

TOP SECRET

"ULTRA"

HISTORY OF THE SPECIAL PROJECT BRANCH, SIS ETOUSA

The Beechnut Project (Special Cryptanalytic Project in SIS ETOUSA) arose from the fact that the SSA could not work operationally on German Army and Air Force Enigma traffic in this country. This inability was due to difficulties of interception, lack of information about cryptanalytic and intercept procedures, and lack of specially trained personnel. It was necessary to have American personnel become thoroughly familiar with the methods of Enigma cryptanalysis in practical operations. In the event that the Japanese Government should use the Enigma machine, that the British facilities should be destroyed or captured, or that the Germans should use it in areas not covered by British analysis, the SSA had to be in a position to solve this traffic. For reasons of security the British Government was unwilling to allow the details of Enigma cryptanalysis to leave England. Accordingly some arrangements had to be made whereby a large number of American personnel could work in the United Kingdom and gain operational knowledge of the methods used at GCHQ. Discussions between Colonel George Bisher, CO of SIS ETOUSA, and Lt. Col. Frank B. Rowlett, Chief of the General Cryptanalytic Branch at the SSA, formulated plans to send a detachment to ETOUSA in order to establish, on a small scale, intercept facilities and a cryptanalytic section for the analysis of German Army and Air Force traffic in co-operation with GCHQ. Mr. W. G. Welchman and Commander Sir Edward Travis came to the SSA in April 1943 to discuss this problem. Under the terms

TOP SECRET

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TOP SECRET "ULTRA"

of the agreement reached on 17 May 1943, signed by Major General George V. Strong and Commander Sir Edward Travis, the SSA was permitted to send a detachment to England to work on the German Enigma Problem. All operational work was to be conducted in the United Kingdom and a part of the research in Arlington. The Beechnut project was authorized by Major General Strong on 9 July 1943. Colonel Bicher and Lt. Col. Rowlett then drew up plans for the classification and number of personnel and the amount of equipment needed for the project. The detachment was divided into two sections: the cryptanalytic unit (which is discussed here) and the intercept unit. The original authorization by Major Strong contained the following provisions:

1. All personnel selected for the project will have special C-2 clearance before assignment.
2. A minimum of twenty-five percent officer personnel and ten percent enlisted personnel will be furnished by Arlington Hall Station and will be highly qualified technicians. The remaining personnel will be procured from other Signal Corps centers and will be given initial training at Vint Hill Farms Station in Warrenton, Virginia.
3. A group of key personnel consisting of about ten officers and ten enlisted men will be shipped to arrive at ETOUSA not later than 1 August 1943 to acquaint themselves with the problems at ETOUSA. Fifty percent of the cryptanalytic unit will arrive not later than 1 September 1943. The remainder will be shipped in suitable increments so that full strength will be reached by 1 December 1943.

TOP SECRET "ULTRA"

TOP SECRET "ULTRA"

4. None of the personnel assigned to this project will be reassigned to duties which will take them into the combat zone.

5. This augmentation to SIS HTOUSA will operate directly under SIS HTOUSA in accordance with directives issued by the War Department.

The total number of personnel required for the cryptanalytic unit was 39 officers and 286 enlisted men. Priority was requested for their procurement and for the necessary equipment. The provisional table of organization was:

<u>Officers</u>	Lt. Col.	1	1st Lt.	15
	Major	2	2nd Lt.	16
	Capt.	5		
<u>Enlisted</u>	M/Sgt.	3	T/4	31
	T/Sgt.	8	Cpl.	4
	S/Sgt.	2	T/5	76
	T/3	18	Pfc.	60
	Sgt.	2	Pvt.	43

The cryptanalytic unit, designated as the 6815th Signal Security detachment, was then subdivided into three main groups: research, services, and operations. In detail the proposed T/O was:

TOP SECRET "ULTRA"

TOP SECRET "ULTRA"

CO, SIS ETOUSA
(Col. George A. Bicher)

HQ Beechnut
(Major Roy D. Johnson)

SERVICES

guard
message center
teletype

OPERATIONS
(Major William Bundy)

sorting and
indexing
crib identification
control
machine
hand testing
decrypting
translation and
emulation

RESEARCH

traffic analysis
information

In July 1943 Major Roy D. Johnson, then a Captain and OIC of the Enigma cryptanalytic section at the SSA, was named head of the Beechnut Project. Major William Bundy was appointed second in command as head of the cryptanalytic unit and in charge of the advance group. Others with some experience in Enigma cryptanalysis, Lt. Levenson, Sgts. John Hyman, Abraham Lewis, George Walker, George Vergine, and George Hurley were also added to the group. Major Johnson's departure was postponed until Mr. Robert Ferner's return from GCHS in October. The first cryptanalytic detachment left the SSA on 30 July, due to arrive in England about 10 August. Delay in the WAC program, resulting in lack of replacements for the enlisted members of the Beechnut Project, and lack of trained personnel delayed the shipment of fifty percent of the personnel on 1 September as planned. Approximately 30 officers and enlisted men, the

TOP SECRET "ULTRA"

TOP SECRET "ULTRA"

last group available from Arlington Hall, were shipped at the time. IBM men for bombe operation and maintenance, as well as a large number of traffic analysts, were not available at the SSA and had to be procured from BTO and other centers. Delay was also caused by the length of time involved in special G-2 clearance necessary for all personnel connected with the project. The second detachment, however, arrived in England on 21 September. By 15 December the status of the Beechnut Project was:

Total shipped:	26 officers	163 enlisted men
Next shipment:	8 officers	45 enlisted men
Balance needed:	5 officers	39 enlisted men

The original plan of locating the cryptanalytic unit in London was abandoned for two reasons. First, operational and billeting space was unavailable in London, and secondly it was impracticable to separate the unit geographically from the Enigma section at Bletchley Park. Accordingly, all members of the cryptanalytic unit were sent to Bletchley Park as soon as possible after arrival for operational training prior to assignment in the sections. Operational space for the machine section was not available at Bletchley Park; therefore, the unit was transferred to the British Bombe Station at Eastcote, Middlesex, and was designated as the 6812th Signal Security Detachment. Quarters for the unit were located seven miles from Eastcote at Harrow-on-the-Hill. The change in plans necessitated a considerable increase in transportation facilities and overhead personnel. Twenty-two enlisted men were then transferred

TOP SECRET "ULTRA"

TOP SECRET

"ULTRA"

from ETO as overhead. Most of the personnel for the project arrived in January and February 1944, and on 1 February the three units of the Special Project were activated as the following provisional detachments:

1. Special intercept Unit; 6811th Signal Security Detachment, APO 887, Bexley, Kent.
2. Machine Section of the Cryptanalytic Unit; 6812th Signal Security Detachment, APO 517, Eastcote, Middlesex.
3. Special Cryptanalytic Unit; 6813th Signal Security Detachment, APO, 128, Little Brickhill, Bucks.

Headquarters of the project, consisting of two officers and two enlisted men, were located at HQ SIS ETOUSA, 59 Weymouth Street, London. Its functions included co-ordination of all activities with GCCS, administration of the Branch, the compilation of technical and status reports, the maintenance of Branch records and files, and the initiation of any action which might be required for the proper functioning of the Branch.

Training of the Machine Section personnel began in September 1943. One officer and five enlisted men maintained the bombes operationally from September to January when two more officers arrived to begin operations and training courses under Corporal Emsie of the RAF. Training was considerably delayed for other members of the section because they had to assist in the construction of quarters at Eastcote. The construction was supervised by four enlisted men from the 831st Engineer Aviation Battalion who were attached to the machine section for this

TOP SECRET

"ULTRA"

TOP SECRET

"ULTRA"

purpose. By May 1944 the Machine Section was operating on a four-shift basis. The first machine, named the "New York," began operations on 1 May, after a thorough overhauling. The second machine, the "Houston," went into operation on 15 May, and the third machine, "Chicago," on 7 June. Still another machine, "Boston," began operations 26 June. By the end of May, however, forty enlisted men from the section were still occupied in the construction of quarters.

Training of the cryptanalytic group was started immediately upon the arrival of the personnel in England. Eleven officers and twenty-five enlisted men began their training at Bletchley Park, about 45 miles from headquarters in London, early in September 1943 following a short orientation course at HQ ETOUSA. Their work became operational shortly afterwards when they attained individual proficiencies. On 29 December three officers were flown from the United States for the translation section and immediately began operational training.

On 2 March 1944 the remaining officers and enlisted men began arriving at the detachment and, after completing operational training, were assigned to sections at Bletchley Park. By the middle of April the cryptanalytic section had reached full strength and all personnel were active in operational sections.

On 1 April 1944 the system of German Air Force discriminant allocation was radically changed. To meet the needs of cryptanalysis due to this change two Hut 6 sections were abandoned (Sorting and Indexing, Deciphering) and three new ones were added: Traffic Identification,

TOP SECRET

"ULTRA"

TOP SECRET "ULTRA"

Identification Control, and Duddery. The combined efforts of the British traffic analysis group at Bletchley Park and the American sections brought about solution of the new system within one week. In assigning American personnel to the sections at Bletchley Park, not only was the highest consideration given to the ability, training, and background of each individual to assure that he was fitted for the job, but also care was taken so that the United States Army was represented in every major activity dealing with the German Enigma traffic. Many key positions were generously relinquished to American personnel. The changes which occurred in cryptanalysis during April 1944 permitted the assignment of two officers and three enlisted men to the solution of high-grade German teleprinter ciphers.

The following American officers were assigned to Hut 3, the Translation and Intelligence section, for work on Enigma decipherments: Major Edgerton, Capt. Donahue, Capt. Vogel, Lts. Laptook, Lively, and Prengle. Other officers and enlisted men were absorbed in the cryptanalytic sections of Hut 6 and the Traffic analysis group (SIXTA).

During July two more machines were in operation, "Atlanta," and "Minneapolis." The total number of solutions during the month was thirty-three, which was a hundred percent increase over the previous month. At this time the "New York" was taken out of operation for training purposes. On 10 July the Germans introduced a new cryptographic feature in the Enigma encipherments. This addition was a

TOP SECRET "ULTRA"

TOP SECRET

"ULTRA"

substitution between the endplate and the cipher maze, known as the Enigma UHR. Its use was confined to the Western nets of the German Air Force. The function of the Enigma UHR was the production of a set of 40 non-reciprocal endplate pluggings on each key. Since no mention of the device was found in decipherments, its introduction came as a complete surprise. However, the new problem was solved by the crib section without serious delay.

By 1 September the intercept group was completely covering its assignments. The operator's training school was closed, as all operators showed adequate proficiency for operations. Solutions on the bombs during August numbered twenty-three. Three more machines were put into operation, bringing the total to nine: "Philadelphia" on 20 August, "San Francisco" on 29 August, and "Omaha" on 30 August.

During December 1944 the production of the United States bombs section was greater for each machine than was the production of any other bombs station.

The harmony of the working agreement with the British is mainly due to the high caliber of personnel chosen from both nations for this project and has resulted in a mutual respect for each other's ability. Opportunities have been given to all workers to become experts in their field and British authorities have praised highly the contributions of this American unit to the joint war effort.

TOP SECRET

"ULTRA"