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AMERICAN ARMY FIELD CODES  
IN THE AMERICAN EXPEDITIONARY  
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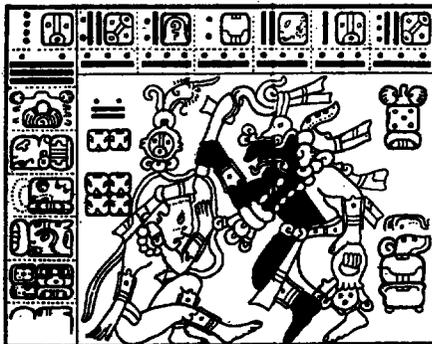
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Elizebeth Smith Friedman



*Lay ca-buunil kubenbil tech same.*  
 This our book we entrusted you a while-ago.

*Ti manaan apaclam-tz'a lo toon*  
 It not-being you-return-give it us,

*Epabal ca-baat tumen ab-men.*  
 Is-being-sharpened our-axe by the expert.

30 April 1959

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WAR DEPARTMENT  
WASHINGTON

AMERICAN ARMY FIELD CODES  
IN THE AMERICAN EXPEDITIONARY  
FORCES DURING THE  
FIRST WORLD WAR

By

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## AMERICAN ARMY FIELD CODES IN THE AMERICAN EXPEDITIONARY FORCES DURING THE FIRST WORLD WAR<sup>1</sup>

### 1. INTRODUCTION

When the first units of the American Expeditionary Forces arrived in France in the summer of 1917, there were available for secret or confidential communication within the AEF but three authorized means: (1) An extensive code for administrative telegraphic correspondence, the 1915 edition of the War Department Telegraph Code, which had been printed for the War Department by a commercial printing firm in Cincinnati, and which while it was fairly well adapted for confidential administrative correspondence, was not at all suited for rapid and efficient tactical correspondence; (2) a cipher system known as the *repeating key system*, which used a simple celluloid device called "the Army Cipher Disk," the basic principles of which were understood and described as far back as the year 1500; and (3) a cipher system called the *Playfair cipher*, which had been frankly copied from the British, who had used it as a field cipher for many years before the World War and continued to use it during that war. In addition to these authorized means there were from time to time current in the AEF apparently several—how many, no one now can tell—unauthorized or locally improvised "codes" of varying degrees of security, mostly nil. Of both authorized and unauthorized means, we shall hear more details in their proper place later on in this paper. Seen in retrospect, when the AEF was first organized it may have been unprepared in respect to means for secret communication in the field, but it is certain that it was no more unprepared than was any other of the belligerents upon their respective entries into the First World War. An inquiry into the causes of this situation does not come within the scope of the present paper, but at this point it will merely be said that never before in the history of warfare had cryptography and secret communication methods played so important a role. When measured by standards of 1940, it must be said that not only was the AEF unprepared as to secret communication means and methods but for a limited time it seemed also almost bereft of hopes of being able to catch up with the times, for their allies, the British and the French, were at first most reluctant to disclose much of their hard-earned information about these vital affairs.

Nevertheless, and despite so inauspicious a commencement, by the time November 1918 and the Armistice came, not only had the AEF caught up with their allies but they had surpassed them in the preparation of sound cryptographic methods, as may be gathered from the fact that the British and French had by then decided to adopt the American system of field codes and methods for their preparation. It is the purpose of this paper to relate some of the important steps in this remarkable progress.

### 2. ELECTRICAL COMMUNICATIONS AND CRYPTOGRAPHY

The great inventions in the field of electrical communications, and especially radio communication, have exercised a profound influence upon the science of cryptography as applied to the military art. Let us see how this situation arose.

<sup>1</sup> This paper was submitted on July 9, 1940, as thesis constituting one of the requirements for promotion to the grade of colonel, Signal Reserve.

Although the necessity for the occasional use of cryptography in military operations has been recognized from time immemorial, it was only in comparatively recent years that the widespread employment of codes and ciphers became a factor of vital importance in warfare. Four primary factors may be recognized as contributing to this situation. In this paper they need only be referred to very briefly.

First of all came the great inventions of the nineteenth century in the art of wire communications, which made it practicable for the first time in history for a single individual effectively to command the innumerable tactical and service elements constituting a large modern army. Such a situation also necessarily calls for adequate signal communication means whereby subordinate commanders can keep in touch with one another as well as exercise control over the movements and operations of their smaller tactical, supply, and service units scattered over an extensive and irregular terrain. Now in a well-developed country, and in the usual defensive situations in friendly territory, wire-communication facilities today may, and usually do, serve adequately in this respect. In this paper we are concerned, however, not so much with the adequacy of such communication facilities as with their safety from enemy surveillance. Although no thoughtful student would consider wire communication so secure against enemy intelligence services that the cryptographing of messages may be considered to be wholly superfluous under all circumstances, nevertheless, for the large majority of such messages exchanged over well-protected wire lines in friendly territory at a sufficient distance from the front to make earth interception impossible or improbable, the additional protection that would be afforded by employing codes and ciphers for these messages is commonly and rightly deemed hardly worth the large amount of labor that would have to be expended in the cryptographing and decryptographing processes. This applies, of course, only to the minor signal communications of supply and replacements; cryptography is still essential for the tactical communications of major strategy, even if well-policed wire routes are employed in friendly territory. The picture changes, however, if these communications must pass over wire routes in occupied enemy territory, where enemy agents or sympathizers may well be in a position to tap the lines or copy the signals by one means or another. Cryptography then becomes advisable, and in many cases essential, especially when consideration is given to the modern means for electrical interception by inductive methods.

The second factor which led to the increased use of cryptography in military operations involves a consideration of the results of the many inventions involved in the development of modern transport facilities based upon the steam and gas engines, for the latter, for the first time in history, made the rapid shifting of forces and, particularly, the remarkable mobility of modern high-power weapons practicable of accomplishment on a large scale. The mobility of men and artillery is in fact so striking today that it is obvious that even our most modern facilities for the establishment of wire routes can hardly keep pace with the speed with which movements of whole divisions and their fire equipment may be effected. Especially is this true in a rapid advance, when maintaining wire communication becomes extremely difficult. In fact, as armies grew larger and transportation facilities improved, it soon became apparent that either new and much more rapid means of laying wire would have to be devised to keep pace with this mobility or else some new means not requiring wire would have to be invented.

This need had hardly become apparent before it was met with the third of the factors mentioned above; namely, the invention of radio communication and its speedy adoption in the military art. Now, although it can hardly be said that all commanders from the very earliest days of this application of radio to the military science recognized one of the most important of disadvantages of radio—namely, the fact that radio signals may be more or less easily intercepted by the enemy—it was not long before the consequences of a disregard of this obvious fact impressed themselves upon most commanders, with the result that the transmission of plain

language became the exception rather than the rule. This gave the most momentous stimulus to the development and increased employment of cryptography that this science had ever experienced.

There was perhaps another factor which should be mentioned in this connection, and that is that the excessive demands for wire in a war of extensive movement made a heavy drain upon the resources of some of the belligerents, such as Germany and France, so that radio, as a means of communication in which this drain was no longer felt, was most welcome.

The last of the factors alluded to above may almost be regarded as a concomitant of the second, since its existence was also dependent upon the invention and development of the gasoline engine. It was the invention and development of aircraft and the speedy adaptation of aircraft to military operations. This introduced not alone the factor of mobility but also the factor that wire communication between aircraft or between aircraft and ground stations is manifestly impossible, so that radio naturally became the most practicable means of such communication. This, of course, had been true for about a decade, as regards communication between ships at sea and between ship and shore stations.

A very brief résumé of the early history of the use of radio in military operations may not be amiss. In his very interesting article entitled "The Powers and Limitations of Radio Communication Within a Modern Field Army,"<sup>2</sup> Maj. Richard B. Moran, Signal Corps, gives a succinct summary which is quoted in full below:

Radio was not put to any practical military use in the field prior to the World War, although some experiments were made involving the use of radio by the British in the Boer War in South Africa in 1899. Since 1906 the principal armies of the world have had some radio equipment. The first field radio equipment made its appearance in our army in 1903 and was used in maneuvers held in Kentucky under General Bates.

Radio was early recognized as a valuable means of signal communication for forces whose movements were rapid. The British entered the World War with radio provided in a meager manner for independent cavalry. The increase in the use of radio during the World War as a means of signal communication continued throughout its length, as is ably demonstrated by Priestly's account of the British Signal Service, Carlswald's description of the German Signal Service, and the report of the Chief Signal Officer, United States Army, 1919. Its value is shown not only to cavalry but to aviation, artillery, tanks, and forward infantry units.

One of the first uses to which radio was put was that of providing communication between airplanes in flight and ground stations. While radio was early employed for this purpose, other means, such as dropped messages and visual, seemed to be preferred both in the British and American services. There was one type of operation, however, which required the use of radio, that was "spotting" for artillery. Prior to the Aisne offensive in the fall of 1914 spotting for artillery by observation aviation was unknown in the British service. On October 1, 1914, the first experiment in spotting was conducted, using radio for communication, with conspicuous success.

The following extract from the same article is also worth quoting.

One of the outstanding characteristics of radio transmission is that waves radiated at the transmitter travel in all directions. The extent of travel in all directions is not the same but, except in the case of ultrahigh frequencies, this fact may be neglected in military sets since they are designed to transmit over a minimum distance in any direction.

This characteristic is both advantageous and disadvantageous. The advantage is that communication can be established quickly between stations without orientation and usually regardless of intervening terrain. It has the important disadvantage that enemy receivers located within range of friendly transmitters may pick up any transmission and make use of information thus obtained. \* \* \* Since the enemy may and will intercept radio messages, they must be sent and received, and the information they contain utilized before the enemy can make use of it. The use of codes and ciphers increase the delay to the enemy although their use consumes time in the transmission of messages.

It has, therefore, become the policy of all nations to encode or encipher all radio messages containing information of value to the enemy, and to send in clear only messages which, if intercepted by an enemy, will be of no value to him. The idea must not be gained that encoded or enciphered messages cannot be read by the enemy. They can. The advantage of cryptographed messages is that they force the enemy to consume time in securing the information he seeks.<sup>3</sup>

<sup>1</sup> The Signal Corps Bulletin, Nos. 91 and 92, 1936. The first extract is quoted from page 34, the second from page 33 of Bulletin No. 91.

<sup>2</sup> Annual Report of the Chief Signal Officer, 1919, p. 216.

When the United States entered the war on April 6, 1917, field radio was by no means a novelty in the United States Army, for the radio activities of the Signal Corps dated from 1903, and several years prior to 1917 a Signal Corps radio laboratory had been established at the Bureau of Standards, in Washington. The Signal Corps had kept abreast of progress in the new art, and in some respects had been in advance of others. Small portable field sets had been developed, and in 1912 small high-frequency (then 500-cycle!) pack sets had been placed in service. A number of these sets were in operation on the Mexican border at the time of the Villa affair, and communication was maintained in some cases with stations over a distance of 200 miles.

Soon after the first units of the AEF reached France, a radio division was established in the office of the Chief Signal Officer, AEF. With increasing knowledge of the methods of the French and the British, and with the increasing size of the American forces in Europe, the field of activity of the initially small radio division greatly expanded. Radio communication within the AEF was soon practically continuous but—remarkable to relate—it was seldom used! To telephone was the American way, and thus arose the story which will always be history in Signal Corps circles—that concerning the message from a brigade commander to division, by radio, saying “I am absolutely out of all communication” when only his telephone lines had been shot out.<sup>4</sup> Nevertheless, there was sufficient radio communication within the AEF to make cryptography a necessary adjunct to correspondence by this agency.

### 3. CIPHERS, CIPHER SYSTEMS, AND CIPHER DEVICES IN THE AEF

Coming now directly to the subject of the present paper, cryptography in the AEF embraced all forms: Ciphers, cipher devices, codes, and enciphered codes. We shall take these up in turn.

A detailed discussion of the cipher systems employed by the AEF will not detain us very long. The only cipher device (if it may properly be called a device) which was known to the AEF was the simple United States Army Cipher Disk, a photograph of which is shown as appendix 1. It had been in use a good many years in various field exercises in which units of the United States Army engaged at irregular and infrequent intervals. The 1916 Signal Book of the United States Army gives instructions for the use of the cipher disk, and these apply clearly to the simple form of repeating-key or multiple-alphabet system, using quite short keywords. The origins of this system can be traced back several hundred years; by 1916 it was certainly unworthy of use in serious military operations, for not only is it extremely slow in operation but also it presents hardly any security worth mention. The records of the AEF show that this system was certainly studied and taught at the Army Signal School (see appendix 2), but I have been unable to find any evidence that the system was actually employed for the exchange of official messages in the AEF. This surely is a gratifying finding.

The only other cipher system that was taught at the Army Signal School in the AEF was the so-called Playfair cipher. The appendix last referred to also describes this system. The fact that it was actually used for secret communication is proved by the exhibit contained in appendix 3, which was found by me among some miscellaneous records of the World War. The British used the Playfair cipher, too, but with some modifications which consisted largely in a greater disarrangement of the letters within the square than can be obtained by merely inscribing a key-word mixed sequence in normal fashion within the square. Even with such modifications the Playfair system presents very little security. How widely the various tactical units of the AEF used the Playfair system is not known to me, but it could not have been extensive, for by the time that the AEF grew to any appreciable size or engaged in any important operations the various field codes devised, prepared, and issued by the Signal Corps, AEF, were available and were probably given preference over the Playfair cipher. It is, therefore, desirable to enter at once into a discussion of these important codes, their origin, development, and usage.

<sup>4</sup> Ibid, p. 448.

## 4. THE ORIGIN AND DEVELOPMENT OF FIELD CODES DURING THE WORLD WAR

Although it is well known that long before 1914 the use of code and even of enciphered code was by no means a novelty in the armies of the various belligerents, including the United States Army, code systems were restricted in their employment to communications exchanged among only the highest headquarters and headquarters staffs. Practical military cryptographers of those days maintained, for reasons which may seem obscure or perhaps incomprehensible to military cryptographers of today, that code books would be entirely impractical for tactical operations in the field and hence it would be useless to try them out in the field. It is pertinent to this paper to inquire into the reasons for such an attitude.

It must be emphasized that the adoption of a code system for field use entails certain disadvantages of no small importance. First of all comes the question of production and reproduction of the books themselves. Then comes that of the proper distribution of the copies which must be issued to many and perhaps widely scattered organizations, and this alone constitutes a problem of no mean proportions when a large army is in the field. Finally comes the matter of the proper safeguarding and accounting of these copies, for it is obvious that the capture, theft, or loss of a single copy is sufficient to compromise the entire edition and necessitates an immediate replacement. Each of these questions will be examined in turn. It may be that the early objections to the use of code in tactical operations are still of serious nature and are not to be overlooked even today.

First let us consider the matter of the production and reproduction of codes by field forces and under field conditions. If the question were merely one that could be disposed of for good, once an edition of the requisite number of copies had been produced, there would obviously be no difficulty. By this is meant, of course, that under such a system a single edition of the code would be all that would be required and once copies were in the hands of troops only such additional copies would have to be issued as were necessary to meet the needs for replacement due to ordinary wear and tear.

Now it is obvious that the degree of cryptographic security that would be afforded by such a code would be almost negligible after a short time. This would of course be true whether the code were of the one-part or two-part type. For if it were of the former type, solution could be achieved rather readily; if it were of the latter type, solution would require more time and traffic, but once accomplished both types remain on an equal footing. And of course the danger of capture, theft, or loss is as great in one case as in the other.

Now if the security afforded by such codes is to be sufficient to make the trouble that their use involves at all worth while, it becomes obvious that in the case of a one-part code it is essential to resort to superencipherment; that is, apply a cipher system to the code text of the messages. In the case of a two-part code it is essential to adopt a system of more or less periodic replacement of editions, dependent upon such factors as volume of traffic, loss by capture or theft, etc. Let us consider each of these alternatives from a technical and practical viewpoint.

At best, plain or unenciphered code is a rather slow means of cryptographic concealment of the intelligible text of a message. To superimpose a cipher system upon this simple structure seems easy enough. But when a simple and rapid encipherment is employed, the additional security afforded is usually quite illusory; and when a complex encipherment is employed, the process becomes hopelessly slow and too intricate for successful application by the average military code clerk in the field. Superencipherment of a complex nature may be practical and satisfactory for employment at large, fixed headquarters or offices where speed is not vital or where the work can be parceled out among the various members of a numerous personnel in case rapidity in cryptographic operation constitutes a very important factor. But in tactical operations in the field, speedy communication is vital and anything which acts as a brake upon speed,

such as the necessity for cryptographing and decryptographing these communications, is usually tolerated by commanders in the field only after urgent insistence from higher headquarters upon such necessity. Even then there seem to be occasions when the rules must be disregarded. Hence, it follows that a cryptographic system using a one-part code with a complex superencipherment is hardly practical for field use. It did not take the Signal Corps in the AEF a long time to reach this conclusion, as will presently be shown by presenting the facts attendant upon certain experiments which were made very soon after the Signal Corps Code Compilation Section at GHQ was organized.

There remained to be tried the system using a two-part code without superencipherment, which involves the problem of production and distribution of replacement editions upon a more or less regular schedule. This was finally the solution adopted by the Signal Corps, and we shall soon see how well it worked. But at this point it may merely be said that it is well to remember that it is only in comparatively recent times that technical or rather mechanical advances in the art of printing, and the science of electric-power production and distribution have made the printing of codes in the field a practical matter. For instance, it would not have been practicable in our Civil War to generate electric power in the field for printing presses. Furthermore, neither the linotype nor monotype machine was available in those days.

So much for the theoretical considerations which should alone have led directly to the solution that was ultimately adopted by all the belligerents. But theoretical considerations are not enough, and "hindsight" is usually easier than "foresight." Let us see how this solution was attained in actual practice. This will involve a brief examination into the history of the field codes used by the French, British, and German Armies during the World War, before the AEF appeared upon the scene in any considerable numbers.

Some attention was given above to the factors which led to the introduction of radio communication in military operations. The progress in this art was rather slow until the invention of the vacuum tube, which came a very short time before the outbreak of the World War. But a great step forward was made after this important invention. Suffice it to say that by 1916 radio communication with radio sets employing thermionic valves was well established and in common use by all the belligerents on all fronts. Now the possibilities and consequences of enemy interception of the radio messages were more or less well recognized by most of the belligerents before our entry in the World War, and it will be interesting to recall the authoritative though brief account of the effects of the recognition of the dangers attendant upon the use of radio, given by Col. Marcel Givierge in an important article which appeared in the June and July 1924 issues of the *Revue Militaire Française*, a translation of which was published in the Signal Corps Bulletin:<sup>5</sup>

However, a new element was to make its appearance in the cryptographic war. It was a consequence of the development of wireless telegraphy in the front-line units. We mean the code notebooks.<sup>6</sup>

Those notebooks were introduced with us to facilitate secrecy of telephonic communications. It had taken a long time, despite the cautions of experts, to comprehend that the telephone was not a safe means of communication; but after a few cruel experiences, in which it was evident that the enemy had been advised of a relief or a surprise attack by an intercepted telephone message, a means was sought to conceal the meaning of the messages. There had been placed in service in our Army, for the sole purpose of permitting the encoding of important words in telephone messages, leaflets containing in essence tables serving to replace letters by groups of two figures, by selecting now one table and now another. These notebooks showed for 50 common expressions the way to encode them in a single group of three figures. When the communications by wireless telegraphy between small units developed, the use of these notebooks was authorized, by way of exception, to add to the signals which the posts were to employ—as a rule, a few encoded expressions. There was developed later the table of words in addition to the tables for encoding by letter. Then the idea of making this notebook a document for encoding, especially letter by letter, was abandoned, and it was made into a small dictionary of words and syllables. For the large

<sup>5</sup> See Nos. 33 and 34, March and May 1926.

<sup>6</sup> The original French reads "carnets de chiffre," literally, "cipher notebooks." These are merely short lists of code equivalents for letters, syllables, and a few common words.

units, documents more voluminous than the notebook designed for troop units were prepared, and they were called codes. Both of them, at the end of the war, were based on the same principle as the code book of the general staffs but on a smaller scale.

With the Germans, a similar evolution had been seen. The small units had at first used encoding tables, in which the most usual sentences were represented by groups of letters or figures. Some of these, *Befehlstafel* (command tables) or *Geheimtafel* (secret tables), were captured in surprise attacks. In order to modify the encoding work, certain of these tables were of a circular form, the words to be encoded being written on the radii, at uniform distances from each other, of a large circle, while the groups were on the radius of a small concentric circle. The latter was movable, and by changing the position of it the correspondence of the groups to the words was varied. Others of the documents were in the form of a notebook with variable pagination. Then, without these transformations succeeding each other according to a precise chronological order, our enemies adopted notebooks nearly similar to ours. Was this merely one example among many which might be found in the history of cryptography, a science in which each guards his secrets, of those "ideas which are in the air"? Was it the result of information given by documents found on the field? It matters little, in any case, in June 1917 the system had become general.

Let us take careful note of what this authority says of the earliest *carnets de chiffre* or code notebooks. Givierge states that the first ones were (1) intended solely for use in telephone communication; (2) they had "tables serving to replace letters by two-figure groups, by selecting now one table and now another"—in other words, a sort of polyalphabetic scheme of encipherment; and (3) they also had 50 common phrases which were representable by three-figure groups. Then later, when radio communication between small units developed, and "the use of these notebooks was authorized, by way of exception," a few expressions were added to the signals which the posts were to employ. "There was developed later the table of words in addition to the tables for encoding by letter. Then the idea of making this notebook a document for encoding, especially letter by letter, was abandoned, and it was made into a small code of words and syllables."

Let us devote a few moments to a consideration of these early codes. The writer is fortunate in possessing in his personal collection of cryptographic items examples of some of the French codes of this early period. Appendix 4 shows a photostatic copy of a page of one of these early French codes. It is, to be sure, not one of the first of the type to which the French applied the name *carnet réduit*, but it well illustrates the principles upon which it was based.

It will be noted that it was to be used by telephone, earth telegraphy, radio telegraphy, and visual telegraphy. It had a name "Olive," to be used as a signal in telephone conversations, and an *indicator* "O.O.O." (the initial letter of that name given three times) to be used as a signal when this code was used in telegraphic communication. It was not strictly a one-part code, since there was a division into several sections: Alphabet, numbers, verbs, verb tenses, measures, orientation, place indications, infantry, artillery, common words, and phrases. It will be noted, however, that the three-letter code equivalents, while in strict alphabetic order, show breaks in sequence. For example, the first group is not AAA but AIC, followed by AKE, then AKI, ALB, etc. These skips in sequence were intentionally quite irregular, the purpose being threefold, as discussed below.

First a somewhat greater degree of security than would be the case if there were no breaks is provided by such an arrangement, since enemy cryptanalysts are not in a position to know approximately how many groups intervene between any two which had actually appeared in the traffic. For example, suppose that the groups AKE and AKI have appeared in the traffic. If an unbroken alphabetic sequence of code equivalents were the basic principle, then the cryptanalyst would know that there must be three groups intervening between these two groups, and this would have an important influence upon his assumptions for the probable meaning of AKE and AKI. But where there are breaks in the sequence he is not in so good a position to make these assumptions. The more irregular the number and extent of these breaks in alphabetic sequence are, the harder it becomes to make these assumptions. But of course the difficulties in this respect

hardly begin to approach those encountered in the true two-part code, where the principle of parallelism in progression between code equivalents and plain-text elements no longer obtains even to the slightest degree.

The second purpose of having breaks in alphabetic sequence of code equivalents is that it affords opportunity for the preparation and issue of a new edition after an earlier one has been in use for so long a time as to have been solved or has been captured or otherwise compromised. The new edition may employ new code groups with a different arrangement of breaks in alphabetic sequence so that any information the enemy cryptanalysts may have derived from the preceding edition will be valueless.

The third purpose of having breaks in alphabetic sequence of code equivalents is that it permits of the simultaneous use of several editions of the basic code by organizations fighting upon different fronts or in different sectors of the same front, since the skips in one edition may be quite different from those in another.

The writer is unable to state how long the French continued to use this type of one-part code. It is quite clear from what Givierge says about the way in which codes came to be employed by the French Army that the success which attended these earliest codes soon led to their increase in size and to their widespread use, for he says: "For large units, documents more voluminous than the notebook designed for troop units were prepared, and they were called codes." It is important for us to note also his statement that "both of them (i. e., the *carnets de chiffre* and the *codes*) at the end of the war were based on the same principle as the code book of the general staffs but on a smaller scale." By this he can only mean that the principle of the one-part code was abandoned in favor of that of the two-part code. This conclusion is corroborated by two exhibits in the writer's possession. One of them is the carnet "Urbain," a true two-part code notebook of about the same number of words and phrases as the carnet "Olive," but in which the sequence of code equivalents no longer presents a parallelism with the alphabetic order of the plain-text elements. (See appendix 5.) The other exhibit is a much more extensive two-part French field code of approximately 2,300 groups. (See appendix 6.) This code also provided for a method of superencipherment, but how much this was used is unknown to me. A copy of an enciphering table is shown in appendix 7.

So much for the French field codes.

A few words must be added concerning the field codes of the German and the British Armies. For a good account of the cryptographic systems used by the German Army from the outbreak of the war until the time that field codes had been developed by that Army, the reader is referred to the interesting brochure of Yves Gylden, a translation of which appeared in seven successive installments in the Signal Corps Bulletin beginning with the November-December 1933 issue. Suffice here to indicate that they employed several different types of systems, including simple substitution, simple columnar transposition, combined substitution-transposition, double transposition, and polyalphabetic systems of a rather complex nature. Of these, only two were really practical and successfully employed for any length of time: (1) A double transposition cipher system, and (2) a cipher system using only the letters ADFGVX in the cryptographic text and therefore called the ADFGVX cipher system. But these were reserved for use in communications between only the highest headquarters and a detailed discussion of them falls outside the scope of this paper. As for the other systems, we may summarize them by quoting from Gylden:

The German systems employed during the first few months of the World War were particularly impractical. \* \* \* This explains the uncommonly great proportion of repeated telegrams and the unnaturally long delays mentioned above. \* \* \* The systems were far too difficult to handle by radio personnel not especially trained in that line; they were likewise far too time-consuming for practical purposes and useless when there was interference. \* \* \* As a rule, the correspondence was in cipher. However, frequently names in clear text occurred, as well as words and even whole sentences which had not been understood by the person for whom the (original) message was intended. \* \* \* Still more important was this telegraphing in clear

text because of the fact that it accustomed the French cryptanalytic experts to the ordinary telegraphic style used by the Germans and to their ordinary abbreviations, as well as to the nulls which they interpolated in their messages<sup>7</sup>.

In appendix 8 is shown a sample page of each of three German field codes. It will be seen there that the general vocabulary of the *Schlüsselheft* was a simple one-part code, whereas the *Satzbuch* was a true two-part code. The former was enciphered by a cipher key called the *Geheimklappe* which changed about every 7 to 10 days. It will be seen that this system was very similar to the very first field code which was produced by the AEF but which was hardly used before it was superseded by the excellent two-part "Potomac" code, which was similar to the German *Satzbuch* and required no encipherment.

As for the British field codes, I am unfortunately able to offer very little information. So far as I am aware, they adhered throughout the war to their peculiar type of code called technically a *caption code*, in which the contents are subdivided into headings or captions such as "punctuation," "common words and phrases," "attack," "bombing and bombing attack," etc. Under each caption there were several items to each of which was assigned a three-figure code group. *The code groups were in serial order* except in two particulars: A very few breaks were introduced in sequence, probably to allow for additional insertions, and the code groups assigned to the 26 individual letters of the alphabet (for a spelling table) were in random order. Obviously, superencipherment must have been used. A few pages in appendix 9 give a good idea of what this code was like.

#### 5. THE PREPARATION OF FIELD CODES BY THE AEF

The following extracts are taken from the official Report of the Code Compilation Section of the AEF, prepared by Maj. Howard R. Barnes, the officer in charge of that Section from the time of its organization in December 1917 until its demobilization shortly after the Armistice in November 1918:

It must be borne in mind that at the commencement of the war no permanent experienced organization existed in the American Army either for the building up or the breaking down of codes.

\* \* \* \* \*

When the Code Compilation Section was organized in December 1917, it consisted of a captain, three second lieutenants, and one corporal. These men were assigned to duty at General Headquarters, American Expeditionary Forces, and began the task of compiling codes for the Army in the field.

The data on the subject of codes was most limited in scope. Previous to this war the United States Army had never had a code book, properly so called, for field service, and had had recourse to the cipher disk or short-lived emergency codes. Moreover, the Army was confronted with a foe who had profited not only by their own experiences of 3 years but the mistakes of the Allies which they had observed through their interception of wireless messages and the information gained from captured code books. At first the British and French were rather reluctant to disclose the systems which they had adopted for their codes, but eventually copies of obsolete editions were turned over to this Section for reference and study. With this meager data the compilation of a front-line code was begun. The fundamental principle upon which the books were founded was a complexity sufficient to delay solution with a simplicity sufficient to afford ease of operation.

The first American Trench Code, a small book consisting of some 1,600 words and phrases, was intended for distribution down to and including companies actually in line. Accompanying it were certain tables containing a distorted alphabet. It was proposed to change these tables at frequent intervals and thus delay the solution of intercepted messages. This Trench Code was never in fact actually delivered to the front line, and went no farther down than regimental headquarters because of the danger of capture. An edition of 1,000 was printed. This book was about 4½ by 7 inches and could easily be slipped into a breast pocket. The three-letter group system was adopted with an alternative four-number series. [See appendix 11.—*W. F. F.*]

\* \* \* \* \*

To provide for the needs of the firing line, a smaller code book was prepared for emergency use and issued down to companies. This code contained about 500 carefully selected words and phrases. Before compilation,

<sup>7</sup> Signal Corps Bulletin, No. 77, p. 47.

an officer of this Section spent some time at the front in an effort to obtain some first-hand information as to the specific needs of the front line.

An edition of 3,000 copies was issued.

This code book, known as the "Front Line Code," was about 3 by 6 inches and could be carried in an inner pocket. Two-letter groups were assigned to each word and phrase arranged alphabetically beginning with AB and ending with ZZ. A few blanks were left at the end for emergency use. [See appendix 19A.—W. F. F.]

In this book were inserted a number of "nulls" by the use of the parenthetical phrase, "This group means nothing."

To facilitate operation in the use of the two codes it was so arranged that the same distortion cards could be used with the Front Line and Trench Codes. [See appendices 12 and 19B.—W. F. F.]

Major Barnes summed up the experimental work that was done on these first two field codes in the following words:

Before these codes had become widely distributed or much used, it was seen that the effort to provide a quick-operating, simple code had proved a failure by reason of its very simplicity.

He does not give the details of how this failure was established but the writer is fortunately in a position to supply some of the elements lacking to complete the story of these two early attempts to produce a satisfactory field code.

Major Barnes does not indicate exactly how long this first Trench Code was used. He merely says "before these codes had become widely distributed or much used." For reasons which will soon become apparent it seems clear that at most, this period could not have exceeded a couple of months, and there is even reason to believe that this type of code was never actually used except for training purposes.

In collecting the data for this paper the writer encountered in the World War files references to a report, dated May 17, 1918, in which a series of 44 messages prepared by means of this first Trench Code and its "distortion alphabet" formed the subject of a study of security.

The report referred to of course became the object of a search and was readily found. It is of considerable interest in connection with this study. It was written by First Lt. J. Rives Childs, a member of a section of G-2 of GHQ known as the Enemy Code Solving Section, G2-A6 being its abbreviated designation. Code compilation, however, was a function of the Signal Corps under the Chief Signal Officer, AEF, and a section for this purpose was in existence. It would appear then that either G-2 directed that a test of the first Trench Code be made or the Chief Signal Officer of the AEF initiated such a project and called upon G-2 to make the test. In any case, the test seems to have been a highly successful one from the standpoint of demonstrating the weaknesses of this first code and its enciphering system, for it led to their quick abandonment. This report is so interesting a document in itself that it is included in toto herein as appendix 10.

There is another reason for including this report in its entirety. In a book<sup>8</sup> which, in most libraries, is undoubtedly cataloged under the class of nonfiction and which seems to bear the stamp of authenticity because of the official position held at one time by its author, there appears an allegedly factual account of the codes and ciphers employed by the AEF. Attention will be confined only to those portions of that account which are pertinent to this paper, viz, those dealing with the alleged work of a "young officer who without any knowledge of the American method of encipherment \* \* \* solved within a few hours" a series of extremely important messages which had actually been transmitted within the American sector. The following is a verbatim quotation of the paragraphs of interest (they have been numbered below for purposes of reference):

(1) The compilation of codes and ciphers was, by general orders, a Signal Corps function, but the war revealed the unpreparedness of this department in the United States. How much so is indicated by a talk I had with a higher officer of the Signal Corps who had just been appointed a military attaché to an allied country.

<sup>8</sup> Yardley, H. O. The American Black Chamber, Bobbs-Merrill, Indianapolis, 1931.

It was not intended that attachés should actually encode and decode their own telegrams, but as part of an intelligence course they were required to have a superficial knowledge of both processes in order that they might appreciate the importance of certain precautions enforced in safeguarding our communications.

(2) When the new attaché, a veteran of the old Army, appeared, I handed him a brochure and rapidly went over some of our methods of secret communication. To appreciate his attitude, the reader should understand that the so-called additive or subtractive method for garbling a code telegram (used during the Spanish-American War) is about as effective for maintaining secrecy as the simple substitution cipher which as children we read in Poe's *The Gold Bug*.

(3) He listened impatiently, then growled: "That's a lot of nonsense. Whoever heard of going to all that trouble? During the Spanish-American War we didn't do all those things. We just added the figure 1898 to all our figure code words, and the Spaniards never did find out about it."

(4) He outranked me greatly or I might have added that we were not at war with medieval Spain but with twentieth-century Germany, who had gathered the brains of her empire behind the greatest war machine the world had ever seen.

(5) Amazing as it may seem, his attitude was characteristic, even at the front. One of the young officers whom we had trained confirmed this when he arrived at General Headquarters in France. He had received his instruction and practical experience in my Bureau. Having observed the necessity for revising the War Department's communications in this country, he was eager to learn whether the codes and ciphers of General Pershing in use at the front were safe.

(6) The first thing which this young officer did after arriving in France was to induce his superiors to intercept by wireless our own radio code and cipher messages along the American sector. These codes and ciphers were used to transmit the most secret and important messages and by those who employed them they were considered safe.

(7) Without any knowledge of the American method of encipherment, the young officer solved these messages within a few hours. The system was wholly inadequate and as a means of insuring secrecy was little more than a farce.

(8) Through decipherments of German intercepted cipher messages, our Cipher Bureau in France knew that the enemy maintained a large staff of skilled cryptographers. All radio messages of the Allies and of the Americans were intercepted and sent to the German Cipher Bureau for attack. If this young American officer, who was still merely a student cryptographer, could solve these messages, the German cryptographers, with their long experience of code and cipher solution, without question had also solved and read these telegrams even more quickly than he. And once the system was broken, the enemy could solve every message as easily as the person to whom it was addressed.

(9) As it happened, the contents of this particular decipherment were so important and their secrecy so imperative that the young officer's memorandum on the matter threw the General Staff into a panic of confusion. From these wireless intercepts he learned the disposition of troops along the St. Mihiel salient, the number and names of our divisions, and, finally, the actual hour at which the great American offensive would be launched. This, then, the enemy knew!

(10) The herculean effort of flattening out the salient, which for 4 years had formed a huge "pocket" inside the French lines, cutting off communication and stopping railways between Verdun and Toul, was the task of the Americans. And by reading the intercepts, the Germans had already learned in detail, just as easily as this young officer had learned, plans and preparations for the great American offensive. Incredible! No wonder the General Staff was in a panic. In these messages were contained some of the most important stratagems of the World War.

(11) The Germans considered their position in the salient impregnable. General Pershing knew that the enemy had several lines of defense, the second known as the Schroeter Zone, another as the Hindenburg Line or Kriemhilde Position. What was to happen to the great American offensive of 1918 if the enemy was prepared for it? Or, if the defenses were not considered strong enough now to meet the offensive, was the enemy, warned by our messages, withdrawing?

(12) The latter was the case. Our young officer had shown the General Staff the leak in the offensive, but it was too late to swoop down upon the Germans in a surprise attack. The messages were already in their possession and a retreat had begun. The American offensive of September 12, 1918, was considered a triumph, but it represents only a small part of what might have been a tremendous story in the annals of warfare had the Germans not been forewarned. The stubborn trust placed in inadequate code and cipher systems had taken its toll at the front. The enemy had actually been taken into American confidence, through the nonsecrecy of communications. It was not a surprise attack which was achieved. Pershing pursued an already retreating horde and entered St. Mihiel on September 13. The salient was broken, but the surprise attack never came

to pass. Too many staff officers in France had, like our authorities in Washington, placed a childish unfounded trust in any encipherment which could not be read at sight.

The author does not name this "young officer" but he need not be nameless, for he was beyond all doubt the author of the report referred to above, First Lt. J. Rives Childs, who was indeed a member of the Code Solving Section (G2-A6) GHQ-AEF. It was certainly not within this young officer's province to be "eager to learn whether the codes and ciphers of General Pershing in use at the front were safe" but we may assume that he was not merely presumptuous and that perhaps he did express such a desire. At any rate, the official records show that he was assigned such a project; and since only one report on the subject was found in the files of the World War, it seems certain that the "young officer" was Lieutenant Childs.

Let us now analyze the paragraphs quoted from the Yardley book in the light of the Childs report and the facts which are established by studying that report.

First of all, the messages which Childs used were one and all test messages which had been prepared for the specific purpose. *Not a single one of them had been actually transmitted. There was no interception whatever involved in the matter.*

Secondly, Childs not only had a complete "knowledge of the American method of encipherment" but was given a copy of the code used, for let it be noted that strictly speaking this officer was given, not a complex problem in enciphered code, but a simple problem involving the solution of a single mixed alphabet. This statement is based upon evidence in the report itself, for no other conclusion can be drawn from several remarks contained in it, such as the following [the numbers at the side refer to the correspondingly numbered paragraphs in appendix 10]:

- (3) The solution of the cipher alphabet \* \* \*
- (5) Reference was had to the book and the result \* \* \* was confirmed.
- (6) These results were than checked up by means of the code book, and confirmed.
- (6) If the verb "work" is encoded on page 35. [The copy of the code book in possession of the writer (one of the valuable souvenirs of his participation in World War I) shows the word "work" on page 35. (See appendix 11.) Childs could certainly not have been aware of this fact unless he had a copy of the code.]
- (9) What letter was there in the code whose initial and final letters were the same? There was only one, "H"; we were not even under the necessity of trying and fitting from among several. [Childs would certainly not have been able to make such a statement had he not had the code.]
- (12) Suppose we turn to pages 14 and 15 of the code book. \* \* \* [Several references of similar import occur in this same paragraph.]
- (13) And again, it might be further added that the fact that there exist no blind groups or nulls anywhere in the code \* \* \*

It is believed that these references beyond all question establish the fact that Childs was given a copy of the code, told what the encipherment system was (or given an exemplar of the enciphering card similar to that shown in appendix 12) and asked merely to solve the single mixed alphabet involved. This was a particularly easy problem even in those days, as it would be today. *Had Childs been given nothing but the 44 messages*, the story would have been quite different; he might have reached a solution of the alphabet, and have read some of the messages in part, but the problem would have taken a good many days, perhaps 10 days instead of only 10 hours.

Obviously, from the foregoing facts Yardley's story collapses like a house of cards. Other evidence is hardly needed, but attention may be called to one other misstatement of fact which is glaringly patent: The Childs report is dated May 17, 1918, and Yardley talks about the reduction of the St. Mihiel salient, which did not begin until September.

Yardley completes his account with the following statements:

In a history of the World War, one reads the story of this amazed young officer, in some short uninformative generalization. He knew that the code and cipher systems were inadequate; but all he could do was reveal his findings and give warning to the General Staff. The story of his revelation is one which, like many others enacted

behind a curtain of warfare, is seldom told. It was too late to undo the damage after the young officer had revealed the inadequacy of the codes and ciphers.

\* \* \* \* \*

The Signal Corps in France was using inexpert and ineffective codes and ciphers to carry over the wireless the secret orders of the General Staff in France.

How far from the truth these statements are can easily be shown. As soon as it became clear that the first Trench Code and its simple encipherment scheme did not afford adequate security the whole system and the code were discarded. It was then, in the words of the Barnes report, that—

a code constructed upon the "chance" plan, provided with encoding and decoding sections was adopted, \* \* \* and \* \* \* in June 1918 the first issue of the new series was published and 2,000 copies were turned over to G-2 for distribution.

Of this and the succeeding codes more will be given presently, but before leaving the subject of the Childs report one more remark must be made. When the important statement of Major Barnes—the one to the effect that "before these codes had become widely distributed or much used, it was seen that the effort to provide a quick-operating, simple code had proved a failure by reason of its very simplicity"—is weighed in the light of the evidence, it must be admitted that the reason he assigns for the withdrawal of these two early codes is hardly an adequate one. For from the point of view of providing "a quick-operating, simple code" any two-part code without encipherment is certainly to be preferred over a one-part code which must be enciphered, since in the case of a two-part code (as regards both outgoing or incoming messages) there is only operation, and this step is exactly the same as in the case of a one-part code; whereas in the case of a one-part code with encipherment, an incoming message must first be deciphered and then decoded, an outgoing message must first be encoded and then enciphered. So Major Barnes' reason for the withdrawal of these two codes hardly tells the complete story. Of course, from the point of view of code compilation there is no question as to which of the two systems (one-part superenciphered code or two-part unenciphered code) is preferable. But while the production of two-part codes involves considerable additional labor for only a very few persons in the Code Compilation Section, the use of superenciphered one-part codes involves much labor for hundreds of code clerks working under the difficult physical and mental handicaps usually found in the field of active military operations. It is evident that this conclusion was the one soon reached by the Code Compilation Section, as is attested to by the following extract from Major Barnes' introduction to his report:

Two methods of compiling codes presented themselves. First, to construct a code book containing words and phrases in common use and supplement it by a series of distorted alphabets and cipher keys which could be rapidly distributed to organizations in the event of the capture of a code book. Second, to take away from the front area and place upon General Headquarters the burden of distortion and substitution by the printing and distributing of new code books at frequent intervals.

The first method imposes upon the front-line code men the double duty of putting up a message on code and changing by the use of a cipher table. In view of the fact that code work is frequently done under heavy bombardment and gas or in the critical moments of an advance, it does not seem advisable to add any additional burdens of code operators.

The second method, by avoiding the use of the cipher tables, does away with this double encipherment and puts upon headquarters the work of double encipherment which is accomplished by the reissuance of editions of code books compiled in the comparative quiet of the back area under more or less normal conditions.

If any apologia is necessary in extenuation of the facts concerning the first two unsuccessful codes put out by the Code Compilation Section of the AEF, we need go no farther than Major Barnes' own report, which states the matter quite succinctly in the following words:

It must be borne in mind that at the commencement of the war no permanent organization existed in the American Army either for the building up or the breaking down of codes.

Major Barnes, whom the writer knew rather intimately from 1919 until his death in 1926, himself never set forth any claims of cryptanalytic skill or experience. He was a code clerk in the State Department when the United States entered the war, and he was chosen not for any pretensions he may have put forth as a cryptanalyst but because he had at least some experience with codes and their handling in communications. It is doubtful if anybody else would have avoided any early mistakes he might have made, for, as he says, there did not exist any organization "either for the building up or the breaking down of codes." Another very illuminating sentence must be quoted from the Barnes report:

At first the British and French were rather reluctant to disclose the systems which they had adopted for their codes, but eventually copies of obsolete editions were turned over to this Section for reference and study.

It would be very interesting to know definitely when these obsolete editions were made available. That by the time Lieutenant Childs made his study the relations between the Code and Cipher Compilation Section of the AEF and of the British and French were quite close—if at the beginning of American participation they had been rather distant—is attested to by the fact that on June 13, 1918, Maj. Frank Moorman, officer in charge of the Code Solving Section, G2-A6, GHQ-AEF, addressed the following letter to Maj. M. V. Hay, the officer in charge of Code and Cipher Solution Section of the British War Office, in London:

GENERAL HEADQUARTERS,  
GENERAL STAFF, SECOND SECTION (G-2 A-6),  
France, June 13, 1918.

CAPT. M. V. HAY, GENERAL STAFF,  
M. I. 1 B., British War Office, London.

DEAR CAPTAIN: The enclosed sheets are messages encoded by use of our new code. No enciphering is required. Code books are to be rearranged and republished at frequent intervals. Would be very glad to receive any suggestions or criticisms that occur to you.

Very sincerely yours,  
FRANK MOORMAN.

An identical letter was addressed to Capt. O. T. Hitchings, the officer in charge of the Code and Cipher Solution Section at the General Headquarters of the British Expeditionary Forces in France. The messages referred to in the letter will be found in appendix 13.

The following reply was received from Major Hay:<sup>9</sup>

M. I. 1 B./890/Cy.

M. I. 1 B., WAR OFFICE,  
24th June, 1918.

DEAR MAJOR MOORMAN: Many thanks for your encoded messages. We have not been able to solve them or even to get any light. The security appears of a high order.

I enclose a memorandum embodying my views on this code.

Yours sincerely,  
M. V. HAY,  
Major, General Staff.

MAJOR MOORMAN,  
General Staff, 2d Section (G-2),  
AEF, France.

<sup>9</sup> The memorandum mentioned in the second paragraph of Major Hay's letter is given in full in appendix 14 hereto.

The following reply was received from Captain Hitchings:

SECOND SECTION,

General Staff, AEF

DEAR MAJOR MOORMAN: I am sending you a short survey of our observations on the 41 messages you sent me for criticism and eventual solution. As I told you in my last letter we have not succeeded in solving them, but you will see in the enclosed survey a few possible lines of attack.

Certainly up to date I have not the slightest doubt but that you have produced a code which if easily workable is far sounder than the present German system.

I shall be interested to know how it works in practice.

Yours sincerely,  
O. T. HITCHINGS.

INTELLIGENCE E (c),  
2d Echelon,  
30th June 1918.

The "short survey" to which Captain Hitchings referred is given in appendix 15.

The following memorandum from Major Moorman to Col. D. E. Nolan, then A. C. of S., G2, GHQ-AEF, will also be found to be of interest in this connection:

GENERAL HEADQUARTERS,  
GENERAL STAFF, SECOND SECTION (G-2, A-6),  
France, July 13, 1918.

Memorandum for A. C. of S. (G-2):

I have recently had a number of messages prepared and encoded by use of our "Potomac" Code which is used for radio messages in divisions.

Copies of these coded messages were furnished code men in my office and were also sent to Major Hay of the British War Office and Captain Hitchings at British G. H. Q., for test as to security of code.

Reports from code men in my office were made verbally. They were uniformly to the effect that while, by no means "unsolvable," this code was more difficult than any employed by the Germans.

The enclosed letters from Major Hay and Captain Hitchings show that these officers, both of whom are expert code men, approve of our system.

Each also furnishes an interesting but rather long and highly technical discussion of possible means of attack. These are filed in my office and are available for your inspection if desired.

The Potomac Code has been furnished corps for all divisions except those which have just arrived from the United States. Its general use will begin July 15.

New books will be issued at irregular intervals varying from 2 to 4 weeks. One complete edition is now held in reserve for immediate issue in case of loss or "accident" to one or more copies now in service.

I think the Signal Corps is to be congratulated on having turned out an excellent book.

FRANK MOORMAN,  
Major, G. S., AEF.

The foregoing memorandum formed an inclosure to a letter from Colonel Nolan to Brig. Gen. E. Russel, then Chief Signal Officer, AEF. The letter and its 1st Ind. are given below.

GENERAL HEADQUARTERS,  
GENERAL STAFF, SECOND SECTION (G-2),  
France, July 20, 1918.

From: A. C. of S., (G-2).  
To: Chief Signal Officer.

1. There is enclosed for your information copy of memorandum in regard to the "Potomac" Code, recently compiled by the Signal Corps.

2. The favorable comments of our own and British code men have been brought to the attention of the Commander in Chief.

D. E. NOLAN,  
Colonel, General Staff.

*1st Ind.*

Hq. SOS, OCSO, July 24, 1918—To A. C. of S., G-2, GHQ, AEF.

1. It is very gratifying to learn that the work of our code officers has met with the approval of your office, and the thanks of all concerned is tendered for your bringing it to the attention of the Commander in Chief.

E. RUSSEL,  
Brigadier General, N. A., C. S. O.

About the time that a copy of the new Potomac Code was submitted to the British for comment, Col. Ralph H. Van Deman, who had recently been Director of the Military Intelligence Branch, Executive Division, of the War Department General Staff in Washington, was making a visit at GHQ-AEF, where he apparently had a conference with Major Moorman. The following memorandum resulted therefrom:

GENERAL HEADQUARTERS,  
GENERAL STAFF, SECOND SECTION (G-2, A-6),  
France, July 13, 1918.

*Memorandum for A. C. of S., (G-2):*

Colonel Van Deman suggested the advisability of sending to the Military Intelligence Branch a copy of our Trench Code with brief statement of how and by whom it was used. I have added a request that faults discovered be pointed out.

I request that letter be returned to me for enclosure with code book.

FRANK MOORMAN,  
Major, C. S., AEF.

The following letter was thereupon sent to Washington:

GENERAL HEADQUARTERS,  
GENERAL STAFF, SECOND SECTION (G-2.),  
France, July 13, 1918.

From: A. C. of S. (G-2),

To: Chief Military Intelligence Branch, Executive Division, General Staff, Washington, D.C.

Subject: Trench Code.

There is enclosed for your information copy of our "Potomac" Code. This is designed for use within divisions for messages sent by Radiotelegraphy or other means liable to interception by the enemy. It is proposed to change these books at irregular intervals varying from 2 to 4 weeks.

As future editions will differ from this in little besides the arrangement of the code groups, copies will not be furnished you unless specially called for.

A reserve edition is on file for immediate issue in case of loss or "accident" to one or more copies of books in service.

Copies of coded messages have been furnished code men of this section and the British War Office. All have reported favorably.

It would be appreciated if you would have tests of this code made and any faults pointed out.

D. E. NOLAN,  
Colonel, General Staff.

It was at this very time that Yardley was in charge of the Cipher Bureau (M1-8) at Washington, and this letter with its accompanying code must have come to his attention, but I have not been able to locate a reply to this letter. It is pertinent to inquire: If the AEF field code was so faulty, why did he not call attention to the weaknesses it contained—if indeed it contained them?

A final letter in this connection will also be of interest:

JULY 16, 1918.

CAPT. H. R. BARNES, Sig. R. C.,  
Office of Assistant Chief Signal Officer,  
GHQ, AEF, APO 706.

MY DEAR CAPTAIN BARNES: I am in receipt of a letter from Colonel Hitt, enclosing a copy of the comments made on your Potomac Code by the British General Staff. They are very complimentary about this code, and Colonel Hitt has supplemented their remarks with the following comments:

\* \* \* We believe that this code system will be better than anything now in use on either side, and that messages intelligently sent will be perfectly safe.

In this connection, I would like to call attention to the excellent work which has been done on these Front Line Codes and on the Staff Code by Capt. H. R. Barnes and his assistants in the Code Compilation Division. They have worked without regard to hours, and have given their best ideas and most painstaking attention to their work. The result is a series of military codes that are better than anything I know about. I commend these officers and soldiers to your attention for their zeal and professional ability in an important and highly specialized branch of our work. \* \* \*

I have recommended Lieutenants Chambers and Ryan for promotion, in accordance with recommendations which were sent me. I wish you would acquaint them of my pleasure on noting the good work they have done, and I think it just to express my appreciation of your and their devotion to the important duties which you have to perform.

With best wishes,  
Very truly yours,  
E. RUSSEL,  
Brigadier General.

#### 6. THE "RIVER" AND "LAKE" SERIES OF AEF FIELD CODES

The principle of the two-part code having been adopted as the basis of the AEF field codes, the first of the remarkable series of such codes was, as already stated, the "Potomac Code," named of course after the famous river marking the location of the Capital of the United States. This code was issued on June 24, 1918, in an edition of 2,000 copies. There then followed a series of 14 codes prepared in a period of 5 months from June to November 1918, nearly 3 codes per month, an achievement which will on consideration be found most noteworthy in comparison with what other belligerents accomplished within the same period. But let Major Barnes' excellent report tell the story in his own words:

In June 1918, the first issue of the new series was published and 2,000 copies were turned over to G-2 for distribution.

This code book, known as the "Potomac Code," the first of the so-called "River Series," contained approximately 1,800 words and phrases, and with the decoding section made a pamphlet of 47 pages. It was approximately 7¼ by 9¼ inches printed in "typewriter type," a type selected for its good legibility under the poor lighting conditions of the field.

Each page contained 2 columns of 50 lines each, or 100 lines to the page. At the margin of each column were printed in a small block a "null" and the following spelling combinations:

"ed, en, er, es, ing, ion, ll, ly, nd, re, s, st, th"

Thirty-five different nulls were provided and the instructions were that 1 at least should be used with every 10 groups and invariably between groups used to spell out words.

The "Potomac Code" marked the inauguration of the policy of taking away from the front line all possible extra work in connection with coding and decoding and putting upon headquarters the burden of affording security by replacing and reprinting the books. The reissuance of code books provided the necessary secrecy since no particular code was intended to be in service for a great length of time, and, therefore the amount of intercepted messages would be comparatively small. In accordance with the plans of G-2, who distributed the code books, one edition was to be distributed down to regiments; another edition sent down to Army Headquarters; and a third edition held in reserve at General Headquarters. That this plan was well conceived was demonstrated by the fact that when this particular book was captured, 1 month after publication, the two sets were ready in reserve and were reissued to the entire Army organization, within 2 days.

\* \* \* \* \*

The following points were considered in the actual construction of the Trench Codes:

1. *Clearness of type*, account being taken of the poor lighting facilities at the front.
2. *Simplicity of operation*, believing that the absence of complication would tend to reduce error in preparation and transmission and increase the number of coded messages.
3. *Size of the book*, in order to make it convenient to handle and preserve.
4. *Vocabulary*, large enough to provide a working basis for all ordinary conversation, yet not too large to be easily handled.
5. *Paper*, of a quality sufficiently good to last for the short life of the book, yet poor enough to permit of rapid destruction if necessary to prevent capture.
6. *Variants*, to provide safeguards to avoid repetitions as much as possible of common expressions, and,
7. *Certain accentuated features*, to call particular attention to things to be remembered or to make them conspicuous.

\* \* \* \* \*

The "Potomac" was followed on July 15 by the "Suwanee" in an edition of 2,500 copies. No radical change was made.

The "Wabash" followed on July 31 in an edition of 2,700 copies. This code followed the same general plan, but was slightly smaller.

The "Mohawk" followed on August 3, in an edition of 3,200 copies. This code was the first one with four-number code equivalents, running from 2,500 to 5,000, making a total of approximately 2,500 groups provided for some 1,600 words and phrases. This book was captured in October.

The "Allegheny" followed on August 12, with 3,200 copies and the number groups were selected from numbers ranging from 1,500 to 5,000. Fifty blanks for the emergency use of organizations were also provided. This book was captured in October, making the third to be put out of commission in this manner.

The "Hudson" followed on September 2, with 3,200 copies; also a number group code. In this code a group of 5 different "nulls" was printed on the margin of each 50 lines with a view to encouraging their use by making them conspicuous. With the object of providing a group for transmission from memory in the event of the loss of a code book, the group "2222" was printed in red ink on the outside cover of the book where it might be readily and often seen.

The "Colorado" followed on September 24, with 3,200 copies, using letter groups instead of numbers. The code books had been slightly reduced in size from time to time, but this issue marked the last reduction. Without reducing the legibility of the type, the lines were closed up and the outside margin reduced to 5½ by 7½ inches as against the 7¼ by 9¼ inches of the first issue. For the first time spelling combinations were printed at the bottom of each page, 16 in all being provided, with 2 or more variants for each combination. On the cover the group "DAM" was printed to be memorized and used if the code were lost.

It was believed that the issuance of the large number of copies necessary to supply both the first and second Armies would needlessly jeopardize the code, and it was decided to issue different series to the two armies. Accordingly, the "Lake Series" of codes was begun, commencing with the "Champlain" on October 7, and an edition of 2,500 copies of each code was put out. To accentuate the difference in the series, the cover printing on the "Lake Series" was in red ink and that of the "River Series" in black ink. The "river" codes were issued to the First Army and the "lake" codes to the Second Army.

Instructions were issued directing that all messages sent in these codes should be preceded by a 3-letter code combination which would indicate the particular code used. Thus a "Hudson" message was preceded by "HUD"; the "Colorado" by "COL"; the "Osage" by "OSA," etc.

After the "Champlain" came the "Huron" on October 15, the second of the "Lake Series." This book differed from its predecessors in that it contained in the front the "Emergency Code List," which was also issued separately down to companies for emergency use. In the back of this code there appeared a double receipt easily detachable, for the convenience of officers receiving and delivering the code books.

The instructions were so altered as to include the telephone alphabet which was intended to simplify the transmission of code messages by telephone.

The "Huron" was followed by the "Osage" on October 28. The changes consisted in the additional printing on the cover of the order to—

"Precede every message in this code by OSA"

and:

"NOTE.—The \* indicates new word or phrase"

This last direction was added in order that officers might have their attention quickly directed to new words or phrases which previously they had been spelling letter by letter.

After the "Osage" came the "Seneca" on November 6. This code differed only on the first page of the Encoding Section where on the margins were printed the variants for "minutes," "o'clock," "battalion," "regi-

ment," etc., and the ordinals from first to tenth inclusive, and the printing of the initial letters of each word or phrase in small letters rather than in capitals. This last change was made as an aid to the eye in constructing sentences.

This book contained nearly 1,900 words and phrases as against 1,750 in the early issues of Trench Codes. Many changes had been made in phraseology, however, and of the original list of words and phrases 1,045 alone remained unchanged.

At the time of the Armistice this Section had in press the "Niagara" Code, and the "Michigan" and "Rio Grande" in manuscript. Thus, during the Armies' operations 15 codes were actually compiled in the Trench Code Series. To be more exact, 14 codes were prepared in the period of 5 months from June to November 1918, nearly 3 per month.

In the 10 months of active operations the Section completed and printed more than 80,000 code books and pamphlets, all numbered, recorded, issued, and receipted for when issued. The record is complete, no copy being missing.<sup>10</sup>

#### 7. THE "STAFF CODE"

At the same time that the Code Compilation Section of the AEF was engaged in preparing the field codes, it embarked upon an even larger project, that of preparing a "Staff Code." The story is tersely told in Major Barnes' report:

The American Army in the field had no comprehensive code for headquarters work except the War Department Code which was intended primarily for cable work and not for active operations in a foreign country. The demand for a substitute was so insistent that a code was compiled primarily for communication within France.

The preliminary work covered a wide range of activities and required several months' study of confidential papers of organizations, replacements, operations, and military documents generally.

In May 1918, the "Staff Code" went to press and was completed 1 month later. This code contained approximately 30,000 words and phrases. Among other things it embodied a list of several thousand French towns and villages and a complete list of the Army organizations up to May. It is believed that this is the largest and most comprehensive code book ever printed in the field. It contained both number and letter group equivalents. More than 50,000 telegraphic combinations were sent over an instrument in order by selection to reduce to a minimum the chances of error in transmission over the telegraph lines. One thousand copies of this code were printed and bound with a flexible cover.

This code differed from many others in that it was an alphabetical rather than a subject code. It was divided into what was known as a right-hand and left-hand column series. The left-hand series of code combinations differed in plan from the right-hand. This was done to confuse as much as possible enemy code experts. The complete Army organizations and all proper names appeared in this column, the right-hand column being reserved for the usual words and phrases of a code.

With this code were provided five different tables of distortion for G-1, G-2, G-3, G-4, and G-5. These gave a cipher combination to the original group and made an added security.

These distortion tables were prepared with an Enciphering and a Deciphering Section. They consisted of certain selected two-letter combinations from AB to ZY, arranged alphabetically with two-letter equivalents selected at random.

For example, the code group FSNB might be distorted to read, VKXV. This was done simply by dividing the four-letter group FSNB into two parts and distorting each part separately.

The decipherment consisted in the reversal of this process by consulting the table and translating VKXV to read FSNB.

Five different tables were provided for use with the Staff Code but there was no limit to the variety which could have been made under this system of distortion.

A page of the Staff Code, and a sample of the enciphering table are shown in appendix 17.

#### 8. MISCELLANEOUS CODES PREPARED IN THE AEF

Among the miscellaneous codes<sup>11</sup> prepared by the Code Compilation Section, AEF, the following deserve mention, as described in Major Barnes' report:

In March 1918, an addenda sheet was compiled in order to provide code equivalents for a number of words omitted from the "War Department Code" and in addition to provide code groups for transports and a number of French cities and towns. One thousand copies of this supplement were issued.

<sup>10</sup> A page of each of these field codes is shown in appendix 16. In addition to those mentioned in the Barnes report will be found Field Code No. 1, Field Code No. 2, and Field Code No. 3. These were printed in the AEF but were never issued. They were transported to the United States after the Armistice, kept in reserve for about 3 years, and then destroyed as obsolete.

<sup>11</sup> Samples of the various codes mentioned will be found in appendix 18.

In March 1918, what was called a "Telephone Code" (sometimes called the "Female Code") was prepared for disguising the names of organizations and commanding officers. Originally intended for use over the telephone, it was principally used in messages to conceal organizations. Its code equivalents were the first and last names of women, and it was so arranged that the name "Mary Brown," for example, might mean the "Chief Signal Officer of the First Army." Five hundred copies of this code were printed on a single sheet of letter-sized paper and turned over to G-3 for distribution. In October 1918, this code was reissued with the addition of a decoding section.

In June 1918, a short three-letter group code was prepared for use in certain principal telegraph offices in order to conceal troop movements. In July 1918, a more complete code of some 1,300 words and phrases was issued to replace the former edition. These codes were photostated and distributed to six telegraph offices.

In May 1918, a short code list for reporting casualties was prepared and printed. This list was printed later as a general order.

In September 1918, a short code of two-letter combinations was prepared to meet in part the needs of the front line who had no access to the "Trench Codes" or other means of secret communication. Six thousand copies of this "Emergency" Code were printed and distributed down to companies. It contained some 50 commonly used phrases with an encoding and decoding section. A new edition of these lists was put out to accompany each issue of Trench Codes. When the "Huron Code," the second of the "Lake Series," was issued on October 15, the list was printed in the front of the code book in order to provide a ready reference for communication between the users of the large codes and the front line who had but the small list.

This "emergency" list was but in its infancy at the conclusion of the war and the experience gained by observation and criticism would no doubt have greatly improved it.

Up to October 1918, the French Radio Code had been used by the American Army as a service code, but the difficulty in language was a constant source of trouble.

In October, therefore, a new American Code was compiled, consisting of about 1,000 words and phrases, and has been in use up to the present moment.

As an emergency measure, all the work of compilation, printing, and delivery to the First Army was done in a period of 6 days. This code was known as American Radio Service Code No. 1, and 2,000 copies were printed.

In connection with the confusion arising from the use of a multiplicity of codes, authorized as well as unauthorized, Major Barnes says:

Although not properly speaking a function of the Code Compilation Section, the demands made upon it to determine what particular code was being used in the preparation of certain messages were so frequent that the need for centralization of code work was made conspicuous.

At certain times messages were being sent by different organizations in "Playfair"; "Hudson" and "Mohawk" Trench Codes; private organization codes regarding replacements; private casualty codes; ammunition codes; and in addition messages in plain containing such code groups as "Nellie Smith," and giving a location as "Windfall" or "Laredo."

The Code Compilation Section was never able to ascertain how many codes were in actual use at any one time; when they were put into service or withdrawn; or who issued these codes. Moreover, it did not know of any one office that did know. One instance of the confusion which naturally arose out of this multiplicity of codes is the case where a message was received at General Headquarters addressed to an officer in "London." After it had been put on the wire and forwarded to London, England, and a reply received that he was unknown, an investigation developed the fact that an organization in the field had assigned the code word "London" to an adjoining village but had not notified headquarters of its code list. This particular difficulty was straightened out, but not even Military Intelligence had a complete list of the codes in use.

There were far too many codes in use in the American Army, codes prepared to meet an emergency by men who had no special knowledge of such work. These codes must have presented no great difficulties to enemy code men and no doubt gave away much valuable information.

In connection with the latter statement it seems worth while to give in its entirety what must be considered as the gem of the collection of unauthorized "codes" issued and perhaps used by certain units of the AEF, perhaps only for training, perhaps for a few actual messages. The "baseball code" shown in appendix 19 was found among the World War files and the writer vouches for its authenticity. The code words of that gem are the names of famous baseball players of a generation now gone and forgotten. Hence, much of the zest in the reading of the text of that code must be reserved for those old timers who "can remember way back when."

In addition to these miscellaneous codes, mention must be made of a special edition of the French "carnet réduit" which was issued in a French-English parallel column form, for use by AEF troops which at one time were either situated in a French sector or were brigaded with certain French units.

#### 9. PRINTING OF CODES IN THE AEF

The printing of codes was by Army Regulations a function of The Adjutant General's Office and while the work was done by that office, it was conducted in cooperation with the Signal Corps and under the close supervision of the Code Compilation Section.

The following is taken from Major Barnes' report and will give a clear picture of the operation:

The codes compiled by the Code Compilation Section were printed at the printing office of the AGO at General Headquarters.

By an arrangement with that office these codes were given preference over all matter except general orders and bulletins. In general this plan proved satisfactory, but at times, owing to an unusual pressure of work, an issue of codes was considerably delayed. As a rule, this delay was comparatively unimportant, but there was always the danger that a code would be captured and a new issue needed at once to replace it. As a matter of practice two complete codes were always kept in stock for issue, except upon the occasion when three different series were in use on three different fronts at the same time. But the danger was too great to permit of this hazardous plan of control being long used. Frequently a code could be set on the linotype, carried through the composing room, proofread twice, printed and bound in about 5 or 6 days of normal work, but this only under the most favorable conditions. Under pressure, working three shifts of men during the 24 hours, the linotype could complete its work in 48 hours. However, upon occasions all work on codes was stopped for several days and this delay became too prevalent to make for the best results.

During the process of printing, the codes were under the constant supervision of an officer whose duty it was to destroy all spoiled sheets containing impressions even to the mats on the presses. All copies were counted and accounted for and the metal type melted down after the final impression. In many cases two or three officers were on duty in the printing office keeping the various operations in sight.

The number of copies to be printed of each edition of a code was determined by G-2.

#### 10. DISTRIBUTION OF CODES IN THE AEF

The problem of the proper and rapid distribution of codes was one that gave considerable difficulty. According to Army Regulations this was a function of The Adjutant General's Office, but for one reason or another the work apparently could not be performed satisfactorily by The Adjutant General.

In the final report of Lt. Col. Frank Moorman, the officer in charge of the Radio Intelligence Section G-2, GHQ-AEF, there occurs the following paragraph:

On account of the uncertainty of the courier service and their refusal to carry heavy packages, the lack of interest in the distribution of code books by other departments and urgent need of making distribution on time, the work of distributing the Trench Code books was taken over by this Section.

Officers from the Radio Intelligence Section at GHQ served as special couriers to carry the heavy packages referred to by Colonel Moorman to Army Headquarters. From there further distribution was made by personnel of the Radio Intelligence Section of Army to division, corps, and Army troops.

Major Barnes says in connection with this subject:

The problem of distribution was a difficult one to solve inasmuch as the whole question was without precedent in the American Army and was changing from day to day by the peculiar conditions of the front and by the formation of the Second and Third Armies. In the main the centers of distribution were the officers of the G-2 section who had manifold other duties of equal importance to perform.

Today the situation in this respect is far more satisfactory, since the War Department has realized the importance of this matter and has concentrated all code work, including the compilation, printing, distribution, and accounting of codes, in the Signal Corps.

## 11. COOPERATION WITH G-2

The following remarks are quoted from Major Barnes' report:

During the entire period of the war this Section was cooperating closely with G-2 at General Headquarters. A careful study of the errors committed by the enemy was made and later, when the American intercept stations were established, close examination was made of the American messages both by G-2 and by this Section to determine the common errors of commission and omission. When grave mistakes or violations of orders occurred the attention of the offending officers was invited by G-2 to the danger of such practices, and helpful suggestions were given them for their better understanding.

Lieutenant Colonel Moorman was indefatigable in his endeavors to educate, encourage, and assist the code men of the Army, a task made the more difficult by the vast amount of "propaganda" necessary to popularize these codes. This work he assumed in addition to the already heavy burdens of enemy-code destruction. To his unflinching courage of conviction and clearness of vision the Code Compilation Section is indebted for a large part of its achievements.

The present writer is able to elaborate somewhat upon Major Barnes' statements.

The inexperience and perhaps early faulty training of American troops caused numerous messages to be sent in plain language. Other messages violated the regulations adopted for the control of radio communication within the AEF. The intercept stations of the Signal Corps, working in close cooperation with G-2, were given the additional function of listening in upon our own transmissions with the result that the need for stations which should specialize in copying messages from American nets was soon demonstrated. The first station of this sort was established at Toul on July 11, 1918, for intercepting American damped-wave transmissions and soon afterwards another control station was established for copying continuous-wave transmissions. When the First Army Headquarters moved to Souilly, two undamped-wave stations were established to monitor American radio traffic in this sector. These stations monitored the messages transmitted and, by promptly reporting messages sent in clear, on several occasions succeeded in nullifying slips which might otherwise have been disastrous. However, messages in code could not, of course, be monitored so easily. These had to be sent on to GHQ, where they were studied by a special section set up for this purpose under the Code Solving Section of the Radio Intelligence Section, G-2, GHQ.

It is important to note that the personnel of this control or "Security Section," as it was called, consisted of trained officers who worked in very close collaboration with the cryptanalysts who were working on the solution of German codes and ciphers. Thus, the benefit of the experience from the study and observation of German code traffic could immediately be transferred to our own traffic.

When serious violations were noted, letters were sent to the responsible commanders calling attention to the dangers resulting therefrom. Many such letters were sent, but regretfully it is to be said that little good was accomplished thereby.<sup>12</sup>

## 12. SECURITY SERVICE

The following is quoted from the Barnes report as being pertinent to this question of communication security, already alluded to in the foregoing section:

Although it may seem a paradox, the most striking feature of the use of Trench Codes was the general inclination to avoid them whenever possible. This idea had its root in the proverbial inclination of the American for the before-mentioned short-cut. It received its nourishment either directly from commanding officers by orders to refrain from codes or indirectly through inattention or general lack of knowledge on the subject. Under this encouragement and on such fertile soil the idea grew so amazingly that even instructions from General Headquarters and the advice of code men were ignored or overlooked. As an instance of this, it is a matter of record that on one occasion a general in command in the field gave positive orders that prior to and during a certain important movement absolutely no code was to be used by his division.

<sup>12</sup> See appendix 22.

On the other hand it was found that in actual practice the very men who might have been expected to shun codes were the ones who used them most. Thus it developed that the officers of the Signal Corps, whose primary duty it was merely to transmit the messages, were in many cases using the codes freely for the transaction of their own business, and moreover, in many instances actually coding and decoding messages for the infantry, artillery, and other organizations. With but few exceptions it was from these officers that all the constructive criticism was received.

As a matter of fact Signal Corps officers had received no more actual instructions in the use of Trench Codes than had the Infantry or Artillery officers, but the course of their instruction contained enough information on the general subject to remove the mystery from the word "code" and make it commonplace to be handled with impunity, so that to them it had no terrors.

\* \* \* \* \*

It will be found difficult to bear in mind under extraordinary conditions all the minute directions which may be laid down for the use of a code, yet a slight deviation from those directions may give to the enemy who has intercepted the message the clue not only to that particular message but to many others. In other operations of an army in the field, an error in judgment or of carelessness may rebound upon the unfortunate officer to his rapid undoing, but an error in code operation may be apparent at once, may not in any way affect the responsible officer, but may wreak havoc upon the plans of the supporting troops adjoining. This might be the immediate result of such error. The late result might be that his mistake had provided the key which could unlock messages hitherto undecipherable, and such messages as might be sent until the notice of error was disseminated. When it is remembered that the secret correspondence of the entire Army may be jeopardized and delayed by one man's carelessness or failure to carry out instructions, officers should treat the preparation of code messages with the seriousness which the gravity of the situation demands. These remarks are apropos of what may seem to be errors of small magnitude, but are made emphatic because they might otherwise be considered of small moment.

Referring to the "Secret Instructions for the Use of Army Codes," the following practices are expressly forbidden:

- (a) To use plain language in the same message with code or cipher.
- (b) To repeat a message in any code or cipher other than that in which first sent.
- (c) To repeat a code or cipher message in plain language.
- (d) To repeat a plain language message in code or cipher.

Under section (a) it is so obvious that the use of a word in plain affords a ready clue to the adjoining words that no comment is necessary. Such words usually would be used to avoid the labor of spelling out letter by letter, and if nothing were lost save that particular message no great harm would result. But the solution of a group by the enemy may mean not only the gain of that group but be like the ever-widening circles in the water caused by the dropping of a stone.

Section (b) emphasizes the fact that repetition in another code may jeopardize the secrecy of the second code, inasmuch as the first may have been intercepted and deciphered.

Section (c) is almost axiomatic in its directions, since it is evident that such a procedure simply presents the enemy with just that many code groups, plus the ratio of the widening circle.

Section (d) is but the reversal of (c), and its importance is equally obvious.

The reference to "Secret Instructions for the Use of Army Codes" is the only time such an item is mentioned in the Barnes report, but a copy of this complete publication is given in appendix 21.

In addition to the foregoing it is thought that certain extracts from Colonel Moorman's report on this subject will be extremely interesting:

*Security Service. Listening Stations*

This service, almost unthought of in 1917, was established by practically all belligerents in 1918.

In our own service its scope should be greatly enlarged. It should include all means of giving false information to the enemy and of keeping real information from him. That part which relates to codes and the use of our own means of transmitting information should be handled by the Radio Intelligence Section under the supervision of the officer having general charge of the entire service. Only officers who have made a scientific study of codes and the information to be obtained from them, even when they cannot be solved, are in a position to know what will or will not give information to the enemy.

One of the main duties of code men is that of taking advantage of the enemy's mistakes. It is hardly possible that we will ever have a sufficient number of trained code men to handle the business of an army in the field. It will therefore be necessary to entrust to untrained men the duty of coding and decoding messages. If this is

done carelessly the enemy will certainly take advantage of the situation and obtain information of the greatest value. Our own experience in the St. Mihiel and the Argonne-Meuse Battles furnished ample proof of this.

An effort to control the use of code by the issue of orders and instructions was unsuccessful. Commanders were too busy to give the matter their personal attention and subordinates to whom code work was entrusted were changed too frequently to permit of all being familiar with the rules and the absolute necessity of following them.

The policy of writing a letter to the appropriate commander in the case of each offense was then adopted and many letters sent out. Only a few of these were answered and in these cases the action taken was entirely inadequate. In one case an officer was reprimanded by his commander. In others the excuse was made that officers did not know or were too busy or thought they were justified in their action. That these unanswered letters or those in which action did not suit the case were not followed up was due at first to the inadvisability of worrying commanders too much with the question of code when their time was fully taken up with the more urgent and important matter of actual combat. Later the signing of the Armistice made further action unnecessary.

In any case the writing of letters to commanders is too slow and cumbersome a method of handling the matter. The commander cannot possibly give his personal attention to the question of whether or not message number 506 was properly encoded. He therefore refers the letter to some overworked staff officer, usually an inspector general, who files it awaiting a favorable opportunity to make the investigation. When the turn of this letter is finally reached it is found that the responsible officer perhaps has been transferred or is sick or can find no record of the message and does not remember of it having been sent out. In the few cases where connection is actually made with the responsible officer the whole matter is so old that it has lost its interest. Under our system of control it has been everybody's business to carry out instruction in reference to use of code. The natural result has been that it has been nobody's business, and in trying to check up and eliminate faults we have found great willingness and ability to refer us to someone else. Some doubts probably as to exactly which one of several persons, but certain to someone else. This is the natural result of our system.

I have recommended an officer at each headquarters from the company up who shall be definitely responsible for this service. When faults occur it will be his business to know by whom they were committed and to take steps to prevent a repetition. When faults are noted by officers at higher headquarters, it should then only be necessary to inform the responsible officer and direct him to call on the offender for an immediate accounting. The result will be that when an officer decides to save time by disregarding some of those "exasperating and useless" instructions from General Headquarters, he will be called on for an explanation before he has had time either to forget or get transferred, sick, or wounded. The case being fresh will seem more important. Finally, the designation of a particular officer at each headquarters who is definitely responsible for this service will insure at least one officer familiar with instruction to whom the others can go for advice or explanations.

It is interesting to observe that it took 20 years for this recommendation to be put into practice, for it was only in 1938 that the War Department directed that at each headquarters a security officer be designated to insure the observance of the rules of cryptographic security.

In connection with this matter of security it is interesting to add some remarks from Colonel Moorman's report:

Codes were almost unknown in our own Army. The importance of care in their use so as to maintain their secrecy and avoid giving information to the enemy was entirely unappreciated. Previous to, and during the St. Mihiel and Argonne-Meuse Battles, a great amount of valuable information was furnished the enemy through carelessness of our own officers and men in the use of code.

The following indorsement will illustrate the effort made from this office to insure care in the use of code. The fact that such efforts were largely unsuccessful was due to the almost total ignorance of officers in the matter of code and the difficulty of exercising control through commanders, who had neither the time nor the special knowledge required for the purpose.

*3d Ind.*

Adjutant General, AEF, September 17, 1918.—To: Commanding General, First Army.

1. Returned.
2. Steps will be taken to learn who was responsible for the misuse of code, brought to your attention in attached letter of September 7.
3. Since the organization of the First Army, the First Army radio stations and telephone operators have furnished information of vital importance to the enemy, in regard to your battle order, the organization of your divisions, the location and form of training of divisions in reserve, the location of heavy artillery and tanks while preparing for the attack, and the date the attack was to take place,

as nearly as it could be ascertained by the telephone operators. Your attention has been called, by letter, to many cases of criminal carelessness in the use of our code and the transmission of messages in clear, or in a mixture of code and clear. Even messages entirely in code have, in general, been so carelessly prepared that the enemy will have no difficulty in solving the code.

4. You are directed to conduct a rigid investigation in all cases of reported misuse of code, to take necessary steps to correct such misuse, and to bring to trial officers who wilfully violate existing orders and instructions printed in the code book.

By command of General Pershing:

ROBERT C. DAVIS,  
*Adjutant General.*

The remedy is thought to be the systematic instruction of our officers in time of peace and the placing of representatives of this section at all company and higher headquarters in time of war.

Small tactical code books should be prepared and frequently revised and republished. They should actually be used by student officers at the staff and line schools.

In the extracts quoted above, taken from the Moorman report, it will have been noted that the writing of letters calling attention to violations of the rules for the handling of codes was the course adopted by him in an attempt to produce an amelioration in the conditions to which he refers. But it is apparent that Colonel Moorman ended his labors with the opinion that this method was far from effective. Today, with a much more thorough indoctrination of all services with respect to the importance of communication security, letter writing is a rather effective means of control so far as concerns our Regular Army administrative headquarters, but one may speculate upon the situation that would obtain in time of war, with multitudinous tactical units constituted hurriedly from semitrained and untrained troops. Hence, despite Colonel Moorman's low opinion of "letter-writing" as a method of control the writer deems it interesting to call attention to several examples of actual cases taken from the World War records. These have been selected from a number of cases and are shown in appendix 22. They make extremely interesting reading even today.

A final word or two must be said of certain parts of the foregoing extracts from Colonel Moorman's report, which may throw some light upon the source of the greatly exaggerated statements cited on pages 11-12 of this paper, as taken from Yardley's book. Could it be that the third indorsement quoted above came to Yardley's attention and that this is what led him astray? It most assuredly seems that way. Note the parallelism in the sequence as regards the kind of information disclosed: The battle order, organization of divisions, and date the attack was to take place. But note the qualifying phrase in the indorsement, as regards the date the attack was to take place. It is distinctly stated "as nearly as it could be ascertained by the telephone operators." Hence, here was a matter not of a poor code, but of poor telephone security! And, of course, it has already been proved that this had nothing to do with the code messages "solved" by the "young officer" referred to by Yardley.

As a matter of fact it can be stated that if Yardley had obtained his information at first hand he would not have been misled as he was by a single, somewhat ambiguous statement made probably for emphasis in the third indorsement quoted on page 25. After a very careful study of all the facts pertinent to the case the writer is able to throw some further light upon the situation, which to some extent will serve to remove a bit of the blame that falls upon Yardley's shoulders for his unwarranted exaggerations concerning the AEF codes. For it turns out that Yardley learned of two "episodes" and by combining them through his ignorance of the facts produced a single, very confused picture.

The first "episode," if it may so be termed, was the one in which Lieutenant Childs figured so prominently, as detailed on pp. 12-13 of this paper. It has been proved conclusively that what Childs did was merely to reconstruct a single mixed alphabet used to encipher the code groups of a series of test messages, he having been given a copy of the code involved.

The second "episode"—really a series of episodes—concerned itself with the studies made by a young officer of the Security Section, G-2 A6, the Section which was entrusted with the work of studying our own radio traffic and supervising telephone lines with a view to picking up infractions of the rules established for safeguarding our communications.

From correspondence exchanged between the writer and Yardley in 1931 (see appendix 16), it is clear that the latter was present at a lecture delivered to the officers of the Military Intelligence Division, General Staff, in Washington, on February 13, 1920, by Lt. Col. Frank Moorman. The writer was fortunate in finding a copy of the stenographic report of this lecture, from which the following is a verbatim quotation (the entire report is given in appendix 23):

Last is our control over our own radio communications and that was an important point that we overlooked at first. It was difficult to get those in authority to see the importance of it for a time. We installed several stations to copy the American messages and send them in to our headquarters to be turned over to a man who knew nothing about the battle order or plans. He solved our code, located the divisions, prepared the American battle order and notified the Assistant Chief of Staff that an attack was to take place. He missed the hour of attack by 24 hours. It was the mistake of the Signal Corps man who sent the message, he stating that the attack was to take place the next morning, when it wasn't to take place until the morning after. When we realized what our men had worked out from these messages, every one of which could be copied by the Germans, it gave an impetus to plans for the control of our own service.

It is unfortunate that Colonel Moorman was not more specific in the foregoing statements for he unintentionally misled Yardley and some of his other listeners, for there never was such a single episode as he describes in which an officer solved our code *and as a direct result* "located the divisions, prepared the American battle order and notified the Assistant Chief of Staff that an attack was to take place." This officer, it is true, did solve a few code groups now and then and *occasionally obtained data regarding the American battle order, but data concerning an impending attack were obtained by listening in on telephone conversations.* In any case, it must be emphasized, it was not the code itself which was at fault, but the personnel who used the code. And had Yardley been better informed about the true situation in this respect he never could have drawn the erroneous conclusions which he did draw from Colonel Moorman's lecture, nor could he have been misled by Colonel Moorman's highly generalized statements given in a more or less casual manner, and probably spoken extemporaneously.<sup>13</sup>

### 13. CONCLUDING REMARKS

The author would like to bring this paper to a close by quoting again from Major Barnes' report:

Throughout a large part of the Army a great deal of criticism was from time to time directed toward the Trench Codes, most of it destructive rather than constructive. This was natural, perhaps, in view of the extremely limited knowledge of codes and ciphers.

The G-2 section sent out a circular letter inviting criticism and requesting suggestions looking to improvement. In the main these suggestions were words and phrases to meet certain local conditions to be added to the vocabulary. Whenever these additions seemed broad enough to cover more than a local need they were added, oftentimes words or phrases being removed to make room for them. It must be borne in mind that the phraseology of war changes very rapidly and words and phrases quickly become obsolete. As an instance "rolling barrage" lived its day and passed out to make way for another phrase of the moment.

Another suggestion, or criticism, frequently made, was a comparison with the French and British code systems. This usually was made by troops who were or had been serving with those forces. The French used groups of three numbers each and were limited therefore to 999, whereas the American codes had nearly twice that number.

Frequent requests were made to provide both letters and numbers for code groups but the peculiar construction of the American codes rendered this impracticable. However, to cover this need the pronouncing alphabet was printed in the instructions in each code book. A study of this would have made the transmission of code groups over the telephone simple and accurate, and it was to obtain this accuracy that numbers were desired.

<sup>13</sup> See appendix 23.

The question of the relative values of letters and numbers for telegraphic transmission was made the subject of an exhaustive study. A large number of telegraph operators, radio operators, code men, and the two most experienced superior officer code experts were consulted. The result was inconclusive inasmuch as opinion was almost equally divided even in each of the various classes.

So far as the actual coding of messages is concerned, I personally prefer numbers for the reason that the combination "2632" is clearer in my mind than the combination "ABZQ," for example.

To return to criticism, it should be said that every effort was made both by circular and by personal solicitation to obtain constructive criticism. Starting as the Section did from absolute zero it was realized that all possible assistance should be sought from the actual users of codes in the field with a view to affording them the maximum assistance. So well in fact was the criticism received that each issue of the Trench Codes was different from its predecessor in material content and in construction; clearness, rapidity in operation, scope and ease of operation being constantly borne in mind. This is illustrated in one comparatively insignificant item by the constant diminution in size of the book itself to meet the wish for a more convenient volume to handle.

Further criticism was invited from the British code experts who first were given a number of messages in the new Trench Code and requested to "break them down" and then requested to point out faulty construction. Later, these same experts were furnished with a copy of the book and further suggestion as to faults was requested and given.

Major Hay, of the British General Staff, after exhaustive study, replied to Major Moorman of G-2:

We have not been able to solve them or even to get any light. The security appears of a high order.

In his report he analyzes his views on the probable construction of the code and adds:

I am of the opinion that this code when used with care could not be read by the enemy until he had collected a very large amount of material. \* \* \* Under favorable conditions this code would be safe for at least 2 months \* \* \* but it would be advisable to make a more frequent change. \* \* \*

This is interesting in view of the established principle of changing every 10 days.

The conclusions drawn by the British experts are not always favorable, although but few criticisms occur, but their deductions are interesting and for the emphasis which they, as well as the Germans, place upon errors and carelessness the reports are submitted herewith.

At the very time when the greatest number of flattering references to the superiority of the British system of double-cipher were being made that Army had in contemplation a complete reversal of their system and the adoption of the American. They did indeed effect a partial change in plan before the cessation of hostilities. When I informed a British Code expert that our codes could be compiled in 10 days he was completely dumfounded, saying it would take them at least 30. This, I think, was the greatest obstacle they had to overcome in a change of system.

\* \* \* \* \*

In conclusion, I should like to express my appreciation of the valuable service rendered by Col. Parker Hitt of the Signal Corps during this trying period. His broad knowledge of codes in general, his intimate knowledge of the Army and the General Staff, his unflagging industry added to a never-failing courtesy even under tremendous pressure of work, made my task far lighter in consequence. To him more than to any other officer of the American Army is due whatever success the American Codes may have obtained.

The accomplishments of the Code Compilation Section, AEF, are succinctly summarized in the Annual Report of the Chief Signal Officer for 1919 (p. 536). A copy thereof will be found in appendix 24.

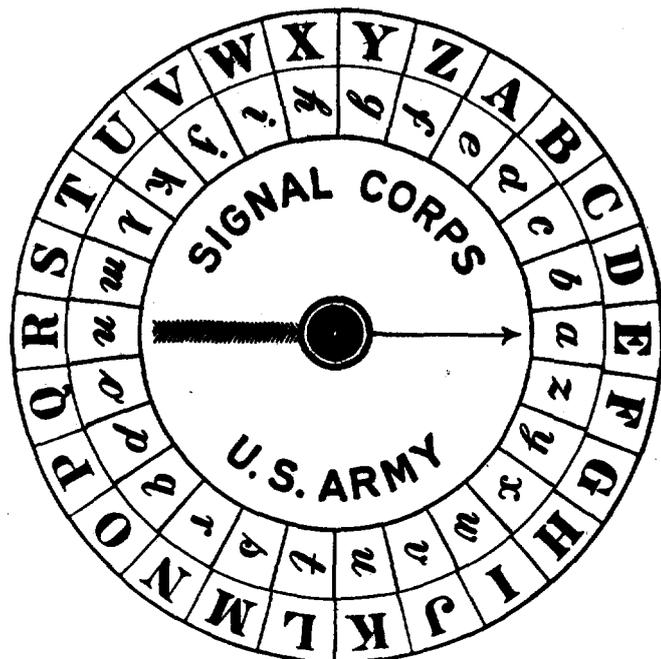
When the difficulties that confronted the Code Compilation Section, AEF, at its establishment are observed in retrospect, and its achievements are measured even by 1940 standards, the present author is of the opinion that one can apply to the work done by this service the salutation so welcome to military personnel: "Well done!"

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\*All appendices except those marked by asterisk are photolithographic reproductions of the originals.

## Appendix I.—THE OBSOLETE U. S. ARMY CIPHER DISK



To encipher a message, the key letter or the first letter of the key word or phrase is set opposite "a." Let us assume it to be "E." The cipher letters to be written are those opposite the text letter when "a" on the circle is set opposite "E" on the card. For example, "send powder" would be written "MARBPQIBAN." To use a key word or phrase, each letter is used in turn to encipher one letter only. When the last letter of the key word is used, repeat until all letters of the message are enciphered. Numbers when enciphered with the disk must be spelled out.

## Appendix 2.—A. E. F. INSTRUCTIONS FOR USING THE CIPHER DISK AND THE PLAYFAIR CIPHER

ARMY SIGNAL SCHOOL  
AMERICAN EXPEDITIONARY FORCES  
FRANCE

VISUAL AND TACTICAL DEPARTMENT  
CODES AND CIPHERS

A code is a table of letters, words, or phrases, to every one of which a definite meaning has been assigned. For example:

Plank—Enemy troops in .....  
Plant—Enemy troops progressing in .....  
Plantain—Enemy troops stopped while progressing in .....  
Plantation—Enemy troops retreating in .....  
Planter—Enemy troops stopped while retreating .....

Generally speaking, a cipher is one or the other of the following classes:

- 1st—Transposition cipher.
- 2nd—Substitution cipher.

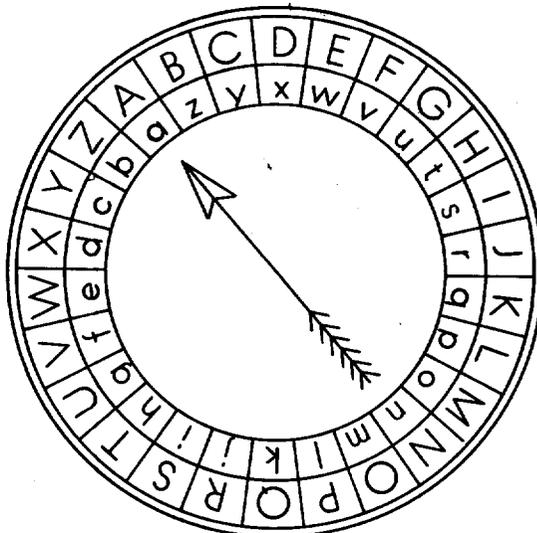
Transposition ciphers are limited to the characters of the original text. These characters are rearranged according to some predetermined plan or key.

Substitution ciphers may be made up of substituted letters, numerals, conventional signs, or combinations of all three, for the letters of the plain text.

If the text is in English, and the cipher is a transposition cipher, a count of the number of letters in the message will show that the vowels AEIOU constitute 40 percent of the whole; consonants LMRST 30 percent, and the consonants JKQXZ, 2 percent. If these proportions do not hold within 5 percent either way, the cipher is undoubtedly a substitution cipher.

By use of a cipher, important messages may be sent with a degree of secrecy. While it is well known that, to date, no practicable military cipher has been devised that is mathematically indecipherable, most military information rapidly loses its value, and it is for this reason that we encipher dispatches, thus hoping to delay the deciphering of the message by the enemy sufficiently for it to have lost its value.

The United States Army cipher disk consists of two plates of celluloid, on the larger of which a fixed alphabet is printed in a circle about the smaller circular plate, pivoted at the center, so that it may be rotated. Around the outer edge of the movable plate the alphabet is also printed, but in reverse order. Coincidence of any letter on the disk with that of any letter on the fixed plate is obtained by rotating the disk.





**Appendix 3.—USE OF PLAYFAIR SYSTEM FOR SECRET COMMUNICATION IN AEF**

~~SECRET~~

GENERAL HEADQUARTERS, AMERICAN EXPEDITIONARY FORCES.

France, August 22, 1918.

~~SECRET~~

30

MEMORANDUM:

Key words for use with Playfair Cipher, under the provisions of General Orders, No. 103, these headquarters, 26 June 1918, are announced, as follows:

From 3:00 a.m.	1 Sept.	to 3:00 a.m.	3 Sept.	....	YARMOUTH
" "	"	3 Sept.	" "	"	10 Sept. .... BOSTON
" "	"	10 Sept.	" "	"	15 Sept. .... ZODIAC
" "	"	15 Sept.	" "	"	18 Sept. .... MADAGASCAR
" "	"	18 Sept.	" "	"	24 Sept. .... CARANZA
" "	"	24 Sept.	" "	"	27 Sept. .... MAGAZINE
" "	"	27 Sept.	"	further notice	.... SUWANEE

Commanders of lower units will be furnished "extracts" by division commanders as required.

In no case will the complete list be taken in advance of division headquarters.

Any suspicion that list has fallen into unauthorized hands will be reported by telegraph to these headquarters. Its use will be continued until receipt of new list.

Receipt of this list will be acknowledged by mail, giving number of copies received and condition of package on receipt.

Attention is invited to G.O. 103, these headquarters 1918, prescribing use of Playfair Cipher only in case of emergency.

By command of General Pershing:

ROBERT C. DAVIS,

Adjutant General.

## Distribution:

- 1 Copy to Adjutant General's Code Office.
- 1 Copy to each Army, Army Corps and Division.

Appendix 4.—A FEW PAGES FROM ONE OF THE EARLY FRENCH CODES: CARNET RÉDUIT "OLIVE"



		PHRASES TOUTES FAITES			
QZD	longueur d'ondes			VBB	patrouille rentrée
RAP	masque			VBD	patrouille sortie
RAT	matin			VKK	patrouille va sortir
RAZ	mauvais (mal)	SNV	abritez tout le monde sauf les guetteurs	VKS	placez (ou complétez) la chaîne des coureurs
RCK	médecin	SOP	alerte	VSE	première ligne passe par
RCN	minenwerfer	SOV	alerte aux gaz	VSK	préparation d'artillerie paraît suffisante
RCP	nuit	TAR	attaque dans conditions convenues	VTA	préparation d'artillerie paraît insuffisante
RDB	observation	TAT	attaque ennemie paraît avoir échoué	VTT	quel est le secteur bom- barde ?
RDE	observatoire	TAV	attaque partie	VTU	que se passe-t-il sur vo re front? (ou vers)
REE	occupation	TBK	avez-vous besoin de	YAA	relève aura lieu
REL	officier	TBY	char d'assaut ami	YAD	relève n'aura pas lieu
REN	opération	TGF	char d'assaut ennemi	YAT	relève commencée
SAR	ordre	TBI	combat à la grenade en	YBI	relève en cours
SBS	outils	TEG	compte-rendu écrit va être envoyé	YCC	relève terminée
SCK	pertes	TEK	donnez moi des rensei- gnements (sur)	YCE	renforts ennemis arri- vent par
SCT	pigeon voyageur	TEN	en panne	YCF	rien à signaler
SDE	piquet de terre	TER	front actuel passe par	YDE	situation rétablie
SDI	possible	TGE	indices d'attaque enne- mie en	YGG	surveillez attentivement
SDR	poste d'écoute	TGP	infanterie ennemie at- taque	YHA	suspendez l'exécution de l'opération
SET	poste émetteur de T. P. S.	THI	infanterie ennemie a at- teint		
SFI	poste récepteur de T. P. S.	THS	infanterie ennemie pro- gresse dans boyaux		
SFO	poste mixte de T. P. S.	THV	infanterie ennemie se replie		
SFY	poste émetteur de T. S. F.	UAA	je n'ai pas de renseigne- ments sur		
SGT	poste récepteur de T. S. F.	UAR	je vous envoie matériel demandé		
SGK	poste optique	UAV	liaison assurée avec		
SGS	prisonnier	UBJ	n'envoyez plus de mes- sages chiffrés		
SHO	régiment	UBK	nous avons évacué		
SHP	relève	UCO	nous avons occupé		
SHQ	réponse	UDV	nous avons réoccupé		
SHS	réseau	UDZ	nous nous replions (sur)		
SH	réserve	CFI	nous occupons sûrement		
SIO	signaleur de 14 c/m.	CFI	nous paraissions occuper		
SIP	signaleur de 24 c/m.	UGB	nous progressons vers		
SKO	situation	UGD	nous sommes arrêtés en		
SKV	soir	UHI	objectif atteint		
SLY	sous-officier	VAB	objectif non atteint		
SLZ	tableau à 4 directions	VAK	ordre en voie d'exécu- tion		
SMM	tableau à 12 directions	VAL	où passe la première ligne ?		
SNO	torpille	VAT	pas de liaison avec		
SMT	troupe				
SMY	tube ou lampe à vide				
SNF	tué				
SNG	urgent				
SNL	vivres				





Appendix 5.—A FEW PAGES FROM THE FRENCH CARNET RÉDUIT "URBAIN"

N°

NOM DE CE CARNET

**URBAIN**

U. U. U.

**SECRET**

# Carnet Réduit

*L'Autorité à laquelle est délivré ce Carnet en reste **propriétaire**, tant qu'elle demeure sur le territoire de l'Armée, qu'elle soit en secteur ou au repos.*

**Elle en est responsable.**

*Elle doit le restituer à l'autorité qui le lui a remis lorsqu'un nouveau Carnet est mis en service ou lorsqu'elle quitte le territoire de l'Armée.*

**REMARQUE IMPORTANTE :** *Ne pas oublier de parcourir ce Carnet avec grand soin dès que vous l'aurez reçu.*

VIII<sup>e</sup> ARMÉE  
 —  
 3<sup>e</sup> BUREAU  
 ET  
 = CHIFFRE =  
 ↻

**SECRET**

# CARNET RÉDUIT

NOM  
 DU PRÉSENT CARNET :

**URBAIN - U. U. U.**

Ce document est **secret**.

Le brûler s'il est en danger d'être pris.

S'il vient à disparaître, en aviser **immédiatement** l'Autorité Supérieure.

Il doit toujours être en la possession de celui qui, **même momentanément**, commande l'unité pour les besoins de laquelle l'autorité supérieure l'a établi.

Ex. : Un Officier partant en permission, etc..., devra le remettre à son remplaçant provisoire.

## CHIFFREMENT

### 1<sup>re</sup> PARTIE DU CARNET

Les messages doivent être remis chiffrés au Personnel chargé de leur transmission.

**Toujours chiffrer plusieurs mots successifs.** - Relire ensuite le message et s'assurer que les mots restés en clair ne font pas deviner la signification des passages chiffrés. - **Quand c'est possible, mieux vaut tout chiffrer.**

*Voici les procédés à employer pour chiffrer correctement les différents messages que le Commandement peut avoir à transmettre :*

#### 1<sup>o</sup> MESSAGE TÉLÉPHONÉ

Le commencer par le nom du carnet en clair :

**AVEC LE PRÉSENT CARNET CE SERA: URBAIN**

Puis substituer à chaque lettre, mot ou phrase que l'on veut chiffrer le **groupe de 3 chiffres** placé en regard dans le tableau de chiffrement.

**2° MESSAGE par T. S. F., T. P. S., OPTIQUE, etc.**

Le commencer par la lettre initiale du nom du carnet répétée 3 fois :

**AVEC LE PRÉSENT CARNET CE SERA: U. U. U.**

Puis substituer à chaque lettre, mot ou phrase que l'on veut chiffrer le groupe de 3 lettres placé en regard dans le tableau de chiffrement.

**3° MESSAGE par P. V.**

Utiliser dans toutes leurs prescriptions l'un ou l'autre de ces deux procédés, mais dans un même message, ne jamais mélanger de groupes de 3 chiffres à des groupes de 3 lettres.

**DÉCHIFFREMENT 2° PARTIE DU CARNET**

Les groupes de 3 lettres ou de 3 chiffres sont classés par ordre alphabétique ou numérique. Les recherches sont donc faciles.

**Le déchiffrement est fait par l'Autorité destinataire.**

Les erreurs, toujours possibles, ne portent généralement que sur un chiffre ou sur une lettre. On trouvera facilement le groupe exact en remplaçant successivement chacun des trois caractères par les autres caractères employés, chiffres ou lettres.

Exemple : on a reçu le groupe 124 au lieu de 127. En remplaçant le 4 par 1, 2, 3, 5..... 9, on aura nécessairement rencontré 127, qui donne le sens voulu.

Aux éléments qui, du fait de leur mission, sont particulièrement exposés (tels que les unités prenant part à un coup de main, les chars d'assaut ou les avions munis d'un poste récepteur de T. S. F., etc.), il est **rigoureusement prescrit de ne confier qu'un extrait du présent carnet. L'Autorité qui doit correspondre avec les dits éléments déterminera, dans chaque cas particulier, la composition de cet extrait.**

**N'oubliez jamais que l'ennemi vous écoute**

- 3 -

## TABLEAU DE CHIFFREMENT

ALPHABET			NOMBRES		
DQA	162	A.	MYU	554	0 ou nul.
BJG	059	A.	JGZ	340	1 ou premier.
JDF	326	B.	PFT	677	2
KUM	420	C.	LPX	473	3
NWB	597	D.	BKO	001	4
RGA	835	E.	EXM	192	5
VDY	207	E.	NFJ	565	6
'AF	667	E.	OJL	626	7
RWQ	863	F.	QMU	790	8
MRB	543	G.	RQG	855	9
JWP	368	H.	FKC	219	10
FSZ	228	I.	AGR	012	11
BYK	093	I.	IYA	313	12
KEV	387	J.	MUR	546	13
QBN	746	K.	QXI	811	14
OVK	653	L.	MFR	514	15
PMC	707	M.	FKH	212	16
LUB	484	N.	DFG	139	17
AQU	026	N.	CLN	111	18
HAP	298	O.	FZK	239	19
NAB	558	P.	KNO	406	20
CMR	112	Q.	XXP	508	30
DXA	180	R.	PNY	710	40
OAU	607	S.	QAL	742	50
QVL	808	T.	NOR	582	60
SPY	872	U.	DPV	161	70
GUB	279	V.	AUQ	030	80
AXG	036	W.	BSO	076	90
POR	715	X.	GLB	267	100
FAB	196	Y.	BZD	094	1000
HZK	306	Z.	JLR	353	....ième.
			QFK	759	....ième.
LEF	447	à.	LFQ	449	leur.
PTV	728	à la.	FBW	200	leurs.
BDK	047	au.	AKX	016	ma.
DCM	136	aux.	DVQ	173	mon.
KRD	417	de.	CPD	115	mes.
QLB	786	de la.	MJW	525	nos.
FUA	231	des.	NSC	501	notre.
CJL	108	du.	QRV	798	vos.
KLF	400	et.	KYN	428	votre.
PJU	697	la.	DZJ	186	nous.
MDQ	509	le.	BGV	052	vous.
GBF	242	les.	NJX	572	il (s).
HXA	304	lui.	PXN	737	pour.

		<b>VERBES et quelques Substantifs dérivés de ces Verbes</b>		
GJY	262	Abandonner ou Abandon.	WRZ	928 Réduire.
EPX	189	Accepter.	BWL	086 Revenir.
CBP	097	Achever.	FWR	233 Repousser.
LIP	456	Adresser.	KUB	418 Résister ou Résistance.
NKP	573	Ajourner.	PQD	716 Rétablir.
ZIP	396	Aller.	ZTV	991 Réussir.
PVA	730	Apercevoir.	LXK	492 Sortir.
RUN	859	Appuyer.	ONP	634 Surprendre ou Surprise.
DLZ	151	Arrêter ou Arrêt.	JMA	356 Téléphoner ou Téléphone.
BYN	085	Atteindre.	CQA	117 Trouver.
MAZ	499	Attendre ou Attente.	RNP	850 Utiliser ou Utilisation.
ÖDK	614	Avancer ou Avance.	RAL	821 Voir.
FIP	214	Avoir.	UAR	885 Faut-il.
IBM	307	Bombarder.	ZFL	975 Transmettre.
GPL	271	Cesser.		
ADF	006	Commencer.		<b>Temps de Verbes</b>
MUW	548	Compléter.	PKN	699 Présent.
LSY	480	Conduire.	KOX	441 Passé.
QOP	795	Conservier.	BPF	069 Futur.
RWZ	864	Continuer.	MZD	556 Impératif.
AZM	040	Déborder.		
UZR	900	Déboucher.		<b>MESURES</b>
WZP	934	Décider.	NZC	955 Coordonnées.
JEP	331	Demander.	ACP	004 Demi.
FKQ	220	Détruire ou Destruction.	QHR	768 Grand, important.
BLC	062	Diriger ou Direction.	LAX	436 Heure.
NGK	569	Echouer.	VWD	916 Jour.
FMK	225	Entendre.	TPA	876 Kilomètre.
QSD	799	Envoyer.	RHM	840 Minute.
TZU	884	Etre.	GFM	254 Mètre.
GLK	269	Exécuter ou Exécution.	MVK	549 Petit, faible.
AYN	037	Faire.	DNY	155 Quart.
WDF	920	Faire connaître.		
PGH	685	Guider ou Guide.	QCX	748 <b>ORIENTATION</b>
KAM	373	Laisser.	VFI	904 à.
UFC	889	Manquer ou Manquant.	XQR	944 Allant vers.
CRA	118	Mettre.	RBX	823 Au centre.
PDV	673	Occuper ou Occupation.	LMX	461 Dans.
UPA	804	Opposer ou Opposition.	ALC	018 Derrière.
ZLO	987	Ordonner.	JAG	317 En arrière (de).
PCN	669	Organiser ou Organisation.	YMS	963 Devant.
VNP	909	Paraître.	PRS	718 En avant (de).
LGH	452	Placer ou Place.	OGV	621 Direction (de).
AFQ	010	Préparer ou Préparation.	GNJ	287 (à) Droite.
LWD	489	Recevoir.	ZKN	983 Est.



## TABLEAU DE DÉCHIFFREMENT

ABJ	003	Attaque ennemie paraît avoir échoué.	GBP	097	Achever.
ACP	004	Demi.	CDK	099	Tir trop à droite.
ADF	006	Commencer.	GFA	101	Canal.
AEV	009	Contre-attaque.	CGU	102	Barrage.
AFQ	010	Préparer ou Préparation.	CIX	105	Bon, bonne.
AGR	012	11.	GIL	108	Du.
B	013	Mortier de 75.	CKS	109	B. C. P.
AKX	016	Ma.	GLN	111	18.
ALC	018	Derrière.	GMR	112	Q.
AMD	021	Nuit.	GPD	115	Mes.
AOY	022	Entrée.	CQA	117	Trouver.
APK	023	Renfort.	GRA	118	Mettre.
AQU	026	N.	CSQ	119	Demandons.
ARC	029	Tir d'interdiction.	CUM	122	Carrefour.
AUQ	030	80.	CXH	123	Commandant.
AVJ	034	Fusée (s) fusante (s).	CWJ	125	Prière de vérifier ou de faire vérifier le chiffre-ment du télégramme No
AWO	035	Secteur.	CXG	127	Abritez tout le monde sauf les guetteurs.
ANG	036	W.	CYK	128	Nord.
AYN	037	Faire.	CZO	131	Abatis.
AZM	040	Déborder.	DAK	132	Tir de surprise (sur...)
BAJ	043	Artillerie de campagne.	DBU	133	Fusil.
BCF	044	Antenne.	DCM	136	Aux.
BDK	047	Au.	DFG	139	17.
BEZ	048	I. D. ou Brigade.	DGW	140	Coup de main.
BFL	049	Réseau.	DHJ	144	Crête.
BGV	052	Vous.	DKP	146	Char d'assaut ennemi.
BHA	053	Obus lacrymogènes.	DEA	150	Division.
BIZ	057	Artifices.	DLZ	151	Arrêter ou arrêt.
BJG	059	A.	DMR	152	Relève ou relever.
BKO	061	4.	DNY	155	Quart.
BLC	062	Diriger.	DOF	158	Alerte.
BMN	064	Relève aura lieu.	DPV	161	70.
BOR	068	Nettoyeurs.	DQA	162	A.
BPF	069	Futur.	DRY	167	Grenade.
BQY	072	Régiment.	DSW	169	Artillerie ennemie tire (sur)
BRZ	073	Attaque partie.	DTX	170	Attention.
BSO	076	90.	DUK	171	Impossible augmenter énergie.
BTV	077	Soutien.	DVQ	173	Mon.
BUA	082	Artillerie.	DVW	175	Nous progressons (vers..)
BVN	085	Atteindre.	DWB	178	Tir sur artillerie (en...)
BWL	086	Rentrer.	DXA	180	R.
BXG	089	Rivière, ruisseau.	DXL	182	Nombre, nombreux.
BXW	091	Vague.	DYF	183	Matin.
BYK	093	I.			
BZD	094	1000.			
CAW	096	Contre-chars d'assaut.			

**Appendix 6.—EXTRACTS FROM A TWO-PART FRENCH FIELD CODE OF APPROXIMATELY 2,300  
GROUPS**

SECRET

EXEMPLAIRE

N° ~~1023~~

*Tout militaire qui reçoit ou qui trouve ce Code  
est prié de lire les recommandations importantes  
figurant à la page V des Instructions.*

# CODE CHIFFRÉ

## SÉRIE 65

**Veillez sur ce Code.**

**Tâchez de le brûler s'il court le risque d'être pris.**

MINISTÈRE  
DE LA GUERRE.

CABINET  
DU MINISTRE.

SECTION DU CHIFFRE.

SECRET  
→←

## INSTRUCTION

### SUR L'EMPLOI

### DU CODE CHIFFRÉ.

Chaque mot ou expression se chiffre par un groupe de quatre chiffres.

*Exemples :* **SOIXANTE** se chiffre par **9518** ;  
**TERRAIN** se chiffre par **3739**.

Si un mot se présente plusieurs fois, on le chiffre chaque fois différemment, soit en utilisant successivement les groupes placés en regard dans la table de chiffrement, soit en le décomposant au moyen de radicaux.

*Exemples :* **PATROUILLE** peut se chiffrer par **8749, 6884, 7311**.

ou : **PA TR OU ILLE.**  
**4620 7663 8817 0773**

Il est expressément interdit de laisser, dans un même message, des parties en clair et des parties chiffrées.

Un message téléphoné, ou transmis par T. P. S., T. S. F. ou par télégraphie optique, doit être entièrement chiffré.

*Exceptionnellement*, si on n'a pas le temps de le chiffrer entièrement, on le transmettra en clair.

Tous les messages transmis par T. S. F. et aussi tout autre message particulièrement secret ou important doivent subir un **DOUBLE CHIFFREMENT** fait au moyen du tableau de concordance joint au Code.

— v —

Pour le double chiffrement, substituer un bigramme de lettres, au premier chiffre du premier groupe, et continuer à constituer un bigramme de lettres à toutes les tranches de deux chiffres qui suivent :

Exemple : 0|75|0    8|75|0    8|39|9    2|73|7.

Les groupes de quatre chiffres se trouvent ainsi enchaînés dans les bigrammes de substitution.

Faire emploi des groupes nuls qui sont à la fin des radicaux pour commencer ou finir les télégrammes, pour encadrer les noms propres syllabés, pour indiquer une séparation de mots syllabés, etc.

Utiliser, le plus possible, les phrases toutes faites.

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#### RECOMMANDATIONS IMPORTANTES.

**Ce Code doit être l'objet d'une surveillance constante.**

**Éviter de l'emporter dans les missions dangereuses.**

**Le détruire, sans hésitation, s'il est en danger d'être pris.**

**Si un Code a disparu, en aviser l'autorité supérieure.**



3213	sept.	8648	quarante et un.
4269		3639	deux.
8650	huit.	9500	trois.
6618		5099	quatre.
4079		1949	cinq.
0250	neuf.	7259	six.
3391		2120	sept.
9049		0077	huit.
5514	dix.	8761	neuf.
4594		3512	cinquante.
1261	onze.	4442	et un.
9950		2936	deux.
7505	douze.	9131	trois.
1356		1549	quatre.
7649	treize.	3950	cinq.
6129		3219	six.
2206	quatorze.	9420	sept.
8573		0049	huit.
6071	quinze.	3862	neuf.
9216		9518	soixante.
0838	seize.	4971	et un.
8986		2579	deux.
3759	dix-sept.	5542	trois.
5222		4314	quatre.
8812	dix-huit.	5800	cinq.
1684		8385	six.
0516	dix-neuf.	6290	sept.
2341		1145	huit.
4114	vingt.	8328	neuf.
4876		0596	soixante dix.
8348	vingt et un.	2113	et onze.
5028	deux.	6636	douze.
7032	trois.	4957	treize.
3560	quatre.	5579	quatorze.
5376	cinq.	1607	quinze.
8407	six.	0000	seize.
6033	sept.	7765	dix-sept.
9580	huit.	3204	dix-huit.
6356	neuf.	6760	dix-neuf.
4122	trente.	1750	quatre-vingts.
7330	et un.	7617	un.
5681	deux.	5860	deux.
9281	trois.	7700	trois.
3236	quatre.	8617	quatre.
2010	cinq.	0667	cinq.
4509	six.	9741	six.
7892	sept.	5668	sept.
2235	huit.	3569	huit.
6565	neuf.	9044	neuf.
4228	quarante.	1250	quatre-vingt-dix.

- 4. -

4212	quatre-vingt-onze.	9031	heure 1/4.
8950	quatre-vingt-douze.	1369	heure 1/4.
2761	quatre-vingt-treize.	6278	heure 1/2.
6829	quatre-vingt-quatorze.	8083	heure 1/2.
7776	quatre-vingt-quinze.	7519	heure 3/4.
8350	quatre-vingt-seize.	2567	heure 3/4.
2319	quatre-vingt-dix-sept.	3823	heure H.
3414	quatre-vingt-dix-huit.	6668	heure II.
6963	quatre-vingt-dix-neuf.	8144	heure H.
4011	cent.	4999	janvier.
2380	—	6500	février.
5399	—	7093	mars.
3831	—	8899	avril.
2023	deux cents.	9949	mai.
1280	—	0265	juin.
1209	trois cents.	3047	juillet.
0632	quatre cents.	7245	août.
4574	cinq cents.	9864	septembre.
0383	mille.	8970	octobre.
5188	dix mille.	6923	novembre.
1971	vingt mille.	9141	décembre.
7222	quatre-vingt mille.	1193	lundi.
9750	deux cent mille.	1778	mardi.
8983	premier.	5012	mercredi.
4037	première.	7871	jeudi.
0570	ième.	9608	vendredi.
9842	ieme.	9689	samedi.
5123	ieme.	1992	dimanche.
7141	ième.	2637	1915.
		7049	1916.
		0500	1917.
		8239	1918.
		2950	1919.
		3800	1920.

## DIVISIONS DU TEMPS.

6522 | heure.  
0700 | heure.

## RADICAUX.

1412	A.	5250	ablement.	8050	af.
6548	—	0757	ac.	2483	ag.
0370	—	9053	ache.	3733	age.
4612	—	8877	act.	6094	agi.
5280	ab.	2750	action.	1030	ai.
1923	able.	9066	ad.	7689	aie.

- 5 -

3077	aient.	7228	ber.	7283	cle.
8856	air.	5878	berg.	5656	co.
5233	aire.	2249	bi.	5155	com.
2832	ais.	4245	bien.	1362	comb.
1760	aison.	6234	bil.	6486	comp.
6729	ait.	7679	bl.	8475	con.
0039	aite.	1003	bla.	7190	cons.
4374	al.	0031	ble.	6373	consi.
2174	alt.	8724	blement.	3612	contre.
0917	ale.	4700	bo.	6882	cor.
4182	alement.	7750	bon.	8110	cou.
0555	am.	1733	bor.	7275	court.
3650	amment.	3686	bou.	5321	cr.
5727	an.	2850	bourg.	2619	cra.
7950	ance.	9545	br.	2150	cre.
5480	ans.	4028	bra.	3312	cro.
6450	ant.	8278	bre.	7605	ct.
1720	ante.	5899	burg.	3127	ction.
9600	anti.	8556	by.	1811	cu.
3335	ap.			4425	cul.
4630	ar.			5132	cur.
2709	art.			4717	cy.
8421	as.	7178	C.		
6600	asse.	5500	—		
8978	at.	9179	—		
1787	ate.	6446	ca.	0374	D.
4100	ateur.	3984	cal.	9999	—
9376	ati.	7980	can.	3520	—
7667	ation.	0978	car.	4918	da.
0865	au.	6889	cas.	9235	dan.
5790	aus.	7004	cat.	5309	dant.
3149	aut.	9015	cation.	6369	dar.
2737	aux.	4839	ce.	3540	dd.
5913	av.	3815	cen.	9968	de.
0950	ave.	8517	ces.	4006	—
3178	ay.	2868	cet.	5220	—
6851	az.	5461	cette.	4172	dec.
		4856	ceux.	5568	del.
		2773	ch.	3279	den.
		1450	cha.	5274	dens.
3029	B.	0357	champ.	0327	dent.
0800	—	6339	char.	8467	der.
9100	—	9964	che.	8515	des.
8999	ba.	1117	cher.	3300	—
4137	bach.	7316	chr.	4778	—
1625	bad.	2958	ci.	0474	deur.
1391	ban.	5527	cie.	7851	deux.
8900	bant.	0058	cien.	0536	di.
2964	bat.	7400	cl.	3854	dis.
6998	be.	4050	cla.	3960	dit.

2.

0707	une.	6378	vice.	3694	X.
9704	uni.	5850	vie.	9152	—
2954	up.	8212	vient.	6737	xe.
8904	ur.	4714	viller.	9009	xel.
5840	ure.	6704	villers.	9270	xer.
3776	ury.	3431	villiers.	8612	xi.
9753	us.	2592	vo.		
8354	ut.	1959	von.		
4615	ux.	1770	vons.		
		0954	vont.	8653	Y.
		2861	vou.	8159	ya.
		2900	vous.	5611	yais.
6661	V.	4367	vr.	7715	yait.
8399	—	2224	vre.	2002	yant.
3302	va.	5265	vri.	6560	ye.
7327	vai.	8263	vu.	0023	yeni.
0508	vais.			5259	yer.
6388	vait			3344	yo.
2290	val.				
7386	vant.	8507	W.		
5828	ve.	7781	—		
7367	veau	5318	wa.	6900	Z.
6400	ven.	2729	wc.	9952	za.
8850	vent.	7772	wei.	3679	ze.
7013	ver.	8979	wo.	9368	zo.
4731	ves.				
9855	vi.				

## GROUPES NULS.

2684	groupe nul.
5450	_____
1437	_____
0532	_____
4471	_____
8989	_____
1643	_____
3700	_____
1961	_____
4308	_____
3868	_____
9338	_____
3259	_____
2914	_____
9831	_____
4758	_____
1665	_____
6533	_____

## VOCABULAIRE.

8112	à.	4215	agricole.
5261	-	7172	aile.
0213	-	1916	ailerons.
7567	à quelle heure.	2561	ainsi que.
6909	A. C.	3718	A. L.
1184	à cause.	8313	A. L. G. P.
6363	à ce.	2621	alerte.
7104	à ce sujet.	6230	allemand.
2194	à cette.	3176	alternateur.
7286	à destination de.	2169	altitude.
5715	à fond.	9811	ambulance.
8510	à l'.	3331	américain.
3792	à la.	4680	ami.
4320	à la date du.	1656	amplificateur.
9307	à la tête de.	8605	ancien.
4688	à l'effectif de.	4769	anglais.
5894	à leur.	5672	angle.
3659	à ma disposition.	0130	annamite.
8302	à temps.	7160	antenne.
6249	à titre de.	5339	août.
5277	à tout prix.	9995	apercevoir.
2156	abandon (ner .	1527	appareil.
7154	abatis.	6211	appartenir.
4520	abord.	6788	approcher.
1008	abri.	7962	approvisionnement.
6657	absence.	2276	appui.
7787	absolu.	5558	appuyer.
0614	absolument.	7926	après.
5354	accélérer.	8706	après-demain.
8497	accepter.	3772	après-midi.
3041	accident.	4380	armée.
1708	accomplir.	8317	arrêter.
4014	accord.	9538	arrivée.
9982	accord avec (d').	9415	artifices.
2557	accrochage.	4682	artillerie.
2512	accumulateur.	3284	_____ de campagne.
3407	accuser réception.	8030	asphyxiant.
8042	action.	8267	assaut.
1416	activité.	5384	assurer.
0267	actuellement.	2769	attaque.
6616	A. D.	7129	attaquer.
1672	adjudant.	5517	atteindre.
5575	adresser.	7064	attendre.
5414	aéronautique.	7319	atterrissage.
6982	aéroplane.	3230	au.
0763	aérostiers.	9804	au cas où.
1169	afin de.	5967	au lieu de.

A-C

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8564	au reçu de.	6261	bande.
7379	aucun.	8800	baraque.
6550	augmentation.	7800	bataillé.
3530	aujourd'hui.	5714	bataillon.
9574	aussitôt.	8755	———— infanterie.
6250	aussitôt que possible.	4335	———— chasseurs.
4256	autocamions.	9255	———— sénégalais.
5623	autocanon.	9110	batterie.
2271	automobile.	6733	beaucoup.
7300	autre.	4150	belge.
2825	aux.	7170	béquille.
0271	aux abords.	5164	besoin.
5712	aux environs.	5307	bicycliste.
1978	avance.	8338	bientôt.
1928	avant.	6017	bivouac.
3809	avant (en.)	3550	blanc.
1266	avec.	9155	blessé.
5111	avez-vous.	1560	bois.
3524	aviation.	8550	bombardement.
1726	avion.	8459	bombe.
5235	—— d'artillerie.	0852	bon, bonne.
2724	—— de bombardement.	7009	bon terrain.
7674	—— de chasse.	2977	bord.
0818	—— de commandement.	4675	bordure.
3702	—— de destruction.	0300	bougie.
9912	—— d'infanterie.	4128	boyau.
0600	—— de jalonnement.	0286	brancard.
6304	—— de réglage.	6825	brancardier.
8223	—— de surveillance.	2706	brigade.
4850	—— de patrouille.	8866	britannique.
6862	—— brisé.	9640	brouillard.
9463	avoir.	9118	brume.
8104	——		
7854	——		
		4600	C.
		3105	-
		2466	-
		7672	C. A.
		1542	câble.
		8536	—— de campagne.
		7996	—— léger.
		2338	cadavre.
		4300	calibre.
		3900	calme.
		2800	camion.
		4362	———— automobile.
3906	B.		
9058	-		
1154	-		
5400	balle.		
8984	ballon.		

1956	canal.	9584	crete.
5367	canevas de tir.	2446	cycliste.
0664	canon.		
7350	canon de tranchée.		
6300	—— de 75.		
2350	cantonement.		
1616	capitaine.		
3250	carburateur.	0308	D.
8253	carlingue.	2819	—
9976	cavalerie.	5619	—
1984	cavalier.	1772	danger.
7762	ce.	4800	dans.
2334	centaine.	2943	—
3491	certain (ement).	0877	—
6773	ces.	0281	de.
1349	chatne.	4936	—
5344	changement.	7218	—
1876	chasseur.	8012	déborder.
0400	cheddite.	7086	décembre.
5750	chef de bataillon.	6346	déchiffrer.
7250	chemin.	2433	décision.
4329	—— de fer.	6273	défaut.
4686	cheval.	8955	défense.
9189	chiffre.	3387	dégâts matériels.
0770	cimetière.	8691	délai.
3574	clair.	9650	—— (sans).
8720	classe.	5953	demain.
1784	code chiffré.	7353	—— matin.
6721	colonel.	7719	—— soir.
2440	combat.	9062	—— (après-).
6609	commandant.	7432	demande.
3526	commandement.	9684	demander.
4131	commencer.	5663	demi.
4417	compagnie.	8290	démolition.
9169	comprendre.	6743	dépannage.
5466	compte rendu.	3706	dépanner.
2655	connaître.	9776	dépanneurs.
6833	contact.	5536	départ.
7989	contre-attaque.	1288	dernier.
0547	contre.	3951	derrière.
9956	coordonnées.	0223	des.
1938	——	8621	——
7612	——	8231	——
9384	corde à piano.	2899	déserteur.
3340	corps.	4353	destination.
5550	—— d'armée.	9990	destruction.
5295	cote.	4789	devant.
8842	coureur.	2265	difficulté.
3670	couvert.	6752	direct.
7739	créneau.	4234	direction.

## PHRASES.

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## PHRASES TOUTES FAITES.

4909	Abritez tout le monde sauf les guetteurs.
3827	Alerte.
1691	Alerte aux gaz.
5717	Allongez le tir de barrage.
2133	Artillerie ennemie nous cause de grandes pertes.
8727	Attaque dans conditions convenues.
6838	—— ennemie paraît avoir échoué.
2586	—— ennemie repoussée.
0784	Avez-vous besoin de...
7489	Avons besoin de...
4673	Brancardiers nécessaires pour blessés.
1178	Bruits faisant présumer travailleurs ennemis.
3467	Cessez le tir sur...
8187	Char d'assaut ami.
0831	—— ennemi.
4693	Circulation anormale d'isolés.
9435	Compte rendu écrit va être envoyé.
5521	Contre-attaque ennemie sur.
7313	Déclenchez attaque.
8634	Demande (je) autorisation de...
6481	—— ravitaillement en munitions...
9994	Dispositif d'alerte.
7524	Donnez-moi des renseignements sur...
8472	Demandons contre-batterie sur...
5230	—— tir de représailles sur...
6421	—— tir de barrage sur.
7945	—— renforts.
4699	Diminuez la cadence du tir.
7531	En panne.
3032	Évacuez les premières lignes.
6792	—— les deuxièmes lignes.
8432	Front actuel passe par...
6783	Indices d'attaque ennemie en.
2984	—— de relève ennemie en.
9417	Infanterie doit être vigilante.
1837	—— ennemie attaque.
0484	—— a atteint.
8671	—— progresse dans boyaux.
1282	—— se replie.
2741	Je n'ai pas de renseignements sur.
7477	Je ne comprends pas votre télégramme.
3496	Je vous envoie matériel demandé.
4737	Liaison assurée avec.
6830	—— perdue à gauche.
5882	—— à droite.
1089	—— à droite et à gauche.
5970	N'envoyez plus de messages chiffrés.

1830	Nombreuses pertes résultant de notre artillerie.
0325	Nos troupes ont évacué.
3592	———— se sont repliées sur...
5407	— premières lignes sont bouleversées.
7521	Notre attaque progresse.
1577	Nous avons occupé.
4722	———— réoccupé.
8135	— nous replions (sur).
0808	— occupons sûrement.
6134	— paraissions occuper.
2926	— progressons vers.
9515	— sommes arrêtés (en).
3479	Objectif atteint.
7035	— non atteint.
5685	Ordres en voie d'exécution.
4461	On passe la 1 <sup>re</sup> ligne.
8379	Patrouille rentrée.
4623	———— sortie.
2979	———— va sortir.
6983	Placez (ou complétez) la chaîne de coureurs.
3409	Préparation d'artillerie paraît suffisante.
7983	———— insuffisante.
9239	Quel est le secteur bombardé?
3637	Que se passe-t-il sur votre front?
5779	Rassemblements ennemis en...
7132	Relève aura lieu.
8325	— n'aura pas lieu.
6935	— commencée.
8322	— en cours.
4892	— terminée.
2535	Renforts ennemis arrivent par.
8454	Situation rétablie.
6454	— critique.
1777	Sommes débordés à notre droite.
5639	———— gauche.
0043	———— des deux côtés.
3939	— encerclés.
9533	Sur quoi tire l'ennemi.
7618	Suspendez exécution de l'opération.

## Artillerie.

2570	Artillerie de campagne (A. C.).
1364	— lourde (A. L.)
5183	— de tranchée (A. T.).
1559	— d'assaut (A. S.).
6528	— amie va tirer (sur).
8587	— tire (sur).
4487	— a fini de tirer (sur).

0000 à 0532

— 30 —

0000	Soixante-seize.	0271	aux abords.
0001	str.	0274	moindre.
0005	i.	0276	rouge.
0009	Présent.	0277	reculer.
0012	nage.	0280	tir de contre-préparation.
0014	rre.	0281	de.
0016	leu.	0283	raccordement.
0023	veni.	0286	brancard.
0024	ns.	0290	ens.
0028	oux.	0300	bougie.
0031	ble.	0303	na.
0035	e.	0310	observez le tir sur.
0039	aite.	0315	marche.
0043	Sommes débordés des deux côtés.	0321	ssion.
0046	Accusez réception de.	0325	Nos troupes ont évacué.
0049	cinquante-huit.	0327	dent.
0050	part.	0330	front.
0056	millier.	0338	ture.
0058	cien.	0343	prise.
0067	virgule (,).	0349	hôpital.
0070	q.	0350	quent.
0077	quarante-huit.	0357	champ.
0086	g.	0361	sse.
0096	fie.	0370	a.
0100	dirigeable.	0374	d'.
0102	donnée.	0375	ing.
0109	ent.	0379	sondage.
0111	marquer.	0383	mille.
0119	mb.	0389	r.
0124	gil.	0393	u.
0130	annamite.	0400	cheddite.
0134	fer.	0409	euse.
0139	photographe.	0418	ieur.
0144	parachute.	0424	tir indirect.
0149	sau.	0426	etr.
0201	m.	0430	sénégalais.
0208	d.	0436	pièce.
0213	à.	0440	parvenir.
0223	des.	0470	recevoir.
0228	six.	0472	obliquer.
0231	tir de harcèlement.	0474	deur.
0233	panique.	0484	Infanterie ennemie a atteint.
0235	ordre de mouvement.	0494	flo.
0240	excepté.	0500	1917.
0244	point de rassemblement.	0508	vais.
0249	nombreux.	0510	mort.
0250	neuf.	0516	dix-neuf.
0256	gradé.	0519	sie.
0265	Juin.	0527	hussards.
0267	actuellement.	0532	groupe nul.

0536	di.	0795	vétérinaire.
0539	général.	0799	note.
0547	contre.	0800	b.
0550	ku.	0804	es.
0555	am.	0808	Nous occupons sûrement.
0561	ligne téléphonique.	0818	avion de commandement.
0564	canon.	0825	tout.
0570	ième.	0827	division.
0577	ja.	0831	char d'assaut ennemi.
0580	organique.	0834	retard.
0586	ten.	0838	seize.
0596	Soixante-dix.	0842	radiogoniométrique.
0600	avion de jalonnement.	0848	proportion.
0602	menaçant.	0852	bon, bonne.
0607	ennemi.	0860	E. N. E.
0610	os.	0862	en panne.
0614	absolument.	0865	au.
0616	lot.	0869	qu'.
0622	parc d'artillerie.	0877	dans.
0625	jo.	0880	tir trop à droite.
0632	Quatre cents.	0881	jusqu'à nouvel ordre.
0638	prière de.	0886	sopwith.
0642	ition.	0889	vous.
0652	sp.	0899	en plus.
0666	gou.	0902	poste radiogoniométrique.
0667	quatre-vingt-cinq.	0909	é.
0679	iers.	0917	ale.
0691	ordonner.	0924	pioche.
0700	heure.	0929	ter.
0707	une.	0933	prochain.
0711	ne.	0937	quelque.
0714	italien.	0941	placer.
0717	moins vite.	0948	régiment d'artillerie.
0721	deux.	0950	ave.
0726	je:	0954	vont.
0731	grand parc.	0963	part.
0734	pre.	0978	car.
0737	le plus tôt possible.	0980	ette.
0744	préparatif.	0980	non.
0750	t.	0991	sous-lieutenant.
0757	ac.	0992	secteur.
0759	tué.	0994	qu'y a-t-il.
0763	aérostiers.	0999	Présent.
0770	cimetière.		
0773	ille.		
0778	objet.		
0782	ier.		
0784	Avez-vous besoin de...		
0787	travailleurs.		
0790	ess.		

**Appendix 7.—AN EXAMPLE OF THE ENCIPHERING TABLE FOR FRENCH FIELD CODE**

**TABLEAU DE CONCORDANCE**  
**SÉRIE 65**

**Veillez sur ce tableau.**  
**Brûlez-le s'il risque d'être pris.**

SECRET

TABLEAU DE

CHIFFREMENT.			DÉCHIFFREMENT.		
0 - GS	30 - HR	70 - AN	AR - 09	EM - 49	ND - 13
1 - RH	31 - IA	71 - RB	AD - 82	ER - 88	NG - 66
2 - AM	32 - VS	72 - HN	AE - 39	ES - 20	NH - 34
3 - SI	33 - GU	73 - MH	AG - 14		NR - 81
4 - BH	34 - NH	74 - GD	AH - 60	GA - 01	NS - 5
5 - NS	35 - IS	75 - BU	AI - 78	GB - 54	NU - 27
6 - DA	36 - HD	76 - IE	AM - 2	GD - 74	
7 - TD	37 - TA	77 - DM	AN - 70	GH - 04	RB - 71
8 - EA	38 - IB	78 - AI	AR - 17	GI - 84	RD - 12
9 - UG	39 - AE	79 - RN	AS - 91	GM - 28	RH - 1
			AT - 00	GN - 99	RN - 79
			AU - 50	GR - 46	RT - 21
				GS - 0	
00 - AT	40 - HT	80 - UH	BA - 11	GT - 98	SB - 18
01 - GA	41 - SD	81 - NR	BD - 93	GU - 33	SD - 41
02 - IM	42 - US	82 - AD	BE - 25		SH - 67
03 - DN	43 - DI	83 - BM	BG - 63	HA - 22	SI - 3
04 - GH	44 - EI	84 - GI	BH - 4	HB - 86	SM - 51
05 - MN	45 - BS	85 - ED	BI - 57	HD - 36	SN - 90
06 - HI	46 - GR	86 - HB	BM - 83	HG - 89	SR - 24
07 - VG	47 - MD	87 - NA	BN - 19	HI - 06	
08 - UR	48 - IR	88 - ER	BR - 65	HM - 96	TA - 37
09 - AB	49 - EM	89 - HG	BS - 45	HN - 72	TD - 7
			BT - 10	HR - 30	TN - 62
			BU - 75	HS - 53	TR - 58
				HT - 40	TS - 15
			DA - 6		
			DB - 52	IA - 31	UA - 55
			DG - 23	IB - 38	UG - 9
			DH - 69	IE - 76	UH - 80
			DI - 43	IM - 02	UM - 68
			DM - 77	IN - 94	UR - 08
			DN - 03	IR - 48	US - 42
			DR - 56	IS - 35	
			DS - 95		VG - 07
			DT - 26	MD - 47	VN - 61
				MH - 73	VS - 32
			EA - 8	MN - 05	
			EB - 59	MS - 92	
			ED - 85	MU - 64	
			EG - 16		
			EH - 97	NA - 87	
			EI - 44	NB - 29	
10 - BT	50 - AU	90 - SN			
11 - BA	51 - SM	91 - AS			
12 - RD	52 - DB	92 - MS			
13 - ND	53 - HS	93 - BD			
14 - AG	54 - GB	94 - IN			
15 - TS	55 - UA	95 - DS			
16 - EG	56 - DR	96 - HM			
17 - AR	57 - BI	97 - EH			
18 - SB	58 - TR	98 - GT			
19 - BN	59 - EB	99 - GN			
20 - ES	60 - AH				
21 - RT	61 - VN				
22 - HA	62 - TN				
23 - DG	63 - BG				
24 - SR	64 - MU				
25 - BE	65 - BR				
26 - DT	66 - NG				
27 - NU	67 - SH				
28 - GM	68 - UM				
29 - NB	69 - DH				

## CONCORDANCE N° 65.

Le tableau ci-contre a pour objet de permettre, à défaut de communication par fil, la transmission par T. S. F. de tous messages chiffrés avec le Code chiffré, sans que soit mise en danger la sécurité de ce Code.

On doit faire emploi de ce double chiffrement pour les messages téléphonés qui seraient particulièrement secrets ou importants.

*Exemple de double chiffrement :*

TEXTE :       La    relève    au   -   ra       lieu   demain matin.  
 CODE :        1|65|1  4|27|5  0|86|5  8|75|0  1|06|5  7|35|3  
 TABLEAU : RH|BR| AG |NU| AU |HB| TR |BU| GA |HI| BI |IS|SI

(Le premier chiffre du premier groupe doit constituer *seul* la première tranche.)

Pour le déchiffrement, remplacer chaque groupe de deux lettres par le nombre qui correspond à ce groupe dans le tableau de chiffrement.

On retrouve les groupes du Code en rétablissant les nombres de quatre chiffres à partir du commencement.

Ne jamais transmettre deux fois un même texte dans des chiffrements différents.

Appendix 8.—EXTRACTS FROM GERMAN FIELD CODES

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Appendix 8A.—THE *SCHLUESSELHEFT*

**Geheim!**

# Schlüsselheft

1. Ausgabe.

■ Nicht in Feindes Hand fallen lassen. ■

## I. Morsezeichen und Buchstabiertafel.

a	Adolf . . . . .	·—
b	Berta . . . . .	—...
c	Cäsar . . . . .	—...·
d	David . . . . .	—··
e	Emil . . . . .	·
é	französ. e . . . . .	··...·
f	Friedrich . . . . .	··...·
g	Gustav . . . . .	—...·
h	Heinrich . . . . .	····
i	Isidor . . . . .	··
j	Jakob . . . . .	·—...—
k	Karl . . . . .	—...—
l	Ludwig . . . . .	·...·
m	Moritz . . . . .	—...—
n	Nathan . . . . .	—·
o	Otto . . . . .	—...—
p	Paula . . . . .	·...·
q	Quelle . . . . .	—...·—
r	Richard . . . . .	····
s	Siegfried . . . . .	···
t	Theodor . . . . .	—
u	Ursula . . . . .	··—
v	Viktor . . . . .	····
w	Willi . . . . .	·...—
x	Xantippe . . . . .	—...·—
y	Ypsilon . . . . .	—...—
z	Zacharias . . . . .	—...·
ä	Adolfemil . . . . .	·...—
ö	Ottoemil . . . . .	—...—
ü	Ursulaemil . . . . .	··...—
ch	Cäsarheinrich . . . . .	—...—

— 4 —

**Morsezeichen und Buchstabiertafel.**

(Fortsetzung.)

Ziffern:	gekürzt:
0 -----	—
1 .-----	.---
2 ..-----	..---
3 ...-----	...---
4 ....-----	....---
5 .....-----	.....---
6 -----.	-----.
7 -----..	-----..
8 -----...	-----...
9 -----..	-----..

**Satz- und Hilfszeichen.**

Punkt . . . . .	. . . . .
Komma . . . . .	.-----
Fragezeichen . . . . .	..-----
Binde-oder Gedankenstrich . . . . .	-----
Klammer . . . . .	-----
Bruchstrich . . . . .	-----
Trennungszeichen . . . . .	-----
Irrungszeichen . . . . .	.....
Wartezeichen . . . . .	.....

**II. Buchstabenzeichen.****a) Allgemeine Verkehrszeichen.**

lg	Licht gut
ls	Licht schlecht
wp	Wie dort Empfang?
eg	Empfang gut
es	Empfang schlecht
wt	Wie dort Ton?
tg	Ton gut
ts	Ton schlecht
th	Nehmt hohen Ton
tm	Nehmt mittleren Ton
ti	Nehmt tieferen Ton
mg	Mehr Energie
wg	Weniger Energie
gl	Gebt langsamer
chi	Chiffrierte Nachricht
zi	Stationsnachricht
kr	Dringende Nachricht
nf	Hier liegt kein Spruch mehr vor
fö	Funkspruch gelöst
os	Das Empfangene ist ohne Sinn
ve	Verstanden
nv	Nicht verstanden
us	Störung im Funkerbetrieb
mr	Motorstörung
fs	Hier fremder Störer
wh	Wiederholen
wa	(5) Warten (Minutenzahl), ich rufe wieder an
bp	Bleibe auf Empfang
fa	Folgt Antwort
kü	Kannst Du übermitteln
üm	Ich übermittele an
nü	Ich kann nicht übermitteln
hh	Hauptwelle
nn	Nebenwelle
um	Umschaltezeichen
xx	Ich muß sofort marschieren
ng	Notlandung
dd	Station scheidet aus dem Verkehr aus
gr	Gruppe
pü	Spruch überholt
ru	Sie werden gerufen von Station

**b) Zeichen für Fliegerdienst.****1. Allgemeine Zeichen.**

pa	Planquadrat
wo	Wolken
du	Dunst
nl	Nördlich
sl	Südlich
ol	Östlich
wl	Westlich
gb	Graben
pt	Punkt
ed	Eisenbahndamm
wd	Wald
st	Straße
im	Infanterie in Marschkolonne
iv	Infanterie in Versammlung
am	Artillerie in Marschkolonne
af	Artillerie feuernd
mw	Marschkolonne aller Waffen
bv	Bagagen in Versammlung
at	Ausladen von Truppen
ev	Eisenbahnverkehr
tb	Tank in Bereitschaft
tn	Tank naht
sf	Vorschlag für Störungsfeuer
al	Allg. Schußlage eigenen oder feindl. Feuers

**III. Zahlenzeichen.****a) Militärische- und Ortsnamen.**

<i>Achill</i>	000	000
<i>Ackermann</i>	001	001
<i>Adam</i>	002	002
<i>Adels</i>	003	003
<i>Adler</i>	004	004
<i>Adonival</i>	005	005
<i>Adonis</i>	006	006
<i>Albert</i>	007	007
<i>Albis</i>	008	008
<i>Alvater</i>	009	009
<i>Amsel</i>	010	010
<i>Anhalt</i>	011	011
<i>Ansbach</i>	012	012
<i>Anton</i>	013	013
<i>Bauer</i>	014	014
<i>Bär</i>	015	015
<i>Blicher</i>	016	016
<i>Bocksberg</i>	017	017
<i>Börse</i>	018	018
<i>Bremen</i>	019	019
<i>Brocken</i>	020	020
<i>Brunnen</i>	021	021
<i>Bürger</i>	022	022
<i>Caputh</i>	023	023
<i>Cardinal</i>	024	024

## Militärische- und Ortsnamen.

(Fortsetzung.)

<i>Caspar</i>	025	025
<i>Caviar</i>	026	026
<i>Cäcilie</i>	027	027
<i>Ceder</i>	028	028
<i>Cement</i>	029	029
<i>Cerberus</i>	030	030
<i>Cigare</i>	031	031
<i>Ciccio</i>	032	032
<i>Cypresse</i>	033	033
<i>Collin</i>	034	034
<i>Damaskus</i>	035	035
<i>Damsdorf</i>	036	036
<i>Daniel</i>	037	037
<i>Danzig</i>	038	038
<i>Dattel</i>	039	039
<i>Delphin</i>	040	040
<i>Delta</i>	041	041
<i>Diamant</i>	042	042
<i>Dichter</i>	043	043
<i>Dido</i>	044	044
<i>Dietrich</i>	045	045
<i>Direktor</i>	046	046
<i>Dornherr</i>	047	047
<i>Donau</i>	048	048
<i>Drache</i>	049	049

## b) Gefechtsmeldungen.

**Vom Gegner:**

Gegner bereitet Angriff vor . . . . .	150
„ greift an . . . . .	151
„ verstärkt sich . . . . .	152
„ geht zurück . . . . .	153
„ in vordere Linie eingedrungen . . . . .	154
„ links von uns eingedrungen . . . . .	155
„ rechts „ „ „ . . . . .	156
„ r. u. l. eingedrungen, Mitte hält . . . . .	157
„ in der Mitte eingedrungen . . . . .	158
„ in der Mitte u. r. eingedrungen . . . . .	159
„ in der Mitte u. l. „ . . . . .	160
„ durch vorderste Linie durchgebrochen . . . . .	161
„ hat starke Verluste . . . . .	162
„ zwischen seiner und unserer Stellung liegen geblieben . . . . .	163
Feindl. Angriff abgeschlagen . . . . .	164
Gegner schießt mit Gasgranaten . . . . .	165
Feindl. Stellung ist noch nicht sturmreif . . . . .	166
Gegner schantzt bei . . . . .	167
Gegner schießt mit Fliegerbeobachtung ein auf . . . . .	168
	169
	170
	171
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	173
	174

**Gefechtsmeldungen.**

(Fortsetzung.)

**Eigene Truppe:**

Wir gehen zurück . . . . .	175
Wir gehen vor (sind zum Angriff fertig) . . . . .	176
Wir haben starke Verluste . . . . .	177
Wir halten die Linie . . . . .	178
Wir werden von der eig. Inf. beschossen . . . . .	179
Wir werden von der eig. Art. " . . . . .	180
Anschluß vorhanden . . . . .	181
Anschluß fehlt . . . . .	182
Eigener Sturm steht bevor . . . . .	183
Gegenangriff im Gange . . . . .	184
Gegenangriff gelungen . . . . .	185
Gegenangriff nicht geglückt . . . . .	186
Unterstützung auf dem rechten Flügel nötig . . . . .	187
" " " linken " " . . . . .	188
Unser Ziel ist erreicht . . . . .	189
	190
	191
	192
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	195
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	197
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## c) Buchstaben und Silben.

<b>a</b> . . . . .	250	el . . . . .	278
<b>ä</b> . . . . .	251	en . . . . .	279
<b>am</b> . . . . .	252	ent . . . . .	280
<b>an</b> . . . . .	253	er . . . . .	281
<b>ar</b> . . . . .	254	es . . . . .	282
<b>au</b> . . . . .	255	eu . . . . .	283
<b>aus</b> . . . . .	256	<b>f</b> . . . . .	284
<b>b</b> . . . . .	257	für . . . . .	285
<b>be</b> . . . . .	258	<b>g</b> . . . . .	286
<b>ben</b> . . . . .	259	gr . . . . .	287
<b>c</b> . . . . .	260	gegen . . . . .	288
<b>ch</b> . . . . .	261	gen . . . . .	289
<b>che</b> . . . . .	262	<b>h</b> . . . . .	290
<b>chen</b> . . . . .	263	he . . . . .	291
<b>cht</b> . . . . .	264	heit . . . . .	292
<b>d</b> . . . . .	265	her . . . . .	293
<b>da</b> . . . . .	266	hin . . . . .	294
<b>daß</b> . . . . .	267	<b>i</b> . . . . .	295
<b>de</b> . . . . .	268	ich . . . . .	296
<b>dem</b> . . . . .	269	is . . . . .	297
<b>den</b> . . . . .	270	ist . . . . .	298
<b>der</b> . . . . .	271	<b>j</b> . . . . .	299
<b>des</b> . . . . .	272	<b>k</b> . . . . .	300
<b>die</b> . . . . .	273	keit . . . . .	301
<b>e</b> . . . . .	274	<b>l</b> . . . . .	302
<b>é</b> . . . . .	275	le . . . . .	303
<b>ei</b> . . . . .	276	<b>m</b> . . . . .	304
<b>ein</b> . . . . .	277	<b>n</b> . . . . .	305

## Buchstaben und Silben.

(Fortsetzung.)

nach . . . . .	306	st . . . . .	328
nd . . . . .	307	t . . . . .	329
ne . . . . .	308	tel . . . . .	330
nen . . . . .	309	ten . . . . .	331
ns . . . . .	310	u . . . . .	332
nu . . . . .	311	ü . . . . .	333
o . . . . .	312	um . . . . .	334
ö . . . . .	313	un . . . . .	335
ob . . . . .	314	ung . . . . .	336
p . . . . .	315	uns . . . . .	337
q . . . . .	316	w . . . . .	338
qu . . . . .	317	ver . . . . .	339
r . . . . .	318	vor . . . . .	340
re . . . . .	319	w . . . . .	341
rück . . . . .	320	weg . . . . .	342
s . . . . .	321	wie . . . . .	343
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se . . . . .	323	wo . . . . .	345
seit . . . . .	324	x . . . . .	346
sen . . . . .	325	y . . . . .	347
sich . . . . .	326	z . . . . .	348
so . . . . .	327	zer . . . . .	349

## d) Zahlen und Uhrzeiten.

0 . . . . .	350	12 Uhr nachts	379
1 . . . . .	351	1 „ vorm.	380
2 . . . . .	352	2 „ „	381
3 . . . . .	353	3 „ „	382
4 . . . . .	354	4 „ „	383
5 . . . . .	355	5 „ „	384
6 . . . . .	356	6 „ „	385
7 . . . . .	357	7 „ „	386
8 . . . . .	358	8 „ „	387
9 . . . . .	359	9 „ „	388
10 . . . . .	360	10 „ „	389
11 . . . . .	361	11 „ „	390
12 . . . . .	362	12 „ mittags	391
15 . . . . .	363	1 „ nachm.	392
20 . . . . .	364	2 „ „	393
25 . . . . .	365	3 „ „	394
30 . . . . .	366	4 „ „	395
40 . . . . .	367	5 „ „	396
45 . . . . .	368	6 „ „	397
50 . . . . .	369	7 „ „	398
60 . . . . .	370	8 „ „	399
70 . . . . .	371	9 „ „	400
80 . . . . .	372	10 „ „	401
90 . . . . .	373	11 „ „	402
hundert . . . .	374		
tausend . . . .	375		
mal . . . . .			376
ter, te, tes . .			377
römisch . . . .			378

## e) Alphabetisches Wörterverzeichnis.

A			
ab	403	Aufsatzschieber	425
abrechnen,		Aufschlag	426
abgebrochen	404	Aufschlag-	
Abend(s)	405	zünder (Az)	427
abfeuern,		Ausladung	428
abgefeuert	406		429
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Alarm	412		436
allein	413		437
allgemein	414		438
am, an	415		439
angreifen,			440
angegriffen	416		441
Angriff	417		442
Anschluß	418		443
Artillerie	419		444
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kommandeur	421		
Artilleriemunition	422		
Artillerie-			
untergruppe	423		
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**Appendix 8B.—AN EXAMPLE OF THE ENCIPHERING AND DECIPHERING TABLES FOR THE  
SCHLUESSELHEFT**

*Verschlüsselungstafel.*

	0	1	2	3	4	5	6	7	8	9
0	23	48	60	05	78	35	58	64	29	52
1	20	77	33	59	21	70	02	40	63	08
2	11	49	01	69	47	41	79	74	22	42
3	32	76	39	18	75	30	09	51	80	65
4	61	19	43	81	06	56	73	62	10	28
5	85	50	24	88	31	84	27	90	55	57
6	03	91	96	53	68	16	44	89	15	87
7	97	25	71	04	95	34	14	37	93	38
8	26	72	54	92	13	83	45	00	66	67
9	86	12	98	36	99	46	82	17	94	07

*Entschlüsselungstafel.*

	0	1	2	3	4	5	6	7	8	9
0	87	22	16	60	73	03	44	99	19	36
1	48	20	91	84	76	68	65	97	33	41
2	10	14	28	00	52	71	80	56	49	08
3	35	54	30	12	75	05	93	77	79	32
4	17	25	29	42	66	86	95	24	01	21
5	51	37	09	63	82	58	45	59	06	13
6	02	40	47	18	07	39	88	89	64	23
7	15	72	81	46	27	34	31	11	04	26
8	38	43	96	85	55	50	90	69	53	67
9	57	61	83	78	98	74	62	70	92	94

**Appendix 8C.—THE SATZBUCH**

Geheim!

# Satzbuch 140

== Teil: ==  
**Schlüsseln**

Nicht in Feindeshand fallen lassen!

# Register-Erklärungen

nebst

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Vor dem Gebrauch des Buches zu lesen!**Vorbemerkungen.**

1. Alle Meldungen und Befehle müssen mit Hilfe des Satzbuches geschlüsselt werden. Klartexte dürfen nur im äußersten Notfalle gefunkt werden.

Mischung von Klartext und geschlüsselt Text, sowie Einstreuen von ungeschlüsselten Zahlen, Zeitgruppen, Trennungs- oder Satzzeichen in den geschlüsselten Text ist verboten.

Redewendungen und Sätze, die nach dem Satzbuch durch ein Signal wiedergegeben werden können, dürfen nicht durch ihre Einzelbestandteile ausgedrückt werden, z. B. „in unserer Hand“ durch „in“ — „unser“ — „Hand“.

Worte und Wortendungen, die zum Verständnis nicht unbedingt erforderlich sind, sind beim Schlüsseln wegzulassen, z. B. schlüssele statt „bei-m Feind-e“ „bei Feind“ usw.

2. Das Satzbuch besteht aus dem Teil „Schlüsseln“ und dem Teil „Entschlüsseln“ und enthält dreistellige Buchstaben-  
gruppen, deren erster Buchstabe a, k, r, s oder u ist.

a) Der Teil „Schlüsseln“ gliedert sich in folgende Abschnitte:

Wichtige Meldungen,  
Allgemeine Meldungen,  
Stations- und Betriebsmeldungen,  
Wettermeldungen,  
Ortsnamen,  
Militärische Decknamen,  
Zahlen,  
Uhrzeiten,  
Buchstaben und Silben,  
Hilfssignale,  
Satzzeichen,  
Wörterbuch und blinde Signale,  
Buchstabierverfahren.

Hinter den einzelnen Abschnitten sowie im Wörterbuch ist für handschriftliche Ergänzungen Raum gelassen.

Die militärischen Namen (Stäbe, Formationen) und Ortsnamen müssen von den Funker-Abteilungen selbst nach Bedarf eingetragen und mit Signalen versehen werden.

Die für diese Ergänzungen zur Verfügung stehenden Signale sind aus dem Teil „Entschlüsseln“ zu ersehen.

Bei Ausfüllung des Satzbuches nicht vorgesehene militärische Namen und Ortsnamen werden mit Hilfe des am Schlusse des Teiles „Schlüsseln“ befindlichen „Buchstabierverfahrens“ wiedergegeben.

Die/Hilfssignale werden hinter die Gruppen gesetzt, deren Bedeutung geändert werden soll. Soll z. B. „angefordert“ geschlüsselt werden, so setzt man hinter das Signal für „anfordern“ das Signal „Mittelwort der Vergangenheit“, also: kax. sav

Die Hilfssignale werden nur angewandt, wenn sie zur Vermeidung eines Irrtums erforderlich sind.

Blinde Signale sind am Fußende jeder Seite aufgenommen. Von ihnen ist ausgiebig Gebrauch zu machen. Vor allem müssen sie in häufig wiederkehrende, ähnlich oder gleichlautende Meldungen und Befehle an beliebigen Stellen eingeschaltet werden.

Kurze Meldungen, die aus nur einem oder sehr wenig Signalen bestehen, sind durch Zusatz mehrerer blinder Signale zu verschleiern.

Beim Entschlüsseln werden die blinden Signale einfach übergangen.

Das Wörterbuch ist alphabetisch angelegt; ä, ö und ü sind als a, o und u behandelt. Bei Eigenschaftswörtern gilt das Signal der Grundform auch für die abgeleiteten Formen, z. B. das Signal für „groß“ zugleich für große, großer, großes usw.; das Signal für „dieser“ auch für diese, dieses, diesem, diesen. Das Signal für die Nennform gilt auch für die Formen der Gegenwart, z. B. „abflauen“ für „flaut ab“, „nehmen“ für „nimmt“. Rückbezügliche Zeitwörter sind unter dem Zeitwort zu suchen, z. B. „sich ausdehnen“ unter „ausdehnen, sich“, „sich eingraben“ unter „eingraben, sich“. Wortgruppen wie: „auf dem rechten Flügel“, „unter Feuer nehmen“, „eigene Artillerie“, „hat aufgehört“, „zu spät“ sind im Alphabet einmal unter ihrem ersten Wort eingefügt (auf, unter, eigene, hat, zu), dann aber auch unter dem nachfolgenden Hauptwort, Zeitwort usw. (Flügel, Feuer, Artillerie, aufhören, spät). In gleicher Weise sind häufig vorkommende Formen von Hilfszeitwörtern und Zeitwörtern wie: ist, war, wird, kann, genommen einmal

unter dieser Form und dann auch unter der zugehörigen Nennform (sein, werden, können, nehmen) zu finden.

Zum Zusammenstellen von Wörtern, die nicht im Satzbuch enthalten sind, sind Einzel-, Doppelbuchstaben und Silben unter „Buchstaben und Silben“ aufgeführt.

Das Buchstabieren von Worten, die im Satzbuch enthalten sind, ist verboten.

Sind für ein Wort oder eine Wörtergruppe mehrere Signale angegeben, so müssen diese Signale abwechselnd gebraucht werden, z. B. auch wenn das Wort nur einmal im Funkspruch vorkommt, ist dafür nicht immer das an erster Stelle im Satzbuch stehende Signal zu wählen.

b) Der Teil „Entschlüsseln“ enthält zunächst die Signale mit dem Anfangsbuchstaben a, hierauf die mit den Anfangsbuchstaben k, r und s und schließlich die mit dem Anfangsbuchstaben u.

Am Schlusse des Teiles „Entschlüsseln“ befindet sich die Entschlüsselungstabelle des „Buchstabierverfahrens“.

3 Bei einer

#### Anderung von Signalen

ist streng darauf zu achten:

1. daß die Änderung im Teil „Schlüsseln“ und im Teil „Entschlüsseln“ vorgenommen wird,
2. daß diejenigen Signale, deren Bedeutung im Teil Schlüsseln an mehreren Stellen vorkommt (siehe oben: auf dem rechten Flügel, unter Feuer nehmen, zu spät, ist, war, kann usw.), an allen Stellen geändert werden.

Zur Erleichterung dieser Arbeit sind diese Signale, soweit sie mehrmals vorkommen, mit einem Sternchen bezeichnet.

## Wichtige Meldungen.

### a) vom Gegner:

Feind bereitet Angriff vor . . . . . kks, rli, esk  
 Feind greift an bei . . . . . aok, kvj, uiz  
 Feind verstärkt sich . . . . . reh, kni, scd  
 Feindliche Gräben sind stark besetzt . . . sde, ato, kcu  
 Feindliche Gräben sind schwach besetzt . kfa, rhh, sxs  
 Feindliche Gräben füllen sich . . . . . rqa, rnr, ada  
 Feind in die vordere Linie eingedrungen . uj, krt, skz  
 Feind links eingedrungen . . . . . suk, rza, kok  
 Feind rechts eingedrungen . . . . . afp, raa, gbz  
 Feind links und rechts eingedrungen, Mitte  
   hält . . . . . kwe, sj, riz  
 Feind in die Mitte eingedrungen . . . . . ugl, aka, syx  
 Feind durch vordere Linie durchgebrochen uya, ahj, rwy  
 Feind zwischen seinen und unseren Stel-  
   lungen liegen geblieben . . . . . rwk, agl, ube  
 Feindlicher Angriff abgeschlagen . . . . . set, kso, rpg  
 Feind hat starke Verluste . . . . . uvi, kkd, ald  
 Feind schießt mit Gasgranaten . . . . . kj, uca, nrk  
 Feindliche Stellung ist noch nicht sturmreif ryo, auy, kbi  
 Feindliches Trommelfeuer liegt auf . . . . . apa, una, ejt  
 Feindliches Sperrfeuer liegt auf . . . . . rdl, smv, uuh  
 Feind löst ab . . . . . ael, kzo, upx  
 Feindliche Truppen unbeschossen bei . . . . . sqq, rxf, uzd  
 Feindlicher Flieger unbeschossen über . . . . . axz, rup, spp  
 Feindliche Kavalleriepatrouille gesichtet bei rtc, kgo, ukw

Blinde Signale . . . . . arq, kye, uzh, sqv, rif

**Wichtige Meldungen**

(Fortsetzung).

- b) von den eigenen Truppen:
- |   |               |
|---|---------------|
| Wir gehen vor . . . . .   | kzj, uel, rwo |
| Wir gehen zurück . . . . .                                      | sca, kma, all |
| Wir halten die Linie . . . . .                                  | aro, kyp, sda |
| Wir greifen an . . . . .  | kca, azf, rga |
| Wir haben starke Verluste . . . . .                             | rfz, uqq, swi |
| Wir können uns nicht halten . . . . .                           | kib, acl, rry |
| Wir werden von der eigenen Infanterie<br>beschossen . . . . .   | rxp, kqa, uao |
| Wir werden von der eigenen Artillerie be-<br>schossen . . . . . | uzn, sly, ryw |
| Eigener Sturm steht bevor . . . . .                             | anx, uvs, kpy |
| Gegenangriff im Gange . . . . .                                 | rnb, aio, sac |
| Gegenangriff gelungen . . . . .                                 | uia, avu, kae |
| Gegenangriff nicht gelungen . . . . .                           | svn, rja, ump |
| Anschluß vorhanden . . . . .                                    | aek, szo, ktt |
| Anschluß fehlt . . . . .  | kxl, roq, udz |
| Erhöhte Gefechtsbereitschaft . . . . .                          | rso, kda, agu |
- c) Artillerie:
- |   |               |
|---|---------------|
| Sofort Sperrfeuer erbeten . . . . .       | uhz, rbz, sio |
| Sperrfeuer kann aufhören . . . . .        | snk, rxx, uzy |
| Feuer vorverlegen . . . . .               | rzi, kik, ame |
| Feuer zurückverlegen . . . . .            | uue, rea, sea |
| Feuer mehr nach links verlegen . . . . .  | kil, atf, rha |
| Feuer mehr nach rechts verlegen . . . . . | aqh, rqz, uho |
| Feuerwalze erbeten . . . . .              | rcj, sma, rzh |
| Feuerwalze weiter vorlegen . . . . .      | rvi, sqn, uyp |
| Halten der Feuerwalze erbeten . . . . .   | shl, aqd, rbp |
| Sprengpunkte heben . . . . .              | awb, sba, kar |
| Sprengpunkte senken . . . . .             | khu, avz, rjz |
| Abwehrfeuer erbeten . . . . .             | rkh, uua, kiz |
| Einbruchstelle verriegeln! . . . . .      | umt, sua, afu |
- d) Erbitten Nachschub von . . . . . sra, upp, kwk
- |                                       |               |
|---------------------------------------|---------------|
| Erbitten sofort Verstärkung . . . . . | aha, utn, kef |
| Tankwagen im Anmarsch . . . . .       | kua, uot, stz |

**Stations- und Betriebsmeldungen.**

Erhöhte F.T.-Bereitschaft . . . . .	knw
Erhöhte F.T.-Bereitschaft aufgehoben . . . . .	akq
Verstärkter Empfang . . . . .	sfj
Station betriebsfertig . . . . .	ayo
Station baut ab . . . . .	kéj
Ich zerstöre die Station . . . . .	rhf
Ich habe die Geheimpapiere vernichtet . . . . .	wpj
Sende mit Erdkabel . . . . .	sxg
Fernsprechverbindung unterbrochen mit . . . . .	ace
Treffer nach Station . . . . .	kro
Langsamer und deutlicher geben . . . . .	rqk
Sende mit Hochantenne . . . . .	uba
Schlechter Empfang . . . . .	skq
Habt ihr unsere sämtlichen Meldungen gehört? . . . . .	usm
Eure sämtlichen Meldungen sind gehört . . . . .	koa
Quittung folgt nicht . . . . .	uxj
Antwort wegen Bestellungsschwierigkeiten verzögert . . . . .	rag
Sofort nach hier senden . . . . .	sbn, kfq
Dies ist ein Übungsfunkspruch ohne Sinn . . . . .	aul, res, sfi
Wo ist Akkumulator-Ladestelle? . . . . .	kbq, aop, rmw
Sind Akkumulatoren fertig? . . . . .	rib, aya, kfz
<b>Blinde Signale . . . . .</b>	<b>rzi, akp, sur, kst, uuv</b>

**Stations- und Betriebsmeldungen**

(Fortsetzung).

Akkumulatoren abholen . . . . . uoz, suw, afg  
 Wo steht ihr? . . . . . sym, kwp, rtg  
 Wir stehen bei . . . . . abo, kff, rdb  
 Station soll auf Empfang stehen um . . . ksh, egy, axa  
 Station wird vorgezogen nach . . . . . rpn, kgf, uka  
 Station marschirt . . . . . wcg, ruj, ufl, spj  
 Station marschirt . . . . . sjl, uxa, rlo, kvv  
 Meldekopf befindet sich bei . . . . . utj, ssb, abu  
 Kopf des Funkspruchs . . . . . kkm, snx, api  
 \*Antwort dringend erforderlich . . . . . avn, tjz, ugb

*Ablösung . . . . . kns, akz	*Draht . . . . . shz
*Akkumulator (Sammeler) . . . . . rfj	Dunkelfeinde . . . . . awq
Amperemeter . . . . . sdd, kdi	Eierketten . . . . . khm
Anoden-Batterie . . . . . rgj	Eisenvorschalt- widerstand . . . . . rkb
Antenne . . . . . uqa	Edison-Akkumulatoren . . . . . ulq
Antennendraht . . . . . svz	Empfänger . . . . . szg
Antennenkabel . . . . . aed	Erdantenne . . . . . agd
*Beleuchtungsmaterial . . . . . kqq	Funker . . . . . kun
*Benzin . . . . . rra	*Funkspruch . . . . . rug, uda
Benzol . . . . . ubz	*F.T.-Verbindung . . . . . sqh, rwb
Blei-Batterie . . . . . slp	*Getränke . . . . . urw
Bosch-Aggregat . . . . . kpi	g-Fukgerät . . . . . xmn
Detektor . . . . . aia	*Gleichstrommaschine . . . . . amr
*destilliertes Wasser . . . . . uwg, raz	Hörer . . . . . rex
<b>Blinde Signale . . . . . snd, roe, abt, uaw, kdj</b>	

**Wettermeldungen**

(Fortsetzung).

darüber . . . . .	axf	in 200 m Höhe . .	rel, aec
diesig . . . . .	kmi	" 300 " " . .	ukf, ush
drehend . . . . .	rkf	" 500 " " . .	sai, kla
durchschnittlich . . . .	axa	" 750 " " . .	ape, ucp
etwa . . . . .	kvo	" 1000 " " . .	seu, kut
etwas . . . . .	uqw	" 1500 " " . .	ueh, sen
Feuchtigkeit . . . . .	sdk, kav	" 2000 " " . .	sue, rya
Fortdauer . . . . .	aoa	" 2500 " " . .	kta, swt
Fortdauer bestehender Wetterlage wahrscheinl.	uut	" 3000 " " . .	rsf, ajw
Frost . . . . .	rfa	" 3500 " " . .	upd, shg
Gebiet . . . . .	kzm	" 4000 " " . .	scu, ume
Gefrierpunkt . . . . .	ase	" 4500 " " . .	aau, rog
geschlossen . . . . .	rnh	" 5000 " " . .	kki, syr
Gewitter . . . . .	szd	" 6000 " " . .	skr, rma
starke Gewittertätigkeit	kej	" 7000 " " . .	utg, azb
gleichbleibend . . . . .	axn	" 8000 " " . .	afa, uxx
gleichmäßig . . . . .	skd	kalt . . . . .	sel
heiter . . . . .	rco	kühl . . . . .	ren
heute . . . . .	apu, urs	langsam . . . . .	kba
hoch . . . . .	sgd	leicht . . . . .	ans
Höhenwind . . . . .	kix	linksdrehend . . . . .	uxo
in der Höhe . . . . .	rze, aku	Luftgewicht . . . . .	ref, asx
in größeren Höhen	uul, ren	mäßig . . . . .	sqj
in Höhe von . . . . .	arv, sjo	mild . . . . .	kjj
in 100 m Höhe . . . . .	srs, kxu	Mittag(s) . . . . .	rno
<b>Blinde Signale . . . . .</b>			<b>aej, krn, sbr, uof, rxm</b>

**Wettermeldungen**

(Fortsetzung).

morgen . . . . .	keo	sehr . . . . .	ass
nach . . . . .	sia	Sicht . . . . .	rne
Nachmittag(s) . . . . .	arj	sichtig . . . . .	krm
nach oben . . . . .	uwd	später . . . . .	sfr
Nacht(s) . . . . .	akf	stark . . . . .	aos
nahe . . . . .	sfa	Stärke . . . . .	uvg
Nebel . . . . .	rzt	stärker . . . . .	sii
nebelig . . . . .	uqe	stellenweise . . . . .	rud
Niederschläge . . . . .	ahw	Sturm . . . . .	aqi
Niederschläge in Schauern	udj	stürmisch . . . . .	ral
Norden . . . . .	ria	Süden . . . . .	ayf
nördlich . . . . .	saq	südlich . . . . .	kte
normal . . . . .	ulm	Südosten . . . . .	rts
Nordosten . . . . .	kwa	südöstlich . . . . .	kia
nordöstlich . . . . .	ssw	Südwesten . . . . .	sjk
Nordwesten . . . . .	ubp	südwestlich . . . . .	agñ
nordwestlich . . . . .	kjv	Temperatur . . . . .	rkp
Osten . . . . .	als	tief . . . . .	kka
östlich . . . . .	kbn	trocken . . . . .	rdg
rechtsdrehend . . . . .	ryj	über . . . . .	uyo
Regen . . . . .	uja	überwiegend . . . . .	agr
Richtung . . . . .	rqq	unsichtig . . . . .	kfr
ruhig . . . . .	ufr	verbreitet . . . . .	uku
Schnee . . . . .	rxt	vereinzelt . . . . .	af
schwach . . . . .	ssi	Verschlechterung des Wetters . . . . .	rne

<b>Blinde Signale . . . . .</b>	<b>kcb, anl, rif, seh, uhl</b>
---------------------------------	--------------------------------

**Militärische Decknamen**  
(Fortsetzung).

Abchnitt "G"

Militärische Namen:

Division "G"	a a v
Inf. Breg.	a a x
Regt. G <sup>I</sup> .	a a y
" " " II.	a b s
" " " III.	a b v
N. J. K. G <sup>I</sup> rechts	a b x
" " links	a c s
" G <sup>II</sup> rechts	a c t
" " links	a c y
" G <sup>III</sup> rechts	a d d
" " links	a d e
etrot. Videtur. G.	a e c
" Hauptgruppe G	a e v v
Fernkampfgruppe G	a f e
Art. U. Gruppe Ost	a f f
" " Mitte	a f r
" " West	a g t
Div. Beob. Kontro	a g v
Div. Finke G	a g y
Div. Fern G	a h i
Gruppe G o r x	a i v

**Zahlen.**

Zahlen, für die keine besonderen Signale gegeben sind, z. B. 7069, werden in der Weise geschlüsselt, daß die Signale der einzelnen Ziffern: sieben, null, sechs, neun, einfach nacheinander gegeben werden; hierbei dürfen nur die Ziffern null bis neun benutzt werden. Runde Hunderte und Tausende, z. B. 200, 300 usw. und 2000, 3000 usw., in der Weise, daß die Signale für zwei, drei usw. und hundert bzw. tausend nebeneinander gesetzt werden.

Die Signale der Silbe „te“ am Ende der Ordnungszahlen dienen zum Schlüsseln der Ordnungszahlen 13te, 14te usw.

Das Signal der Silbe „mal“ am Ende der Multiplikationszahlen dient in gleicher Weise zum Schlüsseln der Zahlen 6 mal, 7 mal usw.

Beispiele: 7069: ukz, ayi, kgs, rxc; 200: adr, uza; 8000: rto, uub; 13te: slh, rmg; 6mal: sga, uma.

null . . . . .	anm, kyw, sfd, ayi	15 . . . . .	aje, egg
1 . . . . .	kez, rne, ujd	16 . . . . .	rkz, wej
2 . . . . .	swa, adr, krg	17 . . . . .	szr, aaa
3 . . . . .	rto, ugz, snz	18 . . . . .	ktm, rpx
4 . . . . .	rys, uxd, kod	19 . . . . .	wdm, sir
5 . . . . .	kjs, apz, rdz	20 . . . . .	hin, amx
6 . . . . .	sga, axv, kgs	30 . . . . .	sch, azc
7 . . . . .	rlz, ukz, srz	40 . . . . .	kdb, rhy
8 . . . . .	ahz, rxc, uep	45 . . . . .	upa, swk
9 . . . . .	spw, rxc, uyk	50 . . . . .	nid, kwb
10 . . . . .	knl, akc, rfw	60 . . . . .	rrr, slz
11 . . . . .	sej, art, kem	70 . . . . .	kpz, apv
12 . . . . .	uju, swx, aem	80 . . . . .	rbx, saz
13 . . . . .	uaq, slh	90 . . . . .	khy, avy
14 . . . . .	uwu, kiv	hundert . . . . .	avh, uza, kzw
		tausend . . . . .	uam, rzz, uub

**Blinde Signale . . . . . rxu, kps, ukr, kmv, aqi**

## Buchstaben und Silben.

a . . . . . alv, ulz, kra	br . . . . . rzm	eh . . . . . srx
ä . . . . . rqu	butte . . . . . uww	ei . . . . . ahy, kux
*ab . . . . . ubm, shk	c . . . . . kjk, apb, rcf	*ein . . . . . rve, uec
age . . . . . aoz	ch . . . . . shn, ava	el . . . . . sqz
agne . . . . . soz	château . . . . . kaj	elle . . . . . rxz
ai . . . . . ryl	che . . . . . rku, umf	em . . . . . kko
ain . . . . . uwy	chen . . . . . szz	en . . . . . alp, kyx
air . . . . . kjd	cher . . . . . agb	end . . . . . sdi
aire . . . . . aim	cht . . . . . kth, rpa	eng . . . . . azu
*am . . . . . rcg	ck . . . . . ucb	ent . . . . . kee
*an . . . . . shc, axl, kgb	côte . . . . . sqb	*er . . . . . rnx, uqt
ance . . . . . rkt	cours . . . . . rxk	*es . . . . . swv, adc
ang . . . . . umn	court . . . . . uym	et . . . . . kqo
ar . . . . . sza	croix . . . . . kmh	ette . . . . . rrf
au . . . . . aab	d . . . . . anf, vic, kzy	eu . . . . . uaz
*auf . . . . . kud, rpu, ucz	*da . . . . . adh	eux . . . . . sib
*aus . . . . . siw	*das . . . . . ars	ey . . . . . ryc
aux . . . . . rwc	de . . . . . keh	f . . . . . uyz, kpj, aqf
ay . . . . . uzz	*dem . . . . . rnd	*fach . . . . . skm
b . . . . . ath, kmz, rec	*den . . . . . uñt, swq	ff . . . . . rdq
bar . . . . . ayb	*der . . . . . ads, kxq	fe . . . . . shw
bas . . . . . ael	dern . . . . . rsp	fl . . . . . avr
be . . . . . kdd	*des . . . . . uht, sok	fontaine . . . . . kgd
*bei . . . . . siq, rnc, uqo	*die . . . . . rzy, uud	forêt . . . . . rkq
ben . . . . . swb	dr . . . . . kpw	fort . . . . . uly
ber . . . . . alv	*durch . . . . . ain, rbm	fr . . . . . syo
*bis . . . . . kwc, ram, uhy	e . . . . . sax, avx, kay	*für . . . . . ahn, kin
bl . . . . . anb	é . . . . . rjy	g . . . . . rvf, udx, spy
bois . . . . . uvb	eau . . . . . unb	ge . . . . . uyl, kml
<b>Blinde Signale . . . . . aep, rpp, uml, kat, eye</b>		

## Buchstaben und Silben

(Fortsetzung).

*gegen . . . amd, rfr	*im . . . rhq, uph	*mit . . . rly, unq
gen . . . sdm, azr	*in . . . swf, adi	mm . . . . . khx
ger . . . . . kch	ion . . . . . rye	mon . . . . . awx
ges . . . . . rnf	isch . . . . . uuw	mons . . . . . sgc
gl . . . . . uju	*ist . . . . . utb, klz	mont . . . . . rdp
gne . . . . . svj	j . . . . . kxm, rsk, uhh	mpf . . . . . aqe
gny . . . . . acv	*ja . . . . . sml	m . . . . . rzn, uuf, kig
gr . . . . . kxh	*je . . . . . uui	*nach . . . . . uht, shk
grand . . . . . rrb	k . . . . . apl, rbi, shx	nd . . . . . rsh
h . . . . . uar, sli, ryb	keit . . . . . avm	ne . . . . . adp, kqk
haft . . . . . uvm	ken . . . . . khv	nen . . . . . uix, owl
haut . . . . . kjm	kl . . . . . rjk	nes . . . . . rgg
he . . . . . apc	kr . . . . . umj	*neu . . . . . ruz
heit . . . . . rcb	l . . . . . agf, kvu, ruy	ng . . . . . kdv
her . . . . . shb	la . . . . . syv	*nie . . . . . aru
hin . . . . . axy	le . . . . . kib	nk . . . . . sep
*hinter . . . . . kgc	les . . . . . arp	nn . . . . . ano, red
ht . . . . . rki	ler . . . . . sde	ns . . . . . klc
i . . . . . ukd, syc, aar	lich . . . . . kzf	nt . . . . . uze
*ich . . . . . ktf, rpl	ll . . . . . rfk	ny . . . . . sqk
icht . . . . . ucf	lles . . . . . anp	o . . . . . kae, roe, neu
ie . . . . . sih, rwn	los . . . . . ayu	ö . . . . . ank
ien . . . . . uzp	ly . . . . . rxl	*ob . . . . . ezi
ier . . . . . kky	ma . . . . . udw, sjw, kle	oire . . . . . uka
ière . . . . . amw	maison . . . . . rok	ois . . . . . rlr
iers . . . . . reb	*mal . . . . . uma	oix . . . . . khtv
ies . . . . . kyj	*man . . . . . ali	on . . . . . aww
ig . . . . . scf	me . . . . . ksf	ons . . . . . saf
il . . . . . azh	men . . . . . abl	ont . . . . . rcm
illy . . . . . keg	mer . . . . . szf	
<b>Blinde Signale . . . . . ard, kye, ukl, rrk, sqv</b>		

## an—Artillerie

*an Stelle von . . . . .	rzd	antreten . . . . .	kwy
andauern . . . . .	aic	Antwort . . . . .	rtr
andere . . . . .	rdn	anwesend . . . . .	ugc
Änderung . . . . .	sgr	Anzahl . . . . .	snv
anfangen . . . . .	awy	*Anzuge, im . . . . .	ryd
anfordern . . . . .	kax	Apparat . . . . .	uvd
Anforderung . . . . .	rlf	Arbeit . . . . .	kjy
Anfrage . . . . .	ukt	arbeiten . . . . .	apm
Angabe . . . . .	sze	Armee . . . . .	rdm
angeblich . . . . .	aho	Armeeoberkommando	
angegriffen . . . . .	kuc	(A.O.K.) sgt	
angreifen . . . . .	uev	Artillerie . . . . .	awv, kbo
Angriff . . . . .	rtk	*eigene — . . . . .	rj, uln
Angriffsstreifen . . . . .	sqf	*feindliche — . . . . .	ste, agg
Angriffsvorbereitung . . . . .	rxg	*Kommandeur d. — . . . . .	rvj
anhalten . . . . .	uyb	*leichte — . . . . .	rpq
anlegen . . . . .	kux	*schwere — . . . . .	sgx
*Anmarsch, im . . . . .	ake	Artillerie-Beobachter . . . . .	kjn
Anmarschweg . . . . .	kyy	Artillerie-Feuer . . . . .	rvi, ksi
Annäherungsgraben . . . . .	sdl	*eigenes — . . . . .	uct, sjn
Annäherungsweg . . . . .	azs	*feindliches — . . . . .	uyc, kke
anzurufen . . . . .	kdw	Artillerie-Flieger . . . . .	aot
Ansammlung . . . . .	rgq	Artillerie-Meßtrupp . . . . .	rei
anscheinend . . . . .	uiy	Artillerie-Stellung . . . . .	kzu
Anschluß . . . . .	svl	Artillerie-Tätigkeit . . . . .	scg
ansetzen . . . . .	afj	Art.-Unterstützung . . . . .	asr
		Artillerie-	
		Verbindungsoffizier . . . . .	kce, rhm
<b>Blinde Signale . . . . .</b>			<b>ugr, rif, seh, kqx, avd</b>

## Artillerie—ausschwärmen

Art.-Vorbereitung . . . . .	upy	aflösen . . . . .	kzk
*ohne — . . . . .	sq	Aufmarsch . . . . .	sci
Arzt . . . . .	ach	aufnehmen . . . . .	azj
auch . . . . .	krk	aufrecht erhalten . . . . .	kci
*auf . . . . .	kud, rpu, ucz	aufreiben . . . . .	rnn
Aufbaumeldung . . . . .	rwl	*aufgerieben . . . . .	sjf
aufbrechen . . . . .	uhm, slr	Aufsatzschieber . . . . .	uik
Aufbruch . . . . .	kpl, uuk	Aufschlag . . . . .	svb
*auf d. rechten Flügel . . . . .	kjp	Aufschlagzünder . . . . .	aeq
*auf d. linken Flügel . . . . .	apd	Aufstellung . . . . .	kxi
*auf der ganzen Linie . . . . .	rdu	Augenblick . . . . .	rsq
*auf Hintergelände . . . . .	sgp, khn	*aus . . . . .	siw
*auf Stellung . . . . .	aad	*aus Richtung . . . . .	rqb, axj
*auf Vorgelände . . . . .	rji, umq	ausbleiben . . . . .	uhp
auffällig . . . . .	syd	ausdehnen, sich . . . . .	snq
auffahren . . . . .	abb	ausführlich . . . . .	ryg
*Aufforderung z. Schuß . . . . .	ayd	ausfallen . . . . .	uwr
*Aufforderung z. Salve . . . . .	agq	Ausgang . . . . .	kip
*Aufforderung zum Wirkungsschießen . . . . .	ksk	ausgenommen . . . . .	ags
Aufgabe . . . . .	rpm	ausheben . . . . .	rcp
aufgeben . . . . .	ucq	Auslade- . . . . .	sar
*aufgerieben . . . . .	sjf	ausladen . . . . .	axq
aufhören . . . . .	rwh	ausreichend . . . . .	kgi
*hat aufgehört . . . . .	uyj	aussagen . . . . .	rlk
Aufklärung . . . . .	kkq	ausschließlich . . . . .	ukg
Aufklärungseskadron . . . . .	aoh, rej	ausschwärmen . . . . .	stg
<b>Blinde Signale . . . . .</b>			
		. . . . .	abt, uuv, rfu, sbr, khc

L

3\*

**Appendix 8D.—AN EXAMPLE OF THE FIRST THREE PAGES OF INSTRUCTIONS AND TABLES FOR  
ENCIPHERING WORDS NOT IN THE *SATZBUCH***

## Buchstabierverfahren.

### Das Schlüsseln.

1. Ersetze in dem zu buchstabierenden Worte ä durch ae, ö durch oe, ü durch ue (z. B. Düsseldorf = Duesseldorf) und zerteile das Wort in Buchstabenpaare. Bleibt dabei ein einzelner Buchstabe übrig, so hänge an ihn einen als wertlos erkennbaren Buchstaben, z. B. j, x, y oder q an.

**Beispiel:** Das Wort „Duesseldorf“ ergäbe:

du — es — se — ld — or — fx

2. Schlüssele die so gebildeten Buchstabenpaare mittels der „Schlüsselungstabelle“. Dies geschieht, indem man die Buchstabenpaare aufsucht und sie durch die in der Tabelle neben ihnen stehenden Buchstabenpaare ersetzt.

**Beispiel:** du = lz, es = jt, se = ch, ld = se, or = bv, fx = wd.

3. Vor jedes so gefundene Geheimbuchstabenpaar setze je als dritten Buchstaben a, k, r, s oder u.

**Beispiel:** klz ajt chu sse rbv swd.

4. Zähle die auf diese Weise gebildeten dreistelligen Signale, suche das ihrer Anzahl entsprechende „Buchstabiersignal“ auf und setze es vor diese Signale. (Die Buchstabiersignale befinden sich auf der folgenden Seite.)

Das Buchstabiersignal gibt dem Entschlüsselnden an, wieviele hinter ihm folgende Signale nicht im Satzbuch aufzusuchen, sondern mittels des Buchstabierverfahrens entstanden sind.

**Beispiel:** klz ajt uch sse rbv swd.

Es sind 6 Signale. Das Buchstabiersignal für „es folgen 6 geschlüsselte Buchstabenpaare“ lautet: upf.

Es wird vor die Signale gesetzt

upf klz ajt uch sse rbv swd.

**Buchstabiersignale.**

Es folgt 1 geschl. Buchstabenpaar	—	uty	ala
Es folgen 2 geschl. Buchstabenpaare	—	ata	sle
" " 3 " "	uso	kmd	rsa
" " 4 " "	aua	rik	uoa
" " 5 " "	kti	sie	uzu
" " 6 " "	rtw	upf	kdc
" " 7 " "	awj	rir	snu
" " 8 " "	svr	asu	kze
" " 9 " "	rce	ajm	uvc
" " 10 " "	uli	stj	amz
" " 11 " "	—	kqe	uup
" " 12 " "	—	rau	apo
" " 13 " "	—	kpu	ugi
" " 14 " "	—	adz	rhn
" " 15 " "	—	sck	klw
" " 16 " "	—	rvp	ufu
" " 17 " "	—	aaq	syz
" " 18 " "	—	sam	kbz
" " 19 " "	—	uaa	soe
" " 20 " "	—	asa	kxz

	a	b	c	d			
aa	nu	ba	ku	ca	ez	da	sv
ab	ha	bb	ah	cb	ir	db	hl
ac	oe	bc	vo	cc	zg	dc	rx
ad	hc	bd	ft	cd	ba	dd	ge
ae	xf	be	sm	ce	up	de	vh
af	gs	bf	ev	cf	lp	df	la
ag	bf	bg	no	cg	tb	dg	ob
ah	qa	bh	nf	ch	ar	dh	lf
ai	kb	bi	gq	ci	rn	di	fr
aj	is	bj	qr	cj	er	dj	qt
ak	vz	bk	kw	ck	st	dk	aj
al	wt	bl	oy	cl	dt	dl	uc
am	fi	bm	jx	cm	kg	dm	sz
an	nk	bn	tx	cn	ye	dn	fx
ao	gh	bo	fl	co	ke	do	nm
ap	sc	bp	xz	cp	vt	dp	wl
aq	id	bq	kk	cq	yy	dq	ac
ar	yi	br	rt	cr	qm	dr	eh
as	fv	bs	ue	cs	hj	ds	yw
at	zk	bt	ik	ct	pn	dt	sr
au	ed	bu	fa	cu	gj	du	lz
av	rh	bv	xk	cv	ni	dv	jk
aw	jn	bw	he	cw	ot	dw	zi
ax	to	bx	ys	cx	jm	dx	kn
ay	mm	by	zu	cy	xq	dy	cv
az	vb	bz	jd	cz	dn	dz	pi

	e	f	g	h			
ea	pq	fa	dj	ga	fn	ha	rv
eb	pl	fb	da	gb	el	hb	tq
ec	zp	fc	xi	gc	kd	hc	mi
ed	iw	fd	vw	gd	ww	hd	qg
ee	zs	fe	bi	ge	et	he	zd
ef	wh	ff	so	gf	ut	hf	an
eg	hr	fg	aa	gg	ji	hg	nq
eh	oj	fh	pe	gh	zq	hh	af
ei	gv	fi	kl	gi	hf	hi	ze
ej	tv	fj	ph	gj	xp	hj	lc
ek	ia	fk	av	gk	vp	hk	kt
el	qh	fl	xx	gl	ja	hl	ui
em	sy	fm	gt	gm	nc	hm	fo
en	az	fn	jr	gn	qv	hn	pd
eo	fc	fo	ov	go	iy	ho	fe
ep	nt	fp	ht	gp	si	hp	ll
eq	bs	fq	th	gq	fu	hq	ol
er	ky	fr	gd	gr	wj	hr	eb
es	jt	fs	ql	gs	pb	hs	sd
et	ao	ft	ei	gt	hw	ht	gk
eü	dg	fu	un	gu	sk	hu	qz
ev	vu	fv	na	gv	ee	hv	yn
ew	fk	fw	ig	gw	rp	hw	di
ex	ug	fx	wd	gx	cn	hx	vj
ey	zn	fy	go	gy	or	hy	kp
ez	ga	fz	zw	gz	ak	hz	jw

Schlüsselungstabelle 140 (a-h)

## Appendix 9.—EXTRACTS FROM A BRITISH ARMY FIELD CODE\*

SECRET

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## SECOND ARMY TRENCH CODE

## COMMON WORDS AND PHRASES

046 About	060 In front (of)	074 Position
047 Against	061 Left	075 Quarter
048 Back line	062 " flank	076 Quickly
049 Behind	063 Line	077 Rear
050 By	064 Located (at)	078 Rendezvous
051 Can	065 No, not	079 Return
052 Centre	066 North	080 Right
053 East	067 Now	081 " flank
054 Enemy	068 Officer (s)	082 Sentry (ies)
055 Flank	069 On	083 Since
056 From	070 Other ranks	084 Slowly
057 Front	071 Our	085 South
058 On front from	072 Parapet	
059 Front line	073 Point	

## GAS AND GAS ATTACK

## OUR FORCES

153 Conditions are favourable for release of gas	165 Gas alert on
154 What is approximate velocity of wind?	166 " " off
155 Approximate velocity of wind is ---- miles	167 All ready for gas attack
156 Wind dangerous	168 Gas will be released at ---- (time)
157 " safe	169 Gas has begun to be released
158 " has dropped	170 " " ceased " " "
159 Gas	171 " " blown back
160 Are we to use gas?	173 Require (number) ---- gas cylinders
161 You will make gas attack	174 Gas cylinders will be carried up to trenches
162 Am / (----) is/ are/ going to make gas attack	175 " " have arrived
163 This retards release of gas ---- hours from original zero	176 Our gas cylinders damaged by enemy's fire
164 Warn gas personnel to have all ready by ---- (time)	177 " " " leaking
	179
	180

\*I never saw an original of a British Army field code. The extract here shown has been set up in type from a typewritten copy (of the original) found in a historical file among Major Barnes' papers.—W. F. F.

## ARTILLERY

## OUR FORCES

*Artillery support*

- |  |   |
|--|---|
| 314 I (----) require artillery support from (nature of guns) | 316 I (----) " consolidate (----) without artillery support |
| 315 I (----) cannot advance without artillery support        |   |

*Barrage*

- |   |  |
|---|--|
| 318 Barrage with (nature guns) required | 328 Barrage effective  |
| 319 " " " " will begin at ----          | 329 Am/ (----) is/are going to advance and artillery should lift               |
| 320 " " " " " cease " ----              | 330 Am/ (----) is/are going to advance and artillery should lift to supports   |
| 321 " " " " " lift " ----               | 331 Am/ (----) is/are going to advance and artillery should lift to point ---- |
| 322 Increase barrage                    | 332 Am/ (----) is/are going to advance and artillery should lift to line       |
| 323 Renew "                             | 333  |
| 324 Stop "                              |  |
| 325 Lift barrage to ----                |  |
| 326 Creeping barrage                    |  |
| 327 Stationary "                        |  |

## REINFORCEMENTS

## OUR FORCES

- |  |  |
|--|--|
| 564 Do you require reinforcements?                   | 572 Have reinforcements ready                    |
| 565 Reinforcements required                          | 573 Reinforce front line trenches                |
| 566 Require following to make good casualties ----   | 574 " support line                               |
| 567 Am/ (----) is/are sending up reinforcements      | 575 " troops at ----                             |
| 568 Reinforcements are on the way                    | 578 Am/ (----) is/are being reinforced by ----   |
| 569 " have arrived                                   | 579 " (----) is/are moving up in support of ---- |
| 570 No reinforcements available                      | 580 Reserves at point ----                       |
| 571 Unable to get up reinforcements owing to barrage | 582  |

## ENEMY FORCES

- |  |                       |
|--|-----------------------|
| 583 Enemy is being reinforced at ----  | 586 " " " " from ---- |
| 584 " has been " " ----                | 587                   |
| 585 " reinforcements moving up to ---- | 588                   |

## SPELLING

- |                       |          |                    |
|-----------------------|----------|--------------------|
| 841 Commence spelling | 410 I, J | 877 S              |
| 014 A                 | 665 K    | T                  |
| 017 B                 | 852 L    | 882 U              |
| 844 C                 | 679 M    | 894 V              |
| 021 D                 | 730 N    | 897 W              |
| 213 E                 | 741 O    | 865 X              |
| 229 F                 | 856 P    | 905 Y              |
| 848 G                 | 771 Q    | 867 Z              |
| 285 H                 | 873 R    | 868 Cease spelling |

**Appendix 10.—REPORT OF 1ST LT. J. RIVES CHILDS \***

\*I have added the paragraph numbers, for reference purposes. The notation (at the end) "Parker Hitt's initials" is also mine. Otherwise this appendix is a faithful reproduction of the original, errors, insertions, deletions, etc., included.—W. F. F.

May 17, 1918.

MEMORANDUM FOR MAJOR MOORMAN.

EXPERIMENTATION WITH OUR CODE.

- (1) A. Time. The recording of the frequency of groups, on attached chart, occupied 3-1/2 hours.
- (2) One hour and a half after the receipt of the messages, the first letters were identified and the word k-i-l-l-e-d, was solved at the end of the third hour.
- (3) The solution of the cipher alphabet was complete at the end of the fifth hour, and the messages were completely decoded and set up on the typewriter at the end of the tenth hour.
- (4) A cursory examination of the messages indicated that the behavior of the group TKG offered the most likely point of entry. This group was isolated in the following manner, attention being paid solely to its repetition as a doublet.

	BCN	<u>TKG</u>	<u>TKG</u>	BCN
	BCN	<u>TKG</u>	<u>TKG</u>	GRO
TWS	BCN	<u>TKG</u>	<u>TKG</u>	GWY
TWS	BCN	<u>TKG</u>	<u>TKG</u>	GWY

Around TKG was noted the repeated appearance of BCN, GRO, GWY, etc.. Inspection was made for the repetition of these groups throughout the forty-four messages. Other groups such as DCA, ACZ, FKA, TWS, were also noted as tending to appear in the vicinity of TKG.

- (5) TKG was immediately assumed to be a single letter, and resort was had to the frequency of occurrence of double letters in English. T and S were assumed for the value of TKG, and immediately discarded, not appearing to fit. L, third in point of frequency as double letter in English was next assumed. The spelling group ED, was the most natural to assume as following the LL. It will be noted that in two cases after the repetition of TKG there is a group whose initial letter is in two instances G, i.e., GWO and GWY. The group representing L ends in G in the cipher, therefore, this letter constitutes a check on our assumption. Reference was had to the book, and the result of assuming TKG to represent the Code-word MIB, (L) and GWY to represent HEG (ED), was confirmed. Meanwhile the groups which surrounded TKG, as noted above, had been identified as single letters, not only because of their appearance, coincident with TKG, but also because of their appearance as a double, i.e.,

page 2.

SCU	<u>DCA</u>	<u>DCA</u>	BCN
ACZ	<u>GRO</u>	<u>GRO</u>	BCN
GRO	<u>ACZ</u>	<u>ACZ</u>	FKA

The fact that these groups appear in this manner and at the same time were the most frequent groups appearing in the forty-four messages, identified them as letters or spelling groups. The doublets could certainly be identified as letters.

(6) In the part which had been deciphered L-L-ED, it was next assumed that the group preceding must naturally be a vowel. The letter "I" was assumed giving "I-L-L-ED", K as preceding "I" following as an inevitable assumption. These results were then checked up by the means of a code-~~book~~, and confirmed. The fact that such a word, as "K-I-L-L-ED", does not appear as a code-word, when it must necessarily form constantly a part of messages in the vocabulary of the Army, illustrates one of the defects of the code. There are certain words such as this, for example, INSTRUCTION, ADVISED, YOUR, SNIPERS, FORGING, TRANSFERRED, SENT, BAVARIAN, AUSTRIAN, ENTANGLEMENTS-DURING, which when employed any number of times, as they are certainly likely to be, without alternative readings for the common letters of the alphabet and for the common spelling groups, will make the decipherment and decoding of any considerable number of messages received by the enemy, a simple task. It might be suggested for example, that where the groups, ED, ING, LY, MENT, are represented by the same values on every page, as many different values might be given them, as they occur. If the verb "WORK" is encoded on page 35, and the past participle "WORKED", is to be used, it would be no more difficult, and would result in no more confusion, for the operator to make use of the value given ED, on that particular page, as distinctive from the other values that might be given ED on the other pages. In receiving the message the operator would naturally decode the message by the use of the value of ED, to be found on the page on which he found himself. This would also result in a check on the two groups in case a mistake had been made.

(7) Upon tabulating results, it was found that in every instance <sup>save one</sup> every premise which we had made was confirmed. Following is the frequency of the groups which we had isolated originally and assumed to be letters or spelling groups

<u>Enciphered</u> <u>code group</u>	<u>Frequency</u>	<u>Code</u> <u>Group</u>	<u>Value</u>
TKG	23	MIH	L
FKA	30	SIK	S
DCA	23	ROK	R
YCI	24	GOF	D

	<u>Page</u>		
AVA	10	KYK	H
BCN	18	LOP	I
GRO	18	HAW	E
GWY	19	HMP	ED
DRF	20	RAS	. (period)
SWZ	16	VEN	TO
BVO	14	lyw	ING
HVL	11	FID	T
SCU	9	VOZ	U

Seventy percent of these prove themselves to be letters, twenty-two percent spelling groups. Group for period was the only one we had miscalculated, out of thirteen.

(8) The fact that the code is enciphered ~~does not~~ not complicate it, nor does it appear, that it would long succeed in puzzling the enemy. If a group TKG, is a code group, representing a single letter, and it is the only code group representing the letter, it might be enciphered and re-enciphered, to the nth power, without altering in the least, its behavior and its positive identification as a letter, when observed throughout any number of messages. The fact that TKG, is represented by MIH, which in ~~turn~~ represents L, is of no concern to the enemy, and is a matter about which ~~he~~ will be little troubled. He is satisfied to know that TKG, represents L, and all the twistings and turnings in the world will not alter its identification as L, as the code stands in its present form.

(9) Of course the use of code-groups to represent letters and spelling groups is, in a code, inevitable, but the ~~worse~~ feature of this evil, may be avoided by the employment of ~~alternative~~ alternative groups, to represent the letters and spelling groups, which must appear most frequently. Otherwise it would always be possible for the enemy to identify the cipher portion, (that is, the groups representing letters and spelling groups) ~~at a glance~~, and from this point, to isolate these groups, and by the use of simple frequencies employed with ciphers, to decipher and decode them, will be a matter of small moment. To illustrate by example: AVA, was identified almost immediately after the code was in our hands, as a group representing a letter. The initial and final letters were identical. What letter was there in the code whose initial and final letters were the same? There was only one-H-, we were not even under the necessity of trying and fitting from among several.

(10) From this it would appear, that if the code is to be enciphered at all, as it stands now, three different alphabets should be employed, one for the initials letters of the code group, one for the final letters and one for the middle letters.

page 4.

- (11) Attached to this report is a chart, showing the frequency, of the groups, as made up immediately upon receipt of the messages. This chart illustrates quite accurately, as we have previously noted, the means by which simple cipher frequencies may be employed, and will be employed by the enemy, to arrive at the solution of the code.
- (12) Furthermore, it will be noted that there are certain columns of the chart, column G for example, which stand out prominently from the remainder. Suppose we turn to page 14 and 15 of the code book, which contains the code groups for E and its spelling groups, ER, EN, the most frequently occurring letter and the most frequently occurring spelling groups, in our language, contained on the same page, with a long entry of code groups, relating to the "ENEMY ADVANCE STOPPED" and etc., The natural supposition is, that the initial letter "E", by whatever means it may be enciphered, will always be identified, in any considerable body of messages, since it is seen to be the initial letter of a series of code groups, representing, letters, spelling groups, and phrases, which are bound to occur most frequently in messages passing in the army. This fact illustrates the glaring fault of permitting the contents of the code, to be encoded, with groups, whose initial as well as whose final letters run in alphabetical sequence. Most often the initial letter of the code, coincides with the initial letter of the matter to be encoded. This, while not so marked at the beginning of the book, gradually increases, so that towards the end the letters run practically parallel. Thus, the initial code-letter, "S" constitutes, the initial code letter of subject matter which begins almost exclusively with "S". The initial code letter "N" on page 23 embraces the code groups from "N-NORTHEASTERLY". Certainly the enemy would eventually determine it, and if the code groups after decipherment, began in E, he would not look for its translation, in a word beginning with Z. Take in message "No. 28." for example and assuming the beginning, "SHORT OF" as solved, the fact that the next group is RUB, will at once warrant the assumption that "MUNITIONS" is an erroneous hypothesis and that "RATIONS" in alliteration with that group, is a quite probable solution.
- (13) And again, it might be further added that the fact that there exists no blind groups or nulls, anywhere in the code, materially simplifies the work of the decipherer and decoder.
- (14) Lastly, the option for the use of words as singular or plural, without any qualifying mark, gives rise to a multitude of misinterpretations, so quote further by example, in the message "Aeroplane(s) coming out" the receiver of the message would not be able to determine whether a single plane was approaching, or a squadron. Also, in the message "Rush rifle(s) ammunition" it is not clear whether rifle ammunition is to be rushed, or rifles and ammunition.

Page 5.

(15)

To summarize, therefore, the weaknesses of the present code as revealed in our attack.

1. The absence of
  - (a) Alternative groups, to represent letters and
  - (b) Nulls or blind groups, makes the cipher makes the cipher portions of the code, stand out in sharp relief, and makes the solution of it by simple frequencies a mathematical certainty.
2. The employment of a simple substitution system to encipher the code, the initial letters of whose groups, coincides most frequently, with the initial letter of the text encoded, affords the best sort of check to the work of the enemy decoder, and offers no security.
3. The Employment of an alphabetical sequence, to distinguish the code groups, through-out the book, gives a frequency, to certain initial letters which cover the portion of the book most used, as pages 14 and 15, for example, already noted, as to enable them to be identified by the frequency of their occurrence.
4. Omission of very common military words, which necessitates, their being spelled out, when it is necessary to employ them, thereby facilitating and practically insuring the decipherment of the text by the enemy.
5. The fact that there is no distinction made between the singular and plural forms of nouns is certain to give rise to grave misunderstandings.

Note: In the forty-four messages, given us, to be deciphered and decoded, errors amounted to about 1 per message.

*Every fault above noted is well taken and can be corrected in a new code. T. H.*

(122)

*↑  
Parker Hitt's initials*

- NO. 1. OR ZOM FRT MRL MKZ ZWI DKL MRY HRA TWS BCN  
TKG TKG GWY MRL UES
- NO. 2. OR SWZ PEM YRD SRI DVD UKF HVI DWI NKL MWT  
HVL AVA IRM MWB PVF MRM PWS UKH TVM PWO YCI  
GRO IKG DWG NRL BCN GVO FWN PVF TCP AWH
- NO. 3. OR PCY YRM NCF YVD TRZ ICP YVF HVL BVO SCU  
BCH FKA AVA UKI GWS NCL NRL
- NO. 4. OR DCA SCU FKA AVA FWB PVY MWZ DWH MGY
- NO. 5. OR LRO BRI SWA UEM NCF UCF ICP AEI URI TCL  
SEP SWZ DEZ GWS ZWG
- NO. 6. OR MWY HCS ZEN GWY SWZ GEO UES HKU MVL UGA  
SCL
- NO. 7. OR ICA YCI UKF FRT SRZ BWO NKL MWZ SRM LKB  
MRH PWS UKD DKZ SWZ AEP BWO NRL BCO BKD
- NO. 8. OR YRS FKA BCN YCI GEN PKL YCA SWZ NCF LEN  
NKZ MRB BVG FWB TCP ZEA GRO GWY PVY PVF DVZ
- NO. 9. OR YVI MWY ZWI UVY DCA YRD MWZ NCB LEM GWD  
HVW PVH ZWY FKA BEG ACL NWA FCB YKT GWY IKG  
UVY DCA DEU PWO YCI SVP TRS GRO UWO IVF NVF  
TCA GWY HET LES BVO DCA SCU FKA AVA GWY
- NO.10. OR YEL TWB PVY DCA SCY FKA AVA GVO DEP FKA  
AVK HET IWG GVH YCI MRI ZWI TWS BCN TKG TKG  
GWY SVD DCA TWG BYO ACY TKG FRT
- NO. 11. OR BVA DCH NEB
- NO.12. OR DVN YRS DKP YCI AKB LKH DEM BRO YVU YCI  
FKA NVF TRD TWG NWA ZWI BKT GVP SRS NRD TWS

NO.13. OR UWN TRS SRI ZRA HVL GRO DCA UEM TWS UKZ  
 YCI NRD GPC FKA BWH NRL AEG SES SRI LEP  
 LKY GWY AKB FRB LKN

NO.14. OR BWT DEZ YCI YVS FKA GWD HVL IKG DWL NVF  
 DEP MVP ZRD SWZ FRI NWA TEL FKA GWD HVL  
 LKB MWB MKO PWS DKH TWP FKA PWO HVL TRS  
 GVO BCH

NO. 15. OR UEM LEP BWI DEZ YCI BVZ TRZ FKA FWZ LKN  
 ZEP BCN HCN

NO.16. OR SRF LEP LKN GWS FEG ZRY GWY AKB ZRA TRZ

NO.17. OR AVA SCU DCA DCA BCN ICP BKS SRB UEM FWB  
 AWG

NO.18. OR AWZ UKH AKY GWY MWY UEO IKG MRB SCL IKT  
 TKG GRO PVN GEN FKA BWN ACD AES FWB PVD  
 TKI FCL URI MCM LVA

NO.19. OR PWO YCI SVP TRS GWY AEL LWT UKF NKF NWO  
 TKG TVM FCB BRH SRI ZWI HVI SWZ FVD LKN TWO  
 NKN ZET TEN NVY FKA GRO TVM HVL

NO.20. AR ACZ GRO GRO BCN SVD BCN FKA AVA BCN AVB  
 HWS LES PVN FKA DRF NRD AVA AKB AVA PED  
 PVF GRO ACZ ACZ FKA DRF

NO.21. OR LEP SVS GWY FCB DKH

NO.22. AR BWT DCA FRT DEY DRF UKZ YCI NWO HVL UUY  
 LRM DKU LRS TEL YCP

NO.23. OR GWS AWG LCF TEU YCA YCI ACZ TKG LKM FKA  
 UET LKB LCN PKG LRH DCA LKB YCI SCU DCA  
 BVO ZVP IEU GRB

NO.24. OR BEG FKA NVF GRO IKT SWZ DCA AEP UKF BEG  
 FKA NV<sup>5</sup> GRO IKT HVL MRP MEP SRM DEU LKB  
 LCF NIO SVP BCN TKG TKG BCN GEN SWO AEY

NO.25. OR NWM TET GWY LKB TVM BCN ACZ ZEA GRO SVP  
 BCN TKG TKG GRO PPT ZPY BRO GEP DVY ACI SOL  
 DEM LVT FKA GWD HVL

NO.26. OR SCL LCF TEU YCA GWY IKG GWS FVT UCL PKL  
 DVS ZCH TEZ GCO DCA BEG HKS DCA SCU IKT SWT  
 FKA SVS GWY SVD SCU AVA

NO.27. OR UES YRL BRH HVL DCA PVN FKA GVO GEN DOA  
 DCA GWY YRI YRD SWZ AWB FEN FCD NWN SWZ  
 HVI ZEY DWI

NO.28. OR FVS NWA DEM DRF ZWI AVA SEM ALZ FKG DRF  
 UWN TRO SRI ZRA HVL GEN UEM SRI DVD

NO.29. OR BOA DRF GEG DRF DET DEM UET BVO SWS GVO  
 DEG GRO

NO.30. OR GWD VKG UEM GWS DRB YCI SCU DCA BVO ZVP  
 MRL DKG DRF LCN PWO SVP PWO DCA BCN PVN  
 FKA DRF MRL TWS BON TKG TKG GWY MRY UES  
 UKP FVM URA FCD SRB

NO.31. OR MRL YRD UKF LKH GCN IRM BCN PVN YCI HKS  
 TEL LKB MWA PWS HRZ AKB LKH NKZ DES DRF  
 AKY LEP

NO.32. OR MRI TWS BCN TKG GWY YRL MWM UES YCI  
 SCU DCA BVO LKH DRF MWZ MRM ZWF AEL SCL  
 ICT YCI DKG HVY SCL NCB YCI DRF GVP SRS  
 DCI NRB

NO.33. OR HWD DCA FKA YCI NRD BVO AEZ UET PVU  
 BVO GWS AKB IKT BVO SRB SWZ TWO SEY YKT

NO.34. OR FCD LCA SWZ DEF DWN GKT TET YCI TEL  
 NRP NIA BWH TKG TKG NRD SVP BCN TKG TKG  
 GRO

NO.35. OR LES TKG BCN GRO SVP GIY SWA AKB HVG  
 SWZ AED BEG PKD YRL ZEN SRA HED DRF LKH  
 UKH HED ACH TKG UEM SRA BKA

NO.36. OR SEA DRF AEI BVL LCN DRD TCT ZET BVA  
 YCL UCF PKH

NO.37. OR BCM SEZ DEB NWA LCN FCB IRZ GWY IKG  
 PCY DRF LRI AVL IWF TWG GRB

NO.38. OR AEL DKP BVO ACH DRF AEY LWT NRL BCO  
 BCN GWY FRT

NO.39. OR UWL DWZ DCA PWO BEG GWY PEM ZVP SVP  
 TRS BCN LCN BCN TKG BCN SCS DWZ

NO.40. OR ARZ IKY UCT ZEN GWY NKZ ZKP DRF MRY  
 SWZ FRI TEL

NO.41. OR MRL ZWI UKF AEH NVY SWZ GWS TEL SKM  
 PVF DWI SKH AEU FKA ZEB LEM GET PVH ZWY  
 FKA

NO.42. OR TCL GWD DCH GVP MRD ZKA AGM MRU PWS  
 SED DEZ HRZ

NO.43. AR PEM HKU LCP SRI NVF LWO BCN ZRY HVL  
 GEN TRS IVO BVO HKM URP AKB BRD UEM PWO  
 DRH

NO.44. OR TKF FKA LKH TVB IKG SRI NEU PKG IVF NVF  
 TKG TRS BWH YCI FWP FKA FRZ GWY UEM GVZ TRZ  
 NWA HWA FKZ NKI UCB DRF AVB HVZ DCA NRD SCU  
 LCN TKG GRO UEM TCT UEM SRI AKF IKI UWI GES  
 GWY LKB DKL DRF BRH HVY HCB FKA AKB SRI LKH  
 NWI FKZ YKM DRF HCU MEP YCH MWA ZKB BVO MRP  
 MEB UES YWB BVO ICT YCI SCL LCB BVO ACB NCI  
 FCD DEM LKN DRF IKT NRD TKG

MESSAGE NO. 1.

MORNING REPORT 242 MEN PRESENT 4 SICK KILLED 2 WOUNDED

MESSAGE NO. 2.

TO ALL COMPANIES THE RELIEF WILL TAKE PLACE ON THE 24TH BETWEEN 23 AND ZERO O'CLOCK WILL BE MADE BY PLATOON(S) NOT IF (probably means NOTIFY) RIGHT LEFT FLANK.

MESSAGE NO 3.

AERROPLANE(S) COMING OUT OPPOSITE DIRECTION CANNOT DISTINGUISH WHETHER ENEMY OR NOT.

MESSAGE NO.4.

RUSH RIFLE(S) AMMUNITION 25 POST(2) 54.

MESSAGE NO.5.

ARE HAVING HARD TIME WITH OUR WIRELESS CANNOT GET WAVE(S) LENGTH UNABLE TO RECEIVE ENEMY MESSAGES.

MESSAGE NO.6.

TWENTY STRETCHER BEARERS NEEDED TO EVACUATE WOUNDED STATION(S) 85 --- (probably 2) TRENCH(ES)

MESSAGE NO.7.

CAPTAIN D., WILL REPORT THESE HEADQUARTERS ON THE 25TH AT TWELVE O'CLOCK WITH (probably WILL) PROCEED TO GENERAL HEADQUARTERS NOTIFY HIM.

MESSAGE NO.8.

CONSIDER ABANDON SECOND LINE DAMAGE TO OUR BATTERY ON TIME 6 INCH RIFLE(S) LEFT NEED AMMUNITION AND REINFORCEMENTS.

MESSAGE NO 9.

DETAIL 4 MEN YOUR COMPANY 25 ORGANIZE BARBED WIRE ENTANGLEMENT IN FRONT OF SECTOR(S) COVERED BY YOUR REGIMENT ADVISE WHEN COMPLETED SUPPLIES BEING RUSHED.

MESSAGE NO 10.

DEFECTIVE AMMUNITION RAPID TRENCH MORTAR AMMUNITION SH FRESH SUPPLIES BREACH EXPLODED 3 MEN KILLED. WRITING --- REPORT.

MESSAGE NO. 11.

INCREASE RANGE OUR ARTILLERY SHELLING US.

MESSAGE NO. 12.

REINFORCEMENTS HAVE ARRIVED CON PREPARED FOR ATTACK  
(probably means COME PREPARED FOR ATTACK) RATIONS HAVE  
BEEN DISTRIBUTED SPIRIT OF MEN HIGH EVERYTHING O.K.

MESSAGE NO. 13.

WHAT IS THE MATTER WITH K. WHY DOES HE NOT GIVE US  
BARRAGE ASKED FOR REPLY AT ONCE

MESSAGE NO. 14.

HAVE YOU RECEIVED DISPATCH SENT BY PISTOL PRE 84  
MAY HAVE TO REPAIR LINE(S) SENT AT 23:38 O'CLOCK  
IS NOT S T IS EVERYWHERE IED

MESSAGE NO. 15.

WITH BARRAGE HAVE NOT RECEIVED INDICATIONS RIFLE(S)  
PIT(S) AT ONCE MUST I STOP

MESSAGE NO. 16.

THICKEN BARRAGE BARRAGE AT ONCE ENEMY SENDING  
MASSED FORMATION

MESSAGE NO. 17.

HURRY CANNOT HOLD THEM WITH RIFLE(S) FIRE

MESSAGE NO. 18.

FIRST LINE WILL BE FOLLOWED 20 YARDS BY 6 TRENCH(ES)  
CLEANERS HAVING GAS GRENADE(S) RIFLE(S) AND KNIFE(VES)  
SECOND(S) WAVE(S) SOBSEHIND

MESSAGE NO.19.

ADVISED GERMAN(S) ARTILLERY WILL OPEN FIRE ON L M  
SECTOR HAVE THE MEN TAKE TO SHELTER AT ONCE KEEP ONLY  
NECESSARY LOOK OUT SECT

MESSAGE NO.20.

GER I WISH I HAD SOME BEANS. OF FOR H ALSO AND EGGS.

MESSAGE NO.21.

BARRAGE WANTED SECTOR

MESSAGE NO. 22.

HAVE YOUR REPORT HEADY. WHY DONT YOU ANSWER  
QUESTION ARE LINE(S) CUT.

MESSAGE NO. 23.

ENEMY FIRE(S) BADLY DAMAGES GLASS WORK(S) AT  
BAGARRAT DURING NIGHT CHURCH STEEPLE(S) DOWN.

MESSAGE NO. 24.

INSPECTOR GENERAL WILL INSPECT 167 REGIMENT AT  
BADONVILLIER TOMORROW, GET READY.

MESSAGE NO. 25.

OBSERVATION POST(S) LOCATED AT MILLE REPORT(S)  
MASS HAVE KEEN ENEMY TROOPS REINFORCE FRONT LINE TRENCH(ES)  
RATION(S) BEING SENT

MESSAGE NO. 26.

TRENCH(ES) BADLY DAMAGED BY ENEMY SHELL(S) WILL NOT  
BE ABLE (TO) REMAIN MUCH LONGER INSTRUCTIONS WANTED.

MESSAGE NO. 27.

WOUNDED, HAVE TRANSFERRED COMMAND COMPANY TO FIRST  
SERGEANT SEND OFFICER TO TAKE MY PLACE

MESSAGE NO. 28.

SHORT OF RATIONS. MEN HUNGRY. WHAT IS BEING THE  
MATTER WITH THE RELIEF

MESSAGE NO. 29.

HOUSE. ENGINEER. REARGUARD RATION WORKING TOGETHER  
F READY (TO) E.

MESSAGE NO. 30.

ENCOUNTER WITH ENEMY PATROL DURING NIGHT 2 PRISONERS.  
BAVARIANS. 2 KILLED 4 WOUNDED WHERE SHALL WE SEND THEM

MESSAGE NO. 31.

TWO COMPANIES WILL ATTACK ENEMY POSITION BETWEEN I  
AND ST LINE AT TWENTY-TWO O'CLOCK SIGNAL FOR ATTACK ONE  
RED STAR SHELL. FOLLOW BARRAGE

MESSAGE NO. 32.

THREE KILLED, 16 WOUNDED DURING ATTACK. 250 METERS  
GERMAN TRENCH(ES) CAPTURE(D) PRISONER(S) TAKEN TRENCH(ES)  
ORGANIZE(D). EVERYTHING QUIET NOW.

MESSAGE NO. 33.

SNIPERS DOING GOOD WORK ANNOYING ENEMY FORCING THEM  
TO KEEP UNDER COVER.

MESSAGE NO. 34.

SEND AVIATOR TO RECONNOITER POSITION ENEMY FIELD ARTILLERY LOCATED LINE(S) N.W.OF HELLOVILLE.

MESSAGE NO. 35.

BELIEVED TIME FOR TANK(S) TO GO IN ACTION, NEED THEIR SUPPORT. ATTACK WILL BE SUCCESS GAS ATTACK SOUTHWEST WITH THEIR HELP.

MESSAGE NO. 36.

UNDERSTOOD. GET IN TOUCH WITH B PERFECT LIAISON NECESSARY INCREASED WIRELESS ACTIVITY.

MESSAGE NO. 37.

HOSPITAL(S) UNIT REAR OF B SECTOR BOMBED BY AEROPLANE(S) ANTI-AIR-CRAFT GUN BROUGHT IT DOWN.

MESSAGE NO. 38.

GERMAN PREPARING GAS ATTACK. GET READY ARTILLERY NOTIFIED REPORT.

MESSAGE NO. 39.

WEATHER CONDITIONS POOR RAINED ALL NIGHT VISIBILITY POOR

MESSAGE NO. 40.

FIELD BUZZER WIRE NEEDED one 4 TO REPAIR LINE(S)

MESSAGE NO. 41.

TWO MEN WILL GREEN (probably mean GO) OUT TO ENEMY LINE(S) TONIGHT AND PLACE T.P.S. GROUND S (s probably abb. for SET.) NEAR BARBED WIRE ENTANGLEMENTS.

MESSAGE NO. 42.

LENTHENS RANGE EVERY 10 MINUTE(S) FROM 15 O'CLOCK UNTIL RECEIVE SIGNAL(S)

MESSAGE NO. 43.

ALL STATION(S) ATTENTION THE P ARTILLERY SUPPORT I MASS TER IS COMING SOON WATCH FOR HAS STOPPED WITH A PERISCOPE.

MESSAGE NO. 44.

LAST NIGHTS ATTACK MADE BY THE OUR LIGHT ARTILLERY ACCOMPLISHED RESULTS REQUESTED WITH EXCEPTION OF SMALL SALIENT ON THE LEFT WING. HAD TERRORABLE (probably TROUBLE) WITH LIAISON WITH THE FRENCH BUT WELL ESTABLISHED ASSEMBLE PRESENT HAVE TAKEN STEPS FOR THE ATTACK(S) OBSERVE SALIENT CORRESPOND. STRIP 67 DEAD 22 MISSING 173 WOUNDED CONSOLIDATING CAPTURED TRENCH(ES) AWAITING FURTHER ORDER(S) SEND RATION(S) AT ONCE COL

**Appendix 11.—THE FIRST AEF FIELD CODE**

GENERAL HEADQUARTERS  
AMERICAN EXPEDITIONARY FORCES

---

**Confidential**

The  
**American Trench  
Code**

No. **768**

*This Code Book has been issued to*

---

*for official use under his direction only.*

By Command of General Pershing:

**JAMES G. HARBORD,**

*Brigadier General,*

*Chief of Staff.*

Official:

**BENJ. ALVORD,**

*Adjutant General.*

---

A. G. PRINTING OFFICE  
1918

## INSTRUCTIONS FOR USE OF CODE.

1. This code book will be used, in connection with secret instructions, in transmitting all messages by radio and earth telegraphy, and in all other cases where the message might by any chance fall into the hands of the enemy.

2. To cover a number of possible methods of sending, a four-figure code group and a three-letter code group have been provided for each word or phrase.

3. The first two figures of each figure group and the first letter of each letter group will be found at the top of the page.

4. Throughout the book will be found a number of prefixes and suffixes arranged in alphabetical order. Those most commonly used are repeated in the margin of each page.

5. To code a message, substitute for the word, phrase or sentence to be sent the figure group or the letter group corresponding to it. The code message should never contain mixed figure groups and letter groups, but should be made up exclusively of one or the other.

*Example:* "Patrol reports indication attack preparation."  
Code either RAL SAM LYN MAN DIT RIB  
or 2307 2408 1993 2009 1447 2334

6. If a phrase is used several times in the same message, code it differently each time, if possible, by breaking it up into separate words.

*Example:* "Gas attack" KOT  
(Gas) (Attack) KOR DIT

7. Numbers may be sent in code or in the clear, but if sent in the clear they must always be preceded by the figures 2370 or the letters RUF.

8. If a code book is lost, it must be reported by number at once through military channels to G. H. Q. A. E. F.

9. Destroy at once by burning all scraps of paper on which coding or decoding memoranda have been made.

10. Your secret instructions for this code must *always* be used in connection with it.

11. Inform your subordinates where you carry this code, and of the importance of saving it if you become a casualty.

**12. THIS CODE MUST NOT FALL INTO THE HANDS OF THE ENEMY.**

**12-B**

---

01 AB.....	0
02 AC.....	1
03 AD.....	2
04 AE.....	3
05 AG.....	4
06 AK.....	5
07 AL.....	6
08 AM.....	7
09 AN.....	8
10 AP.....	9
11 AR.....	10
12 AS.....	11
13 AT.....	12
14 AV.....	13
15 AW.....	14
16 AZ.....	15
17 EB.....	16
18 EC.....	17
19 ED.....	18
20 EF.....	19
21 EG.....	20
22 EH.....	21
23 EK.....	22
24 EL.....	23
25 EM.....	24
26 EN.....	25
27 EP.....	26
28 ER.....	27
29 ES.....	28
30 ET.....	29
31 EV.....	30
32 EW.....	31
33 EZ.....	32
34 IB.....	33
35 IC.....	34
36 ID.....	35
37 IF.....	36
38 IG.....	37
39 IH.....	38
40 IK.....	39
41 IL.....	40
42 IM.....	41
43 IN.....	42
44 IP.....	43
45 IR.....	44
46 IS.....	45
47 IT.....	46
48 IV.....	47
49 IW.....	48
50 IZ.....	49

12-B

12-B

---

51 OB.....	50
52 OC.....	51
53 OD.....	52
54 OF.....	53
55 OG.....	54
56 OK.....	55
57 OL.....	56
58 OM.....	57
59 ON.....	58
60 OP.....	59
61 OR.....	60
62 OS.....	61
63 OT.....	62
64 OV.....	63
65 OW.....	64
66 OZ.....	65
67 UB.....	66
68 UC.....	67
69 UD.....	68
70 UF.....	69
71 UG.....	70
72 UH.....	71
73 UK.....	72
74 UL.....	73
75 UM.....	74
76 UN.....	75
77 UP.....	76
78 UR.....	77
79 US.....	78
80 UT.....	79
81 UV.....	80
82 UW.....	81
83 UZ.....	82
84 YB.....	83
85 YC.....	84
86 YD.....	85
87 YF.....	86
88 YG.....	87
89 YH.....	88
90 YK.....	89
91 YL.....	90
92 YM.....	91
93 YN.....	92
94 YP.....	93
95 YR.....	94
96 YS.....	95
97 YT.....	96
98 YV.....	97
99 YW.....	98
00 YZ.....	99

## 13-C

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01	AB.....	Decimal Point
02	AC.....	4.2
03	AD.....	5.9
04	AF.....	9.2
05	AG.....	9.45
06	AK.....	9.5
07	AL.....	100
08	AM.....	155
09	AN.....	240
10	AP.....	Sunday
11	AR.....	Monday
12	AS.....	Tuesday
13	AT.....	Wednesday
14	AV.....	Thursday
15	AW.....	Friday
16	AZ.....	Saturday
17	EB.....	January
18	EC.....	February
19	ED.....	March
20	EF.....	April
21	EG.....	May
22	EH.....	June
23	EK.....	July
24	EL.....	August
25	EM.....	September
26	EN.....	October
27	EP.....	November
28	ER.....	December
29	ES.....	A. M.
30	ET.....	P. M.
31	EV.....	c'clock

---

32	EW.....	A
33	EZ.....	Abandon
34	IB.....	Abandon first line
35	IC.....	Abandon second line
36	ID.....	Able (to)
37	IF.....	About
38	IG.....	Above
39	IH.....	-Ac
40	IK.....	Accident
41	IL.....	According (to)
42	IM.....	Accurate
43	IN.....	Acknowledge
44	IP.....	Act
45	IR.....	Action
46	IS.....	Active
47	IT.....	Activity
48	IV.....	Activity of artillery
49	IW.....	Adjst
50	IZ.....	Adjutant

13-C

13-C

51 OB.....Advance  
 52 OC.....Advance guard  
 53 OD.....Advancing  
 54 OF.....Advantage  
 55 OG.....Aeroplane (s)  
 56 OK.....Aeroplane observation  
 57 OL.....Aeroplane wifeless  
 58 OM.....After  
 59 ON.....Afternoon  
 60 OP.....Again  
 61 OR.....Against  
 62 OS.....Age  
 63 OT.....Aim  
 64 OV.....Air  
 65 OW.....-Al  
 66 OZ.....Alert  
 67 UB.....All  
 68 UC..... All clear  
 69 UD.....All communication has been cut (with)  
 70 UF.....All is well  
 71 UG.....All of your messages have been received  
 72 UH.....All ready  
 73 UK.....All returned  
 74 UL.....All right  
 75 UM.....Alone  
 76 UN.....Along  
 77 UP.....Already  
 78 UR.....Also  
 79 US.....Alter  
 80 UT.....Altogether  
 81 UV.....Always  
 82 UW..... Am  
 83 UZ..... Am having  
 84 YB..... Am I  
 85 YC..... Am not  
 86 YD..... Ambulance (s)  
 87 YF..... Ambush  
 88 YG..... Ammunition  
 89 YH..... Ammunition depot (s)  
 90 YK..... Ammunition exhausted  
 91 YL..... Ammunition for 75 m.m. Field Gun, reduced  
 92 YM..... Among [charge, explosive projectile]  
 93 YN..... Amplifier  
 94 YP..... An  
 95 YR..... -Ance  
 96 YS..... And  
 97 YT..... Angle  
 98 YV..... Annihilate  
 99 YW..... Announce  
 00 YZ..... Annoy

—ed—1721—HEG  
 —ing—1999—LYW  
 —ly—2083—MUZ  
 —ment—2121—NEG

(7)

(137)

**27-Z**

01 AB..... Was not  
 02 AC..... Watch  
 03 AD..... Water  
 04 AF..... Wave (s)  
 05 AG..... Way  
 06 AK..... We  
 07 AL..... We are about to advance, lengthen range  
 08 AM..... We are held up  
 09 AN..... We are in need of  
 10 AP..... We are losing heavily  
 11 AR..... We are surrounded  
 12 AS..... We attack  
 13 AT..... We cannot  
 14 AV..... We have withdrawn  
 15 AW..... We hold the line  
 16 AZ..... Weak  
 17 EB..... Wear  
 18 EC..... Weather  
 19 ED..... Weather conditions  
 20 EF..... Well  
 21 EG..... Went  
 22 EH..... Were  
 23 EK..... Were not  
 24 EL..... West  
 25 EM..... Westerly  
 26 EN..... Wet  
 27 EP..... What  
 28 ER..... What is the approximate velocity of wind?  
 29 ES..... What is exact range of objective?  
 30 ET..... What is position (of)?  
 31 EV..... What is the situation (at)?  
 32 EW..... When  
 33 EZ..... When shall we be relieved?  
 34 IB..... When will barrage begin?  
 35 IC..... Where  
 36 ID..... Where is your headquarters?  
 37 IF..... Whether  
 38 IG..... Which  
 39 IH..... While  
 40 IK..... White  
 41 IL..... Who  
 42 IM..... Whole  
 43 IN..... Why  
 44 IP..... Wide  
 45 IR..... Width  
 46 IS..... Will  
 47 IT..... Will be  
 48 IV..... Will have  
 49 IW..... Will he  
 50 IZ..... Will I

(34)

(138)

27-Z

27-Z

51 OB..... Will it  
 52 OC..... Will not  
 53 OD..... Will not be  
 54 OF..... Will signal by  
 55 OG..... Wind  
 56 OK..... Wind favorable  
 57 OL..... Wing  
 58 OM..... Wire  
 59 ON..... Wire cutters  
 60 OP..... Wire entanglement (s)  
 61 OR..... Wire reel (s)  
 62 OS..... Wireless  
 63 OT..... Wireless message (s)  
 64 OV..... Wireless out of commission  
 65 OW..... Wireless station (s)  
 66 OZ..... Wiring party (ies)  
 67 UB..... With  
 68 UC..... Withdraw  
 69 UD..... Within  
 70 UF..... Within range  
 71 UG..... Without  
 72 UH..... Without artillery preparation  
 73 UK..... Without delay  
 74 UL..... Wood (s)  
 75 UM..... Work (s)  
 76 UN..... Working party (ies)  
 77 UP..... Worm  
 78 UR..... Would  
 79 US..... Would be  
 80 UT..... Would not  
 81 UV..... Wounded  
 82 UW..... Yard (s)  
 83 UZ..... Yellow  
 84 YB..... Yes  
 85 YC..... Yesterday  
 86 YD..... Yet  
 87 YF..... Yield  
 88 YG..... You  
 89 YH..... You will be relieved (on) (at)  
 90 YK..... Z  
 91 YL..... Zeppelin (s)  
 92 YM..... Zero hour  
 93 YN..... Zero hour has been postponed  
 94 YP..... Zero postponed—hours from original zero  
 95 YR..... Zone (s)  
 96 YS..... X.....  
 97 YT..... Y.....  
 98 YV.....  
 99 YW.....  
 00 YZ.....

ed—1721—HEG  
 ing—1999—LYW  
 ly—2083—MCZ  
 ment—2121—NEG

(35)

(139)

**Appendix 12.—ENCIPHERING CARD FOR FIRST AEF FIELD CODE**

**SECRET**

2-a

**THIS TABLE MUST NOT FALL INTO THE HANDS OF THE ENEMY.**

1. If destroyed to prevent capture, report will be made to the office to which its return is ordered.

2. This table will be used from 3 a. m. ....  
to 3 a. m. ...., after which it will be re-  
turned in sealed envelope to .....

**ENCIPHER**

A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	R	S	T	U	V	W	Y	Z
h	o	m	s	v	a	r	e	c	z	k	n	f	l	u	w	y	i	t	b	d	p	g

**DECIPHER**

a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	r	s	t	u	v	w	y	z
F	V	I	W	H	N	Z	A	T	L	O	C	M	B	Y	G	D	U	P	E	R	S	K

Key word .....

Service message .....

Private message .....

Appendix 13.—TEST MESSAGES SUBMITTED TO BRITISH IN CONNECTION WITH TESTING OF  
FIRST A. E. F. TWO-PART FIELD CODE

(1)	CUP	GWY	PYV	XYP	POF	BKY	MEF	SNP	WBO	NGF	PJA	SGR	LPU	YMP	AFR	GPA	LGS
	YOU	YXM	VOY	BYP	BXK	VEK	DXB	MUW	CFW	LGW	DWM	ANW	RMB	OKB	DCA	GXS	GMJ
	VBX	QYO	OBW	MXF	WOY												
(2)	DIT	MOP	PSJ	FMV	OGN	BWJ	JPY	QOP	DUN	PCO	YJS	FMY	LOB	CUP	GOD	BUN	YOL
	GUM	BFC	FPL	PCX	NBC	BYN	RWS	SNY	WJS	ONG	RYP	VMB	SGR	JEV	VCJ	NFW	RMS
	PUG																
(3)	NOV	JOR	MXF	BUT	VPA	COX	NEF	WAP	POF	MBY	SXG	JFB	LBW	BEW	SUB	RAN	MSO
	CBS	XYF	WCA	XOW	PJY	XMO											
(4)	YAP	CAT	YBJ	VSY	MXG	KSM	NXV	QVK	RYP	LUK	DXA	BXK	REK	XMP	XYS	PBU	FPY
	GPV	MUW	YOU	XYM	MCO	XAV	SAR	NXG	QYM	BWA	GMS	GSM	YPS				
(5)	GOT	GNV	AND	FMB	DYM	KPN	SYP	KVB	MPL	WEG	RUK	SAC	LAD	SMX	OWE	ORK	DSB
	FPS	JWP	YUX	XOW	WYS	JOV	BXK										
(6)	BKO	FAD	DWB	LGS	RYB	WJG	NAC	RWK	BOM	GFY	BAG	NES	QAM	DWM	WOY	VMS	NAT
	XUN	YBP	DCA	BYS	SOF												
(7)	JWO	ABG	YUW	NOT	RKV	XWS	SAW	GWM	MXO	WYK	XYF	KSB	AGF	WBC	XBN	XBO	KGO
	JYB	XSP	SKX	GWP	ONG	BPS											
(8)	COS	CFO	CFV	RMS	XPL	POW	AFY	BNU	FWX	WOS	RWK	NBC	PJY	JEV	VCA	JPO	LGW
	YFO	BPY	MOP														
(9)	MJO	SAT	POB	DIS	PLJ	MGI	SUG	BFX	NES	FWP	GXP	SYK	MSG	POB	JAB	GUM	RAC
	WBC	APW	VSX	WPA	XFY	GFM	MCS	SOB	GUM	NOB	PSJ	BXL	AUM	RMS	AFY	XYP	SCP
(10)	BGL	MGP	JXW	JYM	VNK	LYM	GOV	JMP	CSV	VOY	BPY	OBP	FPB	WPN	FPL	XYF	LGJ
	QYW	MUW	MPB	JYM	RMS	RWK	BOM	YOU	XUN	VEB	SGP	KBS					
(11)	GPS	CUF	SXB	BSO	DIS	MAV	LGX	VEB	QOP	DSV	AXY	PEG	JEV	DPB	FBY	OCF	NWJ
	OCX	NES	COS	GNU	LES	SKX	GFM										
(12)	GBK	DAR	KSA	DEL	BUT	SYP	OWL	RAN	MSY	FMU	MJB	XYF	GBK	LPU	LUP	OCU	BEP
	GNU	ASV	NOV	PYB	YUX	XYP	GSP	KXG	MBY	WMX	LOS	DWJ					
(13)	OXW	GAV	FMS	VOK	LGS	KVA	JWY	NEF	CFV	FEM	SXG	JFB	LBW	FWX	COP	YOU	OCJ
	OCF	OBP	OXM	MXF	WOY	XOW	BXS	WYK	JEV	XJU	JAP	OPL	BAP	MJP	FCM	BMV	
(14)	NOW	MGI	YPA	RMS	DSY	FWC	VOY	WAP	APW	WEG	YAK	GWM	BGP	BYM	JSP	WCF	DCJ
	WBY	FPL	DAB	GMS	NAP	ABK	AWY	RGW	OBX	GAY	FGK						
(15)	GPJ	MAR	QXJ	PLJ	YPO	MJO	SAT	XYF	PXS	RYB	BUK	WNV	RAT	BUN	DXB	SPU	SWU
	FED	DMO	CUT	FPY	YAK	BPS	KGB	ABK	YJA	NYW							
(16)	ANY	MOP	XJU	FCM	FOG	WXY	MBS	LAS	COX	NEF	PNY	BOW	PWU	YOU	ABO	QSO	DCA
	FPG	BEW	RMS	MBY	JYG	XOG	MSB										
(17)	XOW	CMU	YXM	LPN	NOV	LPU	BUG	PJA	BUT	LOW	KSM	NXV	QAG	JEV	FGN	VPA	RYP
	NUM	YJC															
(18)	OSD	YFO	CUF	WMX	XPO	OPL	VAS	VOD	GFY	VXF	LAW	DGA	MUD	GSX	XPL	LPU	YWC
	NES	KMA	SCW	SYP	GNU	BXU	LYK	OPL	SAW	BPS							
(19)	XJU	KXM	PNY	NPO	WSC	RMS	FYN	MES	QYW	BEW	DUN	XGP	GUP	YJC	JEV	KGB	WJG
	RUG	JYM	VNK	LYM	XSP	JWO	XWB										
(20)	VCA	FCM	XGP	BWC	VEG	ASY	ABO	XYF	LEP	MUT	LOR	NBC	OWU	ASY	MUW	DSY	NBP
	XMO	NES	JOB	OCJ	YSO	BYG	DCJ	JGA	ROB								
(21)	POV	NOV	BOW	MOP	YOU	QMJ	NSV	MCP	OSA	XYF	KSM	OSV	DCJ	NAP	WEV	RKY	NAY
	LES	PXK	VYM	WBC	NBC	JOC	GEB	VEB	JXO	GNB	GUM	XYF	BOX	XAV			

(22)	BYW CUP	BNC RYP	MXO FPY	XUJ CWP	XSP	RFB	FPL	JEW	DIS	AUB	BLX	PLY	SAC	WNB	MGD	MEK	OWG	
(23)	FEW QJP	DSY COX	PFW VAN	FSV RGW	REF DKS	WNG XMW	SUP	GFM	RYL	MCP	GXA	MEK	XFH	RAN	VSD	WNO	DYM	
(24)	FCS FMO YOW	RMS JEW NET	FCM PYW AMS	FYL PUS WEV	YPX WBC FPL	PSJ GFY	AFO BPY	QSB XYS	RYB VMJ	XON JSK	NES WOG	OWG SUY	SWU XBY	WPY GXA	GMS JGM	BXK SXB	SGP VPX	
(25)	NOW YBP	GFA MOP	DCA NPA	RGW XOG	JSP LOR	MEK	XJU DUN	PFY XYF	YXM	YSO JXW	JYB WEG	DCA QSB	DWJ SKB	FES VCS	OBX MSG	BFY	BAD	
(26)	OMB KBM MCS GMB YAB JXW	XPL YOU KGU FCV BAM BGX	GBM WYM GMJ NWJ BEW BEV	NFW JAP YPO RKY WCS PWU	LGS BES FMS RMS VOY JGM GUN XYF OBP BYS FGK RYP VSD AWG MGI YFP FPL RUG	SAR YSO XPN NBC XMP GOD LGV BOW MOP OWA JEW REF OPL OWA BEP OWA RUG	YSO XPN NBC XMP GOD LGV BOW MOP OWA JEW REF OPL OWA BEP OWA RUG	REG LOB GYN RBL WOY XSP MOP BEP OWA RUG	LOB GYN RBL WOY XSP MOP BEP OWA RUG	BYS FGK RYP VSD AWG MGI YFP FPL RUG	SOM FLX NES OPV MBS ABO RUG	FLX NES OPV MBS ABO RUG	OPV MBS ABO RUG	MBS ABO RUG	ABO RUG	ABO RUG	ABO RUG	ABO RUG
(27)	BKJ XJU	DSY NAC	COT	BOM	BFY	GFY	YUM	OWE	VCS	FPL	NES	YUB	JAP	XFS	GMJ	FBU	JEW	
(28)	VYL LEB	XYB YOU	FEM XFM	VBC SNA	MEK	YJV	GBM	NFW	RMS	YSO	JSX	NSV	WNX	JOV	PCU	PCM	DSY	
(29)	FAD BAD	MOP JEW	MSK JMP	WOS FES	MYS MPL	ASY AXG	GPA VBA	FPL XFY	LUM MUD	VMJ LPN	FJW BYN	XYF YOU	NCP NUV	SMC KPY	LPU	VSG	COX	
(30)	DSK BAT	ABF POB	DCJ AND	XYF XYM	ROF BKK	SCO RMS	KGB GFY	WPX MES	BPS MPB	NES SXV	DMG CBW	LGW	QOJ	BUN	MJB	VJB	OBY	
(31)	FEW LGB	AUX	BMV	MEK	LBV	MPB	NGF	SYF	NXV	RGN	RYS	YOU	NGK	XAM	YFP	FCM	OCU	
(32)	CBN WBO	NSV XSP	MCP XYF	DSK NEW	YJV YAW	BXU SYK	MUW WEG	KMD LGS	COP FRU	PJB JYB	GAL JFC	XJS	PEK	MOG	RKO	NFY	MEV	
(33)	FOG JEW	NET GOC	LOP YAM	SYK NPY	SCO	SWO	NWA	NES	DIT	FPL	WXY	SYK	WEG	ONV	NFB	JXW	NBJ	
(34)	MPB BFC	POV BEW	DOB RMS	BAK FED	REK YXM	FRP JSK	XYF RKB	NAM GWY	WJY	XWB	SGP	FMV	MPL	XON	YOU	SNP	YUX	
(35)	GNU	FPS	SCO	DUM	YON	GXB	DSY	LEB	OBP	XYP	JYM	SUP	PXS	FPY	GNC			
(36)	MJC LBY XMP	MXG AGU XOW	VXK MAV LGW	QXJ VYN MUD	XSA MUD BFU	LOB DUK	JGX FRB	YWS YAL	DWM YAL	VXW XYF	NES JUW	SWP WJB	BYS MSG	JSP VOM	QOF RYB	GUM MOP	YPO GLP	
(37)	NWY YUM	YSO JPO	DXO YUX	PXB BYP	LAS CMX	JOB YFO	KVY DCA	RWS	COX	BAN	YPO	MCP	MJO	LOB	WJG	LGB	KVA	
(38)	NBL JEW	BNX SOF	XAM POS	RGW YBP	CAK LGS	XUN NUM	BEV BED	YOU RMS	JOP NGF	PUG WBO	AFO DMS	AFM NEF	MOP DCA	FYM	WMX	FPC	MOK	
(39)	AMK	GNU	XOG	YFA	KGB	BYW	NES	XMD	JOC	CFG								
(40)	BNY NXA	BFY BKO	XYF ROB	WCX OWA	SGF YSO	BYG MOP	CUF	APU	LOB	FPY	WOV	RMS	JEW	LBV	SUP	GXA	NEF	
(41)	JXW WOY	FAD JEW	QXJ LGF	MPB SMC	YWS JAP	NES LPU	XUN BAG	GXO YOU	VAF YFO	AFR DUN	DYM PYL	MCP JOV	XBN PCX	FPL OBR	GWM BYS	NBC GPA	PLU RMS	

## Appendix 14.—REPORT OF MAJOR HAY, OF BRITISH GENERAL STAFF (CODE SECTION)

M. I. 1. B/889/Cy.

MAJOR MOORMAN.

The four specimen pages of the code adopted for wireless signalling purposes by the American Expeditionary Force have been examined in this office and, in deference to your wishes, the following observations are submitted.

1. The trigrams employed in the four pages under consideration are composed of any three letters of the alphabet except H, I, and Z, with the further restrictions that E, T and U do not occur as a first component, D, Q, and T as a second or Q as a final component of any group.

2. No letter is repeated in any one trigram, so that groups like AGA, BBM, XPP do not occur.

3. If these conditions hold throughout, there are thus 20 different initial letters, 20 medial, and 22 final, making, when all the remaining combinations are used, a possible aggregate of 7,600 groups. Perhaps, however, the number should be 20, 21, and 22 respectively. This would provide a round total of 8,000 groups and a symmetrical arrangement of columns in the code book.

4. Six hundred and twenty-one different trigrams are used in the total of 1,151 contained in the 41 messages submitted. Of these 621 trigrams 371 occur only once and 135 only twice. The average frequency for each group is less than 2. The deduction is that many alternatives are employed.

5. The most frequent groups are XYF (16), RMS (15), JEW (15), NES (13), MOP (11), FPL (10), DCA (9), YOU (13), LGS (7).

6. The statement above that many alternatives are employed is borne out by the fact that there are hardly any recurrences of the same trigrams in juxtaposition or even in proximity to one another. JEW+XJU occur twice; BEW+RMS twice; NFW+RMS twice. MOP tends to occur near the beginning and end of messages, and suggests therefore, an address or signature, or it might be a stop. Other groups that strike one as worth watching are: DCA, FCM, RMS, XJU, XOW, YFO, YOU.

7. If spelling is used to any extent, it has not been detected (for the reason given in par. 6).

8. Both the code as a whole and the messages in particular would seem to have been composed with great precautions for safety; but from only 41 messages one is unable to form a definite opinion as to the possibility of solution. Appearances are certainly in favor of safety, but much would depend on the amount of traffic and the frequency with which the code was changed. Also information under the following headings might prove of great value to anyone attempting its solution. Moreover most of this information would presumably be available to the enemy.

(a) The date and time of day when the messages were sent.

(b) The approximate positions of the sending and receiving stations.

(c) The system of call signs, general wireless procedure, etc.

(d) The organization and disposition of the forces under the American command.

(e) Names of commanders and designations of units (unless special code groups are used for these in every case).

(f) Intelligence derived from inferences based on actions which seem to follow the reception of certain messages or vice versa.

(g) Chance information gained through carelessness on the part of a subordinate officer or N. C. O., such as the interception by the enemy of the substance of a code message repeated in clear by telephone or power buzzer. This is no doubt strictly prohibited, but in the stress of battle such things may occur.

I am of the opinion that this code when used with care could not be read by the enemy until he had collected a very large amount of material.

One of the principal safeguards against discovery lies in the use of alternatives, and in practice this safeguard loses something of its value owing to the fact that encoders soon get into the habit of using the same common groups and of neglecting to use the alternatives. In fact the user of a code can only with great difficulty be prevented from clothing his meaning always in the same manner both with regard to the language used and the selection of groups for encoding. The length of time for which this code can be considered secure is therefore mainly dependent on the way in which it is handled.

Under favorable conditions this code would be safe for at least 2 months; but having regard to the probability of accidents, I think it would be advisable to make a more frequent change and not at regular, but rather at irregular intervals.

M. V. HAY,  
Major, General Staff.

M. I. 1. B.

24th June 1918.

## Appendix 15.—REPORT OF CAPTAIN HITCHINGS, OF BRITISH ARMY CODE SOLVING SECTION

**SECRET****AMERICAN THREE-LETTER CODE**

SURVEY BY

GENERAL STAFF, B. E. F.

Section Intelligence E (c)

June 30th, 1918 1500

**SURVEY OF AMERICAN THREE-LETTER CODE**

Before entering into a detailed examination of the 41 messages submitted, it should be noted that a code is often rendered insecure by agitated operators failing to comply with instructions to make the fullest use of every alternative group.

There is a tendency on the part of operators to send certain stereotyped messages at stated hours daily, containing, for the most part, the same words, on different sectors of the front. These operators may have obeyed instructions to the letter. Yet a comparison of the messages by the enemy may result in showing that several code groups are the alternatives for the same "clear" letter, word, or phrase.

These are the insecurities caused by modern conditions. They compromise codes and ciphers which may be theoretically insoluble.

## PECULIARITIES

1. No letter is repeated in the same group. This might infer that the code groups are indexed in alphabetical order and also that there is only one group containing the same letters, and that the operator has the option of transmitting the letters of any group in any of the six possible ways.

For example in message 12, groups 14 and 15, we have LPU<sup>6</sup> LUP which if arranged alphabetically would be LPU<sup>7</sup> LPU<sup>7</sup>. (The index number refers to the number of times a group occurs in the 41 messages.)

Likewise in message 14, groups 8 and 9, we have WAP<sup>3</sup> APW<sup>2</sup>, rearranged alphabetically they are APW<sup>5</sup> APW<sup>5</sup>.

However, this is ruled out by the fact that certain letters which occur frequently as second and third letters are not found as initial letters. It is therefore assumed that repetitions have been avoided with a view to ensuring against operator's mistakes.

This also appears to be the case with the omission of the letter H, which is often mistaken for S.

It is consequently observed that groups have been very successfully selected to avoid Morse errors occurring in the transmission of the message.

2. E, H, I, T, U, and Z do not occur as initial letters.
3. D, H, Q, T, and Z do not occur as second letters.
4. H, Q, and Z do not occur as final letters.
5. About 600 groups appear in the 41 messages.
6. The frequent groups are:

XYF occurs 16 times  
RMS occurs 15 times  
JEW occurs 14 times  
NES occurs 13 times  
YOU occurs 13 times

FPL occurs 9 times  
MOP occurs 9 times  
DSY occurs 6 times  
YSO occurs 6 times

7. The following result is arrived at by indexing the groups according to their final letter. It is noticed that there is a tendency for certain initial letters, coming before the same bigram, to be near each other in the normal alphabet, e. g.—

Initial letters	Bigrams	Initial letters	Bigrams
G N V W Y	PA	J K L M Q Y	OP
K L	GB	B R S X	YP
J L M N P R S	OB	B F L M N	ES
K L W X	PN	B N M P X Y	OW
J N X Y	PO	A B G	FV

8. Repetitions are:

jym<sup>4</sup> vnk<sup>3</sup> lym<sup>2</sup> in messages 10 and 19  
 sxg<sup>2</sup> jfb<sup>2</sup> lbw<sup>2</sup> in messages 3 and 13  
 nfw<sup>3</sup> rms<sup>15</sup> in messages 2 and 28  
 bew<sup>4</sup> rms<sup>15</sup> in messages 16 and 34  
 gbm<sup>5</sup> nfw<sup>3</sup> in messages 26 and 28

9. The following are passages of groups which occur more than once:

In message

1 snp wbo ngf pja agr lpu  
 1 gpa lgs you yxm voy byp bxx  
 2 gum bfc fpl pcx nbc byn rws  
 6 lgs ryb wjg nac rwk bom gfy bag nes  
 6 xun ybp dca bys sof  
 7 saw gwm mxo wyk xyf  
 8 fwx wos rwk nbc pjy jew  
 8 jpo lgw yfo bpy mop  
 9 mjo sat pob dis plj mgi  
 9 syk msg pob jab gum  
 9 wbc apw vsy wpa xfy  
 10 jmp osv voy bpy obp  
 10 fpl xyf lgf qyw muw mpb jym  
 10 rms rwk bom you xun veb sgp  
 11 nes cos gnu les skx gfm  
 13 nef cfv fem sxx jfb lbw fwx  
 14 voy wap apw weg yak gwm  
 15 qxj plj ypo mjo sat xyf pxs ryb  
 16 mbs las cox nef pny bow pwu you abo  
 19 yjc jew kgb wjg rug jym vnk lym xsp jwo xwb  
 22 mek owg cup ryp fpy  
 24 psj afo qsb ryb xon nes owg swu  
 25 dca rgw jsp mek xju  
 25 yxm yso jyb dca dwj fes obx bfy bad ybp mop  
 26 bow mop owa jew ref opl mcs  
 26 gmj ypo rkx fms rms bnc  
 28 mek yjv gbm nfw rms yso  
 29 cox bad jew jmp fes mpl  
 29 xfy mud lpn byn you  
 30 pob and xym bxx rms gfy mes mpb  
 34 xwb sgp fmv mpl xon you snp yux bfc bew rms fed yxm jsk  
 37 ypo mcp mjo lob wjg lgb kva yum jpo yux byp  
 41 jxw fad qxj mpb yws nes xun  
 41 dym mcp xbn fpl gwm nbc plu woy jew lgf smc jap lpu bag you  
 yfo dun

## CONCLUSIONS

From the peculiarities as they stand, we cannot infer anything with any great degree of certainty, because there may be others besides those enumerated, and this possibility forbids the general conclusion from being anything but tentative. The conclusions arrived at, are:

- (a) The code is a complex one; i. e., arranged in two parts for encoding and decoding.
- (b) It abounds in alternative equivalents.
- (c) The code groups seem to have been chosen with the object in view of assisting transmission by avoiding the combination of letters whose Morse equivalents might lead to mistakes.
- (d) Solution cannot be effected on the 41 messages; however, it would not be safe to assume that the code is insoluble. From the fact that in 30 messages repetitions of 3 groups do recur on 2 different occasions it must be assumed that as each new message is intercepted the chances of getting repetitions increase at a higher progressive ratio.
- (e) If the test messages submitted are a true representation of the messages which will be sent by different operators on the various sectors of the front, and during uncomfortable circumstances, then the code is an undoubtedly sound one and presents great difficulties to solution on anything under 200 messages. For example in message 32, from the eighth to seventeenth group, inclusive, there are 10 code groups which do not occur anywhere else. It is possible that these could only be discovered after the interception of from 700 to 1,000 messages.
- (f) Estimating that 75 percent of wireless messages in the field are successfully intercepted, it is doubtful if any leakage of valuable information could take place until after 1,000 messages had been sent.
- (g) A study of peculiarities (par. 9) suggests that alternatives are governed by a system, not selected at random. Should this be the case the security of the code is considerably impaired.

**Appendix 16.—SAMPLE PAGES FROM THE VARIOUS FIELD CODES PREPARED AND USED BY THE  
A. E. F.**

(Appendices 16A to 16G formed "the River Series"; appendices 16H to 16K, "the Lake Series"; appendices  
16L to 16N, "the Numbered Series")

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**Appendix 16A.—EXTRACTS FROM THE "POTOMAC" CODE**

***Secret***

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

*The*  
**“POTOMAC”  
CODE**

**GENERAL HEADQUARTERS  
AMERICAN EXPEDITIONARY  
FORCES**

No. 2027

*This book has been issued*

to \_\_\_\_\_

*for official use under  
his direction  
only.*

BY COMMAND OF GENERAL PERSHING:

JAMES W. McANDREW,  
*Chief of Staff.*

OFFICIAL:  
ROBERT C. DAVIS,  
*Adjutant General.*

## Instructions

1. This code book, to be known as the "Potomac" Code, is issued to all combatant troops down to battalions.

It is primarily intended for communication within the division, but may be used for messages to higher headquarters.

Messages encoded by its use may be transmitted by any means at hand, but radio or earth telegraphy should be used only when more secret means are not available.

2. Messages once transmitted in clear or in any other code or cipher must not be repeated in this code.

Messages once transmitted in this code must not be repeated in any other code or cipher or in clear.

Except that number and hour of signature may be in clear when preceding first code group, the use of "clear" in code messages is prohibited.

3. The use of this code for regular routine reports should be limited to actual necessities. Such reports should be transmitted by other means than radio or earth telegraphy.

4. Avoid use of words not in code book when other words with same significance are provided. Words spelled out, letter by letter, not only take time to code, transmit and decode, but they are one of the favorite points of attack by enemy code men.

5. Where two or more code groups are assigned the same letter, syllable, word or phrase, first one and then another should be used so that in a series of messages each occurs about the same number of times. In particular, no group should ever appear twice in the same message.

6. At least one group marked "Null" should be used for every ten code groups in a message. These should be placed at irregular intervals. A "Null" should always occur between double letters; thus the word "boot" would be encoded:

(b) KVG	(o) LOC	(Null) MUD	(o) VYN	(t) ASG
------------	------------	---------------	------------	------------

Note that different groups are used for the letter "O"

7. Coded and decoded copies of messages must never be filed together. All notes and memoranda used in coding or decoding messages must always be destroyed, by burning, if practicable.

8. Messages must be short. Several short messages will be less likely to be read by the enemy than one long one.

Except in emergency a long message, if it must be sent, will be divided into two or more parts and each sent as a complete message.

Very often the best way to handle a long message is to leave out unnecessary words.

9. Addresses will not be used when context of message indicates for whom intended. When used, they must be in code.

10. Signatures should be sent only when absolutely required. When sent, they must be encoded, letter by letter, if necessary. Usually it will be sufficient to indicate origin by some word in code book previously agreed upon by each commander and his immediate subordinates.

11. The message handed Signal Corps operator should be in the following form, on any suitable paper:

"No. 1.      15:40.      KVG      LOC      MUD      VYN      ASG

Send this message to First Division.

1 June 1918

J. M.  
Capt., 1st Infantry"

Items should always appear in this order, that is:

- (a) Number of message.
- (b) Hour of signature.
- (c) Body of message.
- (d) Order directing transmission.

Order directing transmission may also indicate means to be employed when deemed necessary by the Commanding Officer, but this will, in general, be left to the discretion of the Signal Corps.

Number of message and hour of signature should be given only when they will serve some good purpose. They will be in clear.

Body of message must be entirely in code.

12. Blank spaces at end of book are for use of divisions for designation of organizations and local geographical points, or for such other use as may be desired.

Words assigned will be reported to Corps, Army and General Headquarters, and to neighboring divisions.

## ENCODING

0...WNO..MXA..OKU		50...WAJ..JXB	
1...FWP..KSA..GOT		51...PYM	
2...WBO..WCF..RKV		52...JGO	
3...NYF..PJA..NUM		53...RYG	
4...VMB..FSO..CMU		54...PFR	
5...GYN..MJW..WYS		55...BPU..XJB	
6...XJM..FEG..MYS		56...ONP	
7...RMB..RFS..AFR		57...GSY	
8...OXM..GUP..SXM		58...KBJ	
9...YAW..MSX..FUM		59...NBY	
10...MXO..BXS..BGP		60...FUN..BEN	
11...VCJ..JFW..LUK		61...PAW	
12...KGP..OXW..VSD		62...PCF	
13...BUW..RWM..SPY		63...BKS	
14...DPG..PAR..XJS		64...BPN	
15...GBY..OCX..CBY		65...GFW	
16...FMB..PBO..OBK		66...LUN	
17...BUG..VAB..YOC		67...NCX	
18...JOR..AFV..POS		68...MOB	
19...VAF..OBW..FLM		69...VYB	
20...BXL..SYB..MBO		70...JUM..FPE	
21...MSO..CMB..OGV		71...GYV	
22...LYT..GYM..WBL		72...BSM	
23...WSB..FBX..RPA		73...FGX	
24...GPX..PNW..VPN		74...VXG	
25...KBW..PFO		75...GKJ..NEW	
26...MEW		76...DWU	
27...VCW		77...DCS	
28...FXS		78...BMC	
29...CSO		79...XYV	
30...WES..ORK	Null...XSP	80...PSU..FAN	
31...ANO	Nd...WBJ..XWS	81...GKO	Null...LYS
32...PES	St...CBS..GNY	82...XAB	Nd...QOV..WBJ
33...VMA	Th...DYM..MXF	83...NFV	St...DEL..CBS
34...FJP		84...PSO	Th...GAV..DYM
35...OLJ..BLC		85...DGM	
36...ANW		86...JGP	
37...ROM		87...CBM	
38...WXV		88...YSJ	
39...DAR		89...FRO	
40...KMC..REP		90...PFV..RYW	
41...DOS		91...VBP	
42...JMS		92...ASB	
43...RUB		93...OCW	
44...GMU		94...PAK	
45...FSM..AXM		95...OBL	
46...PON		96...GUS	
47...FAK		97...SGB	
48...JWC		98...ROW	
49...MOG		99...BLP	

## DECODING

ABE...Falling back	APE...Relief completed
ABF...Heavy	APF...Retire
ABG...Message received	APJ...Premature
ABK...Supply	APN...Impossible
ABM...Have you received	APO...Withdraw
ABO...Bombardment	APU...Machine gun ammunition
ABP...Barrage	APW...E
ABS...Battalion	APX...Remove
ABV...Automatic	APY...Moving
ABW...Must be	ASB...92
ABX...Truck	ASF...Shell
ABY...Received	ASG...T
AFC...Cannot	ASK...Has not been
AFD...One	ASM...Gas is being blown back
AFJ...Turn	ASO...Control
AFM...Machine gun emplacement	ASP...Removed
AFO...Enemy	ASV...Keep
AFR...7	ASX...Surprise
AFV...18	ASY...(Null)
AFX...Smoke	AUB...Runner
AFY...Stop	AUF...Must have
AGE...Diminish	AUG...Condition
AGF...-en	AUK...Safety
FGH...Picket	AUM...Minute
AGK...Stay	AUP...Rescue
AGL...Field buzzer	AUS...Point
AGN...In communication with	AUW...V. B. rocket
AGO...Question	AUX...On the right
AGU...Lieutenant	AWB...Sometime
AGY...Emplacement	AWC...Require
AMC...Further	AWE...Barricade
AMG...Wounded	AWG...O'clock
AMK...We are losing heavily	AWK...Light signal
AMO...At close quarters	AWO...Double
AMP...Confirm	AWP...Still
AMS...Our first line	AWS...Lengthen
AMV...-ate	AWX...Will signal by
AMX...Might	AWY...Will not
AMY...Evident	AXB...Forcing
AND...Battalion	AXF...Magazine
ANF...During the night	AXG...Trenches
ANG...Fifth	AXM...45
ANK...All stations	AXP...Send
ANP...Observer	AXS...Moment
ANO...31	AXV...Your
ANS...Consider	AXW...Last night
ANW...36	AXY...Going
ANX...Your	BAD...Advance
ANY...Within	BAF...Afternoon
APB...Bombproof	BAG...Division headquarters

Appendix 16B.—EXTRACTS FROM THE "SUWANEE" CODE

***Secret***

MUST NOT FALL  
INTO HANDS OF  
ENEMY

*The*  
**“SUWANEE”**  
**CODE**

GENERAL HEADQUARTERS  
AMERICAN EXPEDITIONARY  
FORCES

## ENCODING

0...WPC..GMX..CJP		50...OCD..PFJ	
1...VEF..ANY..CBU		51...DON	
2...AWO..DEL..DOG		52...RAW	
3...VAG..WCK..XWS		53...DYK	
4...RMO..PBU..DXY		54...OSA	
5...AUX..VSP..FAW		55...XMP..SON	
6...YUM..SBW..BOD		56...CPL	
7...MEG..CMO..BOG		57...NBY	
8...SAN..OKM..MAC		58...FXB	
9...JOV..VMA..BOM		59...BGY	
10...GXS..OSV..AMK		60...JMU..RKO	
11...SGW..WOK..RUG		61...MAV	
12...JVC..DGS..NUB		62...JFA	
13...ANK..SNB..MEP		63...AFO	
14...BKJ..XYF..BFA		64...MUG	
15...LYP..FGR..NWA		65...SYN	
16...BUW..JBS..JAV		66...SUY	
17...FCM..CAF..DMO		67...MYW	
18...KBO..MOB..FLY		68...VNW	
19...QAV..WJX..RUN		69...SBL	
20...BAN..OSY..GWA		70...PXA..SXB	
21...NOC..AWE..BYK		71...XAM	Null...FYN
22...GNA..VPF..NWJ		72...VCJ	Nd...ROF..WYK
23...OMA..BLD..GBL		73...WNX	St...RBS..OGN
24...NAC..OBY..FET		74...RYG	Th...JYF..QAF
25...GNY..MUY		75...MBY..XFW	
26...WUA	Null...AGF	76...GLY	
27...PYK	Nd...ROF..WYK	77...DMX	
28...WJO	St...DWB..SGO	78...KPL	
29...AMP	Th...FLB..LEM	79...GKÇ	
30...WFX..MCK		80...BSX..FMY	
31...PAM		81...OBC	
32...YMV		82...KPX	
33...BMD		83...DSP	
34...DCJ		84...LAV	
35...YJP...GSP		85...DGK	
36...YPF		86...OSD	
37...DOV		87...NEW	
38...KXW		88...CAR	
39...XMD		89...NYK	
40...CBX..BUD		90...SOV..ANS	
41...JSO		91...XGP	
42...QBF		92...FBO	
43...WEP		93...ONW	
44...QVG		94...OPL	
45...BLY..SWM		95...RFW	
46...VND		96...VYN	
47...LES		97...QOJ	
48...FXM		98...VMC	
49...PAD		99...PAY	

Approach...BAW	Await instructions...BUT
Approved...DPW	Away...KXA
Approximate...KVS	Axe (s)...SPF
Approximately...DXJ..NSO..MCX	B...RYB..WEF..ABY
-ar...RFP	Back...LBX
Are...GNU..XYM..VSJ	Bad (ly)...LGN
Are having...WYO	Badly damaged...GLX
Are not...CBY	Badly wounded...MOG
Are they...XUY	Bag (s)...NGK
Are we...CUK	Balloon...GUT
Are you...PXB	Barbed wire...BGK...QEK
Are you all right...FWX	Barrage...SMO..FES..POB
Arm...PEF	Barrage wanted...MBJ
Armored...DSM	Barricade...YMB
Army...VCO	Battalion...MGX..PAC..GAN
Arrive...DGO	Battalion headquarters...KGO..NPC
Arrived...PWC..ONC..KGU	Battery...OWB..YSJ..KSO
Artillery...QXJ..FRA..FCK	Battle (s)...XFP
Artillery fire...FEV	Bavarian...GPX
Artillery observer...PNR	Bay (s)...VAT
Artillery position...BNK	Bayonet...CUM
Artillery preparation...LOV	Be...QEX..JAR
Artillery support...XMA	Be ready...YFB
-ary...RGU	Be released...CSP
As...CFK..MSK..PYS	Because...XON
As far as...CJB	Been...OCX..LOM
As soon as...RMV..BAF	Before...QEG
Ascertain...VEB	Began...JSV
Ask...BUG	Begin...SOK
Asphyxiate...YBJ	Begun...PNO
Assemble...FBX	Behind...KBS
Assist...VXP	Behind the lines...YUW
Assistance...FRU	Being...FYW..LEV
At...NEJ..FGN..KMA..VXY	Being established...GXB
At close quarters...GFP	Being held...XPU
At once...PCB	Being sent...RMB
At point...VOR	Being shelled...MJX
-ate...XGK	Believe...XAV
Attack...VJO..GFO..NXV	Belong...KGW
Attacked...BNO	Below...FBW
Attacking...VEL	Belt (s)...SBY
Attempt...SOR	Bengal lights...GMB
Attention...XBU	Best...SKP
Austrian...YBS	Better...FPO
Automatic...KPO	Between...PUK..WBO
Automatic rifle...YXB	Beyond...ASV
Automatic rifle ammunition...QVK	Billet (s)...NOB
Available...PAK	Bivouac...YWU
Aviator...DAW	Black...GVJ
Await...WAX	Block...JUP
	Null...BNX
	Nd...ROF...WYK
	Re...AGE..NBL
	S...GEW..OXS
	St...OGN..RBS
	Th...QAF...LEM
	Null...MUS
	Ing...PBC..FGA
	Ion...QXY..KMD
	Ll...YJB
	Ly...NXA

## DECODING

ABE...Bomb-proof	APE...Advance guard
ABF...Essential	APF...Yesterday
ABG...Of	APJ...Or
ABK...V	APN...Without
ABM...Section	APO...Could not
ABO...Was not	APU...Has not arrived
ABP...Damage	APW...On the
ABS...Slight	APX...Wire
ABV...N	APY...We are losing heavily
ABW...These	ASB...Relief completed
ABX...And	ASF...Rush
ABY...B	ASG...Exact range
AFC...November	ASK...Communication
AFD...Helmets	ASM...Which
AFJ...Does	ASO...Rations
AFM...Sentry	ASP...Depth
AFO...63	ASV...Beyond
AFR...Why	ASX...He
AFV...Adjust	ASY...Did not
AFX...Telephone	AUB...-ent
AFY...Troops	AUF...Suspect
AGB...Afternoon	AUG...Prussian
AGE...-re	AUK...Stokes
AGF...(Null)	AUM...Prepare
AGK...Our artillery	AUP...To
AGL...Squadron	AUS...Machine gun fire
AGN...Field artillery	AUW...Will
AGO...Most	AUX...5
AGU...Commissioned officer	AWB...Instructions
AGY...Least	AWC...Have arrived
AMC...(Null)	AWE...21
AMG...Aeroplane	AWG...-ous
AMK...10	AWK...By platoon (s)
AMO...Hyphen	AWO...2
AMP...29	AWP...Will lift
AMS...Bombarded	AWS...In enemy's hands
AMV...Follow	AWX...Longer
AMX...Destroyed	AWY...Wounded
AMY...Wagon	AXB...From
AND...Men	AXF...Board
ANF...Come	AXG...No
ANG...Observer	AXM...Poor
ANK...13	AXP...Forcing
ANO...Signal	AXS...Send by
ANP...Let	AXV...Gas attack
ANS...90	AXW...Had
ANW...Too far	AXY...Reconnoitering
ANX...Appear	BAD...Mass
ANY...1	BAF...As soon as
APB...Green	BAG...Will begin

**Appendix 16C.—EXTRACT FROM THE "WABASH" CODE**

**SECRET**

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

*The*  
**“WABASH”**  
**CODE**

**GENERAL HEADQUARTERS  
AMERICAN EXPEDITIONARY  
FORCES**

Appendix 16D.—EXTRACTS FROM THE "MOHAWK" CODE

**SECRET**

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

*The*  
**“MOHAWK”**  
**CODE**

**GENERAL HEADQUARTERS  
AMERICAN EXPEDITIONARY  
FORCES**

## Instructions

1. This code book, to be known as the "Mohawk" Code, is issued to all combatant troops down to battalions.

It is primarily intended for communication within the division, but may be used for messages to higher headquarters.

Messages encoded by its use may be transmitted by any means at hand, but radio or earth telegraphy should be used only when more secret means are not available.

2. Messages once transmitted in clear or in any other code or cipher must not be repeated in this code.

Messages once transmitted in this code must not be repeated in any other code or cipher or in clear.

Except that number and hour of signature may be in clear when preceding first code group, the use of "clear" in code messages is prohibited.

3. The use of this code for regular routine reports should be limited to actual necessities. Such reports should be transmitted by other means than radio or earth telegraphy.

4. Avoid use of words not in code book when other words with same significance are provided. Words spelled out, letter by letter, not only take time to code, transmit and decode, but they are one of the favorite points of attack by enemy code men.

5. Where two or more code groups are assigned the same letter, syllable, word or phrase, first one and then another should be used so that in a series of messages each occurs about the same number of times. In particular, no group should ever appear twice in the same message.

6. At least one group marked "Null" should be used for every ten code groups in a message. These should be placed at irregular intervals. A "Null" should always occur between double letters; thus the word "boot" would be encoded:

(b) *	(o)	(Null)	(o)	(t)
4212	2976	2627	3460	4704

Note that different groups are used for the letter "O"

7. Coded and decoded copies of messages must never be filed together. All notes and memoranda used in coding or decoding messages must always be destroyed, by burning, if practicable.

8. Messages must be short. Several short messages will be less likely to be read by the enemy than one long one.

Except in emergency a long message, if it must be sent, will be divided into two or more parts and each sent as a complete message.

Very often the best way to handle a long message is to leave out unnecessary words.

9. Addresses will not be used when context of message indicates for whom intended. When used, they must be in code.

10. Signatures should be sent only when absolutely required. When sent, they must be encoded, letter by letter, if necessary. Usually it will be sufficient to indicate origin by some word in code book previously agreed upon by each commander and his immediate subordinates.

11. The message handed Signal Corps operator should be in the following form, on any suitable paper:

"No. 1.	15:40.	4212	2976	2627	3460	4704
---------	--------	------	------	------	------	------

Send this message to First Division.

J. M.  
(Capt., 1st Infantry")

1 June, 1918

## ENCODING

0...4616..4585..3524		60...2973..4620	
1...3211..4753..4997		61...3533	
2...3323..4794..3305		62...3920	
3...3657..3517..3188		63...3851	
4...4498..2661..4213		64...4774	
5...3667..2522..4431		65...2714	
6...3272..2875..4900		66...3089	
7...3766..4650..2613		67...3961	
8...4004..3009..2650		68...3498	
9...4550..3137..4313		69...3731	
10...3248..2525..4887		70...2806..4479	
11...3685..2770..4034		71...3824	
12...3203..3755..3613		72...2920	
13...2727..4851..2909		73...2564	
14...4379..3256..4529		74...4680	
15...3047..4271..3251		75...3492	
16...4867..4339..4029		76...3506	
17...2664..4802..3826		77...2847	
18...3267..2800..4059		78...2821	
19...4799..3083..2705		79...4661	
20...3979..2893..3240		80...2544..3200	
21...4210..2717..3579		81...2687	
22...2614..4273..2942		82...2825	
23...3820..2595..4804		83...4521	
24...3710..2778..4026		84...2709	
25...2804..3713..2902		85...4890..4598	
26...3529		86...4916	
27...2788		87...4698	
28...3838		88...2958	
29...4018	Null...3978	89...3243	
30...3653..2749		90...4878..4002	
31...3366		91...4633	
32...4350		92...4984	
33...3171		93...2507	
34...2541		94...4576	Null...3903
35...3155..4816		95...3637	
36...3976		96...4715	
37...2579		97...3221	
38...4830		98...3465	
39...2519		99...4266	
40...2677..4320		100...2684..3173	
41...3281		101...3575	
42...4334		102...3846	
43...2707		103...4778	
44...4487		104...2758	
45...3401..4963		105...4973	
46...3293		106...3899	
47...3079		107...3432	
48...3870		108...4671	
49...2633		109...3349	

Approved...2546	Away...3220
Approximate...4073	Axe (s)...3956
Approximately...2882..4659..3352	B...3482..4212..3320
-ar...4657	Back...3931
Are...3615..3379..4697	Bad (ly)...3008
Are having...2658	Badly damaged...4856
Are not...3977	Badly wounded...3275
Are they...2720	Bag (s)...3844
Are we...4789	Balloon...3424
Are you...3177	Bank...4913
Are you all right...3987	Barbed wire...3101..4898
Arm...2916	Barrage...2787..4568..3141..3566
Armored...4700	Barrage wanted...2801
Army...3403	Barricade...3564
Arrive...4528	Battalion...3331..3655..2554
Arrived...3304..3919..3273	Battalion headquarters...4739..3157
Artillery...4441..2644..4286	Battery...4021..2753..4385
Artillery fire...2901	Battle (s)...2680
Artillery observer...4884	Bavarian...4743
Artillery position...2570	Bay (s)...3222
Artillery preparation...4051	Bayonet...4990
Artillery support...4801	Be...2637..4387
-ary...3127	Be ready...2514
As...4452..3934..2803..3754	Be released...4258      Null...2944
As far as...3497	Because...4886
As soon as...4300..3394	Been...3132..4580
Ascertain...4267      Null...4777	Before...3532
Ask...3175	Began...3355
Asphyxiate...3905	Begin...4797
Assemble...3039	Begun...3441
Assist...4815	Behind...3545
Assistance...3358	Behind the lines...4645
At...4764..3342..4346..2990	Being...3261..4961
At close quarters...4417	Being established...3125
At once...2897..3592	Being sent...3872
At point...2604	Being shelled...2725
-ate...4877	Believe...3935
Attack...2732..4037..3095..4978	Belong...2980
Attacked...3929	Below...4411
Attacking...2515	Belt (s)...3029
Attempt...4048	Bengal flares...4202
Attention...3060	Best...3213
Austrian...4319..2624	Better...3786
Automatic...4404	Between...2547
Automatic rifle...3329	Beyond...3742
Automatic rifle ammunition...4827	Billet (s)...3027
Available...2853	Bivouac...4707
Aviator...3958	Black...3018
Await...3080	Block...3716
Await instructions...3706	Blue...2694

## DECODING

2500...Go	2550...Leave
2501...Tank	2551...Sign
2502...Not	2552...Request
2503...Compass	2553...Combat train
2504...Has been	2554...Battalion
2505...P	2555...Serious
2506...-ou	2556...On
2507...83	2557...Progress
2508...During	2558...Opposite
2509... (Null)	2559...No casualties
2510...Kill	2560...French 75 mm.
2511...Must	2561...-rd
2512...-qu	2562...E
2513...Too little	2563...Men
2514...Be ready	2564...63
2515...Attacking	2565...Defensive
2516...Favorably	2566...Nothing to report
2517...Reinforcements arrived	2567...Border
2518...Earth	2568...And
2519...39	2569...-es
2520...First	2570...Artillery position
2521...Drop	2571...Small
2522...5	2572...Still
2523...Green	2573...Pair
2524...Commander	2574...By
2525...10	2575...Messenger
2526...Lengthen	2576...-ite
2527...Fog	2577...Relieved
2528...Cross	2578...Increase
2529...Body	2579...37
2530...During	2580...H
2531...Cannot	2581...Our
2532...Parachute	2582...Liquid fire
2533...Postponed	2583...End
2534...Men gassed	2584...Out of
2535...Occupy	2585...Considerable
2536...Advised	2586...Raid will take place
2537...Platoon	2587...Moment
2538...H	2588...R
2539...Have taken	2589...Require
2540...Seventh	2590...-ing
2541...34	2591...Repeat
2542...Do not	2592...100
2543...January	2593...Mile (s)
2544...70	2594...Sending up
2545...Breach	2595...23
2546...Approved	2596...Ought not
2547...Between	2597...No
2548...Observation	2598...On this
2549...Quartermaster	2599...Q

**Appendix 16E.—EXTRACTS FROM THE "ALLEGHENY" CODE**

**SECRET**

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

*The*  
**“ALLEGHENY”**  
**CODE**

**GENERAL HEADQUARTERS  
AMERICAN EXPEDITIONARY  
FORCES**

## ENCODING

0...2896..4901..5200		50...2329..3942	
1...1943..5471..3048		51...5343	
2...4071..5784..3260		52...1861	
3...3749..3485..4130		53...4011	
4...4815..5316..2281		54...2276	
5...3012..4207..2844		55...1970..3193	
6...2277..4599..2124		56...2420	
7...5523..2163..2325		57...4738	
8...2178..2238..5842		58...1673	
9...3189..3882..5218		59...2392	
10...3178..1672..2188		60...3501..2267	
11...5527..5098..2079		61...3893	
12...1921..5302..4791		62...3584	
13...2083..1922..4985		63...4044	
14...1815..1509..5142		64...5207	
15...5011..2475..4457		65...1959..3159	
16...1593..2567..1830		66...5886	
17...1658..2284..3069		67...1596	
18...5660..1676..2410		68...3054	
19...4598..5693..1560		69...5103	
20...4581..2176..2594		70...4243..3521	
21...3824..1610..4082		71...3389	
22...1722..4415..2457		72...1845	Null...4060
23...2244..4824..5063		73...4967	
24...4424..3610..4780		74...2723	
25...5275..2547		75...5389..3582	
26...4616		76...3370	
27...5746	Null...4267	77...4477	
28...4075		78...5392	
29...4709		79...2557	
30...5186..1786		80...3347..4260	
31...3609		81...3229	
32...1990		82...2554	
33...2400		83...2900	
34...2351		84...5018	
35...5318..3756		85...3468..3951	
36...3292		86...4959	
37...3651		87...2667	
38...3980		88...5282	
39...1704		89...2993	
40...2913..4518		90...4148..2426	
41...3492		91...3396	
42...1809		92...2289	
43...5122		93...2663	
44...2187		94...3067	
45...2496..3965		95...4429..4909	
46...5287		96...2972	
47...1819		97...1685	
48...5637		98...5977	
49...2817		99...1645	

**Appendix 16F.—EXTRACTS FROM THE "HUDSON" CODE**

**SECRET**

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

**Memorize this Group:  
"2222---Code Lost."**

*The*  
**"HUDSON"**  
**CODE**

**GENERAL HEADQUARTERS  
AMERICAN EXPEDITIONARY  
FORCES**

## ENCODING

0...1797..5519..4887		51...4321	
1...1997..2074..3854		52...5784	
2...5527..2953..2738		53...2172	
3...5295..2742..3759		54...5063	
4...1934..4951..2610		55...4112..2830	
5...5838..2623..3967		56...2478	
6...3498..5214..4057		57...5385	
7...5191..2417..3980		58...3351	
8...2283..2946..4400		59...2650	
9...5979..4412..2136		60...3111..2704	
10...4626..3031..5342		61...3937	
11...1591..5025..2044		62...1992	
12...3286..2681..4277		63...2229	
13...2512..5981..5928		64...1691	
14...3088..2633..5367		65...1752	
15...2554..2488..4532		66...5800	
16...3107..5067..3261		67...3295	
17...3569..4644..1884		68...2420	
18...2334..4865..3204		69...2159	
19...5115..1789..3336		70...1900..2457	
20...1538..4655..3876		71...3118	
21...5033..3479..5243		72...3181	Nulls:
22...4582..5594..4129		73...1714	5471
23...5407..1742..2259		74...2715	4145
24...2669..2395..4254		75...1920..2352	4286
25...2021..5300	Nulls:	76...2145	1683
26...3738	4286	77...3190	4093
27...5767	2809	78...5535	
28...4513	2094	79...3169	
29...3022	4198	80...1527..4305	
30...4733..4052	5078	81...2006	
31...2884		82...3658	
32...5895		83...2547	
33...2238		84...3720	
34...2438		85...2400	
35...4893..2837		86...4801	
36...1812		87...3446	
37...2530		88...4409	
38...2182		89...3301	
39...3080		90...4749..4156	
40...2929..4767		91...2586	
41...5004		92...5739	
42...3664		93...2347	
43...2855		94...2300	
44...5142		95...5501	
45...2407..4902		96...4694	
46...1861		97...5130	
47...3951		98...2049	
48...4288		99...2432	
49...1684		100...2525..5414..1698..4605	
50...2155..4423			

**Appendix 16G.—EXTRACTS FROM THE "COLORADO" CODE**

**SECRET**

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

**Nº 342**

**MEMORIZE THIS GROUP:  
"DAM---Code Lost."**

*The*  
**"COLORADO"**  
**CODE**

**GENERAL HEADQUARTERS  
AMERICAN EXPEDITIONARY  
FORCES**

## ENCODING

0...FWP..OCM..DMA		51...MPL	
1...KSU..RYV..AGL		52...VJS	
2...NBX..JPS..DSK		53...SXB	
3...YMJ..SPF..PCB		54...GMA	
4...LPW..GKX..QBG		55...MXF..VBX	
5...MCA..FBL..KPW		56...SWA	
6...BFC..MYV..OMJ		57...OGX	
7...RPA..CPS..MSG		58...GYM	
8...PWY..JXW..GSC		59...DXJ	
9...RBJ..QYA..NGW		60...VNO..PBL	
10...FCV..GBL..DCM		61...OSX	
11...JFU..ZBW..XPO		62...DYN	
12...VSY..NYK..CJF		63...FYM	
13...BNA..CFX..DWA		64...ZBA	
14...QJC..PLB..NWJ		65...XMY..VCX	
15...GNU..SGA..XBC		66...OGA	
16...RGS..NSV..GNP		67...DPA	
17...JBK..DGA..KXY		68...BWJ	
18...OXW..RBY..XYM		69...JBY	
19...BGR..DPL..RFY		70...OBX..WSX	
20...YWU..XJM..OWY		71...VYW	
21...NXO..BPG..QPJ		72...DMX	
22...PSA..SCO..FGN		73...KMY	
23...GVJ..KXO..OPB		74...WJX	
24...JWC..NFC..MBC		75...GVA..ORF	Nulls:
25...NPJ..QMX		76...AXW	XWO
26...PFJ		77...XGD	YXO
27...LYW		78...SKC	WJS
28...VPA		79...ONS	PNW
29...SMD		80...CPA..LGJ	Luw
30...GFU..CMX	Nulls:	81...PYW	
31...BKV	SKP	82...GXO	
32...KBV	VBY	83...CFG	
33...YPF	XOB	84...JMS	
34...SNW	AUS	85...WXV	
35...VJC..MGX	GWS	86...RFK	
36...ABW		87...OBL	
37...RWB		88...JFC	
38...NGA		89...CBA	
39...JPL		90...OPW..LYB	
40...DYW..RKC		91...SBN	
41...VSA		92...QPM	
42...JSC		93...GMS	
43...NBL		94...LBX	
44...CUY		95...PWA	
45...XJG..WCA		96...GPC	
46...GNA		97...YBW	
47...RMY		98...QVM	
48...APB		99...GWU	
49...YBM		100...DGX..JUW..RPX..WPA	
50...MGI..DCA			

Are having...PAT		Away...JWS	
Are not...SXW		Axe (s)...NYB	
Are we...CSA		B...PSJ...DCV...BWA	
Are you...DUL		Back...YFM	
Are you all right...FPA		Bad (ly)...VYG	
Arm...PWO		Badly damaged...BKM	
Armored...QOY		Badly wounded...DYF	
Army...DOS...AUF		Bag (s)...VEN	
Army headquarters...BYW...DXS		Balloon...QYO	
Arrive...XSO		Bank...MER	
Arrived...ZOY...CMO...FPC		Barbed wire...NPA...GFB	
Artillery...KSM...YJW...XMP		Barrage...NYS...VCP...BGN	
Artillery fire...CJV		Barrage wanted...DOG	
Artillery observer...ANK		Barricade...MUS	
Artillery position...FON		Battalion...YAX...WAP...BAR	
Artillery preparation...WAV		Battalion headquarters...DMO	
Artillery support...REL		Battery...VCA...AFM...GXY (NXB)	
-ary...FOK		Battle (s)...VAB	
As...GBX...XWC...FLB		Bavarian...WSM	
As far as...BSY		Bay (s)...FRX	
As soon as...LUM...NUK		Bayonet...GAL	
Ascertain...ONC	Nulls:	Be...LGW...SNG	Nulls:
Ask...PNB	LAY	Be ready...VPK	PJV
Asphyxiate...GLX	ROB	Be released...BES	FWY
Assemble...FUG	GNW	Because...FMP	VSX
Assist...BLU	PAY	Been...JAW...SYM	GFY
Assistance...AXF	WYS	Before...QXP	PXM
At...JAC...SYK...YON...COT		Began...PBA	
At close quarters...DGO		Begin...JOM...FAK	
At once...WPX...XSA		Begun...BMP	
At point...YSJ		Behind...JGF	
-ate...DSX		Behind the lines...MKY	
Attack...BXM...YWA...SMP		Being...NUW...VMC	
Attacked...RGK		Being established...QSM	
Attacking...LPY		Being sent...AUX	
Attempt...JXM		Being shelled...DAR	
Attention...WEB		Believe...WXG	
August...ABM		Belong...VXK	
Austrian...DPX...NGP		Below...QPX	
Automatic...OVX		Belt (s)...JYG	
Automatic rifle...JSM		Bengal flares...FUN	
Automatic rifle ammunition...RPV		Best...RBS	
Available...JPY		Better...SBC	
Aviator...BNO		Between...RAS...LOR	
Await...KGM		Beyond...AMX	
Await instructions...VNY		Billet (s)...FRA	
-ion...NOG...OVA...DAW		-re...RWU...QVC	
-ly...GFP...JFY		-s...LYN...ASV...DPG...OMB	
-nd...MXA...NWP...ANP		-st...PWJ...BPA...SYM...GMC	
-nt...OPL		-th...KMS...NFW...PLX	

BPN...Perfect	BYA...Commissioned officer
BPO...Will not	BYD...Round
BPS...Renew	BYF...Was
BPU...All ready	BYG...Flank
BPW...Wing	BYK...Work
BPX...Reoccupy	BYL...Conclude
BPY...Early	BYM...Defensive
BSA...Wire	BYN...Good
BSC...Retire	BYP...Reinforcements
BSJ...Bombarded	BYR...Repeat
BSM...Rush	BYV...West of
BSO...Return	BYW...Army headquarters
BSP...Decrease	CAB...Small
BSU...Troops	CAF...Heavily
BSX...Returned	CAK...Will be
BSY...As far as	CAM...Repair
BUD...Has stopped	CAN...Coming
BUF...Visibility	CAP.....
BUG...Report condition of	CAR...Reply at once
BUK...Build  trenches	CAT...Correct
BUM...Leave	CAV...Wagon
BUN...Communication	CAW...June
BUP...When	CAX...The same
BUS...Enemy has lost heavily	CBA...89
BUT...Single	CBF...Top
BUW...Relieving	CBG...Relief completed
BWA...B	CBJ...Trouble
BWC...Several	CBM...E
BWD...Reinforced	CBN...We
BWG.....	CBO...Can be
BWJ...68	CBP...Warning
BWM...Urgent	CBS...Required
BWO...Revetting	CBU...Double
BWP...Division headquarters	CBW...Brigade
BWS...V	CBX...Too early
BWU...Confident	CBY...Has not been
BWX...Right	CFA...Tomorrow
BWY...Wire entanglements	CFB...Relief will take place
BXA...No casualties	CFG...83
BXF...Consolidating	CFK...Thursday
BXG...Were	CFM...Lachrymatory
BXK...Pigeon	CFO...M
BXL...Unchanged	CFP...Confirm
BXM...Attack	CFS...Will open fire
BXO...Without delay	CFV...Renew
BXS...Wireless station	CFW...Wood
BXU...Extreme	CFX...13
BXW...Too far	CFY...Total
BXP...Rifle	CJA...Slow
BXY...March	CJB...Many

**Appendix 16H.—EXTRACTS FROM THE "SENECA" CODE**

**SECRET**

MUST NOT FALL  
INTO HANDS OF  
ENEMY

Nº 457

MEMORIZE THIS GROUP:  
"DAM---Code Lost."

*The*  
**"SENECA"**  
TRENCH CODE

Precede every message in this code by  
"SEN"

NOTE: The \* indicates new word or phrase.

## INSTRUCTIONS

1. This code book, to be known as the "Seneca" Code, is issued to division, brigade, regimental and battalion headquarters of your division. Whether or not it is issued to neighboring divisions must be determined by you before you send them telegrams encoded by its use. (See G. O. No. 172, G. H. Q. American E. F., 1918.)

2. IN CASE OF LOSS OF THIS BOOK, NOTIFY SUPERIOR AUTHORITY AT ONCE. BURN IF IN DANGER OF CAPTURE.

3. Coded messages sent by telephone will be preceded by the word "Seneca." If transmission is difficult, use the following telephone alphabet, authorized by G. O. No. 103, 1918:

A—Able	N—Nan
B—Boy	O—Opal
C—Cast	P—Pup
D—Dock	Q—Quack
E—Easy	R—Rush
F—Fox	S—Sail
G—George	T—Tare
H—Have	U—Unit
I—Item	V—Vice
J—Jig	W—Watch
K—King	X—X-ray
L—Love	Y—Yoke
M—Mike	Z—Zed

Example: If the operator receives "buy" as "vie," and difficulty is experienced in distinguishing "B" from "V," "buy" may be spelled "boy-u-y."

4. Coded messages sent by telegraph or radio will be preceded by the group "SEN."

5. The use of this code for regular routine reports should be limited to actual necessities. Such reports should be transmitted by other means than radio or earth-telegraphy.

6. Avoid use of words not in code book when other words with same significance are provided. Words spelled out, letter by letter, not only take time to code, transmit and decode, but they are one of the favorite points of attack by enemy code men.

7. Where two or more code groups are assigned the same letter, syllable, word or phrase, first one and then another should be used so that in a series of messages each occurs about the same number of times. In particular, no group should ever appear twice in the same message.

8. At least one group marked "Null" should be used for every ten code groups in a message. These should be placed at irregular intervals. A "Null" should always occur between double letters; thus, the word "boot" would be encoded:

(b)	(o)	(Null)	(o)	(t)
RBC	PXB	VAP	COD	VEM

Note that different groups are used for letter "O."

## ENCODING

00...BAT..GPL				50...QMV..JBX	
0...GWO..MEF..BAP				51...VYN	
1...VEN..OCM..GAP				52...JSX	
2...RGD..FJO..QYW				53...PWU	
3...CMB..DGS..NUM				54...XFW	
4...PJV..JAK..XMU				55...MYF	
5...KSP..PLY..WEF				56...GKO	
6...ORB..GPY..YMC				57...XBN	
7...ABG..DYL..MOS				58...BYN	
8...VFA..SPY..QVK				59...KGW	
9...OSC..JUW..XPJ				60...DAR..QJW	
10...CBP..NXP..PNU				61...NWU	
11...NSV..DSK..VSF				62...BGR	
12...RKY..GVO..AMY	0'clock:			63...NCS	
13...KMD..YFJ..CPB		OBK		64...JWA	Nulls:
14...SKX..BUT..NBA		GNA		65...WUP	DWS
15...VXK..JOP..DUW		PNR		66...COT	QAM
16...RWK..DWJ..PAG				67...FLY	BJP
17...SCW..MGV..LAM				68...MCB	YFG
18...YJA..DOG..KPS	Minutes:			69...OXA	XFM
19...PUX..VJB..FPO		DPL		70...SBP..WSO	
20...SON..FEK..OBL		NCV		71...YUJ	
21...GFS..ZVC..QPF		XUB		72...RFX	first...SPG..KGO
22...LBW..SYP..CSV				73...JPU	
23...SNG..JGL..BET				74...QAX	second...YPM..NAK
24...RYK..QEP..VMA				75...SXJ..APF	
25...ZOB..SUC				76...SMO	third...MGW..PBR
26...REL				77...XON	
27...BKS	Nulls:			78...DMA	fourth...VEF..MAT
28...YWX		BNA		79...YXG	
29...FON		NCJ		80...YOB..FCK	fifth...WXM..LOP
30...POV..JEX		NAG		81...XJC	
31...MJP		DEP		82...LYN	sixth...QPX..DAL
32...ZAS		REF		83...YAW	
33...VOL				84...AFO	seventh...VXG..KBG
34...JXM				85...JVN	
35...ONV	battalion			86...QXP	eighth...QBM..SOW
36...OVB		BYG..XAP..JSO		87...LUB	
37...WXO	brigade			88...MPO	ninth...GOC..BSC
38...CAN		SBN..OPS..CBG		89...NAM	
39...LET	corps			90...KBS..BWD	tenth...AWC..PWS
40...MUC..RUW		XJU..RKB		91...OLU	
41...GEX	division			92...WAX	
42...LGN		WNV..LBY		93...SPK	
43...WCO	regiment			94...FWP	
44...BIU		DWA..OSJ..ABY		95...GMA	
45...KVP				96...LOM	
46...MXS				97...GLX	
47...NOW				98...NPS	
48...DPB				99...XUN	
49...WOV				100...KXF..RMX..RPS..PFY	

## DECODING

ABE...bombaraded.	APE...my
ABF...notice	APF...75
ABG...7	APJ...radio message
ABK...degree (s)	APN...come
ABM...ridge	APO...-ty
ABO...D	APU...foot
ABP...-non	APW.....
ABS...converge	APX...our artillery
ABV...take place	APY...all points
ABW...mistake	ASB...report
ABX...are not	ASF...heavy
ABY...Regiment	ASG...was not
AFC...-es	ASK...cross-road
AFD...sometime	ASM...should be
AFJ...S	ASO...-im
AFM...very	ASP...regulate
AFO...84	ASV...be released
AFR...Boche	ASX...Third Corps
AFV...sandbag	ASY...has destroyed
AFX...patrol schedule	AUB...storm
AFY...emplacement	AUF...A
AGB...we are in need of	AUG...large
AGE...hundred	AUK...were not
AGF...situation	AUM...-ate
AGK...aeroplane	AUP...on
AGL...understand	AUS...missing
AGN...question mark	AUW...enemy artillery
AGO...following	AUX...until
AGU...ward	AWB...general
AGY...send out patrols	AWC...tenth
AMC...complete	AWE...numbering
AMG...moving	AWG...(null)
AMK...permission	AWK...October
AMO...do	AWO...working party
AMP.....	AWP...is there any gas
AMS...incendiary	AWS...out of
AMV...station	AWX...comply
AMX...barrage	AWY...more
AMY...12	AXB...required
AND...weather conditions	AXF...has
ANF...enemy infantry	AXG...to be
ANG...mask	AXM...being sent
ANK...open	AXP...suffocate
ANO...H	AXS...him
ANP...British	AXV...relief
ANS...when shall we be relieved	AXW...detachment
ANW...millimeter (s)	AXY.....
ANX...force	BAD...new
ANY...why	BAF...as
APB...an	BAG...machine gun

**Appendix 16I.—EXTRACTS FROM THE "CHAMPLAIN" CODE**

**SECRET**

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

**Nº 131**

**MEMORIZE THIS GROUP:  
"DAM---Code Lost."**

*The*  
**"CHAMPLAIN"**  
**CODE**

**GENERAL HEADQUARTERS  
AMERICAN EXPEDITIONARY  
FORCES**

## ENCODING

0...SCP..RGX..PSC	51...SNB
1...WPX..FBP..VSD	52...JOM
2...APJ..YOP..KGX	53...ZBA
3...FCV..QXA..WEV	54...DWS
4...COM..SOP..WSO	55...DEB
5...RBO..YUX..NAW	56...DGV
6...GLP..QEM..DOS	57...VCF
7...OWL..RGU..JWC	58...BAN
8...RAG..GXJ..SCB	59...WYV
9...BOW..KVS..ZAB	60...SUB..OLJ
10...BES..GAY..FUP	61...BXM
11...LOK..KBY..GFK	62...GSM
12...BKX..WNX..PBA	63...LAK
13...OXF..CSY..WJO	64...WOS
14...NCW..DMA..FPG	65...MAV
15...CPL..MSY..PUN	66...CAT
16...FWJ..XOG..MYG	67...NUG
17...GMX..AGE..XBA	68...YFM
18...FRM..DXS..CBW	69...XJP
19...NUR..VAX..FSM	70...GEF..SAC
20...POV..LEP..JVB	71...QAX
21...KMS..BNM..OBY	72...DCM
22...FEW..AMG..QOS	73...NGX
23...JMY..LGS..AUK	74...WXP
24...QMC..OGP..FYG	75...GFY..RBX
25...XFW..OCX	76...AXB
26...GNW	77...VOY
27...YPK	78...OVX
28...KMA	79...KPL
29...DUG	80...BUD..SWU
30...ABP..MAN	81...CMS
31...NBA	82...NPU
32...OSA	83...ROM
33...XUF	84...BYL
34...PLQ	85...JYB
35...OCJ	86...VYM
36...MGL	87...WAV
37...YJV	88...FAD
38...ZVA	89...ONX
39...RUT	90...QYW..JFC
40...FOL..JBO	91...BGF
41...PKS	92...GPW
42...GBW	93...SNO
43...SYN	94...PUB
44...MJX	95...DIS
45...FJV	96...PJV
46...NOR	97...YUM
47...YAX	98...XYF
48...KWP	99...RPA
49...ASG	100...SXJ..VXM..SYG..ORF
50...SBJ..CPY	

Nulls:  
BPF  
YAW  
FPW  
AUM  
LGP

Nulls:  
PAR  
CFX  
ZVB  
DIW  
SCM

**Appendix 16J.—EXTRACTS FROM THE "HURON" CODE**

**SECRET**

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

**Nº 1644**

**MEMORIZE THIS GROUP:  
"DAM---Code Lost."**

*The*  
**"HURON"**  
**CODE**

**Precede every message in this code by  
"HUR"**

**NOTE: The \* indicates new word or phrase.**

## ENCODING

0...MYB..BMS..JUG		51...JPM	
1...REX..QAP..CUN		52...VPW	
2...NFY..JEB..SKX		53...DWA	
3...MXG..CUY..JYW		54...PFR	
4...KXB..ROS..YXV		55...FSM	
5...FUB..SNV..FGL		56...DOT	
6...PES..BSP..NBA		57...XPR	
7...WUS..NFC..BAF		58...AWX	
8...OXV..GEX..SGV		59...NOR	
9...AFV..NGK..PAR		60...QSO..LPU	
10...FWP..WBS..YPB		61...DUL	
11...LUP..GMP..XOP		62...LBS	
12...GNC..YMV..SKY		63...KXS	
13...DGB..ONC..DIT		64...RUG	
14...VYP..FEV..XYM		65...WYM	
15...PBX..LAV..PFW		66...ASB	
16...WXS..YBJ..LGF		67...BKX	
17...YOB..BPG..ABV		68...SAP	
18...BUN..RPO..MPB		69...MAC	
19...CJM..GAW..SOF		70...GBM..CMG	
20...NCW..DAL..SCU		71...CSX	
21...GPO..RYB..JVB		72...NPJ	Nulls:
22...XUS..KBG..VJX		73...QEK	OLD
23...NAS..GYV..MCU		74...OPY	BGX
24...KPN..VMS..QOV		75...BLG..QYV	REK
25...PWC..KSX		76...XSY	VAG
26...FCX		77...VAK	SYL
27...VEM	Nulls:	78...FAV	
28...DYB	XPO	79...KGF	
29...SUY	LBW	80...YAX..BFS	
30...JOR..LOW	MEV	81...VNP	
31...OKB	MSU	82...FSP	
32...NYV	GMA	83...JMP	
33...GLJ		84...RFS	
34...DEL		85...FXM	0'clock:
35...PUM		86...QJW	OSY
36...QMP	0'clock:	87...PWY	BET
37...GOS	VPN	88...LOB	VPN
38...YJX	OSY	89...WJX	
39...WMP	BET	90...VXY..YSJ	
40...KMS..DPW		91...JGB	
41...OGW		92...AXF	
42...AGL		93...OBG	
43...PLO		94...QPA	
44...APJ		95...YWC	
45...QPM		96...PNA	
46...DXM		97...JYM	
47...POM		98...MEP	
48...MSP		99...RGU	
49...GMC		100...SCK..XFS..OLG..ZVA	
50...CFA..DSB			

Appendix 16K.—EXTRACTS FROM THE "OSAGE" CODE

**SECRET**

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

**MEMORIZE THIS GROUP:  
"DAM---Code Lost."**

*The*  
**"OSAGE"**  
**TRENCH CODE**

**Precede every message in this code by  
"OSA"**

**NOTE: The \* indicates new word or phrase.**

## ENCODING

* 00...DAN..PNW		50...SAK..LBC	
0...FRP..SNG..YPV		51...BGW	
1...DGW..OXK..WSB		52...SYF	
2...KBM..VYP..BNF		53...OCJ	
3...LGF..MCO..YAS		54...RAV	
4...NGS..DYN..QSG		55...GMX	
5...BOL..PLY..JSK		56...WNO	
6...ZOB..LES..AFV		57...CJB	
7...SPO..FUW..KPN		58...PCB	
8...MSO..DPB..KMX		59...JPK	
9...XFC..BAR..RKO		60...VJS..ABY	
10...FUC..PSM..JVY		61...GPB	
11...ZBP..OBC..BKS		62...OKG	
12...OVK..KXW..BWC		63...LBX	
13...VNF..GNY..KBA		64...PYN	Nulls:
14...OWE..BUS..RFO		65...DWX	GXJ
15...COS..LBP..NCV		66...BPF	AGY
16...DOB..OSV..WPA		67...NBP	WSO
17...CMU..YXZ..NAS		68...QMP	DYW
18...JEU..PEV..GFX		69...ASO	ZBS
19...ANO..XOB..FAM		70...GPY..KVX	
20...PAR..WOF..BMA		71...WUO	
21...ROW..GOP..SUN		72...JPL	
22...DSB..XGW..NXA		73...FPS	
23...AWB..QYP..FOB		74...FBP	
24...XMP..LSA..DUN		75...RPJ..DXO	
25...RWF..LAN		76...PMX	
26...YUM		77...FGW	
27...KRW	Nulls:	78...XAY	
28...MPW	JBA	79...MBX	
29...QVP	XAM	80...DCP..CBP	
30...AXS..ZAB	JSM	81...JXW	
31...QJS	XBY	82...WBJ	0'clock
32...GAK	RUC	83...ORA	OKU
33...MJS		84...NEF	JEW
34...NWB		85...BFA	
35...CAF		86...SKM	
36...YBX		87...JBU	
37...FED		88...NOK	
38...SBW		89...BSA	
39...JYS		90...RGU..XPB	
40...VCU..BEV		91...MBC	
41...RBL	0'clock:	92...NUR	
42...KVF	YWU	93...DMX	
43...MGI	OKU	94...QAM	
44...GVA	JEW	95...LOC	
45...PXK		96...BXW	
46...BLX		97...PON	
47...BXK		98...YSV	
48...YOU		99...FLP	
49...OGN		100...QEX..OPV..JOG..WJB	

**Appendix 16L.—EXTRACTS FROM FIELD CODE No. 1**

**SECRET**

Nº 271

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

**MEMORIZE THIS GROUP:  
"DAM---Code Lost."**

**FIELD CODE**

**No. 1**

**Precede every message in this code by  
"FC1"**

**Appendix 16M.—EXTRACTS FROM FIELD CODE No. 2**

**SECRET**

**Nº 2504**

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

**MEMORIZE THIS GROUP:  
"DAM--Code Lost."**

**FIELD CODE**

**No. 2**

**Precede every message in this code by  
"FC2"**

**SECRET****EMERGENCY CODE LIST**

To be used only with Field Code No. 2.

To be issued to companies.

To be used only for communications within divisions.

To be completely destroyed, by burning, when in danger of capture or after a new code has been issued.

**Precede Every Message in This Code by "C 2"**

About to advance...FX	AB...Strong attack
Ammunition exhausted...CZ	AF...Rush
Are advancing...AV	AG...Near
At...ZB	AP...Falling back
Attack failed...XP	AV...Are advancing
Attack successful...ZX	AW...Raiders have left
Barrage wanted...PM	AX...Objective reached
Be ready to attack...FZ	AZ...Everything O. K.
Being relieved...BJ	BD...Casualties light
Captured...PX	BF...Using gas shells
Casualties heavy...FY	BJ...Being relieved
Casualties light...BD	BM...Situation serious
Center...XA	BP...Need water
Enemy...FB	BS...Relief being sent
Enemy barrage commenced...PF	BX...Message not understood
Enemy fire has destroyed...SB	BY...Wire entanglements destroyed
Enemy machine gun fire serious...PO	CA...Relief completed
Enemy trenches...XB	CB...Rifle ammunition needed
Everything O. K...AZ	CM...Trenches have been occupied
Everything quiet...CP	CP...Everything quiet
Falling back...AP	CX...Look out for signal
Gas is being released...SC	CZ...Ammunition exhausted
Have broken through...XG	FA...Machine gun ammunition needed
How is everything...ZP	FB...Enemy
Increase range...SF	FC...Stopped
Left...PV	FM...Our artillery is shelling us
Look out for signal...CX	FS...Trenches
Machine gun ammunition needed...FA	FX...About to advance
Message not understood...BX	FY...Casualties heavy
Message received...ZJ	FZ...Be ready to attack
Near...AG	PB...Not ready
Need water...BP	PF...Enemy barrage commenced
Not ready...PB	PG...Tank stuck
Objective reached...AX	PM...Barrage wanted
Our...XF	PO...Enemy machine gun fire serious
Our artillery is shelling us...FM	PV...Left
Raiders have left...AW	PX...Captured
Recall working party...SM	SA...Using high explosive shells
Reinforcements needed...XY	SB...Enemy fire has destroyed
Relief being sent...BS	SC...Gas is being released
Relief completed...CA	SF...Increase range
Rifle ammunition needed...CB	SM...Recall working party
Right...SP	SP...Right
Rush...AF	SX...Troops
Situation improving...ZF	SZ...Stretcher bearers needed
Situation serious...BM	XA...Center
Stopped...FC	XB...Enemy trenches
Stretcher bearers needed...SZ	XF...Our
Strong attack...AB	XG...Have broken through
Tank stuck...PG	XP...Attack failed
Trenches...FS	XY...Reinforcements needed
Trenches have been occupied...CM	ZB...At
Troops...SX	ZF...Situation improving
Using gas shells...BF	ZJ...Message received
Using high explosive shells...SA	ZP...How is everything
Wire entanglements destroyed...BY	ZX...Attack successful

00...OWG..SMD		50...CAM..RMC	
0...VOR..WNC..XBC		51...ZAB	
1...GWU..FLY..DOK		52...SEY	
2...CUW..BKV..ASK		53...OBP	
3...JOY..PLX..ZBP	0'clock:	54...FCO	
4...WYK..PBN..KGM	CJM	55...WUX	
5...WSY..LGA..DEM	DMB	56...GAD	
6...VBO..QOF..SXB	SCB	57...OSV	
7...BFJ..WCP..JGB		58...YAB	
8...AFD..ROX..NXA		59...QXO	
9...FBL..GBM..XOG	Minutes:	60...DUC..RFG	
10...MEN..NOR..WBJ	AXF	61...MPJ	
11...GLO..RWP..BXG	BNK	62...JXW	Nulls:
12...FOK..YJA..XWB	ONP	63...PUK	YAX
13...WPC..QSO..OLJ		64...KSP	OMB
14...RGN..DWS..JXA		65...JMS	REF
15...MUG..KPN..COD		66...LOX	DYK
16...LYP..PWY..SOX		67...BMO	JOM
17...BNW..VJX..JAB	Nulls:	68...MGL	
18...WJO..NBL..AXG	PFY	69...QJM	
19...OPV..SBL..YWC	FMO	70...SUM..NAB	
20...FEW..GPX..YBO	ZAS	71...VEP	
21...OKS..FRM..CPS	GAV	72...DXS	first...JUM
22...RAG..QBM..JSX	XFW	73...WBX	[...OVS
23...BAW..KVM..PYV		74...OGF	second...KBY
24...MJJ..NEK..SNY		75...AMC..XFB	[...DOP
25...XGO..VYB		76...RYP	third...LEG
26...GCK		77...NSO	[...NCO
27...ANP		78...FLJ	fourth...MEW
28...PEW		79...BUT	[...DCV
29...FGU		80...XOS..GSY	fifth...SWB
30...GUV...XSC		81...FUK	[...PKK
31...CFK		82...PCU	sixth...VNP
32...RBP		83...JVN	[...BPJ
33...BSO	battalion...MOB	84...CBJ	seventh...WEG
34...YPF	[...OWE..DYL	85...KBS	[...GYL
35...ONC	brigade...FXA	86...NGF	eighth...APN
36...JPW	[...LOM..GNS	87...LAD	[...YOP
37...DPX	corps...SYK..PBO	88...DGX	ninth...RMY
38...KBA		89...MAR	[...CBP
39...DAY	division...NOW	90...MXG..SNA	tenth...SAM
40...LBC..BOW	[...QAX	91...CJV	[...GPJ
41...MBU	regiment...DMO	92...VAG	
42...JEB	[...XWU..VOD	93...BGW	
43...SGM		94...WAM	
44...YMO		95...GXP	
45...VMP		96...ABO	
46...GFP		97...NYF	
47...WMJ		98...RUM	
48...POK		99...GMY	
49...AUS		100...FAK..YSX..FWY..XAB	

**Appendix 16N.—EXTRACTS FROM FIELD CODE No. 3**

**SECRET**

**MUST NOT FALL  
INTO HANDS OF  
ENEMY**

**Nº - 2393**

**MEMORIZE THIS GROUP:  
"DAM---Code Lost."**

**FIELD CODE**

**No. 3**

**Precede every message in this code by  
"FC3"**

00...GFM..SWC		50...DYB..ASG	
0...DAB..KVF..PWB		51...CSM	
1...MGW..RAG..QMC		52...OWA	
2...NGU..JMP..FRO		53...MES	
3...BWA..REM..GAY		54...YUJ	
4...CFO..MSP..VCS	0'clock:	55...WNA	
5...WPJ..YXJ..JUD	LES	56...NOW	
6...XGW..AGE..KBO	GOP	57...JEG	
7...YAP..PNB..DOT	XYB	58...GPS	
8...FCK..ROG..OMS		59...XBC	
9...BNC..LBX..WAP		60...SOB..QOJ	
10...COS..SMA..GLJ	Minutes:	61...XUP	
11...LUN..YOC..PYW	RUW	62...RWY	Nulls:
12...NYK..NCX..QAP	BOP	63...PUB	PBA
13...BYV..YPS..FUR	ORA	64...FAM	VNP
14...XAJ..PBY..VAF		65...AUW	BOS
15...XPL..SAM..JOM		66...FSM	ZAB
16...FJO..KMU..DIS		67...BLD	KGM
17...BEP..SYG..OKY	Nulls:	68...YJO	
18...CJX..ZOB..VXF	QEF	69...VBC	
19...MBY..NAP..WJX	XWC	70...CUB..MXF	
20...NSV..QXO..GUM	LGB	71...JPO	
21...BXM..JFW..PSC	GAD	72...MJP	first..WPO..APJ
22...WYB..GXV..QPF	FMC	73...KGA	
23...XFA..RGA..FYB		74...GWC	second..FBO
24...YFA..RPX..GEK		75...NWU..DPX	[..WSX
25...XJW..LAP		76...OCA	third..VAG..WJC
26...VJM		77...AMX	
27...FEW		78...OCW	fourth..QMO
28...SPK		79...BSX	[..XYM
29...VOR		80...RKY..WBY	fifth..WCU..AMS
30...BKC..MOP		81...WSC	
31...JXO		82...KPV	sixth..PUX..KMA
32...DEF		83...VSM	
33...QVC	battalion..YWX	84...XOK	seventh..QYJ
34...DSV	[..QEM..CJO	85...SGR	[..MEN
35...LOR	brigade..LEP	86...GNB	eighth..PUS
36...JAS	[..JSV..CUS	87...FBL	[..QEV
37...OPY	corps..BXU..ABF	88...POT	ninth..YWJ..CBJ
38...MAV	division..XWU	89...PXA	
39...RBV	[..VAK	90...FLY..OXW	tenth..BNK..ROP
40...NUP..WOB	regiment..MGD	91...BFX	
41...AXY	[..APX..GAK	92...QJC	
42...BPW		93...ABV	
43...VYL		94...DCA	
44...CAX		95...FPK	
45...PFR		96...LYW	
46...GOD		97...MYS	
47...WUA		98...GBU	
48...SBX		99...OBA	
49...PYB		100...PEG..VMB..FON..JVC	

**Appendix 17.—THE EMERGENCY CODE LISTS**

**SECRET****EMERGENCY CODE LIST**

To be used only with Field Code No. 1.

To be issued down to companies.

To be used only for communications within divisions.

To be completely destroyed, by burning, when in danger of capture or after a new code has been issued.

**Precede Every Message in This Code by "C 1"**

About to advance...BY	AB...Left
Ammunition exhausted...FB	AF...Enemy machine gun fire serious
Are advancing...PX	AG...Gas is being released
At...SX	AP...Stretcher bearers needed
Attack failed...BM	AV...Recall working party
Attack successful...PP	AW...Casualties heavy
Barrage wanted...XF	AX...Using gas shells
Be ready to attack...ZF	AZ...Relief completed
Being relieved...XA	BD...How is everything
Captured...CB	BF...Right
Casualties heavy...AW	BJ...Situation serious
Casualties light...FZ	BM...Attack failed
Center...PB	BP...Enemy trenches
Enemy...FC	BS...Raiders have left
Enemy barrage commenced...PV	BX...Falling back
Enemy fire has destroyed...SP	BY...About to advance
Enemy machine gun fire serious...AF	CA...Everything O. K.
Enemy trenches...BP	CB...Captured
Everything O. K...CA	CM...Reinforcements needed
Everything quiet...XG	CP...Need water
Falling back...BX	CX...Machine gun ammunition needed
Gas is being released...AG	CZ...Objective reached
Have broken through...SA	FA...Not ready
How is everything...BD	FB...Ammunition exhausted
Increase range...SB	FC...Enemy
Left...AB	FD...Our artillery is shelling us
Look out for signal...SZ	FE...Using high explosive shells
Machine gun ammunition needed...CX	FX...Stopped
Message not understood...PO	FY...Situation improving
Message received...ZX	FZ...Casualties light
Near...SM	PB...Center
Need water...CP	PF...Attack successful
Not ready...FA	PG...Strong attack
Objective reached...CZ	PH...Trenches
Our...XP	PI...Message not understood
Our artillery is shelling us...FM	PV...Enemy barrage commenced
Raiders have left...BS	PX...Are advancing
Recall working party...AV	SA...Have broken through
Reinforcements needed...CM	SB...Increase range
Relief being sent...XY	SC...Troops
Relief completed...AZ	SD...Tank stuck
Rifle ammunition needed...XB	SE...Near
Right...BF	SF...Enemy fire has destroyed
Rush...ZP	SG...At
Situation improving...FY	SH...Look out for signal
Situation serious...BJ	SI...Being relieved
Stopped...FX	SJ...Rifle ammunition needed
Stretcher bearers needed...AP	SK...Barrage wanted
Strong attack...PG	SL...Everything quiet
Tank stuck...SF	SM...Our
Trenches...PM	SN...Relief being sent
Trenches have been occupied...ZJ	SO...Wire entanglements destroyed
Troops...SC	SP...Be ready to attack
Using gas shells...AX	SQ...Trenches have been occupied
Using high explosive shells...FS	SR...Rush
Wire entanglements destroyed...ZB	SS...Message received

**SECRET****EMERGENCY CODE LIST**

To be used only with the "Huron Code."

To be issued down to companies.

To be used only for communications within divisions.

To be completely destroyed, by burning, when in danger of capture or after a new code has been issued.

**Precede Every Message in This Code by "RO"**

About to advance...SP	AB...Gas is being released
Ammunition exhausted...BX	AF...Trenches
Are advancing...XF	AG...At
At...AG	AP...Objective reached
Attack failed...FS	AV...Enemy fire has destroyed
Attack successful...XA	AW...Relief being sent
Barrage wanted...BD	AX...Captured
Be ready to attack...SM	AZ...Look out for signal
Being relieved...ZB	BD...Barrage wanted
Captured...AX	BF...Right
Casualties heavy...BJ	BJ...Casualties heavy
Casualties light...SF	BM...Using gas shells
Center...XY	BP...Left
Enemy...PF	BS...Enemy trenches
Enemy barrage commenced...SB	BX...Ammunition exhausted
Enemy fire has destroyed...AV	BY...Wire entanglements destroyed
Enemy machine gun fire serious...ZF	CA...Our
Enemy trenches...BS	CB...Situation serious
Everything O. K...CZ	CM...Message not understood
Everything quiet...FC	CP...Need water
Falling back...SX	CX...Raiders have left
Gas is being released...AB	CZ...Everything O. K.
Have broken through...PG	FA...How is everything
How is everything...FA	FB...Recall working party
Increase range...XG	FC...Everything quiet
Left...BP	FM...Stopped
Look out for signal...AZ	FS...Attack failed
Machine gun ammunition needed...XB	FX...Using high explosive shells
Message not understood...CM	FY...Tank stuck
Message received...ZP	FZ...Not ready
Near...SA	PB...Trenches have been occupied
Need water...CP	PF...Enemy
Not ready...FZ	PG...Have broken through
Objective reached...AP	PM...Strong attack
Our...CA	PO...Rush
Our artillery is shelling us...PV	PV...Our artillery is shelling us
Raiders have left...CX	PX...Reinforcements needed
Recall working party...FB	SA...Near
Reinforcements needed...PX	SB...Enemy barrage commenced
Relief being sent...AW	SC...Troops
Relief completed...XP	SF...Casualties light
Rifle ammunition needed...SZ	SM...Be ready to attack
Right...BF	SP...About to advance
Rush...PO	SX...Falling back
Situation improving...ZX	SZ...Rifle ammunition needed
Situation serious...CB	XA...Attack successful
Stopped...FM	XB...Machine gun ammunition needed
Stretcher bearers needed...ZJ	XF...Are advancing
Strong attack...PM	XG...Increase range
Tank stuck...FY	XP...Relief completed
Trenches...AF	XY...Center
Trenches have been occupied...PB	ZB...Being relieved
Troops...SC	ZF...Enemy machine gun fire serious
Using gas shells...BM	ZJ...Stretcher bearers needed
Using high explosive shells...FX	ZP...Message received
Wire entanglements destroyed...BY	ZX...Situation improving

**SECRET****EMERGENCY CODE LIST**

To be used only with the "Seneca Code."  
 To be issued down to companies.  
 To be used only for communications within divisions.  
 To be completely destroyed, by burning, when in danger of capture or after a new code has been issued.

Precede every message in this code by "NA."

About to advance...AV	AB...Relief completed
Ammunition exhausted...XA	AF...Enemy barrage commenced
Are advancing...CB	AG...Stopped
At...PO	AP...Being relieved
Attack failed...CZ	AV...About to advance
Attack successful...ZB	AW...Situation serious
Barrage wanted...XP	AX...Objective reached
Be ready to attack...BF	AZ...How is everything
Being relieved...AP	BD...Machine gun ammunition needed
Captured...ZF	BF...Be ready to attack
Casualties heavy...XG	BJ...Troops
Casualties light...FY	BM...Message received
Center...BX	BP...Raiders have left
Enemy...CA	BS...Falling back
Enemy barrage commenced...AF	BX...Center
Enemy fire has destroyed...BY	BY...Enemy fire has destroyed
Enemy machine gun fire serious...FZ	CA...Enemy
Enemy trenches...ZJ	CB...Are advancing
Everything O. K...SB	CM...Our artillery is shelling us
Everything quiet...FA	CP...Rush
Falling back...BS	CX...Need water
Gas is being released...PX	CZ...Attack failed
Have broken through...PG	FA...Everything quiet
How is everything...AZ	FB...Right
Increase range...XY	FC...Situation improving
Left...SZ	FM...Rifle ammunition needed
Look out for signal...FS	FS...Look out for signal
Machine gun ammunition needed...BD	FX...Using gas shells
Message not understood...SF	FY...Casualties light
Message received...BM	FZ...Enemy machine gun fire serious
Near...SA	PB...Tank stuck
Need water...CX	PF...Not ready
Not ready...PF	PG...Have broken through
Objective reached...AX	PM...Our
Our...PM	PO...At
Our artillery is shelling us...CM	PV...Trenches have been occupied
Raiders have left...BP	PX...Gas is being released
Recall working party...ZP	SA...Near
Reinforcements needed...ZX	SB...Everything O. K.
Relief being sent...SX	SC...Wire entanglements destroyed
Relief completed...AB	SF...Message not understood
Rifle ammunition needed...FM	SM...Trenches
Right...FB	SP...Strong attack
Rush...CP	SX...Relief being sent
Situation improving...FC	SZ...Left
Situation serious...AW	XA...Ammunition exhausted
Stopped...AG	XB...Stretcher bearers needed
Stretcher bearers needed...XB	XF...Using high explosive shells
Strong attack...SP	XG...Casualties heavy
Tank stuck...PB	XP...Barrage wanted
Trenches...SM	XY...Increase range
Trenches have been occupied...PV	ZB...Attack successful
Troops...BJ	ZF...Captured
Using gas shells...FX	ZJ...Enemy trenches
Using high explosive shells...XF	ZP...Recall working party
Wire entanglements destroyed...SC	ZX...Reinforcements needed

**Appendix 18.—THE "STAFF CODE" AND SAMPLE OF ENCIPHERING TABLES**

**Secret**

# STAFF CODE

GENERAL HEADQUARTERS  
AMERICAN EXPEDITIONARY  
FORCES

A. G. O. PRINTING DEPARTMENT, G. H. Q. A. E. F.

1918

# INSTRUCTIONS

This code will be known as the Staff Code and will be used only at General Headquarters and such other headquarters as may hereafter be designated.

## DESCRIPTION.

The book is built up in two series, known respectively as the Righthand and Lefthand Columns. Each series has its own distinctive four-letter groups, but the number groups run consecutively throughout the book. The Lefthand Column is intended primarily to provide a comprehensive alphabetical list of proper names of towns, cities, rivers, persons; a large number of spelling combinations; numerals; the less commonly used articles of equipment and supply; and a list of the army organization in France.

In the Righthand Column appear the commonly used words and phrases.

The book is made up with 100 groups on a page, 50 groups in the Righthand Column and 50 groups in the Lefthand Column.

The code is arranged alphabetically throughout, and there are no caption headings. In coding a message it is necessary simply to take the words in the order in which they appear in the written message. For example, in coding the phrase, "Field Supply and Ammunition Train," the operator will look for the word "Field," not for "Supply" or "Ammunition," as might be the case under a caption code.

Throughout the book there appear certain words known as variants, which are to be used in messages from time to time to avoid the repetition in a long message of certain words most commonly used. These variants are indicated on the margins of the pages on which they occur alphabetically. They appear after such words as "with," "to," "commanding officer," "paragraph," "period," etc. It must be borne in mind that it is the frequent repetition of groups which makes easy the breaking down of coded messages by the enemy.

A further safeguard is provided by an alphabet in the Lefthand Column which makes it possible to change from one column to the other in spelling words.

In the Righthand Column the groups are built up entirely of consonants, arranged in alphabetical sequence, the apparent breaks in this sequence being intentional omissions of bad telegraphic combinations.

In the Lefthand Column the groups invariably contain two vowels and two consonants, arranged in logical sequence.

Groups will be taken from whichever column they appear, as, for example, in the phrase, "An aeroplane brought down at Toul," the word "Toul" would be found in the Lefthand Column, while the remainder of the phrase would be in the Righthand.

For messages whose importance makes absolute clarity imperative, phrases are provided for punctuation, beginning and ending of spelling, and for quotations.

In certain places throughout the book marginal reference is made to certain parts of the Lefthand Column to facilitate coding of messages.

## CODING.

The following message indicates the manner of coding by using the letter combinations:

	May 21. 21:45 (JOFO DUMY)		
Your division (XMNR)	will move (XDSW)	on the night of (NXPW)	May (MRFM)
30 (VPNR)	31 (VPRP)	to (VSPG)	Boston (FACO)
in the (KVRS)	rest camp (RSXM)	formerly (JFXM)	occupied by (NVRX)
the (BFSP)	101st Infantry (AKOC)	Period (BKPK)	Further orders (JRPB)
will be sent (XDFF)	you (XMCP)	there (VNRM)	(end of message) (GMFS)

Unless directed to the contrary, all messages will be sent in the four-letter combinations, figure groups being used only under certain prescribed conditions.

### DISTORTION OF MESSAGES.

In connection with this code certain distortion tables will be used, and these tables will be in force from and to such time as may be designated.

The method of distortion is simple and consists in the substitution of the groups as they appear in the finished message for the combinations appearing in the distortion table. These tables are made up in groups of two letters each. It is necessary, therefore, to divide the four-letter groups into two-letter groups, and substitute for use in the completed message the equivalents taken from the distortion tables. In putting up messages in code the Enciphering Table will be used, and in taking out code messages the Deciphering Table.

For example, the following message:

"How many rounds have you on hand?"

would appear in code as follows:

"How many rounds (KJGJ)	have you (KBXB)	on hand (NXFJ)	?" (RBRM)
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and would be sent in that way provided no distortion were used. After distortion it might read:

(KJGJ) SABL	(KBXB) RLAC	(NXFJ) DUFZ	(RBRM) ANLY
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and would be so dispatched.

The process would be reversed on receipt, using the Deciphering Table.

### DATE AND HOUR TABLE.

The following table is provided for use in designating concisely and accurately the exact date and hour of a message, and the telegram so designated may thereafter be referred to by the use of those particular groups.

January	B	0	A	0	B	0	A	0	B	0	A	0	D
February	D	1	I	1	F	1	I	1	D	1	E	1	F
March	F	2	O	2	G	2	O	2	F	2	I	2	G
April	G	3	U	3	J			3	G	3	O	3	J
May	J			4	L			4	J	4	U	4	L
June	L			5	M			5	L	5	Y	5	M
July	M			6	N			6	N			6	P
August	N			7	P			7	P			7	V
September	P			8	S			8	V			8	X
October	R			9	V			9	W			9	Z
November	S												
December	V												

..O (Before 12 noon)

..Y (After 12 noon)

For example, the date, January 29, 22:53, will appear as:

January 29, 22:53  
B OV OF YJ

Add to this message the letter "Y," since the message is *after* 12 o'clock noon, and divide into two groups of four letters each. The date group then reads: BOVO FYJY.

In referring to this message it may be designated as "Your BOVO FYJY."

These groups should invariably contain four letters.

In the date group, May 1, 8:16, the groups would appear as follows:

May 1, 8:16  
J AF AV EP

Add to this "O" since the message is *before* 12 o'clock noon, and the group reads: JAJA VEPO.

It will be noticed that the date is coded as though it read: "May (0)1, (0)8:16," in order to complete the four-letter combinations.

#### PERMUTATION.

Frequently a group will be received in a garbled condition through errors in transmission. This necessitates testing each letter of the garbled group until the correct group is found, and this is done by substituting for the tested letter all letters found in the same relative position to the three remaining letters of the garbled group.

For example, should the group PNPX come in garbled form, and be received SNPX, by substituting for the first letter S every letter found to be the first letter of a group having for the last three letters NPX, you will try BNPX, CNPX, FNPX and so on, changing the first letter each time, until by the context you find that PNPX is the correct group. Should the test on the first letter give no result, the second letter of the garbled group must be tested, and this is done by trying all groups having the first, third and fourth letters similar to the garbled group. For example, should the group PNGV be received in a garbled condition, reading PJGV, the context of the message indicating that PJGV is not the correct group, you will try PBGV, PDGV, PFGV, and so on, until you strike PNGV and find that group to be the correct one. In the Righthand Column it will be seen that the first two letters of every group are repeated one hundred times; that the third letter is repeated ten times, and that the last letter changes each time. For example, there are one hundred groups commencing with PN, ten groups having PNV for the first three letters, and so on throughout the Righthand Column. In testing the last letter of a group it will be seen that the correct group is one of the ten groups having the same first three letters as the garbled group. In testing the third letter of a group it will be seen that the correct group is one of a possible ten having the first, second and fourth letters similar to the garbled group. Permuting a garbled group simply consists in substituting for the tested letter a letter which bears the same relative position to the three remaining letters of a garbled group. If figure characters are used instead of letter characters, the process is the same. In testing the first figure of the group 43,649 you will try 23,649, 33,649, and when you reach 43,649 the context will show that the correct group has been found. In testing the second figure try 40,649, 41,649, 42,649 until by the context the correct group is found. Tests on the Lefthand Column are conducted in the same manner, substituting each letter by one having the same relative position to the three remaining letters of the garbled group. In the Lefthand Column the frequency of the first three letters is not consistent throughout as in the Righthand Column.

By reference to the Morse Telegraphic Code the correcting of garbled groups is often made simpler. An effort has been made in this book to avoid as many possibilities of confusion in transmission as possible. The letter H being four dots (....) is sometimes confused with P, being five dots (.....), and for this reason H has been omitted; T has been omitted for a similar reason, it sometimes being confused with L. For example, the group PNXC could, under some conditions, be confused with PNAYE, the similarity being in the Morse characters:

PNXC being ..... —. —... ..  
 PNAYE being ..... —. —... ..  
 FBSR being —. —... ..  
 FBZI being —. —... ..  
 BCLS being —... .. —... ..  
 BCB being —... .. —... ..

By thus placing the Morse equivalents of a garbled group on paper and comparing them with similar Morse characters the error may frequently be discovered.

N. B.

It will be noticed that the Lefthand Column series ends with the number group 40,149. Beginning with the number group 40,200 the "Righthand Column" is carried in two columns on each page to the end of the book.

200  
BC

- 5-inch	- Abbreviate
20,000 ABAC...0	20,050 BCFG...A
20,001 ABAD...1	20,051 BCFK... certain amount
20,002 ABAF...2	20,052 BCFL... day ('s)
20,003 ABAG...3	20,053 BCFM... delay (of)
20,004 ABAJ...4	20,054 BCFP... direct hit
20,005 ABAK...5	20,055 BCFR... dispatch (from)
20,006 ABAM...6	20,056 BCFs... distance of
20,007 ABAN...7	20,057 BCFV... few
20,008 ABAP...8	20,058 BCFW... ... hours
20,009 ABAS...9	20,059 BCFX... ... miles
20,010 ABAV_1-horse	20,060 BCJB... front of
20,011 ABAW_1-inch	20,061 BCJF... height of
20,012 ABAX_1-mule	20,062 BCJK... large amount
20,013 ABAZ_1-pound	20,063 BCJL... .... force
20,014 ABBA_1-ton	20,064 BCJM... .... number (of)
20,015 ABBE_1½	20,065 BCJP... length of
20,016 ABBI_1½-ton	20,066 BCJS... little
20,017 ABBO_1.5-inch trench mortar (s)	20,067 BCJV... mile
20,018 ABBU_2-inch	20,068 BCJW... minute
20,019 ABBY_2-pound	20,069 BCJX... mistake
20,020 ABCA_2-ton	20,070 BCKC... misunderstanding
20,021 ABCO_2.24-inch	20,071 BCKD... month
20,022 ABCU_2½-ton truck (s)	20,072 BCKJ... movement
20,023 ABCY_2.95	20,073 BCKL... number (of)
20,024 ABDA_3-inch	20,074 BCKN... part (of)
20,025 ABDE_3-inch Field Gun (s)	20,075 BCKP... possibility (of)
20,026 ABDI_3-inch gun (s)	20,076 BCKS... reliable source
20,027 ABDQ_3-inch Stokes	20,077 BCKV... series of
20,028 ABDU_3-pounder	20,078 BCKW... shell
20,029 ABDY_3-ton truck (s)	20,079 BCKX... short distance
20,030 ABEB_3.2-inch	20,080 BCLB... .... time
20,031 ABEF_3.2-inch Field Gun (s)	20,081 BCLC... shortage (of)
20,032 ABEG_3½-ton truck (s)	20,082 BCLJ... slope of
20,033 ABEJ_3.6-inch Field Gun (s)	20,083 BCLK... source (of)
20,034 ABEK_3.6-inch Field Mortar (s)	20,084 BCLM... strength of
20,035 ABEP_3.7-inch	20,085 BCLP... surplus
20,036 ABER_3.7-inch Trench Mortar (s)	20,086 BCLS... thorough investigation
20,037 ABES_4-cylinder	20,087 BCLV... total (of)
20,038 ABEV_4-inch	20,088 BCLW... week
20,039 ABEW_4-inch Stokes (heavy)	20,089 BCLX... .... ago
20,040 ABEX_4-inch Stokes (light)	20,090 BCMC... year
20,041 ABEZ_4-pounder	20,091 BCMD...Abandon (s)
20,042 ABFA_4-ton truck (s)	20,092 BCMG... first line
20,043 ABFE_4.2-inch	20,093 BCMJ... the attempt
20,044 ABFI_4.5-inch	20,094 BCMK...Abandoned
20,045 ABFO_4.5-inch howitzer (s)	20,095 BCML...Abandoning
20,046 ABFU_4.7-inch	20,096 BCMP...Abandonment
20,047 ABFY_4.75mm.	20,097 BCMS...Abate (s)
20,048 ABGA_5-inch	20,098 BCMV...Abated
20,049 ABGE_5-inch siege gun (s)	20,099 BCMX...Abbreviate (s)

- Your base

50,300 XMBC_Yard (s) short		50,350 XMNB_Your battalion	
50,301 XMBD..... wide		50,351 XMNC..... battery	
50,302 XMBS_(An)		50,352 XMNF..... brigade	
50,303 XMBJ_Year (s)		50,353 XMNG..... command	
50,304 XMBM_Yellow		50,354 XMNP..... discretion	
50,305 XMBP..... rocket (s)		50,355 XMNR..... division	
50,306 XMBR_Yes		50,356 XMNS..... flank	
50,307 XMBS_Yesterday		50,357 XMNV..... headquarters	Your
50,308 XMBW..... afternoon		50,358 XMNW..... infantry	36,081 KBJC
50,309 XMBX..... evening		50,359 XMNX..... instructions	47,942 VRMF
50,310 XMCB..... morning		50,360 XMPB..... judgment	50,346 XMJS
50,311 XMCF_Yet		50,361 XMPF..... left	
50,312 XMCG_Yield (s)	Your	50,362 XMFG..... letter	
50,313 XMCI_Yielded	25,562 DFRG	50,363 XMPJ..... message	
50,314 XMCM_Yielding	45,357 RVPS	50,364 XMPM..... number	
50,315 XMCP_You	48,056 VSMS	50,365 XMPP..... orders	
50,316 XMCR.... are		50,366 XMPS..... organization	
50,317 XMCS..... assigned to		50,367 XMPV..... patrol (s)	
50,318 XMCI..... authorized		50,368 XMPW..... position	
50,319 XMCI..... directed		50,369 XMPX..... recommendations desired	
50,320 XMCI..... informed		50,370 XMSB..... request approved	
50,321 XMDG..... not		50,371 XMSC..... right	
50,322 XMDJ..... ordered to proceed (to)		50,372 XMSD..... sector	
50,323 XMDM..... had		50,373 XMSG..... telegram	
50,324 XMDP..... have		50,374 XMSJ_Yours	
50,325 XMDR..... may		50,375 XMSM_Yourself (ves)	
50,326 XMDS..... propose		50,376 XMSP_Youth	
50,327 XMDV..... should		50,377 XMSV_Z.	
50,328 XMDW..... not		50,378 XMSW_Zeal	
50,329 XMDX..... will		50,379 XMSX_Zealous (ly)	
50,330 XMGB..... advance		50,380 XMVB_Zenith	
50,331 XMGI..... arrange		50,381 XMVC_Zero	
50,332 XMGI..... be		50,382 XMVG..... hour	
50,333 XMGM..... advised		50,383 XMVJ_Zig-zag	
50,334 XMGP..... governed by		50,384 XMVM_Zone (s)	
50,335 XMGR..... notified		50,385 XMVP..... of	
50,336 XMGS..... relieved		50,386 XMVR..... action	
50,337 XMGV..... join		50,387 XMVS..... advance	
50,338 XMGW..... report		50,388 XMVW..... fire	
50,339 XMGX..... retire		50,389 XMVX..... operations	
50,340 XMJB..... therefor		50,390 XMVB..... the army (ies)	
50,341 XMJC..... wish		50,391 XMVC..... S. O. S.	
50,342 XMJG_Young		50,392 XMVF.....	
50,343 XMJM_Y. M. C. A.		50,393 XMVG.....	
50,344 XMJP_(Of the)		50,394 XMVJ.....	
50,345 XMJR_Younger	Your	50,395 XMVL.....	
50,346 XMJS_Your	36,081 KBJC	50,396 XMVP.....	
50,347 XMJV..... action	47,942 VRMF	50,397 XMVS.....	
50,348 XMJW..... attention is invited		50,398 XMVW.....	
50,349 XMJX..... base		50,399 XMVX.....	

## ENCIPHERING TABLE

AB ap	BA gw	CA dv	DA sa	EA nk	FA wa	GA oj	IB vt	JA ak	KA bg	LA gv	MA xs	NA bw	OB sa	PA ov	RA fk	SA sj	UB fs	VA gi	WA ju	XA wp	YB pu	ZA sj
AC on	BC sa	CB ma	DB un	ED sl	FE wo	GS dg	ID gu	JB gs	KB de	LB lj	MB wa	NB xv	OC gx	PD fd	RB gj	SB ox	UC gx	VB od	WB ve	XB nk	YC sd	ZB vf
AD lb	BD ya	CD vj	DC be	EP ny	FO gd	GC vb	IP eg	JC zg	KC gf	LC dy	MC gb	NC ji	OD zv	PC eg	RC nw	SC vd	UD nj	VC px	WD or	XO gw	YD sv	ZC xm
AE ro	BE ey	CE sn	DE ag	EO je	FO on	IO xp	UD dr	ED as	LD ok	MD ap	ND wx	OE bi	PD jo	RD om	SD ra	UD ev	VD kl	WD in	XD jb	YF jm	ZD yj	
AF vl	BF on	CF ye	DF op	EJ dx	FE pa	GE fg	IJ aj	JE rf	KG jl	LE vp	MF li	NE er	OG ev	PE nb	RE av	SP ml	UG by	VE us	WE nu	XE wr	YO nd	ZK mo
AJ nd	BO di	OG ge	DO pa	HK pf	PO gd	IP ps	JP op	KI ob	LO vp	MO bd	NE ar	OJ nk	PP en	RF bw	SG np	UJ pr	VP om	WF kd	XF fn	IY aw	ZP yk	
AK gn	BI va	CJ ed	DI ka	EP vb	FI xl	OI kr	IL od	NO po	KJ jw	LI fj	MI vx	NO ny	OK ol	PO bp	RO sy	SI xm	TK rw	VO yw	WO fj	XD ab	YK vi	ZO ur
AN sp	BJ of	CK lr	DJ sl	ER fu	FJ iv	OJ sm	IN dk	JI lu	KL lw	LJ bn	MJ wu	NI ar	OL up	PI oy	RJ ko	SJ fe	UL wj	VI is	VI ss	XI pm	YL fw	ZI lg
AE ex	BE pd	OL kv	DK ix	ES kg	FK so	OK ly	IN ki	JK os	KM fy	KL fi	MK uj	NJ la	OM so	PJ xa	RK pj	SK do	UM so	VJ su	WJ so	XJ lo	YH os	ZJ kj
AF un	BL nr	OM be	DL ga	EV tm	FL sw	OL Jg	IP yw	JL ak	KN gp	LM sz	ML of	NM ol	OM km	PK lu	RL db	SL pe	UN xo	VK jr	WK py	XX wk	YH lw	ZK pi
AR xv	BM jn	GN ul	DM le	EN ld	FM da	GN yn	IS ms	JM sx	KO fv	LO wj	MM ja	NM vy	OP ls	PL mg	NM jo	SM ag	UP dw	VL sf	WL md	XL rl	YF ma	ZL wd
AS fx	BN ka	CO fl	EW ex	KX is	PK ax	OH xe	IV bo	JO fp	KP bj	LP pl	NO ng	NO ep	OR fw	PN ax	NM fb	SN go	UR ex	VM ws	WN kb	XN yo	YR bk	ZM or
AV dr	BO la	CP xb	DO rc	EE ge	FO ek	GO ub	IW nk	JP vg	KR no	LO vr	MP fo	NP ij	OS js	PN vr	RO vz	SO di	US fa	VB ob	WF ea	XN wf	YS ey	ZN zf
AW is	BF od	CR ak	DP so	FF nm	GP rk	IX fa	JR sw	KS uv	LS oo	MR sd	NS um	OW xb	PR ig	RS uw	SR kp	UV wl	VP mb	WP lo	XP us	YV af	ZP va	
AX yp	BR va	CS ma	DR ob	FR je	OR ik	IZ jd	JB yb	KU dv	LU ke	MS ux	NU vw	OX ej	PS fr	RU ba	SU lk	UX rp	VR wa	WF dj	XR wa	YX fy	ZR ys	
AZ re	BS id	CV rj	DS br	PE vk	OS mv	JU aa	KV ox	LV av	MU bf	NV zf	OZ ra	PV ru	RV of	SV og	UZ oa	VS co	WS if	XS bk	YX go	ZS du		
	BU zy	CV nr	DU ro	FU dn	GU ap	JV bl	KW os	LV ng	MV ru	NV zf	OZ ra	PV ru	RV of	SV og	UZ oa	VS co	WS if	XS bk	YX go	ZS du		
	BV wa	GW do	DV jv	FV km	GV se	JW lw	KX pb	LX zu	MW ag	NX pk	OY wa	PV an	RW xj	SW ad	TU pn	VU rg	XU ar	YU no	ZU ne			
	BW yd	CX ib	DW na	FW uc	OV eg	JX wf	KY su	LY oe	MX ky	NX pk	OY wa	PV an	RW xj	SW ad	TU pn	VU rg	XU ar	YU no	ZU ne			
	BX sw	CY pe	DX za	FX ok	OX dp	JY ds	KZ xr	NY xi	NY xi	NY be	FX jk	HY ll	EY wo	VX uk	WX fe	XW su	YX wa	ZX ab	ZY el			
	BY wb		DY ks	FY wy	OY ni	ZJ pw																
			DZ vn	FE ze	OZ tn																	

## DECIPHERING TABLE

ab x0	ba ru	ca uz	da fh	eb vh	fa us	ga dl	ib cx	ja mh	ka em	la nj	ma os	na dw	ob dr	pa do	ra oz	sa ju	ub go	va zp	wa xr	xa fj	yb js	za ob
ac wj	bc dc	cb xi	db rl	ed cj	fb hm	gc mc	id bs	jb xd	kb nm	lb ad	mb vp	nc fe	oc ls	pb kx	rb ep	sb zx	tc fw	vd gc	wb by	xb op	yc xm	zb ow
ad sw	bd no	ed vb	de sk	ef ml	fo wx	go sn	if ws	jo pd	ko rj	lo xj	no fb	oc xv	od ep	pc jo	rc ap	sc un	td il	ve yv	wo gv	xo no	yd sw	zc pk
af tv	be ny	ce lx	de kb	eg ow	fd pb	gd fo	ig pr	jd iz	kd wp	ld mw	md wl	nd aj	of bj	pd bk	rd sp	sd yc	uf pz	vd sc	wd zl	xd yo	yd zv	zd nr
ag de	bf nu	cf rv	df jd	ej ox	fe sj	ge kz	ij lb	je bo	kg es	le dm	mf xm	og wz	eg sv	pe sl	re az	sf vl	ug lw	va wb	ve vr	xo om	yg op	ze ov
aj ij	bg ka	eg ip	dg os	ek po	fg ge	gf ko	ih or	jr zo	ki tn	lg zi	mf pl	ng mo	ok fx	pg cy	rg wu	si zy	uk vx	vg jp	wg pc	xg sm	yh zf	zg ju
ak or	bi op	ej oa	di bo	ep no	fi lk	gl va	il ry	ig ol	kj zj	li np	mi xy	ni gy	ol nk	pi zk	rj ou	sj az	ul oh	vi kh	wi uw	xi ny	yl rk	zi dj
am oj	bj kp	ek ld	dj wr	er ne	fj wo	gj rb	im xi	ji nc	kl vd	lj np	mj ol	nj oy	ok wf	pj rk	rk of	sk ja	um ns	vj cd	wj lo	xj rw	ym ip	zj sa
an vo	bk nr	ol ok	dk im	es wh	fr ra	gk uc	in wd	jk px	km pv	kn su	ml ks	nk xb	on od	pk wx	pl xl	ql vw	un ap	vk ps	wk xx	xk of	yn om	zk jl
ap md	bl jv	om rd	dl so	ev oo	fl co	gl nf	ip sx	jl no	kn om	lm kl	nl sp	no pp	op of	pl lf	rm bv	sm fl	up ol	vl ag	wl fd	xl pi	yl ak	zl ed
ar ni	bm tv	on ac	dm xi	ew dw	fm or	gn xc	is aw	jm yp	ko nr	lo wp	mo os	np kr	or zw	pm xi	rn sw	sn pf	up zg	vm dz	wn fa	xm zc	yn zr	zm si
as bc	bn lj	oo vs	dn fu	ex ak	fn xp	gn ak	iv fj	jo nm	kp sr	lp fw	mq ab	no sr	os ym	pn vu	po du	so om	us xp	vn oz	wa db	xv yv	yz ib	za ck
av lv	bo ty	ep df	do gw	es ur	fo mp	go yz	iw vy	jp bn	kr oi	lr ck	ms ee	nt cv	ov pa	po gp	rp ux	sq ou	uv ke	vo lr	wo sy	xo un	yv vo	zo dp
aw jr	bp po	er wg	dr ox		fp jo	gp pc	ix dk	jr vk	ks lu	ls of	mt ve	nu ze	ow vv	pr uj	ra sd	ar zm	us rs	vp lg	wr xa	xp to	yk ed	zp am
ax fr	br ds	os kn	dr av		fr pe	gr km	is vi	js pr	ku pk	lu ji	mv yp	ow ve	ox kv	pa fe	ru mv	sv xu	ux ms	vr pn	wr xe	xr ke	ys pz	zt xu
as kd	bn on	ou ep	ds po		fe ix	ge og		ju wa	kv ol	lv mz	mw ky	nu od	os rp	pu yb	rv pu	sw re	us ve	va bi	wb mb	xc dx		zd da
	bu ny	ev uf	du zs		fu nr	gu id		fv dv	kw jw	lx yw	mw os	nu od	os rp	pu yb	rv pu	sw re	us ve	va bi	wb mb	xc dx		zd da
	bv rp	ow jk	dv ku		fv ko	gv la		jw kv	kx dy	lx bo	mw sz	nu od	os rp	pu yb	rv pu	sw re	us ve	va bi	wb mb	xc dx		zd da
	bw na	ox sb	dv up		fv yl	gv ba		jx uv	ky mx	ly ok	mw jw	nu od	os rp	pu yb	rv pu	sw re	us ve	va bi	wb mb	xc dx		zd da
	bx xb	oy pi	dx zj		fx as	gx oc		jy li	kz dy		mw no	ny kf	ow ve	pr uj	ra sd	ar zm	us rs	vp lg	wr xa	xp to	yk ed	zp am
	by ug		dy lo		fy km	gy be		js os			mw is	ny kf	ow ve	pr uj	ra sd	ar zm	us rs	vp lg	wr xa	xp to	yk ed	zp am
			ds jy		fa us	ga jb																

**Appendix 19.—MISCELLANEOUS AEF CODES**

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**Appendix 19A (1).—EXTRACTS FROM FRONT LINE CODE**

G. H. Q.  
AMERICAN EXPEDITIONARY FORCES

---

**Secret**

# FRONT LINE CODE

No. **11900**

This Code Book has been issued to

---

for official use under his direction only

By command of General Pershing:  
**JAMES G. HARBORD,**  
Official: Brigadier General,  
**BENJ. ALVOED,** Chief of Staff.  
Adjutant General.

---

A. G. PRINTING OFFICE  
1918

**INSTRUCTIONS  
FOR THE USE OF THE CODE.**

This book is to be used, in connection with secret instructions, in sending messages to and from the front line trenches.

A code group is provided for each word or phrase.

A number of commonly used prefixes and suffixes will be found arranged in alphabetical order.

To code a message substitute for the word or phrase to be sent the group corresponding to it. Under no circumstances should a word be sent "in plain" in a code message. Time should be taken to spell the word in code. Never repeat any code message in clear or in any other code or cipher.

The loss of a code book should be reported at once by number through military channels to G. H. Q. A. E. F.

Destroy by burning at once all scraps of paper on which coding or decoding memoranda have been made.

You will inform the appropriate subordinate where you carry this code, and instruct him as to his conduct in the event that you become a casualty.

**THIS CODE MUST NOT FALL INTO THE  
HANDS OF THE ENEMY.**

---

AB..... 0  
AC..... 1  
AD..... 2  
AF..... 3  
AG..... 4  
AH..... 5  
AI..... 6  
AK..... 7  
AL..... 8  
AM..... 9  
AN..... A (an)  
AO..... Abandon (ed)  
AP..... Able  
AR..... About  
AS..... Action (s)  
AT..... Activity (ies)  
AU..... Advance (d)  
AV..... Aeroplane (s)  
AW..... After  
AY..... All  
AZ..... (This group means nothing)  
BA..... All right  
BC..... Am (A. M.)  
BD..... Ammunition  
BE..... Ammunition automatic rifle  
BF..... Ammunition caliber .30  
BG..... Ammunition M. G. in strips  
BH..... And  
BL..... Answer  
BK..... Any  
BL..... Are  
BM..... Arrive (d)  
BN..... Artillery  
BO..... Assist (ed)  
BP..... Assistance  
BR..... At  
BS..... At once  
BT..... Attack (s)  
BU..... Automatic (s)  
BV..... Automatic rifle ammunition  
BW..... B  
BY..... Back  
BZ..... Bad  
CA..... Balloon (s)  
CB..... Barbed wire  
CD..... Barrage  
CE..... Battalion (s)  
CF..... Battery  
CG..... Be  
CH..... Been

---

WT..... Wind favorable for cloud gas attack  
 WU..... Wire (s)  
 WV..... Wire entanglements  
 WY..... With  
 WZ..... Withdraw (ing)  
 YA..... Withdrawn  
 YB..... Work (ing)  
 YC..... Working party (ies)  
 YD..... Wounded  
 YE..... X  
 YF..... Y  
 YG..... Yard (s)  
 YH..... Yes  
 YI..... Yesterday  
 YK..... Yet  
 YL..... You  
 YM..... You will be relieved (at)  
 YN..... Your  
 YO..... Your men  
 YP..... Your position  
 YR..... Your sector  
 YS..... Z  
 YT..... Zero  
 YU..... Zero hour  
 YV..... Zero hour has been postponed  
 YW.....  
 YZ.....  
 ZA.....  
 ZB.....  
 ZC.....  
 ZD.....  
 ZE.....  
 ZF.....  
 ZG.....  
 ZH.....  
 ZI.....  
 ZK.....  
 ZL.....  
 ZM.....  
 ZN.....  
 ZO.....  
 ZP.....  
 ZR.....  
 ZS.....  
 ZT.....  
 ZU.....  
 ZV.....  
 ZW.....  
 ZY.....  
 ZZ.....

**Appendix 19A (2).—SAMPLE OF ENCIPHERING CARD FOR FRONT LINE CODE**

**SECRET**

**31-a**

**THIS TABLE MUST NOT FALL INTO THE HANDS OF  
THE ENEMY.**

1. If destroyed to prevent capture, report will be made to  
the office to which its return is ordered.

2. This table will be used from 3 a. m.....  
until further notice.

**ENCIPHER**

A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	R	S	T	U	V	W	Y	Z
o	i	z	n	t	p	w	s	h	g	u	l	f	m	d	c	a	y	b	e	v	r	k

**DECIPHER**

a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	r	s	t	u	v	w	y	z
S	U	R	P	V	N	K	I	B	Z	M	O	D	A	F	Y	H	E	L	W	G	T	C

Appendix 19B.—GHQ, AEF, BULLETIN No. 46

(FOR OFFICIAL CIRCULATION ONLY).

[BUL. 46.]

**G. H. Q.**  
**AMERICAN EXPEDITIONARY FORCES,**

BULLETIN  
 No. 46. }

FRANCE, July 12, 1918.

In order to shorten telegraphic reports of casualties as required by G. O. No. 40, c. s., these headquarters, as amended by G. O. No. 77, c. s., these headquarters, the following three letter words are prescribed for use as code equivalents for the phrases shown. These code equivalents will be used in the preparation of all casualty reports throughout the A. E. F.

Report following accidentally killed.....	AWL
Report following killed in action.....	BOX
Report following died of wounds.....	COW
Report following died of disease.....	DAY
Report following missing in action.....	END
Report following severely wounded.....	FEW
Report following slightly wounded.....	GAS
Drowned, body recovered.....	INK
Drowned, body not recovered.....	JAR
Death in line of duty.....	KIT
Death not in line of duty.....	LEG
Result of own misconduct.....	MOP
Not result of own misconduct.....	NAG
All in line of duty, not result of own misconduct.....	OAK
All entitled to wound chevron.....	PUN
Not entitled to wound chevron.....	RAM

BY COMMAND OF GENERAL PERSHING:

JAMES W. McANDREW,  
*Chief of Staff.*

OFFICIAL:  
 ROBERT C. DAVIS,  
*Adjutant General.*

A. G. PRINTING DEPT., G. H. Q. A. E. F., 1918.

Appendix 19C.—G. S., 82ND DIVISION, AEF, MEMORANDUM NO. 66

**SECRET**COPY NO. 221

Hq. 82nd Division, American E. F., G-3

DLM

France, 24, June 1918.

SECRET.G. S. MEMORANDUM NO. 66.

1. This list of code names becomes effective at 9:00 o'clock 28, June 1918. All previous code lists that conflict with this one are hereby rescinded. Until that time lists found in the Sector will be used.

2. This code alone will be used in calling up parties on the telephone. Names of towns or individuals will not be given under any circumstances.

3.

<u>TOWNS</u>	<u>CODE NAMES</u>
Andilly .....	Chattanooga
Ansauville .....	Bull Run
Beaumont .....	New Orleans
Bernecourt .....	Poirel
Bouconville .....	Gettysburg
Bousq .....	San Francisco
Bouvron .....	Boulogne (Du-lone)
Cornieville .....	Manila
Domevre .....	Dunkerque (Dun-kirk)
Flirey .....	Vicksburg
Grosrouvres .....	Great Neck
Hamonville .....	Appomattox
Jouy .....	Gold Harbor
Lagney .....	Wilderness
Lironville .....	Loudeac (Lu-di-aak)
Limay .....	Jean d'Arc
Lucey .....	Santiago
Mandres .....	Little Horn
Menil-la-Tour .....	Quebec
Ninorville .....	Marceau
Manoncourt .....	Meaux (Mo)
Manonville .....	Mortier
Noviant .....	Ney
Rambucourt .....	Tippencanoe
Remenauville .....	Reims (Rans)
Raulecourt .....	Ramel
Regnieville .....	Rouen (Ru-ong)
Royaumeix .....	Rostock
St. Jacques .....	Satmur (So-mur)
Sansy .....	Illinois
Seicheprey .....	Colorado
Xivray .....	Texas
Gerard .....	Utah

SECTOR TELEPHONE CENTRALS

360.6-225.2 .....	Waterloo
358.5 -223.9 .....	Antietam
359.95 -232.15 .....	Horner

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ARTILLERY CENTRALS

<u>TOWNS</u>	<u>CODE NAMES</u>
Ansauville .....	Five Oaks
Amilly .....	Anthill
Rambacourt .....	Delaware
Sarzey .....	Illinois
Mardres .....	Lundy's Lane
Mandres .....	Agua Prieta
Ramonville .....	Monterey
Brucy .....	O. P. 23
Bernecourt .....	Poirel
Bernecourt .....	Rain-in-the-Face

CO-ORDINATES

355.5 -225.5 ..... Spotsylvania

<u>NAME</u>	<u>CODE</u>	<u>TOWN</u>	<u>PHONE</u>
General Burnham ....	Eagle .....	Santiago ..	38
Chief of Staff ....	Oriole .....	Santiago ..	39
General Cronia ....	Sea Gull ....	Waterloo ..	
163 Inf.Brig.Hq. ...	Albatross ...	Waterloo ..	
General Lindsey ...	King Fisher .	Cold Harbor	
164 Inf.Brig. Hq. ..	Jay Bird ....	Cold Harbor	
General Rhodes .....	Hornet .....	Santiago ...	5 A
157 F.A.Brig.Hq. ...	Bumble Bee ..	Santiago ...	7 A
Colonel Whitman ....	Mocking Bird		
Colonel McArthur ...	Stormy Petrel		
Colonel Ely .....	Jack Snipe		
Colonel Nelson .....	Whip-poor-Will		
Colonel Williams ...	Rattle-snake		
Colonel Deems .....	Copper Head		
Colonel Pearce .....	Bull Snake		

<u>NAME</u>	<u>TOWN</u>	<u>PHONE</u>
ADMINISTRATION G-1 ).....	Santiago .....	37
Major Maddox )		
INTELLIGENCE G-2 ).....	Santiago .....	35
Lt. Col. Lee )		
OPERATIONS G-3 ).....	Santiago .....	36
Major Wainwright )		
ADJUTANT'S OFFICE ).....	Santiago .....	33
Major Boyd )		
Capt. Kaeffring )		
DIVISION SURGEON ).....	Santiago .....	32
Lt. Col. Koerper )		
DIV'S SIGNAL OFFICE).....	Santiago .....	28
Lt. Col. Hemphill)		

<u>ORGANIZATION</u>	<u>CODE NAME</u>	<u>TOWN</u>
Hdqrs. 325th Infantry ...	Blackbird	
1st Battalion ...	Pigeon	
2nd Battalion ...	Kito	
3rd Battalion ...	Bulfinch	
Hdqrs. 326th Infantry ...	Red Bird	
1st Battalion ...	Buzzard	
2nd Battalion ...	Rail	
3rd Battalion ...	Sparrow	
Hdqrs. 327th Infantry ...	Humming Bird	
1st Battalion ...	Wood Pecker	
2nd Battalion ...	Meadow Lark	
3rd Battalion ...	Swallow	
Hdqrs. 328th Infantry ...	Blue Bird	
1st Battalion ...	Pheasant	
2nd Battalion ...	Grouse	
3rd Battalion ...	Partridge	
319th Machine Gun Bn. ...	Roanoke	
320th Machine Gun Bn. ...	Tecumseh	
321st Machine Gun Bn. ...	Ocoola	
307th Trench Mortar Btry.	Rain-in-the-Face	
307th Field Signal Bn. ..	Wild Bear .....	Santiago 2
157th F.A. Brigade Hq. ...	Bumble Bee	
319th F.A. Hq. ....	Red Snapper .....	Poirel
1st Battalion .....	Salmon	
2nd Battalion .....	Bass	
320th F.A. Hq. ....	Cherry Blossom-.....	Bull Run
1st Battalion .....	Lily	
2nd Battalion .....	Pansy	
321st F.A. Hq. ....	Sullivan .....	Santiago
1st Battalion .....	Kilrain	
2nd Battalion .....	Gorbott	
3rd Battalion .....	Ketcholl	
307th Engineers .....	Alligator .....	Santiago
1st Battalion .....	Crocodile	
2nd Battalion .....	Turtle	
325th Field Hospital ....	Polocat .....	Podunk
326th Field Hospital ....	Mole .....	Quebec
327th Field Hospital ....	Weasel .....	Podunk
328th Field Hospital ....	Chipmunk .....	Podunk
325th Ambulance Co. ....	Caterpillar .....	Podunk
326th Ambulance Co. ....	Scorpion .....	Quebec
327th Ambulance Co. ....	Tarantula .....	Arizona
328th Ambulance Co. ....	Centipede .....	Quebec

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4. The listening in sets have disclosed the fact that indiscreet and damaging conversations have been carried on over the telephone. The enemy is able to pick up these conversations by means of the "listening in" sets. The possible results are obvious.

5. This order is SECRET. Each copy will be signed for and will be required to be turned in upon the issue of a new one. No other copies of this Code must be made.

6. This sector is infested with enemy spies and sympathizers. They tap telephone lines, signal to the enemy, and are responsible for many losses.

7. The Signal Officers of Infantry and Artillery Organizations will listen in on their switchboards with a view to checking indiscreet and improper conversations. They are authorized to terminate any conversation that might give information to the enemy, and in such cases immediate report of the circumstances will be made to the Division Signal Officer.

BY COMMAND OF MAJOR GENERAL BURHAM:

R. E. Beebe,

Lieut. Col., General Staff,  
Chief of Staff.

G-3  
6/29/18  
RSE

Appendix 19D.—EXTRACTS FROM AMERICAN RADIO SERVICE CODE No. 1

**SECRET**

**MUST NOT FALL INTO  
ENEMY'S HANDS**

**American Radio Service  
Code No. 1**

(For the exclusive use of the Radio personnel.)

*This book has been issued to .....*

*for official use of Radio Station located at .....*

**Precede every message in this code by  
"RAD"**

**NOT TO BE TAKEN IN FRONT OF  
BRIGADE HEADQUARTERS**

**AMERICAN RADIO SERVICE CODE NO. 1**

(IT IS POSITIVELY FORBIDDEN TO MAKE COPIES OF THIS CODE.)

1. This code book, to be known as "The American Radio Service Code No. 1," is issued to all continuous wave radio stations down to and including brigades, and to all artillery units equipped with continuous wave radio. It is to be used for all radio service messages for which no special abbreviations are provided.

2. Absolutely nothing will be transmitted "in clear."

3. Avoid the use of words not in code book when other words of the same significance are provided in the code. Words spelled out, letter by letter, not only take time to code, transmit and decode, but they are one of the favorite points of attack by enemy code men.

4. Coded and decoded copies of messages must never be filed together. All notes and memoranda used in coding or decoding messages must always be destroyed by burning, if practicable.

5. Messages must be short. Several short messages will be less likely to be read by the enemy than one long one.

Except in emergency a long message, if it must be sent, will be divided into two or more parts and each sent as a complete message.

Very often the best way to handle a long message is to leave out unnecessary words.

6. Addresses will not be used when context of message indicates for whom intended. When used, they must be in code.

7. Signature should be sent only when absolutely required. When sent, they must be encoded, letter by letter, if necessary.

8. Blank spaces are for the designation of organizations and local geographical points, or for such other use as may be desired, and these designations will be furnished by higher authority.

9. Suggestions for the improvement of this code book are desired.

These should include such points as:

- (1) Unnecessary words.
- (2) Necessary words which have been omitted. (It is not considered practicable to enlarge this book. Therefore, for each word or phrase to be added a word or phrase to be taken out should be indicated.)
- (3) Relative merits of letters and figures in code groups.
- (4) Form of books.
- (5) Arrangement of contents.
- (6) Size and style of type used.
- (7) Any other suggestions having for its object the making of future editions more convenient for use at the front.

Suggestions should be addressed:

"Radio Officer of the Army."

10. The first group in every message will be "RAD," which group will be counted as one word in the check.

11. For convenience a list of "Conventional Abbreviations" has been printed in the back of the book.

12. IN CASE THIS CODE BOOK IS LOST OR OPEN TO SUSPICION THE FACTS WILL BE REPORTED IMMEDIATELY TO THE RADIO OFFICER OF THE ARMY DIRECT.

BY COMMAND OF GENERAL PERSHING:

JAMES W. McANDREW,  
*Chief of Staff.*

OFFICIAL:  
ROBERT C. DAVIS,  
*Adjutant General.*

## TABLE OF ENCODING

### PHRASES USED IN TRANSMISSION:

304...	Antenna was damaged
450...	I am obliged to stop sending until ..... o'clock
367...	I have been calling you since ..... o'clock
513...	I have increased my radiation
584...	It is forbidden to transmit until .....
024...	Send faster
169...	Send slower
242...	Stop sending. You are interfering
312...	Transmitting set was damaged
669...	Wait few minutes; am changing batteries
739...	Was obliged to stop sending until ..... o'clock
814...	Will call you at ..... o'clock
745...	Your sending is bad
957.....	.....
461.....	.....
182.....	.....
109.....	.....
036.....	.....
086.....	.....

### ADJUSTMENTS:

292...	Are you sure your accumulators are well charged?
219...	Are you sure your accumulators are well insulated?
436...	Decrease your wave length ..... meters
524...	Examine your radiated wave length
671...	Examine your transmitting set
590...	I am working on following wave length
946...	Increase your wave length ..... meters
754...	My radiation is good
822...	Send V for two minutes
442...	Take wave length of ..... meters
301...	What wave length are you working on?
018...	When will you require additional accumulators?
319...	Your wave length is correct
468...	Your wave length is not correct
542.....	.....
536.....	.....
679.....	.....
690.....	.....
328.....	.....
255.....	.....

## RULES FOR USING RADIO SERVICE CODE

This service code is intended to be used for communication between radio operators, chiefs of posts and officers of the radio service of the Army and subordinate units. It may also be used for practice telegrams.

It is divided into two principal parts.

The first part, called the "Table of Encoding", is divided into:

- (1) Usual phrases relative to incidents of transmission.
- (2) Usual phrases relative to adjustments of the station.
- (3) Usual phrases relative to working in the net.
- (4) Miscellaneous phrases.
- (5) Phrases descriptive of radio apparatus.
- (6) A list of technical terms, words, and syllables used for composing words not listed in their entirety.

Before each word or phrase is a group of three figures which is the code combination representing the words or phrase after it.

The second part, called "Table of Decoding," contains the three-figure groups arranged in numerical order and after each is the word or phrase which they represent.

### Simple Coding:

Each phrase or word is coded by using the three-figure group corresponding to it. Example:

"Your wave length is correct,"  
(319)

To encode a word not found in this code the syllables shown in the code will be used as in the following example:

"Bad-ly      damage-d"  
(642) (742) (860) (724)

### Simple Decoding:

The three-figure code groups are arranged in the Decoding Section in regular sequence, beginning with 001 and ending with 999.

In decoding a message, the operator looks for each group and writes down the words or phrase appearing thereafter. For example:

(319) equals: "Your wave length is correct."  
(642) (742) (860) (724) equals: "Badly damaged."

—A—		
948...A	160...answer	738...binding
216...able	244...antenna	412...bis
430...about	922...antenna inductance	355...blanket
506...above	710...anti	137...blank
299...ac	845...any	069...blouse
321...accident	280...apparatus	714...bo
459...acid	062...approv	916...bombard
102...accord	266...approximate	768...bomb-carrier
010...account	422...April	812...bond
151...accumulator	123...ar	575...book
727...accur	399...arc	532...boots
972...acknowledge	259...are	392...box
684...act	478...armature	252...breeches
463...action	622...army	113...bridge
334...ad	904...Army Corps	406...bridage
269...add	829...arrival	378...British
094...address	595...artillery	735...broken
992...Adjutant	453...ary	878...bu
780...adjust	375...as	610...but
563...advis	185...at	777...buzzer
489...aerial	332...ate	920...by
337...aerienne	699...ation	—C—
549...aero	910...ator	345...C
613...aeronautic	843...attack	203...cable
677...again	420...au	465...call
043...age	056...Audion bulb	687...call letter
178...agree	205...August	906...can
247...aid	470...automobile	706...cancel
033...air	129...average	060...cannot
457...al	210...aviation	625...capacity
528...alert	—B—	786...captain
665...all	426...B	498...car
001...alone	642...bad	999...carbur
762...along	704...bag	792...case
486...already	908...balloon	572...cavalry
276...also	994...bandages	646...ce
208...alter	545...base	439...cell
067...alternator	325...battalion	967...cent
493...altogether	180...battery	795...central
638...always	467...Baume	444...ch
773...am	607...be	363...charge
475...ambulance	962...bearings	136...charging plant
987...American	824...been	433...chart
837...ammeter	052...before	153...chief
571...ampere	636...Belgian	088...Chief Signal Officer
852...amplifier	387...better	229...choice
835...an	237...between	027...ci
394...and	887...bi	382...cigarette
040...angle	602...bicycle	448...cipher
	958...big	587...circuit

## TABLE OF DECODING

001...alone	051...up
002...oil	052...before
003...ies	053...map
004...infantry	054...sergeant
005...officer	055...good
006...except	056...Audion bulb
007...code	057...Can you relay a telegram to...
008...fault	058...weather
009...ing	059...understood
010...account	060...cannot
011...grouping	061...major
012...cr	062...approv
013...kilo	063...service regulations
014...fly	064...accumulators, 4-volt
015...ground	065...must
016...receiving station	066...system
017...those [cumulators?	067...alternator
018...When will you require additional ac-	068...twenty (20)
019...fuse	069...blouse
020...Thursday	070...plan
021...cylinder	071...You are being called by
022...dispatch book	072...I am re-entering net
023...heliograph	073...yes
024...Send faster	074...German
025...line	075...X
026...messenger	076...Your
027...ci	077...during
028...T.P.S.	078...receiver
029.....	079...slow
030...demand	080...will
031...eighty (80)	081...accumulators, 6-volt
032...enough	082...radio-gonio
033...air	083...drawers
034...how	084...wavelength
035...net	085...director
036.....	086.....
037...miss	087...wrong
038...compensator	088...Chief Signal Officer
039...note	089...Master Signal Electrician
040...angle	090...fourth
041...J	091...indispensable
042...third	092...list
043...age	093...station
044...panel	094...address
045...enemy	095...undamped
046...park	096...decimal
047...today [station and personnel	097...radiat
048...You will report with your complete	098...continu
049...gener	099...pursuit
050...safe	100...meteorological bulletin

**Appendix 19E.—CODE FOR DESIGNATION ORGANIZATIONS,  
COMMANDERS AND STAFF OFFICERS**

**SECRET**

No 93

**For Official Use of Officers to Whom Entrusted****CODE FOR DESIGNATION ORGANIZATIONS, COMMANDERS AND STAFF OFFICERS.**

1. This code will be used when it is necessary to conceal the true designation of organizations, commanders and staff officers in letters, telegrams or telephone conversation.
2. An organization is designated by a single christian name. Example: 33rd Division—"MARIAN."
3. A commander is designated by two names. Example: C. G., 33rd Division—"MARIAN SNOW."
4. A staff officer is designated in the same way by two names.
5. THIS CODE MUST NOT BE USED FOR TELEGRAPHIC ADDRESSES OR TELEPHONE CALLS.  
(The operators are not furnished with the code.)

**ORGANIZATIONS.**

6. H. Q. ....	Ida	30th Division .....	Eva	111th Division .....	Ray
1st Army .....	Bertha	31st Division .....	Kathryn	112th Division .....	Susan
2nd Army .....	Dolly	32nd Division .....	Nell	113th Division .....	Ethel
3rd Army .....	Kate	33rd Division .....	Marian	114th Division .....	Edna
4th Army .....	Vera	34th Division .....	Sylvia	115th Division .....	Marcia
5th Army .....	Maude	35th Division .....	Rose	116th Division .....	Sybil
6th Army .....	Alma	36th Division .....	Georgia	117th Division .....	Beulah
7th Army .....	Kitty	37th Division .....	Letty	118th Division .....	Eliza
8th Army .....	Florence	38th Division .....	Jessie	119th Division .....	Harriet
1st Corps .....	Agnes	39th Division .....	Mary	120th Division .....	Louise
2nd Corps .....	Grace	40th Division .....	Ellen	121st Division .....	Jerusha
3rd Corps .....	Winifred	41st Division .....	Stella	122nd Division .....	Miranda
4th Corps .....	Ruth	42nd Division .....	Mabel	123rd Division .....	Pauline
5th Corps .....	Daisy	43rd Division .....	Virginia	124th Division .....	Emma
6th Corps .....	Carrie	44th Division .....	Mildred	125th Division .....	Audrey
7th Corps .....	Violet	45th Division .....	Belle	H. Q. S. O. S. ....	Zenobia
8th Corps .....	Gabriella	46th Division .....	Gwendolyn	A. S. S. O. S. ....	Tilda
9th Corps .....	Alice	47th Division .....	Leona	I. S. S. O. S. ....	Carmen
10th Corps .....	Helen	48th Division .....	Enid	Base Sec. No. 1. ....	Barbara
11th Corps .....	Wilhelmina	49th Division .....	Martha	Base Sec. No. 2. ....	Josephine
12th Corps .....	Peggy	50th Division .....	Prudence	Base Sec. No. 3. ....	Elizabeth
13th Corps .....	Ursula	76th Division .....	Beatrice	Base Sec. No. 4. ....	Charlote
14th Corps .....	Clara	77th Division .....	Imogen	Base Sec. No. 5. ....	Henrietta
15th Corps .....	Gladys	78th Division .....	Margaret	Base Sec. No. 6. ....	Annabelle
16th Corps .....	Anna	79th Division .....	Priscilla	Base Sec. No. 7. ....	Mattie
1st Division .....	Della	80th Division .....	Nora		
2nd Division .....	Joan	81st Division .....	Alexandra		
3rd Division .....	Frances	82nd Division .....	Caroline		
4th Division .....	Olive	83rd Division .....	Genevieve		
5th Division .....	Sadie	84th Division .....	Iris		
6th Division .....	Maggie	85th Division .....	Lucille		
7th Division .....	Tilly	86th Division .....	Naomi		
8th Division .....	Irene	87th Division .....	Rebecca		
9th Division .....	Blanche	88th Division .....	Betty		
10th Division .....	Julia	89th Division .....	Rhoda		
11th Division .....	Laura	90th Division .....	Hortense		
12th Division .....	Effie	91st Division .....	Cornelia		
13th Division .....	Claire	92nd Division .....	Fanny		
14th Division .....	Lois	93rd Division .....	Bessie		
15th Division .....	Irma	94th Division .....	Edith		
16th Division .....	Victoria	95th Division .....	Rosalind		
17th Division .....	Tina	96th Division .....	Theodora		
18th Division .....	Agatha	97th Division .....	Christine		
19th Division .....	Hazel	98th Division .....	Eloise		
20th Division .....	Jane	99th Division .....	Ernestine		
21st Division .....	Dot	100th Division .....	Constance		
22nd Division .....	Lydia	101st Division .....	Dorothy		
23rd Division .....	Sarah	102nd Division .....	Jocelyn		
24th Division .....	Molly	103rd Division .....	Drusilla		
25th Division .....	Pearl	104th Division .....	Evangeline		
26th Division .....	Theresa	105th Division .....	Lucy		
27th Division .....	Rachel	106th Division .....	Zora		
28th Division .....	Jennie	107th Division .....	Clemantine		
29th Division .....	Elsie	108th Division .....	Yetta		
		109th Division .....	Yvonne		
		110th Division .....	Emelia		

**TITLES OF OFFICERS.**

C. in-C. or C. G. ....	Snow
C. of S. ....	Dow
Deputy C. of S. ....	Jones
A. C. of S. G-1. ....	Fuller
A. C. of S. G-2. ....	King
A. C. of S. G-3. ....	Burns
A. C. of S. G-4. ....	Wells
A. C. of S. G-5. ....	Kelly
Chief of Cavalry. ....	Wise
Chief of Infantry. ....	Rush
Chief of Artillery. ....	White
Chief of T. C. ....	Dick
A. G. ....	Long
I. G. ....	Smith
J. A. ....	Black
C. Q. M. ....	Adams
C. S. ....	Greene
C. E. O. ....	Brown
C. O. O. ....	Pratt
C. S. O. ....	Hart
C. A. S. ....	Fry
C. C. W. S. ....	Brady
P. M. G. or P. M. ....	Page
Chief of M. T. C. ....	Hand
D. G. T. ....	Silver

**SECRET****ORGANIZATIONS.**

Agatha.....	18th Division	Hortense.....	90th Division	Theresa.....	26th Division
Agnes.....	1st Corps	Ida.....	G. H. Q.	Tilda.....	Adv. Sec. S. O. S.
Alexandra.....	81st Division	Imogen.....	77th Division	Tilly.....	7th Division
Alice.....	9th Corps	Irene.....	8th Division	Tina.....	17th Division
Alma.....	6th Army	Iris.....	84th Division	Ursula.....	13th Corps
Anna.....	16th Corps	Irma.....	15th Division	Vera.....	4th Army
Annabelle.....	Base Section No. 6.	Jane.....	20th Division	Victoria.....	16th Division
Audrey.....	125th Division	Jennie.....	28th Division	Violet.....	7th Corps
Barbara.....	Base Section No. 1.	Jerusha.....	121st Division	Virginia.....	43rd Division
Beatrice.....	76th Division	Jessie.....	38th Division	Wilhelmina.....	11th Corps
Belle.....	45th Division	Joan.....	2nd Division	Winifred.....	3rd Corps
Bertha.....	1st Army	Jocelyn.....	102nd Division	Yetta.....	108th Division
Bessie.....	93rd Division	Josephine.....	Base Section No. 2.	Yvonne.....	109th Division
Betty.....	88th Division	Julia.....	10th Division	Zenobia.....	Headquarters S. O. S.
Beulah.....	117th Division	Kate.....	3rd Army	Zora.....	106th Division
Blanche.....	9th Division	Kathryn.....	31st Division		
Carmen.....	Int. Sec. S. O. S.	Kitty.....	7th Army		
Caroline.....	82nd Division	Laura.....	11th Division		
Carrie.....	6th Corps	Leona.....	47th Division		
Charlotte.....	Base Section No. 4.	Letty.....	37th Division		
Christine.....	97th Division	Lois.....	14th Division		
Claire.....	13th Division	Louise.....	120th Division		
Clara.....	14th Corps	Lucille.....	85th Division		
Clemantine.....	107th Division	Lucy.....	105th Division		
Constance.....	100th Division	Lydia.....	22nd Division		
Cornelia.....	91st Division	Mabel.....	42nd Division		
Daisy.....	5th Corps	Maggie.....	6th Division		
Della.....	1st Division	Marcia.....	115th Division		
Dolly.....	2nd Army	Margaret.....	78th Division		
Dorothy.....	101st Division	Marian.....	33rd Division		
Dot.....	21st Division	Martha.....	49th Division		
Drusilla.....	103rd Division	Mary.....	39th Division		
Edith.....	94th Division	Mattie.....	Base Section No. 7.		
Edna.....	114th Division	Maude.....	5th Army		
Effie.....	12th Division	Miranda.....	122nd Division		
Eliza.....	118th Division	Mildred.....	44th Division		
Elizabeth.....	Base Section No. 3.	Molly.....	24th Division		
Ellen.....	40th Division	Naomi.....	86th Division		
Eloise.....	98th Division	Nell.....	32nd Division		
Elsie.....	29th Division	Nora.....	80th Division		
Emelia.....	110th Division	Olive.....	4th Division		
Emma.....	124th Division	Pauline.....	123rd Division		
Enid.....	48th Division	Pearl.....	25th Division		
Ernestine.....	99th Division	Peggy.....	12th Corps		
Ethel.....	115th Division	Priscilla.....	79th Division		
Eva.....	30th Division	Prudence.....	50th Division		
Evangeline.....	104th Division	Rachel.....	27th Division		
Fanny.....	92nd Division	Ray.....	111th Division		
Florence.....	8th Army	Rebecca.....	87th Division		
Frances.....	3rd Division	Rhoda.....	89th Division		
Gabriella.....	8th Corps	Rosalind.....	95th Division		
Genevieve.....	83rd Division	Rose.....	35th Division		
Georgia.....	36th Division	Ruth.....	4th Corps		
Gladys.....	15th Corps	Sadie.....	5th Division		
Grace.....	2nd Corps	Sarah.....	23rd Division		
Gwendolyn.....	46th Division	Stella.....	41st Division		
Harriet.....	119th Division	Susan.....	112th Division		
Hazel.....	19th Division	Sybil.....	116th Division		
Helen.....	10th Corps	Sylvia.....	34th Division		
Henrietta.....	Base Section No. 5.	Theodora.....	96th Division		

**TITLES OF OFFICERS.**

Adams.....	Chief Quartermaster
Black.....	Judge Advocate
Brady.....	Chief Chemical Warfare Service
Brown.....	Chief Engineer Officer
Burns.....	Assistant Chief of Staff G-3
Dick.....	Chief of Tank Corps
Dow.....	Chief of Staff
Fry.....	Chief of Air Service
Fuller.....	Assistant Chief of Staff G-1
Greene.....	Chief Surgeon
Hand.....	Chief of Motor Transport Corps
Hart.....	Chief Signal Officer
Jones.....	Deputy Chief of Staff
Kelly.....	Assistant Chief of Staff G-5
King.....	Assistant Chief of Staff G-2
Long.....	Adjutant General
Page.....	Provost Marshal General or Provost Marshal
Pratt.....	Chief Ordnance Officer
Rush.....	Chief of Infantry
Silver.....	Director General of Transportation
Smith.....	Inspector General
Snow.....	Commander-in-Chief or Commanding General
Wells.....	Assistant Chief of Staff G-4
White.....	Chief of Artillery
Wise.....	Chief of Cavalry

Appendix 19F.—PAMPHLET “TELEPHONE—T. P. S.—T. S. F.—VISUAL”

P A M P H L E TS E C R E T

TELEPHONE -T. P. S. - T. S. F. -VISUAL

No. 578

Name of Pamphlet: OLIVE  
Code Name: Q Q QIt is forbidden to send any message in  
the clear by T.S.F. or T.P.S.

BURN THIS PAMPHLET IF IT IS IN DANGER OF BEING CAPTURED

AIC A	CMT my	EQA to bombard	NBT meter
AKE A	CMV our	EQR to cease	NCI minute
AKI B	CMK our	EES to begin	NCK little, weak
ALB B	CMZ we	ERC to complete	
ALD C	CMK by	EST to lead	<u>ORIENTATION</u>
ALG C	CMN for	ESL to keep	
ANO D	DAR your	<del>ESL</del> to keep on	NCV to the right
ANP D	DBD you	ESS to outflank	NDE to the left
ANS E		ETE to emerge	NDK at end, rear
APG E	<u>Numbers</u>	ETG to decide	NDO at the head
ARS E		ETK to defend	NDR going to
BIC F	DCD 0 or nul	EUI to demand	NEG in centre
BKT F	DCG 1 or first	EUV to destroy	NEK back
BLN G	ICK 2	FAR to direct	NES before, in
BLR H	DCO 3	FAT to fail	front of
BNO I	DCS 4	FAZ to hear	NFT direction of
BNS I	DCV 5	FCZ to send	NGA east
BOA J	DDE 6	FDV to be	NGK north
BOG K	DKK 8	FEI to evacuate	NGW west
BOI L	EAR 9	FET to do	NEV south
BOS M	EAZ 10	<del>FET</del> to advise	NKK coming from
BPO M	EBI 11	FIN guide	
BPD N	EBR 12	FKA leave	<u>LOCATION</u>
BPG N	EDZ 13	FKR miss or lack	
BPQ O	ECA 14	FKT put	NKZ felling,
BPR P	ECF 15	GAI occupy	abatis
BPS Q	ECK 16	GAS oppose	NLM shelter
BQA R	ECR 17	GAT command	NLR wood
BSC R	EOT 18	GDA organize	NLT communication
BSQ S	EDR 19	GBO appear	trenches
BSS S	EDZ 20	GBV place	NOB drain
CAR T	EEI 30	GCI prepare	NOK cross road
CAZ T	EEM 40	GCR receive	NOV quarry
OBI U	EET 50	GCT reduce	NRF strong point
OBL V	EFG 60		NRR grave yard
OBH W	EFI 70	GOV come in	NSC hill
CCY X	EFT 80	GDI answer	NSE crest
CDB Y	EGL 90	GEA repulse	OAF church

-3-

PDL	trench mortar	QEV	field cable	SGK	visual station
PDO	tanks	QFI	light cable	SGS	prisoner
PDP	allied artillery will open fire on	QFS	captain	SHO	regiment
PEI	allied artillery is shelling	QFV	cartridge 86	SHP	relief
PEK	allied artillery has ceased firing on	QFY	cartridge D A M	SHQ	answer
PEP	enemy artillery will open fire on	QGE	head receiver	SHS	not
PFJ	enemy artillery is shelling	QGI	cavalry	SII	reserve
PFK	enemy artillery has ceased firing on	QHC	certainly	SID	14 c/m searchlight
PFT	battery	QHI	tanks	SIP	24 c/m searchlight
PFZ	bombardment	QKE	colonel	SKO	situation
PGA	bombardment by gas shell	QKG	battle	SKV	evening
PGE	Casemate	QKP	Major	SLY	non-comm. officer
PHG	cease fire	QLL	counter attack	SLZ	4 line switchbrd
PHI	anti-air craft	QLO	army corps	SMI	12 line swthbrd
PHT	anti tank	QLY	raid	SND	torpedo
PHZ	time fuse	QNI	critic	SMT	troop
PKD	percussion fuse	QNK	defense	SMY	vacuum bulbs
PKT	instantaneous	QNH	material damages	SNZ	killed
PLC	observe fire on	QNT	demain, tomorrow	SNL	urgent
PLG	gas shell	QNZ	request		
PLL	lacrymatory shell	QOE	missing		
PME	shrapnel shell	QOH	available		
PNF	melinite shell	QOK	distance		
PNA	piece	QOR	division		
PND	range too short	QOV	doubtful		
PNK	range too long	QPE	water		
PNL	range too far to the right	QPK	enemy		
PNT	range too far to the left	QPN	squadron		
POO	barrage on	QPP	execution		
POS	counter preparation range	QQA	general		
		QQF	engineers		
		QRB	non-commissioned officer		
		QRD	wire mesh strips		
		QRE	group		
		QRH	guide		
		QRT	yesterday		
		QSA	man		
		QSS	at once		
		QST	impossible		

PHRASES

SNV	everybody under shelter except the guard	VBB	the patrol is back
SOP	alarm	VBD	the patrol is out
SOV	gas alarm	VKK	the patrol will go out at once
TAR	attack under previous condition	VKS	do complete the chain of the runners
TAT	enemy attack seems to have failed	VSE	first line pass by
TAV	attack is started	VSK	the artillery preparation seems to be sufficient

**Appendix 19G.—TEMPORARY CODE FOR TRANSMISSION OF CASUALTY DATA BY TELEPHONE  
AND TELEGRAPH**

COPY.inp

PH G-3

GENERAL HEADQUARTERS  
AMERICAN EXPEDITIONARY FORCES

SECRET:                   THIRD SECTION G.S.

16 September, 1918

MEMORANDUM

1. The accompanying Temporary Code for Reporting Casualties (Copy No. 35) is furnished to you for use in rendering telephonic or telegraphic reports involving the mention of casualties.
2. Its use is necessary because of the strong objections made by the French to reporting casualties in plain text.
3. This code will be used until further orders by all concerned in reporting casualties by telephone or telegraph to Corps Headquarters or to G-2 or G-3 G.H.Q.
4. Please acknowledge receipt of attached code by number.

By direction:

W. B. HOWE  
Captain, Infantry  
Secretary G-3.

1 encl.  
jem

SECRET

COPY No. 35.

## TEMPORARY CODE FOR TRANSMISSION OF CASUALTY DATA BY TELEPHONE &amp; TELEGRAPH.

Plain Text:	Code:
Casualty report, officers - - - - -	Following required
Casualty report, soldiers - - - - -	Following estimated
No casualties, officers - - - - -	Nothing required
No casualties, soldiers - - - - -	Nothing estimated

Character of casualty (report in order given)

Plain text:	Code:	:	Plain text:	Code:
Killed - - - - -	January	::	Slightly gassed - - - - -	July
Wounded - - - - -	February	::	Taken prisoner - - - - -	August
Seriously wounded - - - - -	March	::	Wounded and prisoner - - - - -	September
Slightly wounded - - - - -	April	::	Wounded by shell fire - - - - -	October
Gassed - - - - -	May	::	Wounded by accident - - - - -	November
Seriously gassed - - - - -	June	::	Missing - - - - -	December

Table for numbers (1 to 999):

HUNDREDS:	TENS:	UNITS:
0 - - -	Caps - - - - -	Bacon - - - - - 0
1 - - - Oil - - - - -	Shoes - - - - -	Rice - - - - - 1
2 - - - Ink - - - - -	Belts - - - - -	Beef - - - - - 2
3 - - - Paper - - - - -	Gloves - - - - -	Flour - - - - - 3
4 - - - Chairs - - - - -	Socks - - - - -	Pork - - - - - 4
5 - - - Tables - - - - -	Coats - - - - -	Salt - - - - - 5
6 - - - Candles - - - - -	Shirts - - - - -	Ham - - - - - 6
7 - - - Lanterns - - - - -	Leggins - - - - -	Bread - - - - - 7
8 - - - Pencils - - - - -	Drawers - - - - -	Mutton - - - - - 8
9 - - - Blanks - - - - -	Breeches - - - - -	Corn - - - - - 9

EXAMPLE

Casualty report: officers - 1 killed, 5 gassed, 2 wounded and prisoners;  
soldiers - 26 wounded, 15 prisoners, 18 missing.

CODE AS FOLLOWS:

Following required: January rice, May salt, September beef; following  
estimated: February belts ham, August shoes salt, December shoes mutton.

(G-3)  
jem

Copy 1f.

(252)

Appendix 20.—THE "BASEBALL CODE"

Headquarters  
52nd Infantry Brigade  
26th Division  
A.E.F.

S-E-C-R-E-T

France, 17 April 1918.

BULLETIN  
No. 1

The following code for communications between Companies, Battalions, Regiments and Headquarters 52nd Infantry Brigade will be effective 18 April 1918, 12 o'clock.

CASUALTIES

KILLED.....Strike out  
SERIOUSLY WOUNDED.....Base on balls  
SLIGHTLY WOUNDED.....Hit by pitched ball  
ACCIDENTALLY WOUNDED.....Balk  
MISSING.....Put outs  
COMMISSIONED OFFICER.....Major  
ENLISTED MEN.....Minors

CAPTURES

HAVE TAKEN (NO) \_\_\_\_\_ PRISONERS.....Stolen Bases \_\_\_\_\_ (NO)  
Have Lost (NO) \_\_\_\_\_ PRISONERS.....Left on Bases \_\_\_\_\_ (NO)  
HAVE LOST MACHINE GUNS.....Errors  
HAVE TAKEN MACHINE GUNS.....Assists

ARTILLERY, TRENCH WEAPONS

WE WERE BOMBARDED BY MINNENWERFFERS.....Johnson using spit ball  
WE BOMBARDED WITH TRENCH MORTARS.....Leonard using slow ball  
WE BOMBARDED WITH STOKES MORTARS.....Leonard using spit ball  
WE BOMBARDED WITH 37 M.M. CANON.....Leonard using a curve  
FIRED ON BY MACHINE GUNS.....Johnson using fast ball  
FIRED WITH MACHINE GUNS.....Leonard using fast ball  
WE WERE UNDER BOMBARDMENT.....Wagner at bat  
WE WERE UNDER HEAVY BOMBARDMENT.....Wagner knocked a home run  
WE WERE UNDER MODERATE BOMBARDMENT.....Wagner tripled  
WE WERE UNDER LIGHT BOMBARDMENT.....Wagner doubled  
WE WERE BOMBARDED WITH GAS.....Wagner singled  
ENEMY REGISTRATION FIRE.....Wagner bunted  
WE BOMBARDED.....Cobb at bat  
WE BOMBARDED HEAVILY.....Cobb knocked a home run  
WE BOMBARDED MODERATELY.....Cobb tripled  
WE BOMBARDED LIGHTLY.....Cobb doubled  
WE BOMBARDED WITH GAS.....Cobb singled  
REGISTRATION FIRE (OURS).....Cobb bunted  
BARRAGE REQUESTED FROM 6566.....famed  
OUR ARTILLERY LAID DOWN A BARRAGE.....Sent in a pinch bitter

MISCELLANEOUS

NO UNUSUAL TRENCH EVENTS.....Game called, rain  
QUIET DAY.....Game called darkness  
ACTIVE DAY.....Extra inning game  
THE ENEMY IS DOING TRENCH WORK at.....He is warming up  
WE ARE DOING TRENCH WORK at.....We are warming up

-2-

LIAISON

WE ARE WORKING IN CONJUNCTION WITH  
REGIMENT ON RIGHT OR LEFT.....We are playing doubleheader  
with Braves or Giants

INFANTRY

RAIDS, ENEMY.....They tried hit and run game  
RAIDS, OURS.....We tried hit and run game.

ATTACKS-ENEMY

STRONG ATTACK.....Kauff drives to the outfield  
SMALL ATTACK.....Kauff drives to the infield.

ATTACKS-OURS

STRONG ATTACK.....Baker drives to the outfield  
SMALL ATTACK.....Baker drives to the infield

SUCCESSIVE ATTACKS

SLIGHT.....1 on base  
MODERATE.....2 on base  
AT ALL POINTS.....B ases full

ATTACK FAILED PARTIALLY.....We made double play  
ATTACK FAILED COMPLETELY.....Bases clear

RELIEF

RELIEF BEGAN.....Went to bat \_\_\_\_\_ inning  
RELIEF COMPLETED.....Scored

ENEMY PATROLS OUT.....They worked squeeze play  
OUR PATROLS OUT.....We worked squeeze play

OCCUPATION OF TRENCHES

ENEMY IN OUR TRENCHES.....They put a coach at \_\_\_\_\_  
WE OCCUPIED ENEMY TRENCHES.....We put a coach at \_\_\_\_\_

LOCATIONS WILL BE INDICATED AS FAR AS POSSIBLE BY CODE NUMERALS

1.....BOSTON  
2.....NEW YORK  
3.....PHILADELPHIA  
4.....ST. LOUIS  
5.....CHICAGO  
6.....CLEVELAND  
7.....WASHINGTON  
8.....DETROIT  
9.....BROOKLYN  
0.....BUFFALO

For purposes of encoding, the sous sector of GIRONVILLE may be described as a base ball field, and the various elements are represented by the positions on the diamond. Field is divided into 2 parts, an imaginary line separating the right from the left battalion, on the 1 to 20,000 map by straight line drawn from GIRONVILLE to the tip of the "goose neck" at 5804 just west of APREMONT. It will be necessary to have two center fields to be designated RIGHT CENTER and LEFT CENTER respectively. the locations of units are encoded as follows:

-3-

REGIMENTAL HEADQUARTERS AT GIRONVILLE.....Home plate

RIGHT BATTALION

THE RIGHT COMPANY IN THE FIRST LINE.....Right field  
 LEFT COMPANY IN THE FIRST LINE.....Right center field  
 RIGHT COMPANY IN SUPPORT.....1st Base  
 LEFT COMPANY IN SUPPORT.....2nd Base

LEFT BATTALION

RIGHT COMPANY IN FIRST LINE.....Left center field  
 LEFT COMPANY IN FIRST LINE.....Left field  
 RIGHT COMPANY IN SUPPORT.....Short stop  
 LEFT COMPANY IN SUPPORT.....3rd Base

COMMUNICATING TRENCHES ON RIGHT.....1st to 2nd Base line  
 COMMUNICATING TRENCHES ON LEFT.....2nd to 3rd Base line

To designate the P.C. of individual units, the names of players are used as follows:

REGIMENTAL P.C.....Garrison *Gironville*RIGHT BATTALION

RIGHT BATTALION P.C.....Janvria  
 RIGHT SUPPORT COMPANY P.C.....Gainer  
 LEFT SUPPORT COMPANY P.C.....Barry  
 RIGHT COMPANY FIRST LINE P.C.....Hooper  
 LEFT COMPANY FIRST LINE P.C.....Speaker

LEFT BATTALION

LEFT BATTALION P.C.....Rath *Appert*  
 RIGHT COMPANY FIRST LINE P.C.....Walker  
 RIGHT SUPPORT COMPANY P.C.....Scott  
 LEFT SUPPORT COMPANY P.C.....Gardner  
 LEFT COMPANY FIRST LINE P.C.....Lewis  
 THE SUB-SECTOR ON THE RIGHT (51st Brigade).....Braves  
 SUB-SECTOR ON THE LEFT (10th Col.I.D.).....Giants

The place where activity occurs may be indicated by the use of the code names of the positions, for example

WE WERE BOMBARDED WITH GAS ON THE FRONT OF  
 FIRST LINE COMPANY OF THE LEFT BATTALION

at 11 o'clock.....Wagner singled to left  
 field in 11 inning.

THEY ARE BOMBARDING THE RIGHT SUPPORT COMPANY  
 OF THE RIGHT BATTALION WITH MINNENWERFERS.....They are using spit ball  
 at 1st base

BARRAGE FROM P.C. RABIER(RIGHT BATTALION).....Rath fanned *Appert*  
 OUR ARTILLERY LAID DOWN A BARRAGE IN  
 FRONT OF THE RIGHT CO. OF THE LEFT BATTALION.....We sent in a pinch hitter  
 for Walker

10 killed.....10 strike outs  
 5 seriously wounded..... 5 bases on balls  
 1 Commissioned Officer..... 1 Major  
 3 Missing..... 3 put outs

BY COMMAND OF BRIGADIER GENERAL, COLE:

FRANCIS V. LOGAN  
 1st Lt. Inf. N.G. A.D.C.  
 ACTING ADJUTANT

**Appendix 21.—“SECRET INSTRUCTIONS FOR THE USE OF ARMY CODES”**

# Secret

## NOTES ON USE OF CODE

*TO BE ISSUED DOWN TO COMPANIES.  
TO BE COMPLETELY DESTROYED AFTER BEING READ.*

In order that information and reports, when they must be transmitted by radio-telegraphy or other means subject to interception, may not furnish valuable information to the enemy, some form of code or cipher is necessary.

No cipher sufficiently simple to be used in the field will long resist solution. For this reason, their use should be limited to absolute necessity, and messages made as short as possible. The "Playfair" cipher has been in use for many years, and is regarded as the best means for temporarily concealing the meaning of a message when a code book is not available. It can, however, be solved in a few hours, and should never be used except in emergency.

The safest means of preparing messages for transmission is by use of a code book. The code book now issued to divisions will, if properly used, be entirely safe for a period of from two to four weeks. If instructions are disregarded, and groups unnecessarily repeated, or "nulls" omitted, or if the code book is used for routine "form" report, the enemy will probably be reading your messages within a week. The surest ways of helping the enemy in the solution of your code are to send a large number of spelled-out words (one group for each letter), or to send part of the message in clear and part in code. A very few messages of this kind will give enough solutions to enable most other messages to be read.

The instructions printed in the code book are based on actual solution of enemy codes, and their importance cannot be overestimated.

To show the serious consequences of disregarding instructions contained in the code book and in General Orders No. 103, G. H. Q., 1918, the following instances of carelessness, or worse, are quoted:

(1) A division engaged in maneuvers in the rear area sent messages reporting progress of various units during the maneuver. These messages gave organizations and names of commanders in clear. This division might as well have notified the Germans definitely of its location, of the organizations forming part of the division, and of its future intentions.

(2) In one organization six code books were lost in action and that fact reported only after the return of the code books had been demanded. Whether these books reached the hands of the enemy or not is not known. No harm was done, for the reason that officers, with a greater sense of responsibility, lost books at the same time and made immediate telegraphic report of that fact, thus insuring the issue of a new edition of the code.

(3) Code messages with address in clear have been intercepted by our control station, and if intercepted by the German stations, gave the exact location of various units.

(4) A number of messages in straight code contain no "nulls." Such messages are always desired by enemy code men.

(5) Many messages contain unnecessary repetition of code groups. In one instance, a message of less than 30 code groups contained the letter "E" repeated three times. The first code group appearing after "E" was used each time. From that one message, the Germans were able to make a good guess at to which one of our code groups stood for "E."

(6) One officer reports the destruction of all the code books in his organization because the division was moving forward and he had no safe in which to store his books. While the destruction of code books to prevent capture is entirely proper, this officer destroyed his books at the very time they might be of the greatest use to him.

(7) Orders now permit the destruction of code books when a new issue is made. The greatest care, however, must be taken that the books are actually destroyed. There are now on file in this office certificates to the effect that certain code books have been destroyed in the presence of the officer signing the certificates. The code books themselves are also on file here. If this can occur with respect to code books returned, it would seem that it could also occur with respect to code books captured by the enemy. The greatest care in verifying the destruction of code books is essential.

To meet the demand of companies and other organizations for a very short code which will permit the sending of important messages without the delay now required to search through a rather large book, there is being published an emergency code list. This will contain about 50 of the phrases most used at the front. It will be republished and issued with each edition of the code book. Its return after use will not be required. It will be printed on a single sheet, which can be readily destroyed, and no effort should be spared to keep it out of the hands of the enemy.

It should be clearly understood that any carelessness in the use of our code endangers not only the officer or organization concerned, but every Allied organization on the Western front.

Before the March offensive the Germans published a complete new code for use by all troops on the Western front. This code was entirely different from anything that had yet been used, and its appearance was regarded as an indication of a coming offensive. Its solution was considered one of the most important duties

of cipher men in French, British or American service. Through the carelessness of a single German officer this code became known, and was being read by all the Allies before March 21st. The carelessness of this one officer undoubtedly cost the lives of thousands of German soldiers, and it is not impossible to believe that it changed the result of the war.

Similar carelessness on the part of American officers may in the same way cost the lives of American soldiers. The careful study of General Orders No. 103, G. H.Q., 1918, and the instructions contained in the code book issued to divisions cannot be too strongly urged.

One of the difficulties in the use of our code is the lack of experience on the part of officers in coding and decoding messages. If the instructions are followed, the work will at first be discouragingly slow, but decoding and encoding a few messages for practice will increase the speed to a surprising degree.

The code should be used freely, but according to instructions. It is the safest means of concealing the meaning of a message from the enemy, and its use for that purpose is urgently recommended.

Not all American organizations use the same code. In particular, each Army has its own code book. Divisions transferred from one Army or independent Corps to another, should leave their code books with the organization from which transferred and procure new ones on new assignment. Independent divisions when assigned to Corps or Army should immediately ascertain whether or not they have the proper code book and, if not, should make application to Corps for necessary issue.

The transmission of messages encoded in the regular way and then having the groups transposed so as to appear out of normal order, is one of the best ways in which to confuse enemy code men. Messages of this character are much feared by all code men. The preparation of this type of message is valuable experience for all officers, and helps to give enemy code men problems which they can never solve.

**Appendix 22.—EXAMPLES OF LETTERS, TELEGRAMS, AND NOTES CONCERNING VIOLATIONS OF RULES FOR CRYPTOGRAPHIC SECURITY**

GENERAL HEADQUARTERS,  
AMERICAN EXPEDITIONARY FORCES,  
France, September 20, 1918.

From: Adjutant General.  
To: Commanding General, 1st Army.  
Subject: Intercepted Radio Message.

The following radio message intercepted by one of our control stations is brought to your attention for suitable action:

Rec'd at U W Control Station. Time Rec'd 04.50 Date 9-18-19

M97 de K69 PO NR I W 120 12.15 Sept 17

BWD	CSA	QOV	FWP	<u>BWU</u>	NUW	DOW	JAC	BKJ	WCO	<u>BSU</u>	<u>QVA</u>	QEX	<u>GAN</u>	<u>BMD</u>	TRP	CPB			
PBY	<u>BKJ</u>	PCS	GKC	AJP	<u>GAN</u>	<u>BMD</u>	<u>WOL</u>	<u>MPO</u>	BGY	<u>FGC</u>	<u>FRX</u>	SXM	<u>LGB</u>	<u>FPL</u>	<u>FGC</u>	FSM	WSM		
<u>LGB</u>	GES	.....	NBP	<u>BMD</u>	JPW	<u>BSU</u>	VNO	JGS	<u>FRX</u>	<u>FPL</u>	<u>MON</u>	JVB	OWU	DAV	DMY	ASX			
VXF	AMV	ABE	.....	J-B	.....	<u>NBV</u>	<u>WNC</u>	WUC	WBV	CAT	DPB	<u>MON</u>	JFC	GOS	MMP	BWY			
NAG	NET	<u>WNC</u>	BKC	SYK	OCA	JSA	FES	<u>REK</u>	<u>QVA</u>	LAN	DXB	.....	<u>BKJ</u>	<u>BWU</u>	<u>MPO</u>	GWO			
OPX	LGA	BAT	GBI	PYF	MSG	DMG	OMS	SUK	<u>OSX</u>	JUF	<u>VEB</u>	MUP	LAW	<u>OSX</u>	GMU	XUJ			
<u>WOL</u>	<u>NBV</u>	<u>FRX</u>	<u>BMD</u>	<u>REK</u>	BUW	<u>WNC</u>	SCP	APO	FYS	ROG	LGO	MBA	<u>VEB</u>	WUX	PJM	BGR			

(Sig) O E BENELL

The following violations of instructions found in the code book are noted:

Eighteen code groups representing letters of the alphabet and figures are repeated from one to three times. Without changing the text 14 of these could have been avoided by using alternate groups that were available. A message of this length should have been sent in at least three parts as separate messages. Words were spelled out which could have been omitted or replaced by words appearing in the code book. The message reads as follows:

"356 Infantry suggests (that) Boche observation aeroplane over Bois de Charey almost before the crack of dawn and (3 groups missed)—at to it and also a pursuit patrol might do good business at that time (1 garbled) field located 60.5-41.5 Thiaccourt group over by 1 Battalion 340th Field Artillery."

The word "Boche" spelled out, could have been replaced by either "German" or "enemy," words which are in the code book. By dividing "Bois de Charey" as follows: "B-o-is-d-e-Ch-are-y" it could have been encoded by 8 groups instead of the 12 groups used. "Day light" would have conveyed the same meaning as "almost before the crack of dawn" and 2 groups would have replaced the 18 groups used in encoding the latter phrase. "Work" should have been used instead of "business" and 1 code group would have done the work of the 8 used in spelling out the latter word. If it is necessary to use "business" in a message it should be divided in this manner, "b-us-i-ness" and encoded with 4 groups instead of using a group for each letter.

By using the code group for "60" instead of the 2 groups for "6" and "0" another code group could have been saved. The same is true of "41." "Thiaccourt" should have been encoded by the groups representing "the" "i," "ac," "our," "t," instead of using a group for each letter. This would have saved 4 groups. By sending "356" and "340th" as "3-56" and "3-40," the "th" after the latter number being unnecessary, 3 more groups would have been eliminated.

The above suggestions would eliminate 40 unnecessary groups and make any repetitions unnecessary, without materially changing the phrasing of the message. By rephrasing it the length could have been reduced to one-half. For example, 55 groups would have encoded the message, allowing for a sufficient number of nulls, if it had been phrased somewhat as follows:

"Enemy observation aeroplane over Bois de Charey daylight 356 Infantry believes it advisable station pursuit patrol field 60.5-41.5 Thiaccourt group near First Battalion 340 Field Artillery."

The message was signed "O. E. Benell." Signatures should be sent only when absolutely required. When sent, they must be encoded, letter by letter, if necessary, and sent as a part of the code message.

Only 4 nulls were used. At least 1 null should be used for each 10 code groups. A null should always be used between double letters, which was not done in the case of the two letters at the end of "business."

Action taken will be reported to these headquarters.

By Command of General Pershing.

J. S. JONES,  
Adjutant General.

GENERAL HEADQUARTERS,  
AMERICAN EXPEDITIONARY FORCES,  
France, September 17, 1918.

From: Adjutant General.  
To: Commanding General, 1st Army.  
Subject: Intercepted Radio Messages.

The following messages are brought to your attention:

(A) Time Rec'd 15:25. Date 9-10-18.

K95 de S95 PO NO 5 PC W18 HO 1500  
ILLUSTRIOUS K95  
BYM JWU GXA FEW ROS QYB MJO QEX JWU AUB CFK ONS RFG  
LONDON IMMORTAL 1

(B) Time Rec'd 12:50. Date 9-10-18.

S95 de K95 PO NO 2 W45 ZP  
TO S95 IMMORTAL  
SAR QEM RPX JWU PNW JGL WXP XFV AHV BAP NBJ AGY WCK VCP DUG SAR KBX ABG  
YJK UBV GWX BPL DPB DAY DPO JVC AGF VSF SBX MOS JSX XUB VJP QSC DAB PEM  
XGW KBX  
ILLUSTRIOUS NO 1

(C) Time Rec'd 11:35. Date 9-9-18.

U34 de U07 PO NO 4 HO 1110 CK 24 FM U07 TO U34 RELAY TO H33  
COX WAJ KMC XOP COX JWW PNW GMJ AUB CUB RFG XYP WAV OCU BNY OLP OKP  
GEORGETOWN IMMORTAL 1

Message A has one word in clear, the rest in code. It reads as follows: "Messages by phone and telegraph should be sent as usual to London."

The word "sent," not occurring in our code book, is spelled out letter by letter. If this message in clear had been made to read "Send telephone and telegraph messages to London," it would have been considerably shorter, would have answered the same purpose as that of the message actually transmitted, and would have given less assistance to enemy code men.

Message B reads: "Please furnish at least 3 copies of annex (?) V (?) to field order 12. We have no means of making copies."

The words "please furnish" are spelled out letter by letter, when the word "request" would have answered the same purpose, and could have been represented by one code group. No reason for including the words "at least" is known. If it were assumed that the officer sending this message would not ask for copies unless they were necessary, the last clause could have been eliminated.

It cannot be too strongly insisted that the sending of these long messages gives the most valuable assistance to the enemy, and will enable him to read our code within a very few days.

Message C reads: "Submit all subsequent reports to First Brigade Headquarters of the First Division."

The words "submit" and "subsequent" are spelled out letter by letter. If this message had read "Send reports to First Brigade, First Division," its length would have been decreased by one-half, there would have been no spelled out words, time in coding and decoding would have been saved, and the recipient would have gotten the same information that was included in the message as transmitted.

Action taken will be reported to these headquarters.

By Command of General Pershing:

J. S. JONES,  
Adjutant General.

[COPY]

SIGNAL CORPS, UNITED STATES ARMY  
[Telegram]

Sept. 1, 1918.

COMMANDING GENERAL, 2D DIV., A. E. F.:

No. 36, G-2 period Messages sent by units of your command have been intercepted by one of our control stations. These messages were undoubtedly intercepted by German stations likewise. They positively identify your division as being in reserve.

HOWELL

GENERAL HEADQUARTERS, A. E. F.,  
GENERAL STAFF, SECOND SECTION (G. 2 A. 6),

France, September 18, 1918.

MEMORANDUM FOR DEPUTY CHIEF OF STAFF:

*Subject: Indiscreet telephone conversation*

In accordance with attached memorandum from Deputy Chief of Staff, I have consulted with Colonel Richardson, representing G-3, and Colonel Gibbs, the Deputy Chief Signal Officer.

I recommend that the service of checking telephone conversation from these headquarters be combined with that of supervising our own radio activity and our own use of code. I now have an officer in my office whose duty is to check all radio messages copied by our own control stations, and prepare letters for the Adjutant General's signature, reporting improper use of code or the transmission of dangerous messages. Copies of these letters are filed in my office and will be checked from time to time to see what action has been taken in each case. If it appears that proper action has not been taken or no answer is received within a reasonable time, the matter will be brought to your attention.

It would seem that letters in reference to indiscreet telephone conversation might well follow the same system. These will be addressed to the commander or individual concerned, direct that suitable action be taken and report made to these headquarters. They will then be submitted through G-2-A to your office for approval and transmission to the Adjutant General for signature.

Authority has already been given for the establishment at Army and Army Corps headquarters of an officer for duty of checking our radio-telegraphic service, and I see no reason why this same officer should not at the same time supervise the telephone conversation at such headquarters. This has the approval of the Deputy Chief Signal Officer and, with your approval, as soon as officers are available they will be sent to the various headquarters as already planned, but will, in addition, have the duty of checking indiscreet telephone conversation.

The Deputy Chief Signal Officer states that necessary listening-in equipment can be furnished at each Army and each Corps Headquarters. I will detail a stenographer for duty with the officer at these headquarters immediately, and as soon as available will also furnish stenographers for duty at Army and Corps headquarters.

Approved 9/19/18.

By direction.

ETTINGER.

Appendix 23.—LECTURE DELIVERED BY LT. COL. MOORMAN BEFORE OFFICERS OF M. I. D.,  
FEBRUARY 13, 1920

**LECTURE DELIVERED TO THE OFFICERS OF THE MILITARY INTELLIGENCE  
DIVISION, GENERAL STAFF, FEBRUARY 13, 1920**

By LT. COL. FRANK MOORMAN, A. E. F., G. H. Q.

**WIRELESS INTELLIGENCE**

GENERAL CHURCHILL. Gentlemen, we have heard about our own M. I. 10, and this morning Colonel Moorman, of G. H. Q., A. E. F., is going to tell us about a similar service in the A. E. F.—Radio interception. From General Nolan's remarks, you know in general, the vital importance of this kind of work, and now we are going to hear from a man who really handled the thing as an expert.

COLONEL MOORMAN. I understand that you are not particularly interested in the troubles we had in getting organized and started. What you want to know is how we worked after getting organized. There are two troubles which we had that I think you should more generally understand. One is the difficulty in getting men who are trained in the work. General Nolan expressed the situation very well toward the latter part of the war when he said that he started in with a misconception of what was required. He said that the next time he would put into this work the best brains of the country. He also admitted that he had not appreciated the importance of the code and cipher work.

Next we lacked liaison with Washington. I do not think that Washington understood our problems in the beginning. We did not understand Washington, and did not make any particular effort to appeal to them for help. Later we discovered that there was such an organization in Washington, and at the same time they found out that we were in existence in France, and then a real effort was made to work together. This would have made more efficient work had not the signing of the armistice made further efforts in this line unnecessary.

Major Yardley was sent over but got lost somewhere between London and Paris, and so never got to us until after the armistice was signed. On that account we never got the advantage of what he was going to tell us, nor to tell him what we needed.

After we got our organization started, we divided the work into five heads, namely:

- (1) The intercepting and decoding of enemy messages.
- (2) Locating and grouping enemy radio stations.
- (3) Following their aeroplanes when they were registering for artillery.
- (4) Getting what information we could from enemy telephone conversations. We had listening sets provided for that purpose.
- (5) The fifth, which we did not take up until towards the last with any particular interest, was the control of our own communication, a very important phase of radio intelligence, to keep our own people from telling the enemy about what we were going to do.

Taking these up in order we find the copying and decoding of enemy messages required a line of stations along the front with a 24-hour service in most cases. Incidentally we discovered that the French with whom we worked had, on the quiet front, lost interest to a large extent on account of their having rested in one place so long. They felt that they knew the enemy's habits and what he was going to do, and that it was not worth while to keep too close a watch on him. Our men being new and keen on the job maintained a 24-hour service, with the result that we picked up several messages of extreme importance, especially at night. I understand that in one case we notified the French of an attack that was to take place on their front, and they ordered a court of inquiry to find out why they got that information from the Americans instead of from their own station.

Our system was to have the message copied at the radio station and sent to the nearest telegraph office, which we tried to make close by. The message was then telegraphed to Army headquarters and there decoded from keys furnished from our headquarters. The Army radio men will not agree with that because they did considerable work solving new codes. When the men at the Army headquarters found out that they could not handle any message, it was telegraphed to General Headquarters, where we had men far enough from the front

so that the enemy activity did not worry them, and where they had a comfortable place in which to work. They worked out the more difficult messages and telegraphed the solutions to the Army headquarters. We had six men at each Army headquarters to handle the work there, and what they could not handle they turned over to us. We tried to turn over to them as much of the work as we could.

We found in the work that the hardest job was that of the Signal Corps man. He sat in a cold station and received groups of letters quite meaningless to him, put them on the wire, and got back a code message which he could not understand and did not know anything about, so that his work was more or less mechanical. By lectures to the men who handled this we tried to impress on them the importance of the work, even though they could not see it themselves. In one case a message copied about 9 o'clock at night was telegraphed in to our headquarters, decoded and then gotten back to the front. It was about a fairly important raid which was planned to take place at 1 o'clock that night. The news had been received by us and gotten back to the front in less than 4 hours. The division at the front which was most concerned had 30 minutes' notice. The Signal Corps man handling it did not know the importance of the message, he was simply obeying orders. The Signal Corps men certainly deserve credit for staying with the work and seeing it through. It took a kind of skill that is hard to develop and hard to find. That is one important item when looking for operators for radio intelligence work, to get operators to do the mechanical work of copying and sending messages. At the Army headquarters they maintained a 24-hour service in three reliefs, two men on each relief. The result was that those men were always busy and had to be familiar with all the different phases of the work. At our headquarters we had more men. We went up to about 60 men so that we had enough to let them specialize. We had certain men to do the decoding, others to handle the goniometric work. Each man had his own specialty. We divided codes and ciphers at our headquarters, that is we had one group of men on ciphers, and another on codes. Now some of you here are perhaps particularly interested in the kinds of codes that we used, but I believe that has already been pretty thoroughly taken up, and do not think it is necessary to go into that too deeply. When we went over there in the first place, we had studied Colonel Hitt's book on ciphers, and thought we were prepared to handle the whole thing from the beginning. We got there and found that the British code on which we had put a great deal of stress and considerable work had been discarded. A British officer told me that they had discovered that it took about 30 minutes to break the Playfair cipher and for that reason they had quit using it. Before very long we discovered that we did not know anything at all about the work. Our line of instruction had been all out of date. We also found out that ciphers were scarcely ever used. Codes were the big thing on the front, something that we had never taken up. The code the Germans used was a three-letter code. They had about 2,000 code groups, and assigned to them letters, words and certain phrases. They changed this code about once a month. We found an order at one time directing that the code be changed every 4 weeks unless there was reason to believe that the enemy had the key. If a code book were lost, they immediately changed the code.

We found that at the end of the first week we were reading some of the routine messages. We found there were a number of stations that were sending regular reports at regular hours. When we got those reports, we could make a good guess as to what was in them. At the end of the second week we were reading many of the messages, and at the end of the third week we practically controlled the code. This really meant that we had for 1 week a real control of each code. The Germans had 14 different codes along the front so that there were always several in good working order. They changed their system just before the March offensive in 1918 by using a number code. You may be interested to know that that was our first real victory at American headquarters. We had close liaison with the British and French headquarters, and there was considerable competition to see who would do the work. The British and French, I must say, until the spring of 1918 were actually doing the work and we were taking advantage of it. In the latter part of February 1918 we got word from the British and French to put our best men on the new code because they thought that the change indicated something serious and that we must get busy. We happened to pick up a code message that called for a repeat of the last message in the old code. It did not take us long to hunt up the message sent from the receiving station about 20 minutes earlier, and we found another from the same station about 20 minutes later. We put the two together and read the message right off. We could read the old code, and it happened that there were two words each of which appeared twice in the message, and they fitted exactly, so we were sure we were right. That gave us an excellent start on the new code. We sent this to French headquarters by wire, but we did not have a special code for use with the British, so sent an aeroplane to take it to British headquarters. This was so no one could by any chance find out we were getting into the new code. At French headquarters a Captain Painvin who was a wizard on that kind of thing worked out in 2 days the system on which the code was built, and the result was that by the time the March offensive started we knew almost as much about the code as the Germans did themselves. They, however, did not use it as much as we hoped, and at that particular time they had adopted a new scheme for deceiving us. On the whole front where the first attack was launched they apparently moved out all the stations. There was absolute stillness so far as radio work was concerned. There was great activity, however, on their other fronts. Large numbers of messages were sent, which we afterwards learned were only fake messages. It was all

false activity, and the Germans were rather successful in their first effort to fool somebody. They fooled the British without any doubt, and we were looking in the St. Mihiel salient for a big attack that didn't come. They had taken a good many troops away. They only left enough men to keep the radio stations working. In spite of that, however, we got valuable information, and after the fighting started, they used the same code, and we still got valuable information.

Shortly afterward the Germans adopted a system of using a different key on the number code for each division. In that way we could follow the divisions.

We picked up a message one night giving orders for a raid, but as the sending station was missed, we could not locate it, and therefore did not know where it came from. One of our men figured out that a certain division, which our battle order map showed was located in a certain place, had sent the message. We took a chance and advised the troops that the raid would take place. Fortunately for us, we guessed correctly and the raid did not take place. We had hit it right.

The Germans did use ciphers at bigger headquarters. They used a combination substitution and transposition cipher. This made a lot of trouble for a long time. Lieutenant Childs, who was on duty in my office and was the best cipher man, did work up a solution for a number of special cases. The different cases he worked out soon developed so that there was little doubt, but of our finding one or two messages to fulfill the special requirements to make the solution possible. Captain Painvin, at French headquarters developed new ideas in that cipher, but I can tell you now that if you ever wish to make trouble for the other fellow use a combination of transposition and substitution or double transposition. That was another cipher they used in the east, between Berlin and the commanders in the east, and we pretty nearly gave up on that. However, some fellow got in a hurry one day and sent a long message with a single transposition. Lieutenant Childs was on the job and got the single transposition, solved it, and decided just exactly what had happened. The fellow had gotten in a hurry and failed to make the second transposition. Childs tried it out on some old messages and by making the first transposition he solved practically every one of them. He solved others as they came in.

Another cipher that was used with considerable good to us was a substitution with a long key word. They had 30 key words used one after the other. For instance message number 1 used the first key word, and so on. Between Childs and the British they got all the key words so that the reading of these messages was a matter of just the length of time it took to rearrange the letters. We did not get anything of particular military value from those messages. They were from Berlin to agents in Northern Africa and Turkey, but they did keep us informed of the troubles they were having. We got some very interesting sidelights on the difficulties the German headquarters were having to keep their forces in line.

I think here I should bring up another point as to the necessity of keeping secret what you are doing. It works to a disadvantage for the men who are doing the job, because no one appreciates it. They must do their work and keep still. The first real message we got in our office was reported to General Nolan, who attached so much importance to it both on account of the message itself and the fact that we had really done something, that he took it to General Pershing, who must have told one of his friends. The next morning when I was going down the street, I was continually being stopped and asked all about it. A peremptory order was issued to all that code and cipher work must not be discussed. The Germans changed their code right afterwards. The work appeals to the popular imagination, and once getting started it wouldn't be downed. Everybody wants to hear about it. We tried several ways to make ourselves known so that people would appreciate us without making too much talk, but it didn't work. We finally decided that the only thing to do was to do our work and say nothing about it.

One thing we had to overcome in our own headquarters was the idea which those over us had that we were doing a lot of unnecessary work. What they wanted us to do was to pick out the important messages, decode them, and let the rest go. They understood that the greater part of these messages were valueless and so thought what was the use of bothering with them. It was a matter of considerable difficulty to make them see that we had to work them out and that the Germans did not tag their important messages before sending them. I think they got it, but you can look for that in the future; that is what they will expect of you; pick out the ones of value, work them out and let the rest go.

Taking up the question of what we got out of the enemy radio station location and grouping. We did not attach so much importance to this at first. Later we found it very important in handling the decoding work. Also in following divisions. For a time the Germans kept certain radio outfits with the divisions. They followed the divisions. Our men got familiar with them. They carried their call letters with them for a while, and we could follow the division by the call letters of the station. We would plot stations on large scale maps, and find out which ones were communicating with others, and before the Germans made an effort to try to fool us on that, we could show you which stations were at corps headquarters, division headquarters, regiments, and could divide the whole line into division, corps, and army areas. Divisions rarely communicated with anyone but division stations and corps headquarters. Regiments would only communicate with division headquarters. This divided the German front into divisions, corps, and regiments just as clearly as if the Germans had sent us a map. Later they got to changing the call letters frequently, and finally changed them every day. They

got to sending messages across army, corps, and division lines. They would send fake messages designed to confuse us as to army and division boundaries, and give us code words to work on which did not mean anything. It served the purpose for a time, but later we found out the way they were sending the messages across division and army lines, and we used the fake messages to check up on one another. When we found the messages which crossed the division boundaries were fake messages, they were discarded. When we found messages went within the division limits we assumed that they were real messages. They put out too many schemes and one checked against the other. They got to sending a great many meaningless groups to break the continuity of special groups. But our men got to working that out fairly well.

We had one thing to do in locating stations, however, after they got to changing the call letters every day, and that was to work out a scheme for locating the army boundaries. The battle order attached a great deal of importance to army boundaries, and messages got to going so thick across army boundaries that we could not break them up for a while, until we discovered that in each alternate army they duplicated the call letters. That is in the First Army they had a certain set of call letter, in the Second Army another set, in the Third Army they duplicated the set in the First Army. It did not take long to compare with the map and check up. In this way we discovered the formation of two new armies, when the Germans were planning a new drive. We discovered this by the fact that the call letters had been changed. We found duplicates where we didn't expect them. We decided that they had put in a new army. We took a chance on that and we were right. The French did most of the work along that line and helped us out.

We found that the Germans had adopted a scheme in assigning call letters, in assigning them for 10-day periods. They were given a list of call letters for 10 days, one to be used for each day. To save making the list too long they were gotten out in such a way that a number of stations used the call letter from right to left, others from left to right. It was not long until we so observed. We then began keeping a list of the call letters of a given station for the first 5 days of a 10-day period. If on the sixth day some other station used the call letter that had appeared on the fifth day, we knew the next four calls and could follow the station for 4 days. This was important to us as call letters would often mean much to us. They would show us where the stations were when the goniometric service failed to get a reading.

We worked on our goniometric service very closely with our code and cipher service, because they connected up so closely. The British were unfortunate in their original organization and they were quite separated. The cipher men would learn 2 days later about movements of enemy stations. We had the advantage of coming in late and could profit by the mistakes of the British. Reorganization in the British service was very difficult to make. We were put there and charged with building up an organization. We did not have anything to break down.

The next duty we had was the following of enemy aeroplanes in registering for artillery. The British had the best success with this and we copied after them. But owing to our troops being first on a quiet front where there was not much firing, and later on a very active front where the line was moving all the time, we didn't have as good success. The British had all the advantage for that kind of work in that heavy fighting was going on on their front and the line moved very little. They had enemy batteries well located by sound and flash ranging, and by photographs and other means.

When an aeroplane went up to observe fire, there was a regular line of procedure. The first thing they would do would be to signal to the station they were to communicate with and see if the radio worked well and this would give us two bits of information—the plane that was going up and the battery that was going to fire. They had a system for following these planes on a chart. When a plane went up, the fact that this was the case was marked down in one of the little square services provided, one for each day of the month for each plane. If the fellow who flew up saw an antiaircraft gun and went back, they filled in the square with yellow. If one went up and got results, they filled in the square with red. By this system of colors it was possible to identify the kind of plane. So that if it was the yellow fellow going up, we didn't bother, but if it was the red fellow we would go after him and get all we could.

The next thing, after the plane circled up there for a few minutes, would be to signal a target. Sometimes if we knew where the targets were, we could notify the troops that they were about to be shelled. If we didn't know the target, we made a record and found out later who was shelled with the idea that we would know the next time the same target was signaled. This worked all right so long as the same call letters were kept by the same stations, but when they were changed it was more difficult. We still got excellent results, however.

Another duty: When it was found out that the German battery was going to open fire, we notified our own heavy artillery, and it has happened we brought fire to bear on the battery that was going to fire on us and did it first. The British were very well organized and got quick action. Another thing they did was to put their ground observers on the job to see where enemy planes were and report the location, getting quicker action than they could from their own radio stations. Radio stations for locating aeroplanes were connected by wire but had difficulty in getting readings from each other where necessary.

The service of charting of aeroplanes, to my mind, is entirely for trench warfare. When we got into a situation where the troops are moving back and forth or in one direction as the Germans got to doing after July 1918, the batteries move too fast and targets are moving so that the service has very little value for mobile warfare.

This same service was used for following the zeppelins. For a time this was done with considerable profit. We could notify London or Paris that zeppelins would arrive at a certain time. After a time the Germans installed a system, as did the Allies, by which the zeppelin could locate itself from stations on the ground. Previous to that the zeppelin in flight would have to keep sending out the question, Where am I?—and the goniometric station on the ground would tell them. During this operation the Allies were always on the job and finding out where they were also. I saw some very interesting maps of the course of different planes across France and over England. They followed them and took regular readings. The Allies followed those planes in October 1917 when the L-45 came down in France. The zeppelins got lost and went wandering all over Europe looking for home, because the radio broke down. Only a couple of them got back. Their course, however, was being carefully plotted by the French, who had full information as to where they were going. As far as our own service was concerned, zeppelins had gone out of fashion, and we never made any effort to handle the zeppelin situation.

Our next activity was intercepting the telephone conversations of the enemy with listening sets. We had an amplifier on our telephone sets. We got much valuable information in that way. The Germans, however, I believe, put in generators at some places along the front to make a roaring in the ground and drown out the telephone calls. We made use of the German generators and put men on the job all the time to listen for the sound and when it stopped notify our telephone operators to stop talking.

The service was not particularly popular with the troops for quite a while. In particular, one division commander objected on the ground that he thought it was all foolishness. It happened that just a few days after registering his objections he called up a regimental commander giving the location of the regimental commander, the designation of the regiment, the location of the division headquarters, and what division it was. One of our men with the listening sets 8 miles away picked up the conversation. When this was shown to the commander in question, he decided that it was an instrument worth having.

Last is our control over our own radio communications and that was an important point that we overlooked at first. It was difficult to get those in authority to see the importance of it for a time. We installed several stations to copy the American messages and send them in to our headquarters to be turned over to a man who knew nothing about the battle order or plans. He solved our code, located the divisions, prepared the American battle order and notified the Assistant Chief of Staff that an attack was to take place. He missed the hour of attack by 24 hours. It was the mistake of the Signal Corps man who sent a message, he stating that the attack was to take place the next morning, when it wasn't to take place until the morning after. When we realized what our men had worked out from these messages, every one of which could be copied by the Germans, it gave an impetus to plans for the control of our own service.

The important thing is to educate troops of the line to use codes and ciphers, and codes in particular. We had the greatest difficulty with our troops in the front lines. They did not see the need of all the "foolish" instructions. One message I recall had been written out in full and then divided into groups of five letters. The man who sent it didn't have time to use the code and so devised this scheme as "just as good." The troops could not see the necessity for changing the code, for putting in the nulls that were prescribed, and for keeping words in clear out of code messages. We tried to tell them that we would rather they sent the whole message in clear than in a mixture of code and clear, because sending them in this way gave the Germans every possible assistance in the solution of our code.

Just about the time the necessity for controlling our own radio communication came up we got a report from the German radio people. They gave every division, French and American, over a wide front, and apologized for missing one or two divisions for a few days. That also had some effect on our plans for controlling our own service. We never got a real control because the armistice came along just about that time, just when we were getting to work.

That will be the real problem for the future, to make the men at the front realize the importance of handling codes carefully and observing "foolish" little details that the code man insists on. They cannot see the need of it and they do not want to do it. They will do anything they can to get out of it. My idea would be to hang a few of the offenders. This would not only get rid of some but would discourage the development of others. It would be a saving of lives to do it. It is a sacrifice of American lives to unnecessarily assist the enemy in the solution of our code.

*General Churchill's closing remarks*

We are very much indebted to Colonel Moorman for stimulating our instructive training, which, without boasting, I think we can call our Intelligence University course.

In addition to that particular phase of the work that his section handled, he has given us important things to think about which concerns not only intelligence as a whole but the General Staff work, and the Army as a

whole. As far as intelligence work in concerned, he has told us why he had to generally preach the intelligence gospel, one chapter at least a day, and how he had to work against ignorance and to a certain extent preach and train. We know, all of us, that anyone who has ever had anything to do with intelligence has had to preach that same gospel, and I want to impress this strongly, that simply because the war is over, we cannot stop preaching that gospel. Everyone that knows anything about intelligence has to keep preaching that national doctrine, so that when we begin the next war, we won't begin it like the last.

The remarks made by Colonel Moorman referring to each one not understanding what the other was doing are well deserved criticisms. We often held that the Atlantic Ocean was the greatest obstacle to military progress, but when we thought that we simply thought of the ships and submarines. But it was a greater mental and physical obstacle. I am perhaps particularly well qualified to criticize people who had a lack of understanding because I was in France nearly 3 years, and when I came home, I knew very little of what was going on in America. We all thought of America sentimentally, but our minds were all turned the other way.

In M. I. D. there was gotten out a weekly report of the activities of M. I. D. This was a confidential document and was sent to G-2 of the A. E. F. In it was given the particular work that Major Yardley was doing, which linked itself with the work that Colonel Moorman was doing in France, and all phases of the work of M. I. D. were touched on this report. Now I believe that if that weekly summary of the work and activities of M. I. D. had been read by everybody in G-2, the Atlantic Ocean would have been partially bridged, but they were too busy to read it.

There is a tendency in the American Army not to read official documents, which is a very serious tendency. I think there are documents from the War Department and the General Staff that pass over many desks and are never read. I know, too, there are officers in the General Staff today who have never read G. O. 80 and yet that is the order on which the General Staff was organized. I think that everybody should try to turn over a new leaf and read the official documents that are sent to them. I know there is a perfect barrage of printed and mimeographed material and it seems almost impossible to read it all, but in a small division like M. I. D., it seems that it could be made possible, by a division of labor, to read and digest the printed and written material that comes in, so that every branch knows the information that is passed about in writing. But no matter how carefully you may read what is sent you, the full story cannot be told without personal contact. That is something that we did not get started in time between G-2 and M. I. D. I think, however, we can be very proud of our contribution both in numbers and quality. We sent Colonel Van Deman, Colonel Mason, Colonel Miles, Colonel Cox, and Major Smiley from the Negative Branch, and toward the end we had a system whereby in each section and branch they knew that periodically certain men would be sent over to carry the gospel from M. I. D. It gave the incentive to the men in M. I. D. that they might go to France. General Nolan regretted the fact that he could not send the men back this way as quickly. Everyone knows how important it was when Colonel Dengler came back, and started to put the instruction in personnel on its feet. I regret extremely that circumstances prevented General Nolan sending more men back who could bring the A. E. F. gospel this way.

There was one reason why we were late in getting our system across the ocean. Up until August we were a branch of a division. At first thought, you would not realize that that was an obstacle, as there was only one superior between us and the Chief of Staff. If we only had one superior interested in what we were doing, it would have been different, but he was running a division made up of unrelated branches, which was unfortunate. The Chief of the Division could not know and would not know anything about what we were doing. His desk was simply swamped with an amount of detail, so that when M. I. D. papers came up to him, they were like Greek to him, and he was so busy, that it was hard to get to him to explain things, and the idea of sending someone to G-2, looked to him as though somebody wanted to go to France when he was needed here.

Now just as soon as General March reorganized the General Staff and put M. I. D. where it belonged, at the same place where General Pershing put his Intelligence at the beginning, we could then direct the Adjutant General to send our men to France and we didn't have to consult anybody. In matters of approved policy we had the right then to carry out the details. The only policy laid down to me was to develop the Intelligence Service and help out General Nolan. If I thought it was a good thing to send Major Yardley to France to get hooked up with the Intelligence people there, I could send him.

If you ever have a staff to establish, you will have to get people to carry out policies they are supposed to execute.

## Appendix 24.—EXTRACT FROM THE ANNUAL REPORT OF THE CHIEF SIGNAL OFFICER (1919)

CHAPTER XXXIII  
CODE COMPILATION SERVICE

The Code Compilation Section was organized in January 1918, and consisted of a captain, three lieutenants, and one enlisted man.

The first work entrusted to it was the compilation of a code book for use in the front-line trenches and the zone of the advance. A book called the Trench Code was compiled and printed. One thousand copies, with distortion tables, were issued and turned over to the General Staff for distribution.

See p. 132

The danger of capture was at once realized, and these books were not issued beyond battalions.

To meet the needs of the front line, a much smaller book was prepared and printed, known as the Front Line Code. Three thousand copies of this book were issued, with 30 different tables of distortion, so that the key might frequently be changed.

The need for a large code to meet the requirements of an expeditionary force was soon felt, and the section was put to work upon the preparation of a code for the transmission of messages between the various staff organizations in the field and at the various headquarters. This was a task of considerable magnitude and required several months' study of telegrams, confidential papers of organization, replacement, operations, and of military documents generally.

In May 1918, the Staff Code was sent to press and was completed 1 month later. This code book contained approximately 30,000 words and phrases and was primarily intended for field work.

It contained, among other things, the names of several thousand French towns and villages, and a complete list of the Army organization up to May 1918.

It is believed that this is the largest and most comprehensive code book ever printed by an army in the field. It contained both number and letter group equivalents. More than 50,000 telegraphic combinations were sent over the instrument in order by selection to reduce to a minimum the chances of error in transmission over the telegraph lines. One thousand copies of this code were printed and bound.

With this Staff Code five different tables of distortion were provided for the five divisions of the General Staff as a further protection to the secrecy of the code. These code books remained in the possession of the section and were issued from time to time upon the direction of the adjutant general.

A short three-letter group code was prepared in June for use in certain telegraph offices in order to conceal troop movements.

A more complete code of some 1,300 words and phrases was issued in July to replace the former edition.

The first trench codes in service were found to be too limited in scope and too easily decoded by the enemy to be satisfactory and a revised edition was put out in June. This book, known as the Potomac Code, the first of the so-called River Series, appeared on June 24, and 2,000 copies were issued. It contained approximately 1,700 words and phrases and was made up with a coding and decoding section in order to reduce the work of the code operators at the front.

The main point of difference from other Army codes lay in the principle of reprinting these books at frequent intervals and depending largely upon the rapidity of the reissuance for the secrecy of the codes. This method did away with the double work at the front of ciphering and enciphering, and put the burden of work upon general headquarters, where it properly belonged. Under this system one issue of codes would be distributed down to regiments; another issue held at Army headquarters; and a third issue held at general headquarters. As a matter of record this first book, the Potomac, was captured by the enemy on July 20, just 1 month after issuance, but within 2 days it had been replaced throughout the entire Army in the field.

After this followed the Suwanee, Wabash, Allegheny, and Hudson Codes, all for the First Army and isolated units. In October a departure in plan was made and different codes were issued simultaneously to the First and Second Armies. This was done in order not to jeopardize unnecessarily the life of the codes by putting in the field at one time between 5,000 and 6,000 copies of any one issue.

Thus the Champlain, the first of what was known as the Lake Series, was issued with the Colorado of the River Series, followed by the Huron and the Osage and the Seneca and the Niagara, in editions of 2,500 each.

A short code of two-letter combinations was prepared in September to meet a measure of the needs of the front line. Six thousand copies of this emergency code list were printed and distributed down to companies. It contained some 50 commonly used emergency phrases, principally for communication from front to rear by officers who had no other code. These lists were also printed in the front of each Trench Code. Six different editions of this code were printed and distributed.

In March an addenda sheet for the War Department Code was compiled, embracing a list of transports, French cities and towns, and a number of words which had been omitted from the old code. One thousand copies of this supplement were issued.

A short code list for reporting casualties was prepared in May and printed. This list was printed in a general order.

A Telephone Code was compiled in March disguising the names of organizations and commanding officers, to be used primarily for communication by telephone. This code was reprinted with a decoding section in October. Five hundred copies were issued.

A series of distortion tables for the Staff Code were prepared and printed in July. This work was done at the Engineer Press in Langres.

A code was prepared in October, to be used as a service code by radio stations to replace the French code used up to that time by the American armies. Two thousand copies of this code were printed. The entire work of compilation and printing of this code was completed in 6 days.

In addition to the regular routine work of the office, the section at different times superintended the printing of certain confidential documents for other organizations.

During all the work of printing, which was done at The Adjutant General's office printing plant, the officers of this section were on constant duty night and day. So close was the surveillance that at all times the officers were prepared to certify that no copy had been lost or stolen during the process of composition or printing.

In the 10 months of active operation, the Code Compilation Section completed and printed more than 80,000 code books and pamphlets, all numbered, recorded, issued, and receipted for when issued. The record is complete and not a single copy is missing from the records.

Two lieutenants were transferred from this Section to take charge of the message centers of the First and Second Armies. The personnel at the close of work consisted of a captain, one first lieutenant, two second lieutenants, two noncommissioned officers, and one enlisted man.

The Special Service Division was the last division of the office of the chief signal officer, American Expeditionary Forces, to be formed. It was established on November 11, 1918, to handle all matters concerning the meteorological, pigeon, code and cipher, and visual signaling services except insofar as any of these matters had been definitely assigned to other divisions of the office of the chief signal officer.

The first officer in charge of the new division was Maj. (now Lt. Col.) Henry G. Gale, previously officer in charge of the Meteorological Section, which was at that time the principal unit absorbed in the Special Service Division. From November 27 this Division also represented the Photographic Division at headquarters, Services of Supply.

Owing to the fact that this Division operated only after the armistice, its activities were not of a constructive nature, but consisted rather in cutting down the personnel and equipment of the various sections as required by their gradually decreasing volume of business.

On February 1, 1919, the Research Division (formerly Research and Inspection Division) was disbanded and its remaining activities turned over to the Special Service Division. On February 12 the Radio Division was turned over, and its former officer in charge, Lt. Col. L. R. Krumm, became officer in charge, relieving Major Gale. On February 23, the Photographic Service was absorbed by the Special Services Division and Lt. Col. Karl Truesdell became officer in charge.

During the period between the signing of the armistice and the preliminaries of peace, the Special Service Division continued to administer these various branches of Signal Corps technical work.

## Appendix 25.—Notes by J. Rives Childs after reading draft of this paper

The following notes were made by J. Rives Childs, formerly First Lieutenant, United States Army Reserve, after reading a draft of this paper:

*Page 5, line 3.*—A message in the Playfair Cipher exchanged between units of the American Army in France came over my desk at GHQ AEF in 1917. I took it in to Colonel Moorman and requested his permission to decipher it in order to illustrate its ineffectuality. Colonel Moorman demurred; I concluded he feared to disturb the brass hats. I agree that it was probably little used.

*Page 11, line 26.*—One day in May, 1918, Colonel Moorman called for me and introduced me to Col. Parker Hitt in his office. I was told they wanted me to test the system of encipherment used in connection with the Army Field Code. I was given a copy of the code and a set of messages set up expressly for the test. I was given a clerk and told to go to work and devote myself exclusively to the test. I did so and the report Colonel Friedman has correctly identified was the result. I was never informed of the use to which my report was put.

*Page 11, line 40.*—See above.

*Page 12, line 14.*—See above.

*Page 12, line 21.*—This is correct. See above.

*Page 12, line 25.*—This time I was in possession of the code book, but, as far as I can now recall, I did not have any prior knowledge of the American method of encipherment. That was my job: To learn how quickly that could be discovered.

*Page 12, line 46.*—See above.

*Page 14, line 24.*—I do not believe these relations were as close as they might or should have been. After making the report I did, I never had any further contact with Major Barnes' work. In view of the work we were doing in Major Moorman's section, the breaking down of enemy codes and ciphers, I consider it would have been highly helpful to the work of Major Barnes' section if he had been in constant touch with all the personnel of G-2 A6.

*Page 17, line 22.*—Upon a review of my correspondence with W. F. F., I consider the point made by him well taken, i. e., that the fact that I knew nothing of the cooperation between Moorman and Barnes does not prove there was no such cooperation. The evidence he offers establishes that there was greater cooperation than I even suspected. I still hold to the opinion, however, that this cooperation, to have been most effective, should have extended down to the personnel of the two sections.

*Page 26, line 14.*—This is correct.

*Page 28, line 12.*—It is clear to me from Colonel Friedman's study that my sweeping conclusion \* \* \* of the lack of liaison between Major Barnes and Colonel Moorman and with others was unwarranted.