abwehr is named as the responsible authority in the Supreme Command of the Armed Forces.

The functions of the Amt Ausland und Abwehr were taken over in early 1944 by Himmler in the Reich Main Security Office (RSHA). The functions were divided, responsibility for censorship and counter-intelligence being given to the Gestapo (Amt IV of RSHA) and the foreign intelligence functions going to Amt Ausland (Amt VI, under Schellenberg).[279] The Abwehr field organization was not disturbed in the reorganization, however, but was directed by the Reich Main Security Office. Various officials of the Abwehr were involved in the 20th of July Plot, e.g. Admiral Canaris and Col. Hanson, former heads of the Abwehr. Details of the censorship organization and of the Amt Ausland und Abwehr of the Supreme Command of the Armed Forces have not been investigated by TICOM.

[279]For details of the Abwehr see IF 216 A and B. For the organization of the Reich Main Security Office see the same documents and the interrogation of the head of Amt VI of RSHA, Schellenberg, IF 164. Some discussion of the relation of the Abwehr with the Signal Intelligence Agency of the Supreme Command of the Armed Forces is given in the volume on that agency, Volume III. The RSHA and the Abwehr are also discussed in connection with Goering's Research Bureau, Volume VII, paragraph 6.

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Chapter XII. Physical Compromises

44. Introduction.--A part--probably a very small part--of the success of the Axis powers in dealing with foreign cryptographic systems was due to physical compromise of the systems. Unfortunately it is in most cases not possible to determine by what route the information reached Axis hands. A few cases are known to be of the "cloak-and-dagger" type, wherein a document was bought or stolen. More are cases of simple capture, either in action, or after the owner had fled, as at Dunkirk. But most of the instances of physical compromise known from TICOM sources are known only in the barest outlines: either a prisoner of war simply said, "We had a copy of such-and-such," or the copy itself was liberated by one of the TICOM teams.

45. United States Systems.--It has been stated that "the Germans, Hungarians, Italians, Finns and Japanese... all...had copies of most of the State Department codes and some of the strip systems... ." From "a source believed to be reliable" comes the report that the first American codes obtained by the Finns came from the United States Legation at Sofia. The Japanese had obtained these codes "at an unknown date early in the war" by bribing person or persons unknown. The Hungarian Intelligence Service was the middleman in this deal. According to the same source, the Japanese gave the American codes to the Russians, and these systems are also in the possession of the Swedes and French. In fact, American codes seem to have attained as catholic a distribution as American money. Systems involved in this complex of skulduggery are said to include State Department codes, Military Attaché Confidential Code No. 2, and strip ciphers.[285]

[285] IF-260.

The United States systems known from TICOM sources to have been physically compromised by European Axis powers are:

The State Department A-1 Code;[286]
The Brown Code;[287]
A code called by the Germans "Z-3" or "Red";[288]
A Military Attaché 5-letter code, no designation known, which the Italians received from the Hungarians;[289]
"War Department Confidential Code No. 2", a Military Attaché system;[290]
A Military Attaché 5-letter code called by the Germans "Mil I";[291]
A Navy strip cipher which the Germans called "DUPYH" from the indicator.[292]

The State Department A-1 Code, called "B 6 a" by the Germans, was in 1941 in the hands of the Cryptanalytic Agency of the Supreme Command Armed Forces (OKW/Chi), which sent a photograph of it to the Foreign Office Cryptanalytic Section (Pers Z S).[293]

286 I-22 p 10; DF-15 p IV. The photostat itself was picked up by TICOM.

287 I-22 p 10; DF-15 p IV; IF-1524 p 9. See also IF-1518 pp 4-5. This photostat is in TICOMMA files as TF-10.

288 DF-15 p III.

289 IF-1524 p 4.

290 DF-15 p V.

291 DF-15 p 3.

292 I-93 p 9.

293 DF-15 p IV.

The Brown Code was likewise received by the Foreign Office Cryptanalytic Section (Pers Z S) from the Cryptanalytic Agency of the Supreme Command Armed Forces (OKW/Chi). This took place in June 1941;[294] but it is claimed that the code had already been broken before that.[295] This code was also in the hands of the Italians.[296]

The code which the Germans called "Z-3" or "Red" was a consular code of which the Germans say it was "solved, later captured and photographed due to lack of caution on the part of the Consul General at Frankfort a/M, but without instructions for encipherment, these instructions were captured later."[297]

The Military Attaché code received by the Italians from the Hungarians was one which the Hungarians had apparently tried unsuccessfully to strip. It went out of use in October 1942.[298]

The system called by the Germans "War Department Confidential Code No. 2" was in the possession of the German Foreign Office in photostat form; we do not know by what means it was obtained.[299]

The code which the Germans called "Mil I" was also in the possession of the German Foreign Office.[300]

Part of the Navy strip cipher "DUPYH" was in the possession of the German Navy, which claimed to have obtained the copy from the Japanese, who, according to the Germans, got it in 1942 from an unknown source.[301]

294 DF-15 p IV.

295 I-22 p 10.

296 IF-1524 p 9.

297 DF-15 p III

298 IF-1524 p 4.

299 DF-15 p V.

300 DF-15 p 3.

301 I-93 p 9.

46. Systems other than United States.--Two other codes of which the German Foreign Office Cryptanalytic Section (Pers Z S) received copies from the Cryptanalytic Agency of the Supreme Command Armed Forces (OKW/Chi) were a Brazilian diplomatic code (ASA trigraph BZD)[302] and a Portuguese diplomatic code. The latter was loaned in December 1942 for photographing, along with some of the substitution tables.[303]

Late in 1944 the Germans came into possession of a Manchurian codebook which had been stolen from the Manchurian Legation after the unreliable character in charge of it had failed to lock it up. A photostat was made and turned over to the Cryptanalytic Agency of the Supreme Command Armed Forces (OKW/Chi).[304]

On the subject of Rumanian codes the Italians were particularly boastful, claiming to have read all of them with the aid of photostatic copies.[305] They did not, however, reveal the source of all this bounty.

We know of two cases of physical compromise in connection with cipher machines, other than tactical capture of machines such as at Dunkirk and from downed planes. One was a "small cipher machine of Swedish origin" which had been "bought by the English" and was "in the possession of OKW"--we do not know how OKW got it. The Germans claimed to have read all messages from the Italian theater enciphered by this machine.[306]

The other was a Croatian Enigma machine which the Germans were able to compromise before it was ever used because a German firm made the machines and reported the wirings promptly to the German authorities. To be doubly sure, the Germans even bought one of the first keys used.[307]

[302] D-16, 1941 Report, p 3.

[303] D-16, 1942 Report, p 3.

[304] I-177 p 2.

[305] IF-1521 p 1.

[306] I-76 p 2.

[307] I-92 p 2.

Probably the simplest way to steal cryptographic material from someone is to walk into his office and pick it up. This was tried by the Germans--not on their enemies, to be sure, but on the Italians immediately after the armistice of 1943. Two German lieutenants walked into the Italian cipher office in Athens and began to pack up the material they saw lying about. But some Italian officers came in and "began shouting rather excitedly"--as well they might--so the Germans discreetly retreated--fetching along, however, what booty they had already collected. It turned out to include an enciphering table for use with the "Ellade" code.[308]

An example of how chicanery can double back upon itself and confound its perpetrator is the case of a Turkish code which the German Reich Main Security Office (RSHA) bought from the Hungarians and delivered to the Cryptanalytic Agency of the Supreme Command Armed Forces (OKW/Chi), which then discovered that the code was one which it had broken and given to the Hungarians over a year before.[309]

A breakdown by countries of the systems reported by German and Italian prisoners of war as having been physically compromised shows the following distribution:

France	25 codes and ciphers
United Kingdom	9 codes and ciphers
Yugoslavia	4 codes and ciphers
Rumania and Turkey	4 codes each.
Russia	2 codes
Belgium, Brazil, Bulgaria, Chile, Greece, Manchuria, Mexico, Poland, Portugal, Spain, and Uruguay	1 code each

It will be noticed that the above list and the one in the last paragraph of this paper show French systems in the overwhelming majority. To what extent this can be ascribed to the "voluntary" relinquishment of codes after the fall of France, we cannot say; but it seems almost certain that the French defeat did swell the lists somewhat.

308 I-100 p 2.

309 I-132 p 2.

In addition to those compromises reported in prisoner of war interrogations, there are numerous ones known to TICOM only because the compromised material itself was picked up. It is in most cases impossible to determine the manner of capture of these systems, though in one instance the material did have a note attached giving the place of capture.[310] Especially when material was found among belongings of the Cryptanalytic Agency of the Supreme Command Armed Forces (OKW/Chi), there is no way of determining its origin; for it was specifically ordered that the three armed forces should place all captured material, on demand, at the disposal of this agency.[311]

An enumeration of the physically compromised systems known to TICOM only through samples follows:

France	68 codes and ciphers.
Greece	1 code.
Italy	1 code.
Poland	3 codes.
Portugal	1 code.
Rumania	2 codes.
Yugoslavia	1 code.

[310] T 477. The note was found with two of the three Polish Navy codes it mentions. It was addressed to the Signal Intelligence Agency of the German Navy High Command (OKM 4 SKL III), and signed Kempf, who was Chief of the Cryptanalytic Agency of the Supreme Command Armed Forces (OKW/Chi). Translated, it reads: "As enclosure, 3 Navy signal books captured in the cryptographic archives of the 2nd Dept. of the Polish General Staff (Pyry, 13 km south of the center of Warsaw) are being transferred for keeping."

[311] T 1620. The order is dated 1 Nov 1944.

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TAB A

A 27. "List of Documents Received from Hungarian Crypt. Unit Eggenfelden." A TICOM document.

Abwehr.--Military Intelligence.

Adler,_____, Major. Chief of Section Ia of Central Group of Armed Forces Communication Group (Employment and Organization, Directive, Journal, Mobilization and Imobilization)

Ag WNV (Amtsgruppe Wehrmacht Nachrichten Verbindung).--Armed Forces Signal Communications Group.

Ahrnens,_____, Col. Commander of Signal Communication Groups under Army High Command (OKH/Kdr. FNT.

Air Force Intelligence Service.--Servicio Informazioni Aeronautica (SIA).

Ame,_____, Brigadier General. Head of Italian Army Intelligence Service.

Amtsgruppe Wehrmacht Nachrichten Verbindung (Ag WNV).--Armed Forces Signal Communications Group.

Armed Forces Operations Staff of the Supreme Command of the Armed Forces.--Oberkommando der Wehrmacht/Wehrmacht Fuehrungsstab (OKW/WFSt).

Armed Forces Signal Communications.--Wehrmachtnachrichtenverbindungen (WNV).

Armed Forces Signal Communications Group.--Amtsgruppe Wehrmacht Nachrichten Verbindung (Ag WNV).

Army High Command Signal Intelligence Control Station.--Oberkommando des Heeres/Chef des Heeres Nachrichten Wesens/ Leitstelle der Nachrichten Aufklärung (OKH/Chef HNW/LNA).

Army Ordnance, Development and Testing Group, Signal Branch.--Chef der Heeresruestung und Befehlshaber des Ersatzheeres, Amtsgruppe fuer Entwicklung und Pruefung des Heereswaffenamts, Waffen Pruefung, Abteilung 7 (Wa Pruef 7).

Army Signal Intelligence Regiment.--Kommandeur Der Nachrichten Aufklärung (KONA).

Arntz,_____, Lt. Col. Aide of Gen. Praun, Chief Signal Officer of Armed Forces.

Baldus,_____, Col. Chief of Section IV of Signal Equipment.
v. Barry,_____, Major. Chief of Section III of the Radio Security Section.
Bethge,_____, Lt. Col. Dr. Chief of Section III of Armed Forces Communications Group Wire Communication.
Biggi, Augusto, Capt. Italian cryptanalyst. Did liaison work with Germans regarding IBM machinery.
Brueggen,_____, Major. Chief of Subsection O of the Armed Forces Communications Group Wire Communication, Section [illegible].
Buck,_____, Technical Inspector. Chief of Chi/V of the Signal Intelligence Agency of the Supreme Command of the Armed Forces.
Canale, Aldo, Col. Chief of Secretariat Section of SIM. Succeeded Col. Nasta.
Canaris,_____, Admiral. Official of Abwehr, involved in July 20th plot.
Central Weather Group.--Zentralwetterdienstgruppe.
Chef der Heeresruestung und Befehlshaber des Ersatzheeres, Amtsgruppe fuer Entwicklung und Pruefung des Heereswaffenamts, Waffen Pruefung, Abteilung 7 (Wa Pruef 7).--Army Ordnance, Development and Testing Group, Signal Branch.
Chef des Heeres Nachrichten Wesens (Chef HNW).--Chief Signal Officer of the Army High Command.
Chef HNW (Chef des Heeres Nachrichten Wesens).--Chief Signal Officer of the Army High Command.
Chief Signal Officer of the Army High Command.--Chef des Heeres Nachrichten Wesens (Chef HNW).
Chiffrierstelle, Oberbefehlshaber der Luftwaffe (Chi-Stelle Ob d L).--Signal Intelligence Agency of the Commander in Chief of the Air Force.
Cipher Bureau of the German War Ministry. Predecessor to the Signal Intelligence Agency of the Supreme Command Armed Forces (OKW/Chi).
Chi-Stelle Ob d L (Chiffrierstelle, Oberbefehlshaber der Luftwaffe).--Signal Intelligence Agency of the Commander in Chief of the Air Force.
COMINCH.--Commander in Chief.
Combined Service Detailed Interrogation Center.--CSDIC.
COMNAVEU.--European Commander in Chief of United States Navy.
"Cryptanalytic Party" of the Eighth Army. Directly responsible to 8th Army, and had no direct connection with SIM.
Cryptanalytic Section of the German Foreign Office.--Sonderdienst des Referats Z in der Personal Abteilung des Auswaertigen Amtes (Pers Z S).
CSDIC.--Combined Service Detailed Interrogation Center.

D 16. "Translation of Annual Progress Reports by Pers ZS covering 1927, 1941, and 1942." A TICOM publication.

D 59. "Notes and Minutes of High-Level Meetings held at OKW/Chi--Cryptographic and Administrative. A TICOM Document.

DF 15. "Berichte der A Gruppe." American Systems worked on by Germans.

De Monte,_____, Commandante. Chief of the Cryptanalytic Sub-Section of SIS.

De Witt,_____, Major. Italian cryptanalyst.

Doelitzsch,_____, Major. Chief of Section III of Signal Equipment.

Doenitz, Karl, Grand Admiral Commander in Chief, German Navy; Reich Chancellor after Hitler's death.

E 7. "Final Report on the Technical Exploitation of the FEUERSTEIN LABORATORY (Director: Dr. Oskar Vierling) carried out by a Special Team under TICOM auspices." A TICOM publication.

E 8. "Detailed Feuerstein Technical Project Report. Reference No. 1 - Agents Transmitter "Taube", Single Sideband Demodulator "Kaethe" and Carrier Regenerator "Spitz"." A TICOM publication.

E 9. "Detailed Feuerstein Technical Project Report. Ref. No. 2; Little Baustein." A TICOM publication.

E 10. "Detailed Feuerstein Technical Project Report. Ref. No. 3: Artificial Speech and Encoding." A TICOM publication.

E 11. "Detailed Feuerstein Technical Project Report, Ref. No. 4: Three-fold Wobbulation and Mechanical Wobbulator Generators." A TICOM publication.

E 12. "Detailed Feuerstein Technical Project Report, Ref. No. 5: Filter Design and Construction." A TICOM publication.

E 13. "Detailed Feuerstein Technical Project Ref. No. 6: Synchronous Cipher System for Teletypewriters--Gleichlauf." A TICOM publication.

E 14. "Detailed Feuerstein Technical Project Report, Ref. No. 7: Investigation of SZ Cipher Machines at Feuerstein Laboratory." A TICOM publication.

E 15. "Detailed Feuerstein Technical Project Report, Ref. No. 8: Wave Analyser." A TICOM publication.

E 16. Detailed Feuerstein Technical Project Report, Ref. No. 9: Ein Neues Elektrisches Sprechgerät zur Nachbildung der Menschlichen Vokale von Karl Willy Wagner." A TICOM publication.

E 17. "Detailed Feuerstein Technical Project Report, Ref. No. 10: Feuerstein Laboratory Plans." A TICOM publication.

E 18. "Detailed Feuerstein Technical Project Report, Ref. No. 11: "Betriebsordnung" Laboratory Rules." A TICOM publication.

E 19. "Detailed Feuerstein Technical Project Report, Ref. No. 12: Technical Interrogation of Feuerstein Employees Dr. Fritz Sennheiser and Wolfgang Martini." A TICOM publication.

Emer, Guido, Lt. Col. Officer in charge of the 8th Army Cryptanalytic Party.

ETOUSA.--European Theater of Operations United States Army.

FA (Forschungsamt).--Goering's "Research" Bureau.

Fellgiebel, Erich, Lt. General. Chief Signal Officer of Army and Armed Forces High Commands from beginning of War until he was executed in 1944.

Fenner, _____, Principal Specialist. Chief of Chi/IV of the Signal Intelligence Agency of the Supreme Command of the Armed Forces.

Forschungsamt (FA).--Goering's Research Bureau.

Foschini, _____, Dr. Director of SID.

Fuchs, _____, Col. Chief of Section II of Radio Security Section.

Gamba, General Vittorio. Chief of Cryptanalytic Section from World War I to Armistice of World War II.

Gastaldo, _____, Col. Chief of Army Intelligence Subsection of SIM. Succeeded Col. Pasquale.

GCCS.--Government Code and Cypher School.

Geheime Staats Polizei (Gestapo).--German Secret State Police.

Gentscheff, Major I. G. Head of the Bulgarian cryptanalytic Agency.

German Meteorological Service.--Reich Wetterdients.

German Secret State Police.--Geheime Staats Polizei (Gestapo).

Gestapo (Geheime Staats Polizei).--German Secret State Police.

Gimmler, _____, Maj. Gen. Chief of Army Ordnance Development and Testing Group Signal Branch (Wa Pruef 7) 1939-1943. Chief Signal Officer to Commander in Chief West, 1943-1945. Chief of Armed Forces Communication Group (Chef Ag WNV).

Gloeckener, _____, Major, Graduate Engineer. Chief of Section II of Signal Equipment.

Goering, Hermam, Reichsmarschall. Commander in Chief of German Air Force, German Air Minister, etc.

Goerings's Research Bureau.--Forschungsamt (FA). One of the six principal German Cryptologic Organizations.

Gorn,_____, Capt. Chief of Section B of Signal Equipment.

Göing, Dr. Wilhem. Nazi Party representative at Feuerstein; in charge of a small laboratory near Lofer in the Berchtesgaden area.

Grube,_____, Col. Dr. Chief of Signal Equipment.

GSI.--General Staff Intelligence.

Hallama,_____, Col. Reported as head of the Finnish cipher section.

Hanson,_____, Col. Official of Abwehr, involved in July 20 plot.

Henkel,_____, Major. Chief of Section I of Signal Equipment.

Himmler, Heinrich. Reichsfuehrer SS, Minister of Interior, Chief of German Police.

Huettenhain, Senior Specialist Dr. Erich. Principal Cryptanalyst of the Signal Intelligence Agency of the Supreme Command, Armed Forces (OKW/Chi).

I 1. "Final Report on TICOM Team 3 on Final Exploitation of Burgscheidungen." A TICOM publication.

I 12. "Translation of the Preliminary Interrogation of O.R.R. Tranow of 4/SKL II/OICM, carried out at Flensburg on 24-25 May 1945 by TICOM Team 6. A TICOM publication.

I 16. Notes on Interrogation of Amsrat Schwabe and Obfkmstr. Warsecha on Russian Naval Cyphers. A TICOM publication.

I 21. Preliminary Interrogation of Oberst Kettler, R.R. Dr. Huettenhain, Sdf. Dr. Fricke and Obl[illegible] Schubert (OKH/Chi).

I 22. "Interrogation of German Cryptographers of Pers ZS Department of Auswaertiges Amt." A TICOM publication.

I 25. "Interrogation of RLM/Forschungsamt Members: Dr. Paetzel, R. R. Fingerhut, R. R. Oden, Dr. Klautsche and Min. Rat. Seifert, at Schloss Gluecksburg on 15, 21 June 1945." A TICOM publication.

I 29. Third Interrogation of Oberstltn. Friedrich, Chief of the G.A.F. Signals Intelligence Service. A TICOM publication

I 31. Detailed Interrogations of Dr. Huettenhain formerly head of research section of OKW/Chi, 18th-21st June 1945. A TICOM publication.

I 43. Report Written by Vierling On:
a) Synchronising Device for Teleprinters (Gleichlauf)

b) Artificial Speech Apparatus
c) "Three-fold wobbling" process
d) Synchronising installation for producing the "wobble-frequencies"
e) Voice-Scrambling Apparatus (small BAUSTEIN)

A TICOM publication.

I 54. Second Interrogation of Five Members of the RLM/Forschungsamt. A TICOM publication.

I 57. Enciphering Devices worked on by Dr. Liebknecht at Wa Pruef 7. A TICOM publication.

I 58. Interrogation of Dr. Otto Buggisch of OKW/Chi. A TICOM publication.

I 64. Answers by Wm. Buggisch of OKH/Chi to Questions sent by TICOM. A TICOM publication.

I 65. Interrogation Report on Four Members of the G. A. F. Sigint Service. A TICOM publication.

I 72. First Part of the Report by Wm. Buggisch on S.G.41. A TICOM publication.

I 76. "Interrogation Reports on Lehwold, Haupts, Klett and Lauerbach." A TICOM publication.

I 78. Interrogation of Oberstlt. Mettig on the History and Achievements of OKH/AHA/In. 7/VI. A TICOM publication.

I 82. P.O.W. Interrogation Report-Dr. Werner Liebknecht of Wa Pruef 7 of the Heereswaffenamt. A TICOM publication.

I 84. Further Interrogation of R.R. Dr. Huettenhain and Sdf. Dr. Fricke of OKW/Chi. A TICOM publication.

I 92. "Final Interrogation of the Wachtmeister Otto Buggisch (OKH/In. 7/VI and OKW/Chi)." A TICOM publication.

I 93. "Detailed Interrogation of Members of OKM/4 SKL/III at Flensburg." A TICOM publication.

I 96. "Interrogation of Oberstlt. Mettig on the Organization and Activities of OKW/Chi." A TICOM publication.

I 100. "Report by Uffg. Herzfeld of NAAST 5 (Gen. d. NA) on the work of the Italian Referat of IM 7/VI." A TICOM publication.

I 102. "Interrogation Report on Dr. Sebastian of the German Met. Service on Allied Met. Systems." A TICOM publication.

I 105. "Interrogation report on Frau von Nida (wife of Major Wolfgang von Nida, onetime deputy Head of OKW/Chi)." A TICOM publication.

I 106. Final Interrogation Report on the Norway Party (NAA 11)." A TICOM publication.

I 109. "Translation of a Report by Lt. Ludwig of Chi Stelle Ob.d.L. (Ref.B) based on questions set for him at A.D.I.(K)." A TICOM publication.

I 110. "Information on Radio Communication Circuits operated in Conjunction with Feuerstein Laboratories." A TICOM publication.

I 111. "Further Interrogation of Oberstlt. Mettig of OKW/Chi on 14th September 1945. A TICOM publication.

I 115. "Further Interrogation of Oberstlt. Mettig of OKW/Chi on the German Wireless Security Service (Funküberwachung)." A TICOM publication.

I 116. "Report of Interrogation of Ltn. Alex Dettmann and Oberwachtmeister Sergius Samsonow of OKH (Gen.d.NA.) at Oberursel, Germany, during August 1945." A TICOM publication.

I 118. Joint Reports by Reg. Rat Dr. Huettenhain and Sdf. Dr. Fricke, written at C.S.D.I.C. on or about 28th August 1945. 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 130. Homework by Hauptmann Herold, O.C. Ln. Regt. III/353. A TICOM publication.

I 131. Obstlt. Mettig of OKW/Chi on WA Pruef 7 and RLM/Forschungsamt. A TICOM publication.

I 132. Notes by Huettenhain and Fricke on OKW/Chi and the German I.S. A TICOM publication.

I 141. Interrogation of Amtsrat Schulze of 4 SKL III. A TICOM publication.

I 142. P/W Barthel's Account of German Work on British, American, Swedish, and French Machine Ciphers. A TICOM publication.

I 143. "Report on the Interrogation of Five Leading Germans at Nuer nberg on 27th Sept. 1945." A TICOM publication.

I 177. "Interrogation of Kirfel on Far Eastern Systems." A TICOM publication.

I 193. "Interrogation of SS Obersturmbahnfuehrer Urban, Liaison Officer of RSHA/VI with the Crypto Bureau of Hungarian General Staff." A TICOM publication.

I 194. "Report by Dr. Regula on German Meteorological Intelligence Service." A TICOM publication.

IF 15. Final Report of TICOM Team 1 on the exploitation of Kaufbeuren and the Berchtesgaden area. From TICOM.

IF 108. "Interrogation of Oblt. Arntz." CSDIC (U.K) SIR 1606.

IF 140 B. German D/Fing in France. Nov. 13, 1945. War Dept. Strategic Services Unit.

IF 163. Photostatic copies of reports:(a) Statements by Arntz, 23 March 1945. (b) Organization and location of German Army Signal Intelligence Service in the West, 26 March 1945. (c) Appendix to Armed Forces Signal Administration, Operations Section, 28 Sept. 1944. (d) Translation of above appendix. (e) Employment, organization of the Signal Corps, 16 Jan. 1945. Hq. 12th Army.

IF 164. "Report on Interrogation of Walter Schellenberg."

IF 176. Seabourne Report. Vol III. "Operations and Techniques of the Radio Defense Corps, German Wehrmacht." From Commanding General, 9th Air Force.

IF 209. Italian Communications Intelligence. Report by Admiral Maugeri with U.S. Navy Introduction.

IF 260. Correspondence, MIS-OSS, on Finish Cryptanalytic Liaison with other Powers.

IF 1500. Italian Intelligence Service: Report on "Organization and Working of the Servizio Informazioni Esercito (S.I.E.) within the period 1/11/41--15/6/43." SCI/560/67 Oct. 18 1944.

IF 1501. First detailed interrogation report of Giuseppe SAMARUGHI. CSDIC/CMF/Y 29.

IF 1502. First detailed interrogation of Giuseppe DOSI. CSDIC (MAIN)/Y 16 21 Nov. 1944.

IF 1517. First detailed interrogation of Augusto BIGI, who worked in the Cryptographic Section of SIM before the Armistice and in SID afterward. CSDIC/CMF/Y 4. 8 Sept. 1944.

IF 1518. First detailed Interrogation of Vittorio Gamba, director of SIM Cryptographic Section until Armistice. CSDIC/CMF/Y 7. 16 Oct. 1944.

IF 1519. First detailed interrogation of Franco SCUILERI. CSDIC/CMF/Y 8.

IF 1520. First Detailed Interrogation og Guido EMER. CSDIC/CMF/Y 8. Oct 22, 1944.

IF 1523. First Detailed Interrogation of Giovanni Gramola, pertaining to Turkish, French, British, and USA traffic. CSDIC (MAIN)/Y 24.

IF 1524. First Detailed Interrogation Report on Three SID Cryptographers -- de Witt, Biagi, Carlini. CSDIC/CMF/Y 32.

IF 1526. Second Detailed Interrogation Report on Five Italian SID Cryptographers -- de Witt, Biagi, Ulieni, Carlini, and Barbagallo. CSDIC/CMF/Y 35.

IF 1527. First Detailed Interrogation Report of Alberto Barbagallo, Italian Naval Cryptographer. CSDIC/CMF/Y 34.

Inspectorate 7/VI of Army High Command.--Oberkommando des Heeres/Inspektion 7/VI (OKH/In 7/VI).

Italian Army Intelligence Service.--Servizio Informazioni Militari (SIM).

Italian Defense Intelligence Service.--Servizio Informazioni Difesa (SID).

Italian Navy Intelligence Service.--Servizio Informazioni Speciali (SIS).

Kaehler,_____, Lt. Col. Chief of Chi/III of the Signal Intelligence Agency of the Supreme Command of the Armed Forces.

". Kalckstein,_____, Lt. Col. Chief of Chi/X of the Signal Intelligence Agency of the Supreme Command of the Armed Forces.

Kettler,_____, Col. Chief of Signal Intelligence Agency of the Supreme Command of the Armed Forces.

Keutel,_____, Mr. Chief of Section II of Armed Forces Communications Group Wire Communication.

Klob, Otto, Dr. Director of Austrian Cipher Bureau until October, 1945.

von Knobelsdorff-Brenkerhoff, Col. Commander of Armed Forces Wire Communications (OKW/Ag WNV/KFA).

Kommandeur der Nachrichten Aufklärung (KONA).--Army Signal Intelligence Regiment.

KONA (Kommandeur der Nachrichten Aufklärung).--Army Signal Intelligence Regiment.

". Laffert,_____, Major. Chief of Section I of the Radio Security Section.

Liebknecht, Werner, Graduate Engineer Dr. Chief of section IIIh of Army Ordnance, Development and Testing Group, Signal Branch (Wa Pruef 7), research agency for developing voice scramblers.

Lober,_____, Major. Chief of the Signal Intelligence Agency of the Supreme Command of the Armed Forces.

Lohse,_____, Major. Chief of Subsection F of the Armed Forces Communications Group Wire Communication, Section 4.

M 1. Vierling's Laboratory at Ebermannstadt. A TICOM publication.

M 2. Major Barlow's Report on Dr. Vierling's Laboratory. A TICOM publication.

M 4a. Full Preliminary Report of Investigation of Dr. Vierling's Laboratory "Feuerstein" -- by Major Heller. A TICOM publication.

M 6. Interim Report on Laboratorium Feuerstein -- by Lieuts. Howard and Tompkins, U.S.N.R. A TICOM publication.

M 12. CIOS Target Evaluation Report on Laboratorium Feuerstein, Ebermannstadt. A TICOM publication.

Magnussen,_____, Major. Chief of Section I of Armed Forces Communications Group Wire Communication.

Menzer,_____, Senior Inspector. Chief of Section IIc of Signal Intelligence Agency, Supreme Command Armed Forces (OKW/Chi) which dealt with the development of cipher machines.

Meteorological Intercept Control.--Wetternachrichtenueberwachung (Wenueb).

Mettig,_____, Lt. Col. Head of In 7/VI from Nov. 1941 to June 1943; Second in Command of OKW/Chi from Dec. 1943 to April 1945.

Military Intelligence.--Abwehr.

Mohr,_____, Mr. Chief of Section Ib of Radio Security Section.

Mushake,_____, Capt. Chief of Section Ial of Radio Security Section.

NAA (Nachrichten Aufklärungs Abteilung).--Signal Intelligence Regiment.

Nachrichten Aufklärungs Abteilung (NAA).--Signal Intelligence Regiment.

Nasta,_____, Col. Chief of Secretariat Section of SIM.

Naumann,_____, Senior Inspector. Chief of cryptanalytic section of German Meterological Service.

Neitzel,_____, Mr. Chief of Registry Office.

Neumann,_____, Lt. Col. Head of Section Ie of Central Group of Armed Forces Communications Group.

Oberkommando der Luftwaffe/Luftnachrichten Abteilung 350 (OKL/LN ABT/350).--Signal Intelligence Agency of the Air Force High Command.

Oberkommando der Marine/4 Seekriegsleitung III (OKM/4 SKL/III).--Signal Intelligence Agency of the Navy High Command.

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

Oberkommando der Wehrmacht, Wehrmacht Nachrichtenverbindung, Funkueberwachung (OKW/WNV/Fu).--Radio Defense Corps of the Armed Forces.

Oberkommando der Wehrmacht/Wehrmacht Fuehrungsstab (OKW/WFSt).--Armed Forces Operations Staff of the Supreme Command of the Armed Forces.

Oberkommando des Heeres/Chef des Heeres Nachrichten Wesens/Leitstelle der Nachrichten Aufklärung (OKH/Chef HNW/LNA).--Army High Command Signal Intelligence Control Station.

Oberkommando des Heeres/General der Nachrichten Aufklaerung (OKH/GdNA).--Signal Intelligence Agency of the Army High Command.

Oberkommando des Heeres/Inspektion 7/IV (OKH/In 7/IV).--Signal Security Agency of the Army High Command.

Oberkommando des Heeres/Inspektion 7/VI (OKH/In 7/VI).--Inspectorate 7/VI of the Army High Command.

OKH/Chef HNW/LNA (Oberkommando des Heeres/Chef des Heeres Nachrichten Wesens/Leitstelle der Nachrichten Aufklärung.--Army High Command Signal Intelligence Control Station.

OKH/GdNA (Oberkommando des Heeres/General der Nachrichten Aufklaerung).--Signal Intelligence Agency of the Army High Command.

OKH/In 7/IV (Oberkommando des Heeres/Inspektion 7/IV).--Signal Security Agency of the Army High Command.

OKH/In 7/VI (Oberkommando des Heeres/Inspektion 7/VI).--Inspectorate 7/VI of the Army High Command.

OKL/LN Abt/350 (Oberkommando der Luftwaffe/Luftnachrichten Abteilung 350).--Signal Intelligence Agency of the Air Force High Command.

OKM/4 SKL/III (Oberkommando der Marine/4 Seekriegsleitung III).--Signal Intelligence Agency of the Navy High Command.

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

OKW/WFSt (Oberkommando der Wehrmacht/Wehrmacht Fuehrungsstab).--Armed Forces Operations Staff of the Supreme Command of the Armed Forces.

OKW/WNV/Fu (Oberkommando der Wehrmacht, Wehrmacht Nachrichtenverbindung, Funkueberwachung).--Radio Defense Corps of the Armed Forces.

Pale, Erkki, Captain. In command of cryptanalytic unit in Finland.

Pasquale,_____, Col. Chief of Army Intelligence Sub-section of SIM.

Pers Z S (Sonderdienst des Referats Z in der Personalabteilung des Auswaertigen Amtes). --Cryptanalytic Section of the German Foreign Office.

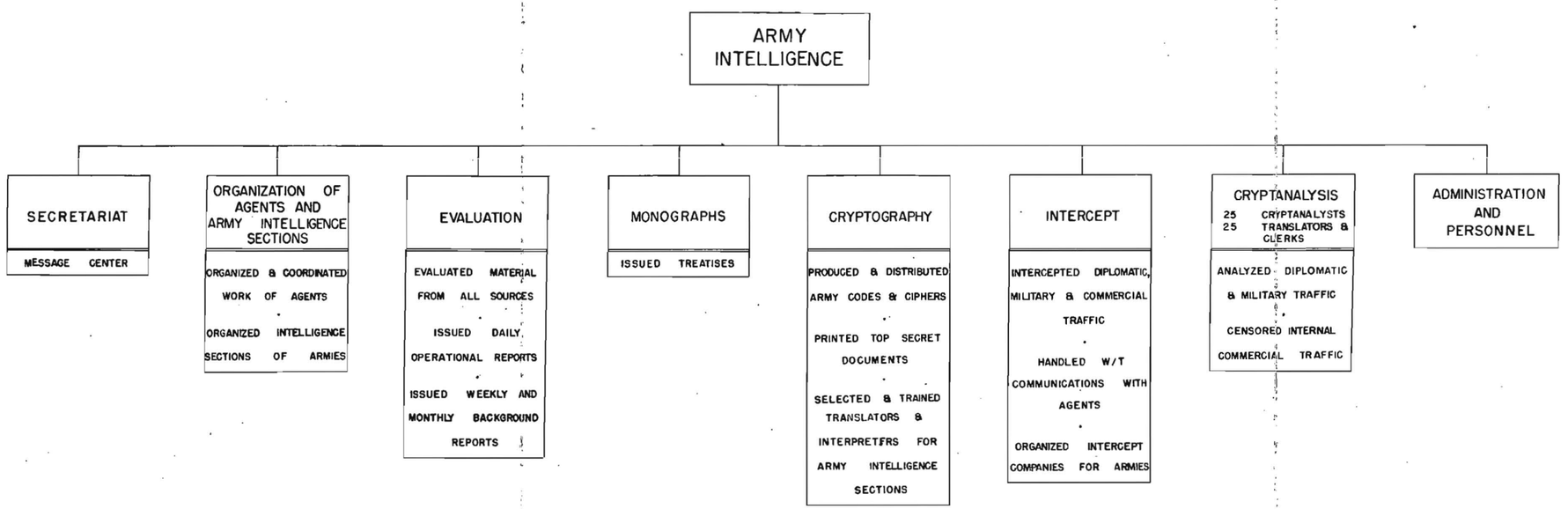
Col. Petrella. Chief of the Intercept Section of SIM.
Piccinocchi, Col. Chief of Cryptograhy Section of SIM.
Pippart,_____, Mr. Chief of Subsection P of the Armed Forces Communications Group Wire Communication, Section 4.
Pohmer,_____, Capt. Chief of Section Ia of Radio Security Section.
Proebster,_____, Major. Chief of Section Ib of Central Group of Armed Forces Communications Group.
Praun, Albert, Maj. Gen. Succeeded Fellgiebel as Chief Signal Officer of Armed Forces, 1944.
Proebster,_____, Major. Chief of Section Ib of Armed Forces Communication Group.
Radio Defense Corps of the Armed Forces.--Oberkommando der Wehrmacht, Wehrmacht Nachrichtenverbindung, Funkueberwachung, (OKW/WNV/Fu).
Radio Intelligence Company (called Radio Telegraph Kompanie, abbreviated RTK by Germans). The cryptanalytic organization of Finland. Called Abteilung X in I-193.
Radio Telegraph Kompanie. See Radio Intelligence Company.
Reinhardt,_____, Mr. Chief of Secretariat section of the Radio Security Section.
Ronge,_____. Chief cryptanalyst of the Austro-Hungarian Empire.
Rosenkranz,_____, Col. Chief of Radio Security Section.
RTK. See Radio Intelligence Company.
Salzbrunn,_____, Mr. In charge of a subsection of Chi/III of the Signal Intelligence Agency of the Supreme Command of the Armed Forces.
Schack,_____, Mr. Chief of Secretariat of Armed Forces Communications Group Wire Communication.
Secret Field Police.--Sicherheitsdienst Kommando, abbreviated (S D Kommando) and Sicherheits Polizei, (SIPO).
Servizio Informazioni Aeronautica (SIA).--Air Force Intelligence Service.
Servizio Informazioni Difesa (SID).--Italian Defense Intelligence Service.
Servizio Informazioni Militari (SIM).--Army Intelligence Service.
Servizio Informazioni Speciali (SIS).--Italian Navy Intelligence Service.
SIA (Servicio Informazioni Aeronautica).--Air Force Intelligence Service.
Seyfarth,_____, Lt. Col. Chief of Chi/II of the Signal Intelligence Agency of the Supreme Command of the Armed Forces.

S D Kommando. See Secret Field Police.
SHAEF.--Supreme Headquarters Allied Expeditionary Forces.
Sicherheitsdienst Kommando. See Secret Field Police.
Sicherheits Polizei. See Secret Field Police.
SID.--Signal Intelligence Division.
SID (Servizio Informazioni Difesa).--Italian Defense Intelligence Service.
Siefert, _____, Dr. Director of Austrian Cipher Bureau after 1935.
Signal Intelligence Agency of the Air Force High Command.--Oberkommando der Luftwaffe/Luftnachrichten Abteilung 350 (OKL/LN ABT/350).
Signal Intelligence Agency of the Army High Command.--Oberkommando des Heeres/General der Nachrichten Aufklaerung (OKH/GdNA).
Signal Intelligence Agency of the Commander-in Chief of the Air Force.--Chiffrierstelle, Oberkommando der Luftwaffe (Chi-Stelle Ob d L).
Signal Intelligence Agency of the Navy High Command.--Oberkommando der Marine/4 Seekriegsleitung III (OKM/4 SKL/III).
Signal Intelligence Agency of the Supreme Command Armed Forces.--Oberkommando der Wehrmacht/Chiffrierabteilung (OKW/Chi).
Signal Intelligence Regiment.--Nachrichten Aufklärungs Abteilung (NAA).
Signal Security Agency of the Army High Command.--Oberkommando des Heeres/Inspektion 7/IV (In 7/IV).
SIM (Servizio Informazioni Militari).--Army Intelligence Service.
SIPO. See Secret Field Police.
SIS (Servizio Informazioni Speciali).--Italian Navy Intelligence Service.
Sonderdienst des Referats Z in der Personalabteilung des Auswaertigen Amtes (Pers ZS).--Cryptanalytic Section of the German Foreign Office.
T 84. "Hollaendische Verfahren."
T 477. "SZYFR Zasadniczy "Mar 2"." [Original copy of Polish 5-figure code book].
T 1620. ES: P. 207. Army Signal Intelligence Organizations.
T 2649. Descriptions of inventions by Dr. Vierling.
T 3614. Records of Shipments from Austrian Cipher Bureau to Cipher Bureau of Reichswehr-Ministerium, Berlin. Also letters. (1934-1937).

TF 29. "Die Ueberwachung des Nachrichtenverkehrs im Kriege." German document containing instructions and Organization for all Censorship.
Thiele, Brig. Gen. Chief of Staff to Chief Signal Officer of Army.
TICOM. Target Intelligence Committee.
Trosken,_____, Lt. Col. Commander of the Central Group of the Armed Forces Communications Group.
Vass,Titus, Lt. "The ace Hungarian cryptanalyst." Worked in Turkish section.
Vierling, Oskar, Dr. Head of Feuerstein Laboratory, worked on German ciphony devices.
von Petrikovics,_____, General. Chief of the cryptanalytic bureau in Hungary.
Triphan,_____, Mr. Chief of Secretariat Section of Signal Equipment.
Tuexen,_____, Major. Chief of a Section of Signal Equipment.
Waak,_____, Civil Official. Chief of Section Id of Central Group of Armed Forces Communications Group.
Wa Pruef 7 (Chef der Heeresruestung und Befehlshaber des Ersatzheeres, Amtsgruppe fuer Entwicklung und Pruefung des Heereswaffenamts, Waffen Pruefung, Abteilung 7).--Army Ordnance, Development and Testing Group, Signal Branch.
Watson Corporation. Italian IBM Company.
Wehrmachtnachrichtenverbindungen (WNV).--Armed Forces Signal Communication.
Wenueb (Wetternachrichtenueberwachung).--Meteorological Intercept Control.
Wetternachrichtenueberwachung (Wenueb).--Meteorological Intercept Control.
WNV (Wehrmachtnachrichtenverbindungen).--Armed Forces Signal Communications.
Zappe,_____. Vierling employee.
Zellien,_____, Major. Chief of Section A of Signal Equipment.
Zentralwetterdienstgruppe.--Central Weather Group.

ITALIAN ARMY INTELLIGENCE ORGANIZATION

NOVEMBER, 1941 — SEPTEMBER, 1943



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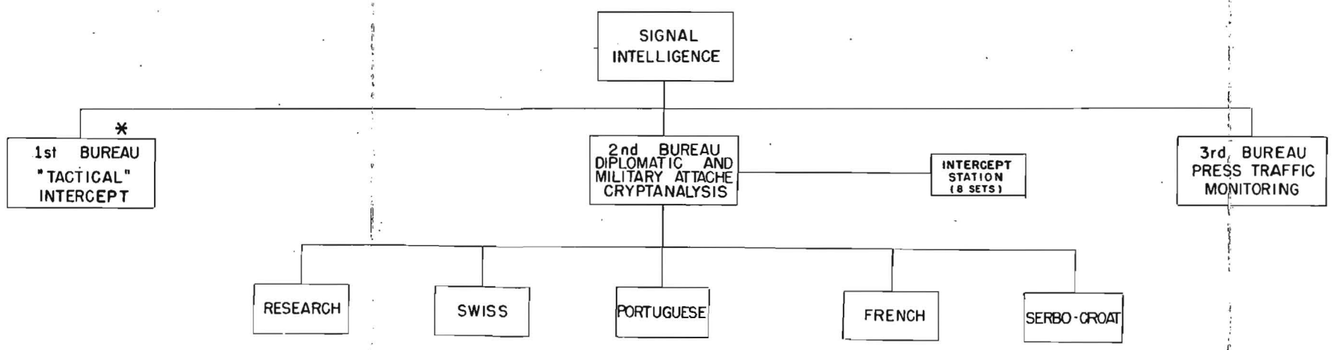
(FORMED FROM FORMER CRYPTANALYSIS AND INTERCEPT SECTIONS OF ARMY INTELLIGENCE)

SUMMER 1944 — MAY, 1945



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