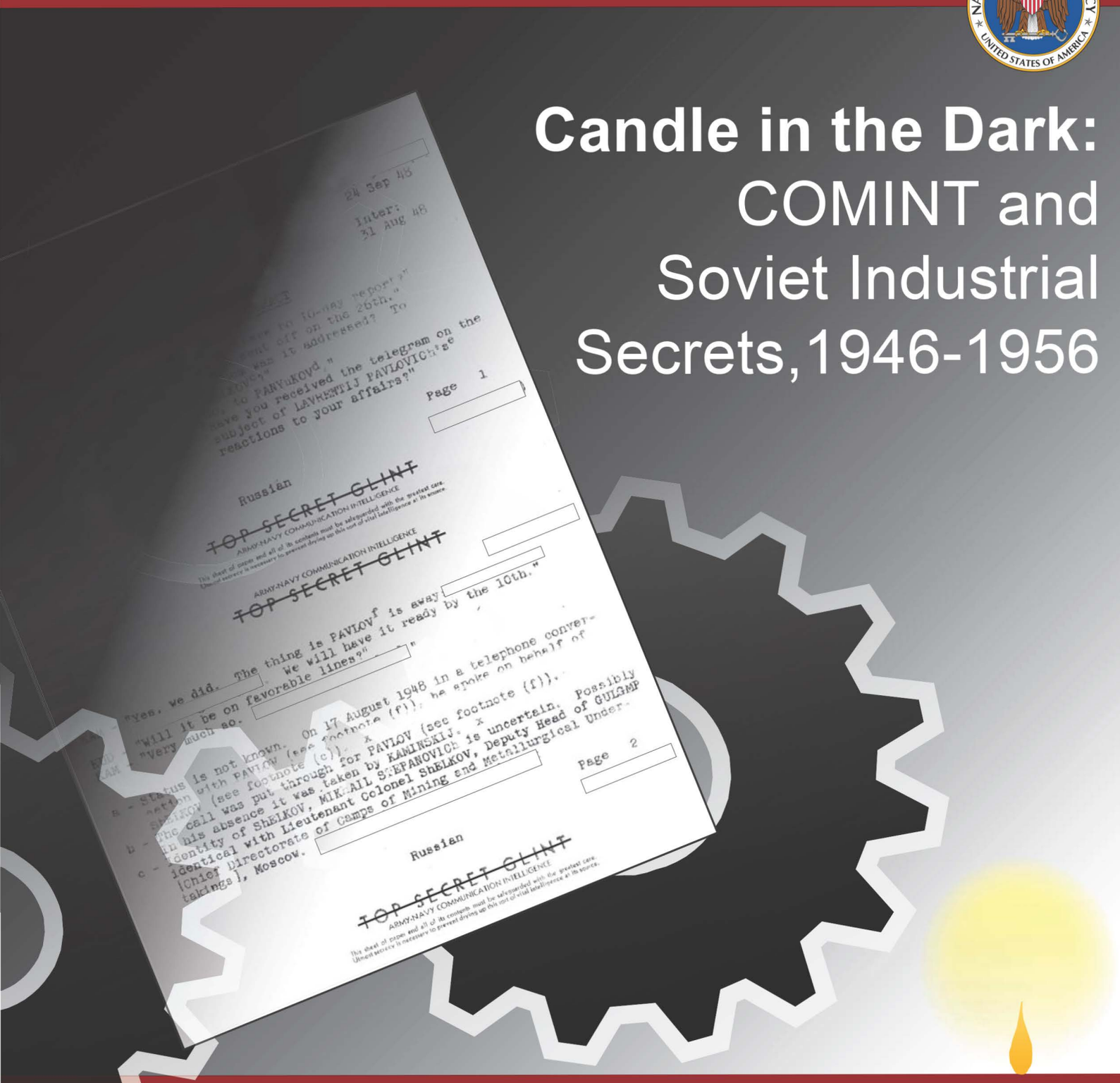
UNITED STATES CRYPTOLOGIC HISTORY



Candle in the Dark: COMINT and Soviet Industrial Secrets, 1946-1956

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United States Cryptologic History

Candle in the Dark:

COMINT and Soviet Industrial Secrets,1946-1956

Carol B. Davis

National Security Agency
Center for Cryptologic History
2017

“Soviet Union, East and South Asia,” 1987 (detail; Perry Castañeda Library, University of Texas at Austin)

Contents

Introduction

> Plain language turned out to be the greatest, continuous thing that we ever invented. Few of us around here really ever want to admit to that. But it was.
>
> —Oliver Kirby, associated with the early development of Russian plaintext at the Army Security Agency (ASA), later NSA deputy director for Operations and the first civilian head of production at NSA

Pioneer communications intelligence (COMINT) analysts at predecessor organizations of the National Security Agency (NSA), the Central Intelligence Agency (CIA), and the British Government Communications Headquarters (GCHQ) began work on the huge numbers of Russian plaintext messages at the beginning of the Cold War. This was part of the Intelligence Community's response to the dramatic change in relations with the Soviet Union, so recently a World War II ally. The purpose of this study is to make clear why, even after so long a period, Russian plaintext remains an important part of COMINT and, indeed, US Intelligence Community (IC) history. This has required a detailed look at what information plaintext provided, how it was worked, and the consequences of that effort both for COMINT producers and the IC as a whole. In the end, it is not the unprecedented volume of the traffic that distinguishes plaintext as much as the major contribution it made to the IC's knowledge of the Soviet economy and major weapons programs that make it important.

Plaintext was part of the first successful use of "national technical means" to provide information on an adversary's weapons of mass destruction programs at this time (the other technical program was the US long-range atmospheric system set up to detect the radioactive fallout from atomic tests).

Plaintext was also a major source for general Soviet defense industrial information, including aircraft, shipbuilding, munitions, and other defense systems. It shed light on the workings of most sectors of the Soviet economy, including the labor camp system run by the Ministry of Internal Affairs (MVD). It also provided limited information on the Soviet political leadership. Plaintext was a highly productive source at a time, prior to Stalin's death in 1953, when other intelligence sources—prisoners of war, defectors and émigrés, agent infiltration of Soviet organizations, open source information, and imagery—were very limited or nonexistent. It was truly a "candle in the dark."

Reliance on Russian plaintext messages—the unenciphered telegrams passed on the high frequency (HF) radio links of the Soviet civil communications network (this study excludes military, foreign trade, and weather traffic)—as a main source of information was a major departure from what had been established practice by the US and UK cryptologic services. During World War II, these organizations cracked enemy codes and worked enciphered diplomatic and military traffic. In the United States, plaintext traffic, much of it derived from international cable and commercial links, had been the responsibility of national censorship or communications organizations, like the Federal Communications Commission.

By 1945, however, as both the UK and US cryptologic services reassessed their priorities, it became clear that all Soviet intercept needed to be assessed for its intelligence value. US cryptologic agencies thus began to collect more plaintext printer traffic in the spring of 1945. US exploitation of plaintext did not come into its own, however, until 1948 when enciphered Soviet military traffic was no longer available.

So, what at first glance had appeared to be an unpromising source, consisting generally of short messages conveying bits and pieces of information, upon closer examination provided a partial picture of important Soviet defense industrial and economic activity.

In addition, the growing volumes of traffic available on the Soviet civil communications network presented a major challenge, requiring a careful winnowing of items of value from the great mass of messages that were thrown away. In a time when traffic was processed manually, the plaintext workforce grew rapidly to try to handle the ever-increasing numbers of messages. Winnowing the "wheat from the chaff" was to remain a dilemma in the exploitation of Soviet communications throughout the Cold War.

Another major innovation was the production by COMINT organizations of analytic product, including organizational studies and reports on different sectors of the Soviet economy, especially defense industries. This came about because individual items became meaningful only when they were connected to each other, revealing relationships between activities and organizations over time.

This synthesizing of information represented a bold move into analysis by the COMINT producers. It drew a strong reaction from the newly formed CIA, which considered analysis its responsibility.

By the early 1950s, plaintext traffic had fallen off in both overall volume and the amount of useful information available in it. Around this time the Soviets began to introduce new teleprinter systems of their own design, replacing the Baudot printer equipment that they had relied on since the 1920s. The ten-year time frame of this study approximates the period (1945-1955) during which the Soviets developed the scientific know-how for their nuclear weapons program and built the full complement of industrial facilities required for it. Russian plaintext traffic, however, did not abruptly end, but rather faded away. Even after it faded, however, both the analytic methods and the organizational knowledge established during the plaintext era were to remain the basis on which further information on Soviet defense industries and economic activity was built at NSA.

The British effort is important in understanding how the US plaintext effort started because it influenced the US effort, especially at the beginning. The British developed this source first, and their analysts made a particularly valuable contribution to the knowledge of various Soviet weapons systems. The work of the British plaintext unit became focused from 1946 to 1948, a critical time in its development. The enduring close working relationship between NSA and GCHQ , including all aspects of plaintext, from collection and traffic exchange to

analysis and reporting, was vital in maximizing the efforts at both centers. While the United States was able to continue to expand its effort, the British plaintext unit became gradually smaller through the 1950s. It nevertheless continued to produce important defense industrial analytic studies.

There were thousands of skilled, dedicated people who contributed to the success of Russian plaintext. They ranged from employees involved in the traffic processing and selection process to senior managers. Among these people were a number of COMINT managers and technical experts, who were either prominent at the time or were to become so later. They included Captain Laurence Frost, later Admiral Frost, NSA director (liaison with the British); William Friedman, pioneering cryptanalyst (special consultant on plaintext on the question of relations with the CIA); Louis Tordella, NSA's longest serving deputy director (involved in the early collection and equipment development effort); Oliver Kirby, the first NSA deputy director for operations (an ASA manager); Rear Admiral Joseph Wenger, vice-director of NSA (member of COMINT coordination groups; senior manager at the Navy's cryptologic agency, the Communications Supplementary Activity, Washington [CSAW], and the Armed Forces Security Agency [AFSA]; and a strong supporter of plaintext); and Frank Rowlett, pioneering cryptographer and special assistant to several NSA directors (senior ASA manager). This study strives to make clear the value of their accomplishments.

The Soviet Union emblem used from1946 to1956. The state motto, "Proletariats of the world, unite!" appears in the languages of the sixteen constituent republics.

Note

A brief comment on transliteration of Russian place-names, proper names, and the rendering of some terms is necessary. I have retained several conventions from the plaintext era: "atomic energy" rather than "nuclear weapons"; "Russian" rather than "Soviet"; and "COMINT" rather than "SIGINT" (signals intelligence). The term "plaintext" is, in current usage, generally considered to be one word, and that is how I spell it in my text. Earlier usage, however, was not consistent. The term could appear as either one or two words, or was sometimes hyphenated. Transliteration of Soviet proper names and place-names generally corresponds to the Library of Congress transliteration system, except where common spellings are used: for example, Beria rather than Berija.

Chapter 1

Definitions, Collection, and Processing

> There is no way to be on top of intelligence problems unless you collect much more extensively than any cost-accounting approach would justify. . . . You might think you could do without most of what is collected; but in intelligence, in fact, as in ore-mining, there is no way to get at the nuggets without taking the whole ore-bearing compound.
>
> —Ray Cline, former CIA Deputy Director for Intelligence[1]

A Target of Opportunity

The Soviet civil communications network was highly vulnerable to exploitation in the 1940s. The system, controlled by the USSR Ministry of Communications, was used by ordinary Soviet citizens as well as by the government. While it included secure landline links between major cities, such links did not cover the entire country. In many areas high frequency (HF) radio transmission links filled in large gaps in the system's coverage. It was especially true of Central Asia, the Far North, and most of Siberia. These links, besides the plaintext telegrams, contained Morse, enciphered traffic, and clear speech as well.[2]

The Soviets had, in general, been unable to provide new secure landline links required by industrial development in the Urals, Central Asia, and areas farther east. When, therefore, the top-priority nuclear weapons program and other defense projects emerged during the fourth five-year plan (1946-1950), many thousands of messages containing discrete pieces of information about these programs and about the Soviet economy were vulnerable to collection and exploitation.

The Soviets had strict regulations about what subjects and information were to be protected, but these prohibitions were not always observed. By 1948 Army Security Agency (ASA) collectors and analysts noted continuing improvement in Soviet communications security measures across the board.

What Plaintext Included

Russian plaintext messages were unenciphered telegrams sent over the USSR Ministry of Communications civil (common carrier) network using a form of the Baudot code teleprinter. Plaintext was generally understood to include "all Soviet plain language communications passed on all Soviet internal links and all plain language and commercial code communications passed on international commercial (ICR) circuits."[3] For the purposes of this study,

it primarily encompasses what was designated as "other governmental" traffic, as well as some personal messages and voice conversations, found on the internal civil network, which dealt with the activities of governmental agencies. This study excludes plaintext messages dealing with the armed forces, some police activities, weather, shipping, and foreign trade (which were worked in other COMINT organizations). Techniques were developed to exploit personal messages, which could provide links to various defense industry activities, military units, and other programs of interest.[4]

The Soviets had adopted the Baudot code teleprinter system in the 1920s.[5] Baudot was a synchronous code using five equal-length bits (current-on/current-off) to represent one character or letter. Named for its inventor, the French engineer Jean-Maurice-Émile Baudot, who patented the code in 1874, it had partially replaced Morse as a commonly used telegraphic alphabet system because of its speedier transmission rate. Baudot later devised a distributor system for multiplex (simultaneous) transmission of printer messages on the same circuit or channel. The system was used throughout Europe, and the Russians adapted it to the Cyrillic alphabet. The Germans also used the Baudot printer for commercial use. German Army intelligence systematically exploited Russian plaintext messages during World War II. From 1942 to 1945 they produced regular summary reports on aspects of the Soviet economy based on plaintext messages.[6] The British and the Americans, in their turn, were able to take advantage of captured German equipment at the end of the war to establish their plaintext collection.

Soviet Baudot teleprinter transmissions included both single-channel and multiplex transmissions (two, three, six, and nine channels). Another feature of the Soviet system was the use of a time-sharing schedule, given the communications links' limited capacity. This was a way to divide time on the circuit so that several hours of teleprinter transmissions would be scheduled, a block of time devoted to voice, Morse traffic, and so forth. Analysis of operator comments would disclose these schedules. In addition, telephone calls between specific users might be scheduled in advance, allowing transcribers to identify specific links and times that information of interest could be collected.

Problems with Signal Quality

Signal quality was a recurring problem with HF collection and a real challenge to both collectors and linguists. While HF signals can propagate for thousands of miles, adverse atmospheric conditions can cause strong interference and "noise," severely degrading the signal and making it partially or completely unreadable. British and US collectors kept each other informed of problems with interference on specific links in order to ensure better signal quality.

Linguists thus had to cope frequently with corrupt, sometimes very corrupt, text and voice. This might involve the occasional missing or incorrect letter(s) or, in the worst case, the corruption of significant portions of the text, making recovery difficult or impossible. Linguists had to examine the traffic carefully, always keeping in mind that they might have to supply elements of the text in order to determine the correct words, terms, and names. This skill was an integral part of the linguists' familiarity with the specific target or targets. Under these conditions, exploitation of voice conversations was particularly difficult. Jack Gurin, the first plaintext manager at ASA, noted that the voice quality was frequently terrible even for the people communicating on the system, who often had problems understanding each other.[7]

Collaboration on Collection Equipment

The Baudot multiplexed printer traffic posed new, but manageable, technical problems to US collection efforts. By 1945 both the Army and the Navy had observed the rapidly expanding use by the Soviets of non-Morse signals. They realized that since the Soviet Union would likely soon be a top

intelligence priority, they would have to develop new capabilities. In early 1945 the Army Communications Branch requested that a two-channel multiplex terminal for intercept use be developed. Other priorities and the lack of an engineer delayed the project. In early 1946, however, the ASA's Research and Development Branch began work on two-channel equipment (the bulk of the multiplexed traffic at this time). The Army used the coverterms Pebble (for two-channel equipment), Boulder (universal multiplex equipment), and Rock (for two-, six-, and nine-channel equipment). By the end of 1946 the Pebble receivers were sent out to collection stations and proved to be efficient.[8] The equipment was designed to process, demultiplex, and print the automatic printer traffic. A mechanical rotating distributor separated the multiplexed signals.

Arlington Hall Station, Building B, in Virginia: the Army and Navy built intercept sets and punch-tape devices in the basement. (later photo)

The United States took the initiative to provide information to the British in mid-1946 concerning its research and development of non-Morse intercept equipment (a term that included the Baudot printer) and operations. The British had already developed their own capabilities, based on wartime collection and the British study of captured German intercept equipment. The US Communications Intelligence Coordinating Committee (USCICC) Intercept and D/F (Direction Finding) Subcommittee sent a report to the London Signals Intelligence Centre (LSIC) on US equipment, with the hope that the British would share their knowledge.[9] By January 1947 the Deputy Chief of Naval Communications had prepared additional information on non-Morse equipment, which was also to be sent to LSIC.

The Navy and Army subsequently pooled their resources—between the two organizations, they had $200,000 to develop equipment—and set up a manufacturing program to build the needed intercept sets for two-, six-, and nine-channel transmissions as well as the punch-tape devices. The assembly line that turned out the equipment was in the basement of the cafeteria building at Arlington Hall Station in Virginia. "Home-built" equipment using interpreted paper tape punches to print out the text and punch the coded characters was also developed. It replaced both the undulator tape recordings and limited quantities of captured German equipment.[10]

Collection Sites

US deployment of equipment to collect Russian plaintext printer messages was well under way to a significant number of collection sites by 1948.[11] Of the twenty-six US collection stations (in the United States and abroad), only a limited number had the capability to collect plaintext printer messages. US and British efforts were complementary: the British sites had better access to European Russia; US sites had better access to the Far East.

Louis Tordella, the future NSA deputy director, was involved in the development of collection

Dr. Louis Tordella

equipment, including some for plaintext, during the 1940s and early 1950s. Tordella had first put his knowledge of radio equipment to use during his years in the Navy during the war. Part of this time he was stationed at the Skaggs Island, California, collection site, one of a number of sites where US collectors first copied plaintext traffic. After the war, Tordella joined CSAW as a civilian and continued his work on equipment research and development. He became the Navy member of the USCICC intercept subcommittee. Some of his work involved development of demultiplexing equipment.[12]

The Navy's Skaggs Island intercept site in northern California collected the Russian plaintext printer signal in the spring of 1945. Tordella had become officer in charge at the station in February or March. He recalled,

> About April or early May I received a message from OP-20-G [the naval SIGINT and cryptanalytic group during WWII] requesting that we find and intercept a two-channel Russian printer signal frequency unknown with a sync[hronized] pulse of 180 to 210 times per minute. We looked for such a signal for a week or so and I had the good fortune to find it idling one morning about 0330 local time. . . . We immediately began undulator tape interception of the signal and organized teams of two WAVES [Navy servicewomen] each to read the material out in thirty-one-letter Baudot code. I later was able to get Russian typeface for the RIP-5 typewriters, but we continued to read out in Baudot code so as not to be overheard by uncleared personnel who were in part of the intercept station building. . . .[13]

Tordella went to the UK for several trips from 1947 to 1949 to learn about British equipment advances and their collection sites. In February 1947 and July 1948, he visited the plaintext unit in London and learned about their collection capabilities and needs.[14] In 1951 Tordella, by this time in AFSA-03A3, was studying ways to streamline and automate plaintext message scanning and processing at Arlington Hall Station.[15]

Scanning and Initial Selection Process

The initial scanning and selection of incoming messages at Arlington Hall Station consisted of a labor-intensive two-stage process before the traffic reached the analysts. A description of it from 1951 notes that AFSA-21, the processing center, received about 70 percent of the incoming traffic in the form of punched tapes and about 30 percent as page copy. A group of about thirty-five scanners reviewed the messages as they came in, retaining only about 20 percent. The scanners were able to read the punched tape, selecting what should be printed out. (The scanners had a list of up to 3,000 key terms, which they consulted in selecting items. Their burn bags for classified waste paper were checked periodically to ensure that they were not rejecting valid items.

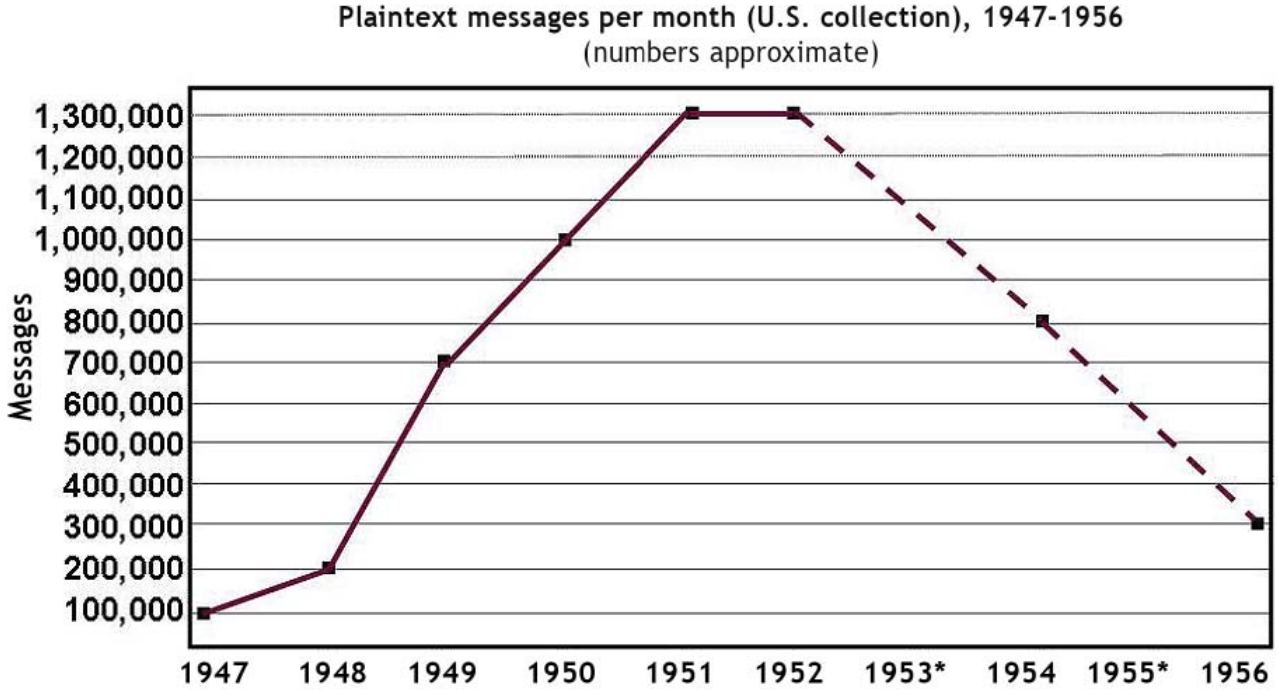
Analysts in AFSA-246, the plain language section, in their turn, checked to make sure that there was not too much "chaff," or useless material.)

The retained messages were then marked with the proper category numbers (there were seventy, which indicated the subject and which of the approximately eighteen panels [teams] were to get them)[16] and source information (date and time of intercept, frequency, intercept station, the circuit and link of origin). In the case of the punched tapes, the selected items were torn out of the tape roll, message by message, separating them from those of no value. Messages selected from page print were separated from a continuous roll—they already had the traffic information typed at the top of each page. The punched tape items then were turned over to a staff of about forty people. They were responsible for page-printing the selected items and typing up the message heading, including all identifying information. The resulting page copies were given individual serial numbers, photographed for record copies, and distributed to the plain language section.[17]

African American workers in Arlington Hall Station during World War II

The clerical staff in AFSA-213 performed this work. They were located in Building A at Arlington Hall; the analytic workforce, AFSA-246, was in Building B. In 1950 AFSA-213 had ninety-eight people who did the scanning, selection, marking, and routing. All or virtually all of them were African Americans.[18] This was one of several data processing areas at the Agency that employed African Americans almost exclusively. They were limited to these low-paying, repetitive jobs at clerical pay grades. Even those with college degrees and other work experience were assigned to this work with little prospect for advancement. The traffic stream seemed to be endless (the unit received an average of 1,300,000 messages monthly by early 1951) and the workers had quotas, a minimum number of messages that they had to process. The work environment was noisy and dirty. The many printers in the room were always on, and people would get dirty from stamping the classification markings on the page prints.

There were people, however, who showed initiative even under such daunting circumstances. Iris Carr and William Jones, for example, both developed a working knowledge of Russian and became scanners, identifying items for further processing. Carr had taught before coming to ASA and had a master's degree. She understood how important the selection process was. "I explained to people that they had to be very careful to give the analysts all the messages we possibly can, because the work was important." She looked for related information as she scanned the traffic.[19] Jones had studied Latin and German in school. He decided to learn Russian and, know-



ing nothing about the language training at ASA, took a Department of Agriculture Russian course. He noted that the work was not easy: "Many times the print on the tape was not clear, so we had to read the punched holes. I think what we did was critical because we threw away what we thought wasn't any good. If there was anything good in there, it was lost—it went into the burn bag."[20]

The Numbers Crunch

The volume of plaintext messages grew rapidly from 1947 to 1952, and then went into decline. The early successes in finding significant information on the atomic energy (nuclear weapons) and other weapons programs, along with the disappearance of much of the Soviet enciphered military traffic in 1948, spurred the application of additional resources to plaintext collection and processing. In November 1947 about 100,000 messages a month were collected; by 1952, at the height of collection, around 1,300,000 messages a month[21] were collected. Receipts then began to decline. By 1954 they were around 800,000 a month, and by 1956 they were down to around 300,000 a month.

The plaintext branch, despite its growing size, continued to fall behind in handling the ever-growing volume of traffic. In mid-1950 AFSA managers made the following calculations about present and anticipated shortfalls in expeditiously processing all messages of intelligence value. They noted that the United States collected an average of about 1,000,000 messages a month (there were an estimated 2,500,000 messages a month passed over all Russian internal commercial circuits). An average of about 150,000 messages (15 percent) were selected for study. Of these, from 60,000 to 70,000 (about 6 to 7 percent of all messages collected) were identified as pertaining to significant intelligence topics and were assigned to top-priority files for immediate processing. But, based on its current strength of about 170 people, the plaintext unit was able to process on a current basis only

about 70 percent (45,000 to 50,000) of them. It therefore was able to produce new or revised studies on specific critical topics only with some delay. By April 1951 AFSA managers estimated that, with the addition of more intercept facilities now in the planning and implementation phase, the volume of intercepted traffic would grow to at least 2,000,000 messages a month. With this additional volume, they estimated that top-priority related traffic would increase to about 150,000 messages or more a month. That meant that 350 additional personnel would be needed in the branch to process the additional material and to prepare studies produced with "reasonable" timeliness.[22] These anticipated increases in traffic volume did not occur, however.

Collection and processing of Russian plaintext thus presented a number of challenges to the US post-World War II COMINT producers. Among them were the development of collection equipment to deal with the multiplexed signals, the growing volumes, and the global reach required to collect as many of the available links as possible. Scanning and selecting items of interest remained a multistep manual process, requiring a large workforce. Next, we will examine the analytic workforce's working methods.

> The early successes in finding significant information . . . spurred the application of additional resources to plaintext collection and processing.

Notes

1. Ray Cline, "Secrets, Spies and Scholars," in *The Literary Spy: The Ultimate Source for Quotations on Espionage and Intelligence*, ed. Charles Lathrop (New Haven, CT: Yale University Press, 2004), 41.
2. See "The Russian Plaintext Mystery," by Carol B. Davis, NSA *Cryptologic Almanac* item, issued 17 November 2006, for a fuller treatment of the vulnerability of Soviet civil communications in the 1940s.
3. AFSA-202 Report by Ad Hoc Committee on the Plain Language Problem to AFSA-02, 9 January 1952, NSA Archives, Accession 8243, G16-0206-2, Folder 4.
4. AFSA-247 informal memo re: Use of plain language system indicators in bulletins originating in AFSA-24, 7 March 1951, NSA Archives, Accession 13375, G16-0304-6, Folder 1.
5. "The History of the Central Telegraph." Accessed in 2008, http://www.ctel.msk.ru/cnt/en/cnt1_7.html.
6. The German Signal Intelligence Control Center on the staff of the Chief of the Army Signal Service (HNW, INA) issued these summary reports on the Soviet military-economic situation. CSAW translated large numbers of these reports in 1949 from the original German into English, trying to determine the original Russian terms as much as possible. NSA Archives, Accession 6539, G22-0306-6, Folders 1 through 5.
7. Jacob Gurin, oral history interview, NSA-OH-2003-07 (30 April 2003).
8. *Post-War Transition Period, The Army Security Agency 1945-1948*, prepared under the direction of the chief, ASA, GAS-22, 21-22, 27, 40-41, 56-56a, http://www.nsa.gov/news-features/declassified-documents/army-security-agency/assets/files/asa-1950.pdf and ASA Annual Report for Fiscal Year 1946, Volume II, Intercept Equipment Branch, 6-12, NSA Archives, Accession 1541.
9. Assistant Secretary of USCICC, Captain Wason G. Campbell memo of 5 August 1946 to Deputy Coordinator for Liaison, OP-20-2, and Secretary USCICC re: Report on U.S. Developments in Non-Morse Intercept Equipment and Opera-

tions; Commander Rufus L. Taylor, Deputy Coordinator for Liaison memo of 6 August 1946 to Senior Liaison Officer, LSIC re: Report on U.S. Developments in Non-Morse Intercept Equipment and Operations, NSA Archives, Accession 1425, G16-0406-7, Folder 8.

10. NSA, D93 (part of early CCH structure) memorandum of 7 December 1992, which quotes remarks made by Oliver R. Kirby at 1991 Cryptologic History Symposium about early research and development of the Soviet target; NSA Archives, Accession 49511, Box CCH 505, Folder 1.
11. USCIB Subcommittee on Intercept and D/F Operations of 25 February 1948 to USCICC re: Estimated USCIB Intercept Terminal Requirements February 1, 1948. The equipment descriptions in this document are, unfortunately, not specific enough to identify numbers of Russian plaintext printer equipment at various sites. NSA Archives, Accession 1425, G16-0406-7, Folder 6.
12. *Cryptologic Almanac* 50th Anniversary Series, "Louis W. Tordella," David P. Mowry, NSA Center for Cryptologic History, May 2002.
13. Louis W. Tordella, "Collection of Russian Transmissions by the Navy—My Recollections," 5 May 1978, NSA Archives, Accession 49511, Box CCH 507, Folder 5.
14. OP-20-L-2 (Tordella) Memo of 2 April 1947 re: Visit to Great Britain (supplement) describes 13 February 1947 visit to the UK plaintext unit (with particular attention paid to specific collection priorities) and Tordella trip report of visit to UK from 14 July to 5 August 1948 (a period that included the BRUSA conference), Section III—Visit to the UK plaintext unit (on 26 July) contains a description of the collection of a Moscow-Magadan link containing MVD, that is, Dal'stroj (Far Northern Construction Trust) traffic.
15. AFSA-03A/wlm Memo for AFSA-03 and AFSA-02 re: Data Handling Survey—First Report, 27 February 1951, NSA Archives, Accession 8243, G16-0206-2, Folder 4.
16. AFSA Working Aid #62-52, 4 February 1952, Plain Language Subject Categories, NSA Archives, Accession 13375, G16-0304-6, Folder 2.
17. AFSA-03A3/wlm Memo for AFSA-03 and AFSA-02 re: Data Handling Survey—First Report, 27 February 1951, NSA Archives, Accession 8243, G16-0206-2, Folder 4. The memo also noted that a number of possible solutions for speeding up processing and reducing the number of people required to handle the plaintext traffic were under consideration. They included higher speed printer for page copy, high-speed reading of chadless tape, and machine scanning of messages.
18. See *The Invisible Cryptologists: African-Americans, WWII to 1956*, Jeannette Williams, Center for Cryptologic History, National Security Agency, 2001, 15-23. This study, using NSA documents and information from oral interviews, recounts the experiences of African Americans at NSA and its predecessor agencies in segregated and low-paying work roles, a situation that mirrored American society at large.
19. Iris Carr, oral history interview, NSA-OH-1999-52 (17 June 1999).
20. William A. Jones, oral history interview, NSA-OH-1986-21 (14 August 1986).
21. AFSA Plain Text Processing Memo, 9 June 1952, NSA Archives, Accession 6420, G16-0205-2, Folder 5. These numbers refer to US collection only.
22. AFSA document, NSA Archives, Accession 6501, Box G20-0103-5, Folder 7.

Chapter 2

US Beginnings

We ourselves have not fully crystallized in actual practice any definite policy in regard to our own plain text group. . . .The processing of plain text by a separate group which is now in a formative state is a new and unusual type of project.

—Frank Rowlett,
ASA Operations Division[1]

★

The rank and file intelligence personnel (at LSIC, the London Signal Intelligence Centre) originally viewed this operation with considerable indifference and skepticism. The general trend of their thought was that plain text was useful possibly as a means of entering the more enlightening field of enciphered communications but had no value as intelligence itself. Fortunately the fallacy of this position has now been fully exposed to higher authority who are now convinced of the inherent value of the P/T (plaintext) material as a unique source of intelligence.

—Information Concerning British
Methods of Exploiting Russian P/T[2]

The Army's First Efforts

The initial ASA Russian plaintext processing effort began in late 1946 or the beginning of 1947 as a part-time experiment.[3] It was undertaken by a small group of Russian linguists who worked primarily on military post box numbers and traffic analysis. To these tasks they added scanning, selecting, and translating some plaintext items for inclusion in the ASA Bulletin, a reporting vehicle sent to customer agencies.[4] Russian plaintext messages had initially attracted attention because they were sometimes closely connected to encrypted messages on the same radio circuits. On further examination, however, it soon became clear that a significant number of them contained useful information on the economy and defense industrial production. Faced with very limited resources, however, higher priority traffic then available (deciphered military traffic) took precedence. While plaintext remained of marginal interest at this time, this first effort demonstrated that the material might have real potential.

The Pentagon plaintext unit (WDGAS-93-B-8), the second Army plaintext foray, began operations on 5 May 1947. Its sole job was to select, translate, and issue significant plaintext items. However, most of the personnel assigned to the unit, initially four and expanding to eight people, did not

have security clearances or were semicleared. This was a real handicap, because most of the linguists were not familiar with Soviet telegraphic conventions, nor were they supplied with standard technical language aids. In June 1947 the unit scanned 5,403 messages and translated or summarized 297 messages.[5] Their translations, subject to final checking by the WDGAS-93-B language staff at Arlington Hall Station, made an impression on ASA management. They decided that a more capable group of linguists was needed for the work. By late 1947, the Pentagon had four translators and one checker, not all of them cleared. The unit no longer scanned traffic, but translated full messages provided to it by the new plaintext unit, whose linguists were fully cleared.[6]

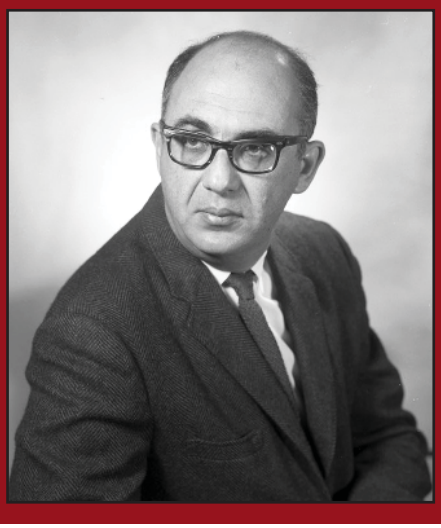
The third organization set up by ASA to work plaintext, CSGAS-92-B-11, the plaintext subsection, also started out very small, but it had the enthusiastic direction of Jacob (Jack) Gurin, the subsection chief, that the earlier efforts had lacked. From the very beginning, Gurin and the other linguists showed that the basic working principle of tying related information together was a viable approach. Their first reports included a number of organizational studies of key Soviet ministries. Set up on 13 November 1947 with six people (four linguists and two clerks), the subsection grew rapidly into an organization with fifty-four people by June 1948. (Assuming that a small number of the fifty-four included some clerical personnel, the plaintext unit accounted for about one-third of the 140 Russian linguists then working at ASA.)[7]

The core group of linguists in the very beginning included, besides Gurin, Constantine Oustinoff (who had also worked in the Pentagon unit), Juliana Mickwitz, and Olin Adams. The first three had native Russian language skills, and Adams had a strong background in economic and technical areas. They decided to organize the material by ministerial sector, to put out ministerial studies, and to augment them with updated activity reports. The very first study on the USSR Ministry of Nonferrous Metallurgy received a letter of appreciation from the Special Assistant to the Secretary of State. Gurin's leadership had shown what the small group could do. Management then provided additional resources.[8]

Plaintext was from then on firmly established as an important source of information on Soviet defense industries and economy.[9] While ASA had had problems earlier in 1947 trying to get authorization to hire qualified Russian linguists, it was able to shift linguists to the plaintext unit when B-211 machine traffic (one version of the Hagelin cipher machines used by the Soviet Army) disappeared from the air in 1948.[10]

The new ASA effort, drawing on the experiences of the first two efforts and the work at GCHQ, adopted the following basic working principles when it started up. First, it was a full-time, dedicated effort. Individuals with limited linguistic training performed the initial scanning process. In order to maximize the efficient use of skilled linguists, only selective translation of items of intelligence value was done. Qualified linguists with a good knowledge of Russian, target knowledge, and access to collateral information were given the autonomy to select items for retention and publication.

Jack Gurin is the person most closely identified with the start-up of the Russian plaintext effort; he was certainly its most enthusiastic champion. Born in Odessa of Russian Jewish parents, he came to the United States with his family when he was a small boy. He spoke Russian at home. He served in the Army during the war in the Pacific and studied Japanese. After the war, he became familiar with Russian plaintext in his dealings with the Pentagon plaintext unit. He saw right away that the traditional practice of simply translating a message here and there would not do. He saw the material's potential: that the bits and pieces, once assembled, could provide a great deal of information about the Soviet Union's industrial activities. There were skeptics who told him, "If the Soviet Union considered



Jack Gurin saw the material's potential: that the bits and pieces, once assembled, could provide a great deal of information about the Soviet Union's industrial activities.

the information important, they would encipher it." Gurin did not agree and, with his near-native knowledge of Russian, he and the other members of the new ASA plaintext unit showed what could be done with the material.

The Navy's Early Work

The Navy's Communications Supplementary Activity, Washington (CSAW) had worked a limited number of Russian plaintext messages from at least May 1946.[11] The limited numbers of linguists, however, at first prevented serious work on plaintext. Having been offered some plaintext traffic (in microfilm form) from the British in 1947, CSAW declined a copy since they did not have enough personnel.[12] By early 1948, however, three translators and an intelligence officer were working the traffic full time.

About 20 percent of the messages were identified during the Navy's scanning process as having some value; the rest were placed in a dead file. Items of interest were divided into five or six general categories, which were called "desk-accumulations." Messages of immediate value (about 1 percent of the total received) were selected for full translation. Depending on priorities and workforce constraints, items of interest were studied in conjunction with available collateral and work center cross-files, which contained other COMINT, including ASA and GCHQ plaintext product. End product was in the form of either intelligence reports prepared under the supervision of, and disseminated by, the Office of Naval Intelligence (ONI) or COMINT summaries primarily intended as collateral and as cribbing aids for the use of cryptanalytic technicians. Examples of CSAW product included an "atomic study," a Far Northern Construction Trust (Dal'stroj) study, various ministerial studies, and naval studies.

CSAW used the following categories for all plaintext processing: weather, shipping, police, and other (this latter category included governmental and economic messages). During 1947 CSAW average monthly totals for this last category included 7,500 messages received (this compared to 17,000 messages a month received for all categories excluding weather messages; the latter category totaled 15,000 a month); 7,000 messages scanned and filed; 500 gisted (summarized); and none translated. In January 1948 it received about 3,000 messages. Translators working the 1947 backlog scanned and

> Russian communications security measures introduced over the period of the last eighteen months, including retirement of certain major cryptographic systems and the virtual cessation of operational radio activity on Armed Forces links, have increased the dependence of the allied COMINT effort on the study and analysis of the large volume of traffic passed on the Russian internal civil radio links. These links, as yet unaffected by Russian communications security measures, are now the major source of current economic and current military intelligence information.
>
> —ASA memo, Frank B. Rowlett, Chief of Operations Division, and Dr. Solomon Kullback, Chief of Research and Development Division, 24 March 1949[13]

filed 6,900 messages, gisted 4,500 messages, and translated 900 messages in January 1948.

Later in 1948 CSAW set up a separate group to standardize English translations for Russian terms and abbreviations. Both CSAW and ASA were faced with the challenge of accurately translating the large numbers of unfamiliar industrial, technical, and procedural (banking, accounting, planning, etc.) terms found in plaintext traffic. The group emulated the methods and procedures used by the GCHQ technical library. Both centers agreed, however, that differing British and US usage would sometimes require dual entries marked British and USN.[14] CSAW had received comments at this time from GCHQ that US translations of some terms were sometimes incorrect.[15]

Selecting Material

Both Army and Navy reporting strove to derive as much information as possible from the messages by using various organizing principles. There were simply far too many messages with valuable information in them and not enough linguists to translate them all. The traditional practice of "cherry picking" and translating individual items was therefore in part abandoned, in order to assemble related items into reports. Anywhere from 10 to 30 percent of the intercepted messages were retained for further evaluation and use; the rest of them were discarded in the initial scanning process.[16] Scanners had to examine the messages, looking at the addressees and originators for a start. Government messages of all types would clearly warrant closer examination. Those involving major economic or defense industry activities were the prizes. Organizing many thousands of messages and providing the most valuable information from them to customers entailed a number of challenges.

The selection process required an in-depth familiarity with related information already found in the traffic and information from collateral or non-COMINT sources. This required the maintenance of detailed files. Only by accumulating related messages over time could the analyst properly understand, connect, and summarize the most significant data. Further refining of the retained material was required, since translation capacity was limited. An estimate from 1951 notes that less than three-tenths of one percent of all messages received were published as translations. Some of the information, however, was incorporated in product such as summaries, studies, or tabulations.[17]

Reporting

Formal reports were produced that detailed the structure and activities of various ministries and other subjects. All analytic product was clearly identified as COMINT (there was no attempt at sanitization), generally carrying the caveat that it was based primarily on plaintext. Organizational

listings were produced using the connections made among the organizations, officials, and documentation in hundreds and sometimes thousands of messages. Beginning in early 1948, ASA began putting out several series of analytic reports at an impressive rate.[18] This achievement is all the more remarkable because the unit had fewer than ten people at the beginning, while it continued to expand and train new people. ASA output included Russian Plain Language Analysis Reports (RU-PLAR series) dealing with the structures of various Soviet ministries. Russian Plain Language Analysis Items (RU-PLAI series) provided supplementary information about activities or parts of these ministries. Occasional Russian Plain Language Analysis Periodic (RU-PLAP series) covered various subjects—for example, one dealt with USSR Gosbank account numbers associated with defense industry activities.

In its first months of operation (November 1947 to July 1948), the ASA plaintext unit issued five RU-PLAR reports on the aviation, chemical, coal, nonferrous metallurgy, and petroleum industry ministries; two RU-PLAP reports (Ministry of Internal Affairs/military supplies and East Siberia Coal Combine); and 156 RU-PLAI items on a variety of ministries. It scanned 901,147 messages, extracting 208,655 for further evaluation, and processed 15,260 of these for inclusion in product. It also produced 35,300 IBM punch cards. In addition, ASA continued to issue individual translations on various economic and defense industry items. By September 1949 ASA's plaintext organization employed 108 people. A total of about 175 people worked plaintext at this time (at both US agencies). Traffic receipts totaled about 700,000 messages a month; 15 percent of them were used or retained in 1948-1949.[19]

CSAW's smaller plaintext production unit also issued organizational and activity reports. Among them were studies of the USSR Ministry of the Communications Industry, the USSR Academy of Sciences, and the Soviet shipbuilding industry; a general summary of Soviet industrial shortages; and "A Key to Locations of Soviet Governmental Organizations." The latter study examined the correlation between telegraphic section designators (two- and three-digit numbers) occurring in telegraph serial numbers seen in messages for several ministries and the identification of specific telegraph office addresses. An interesting distinguishing feature of these CSAW studies was the insertion of line drawings by an anonymous artist. They depicted the activities of the same mustachioed Russian

Cartoon from the Navy's Communications Supplementary Activity, Washington, report on Operational Intelligence Department of Soviet Ground Staff, Naval Forces, 1948

"Ivan" (who might be a sailor, construction worker, cryptographer, etc., depending on the report topic) who seemed to be inept at everything he did.

Translations

The introduction of analytic product did not eliminate what had been the established mode of issuing COMINT information to customers, the translation. Such translations contained information that could stand alone and was significant in some way. However, the limited number of Russian linguists and the high volume of traffic precluded the production of translations of all pertinent material. Some reports reference unpublished messages. (This is how some COMINT customers became aware that they were not getting "everything," which became a point of contention at this time and well into the future.)

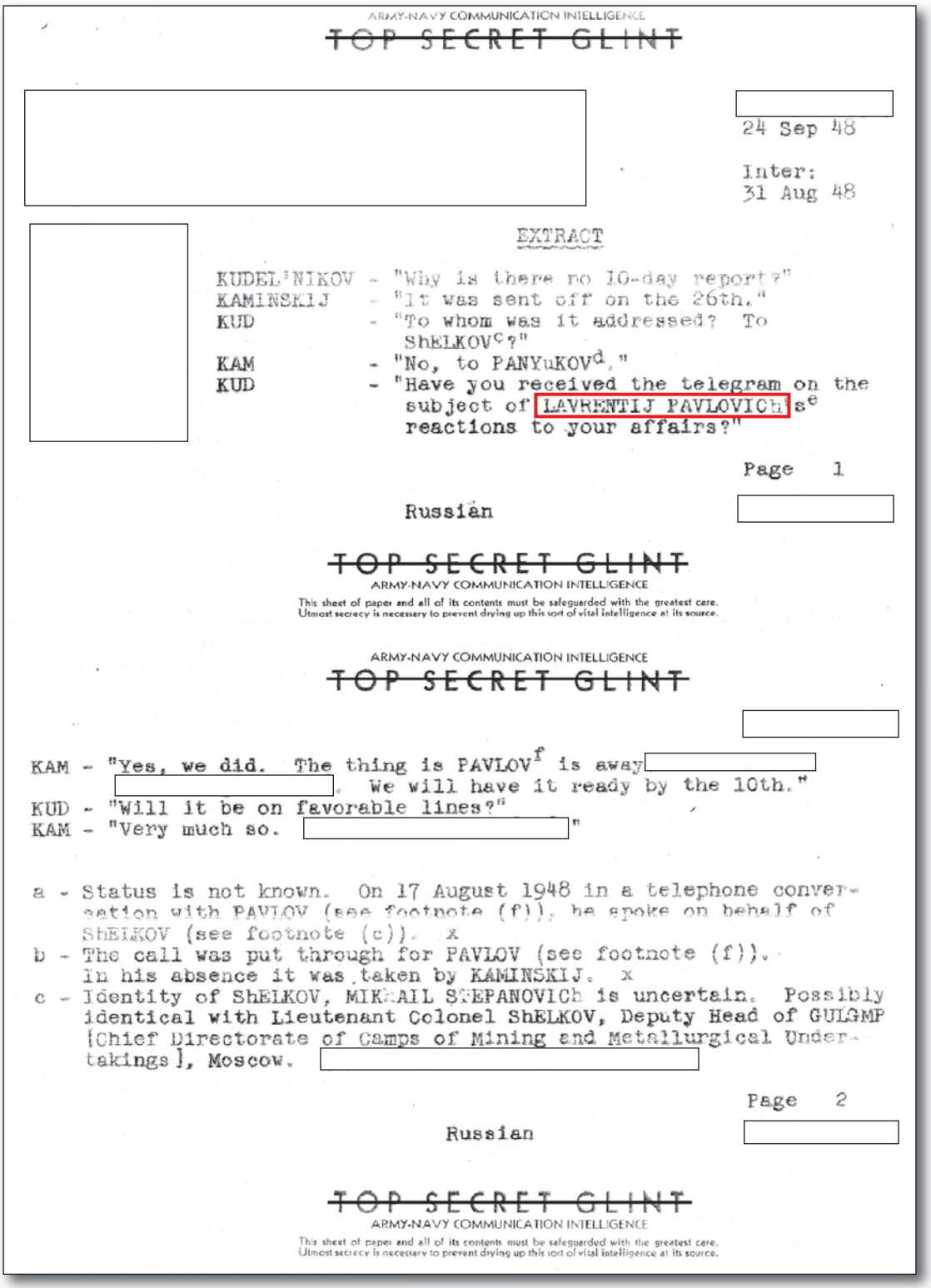
Translations necessarily involved some analysis or evaluation, certainly to the extent that linguists had to be able to relate items to others and to recognize their significance. Translations generally included footnotes and annotations, in order to provide information for the customer to place the item in proper context. Such notes and comments might refer to other translations and provide information derived from COMINT such as explanations for telegraphic addresses, post boxes, and the like; comments on related activities; and collateral information. Translations involving related activities were sometimes issued in sequence or around the same time, thus providing an opportunity for the reader to link the information. They were not necessarily "verbatims," that is, word-for-word translations. Parts of an item that were of no intelligence value might be omitted; messages that were badly garbled would be partially translated or gisted.

IBM punch cards, from which various sorts could be derived, were employed, especially in the early stages of plaintext development. They allowed analysts to identify ministerial organizations, plant subordinations, and associate key personalities and product lines with them. Dependence on IBM processing, however, lessened over time as analysts became familiar with their targets. Never very enthusiastic about having to spend time on this process, analysts (and managers) came to understand that their time was better spent on dealing with backlogs than trying to generate more IBM worksheets.[20]

Analysts remained dependent on voluminous card files, which included both published and unpublished items from COMINT and collateral sources. These files were the nucleus of what eventually became a central file on Soviet industries later commonly known to NSA analysts as C-Ref or Central Reference. Long before computers, these extensive card files grew and grew to become a major resource for COMINT research on Soviet defense industries. They, in turn, also were a kind of model for the computer database that was developed later for the Soviet civil target set up in the 1970s. Called CIVORG, the database contained information on the Soviet economy and defense industries and was arranged on organizational lines.

Army/Navy Division of Effort

ASA and CSAW processed all traffic (enciphered and plaintext) on the circuits for which they were responsible.[21] Traffic that was recognized by one agency as being of interest to the other would then be exchanged. Each US center provided the other with a list of candidate studies in order to avoid duplication. One list that they exchanged in early 1948 revealed only one duplicate candidate study, which concerned the Soviet petroleum industry.[22] The US Communications Intelligence Board (USCIB) Coordinator of Joint Operations determined in early 1948 that the principal duplication between ASA and CSAW was found in the maintenance of identical technical and information files at both agencies, necessitated by their physical separation. There was some rivalry between the two COMINT producers over plain-



ARMY-NAVY COMMUNICATION INTELLIGENCE

TOP SECRET GLINT

[redacted]

[redacted]
24 Sep 48

Inter:
31 Aug 48

[redacted]

EXTRACT

KUDEL'NIKOV - "Why is there no 10-day report?"
KAMINSKIJ - "It was sent off on the 26th."
KUD - "To whom was it addressed? To ShELKOV[c]?"
KAM - "No, to PANYuKOV[d]."
KUD - "Have you received the telegram on the subject of LAVRENTIJ PAVLOVICH's[e] reactions to your affairs?"

Page 1

Russian

[redacted]

TOP SECRET GLINT
ARMY-NAVY COMMUNICATION INTELLIGENCE

This sheet of paper and all of its contents must be safeguarded with the greatest care. Utmost secrecy is necessary to prevent drying up this sort of vital intelligence at its source.

ARMY-NAVY COMMUNICATION INTELLIGENCE

TOP SECRET GLINT

[redacted]

KAM - "Yes, we did. The thing is PAVLOV[f] is away [redacted]. We will have it ready by the 10th."
KUD - "Will it be on favorable lines?"
KAM - "Very much so. [redacted]"

a - Status is not known. On 17 August 1948 in a telephone conversation with PAVLOV (see footnote (f)), he spoke on behalf of ShELKOV (see footnote (c)). x
b - The call was put through for PAVLOV (see footnote (f)). In his absence it was taken by KAMINSKIJ. x
c - Identity of ShELKOV, MIKHAIL STEPANOVICH is uncertain. Possibly identical with Lieutenant Colonel ShELKOV, Deputy Head of GULGMP [Chief Directorate of Camps of Mining and Metallurgical Undertakings], Moscow. [redacted]

Page 2

Russian

[redacted]

TOP SECRET GLINT
ARMY-NAVY COMMUNICATION INTELLIGENCE

This sheet of paper and all of its contents must be safeguarded with the greatest care. Utmost secrecy is necessary to prevent drying up this sort of vital intelligence at its source.

Pages 1-2 of Army Security Agency transcript of Soviet labor camp officials' discussion ("Lavrentij Pavlovich" is Lavrentij Beria, Stalin's chief of security)

text. ASA objected to CSAW's creation of its series of geographic handbooks (which contained large amounts of COMINT); ASA believed they were not part of the original plan for the production of collateral information and noted that "information contained in the handbooks is largely duplicated in ASA files."[23]

While both ASA and CSAW had made excellent starts in plaintext exploitation, ASA had been able to augment its workforce more rapidly. ASA managers thus believed they were in a good position to take over the effort. They therefore proposed in December 1947 to become responsible for all US plaintext processing. In a proposal submitted to Captain Joseph Wenger as coordinator of joint operations (CJO), Frank Rowlett, the deputy coordinator for processing allocations, requested that the new ASA plaintext unit process all Russian plaintext, regardless of the subject. With discussions under way with GCHQ to cooperate on plaintext, a decision was delayed and the proposal went to a joint ad hoc committee for study. All USCIB member agencies subsequently became involved in the decision, since CIA had also weighed in, requesting improved plaintext processing early in 1948. The enlarged panel worked out an agreement in March 1948 that gave both ASA and CSAW responsibility to continue to process plaintext as they had before. They were to exchange traffic of mutual interest and notify each other of their plans to report various studies.[24]

Civil Voice Processing

Unenciphered conversations related to Soviet civil topics were worked on a small scale throughout the plaintext period. The graphic material, the telegrams, naturally received the most attention and resources because they were far easier to process and analyze and had the most valuable information. The transcription work required either native or near-native ability with the language or specialized training in transcription. The quality of the voice signal, however, was frequently very bad—another obstacle to the work. Recording technology was in its infancy, and the quality of the recordings could also be poor.

Among those at ASA first assigned to transcription work were William Weisband* and Juliana Mickwitz, both of whom had native language skills. The voice effort consisted of a small team collocated with

*Editor's note: Unfortunately, William Weisband, despite his capabilities as a Russian linguist, was a disastrous choice for the plaintext program. According to a paper presented by Robert Benson and John Schindler at NSA's 2003 Cryptologic History Symposium, Weisband was "recruited by Soviet intelligence in 1934" and in the late 1940s "regularly passed information from inside Arlington Hall to the KGB," compromising America's ability to decrypt "high-level Soviet military and civilian communications." The authors note that "Weisband was known to the KGB under the covername ZVENO (LINK)." The KGB memo quoted was found in the KGB archives after the collapse of the Soviet Union. As Benson and Schindler explain, "A KGB memo from 1948 regarding Weisband's work told much of the story: *'For one year, a large amount of very valuable documentary material concerning the work of Americans on deciphering Soviet ciphers, intercepting and analyzing open radio-correspondence of Soviet institutions, was received from [Weisband]. From these materials, we came to know that, as a result of this work, American intelligence managed to acquire important data concerning the stationing of the USSR's armed forces, the productive capacity of various branches of industry, and work in the field of atomic energy in the USSR. . . . On the basis of [Weisband's] materials, our state security organs carried out a number of defensive measures, resulting in the reduced efficiency of the American deciphering service. This has led to the considerable current reduction in the amount of deciphering and analysis by the Americans.'*" Robert Benson and John Schindler, "LINK: The Greatest Intelligence Disaster in U.S. History" (presented at NSA's 2003 Cryptologic History Symposium and available at the National Cryptologic Museum Library).

the much larger plaintext printer effort.[25] Transcripts of conversations were issued as individual items in the translation series and covered a variety of subjects. They were clearly identified as transcripts (transcribers were then called auditors). Sometimes they were verbatim, or word-for-word renderings, if the conversation or the speakers were important enough. In other cases, parts of conversations were gisted or summarized. Items were selected that referred to significant problems and helped maintain continuity on organizations, especially those for which there was complementary graphic material.

Juliana Mickwitz, one of the early senior Russian linguists at ASA, helped start up and guide the Russian civil voice effort for a number of years. Mickwitz was born in 1889 in what was then part of the Russian empire (which later became independent Finland), grew up in St. Petersburg, lived in Warsaw during the interwar period, and came to the United States in 1942. She got a job at ASA in 1946 after working for several years in the War Department. With her native language ability, Mickwitz was a vital part of the transcription effort. Her small team was collocated with the plaintext effort, which was in a big room in Wing 1 of Building B at Arlington Hall. Mickwitz helped train Russian linguists and introduced some of them to Russian literature during lunchtime tutorials. Remembered fondly by many for her energy and engagement in her work, she was known to have "collared" ASA Director General Ralph Canine to explain how her work was going and what she and others needed in order to get the job done properly. She was the recipient of two Meritorious Civilian Service awards during her career.[26]

AFSA sought to expand its civil voice effort in 1952, probably in response to a CIA inquiry into its potential. At this time a team of five linguists was formally assigned to work commercial radiotelephone traffic, with another ten linguists to be added after specialized training. AFSA managers noted that there were difficulties in developing the voice effort in any kind of systematized way. They included developing continuity in order to identify likely sources on various links and the need to invest the time and effort in training a competent transcription workforce. It was anticipated that it would take from eighteen to twenty-four months to train personnel who had no previous Russian language training to work the voice traffic.

Juliana Mickwitz, senior Army Security Agency linguist and native Russian speaker

An AFSA memo describing the program noted, "our effort on Russian commercial R/T (radiotelephone) was discontinued in 1949 due to the lack of skilled Russian voice linguists, and also due to the fact that at the time, the yield of worthwhile material from this source was considerably less than the proportional yield from the more easily exploitable traffic intercepted on Russian internal commercial Radio Printer and morse nets and from service (that is, military) radiophone nets."[27] In fact, the small transcription effort was never suspended. Transcripts were sporadically issued in 1950 and 1951 (as well as in later years) in the translation series. It is possible, however, that the original transcription team was disestablished.

From plaintext's earliest, tentative beginnings in 1945-1946, the Army and Navy achieved an organized effort by 1947. They expanded their work rapidly in 1948 and 1949, with the assignment of additional personnel who had worked enciphered military traffic, which disappeared around this time. Messages were selected and organized to produce ministerial studies and a variety of activity studies. Large numbers of translations were issued. IBM punch cards provided a databasing technique that was useful, especially as analysts sought to delineate relationships between organizations. A small voice effort also began early, even though the voluminous graphic material was easier to exploit.

Notes

1. WDGAS-90 memo to Chief, ASA, 8 September 1947, re: Resumé of Proceedings of the USCICC Subcommittee on Intelligence and Security Pertinent to Use by the British of Semi-cleared Personnel for Translating Russian Plain-Text, NSA Archives, Accession 8837, G16-0704-2, Folder 8.
2. Author unknown, 11 September 1947, NSA Archives, Accession 8837, G16-0704-2, Folder 8.
3. History of GENS-6, Civil Division of the Office of General Studies, NSA Archives, Accession 9895, H01-0407-1, Folder 7, 1. This study unfortunately lacks a date and its authorship is not specified. Based on the text, however, it appears that the author(s) worked in GENS-6 in 1956 and had previous experience in the ASA and AFSA plaintext organizations.
4. *Post-War Transition Period, The Army Security Agency 1945-1948*, Prepared under the Direction of the Chief, ASA, GAS-22, 66, http://www.nsa.gov/news-features/declassified-documents/army-security-agency/assets/files/asa-1950.pdf.
5. Annual Report WDGAS-93B for 1 July 1946–30 June 1947, NSA Archives, Accession 36332, G20-0110-3, Folder 24.
6. ASA Memorandum, 10 December 1947, Subject: Russian Plain Text Processing at ASA, NSA Archives, Accession G16-0410-4.
7. Army Security Agency CSGAS-90 Operations Division Annual Report, 1 July 1947–30 June 1948, NSA Archives, Accession 14993, G20-0204-1A, Folder 1.
8. *Post-War Transition Period*, 7 April 1952.
9. History of GENS-6.
10. Draft of "Historical Study of COMINT Production under the Joint Operating Plan, 1946-1949," Dr. George F. Howe and Dr. Robert J. Watson, April 1957, 117, NSA Archives, Accession 49511, Box CCH 508, Folder 5.
11. Joint Liaison Group Memo 0001868, 3 February 1948 for JPAG, Report on Processing of Russian P/L at CSAW, NSA Archives, Accession 4438, G16-0108-7A, Folder 5.
12. Joint Liaison Group Memo 002259, 27 January 1947 for US Liaison Office, LSIC, re: Filmed Baudot Traffic, NSA Archives, Accession 4357, G16-0108-3, Folder 3.
13. From "Additional Russian Plain Text Requirements for FY 1950," NSA Archives, Accession 49511, Box CCH 619, Folder 11.
14. Joint Liaison Group Memo 0003144, 21 September 1948 for US Liaison Office, LSIC, re: Russian Equivalents, NSA Archives, Accession 4357, G16-0108-3, Folder 3 and Senior Liaison Office, LSIC, Memo 000128 of 18 October 1948 for Joint Liaison Group, re: Russian Equivalents, Accession 4357, G16-0108-3, Folder 3.
15. US Liaison Office at LSIC, 24 November 1947, Memorandum for Joint Liaison Group, Washington, NSA Archives, Accession 4357, G16-0108-3, Folder 3. Signed by P. H. Currier, Commander, USN, the one specific example cited was a CSAW translation, but the criticism seems to have applied to both Army and Navy translations.
16. "Transcript of AFSA-02 Study Group Meeting," 30 November 1951, which contains a largely verbatim account. Attending the meeting were Oliver Kirby, Jacob Gurin, and other AFSA officials. Gurin noted at one point, when the study group said that about 10 percent of the traffic reviewed was retained, that the percentage was more likely 15 or 20 percent. NSA Archives, Accession 49511, Box CCH 17, Folder 1.
17. AFSA memo from Capt. (Navy) J. S. Holtwick, Jr., Chief of Office of Operations, 14 April 1951,

re: "Policies Governing Exploitation of Russian Plain Language Training in AFSA," NSA Archives, CCH Box 619, Folder 11.

18. See Bibliographic Note, which deals with the review of extant plaintext product.
19. "Historical Study of COMINT Production," 121.
20. History of GENS-6.
21. "Historical Study of COMINT Production," 115, 116.
22. USCICC memo re: Agenda for the Fifty-first meeting of USCICC held on 31 March 1948; Russian Plain Language, NSA Archives, Accession 2257, G16-0609-1, Folder 2.
23. Joint Procession Allocation Group memo to Coordinator of Joint Operations, 2 March 1948 re: Duplication of Effort Between ASA and CSAW, NSA Archives, Accession 1425, G16-0406-7, Folder 6.
24. "Historical Study of COMINT Production," 118, 119.
25. See *Pullin' Ponyals: A History of Russian Voice Transcription at the National Security Agency and Its Predecessors 1949-1970*, Center for Cryptologic History, NSA, 2002, 25-27 [classified].
26. "I Remember Juliana," by Jacob Gurin, *Cryptologic Spectrum*, Summer 1977, NSA Archives, Accession 4879, H02-0419-7, Folder 5.
27. AFSA memo, 12 September 1952 from Colonel Alfred R. Marcy, Chief of Staff of Signals Corps to USCIB Coordinator re: Russian Radio Telephone Traffic, NSA Archives, Accession 18660, Box H19-0708-4, Folder 6.

Chapter 3

The Early British Effort

Although British resources will be inadequate to cover the whole field [of Russian plaintext], it appears that a joint British-U.S. effort might well achieve this object.

—Sir Edward Travis, Director, Government Communications Headquarters

★

Methods currently in use offer the only means of approaching adequate exploitation of plain-text material. They have been arrived at after study of British methods, and after experimentation with other methods. . .

—Enclosure to AFSA memo on Proposed Concept for a Consolidated Special Information Distribution Office (CONSIDO)[1]

The British Beginning

ASA and CSAW were able to get off to a fast start, in part because of British help. This included all stages of the work—from collection and processing to analysis. The earlier British effort also had a "demonstration effect" for what some initially dismissed as an unpromising source of intelligence—plaintext—and provided support to American advocates, like Jack Gurin, a Russian linguist at ASA, to undertake an intensive effort. Russian plaintext was an important part of the overall US-British SIGINT collaboration that emerged after World War II.

US Interest

US interest in the work of the UK plaintext unit grew in 1946 and 1947. The United States requested that the British provide any pointers they could on how to do the scanning and reporting.[2] The British handled 90 percent of the plaintext processing in mid-1947, with the United States doing the remainder. By 1947 the British provided their product to the United States, but traffic was not forwarded, since the US did not have enough people to work the material.[3] In addition, the UK Technical Language and Library Section provided information to ASA and CSAW on its operations and sets of Russian abbreviation index cards.[4]

Commander Grant Manson, USN, the first senior US Liaison Officer in London after the war, learned about the UK plaintext effort in June 1946. Sir Edward Travis had indicated that the British planned to process Soviet plaintext traffic. Manson noted, "There is a large volume of this material

Sir Edward Travis, director of GCHQ, the UK signals intelligence organization

which is believed by J.I.C. [the British Joint Intelligence Committee] to contain pay dirt, but which has hitherto been neglected for lack of personnel."[5]

Manson was finally able to visit the plaintext office on 30 December 1946.[6] He had been cautioned to be circumspect in his remarks and to try to disguise the Americanisms in his speech when talking to the people in the "working parties," because most of them did not have clearances. The plaintext unit was in a separate location from the rest of GCHQ, in a building that had various tenants; the plaintext office occupied the third and fourth floors. The working spaces consisted of a warren of small rooms, corridors, and partitions, reflecting the apartments that had once been there. Manson noted that the workforce was a "various crew" of young and old, male and female. Several of the workers were obviously "foreign" and unable to speak English. Somewhat to Manson's surprise, quite a few of them looked, spoke, and acted like ordinary Englishmen. Overall, he noted that they seemed to be highly intelligent and well educated.

The work was described in some detail to Manson during the visit. The plaintext messages first went to a group of "readers," who selected items, about 10 percent of all the incoming traffic, which was sent on for further review or exploitation. The rejected items, the bulk of the intercept, were discarded. The messages then went into pigeonholes, which corresponded to the topics of the subsections, or analytic teams.[7] These linguists, in turn, further culled the traffic, setting aside some items for further study and use. They then translated the items of immediate intelligence value. They also maintained extensive files and background materials, which included newspapers, periodicals, and geographic aids. Copies of all their work were kept in chronological order in subject-related binders, many with extensive annotations. Finished translations were sent to the editor's group, which was responsible for approving the final product, adjusting priorities, and handling liaison with GCHQ.

The staff of the plaintext effort approached the large numbers of plaintext messages in a systematic manner for the first time. They identified key ministries and then undertook to find how the organizations within these larger structures were linked to each other. This included basic production units and plants or factories, whose activities, when the plant names were not descriptive, could be inferred from information such as the raw materials that they received and their links to other organizations. There were always information gaps. Data, in the form of related messages, were amassed over time. With continuity on a particular facility or ministry, the understanding of its activities and relationships evolved and became gradually clearer. The biggest early payoff to this approach (in late 1946 and early 1947) included some very significant information.

Other US visitors subsequently came to the UK plaintext office. In February 1947 Tordella, now in charge of developing intercept equipment for the Navy for the Baudot printer traffic, came to see the British operation. He paid particular attention to traffic analysis and to the extensive callsign, frequency, and other traffic files that the British had amassed. Captain L. H. Frost headed a small group of military and civilian intelligence officials who visited the office in late 1947.[8] Travis had issued an open invitation to Frost to see or discuss anything that he wished while in London. Frost noted, "I indicated my desire to become acquainted with the [British] technique in processing Russian plain language intercepts and indicated that we considered the summaries to be valuable intelligence." Frost learned that all of the people doing the basic work in the UK plaintext site were unaware of the existence of GCHQ, what it did, or where the material they were working came from.

The British had put into practice what they considered to be the most practical working methods for Russian plaintext. As Travis emphasized when appealing to the United States for further cooperation on plaintext, only a flexible SIGINT organization that dealt with all aspects of the problem, including the selection and summarization process, could efficiently exploit the material. This was because of the unique characteristics of plaintext—the large volumes, the need to connect individual messages with others in order to extract their full significance, the prevalence of "long-range" intelligence over currently usable information, the "unevenness" with which Soviet activities were reflected, and the availability of some of the information in the press and open sources. The plaintext section's overall goal was to maximize the production of information on a variety of Soviet political, economic, and technical subjects in accordance with established intelligence priorities.[9]

The Voice and Graphic Product

By the spring of 1948, the plaintext site had assigned one experienced linguist to develop the voice traffic on the HF network. This unidentified person was considered one of their very best linguists, with a detailed knowledge of the target. He produced transcripts or gists of conversations of interest that were issued in the same reporting series as the translations. The transcriber sat at a collection

> GCHQ has consistently strived to furnish its consumers with comprehensive reports (compilations of all pertinent plain-text material plus relevant collateral) on subjects of interest to its consumers. The full-message translation method has been reserved for the very few items which can stand alone and tell a good story. Only in the case of special subjects such as Atomic Energy [nuclear weapons program] has there been any attempt to publish all available messages on a subject, and in these rare instances the translations are published in book form rather than as individual cards. On the other hand, AFSA has always been under some pressure to issue as large a number of individual translations as possible. The right to write reports is not universally now acknowledged. In the case of Shipbuilding, AFSA was enjoined to restrict its efforts entirely to message translation.
>
> —William F. Friedman, "Report on Similarities and Differences Between GCHQ and AFSA in Regard to Organization, Methods, and Arrangements for Processing Plain-Text Traffic for the Production of COMINT and a Few Comments Thereon," 1952[10]

> [British and US] . . . cooperation on Soviet scientific, technical, and weapons COMINT was to continue . . . throughout the Cold War . . .

position, listened to the conversation "live," and took down a shorthand version of it. The conversation was also recorded in order to fill in gaps in the initial transcript. It was not possible to work solely from the recordings, since they tended to have a great deal of distortion in them.

The plaintext section's workload was formidable. Its average weekly output in April 1948 was about 390 summaries and 10 full translations. (The section issued translations only when they were truly "stand-alone" items.) The study subsections filed an average of 3,000 messages a week. These were available for subsequent reports and in answering ad hoc requests from customer agencies. It was around this time that Travis made a direct appeal to the United States to work more closely on the plaintext.

A Proposal to Work Together

The London Signal Intelligence Board (LSIB) submitted a proposal in April 1948 to the US Communications Intelligence Board (USCIB) in favor of a more formal and extensive joint British-US effort on Russian plaintext.[11] Noting that this source had yielded very important information and that their own resources remained inadequate to cover the whole field, the British requested that the United States and Britain consider further coordinating their efforts. This could be arranged at a special conference in London in which the British and Americans could discuss the full range of issues connected to plaintext: collection, processing, and customer requirements.

The British proposed that a joint systematic study of all aspects of the Soviet internal network's radio and landline equipment usage be undertaken. This would be coupled with a comparative study at various US and UK intercept sites to determine where collection of specific links could be maximized. In addition, the proposal also included the exchange of scanned traffic and working materials, advance notice of intended output, and specialized liaison officers.

The USCIB countered the British suggestion with a proposal to enlarge the meeting's scope beyond plaintext. USCIB members decided that issues involving cooperation on plaintext could be worked out through regular liaison channels. The British agreed; plaintext issues, while on the agenda, were basically resolved prior to the conference.[12] The London conference held in July 1948 resulted in the expanded 1948 BRUSA Agreement.[13]

All three reporting centers—the UK plaintext section, CSAW, and ASA—were to ensure the exchange of priority collection tasking lists as well as interception records, by highest priority links. The British, evidently wishing to achieve a common understanding of priorities, detailed their scanning procedures and how much information was kept by target categories—to include those areas in which all information was retained and those in which large quantities of traffic were discarded. All centers provided six-month forecasts of reporting projects. CSAW and ASA had twenty-one projects, either organizational studies or specific topics. The British plan categorized by subject area their projects in development, planned reports, and subjects for which material was available but reporting was unlikely during the period.[14]

Thus, by 1948 GCHQ and ASA/CSAW had developed a close working relationship to exploit Russian plaintext. This early cooperation on Soviet

COMINT covered information on Soviet transportation, including electric passenger trains such as the one shown here. (Wikipedia images)

scientific, technical, and weapons COMINT was to continue in one form or another throughout the Cold War to the mutual benefit of both partners.

Notes

1. AFSA-12 memo, 23 May 1950 from Lt. Col. A. C. Peterson to AFSA-02, NSA Archives, Accession 8724, G16-0704-2, Folder 4.
2. Joint Intercept Control Group (JICG) memo, 7 March 1947 to US Traffic Analysis Liaison Office at LSIC, NSA Archives, Accession 5494, G15-0201-2A, Folder 1.
3. British Joint Staff Mission, Offices of the Combined Chiefs of Staff, Col. P. Marr-Johnson memo to Commander R. L. Taylor, 31 October 1946, NSA Archives, Accession 4390, G15-0501-6, Folder 1.
4. Senior US Liaison Officer, LSIC Memo to Deputy Coordinator for Liaison, USCIB, 28 April 1947 on Report on the Technical Language and Library Section of LSIC, NSA Archives, Accession 755, G16-0406-5, Folder 1.
5. Manson memo, 17 June 1946 to Col. Harold Hayes, Coordinator, State-Army-Navy Communications Intelligence Board, NSA Archives, Accession 1983, G15-0509-5, Folder 1.
6. Joint Liaison Group Memorandum from Manson to Coordinator of Joint Operations, OP-20-2, 30 January 1947. NSA Archives, Accession 759, G16-0407-3, Folder 1.
7. US Liaison Office, London SIGINT Centre memo, 16 April 1948 to Frank Rowlett. NSA Archives, Accession 4978, G11-0402-4, Folder 7.
8. Op-32Y1 memo to Rear Admiral Thomas B. Inglis, 18 November 1947, NSA Archives Accession 8325, G15-0510-5, Folder 3. Frost became NSA Director in 1960.
9. LSIB Memo, 2 April 1948 signed by Sir Edward W. Travis to Chairman of the USCIB, NSA Archives, Accession 757, G16-0406-5, Folder 5.
10. NSA Archives, NSA Archives, Accession 49511, Box CCH 17, Folder 1.
11. LSIB Memo, 2 April 1948 signed by Sir Edward W. Travis to Chairman of the USCIB, NSA Archives, Accession 757, G16-0406-5, Folder 5.
12. Coordinator of Joint Operations memo to Chairman, London SIGINT Board, 3 June 1948, NSA Archives, Accession 4390, G15-0502-6, Folder 4.
13. Minutes of the Inaugural Meeting of the U.S.-British Technical COMINT Conference of July 1948, NSA Archives, Accession 5335.
14. BRUSA Agreement, 1948, Appendix K, Agreement for U.S.-British Collaboration in the Russian Internal Plain Text Field, NSA Archives, G15-0510-3.

Chapter 4

The Intelligence Payoff

The U.S. Communications Intelligence Board is . . . of the opinion that the unique material derived from the Russian plain text operation is of considerable importance, and agrees that steps should be taken to improve our present coverage of this source.

—Thomas B. Inglis, United States Communications Intelligence Board Chairman[1]

★

. . . In the case of P/T (plaintext) a real analysis of what may appear to be insignificant fragments is necessary to achieve any worthwhile result.

—Captain Rufus L. Taylor,
Department of the Navy[2]

★

Intelligence analysis is not an easy job in the best of times—the available information on any given analytical problems is invariably incomplete or contradictory or flawed in some other important way—and these clearly were not the best of times. Signals intelligence, which had proved devastatingly effective against the Axis powers in the war, was less effective against the security-conscious Soviets . . . From unsecured Soviet communications, signals intelligence provided reliable information on such things as foreign trade, consumer goods policies, gold production, petroleum shipments, shipbuilding, aircraft production, and civil defense.

—CIA, *Assessing the Soviet Threat, The Early Cold War Years*[3]

The Importance of Analytic Issues

A close look at what was in the Russian plaintext messages and how they were analyzed is vital to understanding the material's true significance. The very large numbers of messages, the selection and analytic process, and the intelligence gaps that the information helped to fill, required a nontraditional approach to the material. The US Intelligence Community (IC), for the first time in peacetime, faced a very secretive and formidable adversary in the Soviet Union. US national security interests dictated that the IC find ways to penetrate Soviet industrial and defense secrets. Clues to many of these secrets were found in Russian plaintext traffic. This meant, however, that the established COMINT practice of providing translations to customers would no longer

> . . . COMINT ranks as our most important single source of intelligence today.
>
> —Lt. Carroll, "The Value of Communications Intelligence" from *Brief of the Brownell Report*, 1952 [5]

suffice. ASA and CSAW analysts showed initiative by taking the individual messages and making the necessary connections to build a larger picture, which included large-scale organizational and activity studies. This necessary measure, however, was to bring the COMINT producers into conflict with customer agencies. In particular, the newly established CIA objected to the encroachment of the COMINT organizations on CIA's responsibilities for analysis.

Soviet society was largely closed off from the world during the Stalinist period. Between 1938 and 1956, from the Great Terror to the consolidation of Khrushchev's rule, "virtually anything was liable to be made secret."[4] With information hard to come by, Russian plaintext emerged as an important source of information. Information sources that were taken for granted elsewhere and that would later become more available in the Soviet Union included books and periodicals (frequently issued in small editions); phone books; and governmental information of all sorts, including the locations and nature of the activities of most government ministries, institutes, and production facilities, the full names of key officials, and the texts of government decrees. Few foreigners were allowed to travel to the Soviet Union; the activities of those who did visit were restricted and monitored. The prevailing atmosphere of fear and paranoia was not conducive to the recruitment of agents. Statistics, even for the civilian sector of the economy, were sparse and suspect.

Russian plaintext's importance was reflected in the fact that it had its own special set of requirements. Issued by the USCIB, first-tier priorities (from March 1950) included publication within a period of approximately six months of all information pertaining to atomic energy; airplanes, ships, guided missiles, electronic equipment, tanks, guns, automotive vehicles, explosives, and other weapon-related information; state reserves; and oil refinery production and distribution. Second-tier requirements included scanning information on the following to ensure that anything related to first-tier requirements was found: chemicals, communications equipment, heavy industry construction, construction materials, electrical equipment, electric power, food, foreign trade, health (or anything potentially connected to biological warfare), highway and railroad construction, maritime activities, metallurgy, Ministry of Internal Affairs (MVD), northern sea route, rubber industry, and state planning.[6]

Russian plaintext traffic thus emerged as a key source of information on Soviet economic, scientific, and weapons developments. In particular, it proved to be, for a time, the main source of information on much of the economy. In fact, the plaintext period was the only time during the Cold War in which COMINT on the Soviet economy was worked intensively.

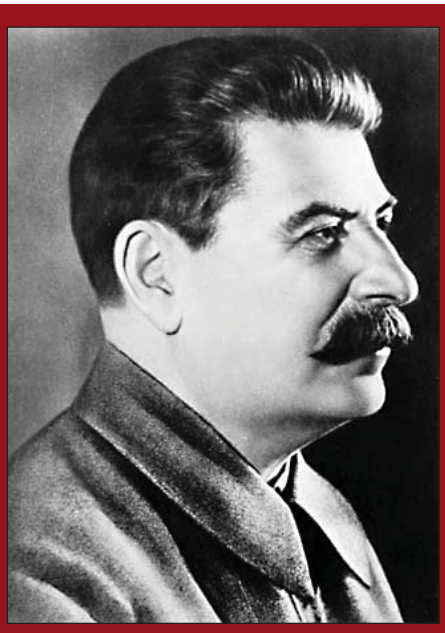
Never again was there so much relatively accessible, wide-ranging economic and industrial information on the Soviet civil network. With the growing amounts of open source and other economic information available in subsequent decades, this meant that, after the 1950s, COMINT was relied on to provide economic data only occasionally and

in sectors that were considered particularly important, such as Soviet oil production.

Defense Industry and Military Preparedness

The economic data in plaintext were considered especially valuable for their usefulness in potentially indicating Soviet mobilization for war. This was possible because plaintext included information across all industrial sectors, including weapons, energy production (oil and coal), and state reserves. These were areas in which signs of mobilization would probably be detected, were they to occur.

The US Army G-2 intelligence staff, a major customer of COMINT, noted that COMINT provided valuable, unique information in the following areas (this included both military traffic and civil plaintext messages): shipments of goods from civilian producers to the Soviet Army, including petroleum products; centers of munitions production; location and composition of supply depots; distribution schedules; transportation means and capacities; and basic raw material information. In terms of indications of war readiness, the G-2 estimated that COMINT contributed about 80 percent of the information available on the ability of the Soviets to produce, store, and distribute military material. It provided key data on the operations of seven Soviet ministries primarily charged with weapons production, which might reveal evidence of conversion from civilian to military production; the only current information of Soviet vehicle production (1951 motor and chassis output at most of the principal production and assembly plants was obtained solely from COMINT); research and development on new weapons, equipment, and modification of same (most of this information was available from facilities in the Far East where tank modification and gun installation information was available). In addition, COMINT showed an acceleration of the development of transportation links in the Far East such as construction of oil pipelines, railroad, road, and transportation/shipment facilities.[7]

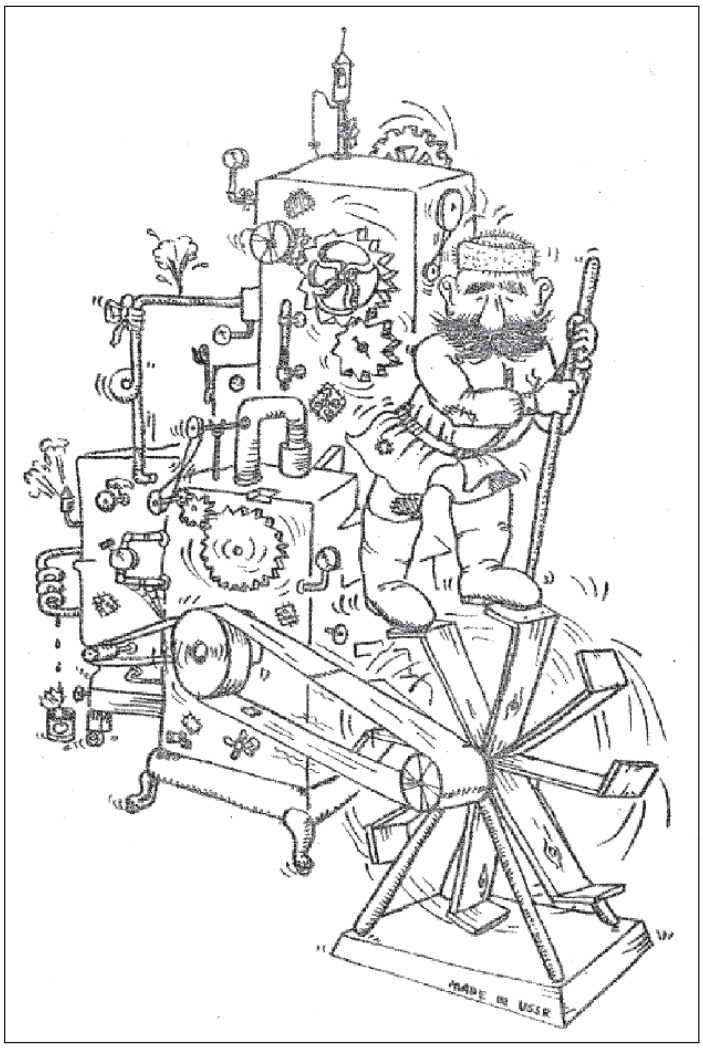


Josef Stalin

The Economy

The fundamental workings of the Soviet economy, especially the basic relationship between production units and the central authorities, were reflected in the plaintext traffic. Moscow exerted near total control over the planned socialist economy, mandating supplies and production targets and making virtually all decisions in all sectors. A noted specialist on the Soviet economy, Philip Hanson, observed, "Stalin had built an economic system that was authority-intensive."[8] It would be hard to overstate the dependence of these subordinate units on their masters in Moscow. Production units were obliged, out of necessity and self-interest, to keep the ministries in Moscow informed of any and all problems.

Messages to and from the central government as well as personal messages provided information on a variety of activities:



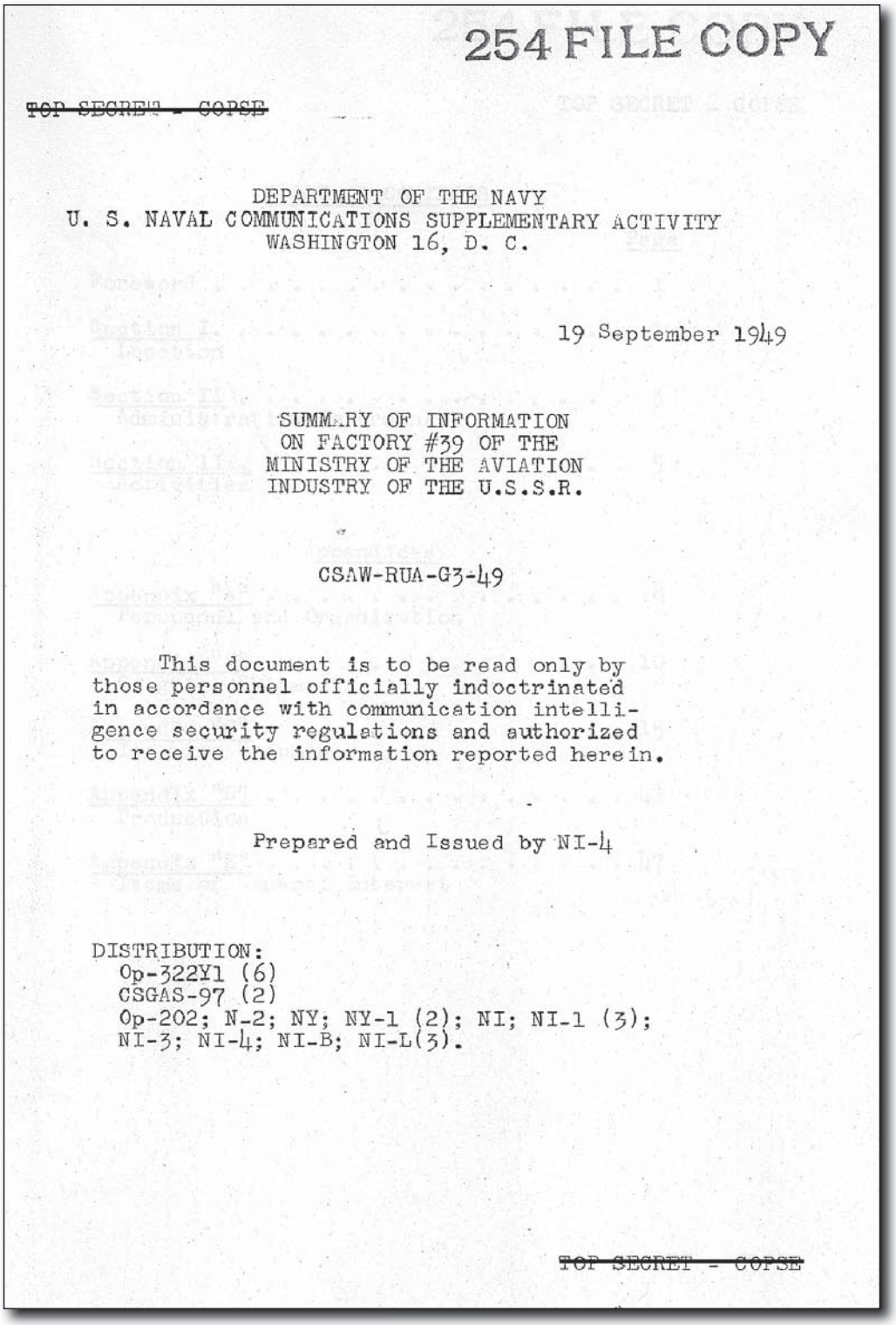
Cartoon from the US Navy's Communications Supplementary Activity, Washington, "Notes on Industrial Shortages in the USSR," 1949. Wheel platform is labeled "Made in USSR."

- Messages from the central government, including ministerial orders, statistical reports, administrative correspondence;
- Messages originating from the local level, including production, financial, and military supply information; activity reports, orders for goods, allocations, supply reports and requests, production reports, personnel information, financial reports, requests for intervention, and complaints;
- Other—including telegrams related to the functioning of the communications networks, press telegrams, and private telegrams, including those addressed to military field post numbers, which provided information on the locations of units.[9]

This information, occurring within the ministerial framework prescribed by the central planning system and showing the responsibilities of the chief directorates and subordinate production units within ministries, lent itself readily to the development of organizational listings. These were among the first analytic products that ASA and CSAW produced.

Plaintext material on virtually all major industries was rich and provided much unique information, especially through the early 1950s. As the Soviets began to publish more production data, CIA felt confident by 1953 that it could properly assess the accuracy of these statistics, using information from various intelligence sources, presumably including plaintext. CIA thus judged that the official statistics on some industries—basic metal production, fuel and power, transportation, and some machinery and chemicals—were probably accurate to within 10 percent of actual production. In the case of steel, oil, and electric power production, it judged that the figures were closer to 5 percent.[10]

Nearly all sectors of the economy and government activity were represented in plaintext: agriculture and food; civil engineering; aircraft; chemical industry; Communist Party activities; decrees and events (such as conferences); expeditions (scientific and other); ferrous and nonferrous metallurgy; finance; First Chief Directorate (nuclear weapons); forced labor (Ministry of Internal Affairs, MVD); fuel (all types—oil, coal, etc.); geology; health (human and animal); industrial crops; internal trade; international trade; labor (wages, recruiting, etc.); law; living conditions; local government; Ministry of State Security (MGB); ministerial organization;



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DEPARTMENT OF THE NAVY
U. S. NAVAL COMMUNICATIONS SUPPLEMENTARY ACTIVITY
WASHINGTON 16, D. C.

19 September 1949

SUMMARY OF INFORMATION
ON FACTORY #39 OF THE
MINISTRY OF THE AVIATION
INDUSTRY OF THE U.S.S.R.

CSAW-RUA-G3-49

This document is to be read only by those personnel officially indoctrinated in accordance with communication intelligence security regulations and authorized to receive the information reported herein.

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Cover page of report from the Navy's cryptologic agency, the Communications Supplementary Activity, Washington, on a Soviet aviation plant

> . . . COMINT is a major, and in many cases the only source of current, timely and reliable information concerning Soviet military capabilities, intentions, war potential and vulnerability.[11]
>
> —US Army G-2 intelligence staff evaluation of COMINT, 1952

movement of personnel, commodities, etc.; northern sea route; prices; production and other priorities; prohibited areas; prominent Soviet personalities; railway construction; rationing; repatriation; roads; scientific institutes; shipbuilding; shortages and bottlenecks; special substances; state reserves; technical information on equipment; telecommunications; and transportation. Two of the organizations in the above list, the MVD (controlled domestic security and the labor camp system) and the MGB (responsible for counterintelligence and foreign intelligence), emerged from the 1946 reorganization of the People's Commissariat for Internal Affairs (NKVD).

Limitations

While some continuity could be developed on many targets using plaintext, in other cases developing a useful context could remain elusive. This could result in knowledge gaps that would require a reliance on inference to reach a tentative judgment about the subject in question. Information had to be accumulated over time in order to assemble an understanding of the nature and scope of related activities.

In addition, as traffic receipts grew through the early 1950s, reporting backlogs grew. What was considered "normal" for reporting timeliness varied but was never very speedy. Standard delays in issuing items were from several weeks to several months (and sometimes more than a year) after the date of intercept. Another limitation of plaintext was that it tended to "skew" toward areas away from central Russia, which was well served by landline links. Information about central Russia might become available only if entities in the areas that were dependent on HF links—Central Asia, the Urals, Siberia, the Far East, and the Far North—were in fairly sustained communication with the heartland.

Information from the central government, at the ministerial level, while fairly plentiful in the earliest days of plaintext, became scarcer in the 1950s. Information from the three main organizations responsible for planning and coordination across industrial sectors—the State Planning Committee (Gosplan), the State Committee for Material and Technical Supply (Gossnab), and the Ministry of Finance—was always scarce, since they generally did not deal directly with production entities. This meant that information, even when it could be pieced together, tended to remain restricted to a fairly narrow sectoral context. Supply and customer relationships across ministerial lines might be clear in some cases and limited or nonexistent in other cases.

As an evaluation of COMINT for the Brownell Report noted, the geographic skewing of the data was a drawback, as was the fragmentary nature of much of the information.

> We read occasional fragments describing actual or planned shipments of identifiable raw materials or identifiable finished products to or from some identifiable plants, and from these we construct estimates of the

> annual capacity of an individual plant or of an entire industry. This is important work, and if we correctly surmise that the government ministries in Moscow exercise direct and detailed control over the operations of Soviet industrial plants, the results of studying this plain text traffic may be more accurate than we can now know. But all we can be sure of is that Russian plain text traffic is better than nothing—better than anything else now available—as a guide to current Soviet economic strength.[12]

Russian plaintext traffic presented a new challenge to COMINT-producing organizations. The initial skepticism about the value of the traffic was overcome as analysts showed how they could connect seemingly disparate pieces of information on high-priority Soviet weapons, scientific, and industrial targets. The process involved the adoption of analytic methods that were a departure from the traditional approach of providing individual, unassociated translations to customers. The payoff from this approach resulted in unique information that shed light on Soviet weapons programs and economic and production activity across virtually all sectors of the economy. This, in turn, could provide information on Soviet efforts to mobilize for war.

Notes

1. USCIB Memorandum for the Chairman, London SIGINT Board, 12 May 1948 re: Russian Plain Text, NSA Archives, Accession 4357, G16-0108-3, Folder 3.
2. OP-322Y1 memo, 5 January 1950 to AFSA-OOB re: Comments on latest draft directive for CONSIDO, NSA Archives, Accession 8724, G16-0704-2, Folder 4.
3. Edited by Woodrow J. Kuhns for the Center for the Study of Intelligence, 2005, 11.
4. John Barber, Mark Harrison, Nikolai Simonov, and Boris Starkov, "The Structure and Development of the Defence-Industry Complex," in *The Soviet Defence-Industry Complex from Stalin to Khrushchev*, ed. John Barber and Mark Harrison (London: Macmillan, 2000), 23.
5. NSA Archives, Accession 49511, Box CCH 619, Folder 11, 18, 1952.
6. Appendix A to AFSA-12 Memo, 23 May 1950 to AFSA-02 on Proposed Concept for CONSIDO (Consolidated Special Information Distribution Office), NSA Archives, Accession 8724, G16-0704-2, Folder 4. This and related documents show AFSA's opposition to the proposed establishment of CONSIDO, which would have taken analytic functions away from AFSA and placed them in a separate organization, limiting AFSA to collection and processing functions.
7. "The Value of COMINT in Army Intelligence," 2 February 1952, prepared by US Army G-2 staff, 2-4, NSA Archives, CCH Box 151, Folder 5.
8. Philip Hanson, *The Rise and Fall of the Soviet Economy, an Economic History of the USSR from 1945* (London: Longman, 2003), 49. See 21-47 for an overview of the postwar period.
9. Proposed U.S.-British Cooperation on the Report of Russian Plain Text Traffic Obtained from Radio-Telegraph Links, Enclosure B to AZ/6106, 1948, II. Statement of Present Position in LSIC, B. Main Problems Encountered in the Reporting of Russian Plain-Text Intercepts, The Raw Material, NSA Archives, Accession 5160, G14-0304-3, Folder 6.
10. Gerald K. Haines and Robert E. Leggett, eds. *CIA's Analysis of the Soviet Union, 1947-1991: A Documentary Collection*, Center for the Study of Intelligence (Washington, DC: Central Intelligence Agency, 2001), 37.
11. "The Value of COMINT," 1.
12. Brief of Brownell Report, "The Value of Communications Intelligence," 22.

Chapter 5

Plaintext, CIA, and Other Customer Agencies

> The [Truman White House] mandate helped to make CIG [the Central Intelligence Group, forerunner of the CIA Directorate of Intelligence] the primary foreign intelligence arm of the U.S. government, but it did not give CIG a controlling role in intelligence analysis. On paper its functions were manifold: to produce national-level intelligence—current, scientific, technical and economic—and to accomplish interagency coordination of national estimates. The latter proved especially difficult in the face of institutional resistance from established organizations guarding their information and what they saw as their prerogatives. Indeed, the existing intelligence organizations were not about to subordinate their own limited analytical capabilities to the upstart CIG.
>
> —*The Directorate of Intelligence, 1952–2002: Fifty Years of Informing Policy* [1]

The US Intelligence Community and Plaintext

The reaction of the customer agencies to the ASA and CSAW analytic product based on plaintext varied. Military and other customers accepted the product, either because they did not have strong objections to the approach and/or had limited resources with which to analyze the plaintext material themselves. It was the newly formed (1947) Central Intelligence Agency which was to present the "hardest sell" on the analytic work. CIA officials believed that their agency, not the COMINT producer agencies, had the mandate to perform analysis. CIA senior managers vigorously pursued their goal of control of the analysis, both with the COMINT producers and in interagency committees.

Navy, Army, and State Department Interest in Plaintext

The Office of Naval Intelligence (ONI) voiced its objections to the summarization and analysis involving areas of interest to it. In particular, it wished to see all the pro forma messages related to the USSR Ministry of the Shipbuilding Industry. ASA mid-level manager Oliver Kirby, Jack Gurin's immediate boss, informed Gurin that the ONI insisted on seeing "everything" and analyzing all the information themselves. Kirby was prepared to honor this customer request. Gurin strongly objected, arguing that ONI analysts would have to become COMINT analysts themselves in order to figure out

the content in the formatted messages. In addition, if the messages were issued as bare-boned translations, other customers would have to figure out the meaning of the messages on their own. Neal Carson, a COMINT analyst and a naval officer, felt very strongly that the analytic methods ASA and CSAW had adopted were the only ones that were practical. He threatened to resign his commission if ONI persisted in its demand. This threat, coming from someone that people at ONI knew and respected, stunned ONI managers; they backed down and accepted analysis of the COMINT product.[2]

Army Intelligence apparently had no qualms about this issue. When AFSA took responsibility for plaintext in December 1949, the Army supported its approach to analytic and summary reporting. Colonel Arthur Peterson, in the Army's Intelligence Division, noted that there were significant efficiencies gained by producing "collated and interpreted reports derived from the analysis of all messages available on a given subject."[3]

The State Department, for its part, was dissatisfied with CIA's effort to interfere in what State saw as the proper functions of the departmental agencies, including intelligence analytic functions. State Department officials made this clear in their comments to the Dulles Survey Group, set up in 1948 to review the issues that had arisen over CIA's relations with other, established IC agencies. The State Department believed that CIA should more properly exercise its coordinating function through the departmental agencies.[4] "CIA/ORE [Office of Reports and Estimates] has tended to develop a maximum production capacity for departmental intelligence which, in turn, tends to duplicate the work of other agencies . . . The Department [State] should point out also that the unbalance described is particularly evident in the fields of political, sociological and certain economic intelligence, which are the fields allocated to the State Department."[5]

The issue of who should do analysis, particularly as it pertained to Russian plaintext, was not only one of principle. It was important because plaintext represented so much of the information then available to the IC on the Soviet defense industries and economy. In late 1951 AFSA stated, based on customer comments, that the IC relied on COMINT extensively for information on the Soviet Union. Information about the Soviet military also had a plaintext component.[6]

Early CIA Interest

The beginning of the plaintext era and ASA's and CSAW's foray into analytic product roughly corresponded with the establishment of the CIA in September 1947. The new agency's analytic elements, while they in part carried over from earlier organizations within the former CIG, were in some flux and still defining their mission. In July 1947 the DCI set up a small unit called the General Division within ORE that was the first recipient of plaintext and other COMINT at CIA. COMINT clearances were granted to other analysts at CIA by the end of 1948.

Secretary of Defense Louis Johnson requested in June 1949 that the Joint Chiefs of Staff work with the USCIB in examining "as a matter of urgency" the emphasis being placed upon communications intelligence with respect to Soviet programs in order to assign the proper priorities. He noted that both the State Department and CIA had interests in this area. This came at a time when an increase in spending for COMINT—about $22,000,000—remained under review because the request had been made before the establishment of the unified cryptologic organization, AFSA.[7] USCIB members, including CIA Director Rear Admiral Hillenkoetter, had a meeting in July with Department of Defense Chief of Staff General Joseph T. McNarney to discuss additional funding, so that AFSA could hire more personnel to work the plaintext traffic. McNarney, however, turned

down the request because of DoD plans to reduce the number of its civilian hires.[8]

The US Intelligence Community as a whole relied heavily on the large amounts of data on Soviet weapons systems and the economy provided by Russian plaintext. Responsibility for the analytic component of the work did, however, cause some controversy and disagreement among various agencies. The Navy, for example, wanted to have the responsibility for analyzing the information then available on shipbuilding activity. The Army did not object to ASA/AFSA's approach to analytic and summary reporting. The State Department objected to CIA's attempt to take overall responsibility for analysis, bypassing the more established IC agencies. In the end, responsibility for analytic reporting at ASA/AFSA was reaffirmed.

RADM Roscoe Hillenkoetter, director of Central Intelligence May 1947-October 1950. CIA Office of Public Affairs

Notes

1. *The Directorate of Intelligence, 1952–2002: Fifty Years of Informing Policy* (Washington, DC: Central Intelligence Agency, 2002), 3.
2. Jacob Gurin, oral history interview, NSA-OH-2003-07 (30 April 2003); Milton Zaslow, oral history interview, NSA-OH-2006-12 (10 May 2006).
3. Undated draft memo prepared by Arthur Peterson to the Director, Armed Forces Security Agency, NSA Archives, Accession 6169, G16-0204-7, Folder 5.
4. Department of State, *Foreign Relations of the United States 1945-1950*, "Emergence of the Intelligence Establishment, Hillenkoetter's Tenure as Director of Central Intelligence," http://www.state.gov/about_state/history (accessed 2008).
5. Memorandum, 22 November 1948 from the Secretary of State's Special Assistant for Research and Intelligence (Armstrong) to the Intelligence Survey Group, Document 354, from State Department website (accessed 2008).
6. "Report by the Chief, Plans and Policy Division to the Director, Armed Forces Security Agency on Processing of Plain Text Foreign Communications for Intelligence," no date; percentages are cited as consumer estimates as of 1 October 1951, NSA Archives, Accession 6420, G16-0205-2, Folder 5.
7. Secretary of Defense memo, 2 June 1949 to the US Communications Intelligence Board re: Atomic Energy Program of the USSR, NSA Archives, Accession 1425, G16-0406-7, Folder 7.
8. Charles P. Collins, *The History of SIGINT in the Central Intelligence Agency, 1947-70* (Washington, DC: CIA History Office, 1971), vol. II, 32.

Chapter 6

Conclusion

> The biggest intelligence success based on SIGINT that always stands out in my mind when I think of the forties and the early fifties is the success that we collectively, that is, the GCHQ, ASA, NSG [Naval Security Group], and then GCHQ-AFSA, GCHQ-NSA, had against the radioprinter that was used by the Russians. That was both a success story in electro-mechanical engineering and also a success story in the intelligence arena. . . . I know we made a terrific contribution to the knowledge the West had of what was going on in Russia. . . . by taking this material, we were able to derive as complete a picture as the one we had in the late forties and early fifties of Soviet science, of Soviet political moves, of Soviet military construction, of Soviet military weaponry.
>
> —Dr. Louis W. Tordella, former NSA Deputy Director, address to the Communications Analysis Association, 8 May 1974[1]

Russian plaintext was a pioneering analytic and reporting effort during the early days of the Cold War that provided a unique window into the Soviet economy and defense industries. It also provided occasional information on social conditions and the political leadership. This exploitation of the Soviet civil communications network received emphasis and additional resources when enciphered Soviet military traffic, which had been worked since the mid-1940s, disappeared from the air. For about ten years, from 1946 to 1956, Russian plaintext played a dominant role in the COMINT effort.

Too large for one agency to handle on its own, work on plaintext helped foster collaborative relationships among US COMINT organizations, the British, and CIA. Following the British lead, the workforce in the organizations at CSAW/ASA/AFSA and CIA expanded rapidly in order to handle the growing volumes of traffic. These analysts assembled, studied, and organized a daunting number of plaintext messages. Dealing with the fragments available to them, they pioneered an in-depth analytic approach that marked a real departure from earlier COMINT reporting, which had provided selected translations.

This relatively rich mix of information was not to last, however. Starting in the late 1940s, the Soviets undertook measures to secure some of the most sensitive information on their vulnerable radio links. This was in part the result of a natural development of upgrading their communications.

Plaintext included information on the Soviet aircraft industry. Shown is an Aeroflot Ilyushin Il-14, introduced in the 1950s (Wikipedia images)

After the mid-1950s, Russian plaintext lost its dominant role as a SIGINT source on Soviet defense industries. New programs, especially missiles, new generations of aircraft, and the Soviet space program required different collection approaches. In this new era, voice intercept and telemetry collected from test ranges became key sources of information. Printer traffic, in the decades to come, thus came to occupy a generally supporting role, rather than the dominant role it once had. Plaintext, nevertheless, had an enduring influence on COMINT exploitation of Soviet defense, industrial, and economic targets. It helped establish the basic connections between central Soviet government managers and their subordinate organizations. It was the foundation on which subsequent discoveries of Soviet weapons and economic developments were based. Without this "candle," the darkness of the early Cold War would have been dark indeed.

Note

1. NSA Archives, Box CCH 505, Folder 9.

Acknowledgments

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This study is dedicated to those pioneers, at all agencies in the United States and in the UK, and in all roles—from interception, processing, and scanning to analysis and reporting—whose dedication and hard work made plaintext the success it was.

Bibliographic Note

My analysis of Russian plaintext serialized product, both translations and analytic studies, must carry the following caveats for the ten-year period (1946-1956) covered in this study. There are no useful plaintext reporting (as opposed to collection) statistics. I have thus had to rely on a review of the available product in the NSA Archives, as well other information in the Archives and at the Center for Cryptologic History. I discovered that the surviving records—including analytic reports and translations from 1951 onward—contain some gaps. While most plaintext product was archived, some translations from this later period, which were sent to the NSA Records Center for possible permanent retention, were discarded because there were so many of them.[1] In addition, analytic product from the later period is sparse; what remains after the early 1950s are mostly translations. There are a limited number of examples of a weekly summary of plaintext highlights called the "Soviet Plaintext Highlights" issued by NSA in 1953.

Even with such gaps in the product record, there still was so much serialized product in the Archives for the ten-year period that it was impossible to examine everything. My analysis and description of product, therefore, are based on a judicious sampling of what remains, some estimates of the number of translations produced in this later period, and my own experience working Soviet civil targets at NSA in the 1970s and 1980s.

That said, the balance of the evidence suggests that ASA and CSAW produced significantly more analytic product (organizational and activity studies) through 1950 than their successor organizations (AFSA and NSA) did afterward. There appear to be several reasons for this. Many of the earliest analytic reports were organization or ministerial listings. Once they were produced, there was little call for producing new ones without significant changes in these organizations. In addition, the decline in the number of official messages and the subsequent drop in the volumes of HF printer traffic that accelerated in the 1950s meant there was less and less information that could be organized into major studies. Translations, however, continued to be issued in large numbers (averaging about 2,000 a month through the mid-1950s).

There is also anecdotal evidence that analytic product during the latter half of the plaintext period decreased significantly. The chief of the GENS 6 organization, which developed information on the Soviet missile and other defense programs, noted that at this time "NSA got more nearly into the analytic deduction business than

A CIA official was shown how many thousands of messages NSA analysts were dealing with—grocery carts full of them—to convince him it was not possible to translate "everything" . . .

they had been before. In other words, we were putting stories together rather than every bit and piece solely going out and never being all wrapped up. That was a problem with, among others, CIA. . . . The Agency felt that intelligence production was its business, and NSA should give them the raw material."[2] That some analysts believed that this form of analysis was a "new" development at NSA suggests that the practice of issuing analytic studies had declined from its earlier prominent role in plaintext reporting. In addition, in the 1970s, new NSA analysts, including the author, heard that, during the plaintext period, product consisted almost entirely of translations. Such beliefs would not have arisen if NSA had continued to produce analytic product at the same or nearly the same rate through the mid-1950s and beyond.

Notes

1. This is based on the personal recollection of an NSA records and archival specialist who participated in the disposal process in the late 1980s.
2. Oral history interview NSA-OH-2003-06 (29 September 2003), Center for Cryptologic History [classified], also describes a visit by a CIA official around this time, who was shown how many thousands of messages NSA analysts were dealing with—grocery carts full of them—in order to convince him that it was not possible to translate "everything" and pass it to CIA.

Appendix: Chronology of Russian Plaintext Organizations

The US Intelligence Community experienced rapid organizational change in the 1940s and early 1950s. These changes were naturally reflected in the organizational designators used by the SIGINT organizations involved in the plaintext effort. From 1946 to 1952, when NSA was established, the three agencies were the Army Security Agency (ASA); the Navy SIGINT organization Communications Supplementary Activity, Washington (CSAW); and, after 1949, the Armed Forces Security Agency (AFSA), an amalgamation of the Army and Navy agencies.

Date	Organization that processed Russian plaintext
Early 1947	ASA (designator unknown) plaintext task given to unit working military field post numbers and some traffic analysis
May 1947	CSGAS-93-B-8 (Pentagon unit) (ASA) (Dissolved 18 February 1948)
13 Nov. 1947	CSGAS-93-B-11 Plaintext Subsection starts up (ASA)
Early 1948	NI-1 (formerly NY-1) established (CSAW)
28 Sept. 1948	CSGAS 97-A, Plaintext Section set up
1949	NI-1 (later NI-3)
16 Dec. 1949	AFSA-246, Russian Plain Language Branch, established
May 1950	AFSA-246
Jan. 1952	AFSA-26, General Exploitation Division, set up (AFSA-261, Russian Plain Language Branch)
4 Nov. 1952	NSA established, General Exploitation Division becomes NSA 26
1 Feb. 1953	NSA 26 becomes NSA 91
7 April 1953	NSA 91 becomes NSA 75, Economic Division
23 July 1956	NSA 75 becomes GENS 6, Civil Division

Derived from "History of GENS-6, Civil Division of the Office of General Studies," NSA Archives, Accession 9895, H01-0407-1, Folder 7; and *Bourbon to Black Friday: The Allied Collaborative COMINT Effort against the Soviet Union, 1945-1948*, Center for Cryptologic History, 1995, 228-229, and Appendix C, 269; http://www.nsa.gov/news-features/declassified-documents/cryptologic-histories/assets/files/bourbon.pdf.

Glossary

AFSA Armed Forces Security Agency, created to centralize cryptology, incorporated elements of ASA and CSAW (NSA predecessor from 1949 to 1952)

ASA Army Security Agency (successor to wartime Signal Security Agency, NSA predecessor from 1946 to 1948); located at Arlington Hall Station in northern Virginia

Atomic energy nuclear weapons program

Baudot code a printer system invented by Émile Baudot in the late 19th century, which employs a 32-character alphabet designed for telecommunications. Each symbol (letter/punctuation mark) is represented by a unique arrangement of five elements, each of which may be a mark or space.

Brownell Report a report issued in 1952 by the Brownell Committee, a panel set up by President Truman to review the organization and functioning of existing agencies responsible for COMINT. The recommendations in the report led to the establishment of NSA in November 1952.

CIG Central Intelligence Group; founded in early 1946, it was a precursor of CIA

CJO Coordinator for Joint Operations, responsible to USCIB for coordinating the efforts of the COMINT-producing agencies ASA and CSAW

COMINT communications intelligence

CONSIDO Consolidated Special Information Distribution Office

CSAW Communications Supplementary Activity, Washington; Naval SIGINT organization from 1945 to 1948 (successor to OP-20-G), located at Nebraska Avenue in the District of Columbia

Demultiplex the process of separating individual channels of a multiplex system for further processing

D/F direction finding

GCHQ Government Communications Headquarters, name of UK SIGINT organization since April 1946

GENS 6 General Studies Civil Division, NSA

HF high frequency, the radio frequency spectrum between 3 and 30 megahertz; commonly used for medium- and long-range radio communications; used extensively by the Soviet communications authorities to fill gaps in the civil communications network

IBM cards punched paper cards that contained formatted information on key organizations that allowed various sorts to be produced; they were the only form of data processing available for plaintext; analysts/linguists filled out worksheets indicating the information that was to be recorded; clerical staff did the actual punching of the cards

IC Intelligence Community

J.I.C. Joint Intelligence Committee UK senior intelligence assessment body; issues intelligence estimates (still active)

JICG Joint Intercept Control Group, a subgroup of the USCIB that dealt with the implementation of customer intelligence priorities and spe-

cific requirements for COMINT; active from 1946 to 1949

KGB Main security agency for the Soviet Union from 1954 to 1991

Landline the part of a communications network using wire or cable on, above, or below the earth's surface; not exploitable by the usual means of radio collection

LSIB London Signals Intelligence Board, a UK authority established at the end of World War II consisting of very senior members of various government customer departments (Foreign and Commonwealth Office, Ministry of Defence, etc.) and the intelligence agencies (GCHQ, Secret Intelligence Service, British Security Service); charged with setting overarching policy for UK SIGINT efforts (now in abeyance; never formally dissolved)

LSIC London Signals Intelligence Centre, a panel below the LSIB, with more junior representatives from UK government customer departments and agencies, which dealt with technical or detailed issues; now in abeyance

MVD Russian Ministry of Internal Affairs

NSG Naval Security Group, a Navy intelligence organization tasked with signals intelligence responsibilities (both collection and security); active from 1952 to 2005

ONI Office of Naval Intelligence

OP-20-2 successor organization to OP-20-G

OP-20-G Office of Chief of Naval Operations, 20th Division of the Office of Naval Communications, G Section, the Naval SIGINT and cryptanalytic group during World War II

P/T, **plaintext** intelligible text that does not require decryption; Russian plaintext is the system of telegraphic messages (both governmental and personal) carried on the Soviet civil communications network; from 1946 to the late 1950s, Baudot printer code was used to transmit these messages

Radio printer telecommunications using two or more printers with radio as the transmission medium

R/T radiotelephone, a device for the transmission of speech by radio

RU-PLAI Russian Plain Language Analysis Items, series of ASA reports based on the analysis of significant numbers of related plaintext messages that updated information originally supplied about key ministries or organizations in RU-PLAR series reports

RU-PLAP Russian Plain Language Analysis Periodic Items, series of ASA reports that studied various subjects organized by identifiers or related activities, e.g., USSR Gosbank account numbers associated with defense industries

RU-PLAR Russian Plain Language Analysis Reports, series of ASA reports based on the analysis of significant numbers of related plaintext messages outlining the structure and related subordinate production facilities of many all-union and republic Soviet ministries

SIGINT signals intelligence

USCIB United States Communications Intelligence Board interagency board of senior US Intelligence Community officials responsible for making COMINT policy and monitoring COMINT operations and results

USCICC United States Communications Intelligence Coordinating Committee, a lower-level element of the USCIB coordinating mechanism


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CRYPTOLOGIC
HISTORY