

This is the outline followed by Col. Bisher in his series of 3 lectures in Autumn 1946, Washington, before a group of officers who were selected to become instructors at Command & Gen Staff College. The outline follows the text prepared by me & also in this folder.

Lecture Strategic Intelligence School
Command and Staff College

Signal Intelligence and Communication Security

1 Introduction

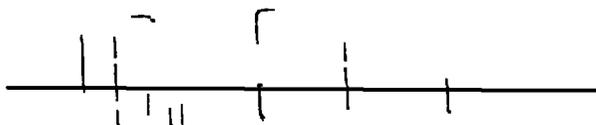
Gentlemen at this point in your course of instruction you are studying sources of information and how this information is processed. One source with which some of you are perhaps familiar is that information derived from tapping the enemy's communications channels. This source is labeled signal intelligence. Closely allied with the activities associated with the collection of signal intelligence is the countermeasure of signal intelligence or as it is called communication security. The latter embraces all activities designed to deny to the enemy that intelligence which he might gain from our own communications. These two subjects *namely, signal intelligence and communication security* are so closely related that we cannot talk about one without including the other.

Before we discuss the technical details of signal intelligence and communication security operations let us examine first the history of these activities in our army *then talk* and a little about the successes which have been attained to establish these two functions among the most important of our intelligence system.

This course is labelled Signal Intelligence and Communication Security I don't think it necessary to go far back into their history but it's necessary to define what we're going to talk about

Signal intelligence is the product obtained from interception and analysis of traffic passed by the various means of communication and from the detection of secret inks micro photographs and open codes Communication security embraces all measures designed to deny to unauthorized persons such information of military value as might be derived from our communications

Some people call signal intelligence and communication security Siamese twins because they are so closely attached and related to each other that you can hardly speak of one without bringing the other into the picture It would be a pretty good analogy to say that they are the obverse and reverse sides or the heads and tails of the same coin piece They employ arts or sciences which have been known and practiced from the very earliest days of writing but it was not until World War I that the Army was greatly concerned with them for until then signal intelligence and communication security activities were not very extensive or on an important scale Largely as a result of the invention of radio and of its rapid and extensive introduction into military operations it became necessary for the Army to give a great deal more attention to signal intelligence and communication security activities



To recapitulate briefly the story of Signal Intelligence and Communication Security has been one of gradual consolidation of what were once regarded or at least practiced as independent arts. The phenomenal growth of electrical communications coupled with the relatively easy opportunities for interception which characterize them have led to widespread developments in the fields of Signal Intelligence and Communication Security. Today the cryptographic systems of World War I are regarded as primitive as bows and arrows and the volume and importance of intelligence derived from communications has increased a hundred fold. The future holds still greater promise for two reasons.

First the coordination between signal intelligence and communication security is being further improved day by day. The strides which have been made in both fields are closely interrelated. The constant and immediate exchange of information between the specialist who studies the enemy's communications and the one who devises the means by which the security of our own communications is maintained on a high level is absolutely essential. Thereby the analyst is warned of possible new security techniques which may in fact already be in use by the enemy. The findings of the analyst in turn contribute to improvements in security by exposing weaknesses in current security means and practices or by narrowing the breach between what we know the analyst can do and the estimated security of our own systems. Thus

progress is stimulated systems and techniques evolve and gradually the full capabilities inherent in them unfold

Secondly the closest possible coordination in the application of security measures and in the collection and processing of signal intelligence has been recognized. Until recently the United States Army had regarded these functions as being of primary interest to the local commander. Since Civil War days the War Department has made it its business to provide technically sound cryptographic aids and to prescribe sound transmission practices in order to eliminate the most dangerous pitfalls but the application of these security measures remained a local matter throughout the Army. As long as warfare remained fairly immobile the repercussions stemming from poor security practices and discipline were usually localized the offender himself paying the price for his indiscretions but as developments were made in transportation and communications warfare became increasingly fluid until today using the advanced techniques of signal intelligence it is possible to ferret out every broken thread in the enemy's mantle of security to gain an insight into his most secret preparations and to cripple him before he has a chance to strike or prepare an adequate defense.

In intelligence the stream of intercepted communications which feed the analysts must be as complete as possible. There must be no duplication of effort and the energy which

is expended must be directed to that end which best serves the whole military establishment It has been stated on the highest authority that both the European campaign and operations in the Pacific were closely related in conception and timing to the intelligence derived from the analysis of enemy communications Even so the service which was rendered by signal intelligence during the late war was far less than it might have been

While the feeling was growing in G-2 that signal intelligence was the most important source of information gaps in the picture which was being reconstructed by means of it, emphasized the urgent necessity for the closest possible coordination in interception and processing This objective was not possible under the existing organization

At the beginning of World War II the overall responsibilities for signal intelligence and communication security were vested in the Signal Intelligence Service (later Signal Security Agency and finally Army Security Agency) To meet their immediate needs however various commands had organized signal intelligence and communication security units and restricted their employment for the most part to direct support of the missions of the Commander to whom they were assigned The inevitable result was an irretrievable loss of much valuable intelligence through uncoordinated direction and numerous disparities in communication security practices which were quickly capitalized on by alert enemies

Signal Security Agency being a part of Army Service Forces could not exercise operational or technical control over such organizations Neither were there common standards of training operating practices or discipline Thus it was possible for one organization to accomplish apparent miracles while another did well to earn its daily bread

Perhaps one of the most obvious findings of World War II was that there is no line of demarkation that can be drawn between tactical and strategic signal intelligence This is due to three main factors First, the inherent security of cryptographic systems employed on various levels of command do not always follow a scale of increasing security Thus on a low level systems may be used which are complicated out of all proportion to the nature of the traffic which they cover Second, the so called high echelon systems which carry strategic intelligence frequently overlap into the province of intercept agencies which have as their primary mission the collection and processing of intelligence which is of immediate tactical value to the command it serves In such circumstances this traffic must either be disregarded or if intercepted be passed up the chain of command to an agency which is capable of exploiting it to some advantage Third, the actual processing of raw intelligence even of low level systems is frequently so complicated as to be beyond the capabilities of the field units This later factor

more than any other has made necessary a globe circling network of radio and wire links which are or have been exclusively devoted to funneling a prodigious volume of raw intercept material to large intelligence establishments in rear areas or to Army Security Agency itself for processing. During the War it was a normal occurrence for a message to be intercepted by a front line unit transmitted halfway around the world solved translated and returned to the proper field commander in time for action the whole circuit being completed within a matter of hours.

On the security side of the picture monitoring activities to check on correct cryptographic and transmission security practices were never as extensive as they might have been. The old time reliance on net control stations to keep their subsidiary stations in line and to enforce a high caliber of operating discipline proved to be almost entirely unreliable. The same could be said for the systems which had been instituted to bring to light the full extent of cryptographic security violations by means of reports of violations voluntarily filed by receiving or originating headquarters. These infractions though mainly small are present in such numbers where green or poorly trained cryptographic personnel are involved that the hardest cryptographic systems may be placed in serious jeopardy or suffer outright compromises. Consequently various security monitoring organizations were formed. On the whole they did a fine job of

riding herd on the networks which they were assigned to watch. In most cases, however, their efforts were largely spent in staff information monitoring to the detriment of their security responsibilities. Moreover, virtually none of their findings ever reached Signal Security Agency for study. To this day, no accurate estimate can be made of the total security of our communications during the late war.

A careful consideration of the foregoing factors led to the assumption of operational control of Signal Security Agency by the Assistant Chief of Staff, G-2, War Department General Staff, in December 1944. For a time, the Agency remained under the Chief Signal Officer for administration. Although this arrangement was an improvement in some respects, the dual controls under which the Agency functioned proved unsatisfactory. Finally, on 6 September 1945, a directive was issued establishing the Army Security Agency. The Agency was composed of all signal intelligence and communication security establishments, units, and personnel of the Army.

Before we continue in the discussion of how the Army Security Agency is organized and how it functions, let us review some of the results which took place during World War II to establish the importance of these activities.

bulldog perseverance and brilliant research never gave the machine the code name "Magic"

It was the British who first used the word "Magic" as a sort of covername for the product or fruit of certain highly specialized operations which we now call signal intelligence or communication intelligence. Then when the U S Army first began putting out the highly secret document in which these end results were disseminated to an extremely limited number of people the document itself was given the covername Magic Summary. No doubt the name "Magic" thus came to be used by certain V I P. s who had access to that document.

Now if any of you ever looked at a handbook for magicians you'll remember that the information concerning each trick is divided into two sections. First there comes a section labelled The Effect in which is described what the audience sees and the illusion by which the audience is mystified. This is followed by a section labelled The Method in which is explained how The Effect or illusion is produced in other words the secret or the know how of the trick is disclosed. The examples cited by General Marshall are equivalent to The Effect in the glossary of the magician but the letter to Mr Dewey only refers in very general terms to The Method or know how that is how The Effect is produced.