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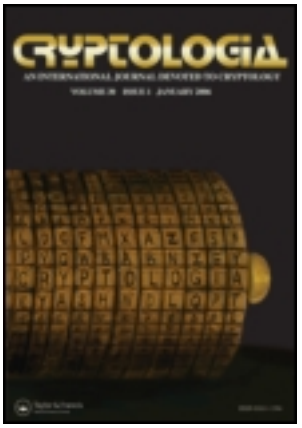

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TICOM and the Search for OKW/*Chi*

RANDY REZABEK

Abstract In the final days of the Third Reich, the Allies sent TICOM intelligence assault teams into Germany in search of the signal intelligence secrets of the Wehrmacht. Chief among their targets was the Wehrmacht cryptologic service OKW/*Chi*. As OKW/*Chi* dissolved in the final days of the war, its archive disappeared, resulting in a months-long search from the northern most border of Germany to the mountains of Bavaria and Austria. This is the story of that search, of which details had remained classified for over 60 years[1].

Keywords 30 A.U., OKW/*Chi*, Russian FISH, Schliersee archive, TICOM, ULTRA, Wilhelm Fenner

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Introduction

World War II has been described as a signal intelligence (SIGINT) war. The efforts to intercept, locate, and decrypt the radio communications of the enemy became a salient characteristic of the conflict [10]. Never before in history had belligerent nations expended so much effort in intelligence gathering to such great effect. On the allied side, tens of thousands of people across the world, laboring with some of the most sophisticated technology of its day, produced an intelligence triumph, which staved off defeat, shortened the war, and saved lives. From discovering the Japanese plans to attack Midway, to eavesdropping on Admiral Dönitz's orders to his wolf packs, to decoding Admiral Yamamoto's flight schedule, to confirming German belief that the invasion was yet to come at the Pas de Calais, SIGINT provided a decisive edge.

Origins of TICOM

By the summer of 1944, Anglo-American leaders, well aware of this advantage and planning for the defeat of Germany, became concerned about the efforts of their enemies in this secret war. It was assumed that Germany, like all other major states, had an active program in diplomatic and strategic SIGINT, and experience had provided plenty of evidence as to their capabilities in tactical SIGINT on the battlefield.

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[1]Many of the TICOM reports cited in this article can be found on the author's website, the *TICOM Archive*, available at https://sites.google.com/site/ticomarchive/. Additional TICOM documentation can be found on Chris Triantafyllopoulos' website, *Christos Military and Intelligence Corner,* available at http://chris-intel-corner.blogspot.com/. Click on the links under TICOM Reports.

Questions arose as to the German's actual capabilities, their level of success against Anglo-American codes and ciphers, and their level of cooperation with their Japanese allies. In order to find answers to these questions, Colonel George A. Bicher, Director of the Signals Intelligence Division, ETOUSA, along with senior managers at the Government Code and Cypher School (GC&CS) began planning a program to actively seek out and capture the cryptologic secrets of Germany as soon as circumstances permitted. U.S. Army Chief of Staff General George Marshall, acting on the recommendation of Colonel Bicher and with the support of U.S. Navy Admiral King, ordered General Eisenhower to cooperate with the this effort, and a secret joint operation was formed, codenamed TICOM (Target Intelligence Committee) [15].[2]

The basic concept of TICOM was to form teams of cryptologic experts, mainly drawn from the codebreaking center at Bletchley Park, to go into Germany with the front line troops and to capture the documents, technology, and personnel of the various German SIGINT organizations before these precious secrets were destroyed, looted, or captured by the Russians. Initial planning revolved around a risky plan to drop TICOM teams into Berlin with the 101st Airborne to capture the various intelligence headquarters in that city [18]. Changing conditions on the ground, mainly the evacuation of the various agencies further west and south to escape the approaching Russian offensive, cancelled that plan. The actual collection effort began in April 1945 when six teams, with representatives from the British GC&CS, the U.S. Army's ASA (Army Security Agency), and the U.S. Navy's OP-20-G, deployed to the continent.

Allied intelligence knew of the existence of SIGINT agencies of the German Foreign Ministry, the Army, Navy, and Air Force, and that of the Supreme Command of the German Armed Forces, the Oberkommando der Wehrmacht Chiffrierabteilung (abbreviated OKW/*Chi*). However, little of its structure, operations, or successes were known. As the highest echelon SIGINT service of the Germans, it was assumed that it was similar to Bletchley Park, coordinating and directing the SIGINT work of all the German armed services and employing the ablest cryptanalysts. Consequently, OKW/*Chi* was the first priority among TICOM targets [15, Vol. 3, p. 1]. This article will trace TICOM's long search for the intelligence heart and soul of OKW/*Chi*.[3]

TICOM teams were flexible in organization and composition, ranging from as little as two officers to over a dozen depending upon the nature of the targets they were searching. Often, additional officers were attached or detached from the team as events developed in the field. The teams were supported by a number of enlisted drivers and radio operators, and were often assisted by intelligence and signals officers from the Army areas they were searching. Each TICOM officer underwent two

[2]Hereafter referred to as TICOM. See Vol. 1, p. 2–4. Also see Vol. 8, p. 51–54, and memos from Marshall to Eisenhower, p. 55; COMINCH to Commander Twelfth Fleet, p. 57; and Eisenhower to Bicher, p. 58.

[3]The April 2011 release of NSA documents to NARA contained a number of items that pertain to TICOM's investigation of OKW/*Chi* (accession numbers follow): "Order of Battle of OKW/*Chi,*" 4 June 1945, #2912; "Notes and Minutes of High-Level Meetings Held at OKW/*Chi*," 18 November 1945, #5637; "Notes on Cipher Security and Minutes of Meetings Held at OKW/*Chi*," 6 December 1945, #5639; "TICOM I Reports 151–194," 22 March 1946, #716; and "Report by Uffz Heinz W. Beyreuther on the Organization of OKW/*Chi*," 23 October 1945, #6997.

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months of additional training at Bletchley Park to be designated as a TRO (Target Reporting Officer).

Each team faced challenges in coordination, communications, transportation, and other liaison issues in the field. Although TICOM teams were issued with special identification cards and orders from SHAEF, they still had to coordinate with the local Army and Army Group authorities. The top-secret ULTRA classification of their mission meant that only a small number of field officers at the top understood the nature of their work. Extensive coordination was required, with stops in Paris first for liaison with the Signals Intelligence Division of the European Theatre command, and then further stops to introduce themselves to each Army or Army Group headquarters in whose area they were assigned to operate, and upon whom they were dependent for clearances, berthing, transportation, and substance. Communications for the teams were a concern because an unknown transmitter sending encrypted communications from behind Allied lines would set off alarms among their own Communications security organizations. This problem was solved by borrowing radio operators from Special Liaison Units/Special Communications Units (that worked the ULTRA intelligence circuits) to transmit TICOM messages along their established frequencies. Encryption was via one-time pads.

The physical security of the teams was also a concern. The first teams were on the road just prior to the German surrender, and since the TICOM officers were all ULTRA cleared, they needed to be protected from capture. Even after the surrender, the chaotic conditions within Germany meant that German forces were still armed and occupying many of the target areas. For instance, a party from Team 6 was among the first allied troops to enter Flensburg, still under the control of Dönitz's Nazi government. Field security and the troops necessary to seal off and protect enemy crypto targets were provided by attaching the TICOM team to 30 Assault Unit, a Royal Marine Commando that had been formed in 1942 under the supervision of Commander Ian Fleming, RNVR,[4] to act as a special intelligence assault unit. TICOM teams in the American sector often drew upon local SIGINT companies and battalions for assistance and support.

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Searching in the North

TICOM Team 6, formed in February 1945, was a joint team dedicated to the capture and exploitation of German Naval SIGINT targets. Its specific targets were the German Naval Intelligence Center, thought at that time to be at Lanke, and the OKW SIGINT headquarters believed to be at Eberswalde, both in the Berlin area. However, the Soviet offensive that month drove these units northwest into Schleswig-Holstein, closer to the Naval bases around Kiel and Dönitz's headquarters in Flensburg. After crossing the Rhine, this area was to be the responsibility of 21st Army Group, allowing TICOM access to these suspected SIGINT sites.

Due to these circumstances, Team 6 was the first TICOM team sent out. The team as organized was under the command of Commander A. M. S. Mackenzie, RNVR, with Lieutenant John Nuelsen, USNR, as executive officer, with two British and two American junior naval officers. The team, activated on 15 April, was sent to

[4]Ian Fleming, the inventor of James Bond, was serving at the time as the personal assistant to the Director of Naval Intelligence.

the front to link up with 30 AU headquartered at Venlo, Holland. Signaler Corporal Roberts and his SCU station "BARNEY" were assigned to provide communications. For the next two months, they followed (and sometimes led) the army into northern Germany, and captured a number of important naval intelligence targets, including:

- The German Naval "Y" (intercept) station at Neumünster and the top-secret "Kurier" station at Bokel, which received burst-encrypted messages from U-Boats.
- "Flusslauf," a new bigram table that was due to go into force on 5 May. Apparently, it was for a little used merchant raider and blockade runners' cipher that was of interest to TICOM because it had not yet been broken.[5]
- OKM 4/SKL III (the B-Dienst, Beobachtung-Dienst), the Kriegsmarine SIGINT organization, evacuated to the Naval Signal School at Flensburg.[6] This was one of the two German SIGINT organizations (the other being the Foreign Office) that were captured intact [11].

By 3 May, when the German collapse appeared to be imminent, TICOM decided to reinforce Team 6 with four additional army TROs, two Britons and two Americans. These officers, Major Morrison and Lieutenants Laptook, Kirby, and Morgan, arrived in Venlo two days later. This group was to concentrate on German military targets, especially anything to do with OKW/*Chi*.

The fortunes of war were kind to TICOM, for accompanying the German surrender party to SHAEF Headquarters in Rheims on 6 May was Lieutenant Colonel Mettig, the second in command of OKW/*Chi*. Also taken into custody at the same time was the OKW/*Chi* chief of the mathematical cryptanalytical section, Dr. Erich Hüttenhain, along with his assistant, Dr. Walther Fricke. When Team 6 as a whole arrived in Flensburg on 19 May, Morrison and Kirby made contact with Colonel Hugo Kettler, chief of OKW/*Chi*. These prisoners provided a font of knowledge to TICOM.[7]

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[5]This was probably the bigram table change mentioned by A. P. Mahon in *The History of Hut 8:* "Dolphin started the new system with a table of its own. . . . The bigram tables did not change on May 5th and few days later work was stopped when we heard that the Grund tables had been captured." (pp. 112–113). Available at http://www.ellsbury.com/hut8/hut8-000.htm (accessed February 12, 2012).

[6]The largest naval intelligence haul in this period, the capture of the Tambach archive containing the German Navy's historical records and the complete war diaries of the Seekriegsleitung and the U-Boat command, was accomplished by 30 Assault Unit's Team 55 commanded by Lt. Cdr. Glanville on April 25. Although TICOM teams worked closely with 30 AU and on the date of the capture, TICOM Team 6 was at 30 AU headquarters at Venlo, there is no mention in the records of any TICOM officers accompanying Team 55 in this operation. See *History of 30 Commando* (latterly called 30 Assault Unit and 30 Advanced Unit), The British National Archives (TNA), PRO HW 8/104, Chapter XIII, paragraphs 55–59.

[7]These interrogation reports can be found at the British National Archives: [15, I-48, *Report on Special Interrogation of Drs. Huettenhain and Fricke, Oberst Mettig, and Lt. Morgenroth* carried out on 29 July 1945: TNA PRO HW 40/166; I-78, *Interrogation of Oberstlt. Mettig on the History and Achievements of OKH/AHA/In 7/VI*: TNA PRO HW 40/167; I-111, *Further Interrogation of Oberstlt. Mettig of OKH/Chi* on 14 September 1945: TNA PRO HW 40/173; I-96, *Interrogation of Oberstleutnant Mettig on the Organization and Activities of OKW/Chi*: TNA PRO HW 40/173; I-86, *Interrogation of Oberstlt. Mettig of OKH and OKH/Chi on the Higher Direction of German Cryptanalytic Work*: TNA PRO HW 40/173; I-127, *Interrogation of Oberstlt. Mettig of OKW/Chi*: TNA PRO HW 40/174.

Colonel Hugo Kettler, who had commanded OKW/*Chi* since the summer of 1943, impressed his interrogators as "an alert, intelligent officer," who was willing to cooperate [15, Vol. 3, p. 2]. However, Kettler was primarily an administrator who had little knowledge of the technical aspects of his command's cryptologic activities. Nevertheless, he gave Morrison and Kirby the tip that the archives of OKW/*Chi* had been evacuated to the Schliersee, a mountainous lake south of Munich, and provided a contact name, a Dr. Schaedel, who had been in charge of the archive.

Lieutenant Colonel Mettig was a regular signal officer who had worked his way up to hold a number of important posts in command of intercept and cryptologic units. From November 1941 to June 1943, he commanded the Army's cryptologic center, Inspectorate 7/VI. He then commanded a signal battalion on the Eastern front for a few months until assigned as the second in command at OKW/*Chi* in December 1943. Mettig, primarily an administrator, was well positioned to explain OKW/*Chi*'s charter, organization, personnel strengths, chain of command, and liaison with other agencies. His knowledge appeared to be more extensive than Kettler's, and he was valued enough to be later transported to England for more in-depth interrogations. Mettig, however, showed some initial reluctance, feeling that "his dignity as an officer would be compromised by over-eagerness to volunteer information." [15, Vol. 3, p. 3]. Specialist Dr. Erich Hüttenhain was a mathematician hired by OKW/*Chi* in 1937 to build up a research section that investigated the most difficult enemy systems that were beyond the capacity of the regular cryptanalysis section, and to investigate the security of the German's own systems.[8] As a working cryptanalyst, he provided detailed technical knowledge of the work of OKW/*Chi*, and at this point provided the most useful information for the TICOM investigators. He and his assistant, Dr. Walther Fricke, were considered such high value prisoners that they too were evacuated to England on 30 June [15, Vol. 3, p. 4–5].

However, one key official was missing from the bag. William Fenner, Chief Cryptanalyst and a founding member of OKW/*Chi*, was not with the Flensburg group, but rather had led an OKW/*Chi* operational group south.

A change in policy from interrogating enemy SIGINT personnel in England to interrogating them in the field kept Team 6 busy for the first few weeks of June in organizing the effort before the Allied Control Commission began releasing prisoners. Royal Navy intelligence officers carried out the interrogations from the 15 to 23 June, after which TICOM Team 6 wrapped up their business in Flensburg and returned home.

Success in the South

As the impending collapse of Germany loomed, TICOM moved south to Bavaria. Just a few days before the German surrender, TICOM Team 1 dispatched from Bletchley Park under the command of Wing Commander Oscar Oeser, RAFVR, as the officer in charge. Among the Americans, Lieutenant Commander Howard Campaigne, USNR, was the senior officer along with U.S. Army Lieutenants Paul

[8]After the war, Hüttenhain became the chief cryptanalyst for the Gehlen Organization, with the cover name "Studiengesellschaft für wissenschaftliche Arbeiten" (Study Group for Scientific Investigation). From 1956 until 1973, he was head of the Federal Government's "Zentralstelle für das Chiffrierwesen" (German Cipher Board) in Bad Godesberg.

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Whitaker, Selmer Norland, Arthur Levenson, and Captain L. T. Stone.[9] An additional dozen TROs would join Team 1 on a temporary basis during this mission, which would turn out to be TICOM's greatest success [18, p. 278; 22]. Team 1 covered much of Bavaria, mopping up the remnants of a number of German SIGINT organizations that had scattered into Southern Germany in the final weeks of the war [12].

On 9 May, TICOM achieved a coup by discovering the last location of the RLM/FA (Forschungsamt), better known as "Göring's Research Bureau," the Nazi Party's in-house cryptologic service. Allied intelligence was largely ignorant of this organization, and the nature of its operations was unknown. The FA disbanded before the American Army arrived, and most of its documents had been burned. However, a table of organization for the FA was found, and two former members, Gottfried Schapper and Erwin Rentschler, were picked up and interrogated a few days later.

A major goal of this team was to capture intact examples of the sophisticated, on-line encrypted teletype devices that were used to generate the family of German high command ciphers codenamed FISH by the British [3, p. 14; 12, p. 24–25; 21]. Although several of the Siemens and Halske T-52 Geheimschreibers (codenamed STURGEON) had been captured in the Mediterranean, TICOM was interested in finding some of the later models, T-52 D/E's. A number of damaged T-52 s were found, but on May 14, TICOM Team 1 Commander Oscar Oeser, accompanied by 6 Army Group staff officer Lt. Colonel L. L. Rood, investigating the German HQ in the Zell area, found two trains containing new and intact T-52 E's. The other FISH machine, the Lorenz SZ-42 (TUNNY), was also a prime target. Although GC&CS, after years of effort and the use of one of the world's first computers, had broken TUNNY, an actual example of the SZ-42 machine was of great interest to Allied intelligence. Near Berchtesgaden, a U.S. officer turned over to the team a captured convoy of four German signal trucks, complete with TUNNY machines and their operating personnel, which turned out to be Field Marshal Kesselring's communications train (codenamed JELLYFISH). Tester and Levenson decided to accompany the convoy on the long drive back to the channel ports, guarded by their own prisoners [6; 18, p. 280–282].[10]

While Tester and Levenson went on their adventure across war-torn Europe, the rest of the TICOM team moved further east to Rosenheim to interview some prisoners that had served in OKH/GdNA (General der Nachrichten Aufklärung), the SIGINT agency of the German Army. Members of that agency's Group VI, they were specialists in the interception of Soviet radioteleprinter traffic. Anxious to avoid being

[9]Oeser was a Senior Air Adviser at Bletchley Park who formed a section to establish Enigma processing priorities and coordinated Hut 3's Fish processing requirements. Other British personnel on the team included Intelligence Corps Majors A. McIntosh (Hut 5 Military Section), R. P. Tester (of the Testery), E. Rushworth (Hut 3 and Block D(3) Fusion Room), and Flight Lieutenant G. Sayer (BP Air Section), along with two radio operators and two drivers. Of the American officers, Campaigne, Levenson, and Stone worked on Tunny traffic, and Whitaker and Norland worked in Block D, Enigma Army and Air Section. Data from the Bletchley Park Roll of Honour, http://www.bletchleypark.org.uk/content/hist/history/RollofHonour.rhtm (accessed August 25, 2011).

[10]Although Levenson in this oral history referred to it as "Rundstedt's own communications party," the TICOM Team 1 report lists it as belonging to OB West (*Oberbefehlshaber West*). By the date of the capture, command of OB West had transferred from Von Rundstedt to Kesselring.

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turned over to the Russians, they revealed the existence of a device designed to intercept a Soviet high-level communications channel that split the message into nine different parts transmitted on a multiplexed circuit, making it very difficult to detect. This device, later labeled the "Russian FISH," was buried nearby. The next day, the Germans dug up 7.5 tons of equipment and materials and set it up to demonstrate to the TICOM team. By the end of the first week in June, this device and its accompanying German technicians were sent back to England to be set up at an operating station 15 miles from Bletchley Park [3, p. 15–17; 18, p. 282–286; 22, 129–141].[11]

Another major opportunity arose in the capture of the Feuerstein Laboratory on a small mountain near Ebermannstadt, which conducted research and preliminary development of experimental communications equipment. Its director, Dr. Oskar Vierling, was picked up and interrogated. He proved cooperative, reassembled most of his staff, and put them back to work, allowing TICOM to exploit the information derived from this Laboratory [15, Vol. 8, p. 37].[12]

As for OKW/*Chi*, Team 1 had another stroke of luck on 20 May. Major McIntosh, along with Campaigne, Whitaker, Norland, Carter, and Coolidge traveled to Strub, a village near Berchtesgaden, the site of a barracks that temporally housed a headquarters of OKW. While investigating a storeroom holding old Abwehr reports, the team found a locked room containing the abandoned private baggage of a number of staff officers, including that of a Major Nielsen, operations officer for the Chief Signal Officer, OKW. In his bag were a number of top-secret documents, including one laying out the order of battle of OKW/*Chi*, a 1944 activity report for this agency, and an order outlining the coordination and allocation of the work of OKW/*Chi*. This proved to be the first hard documentation TICOM discovered relating to this organization [12, p. 9; 15, D-55 *Translation of Order concerning Cryptanalytic and Cypher Production Work promulgated by OKW/WFS/Chef WNV, taken from the Papers of Major Nielson.* TNA PRO HW 40/174].

The next day, team members Dr. Pickering, Lieutenant (JG) Coolidge and Lieutenant Whitaker made a brief stop at Lake Schliersee to seek traces of OKW/*Chi*, which proved fruitless.

Mopping Up

Lieutenant Commander Howard Campaigne, the senior American naval intelligence officer of Team 1, returned to England in early June, but within two weeks, he was sent back to the field as the OIC of a small, newly formed TICOM Team 4. Joining him were Lieutenant Evelyn Talbot-Ponsonby of the Royal Navy, and American naval officer Lieutenant Christopher Hungington, with Corporal A. G. Able, Royal Signals, responsible for their communications. Captain M. A. G. Howgate, of the British Military Intelligence Corps, later joined them.

The main purpose of this trip was to return to Southern Germany to double check on a number of targets the Team 1 search had passed over quickly. The TICOM team joined up with a troop of 30 A.U. and accompanied them on a search

[11]Also see [15, Vol. 4, RG 467, Entry P11, Box 46, Hem #6861 *Kept by Capt. T. Cartes, I. C., of Tests on Baudot Equipment Conducted in the U.K; June 29 to July 8, 1945*. RG 467, Records of the NSA (Entry 9037), Box 44, Item #6862.

[12]See also, *Detailed Feuerstein Technical Project Report*, document released to NACP RG 457, Entry P11, Box 23, #5423.

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for large number of miscellaneous naval targets in Bavaria; the most interesting included a variety of sites working on V-2 rocket components. Often, tips from local intelligence officers led to dead ends. As Campaigne later explained

> We heard there was a research establishment up in the Tyrolean Mountains on a lake way up there. . . . There was . . . a guard, a U.S. guard at the door . . . And so we went up to the guard and identified ourselves and said, "What went on here?" . . . Apparently, it had to do with seaplanes, because they had been running experiments with pontoons. . . . but nothing (was there) that was . . . cryptanalytic. [7, p. 25]

Talbot-Ponsonby had another bizarre experience when he accompanied 30 A.U. to the Island of Mainau in Lake Constance to follow up a tip about a supposedly evacuated experimental station from Peenemünde. At the gate to the compound, they were refused admittance because the island was neutral territory, the property of Prince Bernadotte of Sweden, despite the fact that the French were currently using it as a displaced persons center. Further inquiries with the Chief Medical Officer brought forth the claim that two British intelligence officers had already visited the island. The team, sent back to Constance to get passes, found that all official offices in the town closed in honor of a visit by the Sultan of Morocco. This incident illustrates the confused situation, poor communications, and competitive interests that were to plague TICOM throughout its searches. Most of the targets investigated by the 30 AU team were unproductive from a SIGINT viewpoint, having been previously thoroughly picked over by other Allied intelligence teams.

Campaigne and his men finally arrived at the Schliersee to follow up on Colonel Kettler's tip. They met up with a Hauptmann Kunz, a former Vienna police officer, now affiliated with the Freiheitsaktion Bayern (F. A. B.), an anti-Nazi militia group now eager to ingratiate itself with the Allied military government. He led them on a careful search of various buildings in the town, including three hospitals, the railway station, the school and adjacent book deposit, the post office and telephone exchange, a hotel, and the site of a nearby landslide on the railway. Except for a number of abandoned teleprinters and telephone sets, they found no other items of interest. However, they heard an interesting rumor from more than one source; Campaigne later recounted the story:

> On May 1st or 2nd, there was a train that came into the town and parked on a siding on the far side of the lake, across the lake from town, and had stood there for a day or so. And there were some soldiers around it and they thought that they had unloaded the stuff and threw it in the lake. Well, we did a little searching. The lake's kind of deep and we couldn't do anything. But we recommended that it should be dragged. [7, p. 22–23]

The next day, Kunz led the team up the mountain to search the surrounding countryside. Some debris from the German army was found in some of the local farms, but nothing unusual or important. They also visited Himmler's hunting lodge and followed up on a rumor about a German Army radio station that had been active in the area, but again, found nothing.

On 28 June, while getting the unit's radio repaired at a nearby U.S. Army Artillery unit, Captain Howgate was told by the unit signal's officer of a large cache of wireless

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equipment found in a canyon above the Municipality of Bayrischzell. The sergeant in charge of the original search party led them to a few remaining boxes further up the ravine, but they contained only food. After a couple of fruitless hours trying to track down the original source of the information, a local bathing pool attendant, they abandoned the search. Nor did they find any trace of the mysterious Dr. Schaedel.

In the final report of the Schliersee search, Campaigne concluded that the OKW/*Chi* archives might have been either dumped into the lake from the railway tracks near the landslide, buried up in the mountains, or evacuated further to the south [13].

Team 4 left the area on 30 June and for the next week investigated a number of miscellaneous targets, stopping in Innsbruck for two days to reinvestigate a targeted building that Team 1 had earlier hastily searched. They found some miscellaneous materials of minor importance. Upon leaving Innsbruck, they received a telegram from TICOM recalling them back to England. Although largely a bust, Campaigne and his team did dig up some important clues as to the whereabouts of OKW/*Chi* archives.

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Diving for Secrets

But for a stroke of luck, the archives of OKW/*Chi* might have remained lost. In the last week of July, at Lake Schliersee, a soldier from the Third U.S. Army drowned. While dragging for the body, officials snagged a box from the north end of the lake [14, p. 1].[13] Upon inspection, it turned out to be a waterproof box containing a number of translations of decoded messages and a file of correspondence addressed to OKW/*Chi* [15, Vol. 3, p. 8]. TICOM, having already acted on Campaigne's request for a dive team for Schliersee, paired the recently returned Lieutenant Talbot-Ponsonby with U.S. Army Lieutenant Alfred P. Fehl and quickly dispatched them as Team 5.[14] Stopping in Paris for the usual round of clearances and discussions, they proceeded overland to Schliersee, arriving on 8 August after reinforcing the team with Captain Richard Farricker from Signal Security Detachment "D" and 1st Lieutenant Gene Silber, a SIGINT officer from Third Army.

Starting at the north end of the lake near the Schloss Freudenberg where the box was recovered, the team did an initial survey, finding the beach still littered with abandoned radios and teleprinters. Talbot-Ponsonby and Fehl then attempted dragging the lake near the landslide on the west side of the lake and nearly snagged an object several times, but it was too heavy to recover. While this was ongoing, a further inquiry launched into the whereabouts of Dr. Schaedel by the local Counterintelligence Corps detachment produced no results.

The next day, the team, with the assistance of some engineers, took soundings and discovered that the depths in the target areas ranged from 20 to 50 feet. A more detailed survey by a navy diving officer resulted in the recommendation that the job was within the capabilities of the Army pier divers from Le Havre.

Talbot-Ponsonby and Fehl made a trip to the Bad Aibling prison camp to investigate a rumor that a score of section heads of OKW/*Chi* had been held there. A search of the camp's records produced no information. On 17 August,

[13]The additional team reports are: NACP, *Final Report of TICOM Team 2*, RG 457, Entry P11, Box 131, Item #35239, Records of the NSA, Box 168, and *Final Report on TICOM Team 3 on Exploitation Burgscheidungen*, RG 457, Entry P11, Box 46, Item #6865.

[14]Fehl was a specialist in traffic analysis and had worked in SIXTA and Hut 3 at Bletchley Park.

Talbot-Ponsonby returned to the United Kingdom, leaving Fehl in charge of the operation. Fehl then made other trips to the Freising P/W cage and to Unken, Austria to interview a former translator for GdNA, both visits leading to dead ends.

A week later, a small party of Army engineers arrived with pontoons and began building a raft for use in the diving operations (Figure 1). The leading group of the 1051st Construction and Repair Group, the pier divers, began to arrive on 2 September, and the rest of their party arrived with equipment a week later.[15] Diving operations began on Tuesday, 11 September, and lasted for a week. The first area worked was the site of the recovery of the original box, and although the murky water complicated diving operations, the site yielded 28 boxes, most found below the slope in 30 to 50 feet. It appeared that the materials had been hastily dumped from a boat. The second area explored, near the landslide, recovered seven boxes of discarded equipment from the local German SS artillery school, but produced no SIGINT material.

The recovered boxes were transported to the Third Army Signals Intelligence Battalion at Camp Goulette where they were stored in a vault. There they were sorted, non-relevant equipment discarded, re-boxed, and sealed for transport. This resulted in 19 boxes, totaling 188 cubic feet and weighing 8,162 pounds. No attempt was made to dry out the documents; instead TICOM wanted the materials moved to England as quickly as possible. Fehl arranged for an airlift, and on Friday, 5 October, two C-47 s landed at Biggin Hill where trucks met them to carry the cargo to Bletchley Park. The search for OKW/*Chi* was complete.

All documents and captured materials shipped back to Bletchley Park were registered and processed, given a library number according to a standard classification, given a suitable title in English and German, and if necessary, a synopsis was written and attached. For example, seized OKW/*Chi* documents were numbered

Figure 1. U.S. Army pier divers searching for the OKW7/*Chi* archives in the Schliersee, September 1945. Photo provided by NSA.

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in the TICOM "DF" series; interrogation reports or translations of the "homework" produced by German personnel were published in the "I" series. German translations of decoded traffic were in the "T" series. Accession lists, which cataloged the captured documents, were produced, and then distributed to the various intelligence organizations that had an interest in such materials. Units could send a representative to inspect the selected document, and services were provided for translation. A U.S. Navy microfilm unit copied documents intended for Washington [8].

Results

TICOM officers wrote their final team reports, and for the Americans at least, headed home. The TICOM organization was officially dissolved on November 25, 1945. The Army Security Agency collected and evaluated its TICOM materials and in May 1946 published a nine-volume study, *European Axis Signal Intelligence in World War II as Revealed by TICOM Investigations*. Volume 3 of this study was devoted to the information derived from the exploitation of OKW/*Chi* [15, Vol. 3, p. 13–14].

TICOM concluded that although OKW/*Chi* was the highest-level agency among the military hierarchy, its power to coordinate and set policy for the rest of the military SIGINT organizations was limited. Its coordination efforts mainly concentrated on the creation of the German's own secure communications systems. As far as cryptanalysis was concerned, OKW/*Chi* acted as a troubleshooter, providing high-level assistance for those systems that were difficult for the individual services to solve themselves. Most of its own effort focused on diplomatic communications.

The roots of the OKW/*Chi* lie in the post-WWI cipher bureau of the Defense Ministry created in 1920 and staffed by cryptologic veterans of the war. Wilhelm Fenner, with his friend and mentor Professor Novopaschenny, were hired as part-time Russian specialists in the autumn of 1922. The following year, they were promoted to full-time, and Fenner was made chief of the cryptanalysis section. This small unit managed to survive in the bureaucracy until the rise of the Nazis led to remilitarization, the formation of the OKW as the Armed Forces Supreme Command, and the subsequent growth of the armed services. During the interwar period, Fenner provided the leadership to professionalize and systematized the service. By 1937, the OKW/*Chi* had 40 employees, which grew to almost 200 by the outbreak of the war, and by 1944, the central organization had grown to 800 personnel [2; 15, Vol. 1, p. 18]. By this time, its efforts had shifted to the strategic with an emphasis on diplomatic and broadcasting traffic [15, Vol. 3, p. 13–14].

OKW/*Chi* was organized into four principal groups concerned with liaison, cryptanalysis and translation, interception, and intelligence. The cryptanalytic section was composed mainly of linguists but also had a dedicated mathematical section that was set up in 1937 under the direction of Dr. Erich Hüttenhain, which concentrated on the more challenging ciphers. The interception group controlled the agency's main station at Ludwigsfelds and a number of substations. It was primarily concerned with monitoring foreign news broadcast and news services, and prepared a daily foreign news summary. In addition, it also controlled a second intercept system concentrating on encrypted diplomatic Morse networks, with two large intercept stations at Treuenbrietzen and Lauf.[16] OKW/*Chi* also received intercepts from the other

[16]Lauf was reopened as an intercept site in 1955 by the Gehlen organization. It remained in service for a few years with Wilhelm Flicke as the chief. See [20].

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German SIGINT organizations and received raw traffic from Germany's allies. The intelligence section was responsible for evaluating and distributing broken and translated messages and controlled the agency's archives [15, Vol. 3, p. 1–4; 16].

Overall, OKW/*Chi* was primarily an agency for gathering intelligence, and its development and control of secure cryptologic systems was limited to the military and a few minor government agencies. Toward the end of the war, there was a shift in emphasis away from intelligence and toward cipher security, as represented in the November 1944 reorganization of OKW/*Chi* into a cryptology division and a cryptanalysis division. However, it never achieved a strong centralized authority over cipher security, and it had little influence outside the services or even within, with the Navy successfully opposing its attempts to monitor naval communications security [15, Vol. 3, p, 19–20]. This lack of cooperation must have been a contributing factor to the insecurity of many German systems, including the ENIGMA.

Since the early 1920s, the predecessor to OKW/*Chi*, the Cipher Bureau, had a strong interest in diplomatic communications. The conditions of post-WWI Europe resulted in a lack of foreign military communications for study, so Fenner believed that access to diplomatic traffic would provide the practice necessary to build the staff's skills and increase the influence of his bureau. The Cipher Bureau competed with the Foreign Ministry for access to diplomatic cables passed by the post office, successfully arguing that diplomatic communications would also contain information relevant to military matters. In the early 1930s, a new rival appeared, the Forschungsamt (FA), created when three Nazi sympathizers quit the Cipher Bureau and made a deal with Herman Göring to form a new SIGINT organization under his sponsorship and in the service of the Nazi party. Their ambition was to centralize all SIGINT within the FA, and they emphasized diplomatic communications along with domestic surveillance. Other potential rivals appeared with the reorganization of the German armed forces after the Nazi's assumption of power with the creation of SIGINT organizations for the Army and the newly formed Air Force. However, the start of the war focused their attention on tactical SIGINT while OKW/*Chi* continued to focus on diplomatic communications [2]. This scattering of effort among competing intelligence organizations in strategic intelligence was a major German weakness.

In terms of cryptanalysis, the agency did achieve a series of minor success. Reporting on diplomatic intelligence was a function of the linguistic section, under the supervision of Fenner. OKW/*Chi* maintained a large section, up to 40 to 50 persons, dedicated to attacking Anglo-American communications. Breaks made into the diplomatic American strip system and possibly some military attaché M-209 traffic kept a steady flow of intelligence to the high command [15, Vol. 3, p. 55]. OKW/*Chi* had a role in the German's successful break into the system of the American military attaché in Cairo, Colonel Bonner F. Fellers, which provided much useful intelligence to Rommel.[17] Other U.S. diplomatic systems attacked, included a five-letter system and an unenciphered codebook of about 100,000 groups. There was successful work done against the British Interdepartmental Cipher; however, no attacks were successful against high-level American or British machine ciphers, and OKW/*Chi* soon gave up its attempts. Attacks were made against many other systems of both Germany's enemies and allies, totaling at least 29 nations.

[17]This well-known event is documented in a variety of sources; see [5, p. 95–96; 9, p. 473–476; and 19, p. 170].

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However, the Russian section of OKW/*Chi* was small and seems to have accomplished little against Soviet diplomatic traffic. This traffic, encrypted with one-time pads, OKW/*Chi* found impossible to break. Other German SIGINT organizations had much greater success against Soviet military and administrative traffic than the OKW/*Chi* had against Russian diplomatic systems.

OKW/*Chi* began to disintegrate at the end of the war. Sections moved out of Berlin by March 1945 to the Army Signal School at Halle, while the Agency's archives moved to Lauf. By April, most of the agency's personnel began to move toward south Germany, breaking up into different transport trains, with most of them ultimately ending up at Werfen, near Salzburg, where they were captured by American troops. Some of the leadership of the agency went north to join the remnants of the German government near Flensburg, where the British arrested them.

While Kettler, Mettig, and Hüttenhain went north, Wilhelm Fenner, Chief Cryptanalyst, led the remnants of OKW/*Chi* into Austria. On 23 April 1945, OKW/*Chi* officially dissolved, and its personnel were incorporated into the southern branch of the Army's GdNA. In anticipation of the arrival of the American Army, remaining materials were burnt or thrown into a river. After the surrender on 8 May, all remaining personnel were released. The Germans officially discharged Fenner from government service on 19 June with only a letter of recommendation. He then made his way back to Landshut, Bavaria and found a job as an auto and bicycle mechanic in nearby Straubing. He lived quietly there until being picked up by occupation authorities and held as a witness for the Nuremberg trials in July 1946. He was interrogated from September to December, while being held at Haus Alaska, a building on the grounds of the 7707th European Command Intelligence Center at Oberursel. Reports based upon his information continued to be issued by the ASA until as late as 1950 [17; see also 15, I-200 *Interrogation of Min. Rat. William Fenner of OKW/Chi.* TNA PRO HW 40/174].

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Wrapping Up

The capture of the archives of OKW/*Chi* was only one step in the process of discovering Germany's SIGINT secrets. Over 4,000 separate documents weighing over 5 tons were captured by the TICOM teams, resulting in 196 intelligence reports being issued by May of the following year. The ASA's summary of this information, *European Axis Signal Intelligence in World War II as Revealed by 'TICOM' Investigations*, was so sensitive that most of it has remained top secret until recently.[18] Review of these materials reveals two key weaknesses in the German's SIGINT effort.

The German contempt for their enemies led them to underestimate their opponents' capabilities and determination. The Germans were aware of the cryptologic weakness of both the ENIGMA and FISH machines, and had been warned by

[18]The security status of the TICOM materials is a complex topic. Author David Alvarez notes that *European Axis Signal Intelligence in World War II* was released to him under the FOIA in 1996 [1]. However, the declassification stamps on these volumes (with one exception) are all dated 2008 and 2009. TICOM-related documents continue to be reviewed and released by the NSA on a steady basis, but details of some documents dealing with "The Russian Fish" continue to be heavily redacted; see [15, I-169 *Report by Unffz. Karrenberg on the Bandwurm.* FOIA request, case #64093. 29 March 2011]. In addition, some U.S. Navy TICOM reports from the NSG Crane Library (NACP RG 38, Entry 1030) are still classified (NARA letter to the author, August 2, 2011).

Finnish sources of the Swedish cryptographer Arne Beurling's break into the T-52 [4, p. 400; 15, Vol. 2, pp. 4–5]. However, they did not believe that anyone could apply the practical effort it would take to continuously break their systems. Conversely, believing that their own high-level machine ciphers were unbreakable, they soon gave up their attacks on the Allies' TypeX, and SIGABA machines. TICOM characterized this attitude:

> In his final decision on the Enigma, Hüttenhain betrays a certain academic aloofness and one is tempted to say, smugness, which may have been his leading flaw as even a cryptographer. ... Allied to this academic attitude is the curious lack of interest, which Hüttenhain and the other German cryptographers seemed to have shown in the actual size of the Allied cryptanalytic effort against the German systems. The Germans knew of the Deuxième Bureau. They knew nothing, however, of English cryptanalysis—''the English, of course are notoriously stupid.''—All they knew about American cryptanalysis they had learned from Yardley's *Black Chamber*. [15, Vol. 3, p. 85]

Organizationally, the Germans adopted a decentralized approach, with multiple agencies operating on their own, seldom cooperating, and often competing with each other. For example, diplomatic and strategic communications were the targets of OKW/*Chi*, the Foreign Office, and the FA. As common in many dictatorships, Hitler deliberately wanted multiple competing subordinates as a way of minimizing their influence and avoiding challenges to his own power. This prevented the sort of organized, determined effort that the British and Americans enjoyed at Bletchley Park and through their U.K./U.S. agreements, or access to the nation's leadership, like that enjoyed by Sir Stewart Menzies in delivering ULTRA to Churchill. The German's efforts at communications security floundered, and ultimately failed, because of the Nazi culture itself.

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