The MAGIC Documents:

Summaries and Transcripts of the Top-Secret Diplomatic Communications of Japan, 1938–1945

A Subject and Name Index to

The MAGIC Documents: Summaries and Transcripts of the Top-Secret Diplomatic Communications of Japan, 1938-1945

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A Brief History of Communications Intelligence in the United States

by

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CAPTAIN SAFFORD'S VERSION OF PRE-PEARL HARBOR HISTORY PREPARED 21-27 MARCH 1952 (WITH SPECIAL REFERENCE TO COORDINATION AND COOPERATION)

Prior to 1917 United States activity in the field of Communications Intelligence[1] was sporadic, and there is little recorded of it. For all practical purposes the history of American cryptanalysis begins with our entry into World War I. Codes and cyphers at that time, even those used to carry the most sensitive information, were by current standards naive. They were hand-coded and hand-applied cypher systems usually overlying double-entry code

[1]The phrase "communications intelligence", abbreviated for the sake of convenience to "COMINT", means intelligence produced by the study of foreign communications, including the breaking, reading and evaluating encyphered communications; "cryptology" is a synthetic which is applied to the combined cypher activity—i.e., constructing cyphers as well as breaking cyphers, to which, in turn, the synthetics "cryptography" and "cryptanalysis" are applied, respectively.

books, the attack upon which required skills and patience but not the elaborate electronic and tabulating devices of today. Consequently, the codes which this Government "cracked" from 1917 to 1919 were handled by a small group of lexicographers, mathematicians, and people who had acquired some background in what was then the hobby of cypher construction, usually related to some such cult as the "Baconian Theory."

The War Department set up the first organized cryptanalytic office in June 1917, under Mr. H.O. Yardley, an ex-State Department telegrapher who had taken some interest in cryptography, or cypher construction. The strength of this office, at first three people, grew rapidly, was subdivided into functional sections, and at the conclusion of the War had a table of organization of some 150 persons with an annual budget of $100,000. Its security regulations were primitive. Cyphers were broken and code values were recovered entirely by hand process. The volume of traffic handled by the group was nevertheless respectable, and the results of their work on the military, diplomatic and economic fronts were important enough to impress both the General Staff and G-2. But its budget for fiscal year 1921 ran into opposition, and during that decade was steadily diminished, falling at length to $25,000. No research was carried on; there were no training activities, no intercept, no direction finding studies. The personnel had fallen to six. The coup-de-grâce was given in 1929 a few weeks after Mr. Stimson became Secretary of State. By default the records and physical possessions of "The American Black Chamber" fell to the Signal Corps of the Army.

The Navy Department attempted no cryptanalytic work during 1917-1918 but set up a system of medium frequency direction finder stations along the Atlantic Coast for tracking German submarines operating in the Western Atlantic. After the Armistice these Navy coastal D/F stations were diverted to use as aids to navigation but were retained in full operation until "navigational D/F service" was turned over to the Coast Guard in 1941. Although the U.S. led the world in the development and use of the IFDF it lagged badly in development of the HFDF. Finally, in 1937 or 1938, the Naval Research Laboratory developed a HFDF that would work. Production was undertaken at the Naval Gun Factory, installations were made at selected coastal D/F stations in the continental U.S., and overseas "strategic" (HF) D/F stations were established at Manila, Guam, Midway, Oahu, Dutch Harbor, Samoa, Canal Zone, San Juan, and Greenland. By 1939, the "strategic" D/F organization was successfully tracking Japanese warships and merchant vessels in the Western Pacific; the Japanese had been tracking U.S. Naval ships since 1934. By 1940, the East Coast strategic D/F net was successfully locating and

tracking German submarines in the Atlantic. About May 1941, the Navy Department and British Admiralty began exchanging D/F bearings on German U-boats: U.S. D/F stations compared favorably with British D/F stations in this respect. These U.S. Navy D/Fs were also supplied to all Naval Air Stations for air navigation and lost plane procedure, and were made available to the FCC and to the Army. In 1940 Monsieur Busignies fled to America from Paris, ahead of the advancing German armies, taking with him complete plans for a new and radically superior fixed-Adcock type of HFDF. The Navy placed a production contract for the Busignies D/F through the Federal Telephone and Telegraph Company. It was necessary to re-engineer the Busignies D/F to take standard American tubes, 60-cycle power supply, and otherwise adapt it to American use and manufacturing processes; as a result the Busignies D/F did not get into service until 1943. The Collins Radio Company submitted to the Navy the plans of a new and radically different type of rotating D/F about the same time as M. Busignies. The Collins D/F was rushed into production and went into service in 1942. On 7 December 1941, the U.S. Navy was using the DT-1 and DT-2 HFDFs of Navy design and construction; and had a continuity of direction finding effort since 1917.

On the Security side, the Navy built up during 1917 and 1918 an integrated organization (the Code and Signal Section of Naval Communications) for the compilation, production, distribution and accounting of Codes and Ciphers. The Registered Publication Section was divorced from the Code and Signal Section in 1923 and its functions were expanded to include distribution and accounting for ALL secret and confidential documents prepared by the Navy Department and bearing a register number. During 1917-1918, the U.S. Navy relied heavily on cryptographic advice given by the British Admiralty, whose famous "Room 40" led the world in practical cryptanalysis at that time. The Code and Signal Section, maintained at reduced strength after the Armistice, gradually built up a War-Reserve of Naval Codes and Ciphers and made plans for technical improvements. As early as 1922 the Navy recognized that the future of secret communications lay in machine cipher systems rather than in its current systems of enciphered-codes, and sponsored the development of the Electric Cipher Machine from that time on. By 1931 the Navy had tested and discarded the double-printer model of the Hebern Cipher Machine and had placed an order for 30 single-printer Hebern Cipher Machines for service tests. An early form of "strip cipher" was introduced by the Navy as a step in the transition from codes to ciphers and to serve as an interim system until the Electric Cipher Machine could be perfected. The Army took a dim view of

the Electric Cipher Machine at that time and attempted to induce the Navy to abandon it: under the circumstances "collaboration" was impossible.

In 1924 the Navy established a Communication Intelligence Organization under the Code and Signal Section of the Office of Naval Communications with covering title of "Research Desk". The initial allowance was one (1) officer and four (4) civilians, later supplemented by two (2) enlisted radiomen. An immediate start was made on establishing intercept stations in the Pacific Area, getting the Washington Cryptanalytic Unit to function, training personnel, and planning for future expansion. Training was accomplished through technical manuals (which had to be prepared) and correspondence methods plus temporary duty "under instruction" in Washington. Intercept stations were established as trained personnel became available in approximately the following order: Shanghai, Oahu, Peking, Guam, Manila, Bar Harbor (Maine), Astoria (Oregon), and Washington, D.C. Minor intercept activities were later established at various "strategic" (HF) D/F stations. Advanced CI (decrypting) Units were established in the Manila Area in 1932 and at Pearl Harbor in 1936, serving CINCAF and CINCPAC respectively. Beginning in 1935, selected Naval Reserve officers were ordered to Washington normally for a two-weeks "training cruise" and given advanced cryptanalytical instruction and training. In 1938 the "Communications Security Group" (successor to the "Research Desk") took over the operation of all Naval D/F facilities. The growth of the Navy COMINT Organization was slow, steady, and uninterrupted until the fall of France (June 1940) and the President's proclamation of the Unlimited National Emergency (June 1941) permitted calling to active duty trained (or at least partially trained) Naval Reservists previously earmarked for CI duty. The strength and growth of the Navy COMINT Organization is shown by the following table.

Once Intercept Stations had been established at Shanghai and Oahu, and a few radio operators had learned to copy the Japanese Morse Code, the U.S. Navy was off to a flying start in its study of Japanese Naval Messages—due to a fortuitous circumstance. About 1922 a shock-team of FBI, ONI, and New York Police representatives succeeded in "picking-the-lock" of the safe of the Japanese Consul General in New York and discovered a Japanese Naval Code belonging to a Japanese naval inspector. This was photographed, page-by-page, over a period of time, and rephotographed a year or two later to pick up extensive printed changes. The cipher used with this code was not too difficult—and we were literally surfeited with blessings. The one or two available translators could not possibly go through all the intercepted

COMPLEMENT OF THE NAVY COMMUNICATION INTELLIGENCE ORGANIZATION

Date	Officers	Enlisted	Civilians	Total
1925	*1*	*2*	*4*	*7*
1926-1935	*Net increase of about 10 men per year, plus "qualified" personnel performing other duties*			
1936	*11*	*88*	*10*	*109*
June 1940	*12*	*121*	*15*	*147*
	(Does not include 150 operators performing navigational D/F services)			
January 1941	*44*	*489*	*10*	*543*
7 December 1941	*75*	*645*	*10*	*730*

messages so it was necessary to sort out the high priorities, important originators, important addresses, etc., and thus skim off the cream. The Japanese used this code until December 1930, thus giving U.S. Naval Authorities (CNO, War Plans, and Naval Intelligence) a complete picture of the Grand (Japanese Naval) Maneuvers of 1930 including Japanese Naval War Plans, strategic concepts, and the fact that the maneuvers were a "cover" for a 100% mobilization of the entire Japanese Navy. When the Japanese Army began the invasion of Manchuria a few months later, its rear was guarded by Naval Forces superior in strength to the peace-time U.S. Navy, *and CNO knew it.*

In the Army, the period 1930 to 1935 was one of energetic revival. In those years the work was under the direction of Mr. William F. Friedman, who has continued to be a leader in the field and who is presently associated with AFSA, the joint Army-Navy-Air Force cryptologic center in Washington. The first job was to reassemble former personnel and enlist new recruits; a training program with instructional literature was organized, and it is noteworthy that for the first time a total cryptologic activity, (the construction of our own cyphers) was envisaged. There was still no Army intercept service, as we understand it today, but raw material was clandestinely obtained through "backdoor" arrangements, and the secrecy surrounding the work was such as, in the backwash of shock following the Stimson ultimatum, to preclude showing the results of the effort to anybody but the Chief Signal Officer—even G-2 was proscribed. In these depression years funds were extremely difficult to get, especially in view of the nervous secrecy engendered by the Yardley[2]

[2]"The American Black Chamber" by H.O. Yardley; Bobbs Merrill, Indianapolis, 1931.

disclosures. Perhaps the greatest triumph of the Army cryptanalytic group at this time of stringency and uncertainty was the establishment under the Signal Intelligence Service of a training school for officers, which grew from a student body of one in 1931 to about a dozen ten years later.

When the newly established Navy COMINT Unit began its study of JAPANESE DIPLOMATIC systems in 1924-25, the Army steadfastly refused to give the Navy any assistance or to admit that Yardley's "Black Chamber" in New York City ever existed. In 1931 the Navy set an example of collaboration by giving the Signal Corps all JAPANESE DIPLOMATIC keys which had been recovered since the abolition of the "Black Chamber" plus full data on new systems which had come into being since that date. The Army more or less took over JAPANESE DIPLOMATIC systems leaving the Navy free to devote its efforts to Japanese Naval systems. From that time on there was complete interchange between the Army and Navy regarding all technical features of JAPANESE DIPLOMACY as well as exchange of important translations. During the winter of 1935-1936 a new Japanese diplomatic system came into effect which the Army correctly estimated to be a machine system. The Navy suspected that it might be similar to a Naval Attaché cipher machine, which the U.S. Navy was currently reading, if not the same machine. The Navy gave the Army full technical details of this machine, plus a "reconstructed" equipment, and the techniques of its solution. Shortly thereafter the Army was reading the messages in this diplomatic system, subsequently called the "Red" Machine. Later on the "Red" Machine disappeared from the major embassies and reappeared in less important diplomatic posts. The new machine (subsequently called "Purple") had some similarities to the "Red" Machine but was much more complex. As far as technical difficulties are concerned, the Army's solution of the Purple machine was the masterpiece of cryptanalysis in the pre-war era. It required about two (2) years time plus copious "cribs" and translations, and literally drove some of the participants to the verge of nervous breakdown. The Navy assisted by fabricating "reconstructed" Purple Machines at the Naval Gun Factory. These were distributed to the War Department, Navy Department, CINCAF, and subsequently to the British COMINT organization in London. Solution of the Purple Machine itself was not the whole story by any means because a new key was used each day and had to be recovered each day, as well as the special keys for special services which were introduced later on. The Navy assisted the Army in the recovery of these daily keys and eventually developed a system of "predicted keys" whereby older keys could be re-used after going through certain manipula-

tions. The all important messages sent from Tokyo to Washington on 6 and 7 December 1941 were in "predicted" keys so the only delay in reading these messages was decoding and editing.

The Navy COMINT Organization always recognized that its proper targets were the major Navies of the world—particularly the Japanese Navy. It began solution of diplomatic systems in 1924 for training of personnel and because the messages were on hand (relayed by U.S. Naval Radio Stations for several years). No Japanese Naval messages were then available and there were no intercept stations or operators capable of copying them. Work on Japanese diplomatic systems was continued, partly for training and partly to be independent of U.S. Army sources, to say nothing of orders of higher authority. During the hiatus between closing of Yardley's "Black Chamber" and the establishment of the "revived" Signal Corps Unit in Washington, the Navy was the only source of JAPANESE DIPLOMATIC COMINT: attempt was therefore made to translate all diplomatic intercept during this period. For the rest of the time, up to 1938 or 1939, Navy interest in JAPANESE DIPLOMACY centered in solving the ciphers and recovering the keys. The CinC Asiatic Fleet was kept supplied with JAPANESE DIPLOMACY ciphers and keys from 1931 through 1941, and his Fleet Intelligence Officer made such translations as were required by the CINCAF. In 1938 or 1939 it was discovered that the same same safe which yielded the Japanese Naval Code in the early 1920's was a never-failing source of supply for "effective" and "reserve" diplomatic ciphers and keys with the exception of the two machine systems. This enabled the Navy Department to provide CINCAF and the Army with JAPANESE DIPLOMATIC Ciphers and Keys before they came into use. At that time the U.S. Navy was devoting 100% of its cryptanalytic effort and about 90% of its translating effort to Japanese Naval Codes and Ciphers, leaving JAPANESE DIPLOMACY to the U.S. Army almost exclusively. Later, during the winter of 1940-41, when the White House and the State Department became seriously interested in JAPANESE DIPLOMATIC messages, the picture changed.

Once the Purple system became readable and the need for current JAPANESE DIPLOMACY was felt, the War Department COMINT Unit did not have enough Japanese translators to handle the job efficiently. Furthermore it was under pressure to divert some of its cryptanalysts and crypto-clerks to German cryptosystems. Therefore the Army requested the Navy to assist with JAPANESE DIPLOMACY on a 50-50 division of effort. After studying and rejecting two earlier proposals it was agreed to divide all JAPANESE DIPLOMACY "processing" (decrypting or decoding) plus translation on a daily basis, the Navy taking

the odd days and the Army the even days, as the simplest way to evenly divide the work load and prevent duplication of effort. A few months later Naval Intelligence and G-2 arranged for the dissemination of JAPANESE DIPLOMACY to the White House and State Department on a monthly basis, the Navy taking the odd months and the Army the even months.

The collaboration between the Army and the Navy on Japanese Diplomatic crypto-systems did not extend to Japanese Military (Army and Navy) crypto-systems. A secret divulged to a third party is no longer a secret. The U.S. Navy withheld all details of is success with Japanese Naval crypto-systems from the Army and in turn made no inquiries about the Army's progress with Japanese Army crypto-systems. The U.S. Army followed a similar policy. When the Japanese Army invaded Manchuria in 1931 the U.S. Navy intercept station at Peking (manned by Marine Corps operators) went to watch-and-watch condition and obtained a wealth of tactical intercepts. These were all turned over to the War Department for exploitation—and no embarrassing questions were ever asked. From 1936 on, Navy intercept stations in the Far East copied considerable Japanese Army traffic which was turned over to the War Department. For some strange reason the U.S. Army posts at Tientsin (China) and Manila failed to profit from the wealth of Japanese Army messages available at slight effort. Not till the spring of 1941 did the War Department attempt to set up an intercept unit in the Philippines and sent a Signal Corps officer to take charge. The Navy collaborated with the three-months loan of an experienced and qualified Chief Radioman to act as instructor, and the supply of all available technical literature on intecept operator training, Japanese radio procedure, Japanese radio organization, Japanese call-and-address sytem, etc., but left the Army "on their own" so far as Japanese military crypto-systems were concerned.

On 1 December 1930 the old 1918 Japanese Naval Code was replaced by a 1930 Naval Code which remained in effect until 31 October 1938, giving the U.S. Navy COMINT organization a severe, although temporary, set back. The new code was never used without a cipher; the cipher had to be stripped off, before the code could be reconstructed. To make a long story short the Navy cryptanalysts, spear-headed by Mrs. Driscoll, "accomplished the impossible", solved the ciphers and then reconstructed the code. This was the most difficult cryptanalytic task ever performed up to that date and possibly the most brilliant as there were no "cribs" and "translations" to help out as in the subsequent Army solution of the Purple machine. IBM tabulating machinery was introduced by the Navy incident to the solution of the 1930 Naval Operations Code. This machinery greatly speeded solution and

increased the per-capita output of the Decrypting Unit. In 1941 similar IBM equipment was sent to Pearl Harbor and to Corregidor.

The Japanese Navy held Grand Maneuvers every three years. With the 1930 Grand Maneuvers fully digested, comprehensive plans were made for the 1933 Grand Maneuvers. Subsequent events proved that these maneuvers were a dress rehearsal for the Conquest of China—while warding off intervention from the U.S. Fleet. The U.S. Navy tested its theories of Traffic Analysis under simulated war conditions and found them practicable and reliable. The success of the Asiatic CI Unit convinced CINCAF (Admiral Upham) of the necessity of a permanent Navy COMINT installation on Corregidor. The project was begun in 1938 and completed in September 1941. On 7 December 1941 the Asiatic CI Unit consisted of 9 officers and 61 men, located in a bomb-proof tunnel on Corregidor, and functioning with 100% efficiency. This Unit was subsequently evacuated to Australia by submarine and played an important part in the Battle of Coral Sea and in the Battle of Midway.

Extensive arrangements (including a mobile intercept unit aboard a destroyer) were made to cover the 1936 Grand Maneuvers of the Japanese Navy. But these Maneuvers were delayed and finally turned into the real thing, the Invasion of China, as forecast by the 1933 Grand Maneuvers. The navy COMINT organization gave the CNO and CINCAF advance information on all important moves and this information was later verified without exception. It proved what could be done by COMINT, even without radio direction finders, and HFDF's (we hoped) were "just around the corner". The 1930 Naval Operations Code was thoroughly reconstructed by that time and the only limits to our detailed knowledge of what was going on inside the Japanese Navy was the acute shortage of translators and the fact that sometimes the Japanese did not entrust important secret matters to radio communications. The "China Incident" high lighted the need for a secure COMINT post in the Ultimate Defense Area of the Philippines. The Corregidor Project was revived; the CNO finally beat down the objections of the Army Chief of Staff which had delayed the project for two years. The two years additional delay before this project was really commenced were due to cussedness and cowardice on the part of certain high ranking officers[3] in the Navy Department itself.

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[3]When Admiral Moreal was "propositioned" on the Corregidor Project a few days after taking office as Chief of the Bureau of Yards and Docks he exclaimed, "Hell—I don't need Congressional authorization to dig a hole in the ground! But I will need it before I put up any buildings. If the CNO can get me funds for the Tunnel I will start it immediately and I will also get the funds for the Quarters and take care of Congressional approval."

The most important and certainly the most dramatic incident connected with the 1930 Naval Code was the message reporting the NAGATO's post-modernization trials in 1936. We were fortunate enough to intercept the message and got a solid translation. The NAGATO's new speed was better than 26 knots—the same as the four KONGO-class battle cruisers. There was no doubt as to the correctness of this information. By inference, this was the prospective speed of the modernized MUTSU and minimum speed for the new Japanese battleships of the YAMATO-class. This information created consternation in the higher echelons of the Navy Department because the MUTSU-class was believed good for only 23½ knots, and our new battleships (then in the blue-print stage) were going to have a speed of only 24 knots. The information was referred to the General Board; the maximum speed for battleships NORTH CAROLINA and WASHINGTON was raised to 27 knots, and for later battleships to 28 knots. The twelve (12) battleships of the new building program were thus given a superiority in speed over the Japanese battleships.[4] It proved impossible to get any COMINT information on the tonnage, speed, or main-battery caliber of the YAMATO-class: the Japanese never sent this information by radio.

On 1 June 1939 the Japanese Navy introduced a new type of numerical code referred to by Navy COMINT personnel as [ ] the Operations Code.

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Mrs. Driscoll and Mr. Currier spear-headed the attack and we were soon [ ] reconstructing the code. Recovery of the [ ] keys, however, involved much more labor and required many more crypto-personnel than the earlier transposition keys. Main work of solution was undertaken at Washington. By December 1940 we were working on two systems of keys used with this code book: the "old" keys for code recovery and the "new" keys for current information.

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and a set of "code-values", cipher keys, skeleton code-book, cryptanalytical techniques, etc., intended for Pearl Harbor were diverted to Corregidor. A replacement was hastily prepared in Washington and sent to Pearl Harbor, arriving in November 1941. On 10 December 1941 the Pearl Harbor COMINT Unit discontinued attack on the Japanese Flag Officers' Cipher and

[4]It is fashionable nowadays to sneer at battleships, but when the war was on and Japanese battleships and heavy cruisers were active our Naval aviators were very glad to include fast battleships in the Carrier Task Forces. A carrier, at night, is an easy victim to any heavy surface craft.

concentrated all effort on the "Numbers System". Incidentally, we never solved the Flag Officers' Cipher and the Japanese discontinued its use, probably because of its slowness, complexity, and susceptibility to error. It was *the only* Japanese Naval Cryptographic system which the U.S. Navy ever failed to solve.

On 1 December 1941, the numbers system became unreadable, CINCAF promptly advised Washington to this effect. This could have been a tip-off as to coming hostilities, but it also could have been merely a routine change of system. After all, the code had been in use for 2½ years. Two weeks later Corregidor flashed the good news that the same old code was still in use but that new keys were being used with it.[5] This was the third or fourth set of keys used with this same code-book. By February 1942 the new keys had been solved to a readable extent. This same code was retained in use through the Battle of Coral Sea and the "build-up" for the Battle of Midway. It was finally superseded on 31 May/1 June 1941 by a similar code. *If* (and it is a big if), *if* the Japanese Navy had changed the code-book along with the cipher keys on 1 December 1941, there is no telling how badly the War in the Pacific would have gone for Australia and the U.S. or how well for the Japanese in the middle stages. Without detracting in any way from the cryptanalysts who spotted the actual tip-offs, or from the men who did the fighting, due credit for Coral Sea and Midway should be given to the Navy's pre-Pearl Harbor COMINT effort.

The decryption of Japanese Diplomatic messages in Washington throughout 1941 is now a matter of public knowledge and some 40 volumes of official record. We may summarize by stating that the COMINT organizations of the Army and the Navy worked in perfect coordination during this period and provided the White House, State Department, Army General Staff and Naval Operations with authentic timely and complete information concerning the Diplomatic Crisis and the mobilization and movements of Japanese amphibious forces for the conquest of Southeast Asia. The White House and State Department used this information with consummate skill. The failure of the General Staff and Naval Operations to profit from the same information[6] is beyond the scope of this "History".

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[5]"COM 16 TO OPNAV INFO CINCAF—TOP SECRET—151250—TWO INTER-CEPTS IN [ ] PLAIN CODE SIXTH AND THIRTEENTH FOLLOWED WITHIN A FEW HOURS BY ENCIPHERED VERSIONS CONFIRMED INDICATOR [ ] ALREADY RECOVERED BY MATHEMATICAL ELIMINATION PM CODE REMAINS UNCHANGED X WILL SEND [ ] RECOVERIES THIS SYSTEM IF YOU DESIRE BEGIN WORK ON CURRENT PERIOD".

[6]"The Committee has been intrigued throughout the Pearl Harbor proceedings by one enigmatical and paramount question: Why, with some of the finest intelligence available in our history, with the almost certain knowledge that war

So long as the Navy did all the interception and the Army relied on "back-door methods" for its source of messages there was no problem about "collaboration" or "division of effort" in interception. But troubles arose when the European War broke out and the Signal Corps began to establish intercept units at Army posts. The Signal Corps officers responsible for the Army Intercept Service were strong on theory but weak on performance and unwilling to profit by the greater experience of the Navy. Coordination and consultation were considered by them to be more important than getting on with the job. Weeks were wasted in fruitless conferences while the Signal Corps learned "the hard way" and saw their pretty theories demolished by disagreeable facts. In 1940-41 the Army had no intercept stations which could match the Navy's "big five" Corregidor (P.I.), [ ] Bainbridge Island (Wash.), [ ] and Cheltenham (Md.) with their directional antennas beamed on the "target" transmitters, diversity receivers to overcome selective fading, syphon recorders for copying high speed automatic transmissions, highly trained operators, and experienced supervisors. Allocation of intercept effort was finally settled on a trial-and-error basis. The Signal Corps covered such of the International Commercial Transmitting Stations as it could; the Navy covered the others as a matter of necessity. Theoretically it was bad to "split" a circuit: practically there was no alternative. Assignments were changed almost weekly as radio propagation suffered seasonal changes, as more operators and more receiving equipment became available, and as the pressure from higher authority required speeding up delivery and "bridging the gaps" in intercept traffic regardless of cost.

Covering international radio circuits is like fishing with a dragnet, anything and everything comes in with the haul. Then it is necessary to sort out the catch and discard what is not wanted. Monitoring for the Japanese diplomatic traffic automatically gave naval attaché messages, German diplomatic,

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It is needless to review all the arguments and discussions that took place in 1940. Not only did intercept assignments between the services change from time to time during 1940 and 1941, but the assignments to intercept stations within each service

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was at hand, with plans that contemplated the precise type of attack that was executed by Japan on the morning of December 7—why was it possible for a Pearl Harbor to occur?" Report of the Joint Committee on the Investigation of the Pearl Harbor Attack. (Senate Document No. 244—79th Congress)—page 253 (Recommendations).

changed from time to time. For example, we eventually found we could get the best coverage of the Berlin-Tokyo circuit at Corregidor; messages in the "Purple" system were therefore reenciphered in a Navy system and forwarded to Washington by radio. During the last few weeks before the Pearl Harbor attack, while U.S.-Japanese relations were at a crisis, Japanese diplomatic messages intercepted at Bainbridge Island (Wash.), [ ] and Cheltenham (Md.) were relayed to Washington by landline teletype. Army intercepts continued to come in by mail after 7 December 1941. The Navy also arranged for "backdoor" services on all DIPLOMATIC traffic in and out of Washington and New York—to back up the radio intercept stations.

The squabbles between the Army and the Navy COMINT organizations were confined to the interception, "processing", translation and dissemination of Japanese diplomatic messages. These controversies settled themselves in the course of time, and in retrospect are seen to have been merely petty annoyances.

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In JAPANESE DIPLOMACY the Navy found it had a bear by the tail and couldn't let go until after the attack on Pearl Harbor when JAPANESE DIPLOMATIC messages became greatly reduced in volume and importance. Then the Army was able to handle all JAPANESE DIPLOMATIC decryption and translation unaided, leaving the Navy free to undertake a serious attack on German submarine communications.

During November and early December of 1941, JAPANESE DIPLOMACY was diverting 30% of the Navy's Intercept and D/F effort, 12% of its Decrypting effort and 50% of its Japanese translation effort from their proper military functions. Loss of the translators hurt us the worst as the total number available was inadequate even for Japanese Naval messages. Loss of Decryption personnel was more serious than the numbers indicate because our "first team" in Washington had to be assigned to JAPANESE DIPLOMACY. Detailed breakdowns are given in tabular form on the page following.

There were no problems of collaboration for strictly military COMINT matters where each service was working alone in its proper sphere of activity. The Navy COMINT team did a thorough job on the Japanese Navy with no help from the Army [ ] No assistance was requested from the Army other than permission to establish a Navy COMINT Unit on Corregidor. The Navy gave the Army all its Japanese Army intercepts, assisted in training an Intercept Unit at Manila, never denied the Army any legitimate information it requested, and gave the Army all the help it was willing to accept. The Army, in turn,

DISTRIBUTION OF NAVY COMINT PERSONNEL - EARLY DECEMBER 1941

CATEGORY	ATLANTIC (Navy Dept.)	PACIFIC (Pearl Harbor)	ASIATIC (Corr-egidor)	IN TRANSIT (Diverted to Australia)	TOTAL
Officers	53	12	9	6	80
Crypto-Clerks	157	18	19	20	214
Subtotal	210	30	28	26	294
Intercept Stations & D/F Control	178	72	42	--	292
Outlying D/F Stations	60	84	8	--	152
TOTAL	448	186	78	26	738

ALLOCATION OF NAVY COMINT EFFORT - EARLY DECEMBER 1941

CATEGORY	JAP DIP	JAP NAVY	GERMAN/ITALIAN NAV.
Intercept, D/F, & D/F Control	30% (Includes *all* DIP Interception)	50%	20%
Decryption	12%	85%	3%
Translation	50%	50%	None

provided the Navy copies of all its technical cryptanalytical manuals and training courses.

A summary of the Navy's pre-Pearl Harbor COMINT effort and COMINT concepts may be obtained from a secret letter (Serial 081420) sent by the CNO to the Commanders-in-Chief of the Asiatic and Pacific Fleets and to the Commandants of the 14th and 16th Naval Districts, in October 1940, extracts from which are quoted below:

> "Subject: Cryptanalytical Activities, status of.
>
> "1. In view of the present serious international situation, it is desired to acquaint the addressees with the present status and prospects of solution of Orange naval cryptographic systems....
>
> "2. During the past ten years, Orange intelligence has been provided by solution of Orange cryptographic systems, and to a lesser extent by direction finding and traffic analy-

sis. Every major movement of the Orange Fleet has been predicted, and a continuous flow of information concerning Orange diplomatic activities has been made available....

"3. There are five major Orange naval cryptographic systems in current use, all of the enciphered code type, namely:

A. *Administrative Code system.*

The cipher used with this code changes every ten days. Code and cipher recovery is in the hands of Commandant, Fourteenth Naval District, and has progressed to the point where intelligible text can be obtained from nearly all intercepted messages....

B. *Merchant Ship Code system.*

The system itself is 99% readable, but an auxiliary system of ship and place names has not yet been recovered. The cipher changes quarterly, and has been predicted through June, 1941....

C. Materiel Code System.

This code has its cipher changing at irregular intervals of from ten to thirty days. Current information is not now being obtained from this system, but it is estimated that within six months we will be able to read most of this traffic shortly after receipt....

D. *Operations Code system.*

An [ ] cipher is employed with this code, and although the method of recovery is well defined, the process is a laborious one, requiring from an hour to several days for each message....Recovery is being pursued by the Department, and details will be promulgated later.

E. *Intelligence Code system.*

This system, being of least importance, has been neglected in favor of the others.... Solution is being handled by the Department.

"4. With regard to the immediate dissemination of intelligence, it is incumbent upon the Communications Intelligence Units to provide the proper authorities with information and inferences obtained from Communications Intelligence. Since it is manifestly impracticable for the Commander-in-Chief, U.S. Fleet, to gather such information first hand, and impossible for him even to use recovered cryptographic systems without an Orange language officer on his staff, it is desired that Commandant, Fourteenth Naval District, and Commandant, Sixteenth Naval District, disseminate such intelligence from time to time to both Commanders-in-Chief and to the Department. This will require that all messages in readable Orange navy systems be translated promptly upon receipt, to insure intelligence of as fresh a nature as possible, and all cryptanalytical and cryptographic activity must be subjected to this end. As a general rule, readable Orange navy encrypted communications should be handled in inverse order of interception.

"5. It must be borne in mind that the present Orange cryptographic systems may be replaced by new ones imme-

diately upon the outbreak of war. Therefore, cryptanalytic intelligence, per se, may not be available from that time until after successful attack has been conducted. Meanwhile, enemy information can be obtained from radio intercept and direction finder activities as has been the case during the past year.

(Signed) R.E. INGERSOLL
Acting."

Expansion of the Signal Intelligence Service from 1930 - 7 December 1941

by

William F. Friedman

HEADQUARTERS
ARMY SECURITY AGENCY
WASHINGTON 25, D.C.

WDGSS-14 4 December 1945

SUBJECT: Historical Report

To: Deputy Chief, MIS
Room 2E 80, The Pentagon
Washington 25, D.C.

In accordance with your telephonic request, supplementary information in connection with a report written by me in 1942-43, entitled "A Brief History of the Signal Intelligence Service", is submitted herewith.

1 Incl
Sup Rpt on Hist
of SIS

WILLIAM F. FRIEDMAN
Director of Communications
Research

As a result of War Department General Staff action it was directed by the Secretary of War, on 5 April 1929, "That the Signal Corps be charged with the duties pertaining to the solution of enemy codes and ciphers and the detection of secret inks in war, in addition to those duties with which they are now charged pertaining to the compilation of codes and ciphers required by the Army and to the interception of enemy radio and wire traffic in war."

From almost the very day that he took over the indicated additional duties, the Chief Signal Officer not only began to initiate plans for properly organising, but also for expanding the Signal Intelligence Service, as it came to be called. On 19 July 1929 a conference, in which Major Albright of G-2 participated, was held by the Chief Signal Officer regarding these plans. It was there agreed that *the primary function of the Signal Intelligence Service was to be that of training for war and the establishment of the necessary organization to accomplish the training.* The principal missions of the respective sections of the Signal Intelligence Service were stated to be as follows:

a. The Code and Cipher Compilation Service produces the codes and ciphers for use in peace and also a certain amount of reserve codes and ciphers for immediate issue in time of emergency. It also has the peace-time mission of training personnel for proper functioning in the field in time of war.

b. The Code and Cipher Solution Service solves enemy codes and ciphers in time of war. Its peace-time mission is fundamentally that of organising and training for proper functioning in war.

c. The Intercept and Goniometric Service intercepts enemy communications and locates by goniometric means enemy transmitting stations. Its peace-time mission is the same as that of *b*.

d. The Secret Ink Service devises and develops secret inks for the use of our own G-2 personnel, and detects secret inks in enemy documents. Its peace-time mission is purely one of research and training for war-time functioning.

It was agreed that all of the foregoing services should be organised in a unified manner and administered in the Office of the Chief Signal Officer, where, as a unit, it was to take its place and fit into the office as and when reorganized.

As mentioned above, the Signal Intelligence Service was to be organised primarily on the basis of *training for war,* rather than for active operation for enemy interception and solution of the communications of foreign governments or armies. However, it was also stated that if information of present or immediate

value to G-2 should be intercepted and solved, such information would be acceptable to G-2, but it was to be clearly recognized and regarded as a by-product of the training work, and not as the fruit of the functioning of the Signal Intelligence Service in peacetime.

It is important that the foregoing emphasis on training be appreciated and the reasons for it understood. First of all, there is no question that the necessity for training had been overlooked until Major Albright made his important staff study which led to the establishment of the Signal Intelligence Service. After all, the function of an Army is to be prepared for war if it is to have any hope for victory. Training in code and cipher work was all the more necessary because no counterpart exists in civil occupations. But in addition to this foregoing reason for the emphasis on training, there was another important reason. Because of the rigidity of our laws regarding inteception of communications, the activities of the Signal Intelligence Service had to partake of the nature of a clandestine activity, since it was illegal to intercept messages, and the penalties for divulging even the existence of a message were severe. The law did not exempt *anyone* from its penalties, and therefore, the War Department and all the people connected with the work of interception and solution of the communications of foreign governments realized the necessity for keeping the activity secret. By emphasizing the training aspects of its activities, it was thought that the illegal nature of some of the work of the Signal Intelligence Service (interception and solution of foreign communications) could be more easily defended if word of these activities should "leak out." The foregoing reason for secrecy was, of course, to be added to another important reason for keeping the activity secret—namely, the requirement to keep from foreign governments the extent of our success with their communications, and even the fact that we were sucessful in reading any of such communications. Under such circumstances, therefore, it was only to be expected that the normal channels for obtaining of funds for such an activity would be made somewhat difficult—and they were. Up to this time, it must be understood, the War Department support for the solution activities came from Military Intelligence Division Contingent Funds, which are not subject to review by the Controller General.

For one reason or another, none of the six persons who had been working in the old MI-8 Section when the Chief Signal Officer took over the solution activities from G-2 could be added to the staff of the Signal Intelligence Service, which then consisted of one cryptanalyst, (P-5, $4,600) and one clerk-typist (CAF-3, $1,620). A whole new organization had therefore to be built up—with the very scanty funds ($6,666.68) that remained from the

original War Department contribution of $10,000 for the rest of the fiscal year 1930. Therefore, to begin with, the real establishment of a permanent Signal Intelligence Service had to await the availability, to the Chief Signal Officer, of funds specifically for the purpose; and then, of course, the long period of training required to produce cryptographic and cryptanalytic skill was another factor that resulted in what may appear to be a rather slow development, in addition to the usual lack of funds.

However, the hiring of new personnel did not have to await the availability of funds, for until the Chief Signal Officer was able to include in his own estimates the specific funds necessary for the support of the Signal Intelligence Service, he could draw by allotment upon the funds available to the Assistant Chief of Staff, G-2. These, however, amounted to only $10,000 per annum. The sum of $6,666.68 was allotted by the Assistant Chief of Staff, G-2, to the Chief Signal Officer for the payment of personnel engaged in code and cipher work on 16 December 1929 for the balance of the fiscal year 1929.

On 4 January 1930 the Secretary of War was requested by the Chief Signal Officer to authorize the employment of four junior cryptanalysts (P-1, $2,000 per annum). Since the G-2 funds ($10,000 per annum) were available to the Chief Signal Officer for the FY 1930 and 1931, this request was approved quite promptly; three persons were obtained from Civil Service rosters of eligible in scientific pursuits (junior mathematicians, etc.) and appointed. An additional person was obtained by Schedule "A" or excepted appointment for the position of Japanese translator (SP-5, $1,800 per annum) because no Civil Service roster of eligibles was available for selection. On 2 September 1930 an additional person (SP-5, $1,800 per annum) was appointed, making the original staff of the Signal Intelligence Service a total of seven persons by the end of 1930. Except for one or two changes in personnel and the addition of one or two clerk-typists, the technical staff was not augmented until July 1938. In 1936 and 1937 a cryptanalyst was sent to each of the Panama Canal and Hawaiian Departments to work as advanced echelons of the Signal Itelligence Service, and these two persons' positions were filled by two additional candidates selected from Civil Service rosters. However, by the end of 1938 both cryptanalysts who had been sent to overseas stations were back in Washington, for the experiment was not a success, and we badly needed them here. What could one lone cryptanalyst do in Panama or Hawaii?

The years 1931 to 1936 were particularly trying ones—promotions were out of the question, and further expansion was greatly handicapped by the program of economy imposed upon the War Department during the depression.

Several examples may be cited to illustrate our attempts to expand the Signal Intelligence Service over the years 1931-1938 and the more or less fruitless results thereof.

On 14 October 1931 the Chief Signal Officer requested approval of a project to include four additional positions in the Signal Intelligence Service, involving an increase of $7,240 in his estimates for salaries for the fiscal year 1934. As inclosures, the Chief Signal Officer submitted schedules showing the number of people engaged in Signal Intelligence work in the fiscal years 1928-1931 and projecting the numbers estimated by 1934. The request for the four additional positions was "not favorably considered at this time" by the Adjutant General. The reason given was the necessity for holding estimates to a minimum for the fiscal year 1934: "It is not contemplated authorizing new projects unless current or prospective funds are available."

Again in 1932 an attempt was made to attain urgently needed personnel, with no favorable results. It was stated that the need for expanding the code production program was urgent. In addition to the code compilation duties of the section, there were those of conducting research in solution as well as certain administrative duties in connection with correspondence courses, reserve officer instructional training courses, and the regular administrative activities concerned in the use, distribution and improvement in code and cipher communication by the Army, the development of cipher apparatus, methods of secret intercommunication between the Army and Navy, the development of radio intercept and radio direction-finding methods, work in secret inks, etc. The assistance of G-2 was sought at the time, since it was thought that in view of the interest registered in the work of the Signal Intelligence Section on the part of the Assistant Chief of Staff, G-2, and the Chief of Staff, it would be the psychological moment to take the matter up once more in the hope that means might be found to add to the personnel of the section, and thus enable it to carry on in an effective manner. Whether or not the support of the Assistant Chief of Staff, G-2, was obtained, the available record does not disclose; however, even if this support was forthcoming, the attempt remained fruitless.

In 1936, the Chief of the Signal Intelligence Service recommended that the time had come to organize the Signal Intelligence activities of the Chief Signal Officer upon a more extensive basis, "in order that personnel for efficent operation may be available when the situation will require their services." It was also considered essential to provide opportunities for advancement for the personnel already employed, in order that a restricted field might be attractive to them. Otherwise, the Signal Intelligence Service would "become merely a training ground for other departments."

A five-year expansion program was recommended, which would increase the total personnel to 21 by 1942, with a total budget of $54,660.

Various obstacles impeded the immediate approval of this plan. In the first place, in order to be able to keep our trained personnel, long-overdue promotions were very necessary; but any proposal for an increase in the salaries of the personnel in the Signal Intelligence Service was held to be objectionable.

(For several years, owing principally to measures of economy imposed by the President and Congress, it had not been possible to provide administrative promotions for any Signal Corps employees. In addition, the President had directed that no promotions were to be included in the 1937 budget.)

A second obstacle was that the personnel and equipment assigned to the Signal Intelligence Service fully occupied its available space, and because of the critical shortage of office and storage space in the District of Columbia, no additional space was likely to be secured for the expansion of that organization. It was suggested that additions for the existing force would overcrowd the area and be detrimental to health and comfort as well as impair the performance of their duties.

This request for personnel was not approved and the four additional positions had to be deleted from the estimates. One of the contributory factors which brought about this deletion was the lack of support from representatives of G-2. Assurance had been obtained from G-2 on advance that it would cooperate in defense of the item, but its representatives "failed to appear at the hearing when held." Note the following extract from a very interesting memorandum dated 18 February 1936, to the Chief Signal Officer, again requesting an increase in personnel for the Signal Intelligence Service:

> "9. Under date of March 20, 1935, the Chief Signal Officer requested authority to present in connection with the 1937 estimates, a requirement for two (2) assistant cryptographic clerks at $1,620 per annum, and two (2) junior cryptanalysts at $2,000 per annum. The War Department approved the inclusion of this additional personnel in the Signal Corps estimates. The limiting figure, designated by the War Department under date of August 5, 1935, for Project #1, "Personnel", of the Signal Corps estimates to be submitted to the Bureau of the Budget, was reduced to such a point as to necessitate the deletion of these four positions from the fiscal year 1937 estimates. One of the contributory factors in the necessity for this deletion was, no doubt, the lack of support by representatives from the Assistant Chief of Staff, G-2, whose assurance of cooperation in defense of this attempt had been obtained in advance, but who failed to appear at the hearing when held."

At that time it was the opinion of Major W.S. Rumbough, Officer in Charge of the War Plans and Training Division, of which the Signal Intelligence Section was a part, that such "a serious shortage of trained personnel exists in the Signal Intelligence Service", that it could not "fully perform its peace-time mission." If this shortage should "be allowed to continue, no Signal Intelligence Service worthy of the name will be available during the early phase of an emergency when the most valuable results should be expected from this agency."

The memorandum of 18 February 1936 recommended that if funds in the amount of $7,240 accrue by savings, under Project #1, fiscal year 1937, that these savings be used for the employment of two Assistant cryptographic clerks at $1,620, and two junior cryptanalysts at $2,000, to be obtained and trained in this office as soon as possible; alternatively, that if no such savings can be foreseen, funds be diverted from other projects and allocated to Project #1, fiscal year 1937, for the foregoing purpose. But, as already noted, the attempt was fruitless.

It may be stated that about this same time, in May 1936, whereas the Signal Intelligence Service had a total of some seven or eight people, the Navy had some forty, and even the small unit at the United States Coast Guard had seven people.

All attempts to increase the complement of seven people comprising the staff of the Signal Intelligence Service were more or less fruitless until the fiscal year 1938, when four more positions were finally authorized. No doubt one of the factors which led to the final approval of the repeated requests for expansion was the recognition on the part of the high authorities of the War Department of the importance of the work being done. A program of code compilation was being vigorously pursued under severe handicaps; new codes and ciphers were being prepared, printed and placed in storage with two, and sometimes three or more editions in reserve to meet all contingencies. (It is necessary to note that in 1933 the duties formerly assigned to the Adjutant General in connection with the printing, distribution, and accounting for codes, were transferred to the Chief Signal Officer, thus integrating all cryptographic work in the Army within one organization—the Signal Intelligence Service under the Chief Signal Officer.)

Very important progress in research and development of new cryptographic apparatus and devices was being made; and a high-speed, electrical, cryptographic machine of highest security had been invented and developed by our chief cryptanalist—this machine being far in advance of anything that had hitherto been known. Moreover, this machine was going into practical usage for secret intercommunication among War Department and the

Commanders of overseas departments. An intercept service was being organised to provide the raw material for the cryptanalytic training activities, the first station to be established being that at Fort Monmouth, New Jersey, with additional stations being contemplated in the overseas departments. On the cryptanalytic side much progress had already been made, and by 1934 the training program had reached the stage where actual solutions of current Japanese diplomatic messages were being achieved daily. It is, however, a commentary on the peculiar situation which existed to state that so fearful was the Chief Signal Officer that news of the "illegal" activities of the Signal Intelligence Service might leak out, that these solutions were not issued as "bulletins" or distributed to anybody. Occasionally, one would be shown to the Chief Signal Officer, and it is possible that he would show a translation to the Assistant Chief of Staff, G-2, but it is doubtful if dissemination went any farther than that. When important visitors from the War Department were brought by the Chief Signal Officer to the quarters occupied by the Signal Intelligence Service for inspection or other official business, it was important to emphasize that such solution work as was being accomplished was only a by-product and part of the training being conducted, and that no use was made of the product. It was not until 2 March 1935 that "publication" of the bulletin was started, and G-2 began receiving on a more or less regular schedule the translations of Japanese diplomatic messages resulting from the "training". What distribution or dissemination G-2 made is, of course, not known to me, except by indirect evidence.

It was not until 1939 that any considerable increase in funds for the Signal Intelligence Service was provided, as is shown by the following letter:

"September 27 1939

"SUBJECT: Signal Intelligence Service

TO: The Chief Signal Officer

"1. You are authorized to employ the following designated additional civilian personnel from October 1, 1939, at the annual salaries indicated.

1 Principal Cryptanalyst @ $5,600	$5,600
2 Associate Cryptanalysts @ $3,200	6,400
2 Research Analysts @ $3,200	6,400
2 Assistant Cryptanalysts @ $2,600	5,200
2 Junior Cryptanalysts @ $2,000	4,000
2 Cryptanalytic Aides @ $1,800	3,600
4 Principal Translators @ $2,300	9,200
1 Principal Clerk @ $2,300	2,300
1 Principal Stenographer @ $1,800	1,800

3 Cryptographic Clerks @ $1,800	5,400
1 Senior Tabulating Machine Operator @ $1,800	1,800
3 Assistant Cryptographic Clerks @ $1,620	4,860
2 Tabulating Machine Operators @ $1,620	3,240

"2. It is desired that you establish and operate a monitoring station at Fort Hunt, Virginia, and purchase such of the following listed equipment as may be necessary and procurable within the funds allotted:

10 Radio Sets, SCR 243 (or equivalent) @ $260	$2,600
29 Radio Sets, SCR 244 (or equivalent) @ $195	5,655
18 Recorders, BC 17 @ $1,300	23,400
12 Recording Equipment Tape @ $2,000	24,000
9 Diversity Antennae @ $3,000	27,000
14 Diversity Receiving Equipment @ $1,400	19,600
TOTAL	$102,255

"3. The authorized strength of the Second Signal Service Company is increased by the addition of the following listed personnel. The authorized strengths of Signal units from which these men are transferred are reduced by the corresponding grades and specialist ratings. The allotment of enlisted men to the Signal Corps is increased by twenty-six privates (grade 7). No increase in grades above grade 7 or in specialist ratings will be made until such time as additional grades and ratings become available (probably Nov. 8, 1939).

1 Master Sergeant

1 Technical Sergeant

1 Staff Sergeant

1 Private 1st Class, spec. 1st class

6 Privates 1st Class, spec. 2d class

6 Privates 1st Class, spec. 3d class

6 Privates 1st Class, spec. 4th class

4 Privates 1st Class, spec. 5th class

"4. It is desired that you submit the name of and other pertinent data concerning a Regular Army Officer to be assigned as assistant to the officer in charge, Signal Intelligence Service, and the names of and other pertinent data concerning nine Reserve Officers for active duty under the provisions of the Thomason Act.

"5. Funds in the amount of $41,050 from the Administrative Reserve Signal Service of the Army and in the amount of $50,000 from the reserve now in an unallotted status, subject only to direction of the Secretary of War, will be released to you for the salaries of these civilian employees, for the purchase of additional equipment, and for the expenses incident to operation of the Signal Intelligence Service. The balance necessary for the purchase of equipment will not be available for obligation until the total deficiency of $175,405, required for the expansion of the Signal Intelligence Service has been covered by Congressional appropriations.

"6. You will make necessary arrangements in collaboration with A.C of S. G-2 to obtain Civil Service exemptions required.

By order of the Secretary of War:

/s/ WILLIAM W. DICK
Adjutant General"

The total number of additional personnel for the Signal Intelligence Service in Washington authorized by the foregoing letter was twenty-six; with the original staff of nineteen people, the Signal Intelligence Service staff was to be forty-five persons. Steps were immediately taken to hire the new personnel, have them cleared, and to start them in training—a rather lengthy process. Special dispensation had to be obtained from the Civil Service Commission to hire these trainees outside the Civil Service regulations, because no rosters of eligibles in cryptographic or cryptanalytic work existed. In order to obtain the support necessary for such an unusual procedure the Secretary of War requested approval by the President on 26 October 1939 to have the Civil Service regulations suspended so as to permit the employment by the Signal Intelligence Service of not more than twenty-six persons on a temporary basis until 30 June 1940. Through the intervention of the White House, the approval requested was obtained.

The unfavourable way in which the war in Europe was progressing so far as concerned Britain, led to desires to expand the Signal Intelligence Service even more, and as fast as possible. The urgency for cryptographic production to meet the needs of a large United States Army in case the United States became a belligerent was apparent; the output of the cryptanalytic staff was impressive enough to G-2 to warrant further increase of that staff. By September 1940 the Signal Intelligence Service, without the help of any other staff, had succeeded in a most momentous achievement

3 lines deleted

—the solution of the Japanese diplomatic machine designated by them as the "B Machine" and by us as the "Purple". Texts of highest strategic and diplomatic import were being furnished G-2 daily, the value of which was recognized by the Assistant Chief of Staff, G-2, the Chief of Staff, the Secretary of War, and the President. The conduct of our difficult negotiations with the Japanese in regard to the situation in the Pacific was no doubt being guided from day to day by means of the solutions furnished the War Department, the State Department, and the President.

On 16 October 1940 the Chief Signal Officer requested of the Assistant Chief of Staff, G-2, authorization for two further expansions of the Signal Intelligence Service, one of which, to begin 1 January 1941, would involve appointment of forty-eight additional civilian employees at annual salaries totaling $85,580, half of which ($42,790) would have to be provided during the fiscal year 1941, then already in progress. No funds for this purpose were available to the Chief Signal Officer, but this expansion was approved by the Acting Assistant Chief of Staff, G-2, with the concurrence of the Assistant Chief of Staff, War Plans Division, on the very next day.

The second request, made on 16 October 1940, was for expansion involving employment of forty-two other employees, who were to begin work on 1 July 1941. This plan was approved in principle by Brigadier General Sherman Miles, Assistant Chief of Staff, G-2, on 17 October 1940, but its carrying out was postponed until the time of the preparation of the budget for the fiscal year 1942. The paragraph is of interest:

> "3. The complete expansion of the Signal Intelligence Service to place it on a wartime basis beginning July 1, 1941, as recommended in paragraph 1 *c* and inclosure of the basic letter, is not essential at the present time. The recommendation, however, is for funds to enable this expansion to be begun on July 1, 1941. The uncertainty of the future and the necessity in any contemplated expansion of this service to make provision for a time lag incident to selection and training of new personnel make it necessary to provide for an increase in personnel far in advance. It is recommended, therefore, that funds be made available in the fiscal year 1942 budget to provide for total expansion of the Signal Intelligence Service. If conditions develop prior to July 1, 1941, which make this additional expansion unnecessary, the funds need not be expended."

The letter from the Chief Signal Officer to the Assistant Chief of Staff, G-2, on 16 October 1940, contemplated an expanded Signal Intelligence Service for the fiscal year 1942 amounting to 127 persons. The pressure of events was such that the full program must have been approved, for on 7 December 1941, instead of having only eighty-five people, as would have been the case had only the first increment been approved, the strength of the Signal Intelligence Service was as follows:

	Washington	**Field**	**Total**
Officers	44	1	45
Warrant Officers	-	-	-
Enlisted	28	149	177
Civilian	109	-	109
Total	181	150	331

The staff was organised as shown in the accompanying chart, with the following sections and personnel:

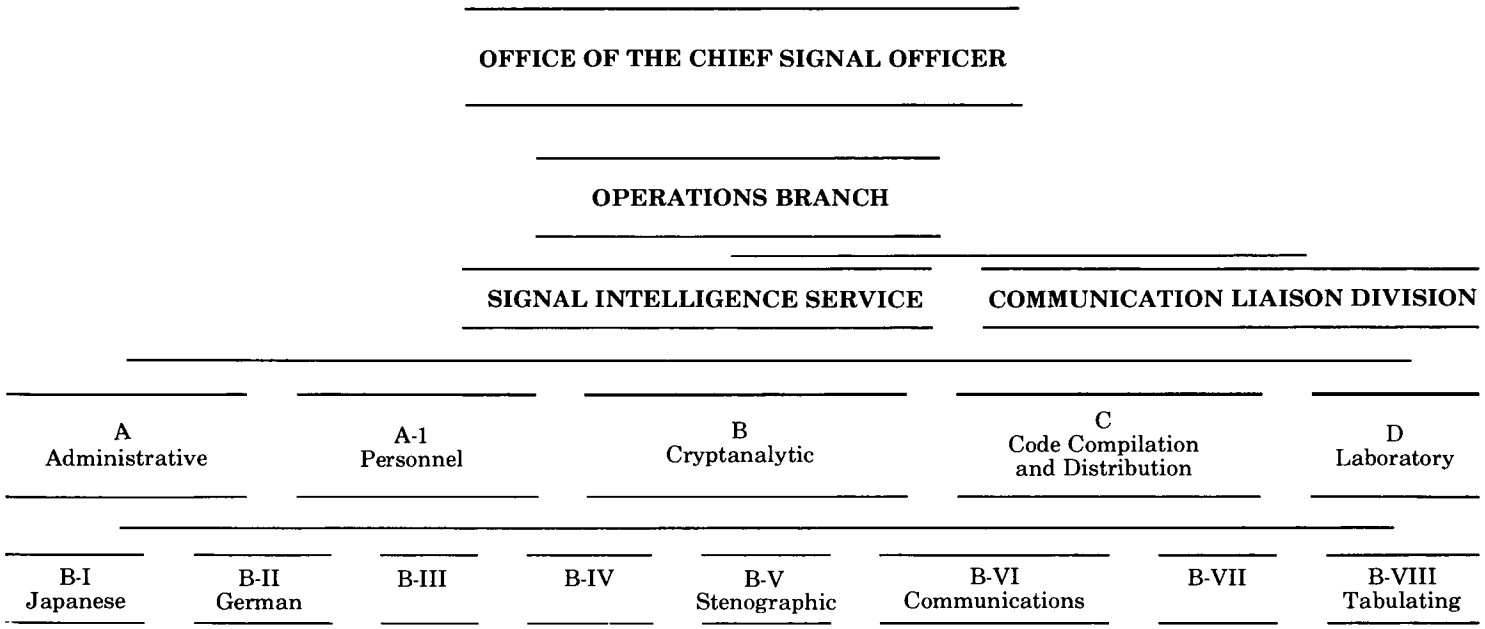
	Officers	Civilian	Total
Administrative	2	2	4
Personnel	2	6	8
Cryptanalytic			
Japanese	10	24	34
German	1	15	16
Cryptographic	16	10	26
Laboratory	4	-	4
Communications	5	2	7
Tabulating (IBM)	1	15	16
"Trainees" in classes	-	22	22
Total	44	109	153

It may be of interest to note the breakdown in grades of civilian personnel:

Grade	No.	Grade	No.	Grade	No.
P-6	1	SP-6	2	CAF-10	1
P-5	1	SP-4	9	CAF-8	1
P-4	1	SP-3	11	CAF-6	9
P-3	5			CAF-5	3
P-1	10			CAF-4	11
				CAF-3	17
				CAF-2	26
	19		22		68 - 109

The nineteen people in professional grades also include Japanese translators; only a few expert cryptanalysts were therefore on hand among those nineteen.

The necessity for producing codes and ciphers has already been mentioned and the staff of 26 persons was hardly adequate for the large volume of work to be done. The production of our electronic cipher machines (Sigaba) was under way and there were multitudinous details to be dealt with in that project above: the preparation of instructional manuals for the maintenance and operation of the machine, the elaboration of keying arrangements; the elaboration of what shall go into spare parts kits, etc. Also, the plans for the production of Converter M-209 were under way—a very large project in itself. Besides all this, keys and control tapes for the electric Converter M134A had to be prepared on a current basis, to maintain security of current communications; strips and key lists for the widely distributed Strip Cipher Device M-138A had to be prepared in large quantities; constant liaison with the Navy Cryptographic Division, for the production and distribution of cryptographic material for joint communication required much time, etc. Also, plans for the production of an



Organization of SIS as of *December 1941,* compiled from records of the period concerned. Made 14 November 1945.

automatic teletype encipherment system invented by Signal Intelligence Service personnel were being brought to fruition.

The ever-expanding requirements of traffic for the cryptanalytic staff meant expansion in the facilities and personnel of the Second Signal Service Company. Seven monitor stations were in operation by 7 December 1941:

1 - Fort Hancock, New Jersey
2 - Fort Scott, Presidio of San Francisco
3 - Fort Sam Houston, Texas
4 - Post of Corozal, Panama Canal Department
5 - Fort Shafter, T.H.
6 - Fort McKinley, P.I.
7 - Fort Hunt, Virginia

Also, of course, a good portion of our traffic came from the United States Navy, which had a large station at Bainbridge Island, Washington, and another at Bar Harbor, Maine. The mere recording and indexing of the large volume of messages constituted a task of no small proportions.

Hence, even with the large expansion of the Signal Intelligence Service there was much more to do than hands to do with. Consider what was done in the field of solving and translating Japanese diplomatic messages alone. By a special agreement between the Chief Signal Officer and the Director of Naval Communications, all work on Japanese diplomatic traffic was divided up between the Army and Navy on the basis that Army would process all messages of even date (cryptographic), Navy, all of odd date—with full exchange of technical data and results. Thus, in collaboration with the Navy and with a total of only 34 persons, the Signal Intelligence Service was attempting to decode, decipher, and translate its half of the traffic for which the Japanese must themselves have had several hundred persons, and the Japanese, of course, did not have to translate the material, a job which was quite difficult for us because of linguistic difficulties and paucity of qualified translators. Moreover, the Japanese had the necessary keys; we had to solve them, and in many cases solution had to await the accumulation of traffic—it could not always be done with a single message, so that occasion delays in solution were inevitable from the very nature of the systems involved. Also, another factor had to be taken into account: the time required to forward the intercept traffic to Washington. Lacking facilities and personnel to prepare *all* the traffic, encipher it, and transmit it to Washington, some of it had to await shipment by air mail, and this factor alone occasioned delays. As has been aptly said by General Miles: "The astonishing thing,

gentlemen, is not that these messages were delayed, but that they were able to do it at all. It was a marvelous piece of work."

WILLIAM F. FRIEDMAN
Director of Communications Research

Prepared on
4 December 1945

Origin, Functions and Problems of the Special Branch, M.I.S.

INDEX

April 15, 1943.

MEMORANDUM FOR COLONEL CARTER W. CLARKE:

Subject: Origin, Functions and Problems of the Special Branch, M.I.S.

Following our recent discussions, I am putting down in this memorandum what seem to be the important facts relating to the Special Branch, in the hope of clarifying the problems now confronting us.

A. *Responsibilities of War Department for Intelligence Derived from Cryptanalysis.*

The outstanding feature of "black chamber" activities in the United States is that they are performed almost exclusively by the armed services and that the great bulk of the work is done by the Army. The F.B.I. and the Coast Guard operate in certain limited fields. The Navy confines itself exclusively to naval traffic. The Army is responsible not only for military and M/A traffic but for the large residual field that is loosely called "diplomatic," which includes the great bulk of the important traffic over commercial, official and semi-official radio networks throughout the world.

2½ lines deleted

From the standpoint of the Army the present U.S. arrangements are the more desirable, especially in time of war. The Army is not dependent upon the State Department, [ ] for its information about all the complicated cross-currents of political and economic diplomacy and for the enormous amount of intelligence that is found in foreign official messages. On the contrary, the State Department is dependent upon the Army, which now controls the sources and determines the order of priority in which those sources will be exploited.

The continuation of Army-Navy control over such sources is important for the immediate necessities of war, and it is at least equally important for the long-range future. The availability of important intelligence from cryptanalytic sources, during the critical 18 months prior to December 7, 1941, was due solely to the fact that the Army and the Navy, in the face of difficulties and even legal prohibitions, were able to maintain skeleton organizations in this field, in preparation for the day when they would be vital to the national defense. The armed services are the safest repositories of cryptanalytic material and activities, since they can operate with greater secrecy and with a longer-range viewpoint than can the political agencies of the Government. The chances of continued cryptanalytic progress after the war are believed to be better if control of the field remains in the armed

services than if the non-military fields are taken over by a civilian agency.

However, control involves responsibilities, and in case of the diplomatic traffic it involves specific commitments to the President and to the State Department to get as much usable intelligence as possible out of the material.

B. *Handling of Intercept Intelligence Prior to the War.*

When this country declared war, both the intercept work and the cryptanalytic work in the diplomatic field were divided between the Army and the Navy, though actually most of the work was being done by the Army. The combined intercept and cryptanalytic facilities of the Army and Navy had produced some 7,000 decrypted and translated messages in the 6 months before Pearl Harbor, or an average of about 300 per week, of which only 1,561 were considered of enough significance to be filed for future reference. The responsibility for bringing important messages to the attention of the Secretary of War and the top officers of the Army was vested in the Chief of the Far Eastern Section, M.I.S. O.N.I. served the President, the Secretary of the Navy and the top officers of the Navy.

In M.I.S. the material was handled as follows: Each day's batch of messages was examined by the Chief of the Far Eastern Section. Those not considered important were put aside for burning. Those that were thought important were circulated to the Secretary of War, the Chief of Staff, the Assistant Chief of Staff, Op.D., and the Assistant Chief of Staff, G-2. One copy of each circulated item was put into a locked file; the other copies were burned after they had been returned by the readers. No personnel were assigned to a continuous study of the material; hence very little could be done to put any of it together in connected form. The Chief of the Far Eastern Section, M.I.S., having as such a full-time job and limited personnel, could do no more with the messages than carry the important facts in his head.

C. *Decision of the Secretary of the War Concerning Exploitation of Cryptanalytic Field.*

When the sudden attack on Pearl Harbor occurred, it became apparent that the event had been clearly foreshadowed in the Japanese traffic of 1941. The Secretary of War, and no doubt others, then concluded that the traffic had not been given sufficiently close attention, and that same agency should be set up to deal with cryptanalytic intelligence in a more thorough-going fashion than previously had been thought necessary. The Secretary decided that the job ought to be undertaken by a lawyer having a special type of competence and training, such as may be acquired in the handling and presentation of large cases involving complicated facts.

After consulting with the Assistant Secretary, Mr. McCloy, about possible candidates, the Secretary authorized Mr. McCloy to offer this assignment to me, my experience over a number of years having been along the indicated lines. The matter was put up to me early in January, 1942, and after some discussion I agreed to undertake the job, resigned from my law firm, and took office as a Special Assistant to the Secretary on January 19, 1942.

On that day I received my instructions from Mr. Stimson. Briefly, they were that I was to study the problem and determine what had to be done in order to expand the cryptanalytic operations to meet the requirements of war, and to make sure that all possible useful intelligence was derived from the cryptanalytic material. Both the Secretary and Mr. McCloy emphasized the need for close and continuous study of intelligence derived from cryptanalytic activities and of piecing such intelligence together in connected form.

For two months I studied the back materials, investigated production facilities, had numerous conferences with Mr. McCloy, General Lee and others interested, and made recommendations as to what should be done and how the work should be handled. The details are no longer of any importance. Everyone agreed that there was a very large job to be done.

D. *Organization of M.I.S. Section to Handle Intercepts.*

Shortly after I started work, there was set up in the Far Eastern Branch of M.I.S. a section which was to follow and report upon the cryptanalytic material. It soon became apparent that there were at least two fundamental differences of opinion between the officer chosen to head that section and myself.

First, I disagreed with the notion that any reserve officer, or any civilian who had been graduated from college, was qualified to handle cryptanalytic intelligence. It seemed to me that the job could be done effectively only by persons with very special qualifications; that the most careful selection of personnel was necessary, and that only individuals of first-rate ability and suitable training should be taken into the work.

Second, I disagreed with the method that was adopted for reporting the intercept material, which was to take what looked interesting and to pass it along in paraphrased form, without any attempt either to check or evaluate the information or to supplement it by collateral intelligence. It seemed to me that the Secretary, the Chief of Staff and the others to whom reports were made were entitled to have every item carefully checked, evaluated and supplemented by all possible sources of intelligence, and that their time should not be wasted in reading odd and unchecked bits of information not related to attendant circumstances and given their proper value. Further, it appeared to me that the daily

reporting of current messages was only one part of the job; and that the real job was to dig into the material, study it in the light of outside information, follow up leads that it gave, and bring out of it the intelligence that did not appear on the surface.

E. *Organization of Special Branch.*

My investigations of the intercept and cryptanalytic problems brought me in contact with you, and we had many discussions on the subject and some discussions with General Strong. His thinking was along the same lines as ours and he approved of our conclusions. The upshot was that the M.I.S. section in charge of cryptanalytic activities was made the Special Branch, with you as its Chief. We moved into common quarters and worked together, your staff (part of M.I.S.) and my staff (part of the Secretary's office) being made into a single working unit as fully as if they were all part of the same agency. You concentrated on pushing the expansion of the intercept facilities, on setting up a workable system of priorities, and on the many technical problems that were encountered. You were fully familiar with those problems and had arrived at the same conclusions that I was reaching, with respect to the necessity for a great expansion of the intercept facilities and for an attack on the cryptanalytic problems on a much broader basis. You were largely instrumental in inducing the Signal Corps to embark upon the program that it is now carrying to completion, involving the acquisition and development of Arlington Hall, the location at Vint Hill of one of the largest intercept stations in the world, the expansion of facilities at Two Rocks, California, and elsewhere, and a personnel program reasonably adapted to requirements of a war-time job.

Meanwhile, I concentrated on recruiting a suitable staff and on the problems involved in getting intelligence out of the intercepts and devising methods of checking, evaluating and reporting it and of keeping track of it by suitable files and indexes. General Strong and you felt that it was desirable for me to go into the Army, and I was commissioned in June. Thereafter the Special Branch absorbed the staff that the Secretary's office had assigned to me.

F. *Work of the Special Branch.*

Since this memorandum is devoted to our unsolved problems—to what we have *not* been able to accomplish—it may serve to give a better perspective if something is said about the things we have been able to accomplish.

It seems fair to say that we have a good organization of people well above the average level of competence, who work full stead and on the whole have given a good account of themselves. Our so-called "Magic Summary" appears to be accepted as a

satisfactory job of reporting. At the Navy's request a copy now goes to the Secretary of the Navy, and at the State Department's request copies now go to the Secretary of State and to the Assistant Secretary of State who follows cryptanalytic intelligence.

A great deal of our work does not get into the "Magic Summary." I think we probably do more work in deciding what to exclude from the Summary than we do on items that are put into it. We try to avoid reporting mere details, and we consider that those to whom we report should not be bothered by material which, if properly checked and studied, would be found to be of no value.

A lot of our work, from the reporting angle, consists in feeding information to the M.I.S. geographical sections, to other agencies of the Department, and to outside agencies. We employ one officer full-time in verifying Order of battle information and reporting such information to the O/E sections and the Air Branch of M.I.S. When security considerations permit, we pass on economic information to the B.E.W. We are constantly called upon for information by those in the State Department who have access to our material, and we employ one officer full-time in serving the State Department and getting necessary information from them. We prepare periodical reports on South American information for the Coordinator of Inter-American Affairs. When information is of a sort that the Assistant Chief of Staff, G-2, should bring to the attention of other agencies, such as the O.S.S. or the O.N.I., we prepare reports or paraphrases for his signature.

The whole body of intelligence which flows out of intercept material, into the various sources that have been mentioned, adds up to a considerable amount. This memorandum will not attempt to evaluate it, as compared with other sources of intelligence, but it may be worthwhile to mention a number of examples of important intelligence material, with which the readers of the "Magic Summary" will be familiar:

a. Practically the only good information about the relations between Japan and Russia has come from the intercept material. Much of it has not been obvious on the face of the material, but has required a great deal of study and collateral research in order to piece it together. (At a time when almost everyone expected Japan to attack Russia, and when M.I.S. went on record as predicting such an attack at an early date, we had concluded from the intercept material that Japan had no intention of attacking Russia, but wanted to keep out of war with Russia at all costs.)

b. The best information about the attitude and intentions [ ], following the African invasion, came from that source.

c. That source has also yielded, in addition to considerable information not otherwise obtainable about Japan, the most accurate and dependable information about the relations between the Japanese Government and its Axis partners and about trade between Axis Europe and the Far East.

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Many other examples of lesser importance, but of the same general type, might be given.

It would take a lot of space to give a good pictue of what might be called the "detail intelligence" that we get, of its present value and of the future value that it may have as it gradually builds up facts. Perhaps the picture can best be given by the following illustrations:

The nature of the materials bearing on the Far East is such that the most astute person, even if an expert on the Far East and possessed of a photographic memory, would derive few connected impressions—and very little usable information—from merely reading the messages from day to day. They must be pieced together by the most painstaking and laborious process, involving collateral investigation, often of minute points. The work is very difficult, but the rewards in the way of intelligence are substantial. For example:

As you know, we are in possession today of enough information about Japanese shipping to and from Indo-China and Thailand so that we have a pretty clear picture of the movement of supplies on those runs and of the problems that Japan is encountering in getting raw materials out of those areas and keeping them supplied with the minimum of essential imports. Our information has been put together from an infinite number of scraps of fact. As you recall, the material on this subject was not at first very promising. It looked hopeless to make any connected sense out of the garbled texts, incomprehensible ship names, abbreviations and alphabetical designations, and the inconsistent tonnage figures, loading reports and ship schedules, especially because in many cases the key messages had not been intercepted.

Finally, however, by struggling with the S.S.D. translators, doing research on Japanese merchant vessels, gradually identifying ship names, eliminating duplications of cargo information, checking ship tonnages and schedules and, in general, applying what might be called high class detective methods, we built up a picture that is clear and substantially complete in its principal parts. Having built up that picture, it is now possible for us to follow the pertinent messages from week to week and to understand what they mean. Had the job not been done, the current messages would be largely incomprehensible.

Since Japanese shipping has been selected as an illustration of the piecing together of incomprehensible bits of intelligence into a connected whole, it is interesting to note that we arrived at several conclusions about Japanese shipping which made it necessary to change previously accepted figures. For instance, we established that the Japanese have been employing at least 450,000 tons of merchant shipping in the South Pacific, whereas the J.I.C., apparently with the approval of the Navy, recently published a study which showed that only 300,000 tons of shipping were employed in moving goods to and from that area. We brought our findings to the attention of O.N.I., whose people first explained them away. A few days ago, however, we were advised informally by O.N.I. that they now agree with our findings and that, while they do not want to revise their published figures at present, they will make the corrections when they next issue a report.

This little story has a pertinent moral. Until we gave them the above and certain other findings on Japanese merchant shipping, the O.N.I. people were polite and cooperative, but they stopped short of giving us their own secret information. But, when we brought them to our office and explained what we were trying to do and how far we had progressed, they offered to put at our disposal all their own information on the same subject. Since that time, which was last fall, they have prepared for our special use and delivered to us each morning a summary of all information received on the previous day about merchant shipping in the Far East, from sources other than our own material.

From this daily report, pieced together with our other material, we are building up a wealth of evidence on the movements of Japanese vessels and cargoes. We have hopes that the time is not far distant when we will have the whole picture of Japanese shipping and water-borne trade reconstructed to a point where its main outlines will be clear and many if not most of the important details will be known.

The above is given as a sample of the work that we are trying to do; and while this memorandum is not intended as an analysis of S.S.D. traffic, present or potential, it may be worth while to carry the story just a little further:

Japanese shipping is only one of the important subjects on which the intercepts are gradually building up connected and definitive information, not obtainable from any other source. Referring only to the Far East, it is our hope that over the next year, if the same kind of material keeps coming in and if sufficiently painstaking work is done on it, we will have the Far Eastern picture—except perhaps for the East Indies—pretty well reconstructed in its economic and political aspects and be able to

make increasingly accurate diagnoses of Japanese capabilities, difficulties and plans.

The story of the Dutch East Indies is buried, we think, in the water transportation traffic of the Japanese Army. The cryptanalysts at Arlington Hall think they have solved the cryptographic system in which this traffic is sent and that in 1, 2 or 3 months they will have built up code values to a point where the traffic will be completely readable. If that should prove to be true, then the East Indies will be opened up from the intelligence standpoint and the geographical coverage of the Far East will be complete.

G. *Increase in Volume of S.S.D. Material.*

Meanwhile, coverage is being extended, new systems are being solved and translation and processing facilities are being built up.

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In the 6 months before Pearl Harbor almost all the traffic produced was Japanese, with a scattering of German [ ] messages. A large volume from many sources is now handled, and language coverage has increased.

The recent solutions of the German Key Word Code and the Japanese M/A Code represented substantial progress in cryptanalytic work; and the expected solution of at least one of the highest grade Japanese military ciphers—and possibly of the whole Japanese military system—will, if it occurs, be an event of major importance from the intelligence angle.

Intercept coverage has been extended by the development of 3 large fixed monitoring stations, giving approximately global coverage for what is broadly described as "diplomatic" traffic, and by field radio intelligence companies. Not only do the new stations permit more intercept facilities to be used, but the better antenna installations and better equipment make it possible to listen to circuits at times when previously they could not be heard. For example, until completion of a recent installation at Vint Hill, the Berlin [ ] circuit could be listened to for an average of perhaps one or two hours per day. Now it is estimated that the good listening hours have increased to 8 or 10 hours per day, and possibly more. When the Fairbanks stations—the only one that can listen to traffic between Tokyo and [ ]—gets new antennas, as it will when the spring weather comes, amount of traffic intercepted from those circuits should increase from a mere driblet to a substantial volume.

During the month of March we received 4,500 deciphered messages from Arlington Hall. This was still only a fraction of the available material, as may be shown very readily by the figures for the messages [ ] during March.

	Total
Japanese Army and weather traffic	91,596
Other traffic	22,489
	114,085

The bottleneck—by reason of which this Branch received only 4,500 messages from Arlington Hall in March, as compared with our 22,000 (excluding Japanese military) [ ] lies in the processing and translating facilities of Arlington Hall, which are largely a problem of civilian personnel. They had 105 civilians on December 7, 1941; they had 1,754 on February 1, 1943 (the last date when we obtained exact figures). They now have over 2,300 and their T/O calls for 3,683 by June 30, 1943. It is estimated that—apart from the problem of Japanese military traffic—the volume of S.S.D. material coming into the Special Branch will at least double by the end of June. It will continue to increase as the successive bottlenecks are eliminated. More traffic will be intercepted; more will be decoded; more will be translated. Leaving out of account the Japanese Army traffic, the total volume could easily increase four-fold by the end of the year.

This increase of material emphasizes our manpower problem. But the problem exists independently of the question of volume, and the factors involved in long-term planning are much more important than merely the question of handling a certain number of intelligence items per day.

H. *Basic Factors in the Problem of Cryptanalytic Intelligence.*

Certain considerations that are fundamental to our problems may be mentioned:

a. An effective intelligence agency—especially one that must deal with such difficult material as decrypted intercepts—cannot be built up by writing a T/O and filling the places with what personnel happens to be available. To do the work well, a man must have not only a broad education and background of information, but he must have more than his share of astuteness, skepticism and desire to solve puzzling problems; and he must have a capacity for laborious detail work that very few people have. As you know, we have had 2 cases of men who proved incapable of doing our work, though both of them had fairly successful careers in civil life. Not only were they able to produce nothing by their own efforts, but they used up so much time of others working in the office, and made so many mistakes that it took time to correct, that we found our net efficiency increased by

taking them entirely off the work and inventing jobs to keep them busy until they could be assigned elsewhere.

b. One principal reason why exceptionally qualified personnel are required in the intelligence agency that deals with cryptanalytic material is that such an agency cannot afford to make mistakes, because it tends to become a focal point in intelligence activities. There are several reasons for this:

(1) Intelligence from intercepts, where the material is firsthand and of dependable origin, is the most reliable information and frequently the first to arrive. Hence it is looked to as a primary source of high-grade intelligence.

(2) Much of the intercept material consists of odd pieces of information and sometimes no more than a clue, which can be understood or followed up only in the light of information that must be obtained from other sources. Hence the processers of intercept intelligence tend to draw into themselves—and must draw into themselves to be effective—the intelligence output of other agencies. This they must put together with what they have; and if their own information is good they are likely to come out with more accurate and better evaluated information than is elsewhere available. We see this constantly in comparing our information on various topics with information put out by the B.E.W., O.S.S., J.I.C. and other agencies.

(3) Because they must constantly seek information from outside sources, those who deal with intercept intelligence have an opportunity to learn what the good sources of information are on a wide variety of subjects. In view of the multiplicity of intelligence agencies and would-be intelligence agencies in Washington, the large amount of duplication of work, and the penchant of certain agencies to bring forth a stream of classified reports that are inaccurate and, in many instances, not much more than irresponsible guesswork, this is a very important point. (For instance, though the Joint Intelligence Committee is among the least of the sinners in this respect, I think it fair to say that its Weekly Summaries in the past two months have contained a number of inaccuracies and some positively erroneous or misleading information, which this Branch, at least, would never have put out under any circumstances.)

c. The guiding consideration in the internal arrangements of the organization that handles cryptanalytic material, and in its methods of dealing with outside persons and agencies, is the consideration of security. One lapse of security is all that is necessary to dry up a radio intercept source. Therefore, both on the officer level and below, only persons of the greatest good sense and discretion should be employed on this work. This consideration is basic, since intercept information involves a different kind

of secrecy than does most other classified information. It will make no difference a year from now how much the enemy knows about our present troop dispositions, about the present whereabouts of our naval forces or about other similar facts that now are closely guarded secrets. But it will make a lot of difference one year from now—and possibly many years from now—whether the enemy has learned that in April 1942 we were reading his most secret codes. Not present secrecy, not merely secrecy until the battle is over, but permanent secrecy of this operation is what we should strive for. That may be too much to hope for in a democracy; but if it is possible to attain or approach it we should try to do so.

d. An essential job of the Special Branch, which must be done well if it is to produce the maximum usable intelligence, is to establish intercept priorities, keep them constantly in tune with intelligence requirements and see to it that those who operate the intercept stations shall understand and follow them. Only a small fraction of the world's radio traffic can be listened to, with the facilities that are at hand or obtainable. To deal with the priority problem there must be a continuous appraisal of materials coming from the various circuits, of the probable intelligence value of what might come from other circuits and of the week to week necessities from an intelligence angle. The whole question is infinitely complicated and time-consuming, as witness the fact that you and Col. Taylor and I spent many days on the last priority directive. But it is an absolutely essential job to be done. With Col. Taylor going to London we will have to find some other man to spend a good part of his time on the intercept priority problem.

e. Another essential job is to establish cryptanalytic priorities and keep track of cryptanalytic projects. Cryptanalysts are scarce and their time must be used to best advantage. This requires a degree of liaison that we have not yet been able to realize, from lack of man-power. This problem, moreover, is closely interwoven with the intercept priority problem. If you are to put the cryptanalysts on a new project when they have finished the one that they are now working on, you must devote a part of your intercept facilities to the building up of a large volume of traffic in the as yet unreadable code, so that when the time comes to tackle it the cryptanalysts may have enough materials to do the job.

f. Still another essential function of the Special Branch is to supply the cryptanalysts with leads and clues, and with intelligence in general. The art of cryptography has outstripped cryptanalysis, to a point where high level codes and ciphers are no longer broken by cryptanalytic methods alone, even though mod-

ern machinery is capable of almost miraculous performance in the analysis and synthesis of cryptographs. Today it is collateral intelligence which solves high-grade cryptographic systems. While that intelligence can come from a number of sources, in the nature of things the best source is the intelligence organization that struggles day by day with the cryptanalytic output and is familiar with what the cryptanalysts are trying to do and what their needs are. From the long term standpoint the Special Branch's function as a feeder of intelligence to Arlington Hall is hardly less important than its function of getting intelligence out of what Arlington Hall produces. We have done a lot of work along this line; but we would be doing a great deal more if we had more help.

g. The experience of the Special Branch has proved that astute people working on the special materials have opportunities to furnish intelligence that leads directly to the solution of codes. Lt. Littlefield, for example, is directly responsible for the recent solution of the cryptographic system used by the Germans in communicating from Berlin to agents in South Africa. From his study of other intercept material he came to the conclusion that a certain class of unreadable radio traffic was being beamed to South Africa, although the intercept people, including those of the Coast Guard, were positive that it was being beamed to South America. He insisted on this position, and informed the cryptanalysts what he thought the messages might deal with; and they applied probable meanings to the messages that they had. The solution of the code followed very quickly, and the contents of the messages proved that Lt. Littlefield's guesses had been correct.

h. Intercept coverage and cryptanalytic work has one very important purpose that is sometimes lost sight of, in addition to the job of getting intelligence out of the messages. That purpose might be described as protective monitoring. This has many phases, of which the following are illustrations:

(1) We get from S.S.D. a large volume of samplings of [ ] traffic, some of which has to do with ship movements, deliveries of airplanes and munitions, assignments of military personnel, placing of orders in the United States, and other subjects having military aspects. Almost none of this material is ever reported by us. Nevertheless we follow it very closely, in order to make sure that it does not become a source of valuable information to the enemy. In one instance we advised the State Department that [ ] methods of controlling and reporting its ships was dangerous; and the State Department thereupon arranged to have [ ] handle its ship messages through the U.S. Navy. With respect to other military information [ ] it is our practice to check each item of information to

determine whether it is one that the enemy could not get from other sources, whether, if it is, the information is of importance and, if it is important, whether the degree of importance warrants taking some action. Generally our conclusions have been negative; but in one or two instances General Strong's attention has been called to such a problem and he has alerted those dealing with [ ] to the dangers involved in giving certain information and in doing business in such manner as to require too much use of the radio.

(2) Another aspect of "protective monitoring" is to keep on the alert for any evidence that the enemy is reading our own codes or the codes of other nations. Since everybody appreciates that codes will be changed or abandoned if the users discover that other countries are reading them—and since, therefore, everybody tries to be very careful about transmitting information from intercept sources—the most meticulous "detective work" is required in dealing with this problem.

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(3) Still another aspect of this subject is to keep track of the enemy's sources of information and to keep posted about what he knows. Prior to the landings in North Africa, attention was directed to all available traffic that might reveal the enemy's knowledge, and it was examined with great care with that in mind. The cutting down of Axis code communications by Chile and later by Argentina was brought about by our State Department because they knew from intercepts what kind of information the enemy was getting, knew how much pressure on the two countries was justified by the facts, and knew, finally, what ace they had in the hole in case they should be forced to use it. The location by [ ] intercept activities, of enemy agents who were sending valuable information to Berlin and Rome, has enabled them to deal with the problem in some instances in a different way, *viz.,* by buying up the agents and getting control over the Axis source. There are several places in the world today where the problems of Axis communications are a live and important issue.

i. U.S. operations in the field of cryptanalytic intelligence are relatively limited. For various reasons, including the piety of the State Department and the fact that our Army was starved for funds prior to the war, we entered the war with relatively little experience in cryptanalytic matters, and with even less experience in dealing with intelligence from intercept sources. This is certainly true as compared with the British, and we have reason to suppose that the Germans—and to suspect that the Russians—were also far ahead of us. While we have made progress, we have a

long way to go. Large as it is, our S.S.D. operation is on a much smaller scale than the various comparable operations of the British. This is also true of the intelligence side of the picture; and so long as it remains true, we will continue to be at a disadvantage

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l. The problem [ ] will become more important as the end of the war draws near and while the terms of peace are being worked out. The divergent interests of the Allies will then come to the front, and there will be less and less interchange of information on subjects of potential or actual differences of opinion. The divergence of viewpoint is likely to assume major proportions in the Far East, where the approach of the British to the peace problem is likely to be very different from ours. We should spare no pains to equip ourselves with the most detailed and complete information about Far Eastern problems; and for that purpose there is no source so good as the cryptanalytic source.

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m. There is one aspect of our relations with the British in intelligence matters that has struck me very forcefully. Our intelligence agencies in Washington appear to spend a lot of their time keeping information secret from one another, in competing for credit and in beating one another into print. All of them have some liaison or other with the British intelligence agencies; and for some reason they are freer in giving information to the British than to one another. The British do not keep their information in watertight compartments, nor do their various agencies seem to care who gets the credit. They are so set up that their intelligence is put together and evaluated; and the job is done promptly. This gives them a great advantage over us in intelligence matters.

n. We have had enough to do with the British to have discovered that there is a considerable amount of intelligence which they withhold from us, not especially by design, but because we do not ask for it. Sometimes it is not asked for because nobody knows it exists. Recently, for example, we have discovered that certain intercept information about Continental Europe, which does not flow regularly into any American channels, is available to us at the Embassy, merely because we deal with cryptanalytic material and have established a certain amount of confidence in our judgment and discretion. If Major Heneman, who has pursued this contact, were not encumbered with a large burden of other work, and could spend half his time at the Embassy, I am confident that he could bring into the United States channels of intelligence a substantial amount of valuable information that either does not get into those channels at present or gets into them too late to be of the greatest value.

o. A fairly important problem that we have—one that will grow with the volume of traffic—is the problem of increasing the proportion of Arlington Hall intercepts which are at least scanned for their intelligence content. The problem exists in all languages covered, but it is particularly acute in the Japanese. Because of the shortage of cryptanalysts and translators, not all decipherable messages can be deciphered, and not all that are deciphered can be translated. There is a scanning and selecting process at both the cryptanalytic and the translation stages. This is done by the cryptanalysts and translators themselves; and on the whole they do a good job. However, to insure that no useful intelligence is missed, the organization handling the intelligence should participate in the process of selection and should continually educate the cryptanalysts and translators in the week to week intelligence needs. This is done in the British Black Chamber organization, and it is done in the Navy organization. We have assigned Capt. Ervin as liaison with Arlington Hall, and he will be able to do this to some extent. However, there are so many liaison requirements that an additional officer will have to be provided before long, if we want to be sure that the work is done thoroughly. In addition, there is a specific need for a man familiar with the Japanese language, to deal with Japanese translators. We have such a man, Dr. Creel, who because he is also a Chinese scholar can help the translators on one of their most difficult problems, which is to identify Chinese names from their Japanese Kana versions. He has already helped them a great deal. But, until we get some additional personnel, he cannot take much time away from the day to day job of handling Far Eastern material.

p. The WT/I field, and the relations of the Special Branch and Arlington Hall's work in this field, are matters that are now under study, and I mention the subject only for the record. WT/I—the derivation of intelligence from radio traffic by all means short of cryptanalysis—

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It has, of course, numerous applications in the field; and it is of special importance to the Navy. Arlington Hall has been experimenting with Japanese Army traffic from the WT/I angle; and the prospects for deriving intelligence from it look promising. But the development of this work, to judge from what I have seen of it thus far, is going to require a close liaison with the military intelligence and, from our standpoint, the full time of at least one man. You have assigned Mr. Randolph to Arlington Hall to be educated in this work, and I think he is well qualified for it. He has, however, carried a large burden of work on the day to day intelligence material, and I will be surprised if we do not have to

recall him for work that is more pressing than WT/I.

I. *Personnel Situation of the Special Branch—Officers and Civilians.*

In the foregoing somewhat discursive remarks, which by no means cover the whole subject, I have tried to show that our problems have many sides, that the field of cryptanalytic intelligence is important, and that there are great opportunities in this field if we are prepared to seize them.

Whether or not the objectives that we have in mind are sound, I think the problems at least are of some real importance to the country. The adage that knowledge is power is nowhere truer than in the field of international relations, especially during a war and in preparation for peace. We are gaining knowledge and experience in many parts of the world, some of it rather expensively; but we still have a lot to learn. In the field of intercept intelligence we have at hand, in my opinion, one of the greatest potential sources of information; but we are not making the most of it. We need to raise our sights.

The above statement of our problems may indicate why the present manpower of the Special Branch is not adequate to do the job that we want to do. A quick picture of our manpower (excluding you and myself) may be given as follows:

Total officers	30	
Civilians comparable to officers	*9*	39
Deductions must be taken for:		
Officers who work in the Cryptographic Security Section and Radio Communications Section (transferred from C.I.G.) who have nothing to do with S.S.D. material	5	
Officers who do purely administrative work, which is very heavy because of security requirements and the large volume of paper work that passes over your desk	3	
Officers about to be transferred to Ground Forces (2) and to London (1)	3	
Mr. Bingham, who has enlisted and is about to be inducted in the Army	*1*	*12*
Balance		27

To get the net working forces on the intelligence job, certain additional deductions of men on special assignments must be taken, as follows:	
Major McKee (Order of Battle specialist)	
Capt. Berle (Liaison with the State Dept.)	
Capt. Calfee (Only technically assigned to the Branch, doing most of his work for AIS)[1]	
Capt. Ervin (in training at Arlington Hall, to be a liaison officer with that organization)	
(Brought forward)	27
Mr. Randolph (about to commence training at Arlington Hall, to work on WT/I material)	
Lt. McCluney (temporarily spending full time on personnel work)	
Lt. Wilkinson (just relieved as Security Officer and engaged in training his successor)	7
Present net working force on intelligence material	20
These 20 men are assigned as follows, according to their work and the parts of the world that they keep track of:	
Editing "Magic Summary" and studies	3
Reading and routing collateral intelligence material from regular sources	1
Biographical Section	2
Far East	6
Near East	1
Eastern Europe	1
Central and Western Europe	3
Southern Europe and Africa	2
Latin America	1
	20

[1]Liaison with AIS through Capt. Calfee is very effective and saves us a lot of time. We have a net gain, therefore, even though most of his time is spent working for AIS.

Considering the volume of material that we have to handle and the job that we are trying to do on it, the figures above speak for themselves.

J. *Suggestions for Future Development of Special Branch.*

I will not attempt in this memorandum to reduce our personnel problem to an organization chart, or to say how many officers and civilians of such and such grades we should have. Lt. McCluney is preparing an organization chart, designed to conform to the prejudices and taboos of the Civil Service. The questions that I want to raise here are of a different sort.

An organization chart and a procurement objective will be of little help to us, unless we can bring about a change of viewpoint toward our job and our problems. What we need is a decision from the higher authorities as to whether our work is important and whether we should be encouraged to do a better job and given a go-ahead signal to build up our staff—not by suddenly taking on dozens of people, but slowly and with great care, with a view to getting the most competent force obtainable, and with an eye to long-term considerations.

There seem to me to be two basic questions:

(1) Is the work important enough to justify an organization that by the beginning or middle of 1944 might amount to, let us say, 75 officers and 150 to 200 civilians?

(2) Are we doing the work well and planning along sound lines, and are we competent to do the job on the scale that we believe necessary?

If these two questions are answered affirmatively by those in authority, the T/O problem will be merely a matter of appropriate instructions. The last thing that I would favor would be a large and unwieldy organization. It has been my own ambition, and I know that it has been yours also, to keep the staff of this Branch down to the absolute minimum necessary to do the work. I am certain that a small, compact unit of first-rate people, who get along well together and are free from discordant elements, can do twice the work of some of the large, unwieldy and disorganized units that I occasionally encounter in Washington.

I have the following suggestions which I think would solve our personnel problems, and solve them very satisfactorily:

a. Allow us to commission a few topflight and specially qualified men out of civilian life (perhaps 6 or 8) with commissions that take some account of their living requirements and personal attainments, and without too strict an application of the numerous existing rules to which exceptions are permitted. We have several such cases in mind. For instance:

(1) We can probably get one of the best men in the Government, a first-rate economist and a man of all-around ability, if we can commission him as a Lt. Colonel. He is 47 years old, was an officer in the last war, and at present receives a salary of $9,000 per year. He is anxious to go into the Army and is ideally suited to take over a part of the work that I no longer have time to do; but he is unwilling to take a commission as a Major, first, because he has a wife and two children to support; second, because some of his friends and contemporaries, of comparable standing, have gone into the Army (mostly in the S.O.S.) in the grade of Lt. Colonel, and there is a question of prestige involved. I am informed that there is no Lt. Colonelcy available in M.I.S.

(2) A number of other very able men are available, but the best of them are between the ages of 30 and 35. Hence we cannot get them unless exceptions to the 30-35 year old rule are made. No one of them is in danger of being drafted under existing regulations.

b. Extend to us the privilege that the Counter Intelligence Corps has, of taking specially qualified men out of the Army.[2] Our needs for highly qualified men are certainly no less than those of the C.I.C. Most of the work that we have to do is young men's work. It requires energy and enthusiasm and a kind of adaptability which most men lose as they get older.

5½ lines deleted

We could recruit, from men that I already know about who are in the Army—all of whom are in non-combat assignments and many of whom are classified for limited service only—8 or 10 eminently qualified men in very short order; and from similar available personnel we could build up a working organization to meet almost any demand upon us, in my opinion.

c. Allow us to have an adequate number of civilian clerical employees, and to recruit them to meet our special requirements. Although to the Civil Service an office is an office and a branch is a branch, it is obvious that our requirements are not the same as those of an office engaged in issuing travel orders or writing up form contracts for the purchase of airplane parts. At present our greatest shortage and handicap to efficiency is the lack of adequate clerical help. It would be difficult to improve upon our clerical staff, so far as it goes; but it is wholly inadequate for the work. An analysis of our clerical problem, giving the details and the requirements for every type of work in the office, has been prepared by me and is contained in the attached folder. Up to

[2]If this is done, perhaps some way ought to be found—if the arrangement is to be workable—of commissioning qualified men without separating them from the work of the Branch for the time necessary to take an O.C.S. course.

date, and until Captain Adams took over the personnel job in the Office of the Chief of Staff, while we had trouble with the Civil Service Commission, I am sorry to say that we had even greater troubles with the personnel and Civil Service experts of the War Department. I am sure that the whole problem could be solved by suitable instructions to the personnel people, provided Captain Adams is told by his superiors that our requirements are serious, that we are the best judges of our own peculiar needs, and that every effort should be made to help us. We can find the people and we can complete the organization of the staff, provided we get adequate help in breaking down the Civil Service barriers. Civilian agencies such as the O.S.S. and the B.E.W. have been able to break them down; there is no reason why the War Department should not be able to do it.

My feeling about clerical personnel is the same as expressed above in respect of officers. I think we should strive to operate with the absolute minimum number of people, using great care in each selection, and employing only the most competent available individuals. Security considerations alone would dictate such a policy.

I am dubious about WAACs as a solution to our clerical problem, especially if we would have to dispense with our female staff or if (as I fear) the female staff would disappear because of the presence of WAACs. We have spent no end of time and trouble in building up the female staff; we have several groups of women who are thoroughly experienced in their special work, who have learned to work as teams and are giving a most efficient performance. Our clerical problems are rather complicated, and it would put us back a long way if we had to start afresh with a new group of filing girls, indexers, biographical researchers, the first-class stenographers who now do summarizing and similar type of work, or the individually assigned girls who work in the geographical sections and have become familiar with the material handled. It seems to me that it is not necessary to resort to WAACs, if we are allowed even a little liberality in civilian recruiting.

Whoever may read this memorandum may not appreciate the significance of these personnel suggestions, unless he knows the terrible struggle that we have had to build up an efficient staff. I will not encumber this memorandum with the details, but perhaps they should be made known to those who may give attention to our problems.

K. *Problem of Japanese Military Traffic*

When and if the Japanese military traffic begins to come in, the burdens on us will be greatly increased. I am not afraid that we will have difficulty in handling this traffic. Our force is very

mobile, and we can put enough highly skilled men on this job to handle any volume that is foreseeable. What I am afraid of is that, during the period when we are getting the work organized and learning how to handle it efficiently, we will get further and further behind on the work that we are now trying to do and, instead of making progress toward the various objectives that have been stated in this memorandum, we will find ourselves moving backwards. I feel, therefore, that it is important that we get and train, as soon as possible, at least 3 men of the type mentioned in the first recommendation made above (i.e., topflight men with very particular qualifications) and at least 7 or 8 men of the type mentioned in the second recommendation (i.e., younger men for the tough detail work).

It should be noted also that one thing the Japanese military traffic will certainly do, if it begins to come in, is to add greatly to our clerical burdens.

There is another problem relating to clerical work, which should be mentioned for the record, though we have not had time to study it out and determine just what it involves. It would be advantageous for a number of reasons, which need not be enumerated, to transfer from Arlington Hall to the Special Branch the last step in the process of getting out the finished messages, i.e., discarding the unimportant ones and determining the order in which the stenographic force shall turn out those selected for transmission to the agencies which receive the raw material (i.e., the Army, Navy and State Department). This would involve a teletype operation from Arlington Hall to our office and would require some additional clerical force, plus the use of one or two of our best people on the selecting job. As soon as the special equipment has been installed on our teletype machines, we can use the installations experimentally on a part of the S.S.D. material and determine what the mechanical operations are and what additional problems would be presented if we were to use such a system.

One other point, affecting our problem, might be mentioned, *viz.,* the problem of commissioning our 8 or 9 male civilian employees. Most of them are 4-F draft cases or have other deferred classifications, and none of them has any immediate draft problem. A change in the rules, however, might take these men away from us, and we could ill afford to lose them. With the loss of Mr. Bingham, I think you will agree that our whole reporting operation would be crippled if we were to lose Mr. Rigby and Mr. Stone. In view of their experience and past knowledge of the S.S.D. materials and the problems connected therewith, it would be absolutely impossible to replace either of these men. It would be difficult to replace any of the others, and the training of successors would take a long time.

Since Mr. Rigby has been on leave this week, I have not been able to show him this memorandum. I have, however, shown it to Col. Taylor, Mr. Stone and Capt. Huddleson, as the men who, in addition to Mr. Rigby and ourselves, have given the greatest amount of attention to our problems as a whole; and they are in general agreement with the views above expressed.

Alfred McCormack,
Colonel, G.S.C.

History of Special Branch M.I.S. June 1944 - September 1945

I. GENERAL

The directive reorganizing the Military Intelligence Service in the spring of 1944 provided for the establishment of a Special Branch to take over certain functions of the former Special Branch, M.I.D., when the latter ceased to exist. Those functions included the maintenance of liaison with the Signal Security Agency (now the Army Security Agency) and with the State and Navy Departments on matters pertaining to signal intelligence. They also included (a) the supervision of M.I.S. special security officers disseminating signal intelligence overseas, *and* (b) the duties of the Cryptographic Control Section of the former Special Branch.

The new Special Branch was activated on 4 June, 1944. Personnel for the Branch were drawn initially from officers and civilians formerly assigned to Special Branch, M.I.D. To carry out its assigned functions, the Branch was organized under a Chief into four sections as follows: (1) Administrative Section, (2) Local Liaison Section, (3) Overseas Liaison Section, and (4) Cryptographic Section.

II. ORGANIZATION

1. ADMINISTRATIVE SECTION. The Administrative Section consisted of the Chief of the Branch, Executive Officer, and two civilians who performed stenographic, filing and receptionist functions for the Branch as a whole. On the organization chart the Branch was placed under the Supervisor of Source Control, who in turn was under the Director of Information. Actually almost all of the administrative and policy problems which arose concerned the collection and dissemination of signal, or Ultra, intelligence.

The Deputy Chief, M.I.S., immediately after the reorganization of M.I.S., was charged by the Assistant Chief of Staff, G-2 with complete responsibility for all questions involving Ultra; in this capacity the Deputy Chief, M.I.S., was also known as the Special Security Officer, M.I.S. Therefore, and by agreement with the Supervisor of Source Control and the Director of Information, the administrative and policy problems of the new Special Branch were handled directly with the Deputy Chief, M.I.S., and all intermediate channels were by-passed.

In addition to general supervision of all sections of the Branch, the Administrative Section devoted most of its time to performing the duties of the Overseas Liaison Section. The Chief of the Branch served as Chief of the Overseas Liaison Section, and the Executive Officer performed all of the administrative work involved in maintaining the special security officers at overseas commands. A description of these functions is more fully presented in a separate history of the Special Security Officer System prepared in the Office of the Deputy Chief, M.I.S.

2. LOCAL LIAISON SECTION. The local Liaison Section consisted at the outset of three officers who were responsible for full-time liaison on matters pertaining to signal intelligence—one with the State Department, another with the Navy Department and the third with the Army Security Agency at Arlington Hall.

A. *State Department Liaison Unit.* The responsibilities of the officer charged with State Department liaison on signal intelligence remained what they had been in the former Special Branch. In June, 1944, those responsibilities were as follows:

a. To act as representative of the Special Security Officer, M.I.S., on matters involving policy or security in connection with signal intelligence at the State Department.

b. To read daily the entire output of decoded diplomatic messages processed at Arlington Hall.

c. To acquire for those individuals working with decoded diplomatic messages in the Branches of M.I.S. information obtainable only at the State Department.

d. To acquire at the State Department for the cryptanalytic, translating and information groups at Arlington Hall material which could be used to assist in breaking diplomatic codes of foreign countries and in translating foreign language telegrams after decoding.

e. To keep informed of current events throughout the world by daily reading of State Department cables, M/A reports, newspapers and the like.

During the course of the summer of 1944, it became increasingly apparent that one officer, with the assistance of a civilian secretary, could not handle those responsibilities effectively by himself. The volume of intercept traffic had increased, and the daily scanning of messages took increasingly more time. At the State Department, diplomatic activity had become intensified as the end of the European war drew near, and the officials of that Department desired conferences with the liaison officer to discuss the messages for the light which might be shed on political problems. As a result, less time was available for studying the cryptanalytic needs of Arlington Hall and for consultation with the research units of M.I.S. The task clearly required additional officers who would share the responsibilities and who would divide their time between M.I.S., the State Department and Arlington Hall.

Accordingly, a project was approved whereby two additional officers, selected for their linguistic background and their knowledge of history, were made available for State Department liaison. Two civilians, and later a third, were also added to the Unit to assist the three officers in research and clerical work. It was understood that the original liaison officer would continue his former functions but would delegate certain of those functions to the new officers. The principal responsibility of the new officers would be to acquire material for Arlington Hall for the use of cryptanalysts and translators. Secondarily, they would be available for briefing State Department officials on intelligence derived from reading foreign encoded messages, and would likewise be available for consultation with research units within M.I.S. with respect to such intelligence.

Under the new arrangements, the three officers divided the intelligence field among themselves on a geographical basis. One officer assumed responsibility for Europe, another for the Near East and Africa, and the third for South America and the Far East. That allocation corresponded closely with the main political divisions of the State Department, and it was assumed that each officer would familiarize himself with the personnel and the work of the State Department Division corresponding to the geographical area for which he was responsible. In addition, each officer was expected to follow closely political and economic developments in his area on the basis of careful reading of State Department cables and other collateral material from M.I.S. and other sources.

With an enlarged staff, the former functions of the State Department Liaison Unit were expanded in the following manner:

a. The original liaison officer had more time to devote to conferences at high levels in the State Department with a view to working out policies for a more effective interchange of intelligence between the State Department and Arlington Hall. Two concrete results of those conferences may be noted. Clearance was secured for an officer of the Unit to make a daily inspection of all incoming and outgoing Top Secret and limited distribution State Department cables and to take extensive notes on any which might be of possible use of Arlington Hall. Since M.I.S. had never before had access to those cables,[1] and since they contained detailed information with respect to the policy of foreign governments, the gain to translators and to those engaged in setting up priorities at Arlington Hall was considerable. Another result of such policy discussions was that arrangements were made for officers of the Unit to attend the United Nations Conference at San Francisco (April-June, 1945) as Official Observers on the United States Delegation.

8 lines deleted

b. Each officer of the Unit made it his responsibility to become personally acquainted with most of the personnel of the Division at the State Department which was his primary concern.

10 lines deleted

c. In the course of conversations with the four Directors of the political Divisions at the State Department, the Unit officers

[1]State Department cables classified "Secret" and below were made available to M.I.S. daily through paraphrases made by certain members of Washington Liaison Branch, M.I.S. Notes taken by Special Branch officers from the "Top Secret" and limited distribution State Department cables received almost no dissemination with M.I.S.

found that current Arlington Hall traffic did not reach those Directors promptly. Although copies of all diplomatic messages turned out by Arlington Hall were sent every day to the State Department by Special Distribution Branch, M.I.S., those copies circulated slowly from one division to another and often took as long as six weeks to reach all recipients. To ensure prompt dissemination of the traffic to the authorized recipients, the Unit officers undertook to select every day from the Special Branch copies of the traffic all messages of current importance. These they took to the State Department, generally about twice a week, and showed to the Directors and Deputy Directors of the political Divisions concerned.[2] This method did not interfere with normal channels for distributing the traffic. It supplemented them and was useful in several ways. From the point of view of the State Department, it enabled certain officials who needed the traffic to see it promptly. It also gave those officials an opportunity to ask the Unit officer who was presenting the traffic to explain obscure points or to fill in background where needed. The Unit officer, on the other hand, had an opportunity to discuss, on the basis of the traffic, State Department policy and current problems, and he could relay the information so received to Arlington Hall as a guide in establishing traffic priorities.

d. Unit officers spent several hours each week in conference with officials at Arlington Hall, particularly those in charge of the cryptanalytic and translating sections. Those conferences gave Unit officers an opportunity to indicate the problems with which the State Department was currently concerned and enabled them to indicate the subjects appearing in the traffic which should receive the immediate attention of the translators.

11 lines deleted

The conferences at Arlington Hall were especially important in assisting Unit officers to perform adequately their mission at the State Department. In order to know what material at the State Department would be of conceivable use to Arlington Hall, it was necessary for Unit officers to know at all times which codes would be read, which were unreadable or which would become unreadable. Only with this knowledge was it possible to anticipate the needs of Arlington Hall in addition to satisfying them as they arose.

e. Finally, as a result of growing familiarity with State Department problems from a specialized approach, Unit officers

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[2]The Secretary of State, the Under Secretary, and those Assistant Secretaries entitled to see the traffic were not briefed in this way unless an exceptionally important message was concerned, since they had daily access to the Magic Diplomatic Summary published by the Immediate Reports Branch, M.I.S. The Summary was not circulated below the level of Assistant Secretary of State.

were able to be of greater assistance to research groups working with the diplomatic traffic and to the Immediate Reports Branch in M.I.S. by supplying needed information or orientation. Because the officers made frequent trips to the State Department and because of their personal contacts there, it was possible for them to get prompt and detailed answers to most of the problems posed.

The value of the work performed by the State Department Liaison Unit was recognized and repeatedly acknowledged by officials both at Arlington Hall and at the State Department.

10 lines deleted

One principal defect characterized the operation conducted by the State Department Liaison Unit, namely, that the success of the operation depended almost entirely upon the individual energies of the officers of the Unit, and on the personal contacts which those officers were able to make at the State Department. The flow of material from the State Department to Special Branch was by no means smooth or automatic; continual priming on the part of Unit officers was required to assure delivery of needed documents and information. Furthermore, in the absence of an express directive from top officials of the State Department, many officials at lower levels were reluctant to turn over all material and frequently did so only upon the personal recognizance of the Unit officer that the material would be properly safeguarded and promptly returned. Much needless discussion and extra copy-work arose from such attitudes, work which could have been eliminated if it had been possible to secure from the Secretary of State a directive that one copy of all material coming into or going out of the State Department should automatically be made available for Arlington Hall.

It may also be observed that the briefing of State Department officials performed by Unit officers became necessary largely because the State Department channels for distributing the traffic were very slow and imperfect. Competent State Department officials, specialists in their Divisions, should have been available to scan the traffic as it was delivered and to select from it important messages for the Division Directors. It is to be hoped that with the establishment of a central intelligence agency within the State Department some responsibilities can be taken over by State Department officials whose primary responsibility they are. Some liaison tasks must continue to be performed by M.I.S. personnel, but the number of persons so employed could be reduced if certain of their functions were allocated where they logically belong.

B. *Navy Department Liaison Unit.* The responsibilities of the officer charged with Navy Department liaison remained what

they had been in the former Special Branch. In June, 1944, those responsibilities were as follows:

a. To examine daily the signal intelligence relating to Japan produced by the Navy and to extract all items of interest to M.I.S.

b. To acquire from the Pacific Section, Combat Intelligence Division, for the Branches of M.I.S., evaluated information based on Naval signal intelligence which concerned Japanese fleet dispositions and operations.

c. To furnish authorized Navy officials with Japanese ground order of battle information.

d. To bring together Army and Navy personnel for the purpose of coordinating intelligence activities in the field of signal intelligence which related to Japan.

Liaison with the Navy Department continued on the foregoing basis for the next several months. During that time substantial progress was made in the direction of coordinating signal intelligence activities between the Army and Navy and eliminating duplication. To that end, joint committees of both services met frequently and prepared Japanese air and shipping estimates based on signal intelligence. In October, 1944, arrangements were made whereby all signal intelligence items concerning Japan produced by the Navy were made available to M.I.S. on a daily basis in several copies, so that the function of selection by the Liaison Officer became unnecessary.

In November 1944, regular liaison was established with the Atlantic Section of the Combat Intelligence Division. The liaison with this Section was much more limited in scope than that with the Pacific Section as the former was engaged principally in the charting and disseminating of information concerning German submarine operations. Hence, no broad basis for liaison activities was presented and the liaison consisted chiefly in a daily briefing of the Army Liaison Officer on submarine operations.

Most of the information-gathering functions described in the foregoing paragraphs were eliminated with the termination of the hostilities. However, it was felt by both services that liaison on this level should be continued in order to retain insofar as was practicable the benefits of the cooperation achieved during the war.

In the performance of his duties, the Liaison Officer encountered certain difficulties which should be mentioned in conclusion. There was a noticeable lack of Navy Intelligence personnel authorized to see and to work with signal intelligence material. As a result, no extensive research comparable to that conducted in the Branches of M.I.S. was possible, and the preparation of extensive joint studies was accordingly impractical. Moreover, important differences in the intelligence requirements of the two

services (i.e., the Navy was principally interested in signal intelligence for operational purposes, whereas the Army was in addition very much concerned with long-range studies for planning purposes) constituted a serious obstacle to effective cooperation. These differences in method and purpose were never entirely reconciled and prevented the attainment of full coordination of intelligence activities between the services in the field of signal intelligence.

C. *Army Security Agency Liaison Unit:* Liaison with Arlington Hall,[3] or the Army Security agency, was maintained by the former Special Branch from the time of its organization in 1942. A complete history of the changing nature of this liaison goes far beyond the account of the duties and responsibilities of the officers who were assigned to the new Special Branch. However, a brief outline of the general developments should be presented here; no other Branch history will include the complete story.

When the original Special Branch was organized in 1942 it was located in the front wing of the Munitions Building on the second floor. The organization which is now located at Arlington Hall occupied the rear wing of the same floor. It was known as the Signal Intelligence Division (hereafter, S.I.D.) and was a subordinate Division of the Office of the Chief Signal Officer. S.I.D. was charged with the responsibility for interception and cryptanalysis of all enemy [ ] coded communications. Its duties were completed when it had produced an English translation of any messages which it could read. At that point its only responsibility was to deliver to G-2 as many copies of the final product as G-2 desired. General directives as to the intelligence targets of interest to G-2 were to be supplied to the Chief Signal Officer by the Assistant Chief of Staff, G-2, in order that the work of the Signal Intelligence Division would be directed to the intelligence needs of G-2.

Although Special Branch and S.I.D. were located in adjacent areas and working on identical problems, no officer of Special Branch was permitted to enter the area occupied by S.I.D. Shortly after the old Special Branch began operations, it became apparent that there were innumerable questions concerning the detailed operations of S.I.D. which had a direct bearing on the proper evaluation of the messages received daily from them. For example:

a. Whether a particular passage had been translated correctly.

[3]Arlington Hall will be used as a term to designate the organization which is now known as Army Security Agency. Originally it was known as the Signal Intelligence Division. Thereafter it became, in turn, the Signal Security Division, Signal Security Agency, and Army Security Agency.

b. Whether there were additional messages in a number series which had not been translated at all by S.I.D.

c. Whether intercept facilities were being directed to obtain traffic from particular centers which were of immediate interest to G-2.

d. Whether early messages bearing on the same subject were in the files of S.I.D.

The first arrangement devised for obtaining this information was for the Chief of Special Branch to consult personally with the Chief of S.I.D. This was completely unsatisfactory since direct contact between the research analysts working on a particular problem and the corresponding translation, or cryptanalytic, section of S.I.D. was the only means by which a full exchange of information could be had. There was constant and vigorous objection on the part of the Chief Signal Officer to any such lateral liaison, and it was not until late in 1942 that any progress was made to achieve it. At that time a system was devised whereby any research analyst in the Special Branch could write a memorandum asking a specific question and direct it to an officer of S.I.D. who had been designated as liaison officer with Special Branch. This officer made periodic visits to Special Branch to acquaint himself with the work of the Branch. In addition, one officer of Special Branch was authorized to make personal visits to S.I.D. in case of emergency.

In the fall of 1942, S.I.D. moved from the Munitions Building to Arlington Hall, and Special Branch moved to the Pentagon. The physical distance separating the two organizations caused a further delay in establishing liaison at the working level.

At the beginning of 1943 several events occurred which helped the situation immeasurably. A new Commanding Officer of Arlington Hall was appointed by the Chief Signal Officer, who at once adopted a more practical attitude toward the solution of the liaison problem. In February of that year a full-time liaison officer from Special Branch was stationed at Arlington Hall and given free access to almost all of the translation and cryptographic branches. The ban on direct conferences between the working members of the two organizations was lifted and a series of exchange visits inaugurated in order that the intelligence officers working on a particular problem could become fully acquainted with their opposite numbers at Arlington Hall. A two-way exchange of information resulted: Arlington began to receive much more intelligence material from non-Ultra sources, which provided aid in the solution of systems upon which they were working; Special Branch began quickly to receive accurate answers to their many detailed questions which would throw light upon any particular series of messages. Some progress was

also made in adjusting the work priorities at Arlington to bring their efforts more nearly into line with the work of G-2.

It soon became apparent that the work of the two organizations could never be properly integrated through the efforts of one liaison officer. Additional officers were selected to work upon particular problems and authority obtained for them to have free access to the sections at Arlington concerned with their work. Some of these officers spent most of their time at Arlington Hall, others made periodic trips as often as necessary to accomplish their business.

By the time of the reorganization of M.I.S. in June, 1944, there were two officers assisting Arlington in the section devoted to traffic analysis of Japanese military communications, and four Japanese linguists establishing prioriteis of translation of Japanese military messages, in addition to the one general liaison officer described above. The new Special Branch absorbed the general liaison officer and several of the Japanese linguists. The other liaison officers were assigned in M.I.S. either to the Office of the Director of Intelligence or to the Japanese Order of Battle Section of the Military Branch. During the months that followed the M.I.S. reorganization, these additional liaison officers were gradually transferred back to the Office of the Director of Intelligence inasmuch as the work of establishing priorities was properly a function of that office.

The only liaison function left in the new Special Branch became that of the general liaison officer described above. He devoted his time to establishing procedures for the quick exchange of information between the various research units under the Director of Intelligence and the corresponding working sections at Arlington Hall. As soon as a procedure became established, direct liaison was maintained between the interested sections of the two organizations, and Special Branch stepped out of that particular problem. Secret teletype and secure telephone communications were established between the Pentagon and Arlington Hall in order to expedite this exchange of information, and the two organizations were brought as close together as possible by the continued efforts of this liaison officer.

During the entire period that these liaison arrangements were being developed various efforts had been made to achieve a basic reorganization within the War Department which would recognize the principle that control over the production of signal intelligence should be centralized under the authority of the Assistant Chief of Staff, G-2, WDGS. Although much progress was made in directing the work of Arlington Hall, many major policy problems that arose still had to be settled between the Chief Signal Officer, and the Assistant Chief of Staff, G-2. In addition,

the Chief Signal Officer, being subordinate to the Commanding General, Army Service Forces, frequently would insist that various problems be passed up to that level before decision. The vice of the situation was that neither the Chief Signal Officer nor the Commanding General, Army Service Forces, ever received any of the products of Arlington Hall. The only section of the War Department which was interested in its production and which realized its significance was the Intelligence Division of the General Staff.

The Chief of Staff finally recognized the anomaly of the situation and by directive dated 10 December, 1944, vested full operational control over the interception and cryptanalytic activities of Arlington Hall in the Assistant Chief of Staff, G-2, War Department General Staff. This step proved of great value, although it did not solve the problem completely. Administrative control of Arlington Hall remained in the Army Service Forces under the Chief Signal Officer; administrative and operational control of those sections of Arlington Hall devoted to cryptographic security also remained in the Army Service Forces under the Chief Signal Officer. The numerous problems developed by this division of authority during the remaining months of the war made it apparent that the only sound solution was to remove Arlington Hall completely from the Army Service Forces and establish it as an independent agency directly under the Chief of Staff. At the same time, it was desired that all signal intelligence units in theaters of operations should likewise be made a part of this new organization, since the most satisfactory results can be obtained only by unified control of all intercept and cryptanalytic organizations. The Chief of Staff agreed that this final step should be taken but postponed its effective date until after V-J Day in order not to disturb operation in the theaters. Hence, on 6 September, 1945, the Army Security Agency was organized, bringing together all units, agencies and personnel engaged in signal intelligence work throughout the Army into one organization. The papers leading up to this decision and the final directive of the Chief of Staff, issued in the form of an AG letter, are on file in the Office of the Chief, M.I.S. Immediately after the organization of the Army Security Agency, the Chief of Staff directed that he would exercise his control over the new organization through the Chief, M.I.S.

Brief mention should be made of the operations during the period from 10 December 1944 to 6 December 1945 when G-2 had complete operational control over certain phases of the work of Arlington Hall. The Special Branch played very little part in directing the activities of the Army Security Agency under the new setup. A special unit was established directly under the

Director of Intelligence to perform this function. Under the guidance of Lt. Colonel Huddleson it made remarkable progress in establishing a system for the daily supervision of the work of all sections at Arlington Hall and in making constant changes in priorities of work in order to develop intelligence needed by the Director of Intelligence at the time when it was needed. Certain of the evaluation sections under the Director of Intelligence were physically moved to Arlington Hall and performed their duties in the same room with the producers of the raw material at Arlington. It is interesting to note that the first real progress towards solution of the difficult problem of directing the activities of Arlington Hall was not made until the period of this particular operation in the last months of the war. It had taken four years to correct the basic organizational defect which prohibited earlier solution.

3. *OVERSEAS LIAISON SECTION.* The function of this section was to administer the officers serving as Special Security Officers with overseas commands. This function, began in the old Special Branch, was never completely vested in the new Special Branch, since the Deputy Chief, M.I.S., personally directed the Special Security Officer system. In recognition of this situation, the function was formally transferred to the Office, Chief M.I.S., in February, 1945. A history of the Special Security Officer System is being prepared in that office and will cover the entire period of the operations. Therefore, no further mention of it need be made in this history.

4. *CRYPTOGRAPHIC SECURITY SECTION.* The Cryptographic Security Section took over, with one exception,[4] the functions of the Cryptographic Control Section of the old Special Branch. From June, 1944, through September, 1945, the functions of the Cryptographic Security Section were as follows:

a. To train G-2 personnel who were to be assigned to M/A, M/O and JICA offices in the use and safeguarding of cryptographic systems, documents, devices, methods and procedures. Since June, 1944, over 160 students have been trained by the Section.

b. To control production and distribution of cryptographic systems, documents and devices to G-2 offices throughout the world.

c. To review cases submitted to the Adjutant General concerning violations of cryptographic security and loss or com-

[4]The exception was that policy matters affecting cryptographic security, which had belonged to the Cryptographic Control Section of the old Special Branch, were transferred at the time of the reorganization of M.I.D. in June, 1944, to Policy Group IV, M.I.S.

promise of cryptographic material, and to recommend coercive action. Over 100 of such cases were handled each month.

d. To review cases submitted to the Adjutant General from all over the world for clearances of personnel for Army cryptographic duties. Upwards of 3600 such cases were reviewed every month.

e. To handle correspondence betwen the Chief Signal Officer of the Army Security Agency and the various G-2 offices throughout the world on matters concerning cryptographic security.

f. To assist G-2 personnel in the writing of classified messages.

g. To keep records of cryptographic material held by M/A, M/O and JICA offices in order that changes in cryptonets could be made as communicational situations changed in various parts of the world.

The foregoing duties were performed initially by two officers and one civilian; but with an increase in correspondence of the type outlined in *c, d,* and *e,* above, an additional officer and civilian became necessary.

Two organizational difficulties hampered the work of the Cryptographic Security Section. In the first place, when the power to make decisions in policy matters affecting cryptographic security was transferred from the Section to the Policy Group, M.I.S., no definite arrangements were made for coordinating policy with the work currently performed by the Section. The result was that frequently decisions affecting policy would be made, not only without prior consultation with the Section, but without informing them immediately thereafter that a decision had been made. In thc second place, although much of the work performed by the Section was primarily of interest to the Office of Chief, M.I.S., channels through the Director of Information and the Supervisor of Source Control were prescribed; and it was not intended that either of those intermediaries should have any responsibilities for the Section or for its activities. The result was that, in spite of the cooperation of those intermediate offices, a certain amount of administrative confusion was inevitable. This second difficulty will almost certainly be solved by the assignment of the personnel of the Section directly to the Office of Chief, M.I.S.

INDEXES

Explanatory Note

This index is in three parts. Index #1 is a subject index, covering the substantive information contained in The MAGIC Documents. Index #2 is an index to the offices which sent or received the documents, e.g., Berlin, Hanoi, etc. Index #3 is an index to the diplomatic personnel who sent or received the documents, e.g., Chiba (Berne), von Papen (Ankara), etc.

In all three indexes, references are to reel (Roman numerals) and frame (Arabic numerals), e.g., Indian Ocean, I: 0199, 0450; VII: 0293, 0503. The frame number refers always to the *initial* page of a document; the subject referred to at that number may be mentioned on any or all pages of that document.

Index #1: Subject Index

Index #2: Places Sending/Receiving Messages

Index #3: People Sending/Receiving Messages