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CORG-M-217

THE EVOLUTION OF MILITARY UNIT CONTROL

500BC · 1965AD

By

Virgil Ney

10 September 1965

Prepared by
COMBAT OPERATIONS RESEARCH GROUP
TECHNICAL OPERATIONS, INCORPORATED
under
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HEADQUARTERS
UNITED STATES ARMY COMBAT DEVELOPMENTS COMMAND

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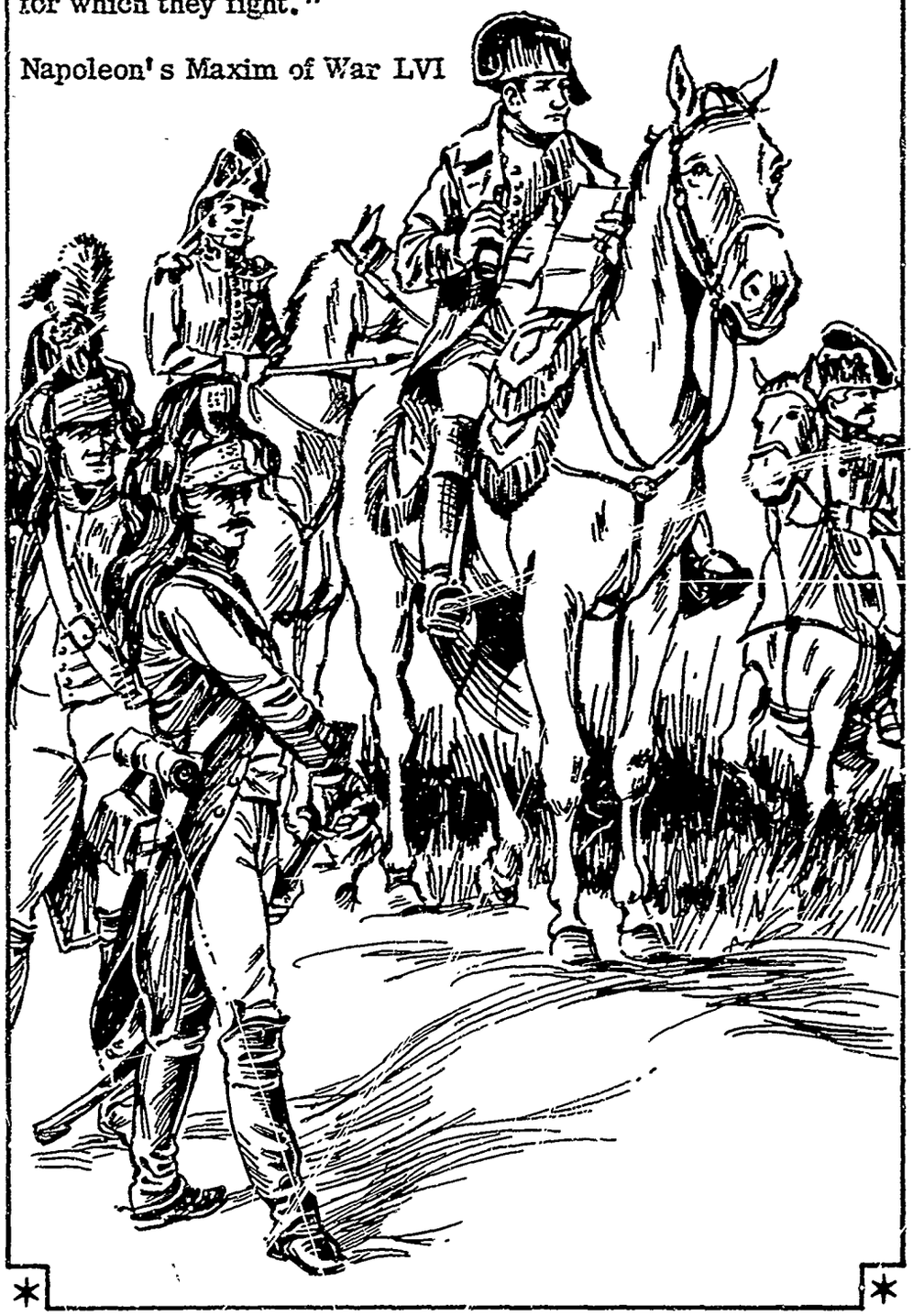
"A good general, a well-organized system, good instructions, and severe discipline, aided by effective establishments, will always make good troops, independently of the cause for which they fight."

Napoleon's Maxim of War LVI



ABSTRACT

Unit control has evolved over a period of several thousand years. The control of military units is based upon the organizational formation for combat and upon the weaponry then currently in common usage. Leadership at all levels and a system of battlefield communication are essential elements for the establishment and maintenance of unit control. Historically, the evolution of unit control falls into two distinct periods: The Ancient and Modern.

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SUMMARY

This study covers generally the subject of the evolution of unit control from ancient times to the present era. Considerable attention is given to the concept of military organization and discipline as the basis for unit control. From the most ancient times, the form, the leadership, and the means of communication available of any military organization have exerted great influence upon its control in garrison, in the field,and in combat. The weaponry in use at the time dictated, to a significant extent, the type of formation adopted.

Mention is made of early military formations such as the Greek phalanx and the Roman legion. For their period of history these organizations were militarily proven units for administrative and combat purposes. Their influence upon the art of war has been profound. Innumerable military methods and procedures in use today trace their origins to these ancient combat units.

Part I, The Ancients: Military Organization, Discipline, and Unit Control covers the historical development of the control of military units from ancient times to the period of Frederick the Great. The development of combat communications and the use of pre-arranged signals and signs for control purposes is covered in detail. The relationship of weaponry to unit control is acknowledged.

Part II, The Moderns: Military Organization, Discipline, and Unit Control covers the historical development of military unit control from the eighteenth century to the present time. The Frederichian and Napoleonic contributions to the art of control in war especially in the development of the staff concept is noted. The emergence of communications and their employment as means of unit controls in warfare is covered. During the American Civil War employment of the electric telegraph is shown as a major breakthrough in military communication.

World Wars I and II are treated historically to show the effects of modern methods of electronic communication and gasoline-powered transportation upon unit control. The use of land telegraph, wireless telegraph,and voice radio is shown to be significant in its ability to control troops at great distances away from headquarters. The employment of the airplane for purposes of unit control is indicated as highly important to modern combat operations. The use of electronic devices such as television as a means of unit control in combat is discussed.

The Korean conflict and the post-Korean conflict period are included to show the basic and continuous influence of organization, leadership, and communication upon unit control in modern times.

The bibliography lists books, articles, reports, official and semi-official publications, and relevant materials used in the research for and preparation of the study.

INTRODUCTION

The basic form of control of military units is to be found in the organizational format currently in use at any given period of history. The mass unit fought with muscle power rather than with controlled explosive or incendiary forces such as gun powder or Greek fire. In the Macedonian and Greek phalanx, unit control in battle was based upon the shoulder-to-shoulder solidarity of the formation. Leadership was exercised on a face-to-face basis with the general or the king often personally and directly joining in the melee.

The shape, size, and composition of any military formation rests upon three fundamental concepts, a line, a column, or a square. The purpose of a military formation is two-fold (1) control and discipline and (2) functional operation in combat. While all of the above formations have been utilized throughout the history of warfare, none is satisfactory for all purposes. The line which is the most elementary formation for control purposes lacks depth and mobility. The column with its narrow front and vulnerable flanks is especially weak with reference to receiving and turning an enemy attack. The square, while it does afford a four-front formation possesses little or no mobility. The 360-degree perimeter defense, similarly to the square formation, is employed generally as a hard-pressed defensive measure.

Within the military formation, regardless of its period of history, authority and responsibility are defined by a system of grades and ranks. Deriving their basic authority from the tribal chieftain, king, or emperor, or president, these offices are merely extensions of the sovereign ruler's will, and as such, were essential to unit control. The officer and non-commissioned officer, even in their earliest primitive forms, are primary to unit control. Command, as the most significant facet of the art of military leadership, is the essential requirement for the control of a unit. Without basic authority, there can be no command function. Without command, unit control is not attainable nor can it be sustained.

The span of control of the responsible commander means simply the number of principal subordinates he must direct in order for his unit to be functional in garrison or on the battlefield. From the human point of view, it has been shown that the span of control is limited by the individual's ability and physical and mental conditions. The professional quality of the subordinates within the span of control has salient effect upon the leadership ability of the responsible commander. Historically, the military profession has sought to reduce the number of individuals within the span of control by constant reorganization of unit formations and individual functions.

The size of a military unit governs, to a considerable extent, the means and methods of control established and used in garrison or in combat. In camp, one of the basic controls was created by the sleeping and eating arrangements within the unit. In the Roman legion, the group of ten men, under the Decanus, became a primitive infantry squad in combat. At that early date, combat experience had proven that there was a limit to the

number of soldiers that could be controlled by one leader in battle. In essence, the leader of ten men, or even of one hundred, could control his unit as long as he could see its members and they could see and hear him. In the tumult of battle there arose the need for smaller units complete with leaders to continue fighting after direct contact with the leader of the larger unit was lost and he could no longer exercise personal control and leadership. The maniple of the Roman legion provided this continuity as an integral part of the larger unit—the century.

The order of battle, as conceived by the ancients and developed by subsequent generations of soldiers is, next to command, perhaps, the most important method of unit control under combat conditions. Pre-planned unit size, position, spacing and intervals between units were essential and vital factors in the organization of the battle array. The attempt to maintain these conditions during the conduct of the battle was an absolute requirement for the achievement of any degree of unit control.

The assignment of frontages, zones, and phase lines has been used from ancient times to the present to assure broad unit control on the battlefield. Originally, the width of the unit, when in order of battle, determined the frontage and the width of the zone of advance. The use of natural objects, such as rivers and mountain ranges, as unit boundaries is not new to the military art. In modern times, especially during the twentieth century global conflicts, geographical theaters of war have been designated as a means of higher unit control. The water within and the air and space above these areas must be considered as contiguous thereto.

The concept of a staff as a means of unit control may be traced to the earliest periods of history. Sun Tzu in 500 B.C. makes mention of the staff of the commander. Frederick, the Great, in the modern era developed the general staff and issued instructions to his generals. Napoleon Bonaparte assured better control by employing one of his marshals as his Chief of Staff. The proper utilization of the staff as a composite intellect for the commander's use assured increased unit control at high and low echelons of command.

Communication has played a most vital part in the evolution of unit control throughout military history. From the most elementary person-to-person type to systematic, that is, signals, sounds, smoke, and lights, the ability to communicate has assured a basis of unit control. In the modern world, instantaneous, electronic transmission of orders and instructions has strengthened unit control at all levels of military organization.

For the obvious reasons of the limitations of time and space factors in a study of this type, it was not possible to encompass all of the great captains and campaigns of the past. Those included are, in the professional judgment of the author, most pertinent as historical examples of organization, leadership, and communication. Further, it is believed that the case studies selected have the most direct applicability to unit control as it evolved and is maintained in the United States Army.

THE EVOLUTION OF MILITARY UNIT CONTROL

500BC · 1965AD

PART I

THE ANCIENTS: MILITARY ORGANIZATION, DISCIPLINE, AND UNIT CONTROL

> Sun Tzu said: "The control of a large force is the same in principle as the control of a few men. It is merely a question of dividing up their numbers. Fighting with a large army under your command is nowise different from fighting with a small one. It is merely a question of instituting signs and signals." (Ref. 1, p. 55)

Sun Tzu, the famous Chinese military scholar in the art of war in his dialogue with Chang Yu, circa 500 B.C., brought out the following principles concerning the management of an army. His basic thesis that management of many is the same as the management of a few is sound when one considers his emphasis upon proper military organization. His discourse upon the assignment of responsibilities to the generals and their assistants and the establishment of the strength of units established a military command system. The first consideration according to Sun Tzu was the assignment of the responsibilities of the generals and the establishment of unit strength. In order to do this, he defined the composition of his military forces. In furtherance of his plan, he specified that each individual and unit in his army would be subordinate to a superior. With each superior being properly trained, command of a large host would be as simple as the command of a few. (Ref. 2, pp. 90-91)

The subordination and discipline of the military structure, as cited by Chang Yu, then became the fundamental means of military control which eventually became unit control in combat. The Chinese were quick to recognize the problem of unit control on the battle field and devised effective means to that end. Among these methods of unit control was the employment of a system of signals made by drums and bells. In addition, flags and banners were prescribed as means of controlling the movements of the

CHINESE ARCHERS - 500 B.C.
(Source: Mitchell)

troops. Chang Yu noted the " . . . to control many is the same as to control a few. This is a matter of formations and signals." (Ref. 2, p. 30, emphasis added)

The necessity for a legal and authoritative basis for all orders and regulations upon which unit control will depend is clearly shown by writings of the Chinese military intellectuals and philosophers. The factor of reward and punishment is noted as contributory to the attitude of the troops in the matter of obedience. An additional factor, that of the clarity of laws promulgated and orders issued, is essential to unit control Unless troops can readily comprehend the orders received their compliance or non-compliance will be in direct proportion to the orders' clarity, or lack of it. Today, this pertinent observation of over two thousand years ago is still fundamentally sound in its application to a rifle squad or a field army. (Ref. 2, p. 159)

The system of signals used for unit control by the Chinese is explained in some detail in the writings of Sun Tzu. Of considerable interest is his early recognition of the value of thorough training of combat as a means toward unit control. The following extract points up this fact:

> Wu Ch'i said: "The regulations for combat training are that the short men carry lances and halberds, and the tall men bows and cross bows. The strong carry the banners and flags; the valiant the bells and drums; the weak are servants and prepare food. The wise lay plans.
>
> "Put men from the same villages together and the sections of ten and squads of five will mutually protect one another.
>
> "At the one beat of the drum all put their weapons in order. At two beats they practice formations. At three beats they go speedily to meals. At four they prepare for action. At five they march off. When they have heard the drums and listened to the orders, the banners are unfurled.
>
> "Marquis Wu asked, 'Are there methods for controlling the army in the advance and at halts?'

"Wu Ch'i replied, 'Over the left wing flies the banner of the Green Dragon; over the right, that of the White Tiger; over the van that of the Red Bird, and over the rear the banner of the Black Tortoise. Over the commander flies the banner of the Great Bear. Under it his staff is assembled."
(Ref. 2, p. 160)

The employment of flags of different colors and symbolic design to indicate the location of the various commanders and their units indicated a high degree of understanding of organization and control by the Chinese. The mention of the command post of the commander and of a staff illustrates a very early use of a staff as a means of unit control. The use of flags of various designs and colors for purposes of unit identification has been a standard practice in the United States Army since its beginning. As late as World War II, Division, Corps, and Armies were designated by special flags. Whistles were provided for officers -- one type for field grade and one type for company grade. Each with its distinctive tone assisted unit control above battle noises by announcing the rank of the user making a specific signal by whistle. It will be recalled that the Chinese Communist troops in Korea relied heavily upon bells, drums, bugles, and flags for combat control. Many Western troops believed that the use of these devices were for psychological purposes but in the tradition of Sun Tzu they are seen to be means of unit control and identification.

Lionel Giles in his translation of The Art of War by Sun Tzu mentions The Book of Army Management and refers to it in explanation of the reason for the military institution of the bells and gongs. Their employment as devices to ensure some degree of unit control in combat is clearly shown as identified with early Chinese military procedures. In connection with the control exercised on the field of battle, the Chinese military philosopher recognized the limitation placed upon person-to-person communication by the tumult and noise of combat. Wisely, he noted that the visual contact required for communication was often obscured by conditions inherent in the nature of hand-to-hand and mass combat tactics. On the battlefield the Chinese found that the spoken word was ineffective in the transmittal of commands. To overcome the noise and confusion of combat, gongs and drums were introduced. Banners and flags were used to attract the eyes of the unit upon a particular point. In night fighting, there was much use of signal fires and drums. In daylight, units were controlled by means of the flags and banners mentioned earlier. (Ref. 1, pp. 66-67)

The Chinese army like the Homeric Greek army based its organizational formations around the war chariot. While essentially a combat vehicle, the chariot was also, in a sense, a personnel carrier. It served as the base for the Chinese infantry organization with each light chariot accompanied by 75 infantrymen and each heavy chariot accompanied by 25 infantrymen. Generally, the battalion consisted of two chariots and 100 infantrymen. In the Chinese army of this period there were about one thousand of these 100 men, 2 chariot units. While Giles shows this unit to be a battalion, in modern terminology it would seem to be a company.

Unit control as developed by Sun Tzu was centered around organization, subordination, and communication. Of these three qualities, communication, or the art of transmitting orders seems to have been the most important one to the Chinese. Sun Tzu through his writings emphasized the need for the general's orders to be understood by those who were to execute them.

In the Chinese army of 500 B.C., the formation itself did not seem to have the importance in unit control as did the phalanx of the Greeks or the legion of the Romans. The reason for this situation may be found in the nature of the terrain of China and the type of wars fought during this period. From the very beginning of his generalship, Sun Tzu insisted upon absolute obedience to the word of command as a prerequisite to unit control. With this quality obtained through training and drill, subordination to higher authority was assured. In this sense, Sun Tzu established a primary base for unit control which has survived to the present time.

THE MONGOLS

Temuchin, the great Mongol military genious, was born in 1162 A.D. the son of a Mongolian tribal chieftain who had gained control over a collection of Mongolian tribes. Succeeding his father at the age of thirteen, he began a life of conquest which earned for him the title of "Jenghis Khan," the perfect warrior.

The Mongols were horsemen of nomadic tradition, highly individualistic and brave when necessary. Poor beyond belief, the plunder afforded by participation in war made the gaining of loot more desireable than the victory itself. Conversely, the Mongol could be the opposite of the brave warrior, he could desert when it pleased him as he gave little or no loyalty to anyone, or anything, except perhaps to his tribe.

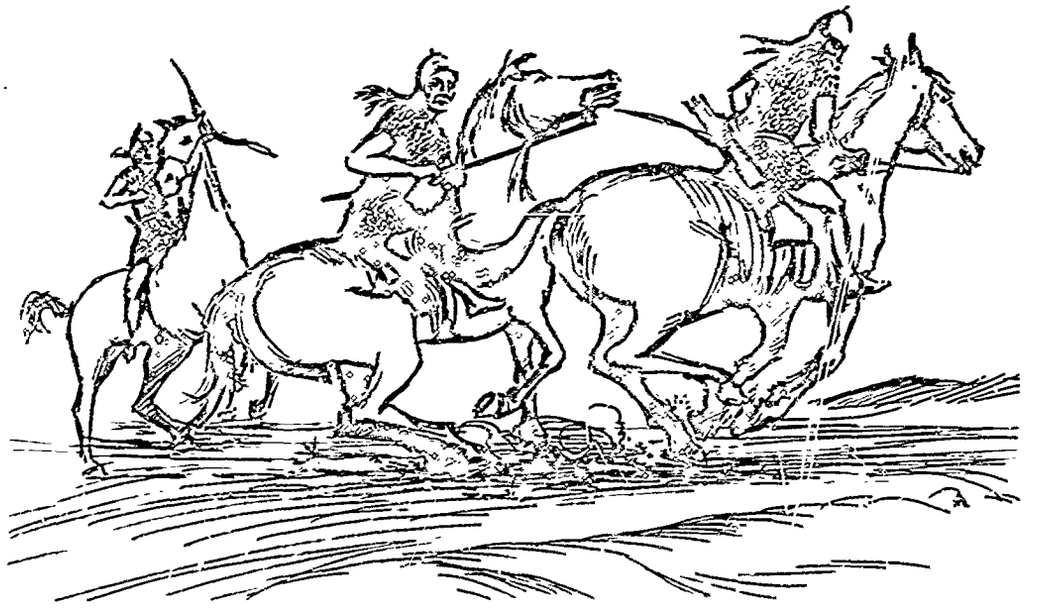
Proximity to the Chinese and their military organization gave the Mongols a somewhat more advanced military posture than the other wild tribes of the area. In due time, the Chinese were attacked across the Great Wall by the raiding Mongols. Using a primitive form of psychological warfare in later campaigns, Jenghis Khan employed Chinese parents and children captives as a shield for his advancing hordes, knowing well that the Chinese respect for ancestor and "old age" would preclude any offer of resistance by the Chinese under these unfavorable circumstances. Using Chinese officers and workmen who were assimilated into his army, Jenghis Khan succeeded in the grafting of a wise and subtle Chinese head onto a thickset Mongol body, and with this terrible hybrid as his instrument Jenghis Khan soon overcame all the people in his path. (Ref. 4, pp. 146-147)

Under the command of Jenghis Khan, the Mongol army was organized on a decimal basis beginning with the smallest unit, a squad of ten men, to the largest unit, a division or touman of ten thousand troops, the regiments within the touman numbered ten, each regiment consisted of one thousand men. The ten squadrons within each regiment comprised one hundred men each and each squadron contained ten squads.

In combat, unit control within the Mongol army was attained by the employment of a set battle drill. Well-conceived and executed by signals this drill eliminated the use of orders and messages in combat. The mobility and rapidity of execution of the drill movements were its outstanding characteristics. The battle formation of the Mongols has been described as:

> "comprised of five ranks, the squadrons being separated by wide intervals. The troops in the two front ranks wore complete armor, with sword and lance, and their horses were armored. The three rear ranks wore no armor, and their weapons were the bow and javelin. From these, mounted skirmishers or light troops were thrown out to harass the enemy as he advanced. Later, as the two forces drew near each other, the rear ranks advanced through the intervals in the front ranks, and poured a deadly hail of arrows and javelins on the enemy. Then, when they had disorganized the enemy ranks, they retired into the intervals, and the front ranks charged to deliver the decisive blow. It was a perfect combination of fire and shock tactics, the missile-weapon troops firing and disorganizing the enemy ready for the shock troops to complete his overthrow." (Ref. 5, pp. 10-11)

MONGOL CAVALRY
(Source: Mitchell)



Discipline within units of the Mongol army was among the most severe known to have existed. While the Mongol army contained, as noted, wild tribesmen who were essentially free and highly individualistic warriors, the discipline exacted from them by Jenghis Khan was based upon swift and deadly punishment. In Rome in 1246 A.D., Pope Innocent IV received the following information from John of Carpini whom he sent to study the Mongols. The Pope's observer's account of punishment of Mongol warriors for various derelictions of soldierly duties contained the following comment:

> "For if one or two or three out of ten flee on the day of the battle, all the rest are tried and executed. Unless there is a general retreat ordered, the first to flee are always so punished. And if two or three out of the band make a gallant assault, and the rest do not follow them, the laggars are likewise put to death. And if one or more are taken prisoners, and the rest fail to rescue them, they also are executed."
> (Ref. 4, pp. 152-153)

In the year 1220 A.D., Jenghis Khan began the conquest of Asia. This ambiticus operation was planned with military skill of high order and it was especially noteworthy because of the pre-attack use of propaganda and psychological warfare. Long before the Mongols entered an area, Mongol spies and agents were there with the express mission of subverting the enemy's will to resist. The campaign against the Khwarismian Empire of Persia illustrates the planning for unit control of the Mongols in designation of objectives for each of the four columns of the 150,000 man force. This movement over the vast deserts of the East has remained as an historical example of coordination and timing. How it was done and the methods of control employed are not too clear but it must be assumed that Jenghis Khan prescribed a rigid timetable for the operation. The capture of Bokhara and Samarkand and the complete defeat of the Shah Mohammed was the result. Montross in his definitive work, War Through the Ages, has this to say about the above operation:

> "The movements executed by these four columns have never been bettered by any modern army of invasion. Both the shah's flanks were turned, his communications severed and his two principal cities caught between swiftly closing pincers."
> (Ref. 4, p. 150)

When Jenghis Khan died in 1227 A. D., the military machine which his genius had created continued on to even greater conquests and victories. As with all armies composed of various racial and ethnic groups, the matter of communication became a major consideration. Unit control was achieved under such polyglot lingual circumstances by the use of a wordless code of command. The employment of signal flags gave the Mongol operation a "ghostly silence."

Under the command of Jenghis Khan, the Mongols exemplified the principle of mobility in warfare. Although composed primarily of wild, native horsemen, the unit control of the Mongol horde had its base in the Chinese system as advocated by Sun Tzu. The great Khan gained much organizational and tactical knowledge by employing Chinese officers on his staff. Among the developments initiated by Jenghis Khan was a set battle drill. This maneuver was controlled and executed by signals. This drill was in a sense a standing operation procedure as used by more modern armies.

From the military point of view, there seems to be a contradiction within the Mongol army. Wild, untamed tribesmen who were highly individualistic warriors were held in control under a discipline which was severe and from a Western point of view unjust. Mass capital punishment of units which failed in battle was commonplace. It may be said that the discipline and control exercised by Jenghis Khan over his troops rested primarily upon fear of failure and the subsequent punishment. This method of maintaining control may be seen in variations throughout military history, from the Roman legion to modern times.

The Mongol leader employed objectives for the control of the marches of his columns. Being knowledgeable in the use of the magnetic compass, it is believed that overall control of the mass movements of the Mongol armies was controlled by magnetic directions and a rigid system of controlled time tables. The use of signal flags for unit control was a device employed by the Mongols throughout their campaigns. As noted, flags were helpful in establishing unit control among the various racial and ethnic groups which had accrued by conquest. The solution of the problem of communication by means of a common signal flag code eliminated confusion and lack of coordination because of linguistic problems. With the emphasis placed upon signals by the Mongols at this early date, assumption is made that much of the effective unit control may be ascribed to the signal system.

故善攻者敵不知其所守善守者敵不知其所攻

Sun Tzu said: That general is skillful in attack whose opponent does not know what to defend; and he is skillful in defense whose opponent does not know what to attack.

THE GREEKS

Thus o'er the field the moving host appears,
With nodding plumes and groves of waving spears. . .
Each leader now his scattered force conjoins
In close array, and forms the deepening lines. Homer

The organization of the Greek army in the fifth century B. C. was centered around the formation known as the phalanx. Basically, the phalanx was a grouping of warriors for mutual protection and strength in combat. Shoulder to shoulder, when facing the enemy in line, the formation, when ordered, assumed a column formation for marching. The basic strength of the phalanx was in its physical solidarity. In its discipline was to be found its secret of unit control in combat.

Warriors of primitive races generally grouped themselves into a formation which could be changed into a column for marching. The virtue of the phalanx was in its solidarity and moral and physical values. Each individual was assured some degree of personal security by the touch of the shield on his right and the spear on his left. The larger the phalanx the less individual fighting spirit, and, hence, dependence upon a mass. The Egyptians generally adhered to a formation of 100 ranks and 100 files. The Greeks relied upon a phalanx possessing a depth of only eight ranks. (Ref. 4, p. 7)

GREEK INFANTRYMAN
(Source: Mitchell)

From the earliest beginnings of military history the mass formation has competed with the line for supremacy on the battlefield. The great advantage of the mass formation was in its crushing weight, its solidarity, and its simplicity of control. As long as a mass, such as the phalanx, was not broken it was invincible. The soldiers of the mass formation were well-drilled and excellent fighters as long as the formation was intact. Once disorganization occurred there was little left for them to do but to continue the fight as individuals or flee to the rear. The valor induced by the shoulder-to-shoulder, shield-to-shield contact could be lost quickly when this vital condition was destroyed.

The phalanx was limited in its usefulness generally to the defensive but it was an indifferent formation for the attack. Depending for its basic strength upon its compact formation, its mobility was that of the slowest hoplite. Combat at this period of warfare consisted primarily of a planned

and directed physical clash between two human masses. The individuals within the phalanx, once the initial impact was over, fought hand-to-hand with the enemy opposite him. Throughout the struggle the phalanx kept its formation, those who were wounded or killed in the front ranks were replaced by others moving up from the rearmost ranks. There was little mobility or maneuver requiring the issuance of orders or commands for purposes of unit control. The general, himself, or the commander-in-chief often fought on foot with his men.

In the Greek army before Alexander the Great, the procedure was for the general to lead his men. Military custom of the period required that the leader demonstrate his bravery at the head of his troops. There was no concept of the general remaining behind the battle line and directing the overall operation. Inasmuch as the battle line consisted of two ranks of spearmen engaged in hand-to-hand combat, the appearance of the commander at the scene was of considerable moral value. There was little maneuver except perhaps the movement of small bodies of reserves to critical points. The great commander Alexander always charged at the head of his cavalry. His presence was not needed there essentially but, according to tradition, he was there because he enjoyed engaging in the resultant melee. What effect, if any, his action had upon unit control, history does not show. However, it must be assumed that commanders and units in the vicinity of Alexander were controlled by his example. (Ref. 6, pp. 30-32)

The history of the Greek phalanx dating from about 500 B. C. has been described by Albion in the following extract from his well-known work on military history:

> "The Greeks had the first important tactical formation -- the phalanx. It was a solid mass of heavy infantry for shock action, in contrast to the loose infantry hordes of the previous empires. The high quality of the Greek citizen-soldiery made them brave hand-to-hand fighters. From four to thirty ranks of foot soldiers stood shoulder-to-shoulder in continuous lines in the solid, regular mass of the phalanx. Well-protected by helmet, breastplate, and shield and armed with both spear and sword, they made their phalanx a formidable body. Their front was one bristling, unbroken array of spears. This formation was almost invincible, provided the soldiers had time to form into its 'hedgehog' mass."
> (Ref. 8, pp. 49-50)

With reference to the above-cited comment upon the matter of the soldiers having time to form the phalanx, it should be noted that battles at this period of history were rather set affairs. Pre-combat arrangement of the troops of the contending armies was the common practice and thus the order of battle became a basic form of unit control. The choice of the battlefield itself depended to a great extent upon the terrain being level and suitable for mass combat. It was not uncommon for one army to wait until

the opposing troops were alined before beginning the struggle. Adcock in his study of the Roman Art of War, had this to say about the order of battle:

> "With the requirement that both armies by deployed into position, it was necessary that an order of battle be devised. This requirement was essentially the beginning of unit control of large masses of troops. The disposition of the troops upon the ground and facing the enemy line consitituted the order of battle. Alexander improved upon this practice by moving his troops across country in order of battle, thus, saving considerable time. Because of the order of battle system, generals could plan how they could fight a battle. Their subordinate commanders would then be instructed as to how they and their unit fitted into the plan. Therefore, the order of battle was an essential element in planning and unit control in furtherance of the plan adopted."
> (Ref. 10, pp. 91-92)

That unit control depended upon factors other than the formation per se was commented upon by Asclepidotus in his Outline of Tactics. This early military philosopher, who is estimated to have been born in 71 B.C., produced theoretical discussion in the area of military science and tactics. There is no direct proof that he was a soldier, yet his observations are valuable because they reflect the military techniques of the time. In the use of commands for the control of the phalanx, he concludes that:

> "The most distinct commands are those given by the voice, but they may not carry at all times because of the clash of arms or heavy gusts of wind; less effected by uproar are the commands given by signals; but even these may be interfered with now and then by the sun's glare, thick fog and dust, or heavy rain. One cannot, therefore, find signals to which the phalanx has been accustomed, suitable for every circumstance that arises, but now and then new signals must be found to meet the situation; but it is hardly likely that all the difficulties appear at the same time, so that a command will be distinguishable both by bugle, voice and signal."
> (Ref. 11, p. 331)

It is interesting to note that another military theorist, Onasander, in his work The General, written before A. D. 59, comments upon what is properly known today as the chain of command. It was his contention that the general should not command in person but should transmit his orders down through his subordinate officers. A general who tries to give orders personally demonstrates that he is an inexperienced and unpracticed commander. His observations upon the garbling of oral orders is as timely

today as it was then. At this point in history the necessity for some form of formal written order for battle seems to occur. That this form of communication did develop from the experience and knowledge of the soldiers of antiquity cannot be gainsaid. As a form of unit control, the written combat order as a form of control deserves a place of distinction in military history. As so trenchantly stated by Onasander, commands and signals are apt to become confused and, hence, misunderstood. Onasander taught that the general must follow what today is known as the chain of command. Every command watchword or countersign should be given to the troops through the officers. They should not be communicated to the whole army by the general in person. Such a practice is that of an inexperienced commander. In essence, Onasander held to the belief that orders should be sent by the general to his higher commanders who in turn would transmit them to their subordinates. Thus, the orders would proceed from the highest to the lowest echelons of command with certainty and in correct form. (Ref. 11, pp. 466-467)

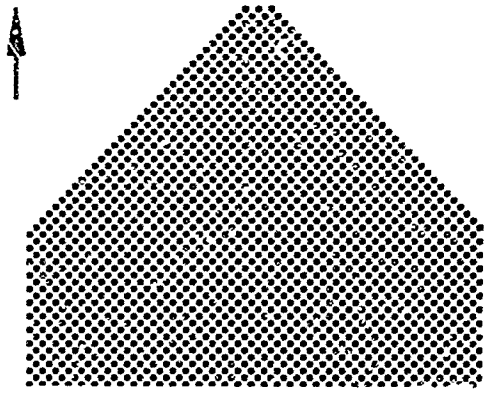
Unit control at the level of the overall commander thus became under the Greeks a matter, not of his personally leading troops in combat with weapon in hand, but rather a matter of his commanding commanders. In a sense, the general became a leader of leaders whose influence was transmitted to the ranks by successive echelons of commanders. The physical location of the general in battle is highly important to his successful management of the troops engaged in the struggle. Obviously, the general cannot be everywhere at once. His ability to communicate his orders and desires must of necessity be limited by the situation of the moment. In order to function as a control, he must achieve communication with his subordinates by voice, signal, or personal representative or staff officer. Where the general is and where he goes is most important to a continuity of high level unit control. In effect, the general's staff officer or courier with orders to subordinate commanders serves to multiply the general's influence and control over the action he is directing. The evolution of the staff officer, as a spokesman for the general, is a significant result of the need of the commander for communication--if he is to control his units. How this evolved in ancient times is shown in the following extract from Adcock:

> "The progress that was made in generalship is most readily tested by the position of the general in battle. He is no longer the man whose place is in the front rank of the hoplite phalanx once battle is joined. At Chaeronea, Philip must have directed the measured retirement of his phalanx from outside its ranks, though he may have charged with it when it turned to the attack. But in the Hellenistic Age generals were apt to be on the wings or even, it may be, behind them so that they could move about the battlefield at need. The full-scale active reserve as distinguished from precautions to limit the effect of a reverse, is almost unknown in Greek and Macedonian practice, but the ordering brain of the general could now make new dispositions as the course of a battle might require."
> (Ref. 7, p. 89)

The Spartan army was the preeminent one among the Greeks. Much of this reputation was based upon the thorough and long-term training of the troops and their strict discipline. The Spartans did have the capacity for maneuver within the limits of their phalanx. How the ability to maneuver this fixed and rigid military formation came about is interestingly told by the Greek historian Thucydides:

> "Thucydides observed how advancing troops tended to edge out towards their right, their unshielded side. They had an instinctive desire to feel themselves more protected by the shields of their right-hand neighbors. Thus, the right wing of a hoplite phalanx was apt to some degree to outflank the enemy's left wing. The Spartans exploited this tendency by being able after outflanking their enemy's left to wheel around and roll up the enemy line. This was more possible because the Spartans advanced, as Milton says, "to flutes and soft recorders" rather than charged at speed. Their disciplined steadiness was not borne down by the impact of the enemy charge, their skill in front-line fighting compensated for its lack of momentum. The united thrust of the line pinned down the enemy until the turning movement decided the day."
> (Ref. 7, pp. 8-9)

GREEK PHALANX - WEDGE FORMATION



The early use of music for the control of the advance of a unit is clearly shown in the above extract. Marching in cadence is, in essence, an elementary form of unit control. From ancient times, movement controlled by musical means has been a fundamental military concept of drill and combat. When the soldier was separated from the compact mass of the earlier formations into more flexible units, the problem of unit and individual control became a most pressing one. Historically, the mass formations were the Greek and Swiss phalanxes and the cavalry charges of the Middle Ages. Included within this classification were the Spanish square and the French perpendicular form of attack. The line tactics of Gustavus Adolphus (1611-1632) and his highly mobile mounted infantry formations are examples of the application of flexibility of formation to the battlefield.

The advent of gunpowder and its replacement of muscle power and hand wielded weapons exerted salient effect upon the organization and formation of military units. But tactics never quite catch up with weaponry and, because of this fact, the mass formation as a means of control

persisted until the end of the American Civil War (1861-1865). It remained for an American military intellectual and combat leader, Brevet Major General Emory Upton, to devise a formation, the infantry squad, which ensured control down to the level of the individual skirmisher. (Ref. 8, pp. 45-46, and Ref. 9, pp. 5-24)

The Persian military system under Darius (522-486 B.C.), although based largely upon the military patterns of the Assyrians, brought new and important changes to the art of war. Darius was instrumental in establishing command coordination and planning to an advanced degree. His highly successful campaigns from the Punjab River in India to the Don River in Russia attest to some primitive form of staff planning and coordination. In the fields of Persian army intelligence and supply may be found examples of planning and execution, but the great void appears to have been in the area of operations. The basic reason for this may be in the fact that the soldier kings generally kept this function close to the throne. Unit control, as a concomittant of proper staff work, seems to have been identified, as it should always be, with command. Lt. Col. J. D. Hittle in his basic work, The Military Staff, notes this fact:

> "We should keep in mind that the one type of staff functioning which we have not yet seen clearly delineated is that of operations. At this time (the time of Darius) there is nothing to indicate that the soldier kings delegated the operational functions to any subordinate. Thus, operational planning and execution appear to have been more or less synonymous with command, as the issuing of orders and supervision of the manner in which they were accomplished remained the personal responsibility and prerogative of the commander. Thus, early we find the theory of the primacy of the operations function firmly implanted in military organization, and in spite of the increasing importance of logistics, such primacy was to remain for centuries to come."
> (Ref. 3, p. 17, parentheses added)

The Spartan King possessed an elementary kind of a personal staff which included two officers who served as general staff officers and aides who were selected from among the victors in the public games. In addition, the king was accompanied by a group of young, mounted warriors as a kind of bodyguard. While this elementary grouping around the commander had little of the characteristics of the modern staff, it did function as a staff in certain areas of military activity.

Philip of Macedon (382-336 B.C.) developed the Macedonian army into one of the most efficient fighting machines in the ancient world. His principal objective was to create within his army an infantry force that could match the Greek phalanx. This he did with his Macedonian phalanx but in a novel and unusual manner. Philip's troops were armed with short swords in addition to their spears. Philip devised the sarissa, a spear of about twenty-three feet in length, which extended so far to the front of the

Macedonian phalanx that the Greeks with their shorter weapons could not reach the Macedonian troops. Philip's cavalry provided the necessary mobility. The organization of the Macedonian army and the phalanx was as noted below.

GREEK PHALANX ADVANCING UNDER COMMAND
(Source: Farrow)

In the army of Philip of Macedon, the units resembled the modern military organization. The infantry company, consisting of 256 men, was divided into 16 files of 16 men each. These files were roughly equivalent to the modern infantry squad. Four companies of infantry comprised what would be now called a battalion; eight companies a regiment. Sixteen companies, or two regiments, constituted a brigade or a half phalanx totalling about 4,000 men. Tactically, the phalanx was a mobile human fortress. On its flanks were cavalry and infantry forces which provided the maneuver elements. Stationed in the vicinity of each flank were archers and javelin hurlers who were used to harass the enemy. This formation was controlled by a collective military brain composed of a staff of experienced officers who advised the king. However, on the field the king retained supreme command. (Ref. 4, pp. 22-23)

The most significant contribution of Philip was his creation of a staff which included engineer, commissary, and hospital functions. For the enforcement of discipline in the camps there was a "provost marshal." Upon his assassination in 336 B.C., Philip left a military system to his son, Alexander, which was ready to respond to the control of a master. In Alexander the military system found a ruler and general who knew how to use it with consumate skill.

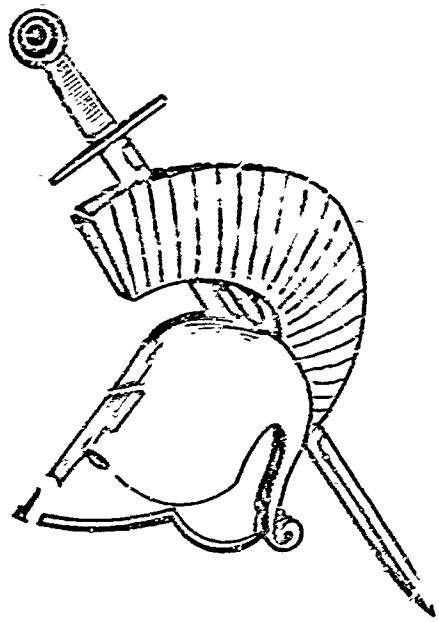
The several officers of Alexander's staff operated under his personal command. Their general functions were as chiefs of staff, adjutants general, and as aides-de-camp. In the matter of unit control, it is noted that there was a signal system. At this time, central control of a battle by one commander had not been developed. Coordination, even with the primitive general and special staffs, was difficult, if not impossible of attainment. Once the battle began, the individual commanders of the wings fought their troops as they saw fit. (Ref. 3, pp. 22-23)

The contributions of the Greeks to military science were considerable. Primarily, their recognition of the size and shape of a unit formation as determinants of unit control is significant. The phalanx as the basic military formation was in reality a mobile human fortress which was capable of waging offensive and defensive combat. The individual soldier within the phalanx could do little by himself. Shoulder-to-shoulder with his comrades he presented a strength and organization which was almost invincible. The secret of unit control within the phalanx was to be found in the nature of the formation itself.

The concept of files operating away from the phalanx did not seem to have occurred to the Greeks. The mobility of the phalanx was the mobility of the entire unit. This simplified to a great extent the control of the unit. Using sheer muscle power, the phalanx with lowered spears moved relentlessly at the word of command upon the enemy line. The weakness of the phalanx was to be found in its inability to operate successfully over rough, uneven terrain, hence, it was most successful when fighting over a prepared, level battleground. Alexander the Great improved the phalanx by adding horsemen and archers and javelin throwers to each flank. These latter groups operated away from the phalanx, but were controlled primarily by visual or auditory signals.

During the Grecian period of military history, it must be remembered that centralized control of one battle by one commander had not been achieved. Once the supreme commander gave the first order, unit commanders led their troops as they saw fit. There was little coordination other than direct observation of the combat battle by the supreme commander. In reverses and emergencies, leaders like Alexander moved immediately to the trouble site and gave personal leadership on the ground. For this period of history, and for the weaponry and tactics involved, this method was generally successful. The advent of future weapon power unknown to these physical warriors was to have far-reaching effects on the battlefields of the future. Until a later age, wars would continue to be waged and controlled by muscle power and the individual bravery and leadership of the commanders.

In contrast to Onasander's theories of generalship, Alexander the Great adhered to the principle of direct and personal command. Often in the tradition of the day, he would lead a cavalry charge or dismount and fight on foot in the ranks of a phalanx. However, it should be noted that Alexander did employ a staff to assist him in unit control. His signal system of fires, flags, and horns was utilized successfully in transmitting orders to units in combat. His elite mounted troops, The Companions, functioned in much the same manner as a bodyguard and an honor guard for Alexander. This picked unit of young nobles performed valiantly in battle, often under the personal command of Alexander. However, its primary mission was to protect the person of the king.



GREEK HELMET AND SWORD-
PERIOD OF ALEXANDER

THE ROMANS

The Roman legion was a descendant of the Greek phalanx. The legion was, however, more flexible than the phalanx. Once the spears had been put in position, the phalanx could not be readily divided. The legion could act as a unit or in parts, and maniples and cohorts could be readily detached from it, even during an engagement. (Ref. 12, p. 30) However, the Romans improved the phalanx by making it more mobile by the addition of cavalry. Within the legion, unit control was based upon a high state of unit organization and discipline. The sub-units of the legion were carefully organized, each with its own commander. According to available information, the legion was composed of 6,000 men. The smallest unit within the legion was the century of 100 men whose commander was a centurion. A company was made up of two centuries and was designated as a maniple of 200 men. The battalion or cohort comprised three maniples. The legion was formed of ten cohorts. (Ref. 12, pp. 28-29)

The infantry combat of the legion was carried on with two primary weapons, the spear or pilum and the gladius or short sword. Flexibility of the formation was enhanced with the mobility of the cavalry which was used generally on the flanks of the legion. The following extract explains the manner in which the legion waged combat:

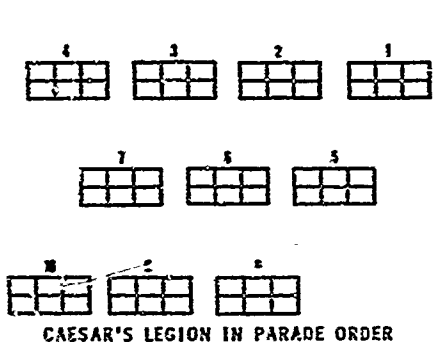
> "The early legion had thirty units or maniples of about a hundred men each, arranged in three lines about 250 feet apart. This was changed about 100 B. C. to ten units or

cohorts of 600 men each. The green men were put in the front line so that dependable veterans would be behind them in case they should break. The legionary was armed much like the Greek infantryman, but his spear or pilum was shorter--about six or seven feet long. Ordinarily the units hurled their spears at fairly close range and then hacked their way through the enemy with short swords or gladii. The cavalry was used as an auxiliary arm on the wings of the infantry to complete the route of an enemy or for scouting."
(Ref. 8, p. 51)

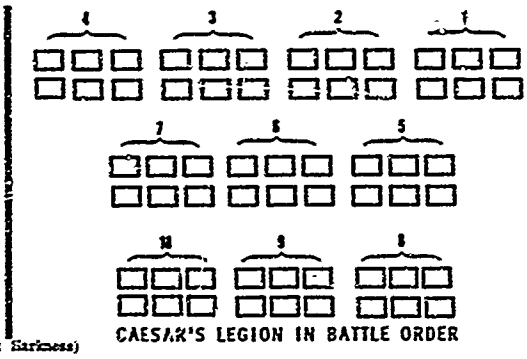
The Roman soldier was essentially an infantryman. Strong and sturdy, he was used to hardships and stern discipline. The Roman legion was an almost self-sufficient military unit. Its leaders controlled every aspect of the soldier's daily life. In contrast to the Greek phalanx with its rigid and inflexible formation, the legion did possess a modicum of flexibility and mobility -- outside the ranks.

The Romans found that the rigid formation of the Greek was not adaptable for combat over rough or uneven terrain. About the fourth century B.C., the legion was reorganized following the manipular system. The legion was arranged in maniples with the centuries in column or in file, one behind the other. This new alignment gave the formation mobility and some disposition in depth. However, as the need for a tactical unit larger than the maniple was recognized--Marius organized the legion into large tactical units called the cohort (roughly the equivalent of a modern battalion). (Ref. 13, p. 209)

ROMAN LEGIONARY
WITH FULL FIELD EQUIPMENT
(Source: Webster)



CAESAR'S LEGION IN PARADE ORDER



CAESAR'S LEGION IN BATTLE ORDER

(Source: Harkness)

As in the case of the Greek or Macedonian phalanx, the Roman legion was controlled basically by the style of formation itself. However, as noted elsewhere in this study, the order of battle exerted considerable influence upon the control of the legion in battle. In effect, the order of battle was a standing operating procedure prescribed for the meeting of all possible conditions of field service in war. The Romans, like the Chinese, understood the need for communication on the battlefield. Signals, standards for units, and music were established as essential to communication and identification in combat. In this connection, it should be noted, that since the Roman period of military history, military forces of all nations have relied upon signals, standards, and music as means of communication and unit control.

In the Roman legion, the banner, or vexillum, of the commander-in-chief was the highest form of signal used for unit control. When it was displayed at the general's tent, it was a signal to prepare for combat. When waved in front of the legions, it was a signal for the charge, incursus. It has been described as carrying the name of the general and of the army in large red letters on a white background. So important was the standard as a rallying point that each legion entrusted its care to the chief centurion or primipilus of the legion. The design of the standard was generally in the form of a silver eagle beneath which was placed a small banner containing the number of the legion. Each of the ten cohorts of the legion carried their own special standard signa. Sometimes these standards were designed as the figure of an open hand on a staff or the figure of an animal such as a wolf or a fox. (Ref. 14, pp. 48-49)

The principal musical instrument of the Roman legion was the tuba or trumpet. There were other musicians in the legion who were equipped with the cornu and lituus, which were horns in various shapes and formed of materials other than metals. Some were made of the horns of animals. Traditionally, the various military movements were ordered by signals emanating from the horns or trumpets. The signal for the charge in combat was called the classicum and was made in unison by horns and trumpets. (Ref. 14, pp. 49-50)

The Roman mode of attack was centered around the order of battle and the securing by the general of a suitable place for the deployment of the

troops in battle array. When the general ordered the attack to begin by the sounding of the signal on the trumpets, the legions moved deliberately forward in order of battle. When a position within five or six hundred feet of the enemy was reached, the standard of the commander-in-chief was carried forward and the horns and trumpets sounded the classicum, or charge.

> "In tactical formation the legion usually offered three lines to the enemy. The first line (hastati) was ordinarily six ranks deep, and the soldiers were armed with sword and two or more javelins to hurl at the foe. The second line (principes) was six to 10 ranks deep, also armed with throwing javelins. The third line (triarii) was three ranks deep, but had only the broad sword (gladius) and the thrusting spear (hasta).
>
> ". . . The Roman attack began with a short charge by the hastati, after one or two volleys of the pilum. In some cases, lightly armed auxiliary troops (velites) began the skirmish, retiring quickly to allow the shock troops opportunity for battle. After the initial thrust, the main body joined the fray, permitting the first lines to retreat in an orderly fashion and tend the wounded. Whenever superior numbers opposed them, the Romans retired slowly, wearing down the vigor of hostile attack with a continual shifting of troops. All of this was accompanied by the blowing of horns and trumpets to spur on Roman valor and to impress the enemy with Roman discipline and coolness. The formation put upon the individual soldier the qualities of steadiness, self-reliance, and strict obedience to command."
> (Ref. 15, pp. 28-29)

The Roman legions marched toward the enemy in an approach formation. During this march, all packs and shield coverings were removed and helmets and crests put on. This march was generally made in a line of three parallel cohort columns. Each cohort was formed in a column of maniple with the centuries abreast of one another or in column. These formations enabled the entire column to be faced easily to the right or the left. If the ground was favorable, the century marched in column. (Ref. 13, p. 208)

Battle leadership of the Roman officer, at all levels, was highly flexible. Even Caesar, when necessary, could enter into the melee and fight with the first ranks in order to set an example. In contrast to Alexander, Caesar was more the intellectual battle leader. The following example of Caesar's exercise of command is significant:

> "On one occasion during the African campaign against Metellus Scipio, Caesar was marking time at Ruspina while awaiting his veterans. His opponent, becoming emboldened, advanced with his whole army and towered elephants right up to Caesar's ramparts. Caesar, without leaving his tent, received reports of

> the moves of the enemy and gave directions how to meet them. This is the first instance in ancient military books where a commanding general is described as managing a battle just as he would today." (Ref. 12, p. 22)

With the complications of control set up by the increased flexibility of the Roman legion and the addition of considerable mobility in the form of cavalry, the personal leadership of a general in battle became less physical and more mental or intellectual. This trend was evidenced as early as 49 A.D. in the writings of Onasander who believed that the science of the general is of more value than his strength. He compared a general who fights as a common soldier to a pilot who leaves his post at sea to perform the duties of a common seaman. The evolution of generalship as the higher art, or science, of the control of troops on the battlefield was a steady, natural, and inevitable growth. Experience of the Romans showed that if a general was to effectively control his units he could not fight or lead with weapon in hand in the ranks. (Ref. 12, pp. 23-24)

Julius Caesar (100-44 B.C.) is, after Alexander, without doubt the outstanding military commander of ancient times. Of all the great Roman generals, Caesar's name leads all the rest. Aside from his personal skill as a soldier, he contributed much to the military profession. Especially valuable was the structure of his command system, many features of which have survived to the present day. In order for Caesar to function as the commander-in-chief, he employed a system of command which he created from the command structure of the Roman legion:

> "The system of command in the Roman legion was a rather divided one. In the Roman system, each legion had six tribunes who functioned much like a board of governors. The tribunes were divided into sets of two, each pair commanding the legion for a specified period, usually two months. The tribunes of each pair alternated daily in command of the legion . . . With the two tribunes doing day on and day off duty as legion commanders, the four remaining tribunes functioned as staff officers, assisting the tribune who would soon be trading jobs with them." (Ref. 5, p. 24)

The control of the units of the legion rested principally upon the officers and noncommissioned officers beginning with the commander, or legatus, who was generally a senator with appointment with the legion for a period of three years. Immediately under the legatus were six tribunes, one of whom was the deputy. The other five tribunes composed the legion headquarters general staff. The senior professional officer occupied the position of praefect castrorum. In a sense, he was a counterpart to the modern headquarters commandant. His duties included internal administration and supply. The company commanders were the centurions who were assisted

by a second-in-command titled optio. Ranking below were the subalterns or tesserarii. Each legionnaire had his service record maintained by special clerks, librarii, at century headquarters. The clerks at legion headquarters, tabularium principis, were occupied with the keeping of food supply records and individual records of legionnaires. In charge of the headquarters clerical force was the cornicularius, ancestor of the modern adjutant. Additional functions were performed by the actuarius, who was a corn tax collector; the aquilifer, the eagle standard bearer, and the tubicen, the counterpart of the modern bugler.

The special staff of the legion consisted of the following:

> "The mensor (who) surveyed and laid out the camp lines. The architectus . . . the master builder, and the hydraularius (who) was responsible for water supply and drainage. There were ballistarii (catapult makers) and sagittarii (arrow makers). The medical officer was often a Greek . . . his medical orderlies were known as medici. Simple operations, such as amputations and the extraction of foreign bodies, were carried out in field-dressing stations. Herbs and antiseptics, such as pitch and turpentine, were used. Religious ceremonies were conducted by the legion priests or haruspices."
> (Ref. 16, p. 92)

Inheriting the somewhat complicated system of command and control, Caesar modified it by adding a legate as commander of the legion with the tribunes as the commander's staff. The special staff of the legion under Caesar consisted of the following officers: Supply (quaestors); Aides (contubernales); Provost Marshal (cohor praetor). The appearance of the information collectors on the legion staff was highly significant as to the value placed by Caesar upon the intelligence staff function. (Ref. 3, pp. 24-25)

The necessity for discipline in order to create and maintain unit control is well illustrated by the example of the discipline of the Roman legion. Discipline was engendered by drill in marching, weapons, and tactical exercise under the command of drill instructors, the lanistae. Physical fitness was ensured by constant marches, target practice, and labor in building fortifications and clearing ground.

The control of the individual and the unit was based to a large degree upon fear of the severity of the punishments meted out for various derelictions of duty. The most serious military crimes, mutiny or desertion in face of the enemy was punished by death of the individual legionnaire. If a unit was involved every tenth man, under the decimation principle, was summarily executed. Death by stoning was prescribed for sleeping sentries. Lighter penalties were flogging, loss of pay, demotion, and hard labor details. (Ref. 16, pp. 94-95)

The Romans may be credited with numerous reforms in the military organization employed in their campaigns. Principally, these reforms

were manifested in reorganization of the legion away from the inflexible phalanx concept. Units within the legion were based primarily upon the maniple of 100 men which was capable of being commanded by a leader. Within the legion formation, flexibility between the three lines was possible in combat by using intervals between the units for passage. On the flanks additional mobility was secured by the use of cavalry. The battle experience of the Romans in the time of Marius dictated the formation of a new unit--the cohort, which was roughly equivalent to a battalion. This unit with its own standard became one of the principal maneuver elements of the legion.

The Roman military system advanced the concept of the order of battle as a basic means of unit control. In the Roman sense, order of battle meant the formation of the troops in camp, on the march, or in the field in the order in which they would wage combat. Such a practice assured control of units in each of the above three situations.

The Romans were among the first practitioners of the military art to recognize the value of the symbol in unit control. The Roman eagle and the legion emblems were utilized as rallying points in combat. The loss to the enemy of an eagle or other emblem in combat was considered a disgrace for the unit concerned. The Roman soldier was identified with his unit and its emblem from the very beginning of his military service. Much ceremonial activity centered about the eagles of the legion. To be an eagle bearer meant that the individual so assigned was a trustworthy and dependable veteran.

Like the Chinese, the Romans employed auditory signals for purposes of unit control; Horns, bugles, and trumpets were essential means of communication and identification in combat. The Roman legion was one of the first military units in world history to march to music. The marching cadence of the legion enabled it to march into combat under a measured discipline. In the legion, the various military movements and maneuvers were executed by signals issuing from horns or trumpets.

The leadership of the Roman officer was highly flexible. Historically, Julius Caesar fought with the first ranks in the legion in order to set an example. Alexander the Great often performed in the same way, yet Caesar functioned in this manner in order to save a desperate situation rather than for a desire to participate in personal combat. Caesar was more modern than Alexander in his exercise of command. He understood thoroughly the art of generalship. He possessed the ability to manage a battle without becoming involved in the physical struggle. The experience of the Romans, before and after Caesar, demonstrated that the general could not effectively control his troops and fight on foot in the ranks.

Under the command of Julius Caesar, the Roman army began to operate in a semi-modern manner. Eventually, under his direction, a legion staff was established which functioned much in the same manner as does the general staff today. In addition to the general staff, Caesar provided a special staff which functioned in the areas of supply, medical care, and field engineering. One of the primary functions of both the general and special

staff under Caesar was collection, evaluation, and dissemination of information and intelligence which had direct bearing upon combat operations.

The Roman military system established for all time the concepts of organization, leadership, and communication. The military profession received its bases from the peace and war experiences of the Roman Legions and their commanders.

GUSTAVUS ADOLPHUS

Gustavus Adolphus of Sweden (1594-1632) is credited with being the first monarch to create a national army. This organization was in sharp contrast to the usual mercenary armies of the period. By placing the burden of national defense upon the Swedish population, the king built an army that was disciplined and obedient to orders. The system of military discipline which Gustavus established was most severe. Of especial importance to unit control were those portions of the Articles of War containing punishments for various military derelictions. By using his own nationals, Gustavus was able to institute a strict military control based upon punishments, many of them capital, for offenses committed within the Swedish service. For example:

> "The penalty for many offenses was death. Among these were despising divine service, third offense; offering violence to a superior; sentry sleeping on or leaving his post. For regimental misbehavior, every tenth man, taken by lot, was hanged and the rest required to do the fatigue of the army. Those who surrendered a fort without cause were hanged; other punishments were loss of a hand, irons, running the gauntlet. There was no flogging. Such discipline was severe, but Gustavus produced successful soldiers by these means."
> (Ref. 17, p. 247)

The discipline of the old Roman legion can be seen as the basis for the Articles of War promulgated by the soldier king's father and himself. The practice of decimation, or the execution by lot of every tenth soldier, was a principal feature of Roman military punishment. But Gustavus Adolphus relied upon other factors to insure unit control in combat. Primarily, he departed radically from the mass, phalanx-like formations of contemporary armies. His army was formed in an order of battle of two lines. In addition, he held out a unit as a reserve and placed mounted troops on the flanks of the overall formation. Further, for combat, he formed a brigade of two regiments with three ranks one behind the other so that all ranks could deliver fire with the front rank kneeling. In the mounted units, the squadrons of horsemen attacked the enemy by firing pistols and charging with drawn sabers. According to Colonel Arthur L. Wagner, in his definitive work Organization and Tactics, Gustavus Adolphus was the first to inaugurate the cavalry charge for its shock power. The successful cavalry charge required unit control of the highest order if units were to strike the enemy simultaneously

for maximum shock effect. It is at this point in military history that the concept of combined arms combat makes its appearance upon the scene. Gustavus Adolphus with his well-organized and disciplined infantry and hard-charging cavalry added one more ingredient -- artillery. His artillery was highly mobile and each one thousand infantrymen were equipped with six cannon. Horse-drawn field guns were attached to each of the regiments of the brigades.

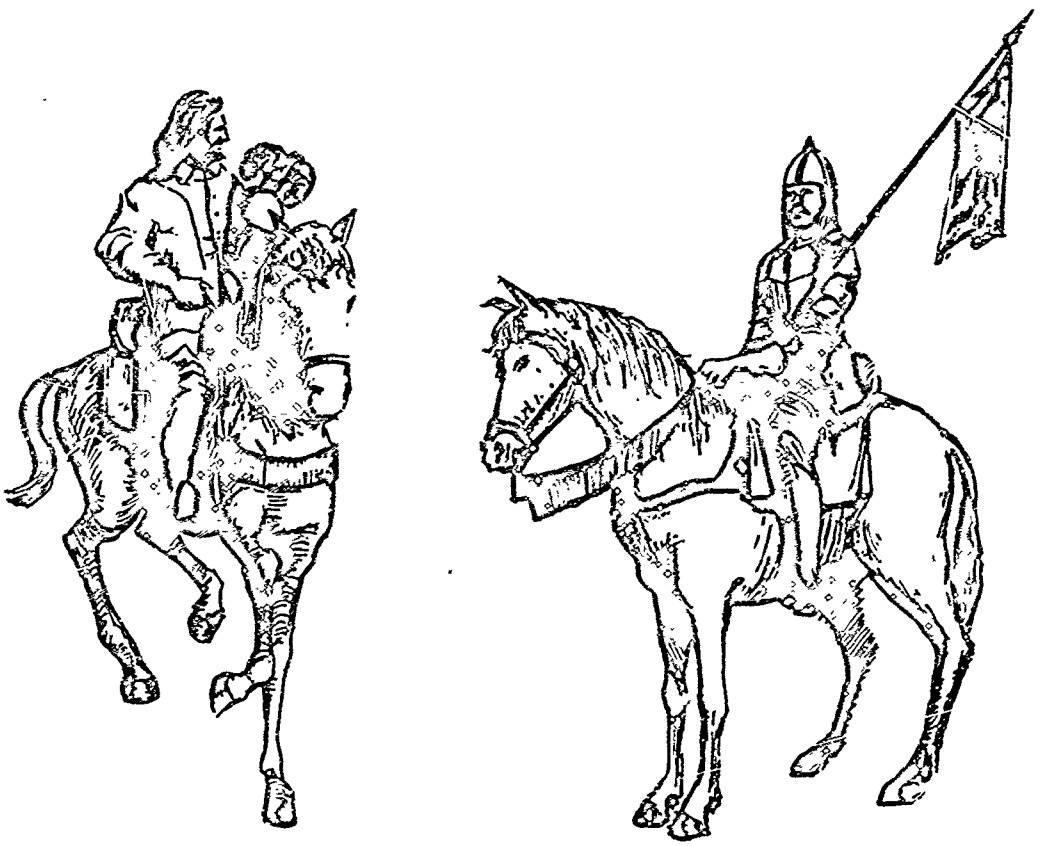
The somewhat detailed organization of the army of Gustavus Adolphus is shown to demonstrate that he had departed from the mass formations of the past. The advent of gun powder and controlled fire-power complicated the matter of unit control. Here was perforce a return to severe discipline as a replacement for the physical solidarity of the old massed formations. With loose, often semi-independent formations operating on the battlefield or in its vicinity, the necessity for some form of unit control other than that engendered by mass, physical proximity was indicated. In a basic and fundamental way, the Articles of War and their severe penalties served as unit control measures against indiscipline and misbehavior in combat. (Ref. 17, p. 251)

With the invention of printing with moveable type by Gutenberg about 1450 numerous authors began to write and publish texts on military affairs. Well-known classical works appeared ranging from the Military Institutions of The Romans by Vegetius and The General by Onasander to Machiavelli's Art of War.[1] War became a serious study for certain elements of society. As a result, literate military men were becoming more commonplace. It must be remembered that the average man of this period could not read or write. Hence, means of communication, in peace and war, were limited to the visual and spoken media. The immediate effect of the new literacy was that written orders were now possible. Further, those who wrote them for, or in behalf of, the commander and carried them to their recipients had become elementary staff officers. Thus, late in the 16th century the staff system was introduced as a primary means of unit control. At this point, the staff system was concerned essentially with the transmission of orders but there were other military and logistical functions to be performed. Among them there were:

> " . . . the chief of staff or constable; the foragemaster general for supply; the chief administrator or provost-marshal; the chief of information; the scoutmaster general; and the operations officer or sergeant major general.
>
> " . . . the king was the commander of the army. His chief of staff was called the constable (comes stabuli, or master of horse). Marshals were of various grades. Each arm had a chief responsible for its equipment and training. The chiefs of the various divisions of the staff were the forage-

[1] See diagram in Appendix A. Source: Warfare, Spaulding.

master general for supply, the provost marshal for administration, the scoutmaster general for information, and the sergeant major general for operations. The drawing up of an army in battle was a complicated mathematical problem which required the use of algebraic formulae or elaborate 'tables' of forms and proportions for sundry battles."
(Ref. 17, pp. 253-254)



SWEDISH TROOPERS-PERIOD OF GUSTAVUS ADOLPHUS
(Source: Mitchell)

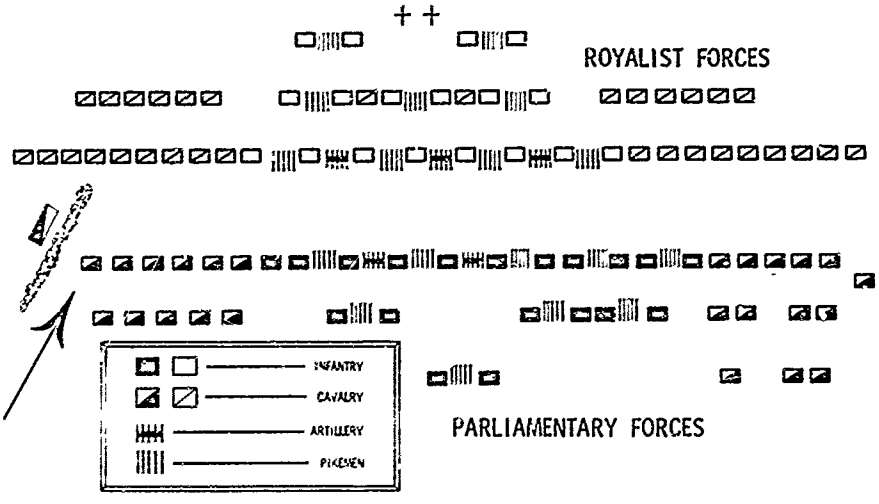
Gustavus Adolphus established his system of military law, including regimental courts-martial, as early as 1621. Thus, the awarding of punishment was given directly to the regimental commander, who was the president of the regimental court. The regimental courts had complete jurisdiction over the military crimes of insubordination, thieving, etc. The crimes calling for capital punishment were tried by a permanent general court martial of which the royal marshal was president and high-ranking officers were the members. The creation of the regimental court martial was a basic step in the direction of the establishment of unit control from a disciplinary point of view. (Ref. 3, pp. 36-37)

> "In spite of technical and organizational advancements, battle was still conducted much as in ancient times. Even during the time of Gustavus, commanders were participants rather than directors of their forces in battle. At Lutzen, Gustavus Adolphus commanded the right wing. Two thousand years before, Alexander had commanded the right wing at Arbela. Commanders had not yet learned to detach themselves from physical participation in the battle, nor had they fully learned the technique of utilizing their staffs to properly control the course of battle.[2]
> (Ref. 3, pp. 39-40, emphasis added)

OLIVER CROMWELL

The contributions of Oliver Cromwell (1599-1658) to the military art are noteworthy from the point of view of his reorganization of the British

ORDER OF BATTLE-PERIOD OF OLIVER CROMWELL
(Source: Mitchell)



[2] This situation obtained generally through the period of the Spanish-American War of 1898. There are examples of general officers personally leading or reorganizing faltering units as late as the Korean War, 1950-1953.

military forces. Under the title of The New Model, Cromwell's army followed much of the combat practice developed by Gustavus Adolphus in the matters of battlefield formations and unit control. It must be recalled that this was the age of transition from the pike to the musket and there were those who believed more in the pike than the inefficient and slow-loading shoulder gun. Cavalry and dragoons (mounted infantry) were employed by Cromwell throughout the Civil War between the Royalists and the Parliamentary forces. Eventually, gun power would force the pike [3] from the battlefield:

> "In spite of the services which pikemen performed during the Civil War, it is possible to perceive more than one sign that the contest between the pike and the musket would end in the victory of the musket. It was so abroad. Before the close of the sixteenth century, English military writers had pointed out that the pike was generally abandoned by the French, and that the English must increase their number of musketeers if they are to fight them on equal terms." (Ref. 18, p. 76)

The New Model Army authorized by Parliament in 1644 followed in general the overall organization as established by Gustavus Adolphus. This was noted especially in the staff organization which provided for a commander designated the Captain-General. There was a chief-of-staff who was also the chief of infantry and sergeant major general. Oliver Cromwell was lieutenant general and chief of cavalry. There was, in addition, a commissary general and a chief of artillery and engineers who was also lieutenant general of ordnance. Medical service was under the direction of two physicians; one the apothecary general and the other, the surgeon general. In the regiments of infantry and cavalry there were regimental staff officers: a provost-marshal, a surgeon, and a chaplain. In the infantry regiments, one staff officer performed the functions of regimental quartermaster. Cromwell's greatest contributions to the art of unit control are found in the areas of organization and leadership. His reorganization of his army and the close supervision he exerted over the officer corps were instrumental in establishing and maintaining maximum unit control. (Ref. 19, p. 248)

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[3] The pike was abandoned in 1705 - but, it reappeared in the American Civil War. The pike was replaced by the "plug" bayonet of the times, an elementary type, which was fitted into the muzzle of the infantry musket.

MARSHAL MAURICE DE SAXE
(1696-1750)

> "War is a trade for the ignorant and a science for men of genius." Chevalier Folard[4]

Maurice of Saxony, the "Prodigious Marshal" contributed much to the art of war in the areas of organization, command, and unit control. His Reveries on the Art of War written in 1732 has become a classic on the subject of war and how to wage it.

From his study of the ancient classics, Marshal de Saxe favored the Roman legion organization for effective unit control and his comments upon the Roman legion are quoted for their significance:

> "I would form my body of infantry into legions, each composed of four regiments, and every regiment of four centuries; each century would have a half-century of light-armed foot and a half-century of cavalry. When centuries of infantry are drawn up in separate bodies, I shall call them battalions, and the cavalry, squadrons, in order to conform to our usage and aid the interchange of ideas.
>
> "The centuries, both of foot and horse, are to be composed of ten companies, each company consisting of fifteen men."
> (Ref. 20, p. 36)

In this instance, the Marshal has indicated his favorable opinion of the legion concept of organization in order to effect unit control. His implied point that the formation, as in the example of the legion, is important to unit control is well taken. However, it should be noted that his infantry company consisting of fifteen men was really more of a section, or a squad, in the modern sense.

As a facet of unit control and discipline, de Saxe advocated that the troops adopt the military step of the Romans and that infantry march in cadence to music. He noted that the battalion of the day:

> ". . . is like a poorly constructed machine, about to fall apart at every moment and which straggles on with infinite difficulty. Do you wish to hurry the head? Before the tail knows that the head is marching fast, intervals have been formed. To close up the column, the tail must run; the head that follows this tail must do the same. Soon everything is in disorder, with the result that you are never able to march rapidly."
> (Ref. 20, p. 30)

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[4] French soldier and eighteenth century military intellectual and writer whose works influenced de Saxe and later Frederick the Great.

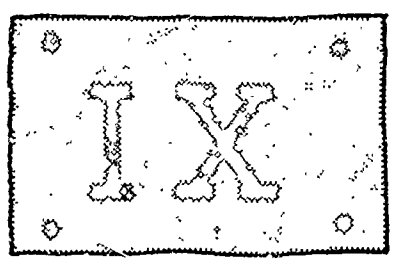
Captain B. H. Liddell Hart in his work Ghost of Napoleon pays tribute to the military prescience of Marshal de Saxe in the following comment:

> "As regards the organization of the infantry regiment Saxe foreshadowed the four-company system--which was only adopted in the British Army on the eve of 1914. Similarly, his line of centuries, with an irregular frontage, and intervals between them to facilitate maneuvers, seems to have been inspired by the same idea that gave birth to the infiltration tactics of 1918. It has certainly more connection with the most modern formation in a chain of combat groups than with the rigid lines of his time, so easily disordered, or even the continuous 'waves' of 1916."
> (Ref. 21, p. 41)

Saxe was instrumental in contributing toward the elimination of the rigid lines of the order of battle of the times. From ancient times unit control had been obtained and maintained in battle by massing the infantry in the center of the line with the cavalry on the wings. In addition to strong unit control, this rigid order of battle did possess the quality of unit solidarity. This was valuable and most essential in a period of military history when the predominant weapons were shock weapons. Hart observed that pre-Napoleonic armies suffered from handicaps both tactical and strategical. He states it well in the following observation:

> "Custom ordained that they (pre-Napoleonic armies) should move as they fought, in a solid block. That custom had its foundation in a common-sense appreciation of the value of concentration. Detachments not only weakened the main body, but they were themselves in ever-present danger of being overwhelmed while isolated. In the days of shock weapons, the clash of forces was abrupt, and a small detachment could only offer a brief resistance, unless it found shelter behind a wall or other obstacle. And because of their defenselessness in the open, detachments tended to become static."
> (Ref. 21, p. 26 parentheses added)

By the seventeenth century, the responsibilities of the general in the field, as a controller of units in order of battle, or deployed for combat, had increased considerably. Under the ancient system which Marshal Saxe wished to revamp as noted in his Reveries, forces in the field had numbered



from 15,000 to 30,000 men in massed formations.[5] This was the formation with the infantry in the center and the cavalry on the two flanks, or wings. But Marshal de Saxe was impressed with his reading of the classical accounts of the Roman and Greek military organization and battle formation. His plan for control of his troop units in combat was startlingly modern in its concept and proposed execution. In effect, his plan was an ancient version of a modern standing operations procedure of World War II and Korea:

> "In the attack, the light infantry were to form an advanced and dispersed line along the front of the regiment, opening fire when the enemy were some three hundred paces distant, and at the last moment falling back into the intervals between the centuries, which would be advancing to the charge. This shock Saxe calculated, would practically coincide with the cessation of the skirmisher's fire upon the hostile ranks, and thus would allow the enemy no time to repair the inevitable disorder."
> (Ref. 21, p. 41)

Marshal de Saxe recognized the value of the identification of the private soldier with his unit by means of some outward, easily recognizable sign, or unit badge. This identification, which was common to the Romans, was to consist of:

> ". . . a piece of copper fixed on each shoulder, with the number of the legion and regiment . . . on them so that they may be easily distinguished."
> (Ref. 20, pp. 39-40)

The traditional means of identification of the individual soldier with his own unit survived throughout the centuries of military history. In modern times, during the American Civil War, division and corps badges were prescribed to be worn. Many of the distinctive devices followed in general the design of the unit flag. The concept of the Marshal has survived to this day and from military experience it has been valuable in assuring a degree of unit identification and control.

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[5] Then came the army of from 40,000 to 100,000 in line, occupying several miles of front. Results depended far more on precision, yet every move still had to be directed by a single commander-in-chief stationed in the rear where he had a full view of the field. There were no staffs in the modern sense of the word, though the commander was assisted by several generals and perhaps a score of younger officers. This tense little group of mounted men watched the fighting, reporting any unusual turn to the commander. He formed his decisions instantly on the basis of their information rather than on their advice, transmitting his orders by means of runners who sought out the battalion officers in the smoke veiling the action. (Ref. 4, p. 351)

Writing at high command level, de Saxe offered his concept of the general which is as valid today, from the standpoint of the control of military units, as the day it was written. Written from his own experiences as a soldier from the age of 12 years, this word portrait unconsciously depicts the great Marshal--as he himself was:

> "I have formed a picture of a general commanding which is not chimerical. I have seen such men.
>
> "The first of all qualities, is COURAGE. Without this the others are of little value, since they cannot be used. The second is INTELLIGENCE, which must be strong and fertile in expedients. The third is HEALTH.
>
> "He should possess a talent for sudden and appropriate improvisation. He should be able to penetrate the minds of other men, while remaining impenetrable himself. He should be endowed with the capacity of being prepared for everything, with activity accompanied by judgment, with skill to make a proper decision on all occasions, and with exactness of discernment.
>
> "He should have a good disposition free from caprice and be a stranger to hatred. He should punish without mercy, especially those who are dearest to him, but never from anger. He should always be grieved when he is forced to execute the military rules and should have the example of Manlius constantly before his eyes. He should discard the idea that it is he who punishes and should persuade himself and others that he only administers the military laws. With these qualities, he will be loved, he will be feared and, without doubt, obeyed." (Ref. 20, pp. 117-118)

Marshal de Saxe's principal contributions to the science of war were in the fields of organization and troop discipline or control. These fields were not new but de Saxe introduced the concepts of flexibility and method. His influence was great upon the future development of military method in all armies. In a sense, his reforms created the need for staff organization and functioning and in the consequent refinement of current and subsequent military techniques. (Ref. 3, pp. 33-34)

General Karl von Clausewitz (1780-1831), the German military intellectual and theorist, expounded his principles of war in his classic volume On War. While his writings do not reach down to the unit level, but are rather maintained on a national scope, Clausewitz does cite many concepts that are indirectly pertinent to the subject of unit control. However, it was his purpose not to provide a set of abstract rules to be applied dogmatically on the field of battle, but rather to provide an aid to self-instruction and observation and to the gathering of practical experience. Von Clausewitz touched upon the "method" indicated by Maurice de Saxe as essential to the refinement of the military profession. The comments of Clausewitz are

highly significant in view of past and current military experience:

> "How far up the admissibility of methodism in military action extends is naturally determined not only according to rank but according to things; and it affects the highest positions in a lesser degree only because these positions have the most comprehensive subjects of activity. A permanent order of battle, a permanent formation of advance guards and outposts are examples of routine methods by which a general ties not only his subordinate's hands, but also for certain cases his own. They may, it is true, have been devised by himself and be adapted by him according to circumstances, but they may also be a subject of theory, insofar as they are based on the general characteristics of troops and weapons. On the other hand, any routine method for drawing up plans for a war or a campaign and delivering them ready-made, as if by a machine, would be absolutely worthless."
> (Ref. 22, p. 90)

FREDERICK THE GREAT
(1712-1786)

> "Frederick's ostensible principle for the formation and management of armies consisted . . . in fear a tergo urging to forward movement."
> (Ref. 23, p. 169)

Frederick the Great influenced the art of war in the area of unit control perhaps as much as any of its practitioners. His greatest contribution to unit control was his insistence upon "iron" discipline and thorough training. There was little patriotic motivation within the Prussian army--it was strictly a professional fighting force one-third composed of foreigners. Because of this lack of identification with the German, or Prussian culture, the soldiers of Frederick required discipline of the harshest kind in order for unit control to be established and maintained. (Ref. 24)

The discipline of the Prussian Army rested upon the principle that:

> "All that can be done with the soldier is to give him esprit de corps, or a higher opinion of his own regiment than all the other troops: since the officers lead him into the greatest dangers (and he cannot be influenced by a sense of honor) he must be more afraid of his officers than of the dangers to which he is exposed."
> (Ref. 25 as quoted in Ref. 17, p. 312)

As noted above, there was little more than hatred of Frederick and his officers evinced by the rank and file. His ability was respected, but he was not liked personally. Yet, in battle, the Prussians fought with inspired courage. The officer corps was an aristocratic one with little sympathy for

the peasant soldiery.[6] However, it was a professional one and its standards of performance of duty were high. Perhaps, in the history of the military art, there is no better example of the attainment of unit control by the use of drill wherein the soldiers became mere automatons responding automatically to the word of command. The soldier was not to think. The officers performed this function for him. One of America's foremost pioneer military theorists commented upon drill in the following observation:

> "Drill is an important means of promoting discipline, but it is merely one of the means, not the end. Many militia organizations noted for expertness in certain drills are not in a high state of discipline, and faultless evolutions are often seen executed on the stage by totally undisciplined people. Drill is an indispensable means of imparting military instruction and promoting military efficiency, but well-drilled troops (though usually) are not necessarily well-disciplined soldiers." (Ref. 25, p. 43)

One of Frederick's great strengths was his highly professional noncommissioned officers corps. While limited in their promotion potential, they were long-serving and faithful. The leavening effect of the noncommissioned officer was felt in each unit throughout the army. In a sense, the officer was the proprietor of the unit and the noncommissioned officer was the foreman. This relationship assured the maximum of unit control.

The organization of the infantry of the Prussian army under Frederick consisted of the infantry battalion of six companies; but in combat the battalion formed into four divisions of two platoons each. The platoon was the firing unit. By adopting an iron ramrod for speedy loading, cutting the skirts of the soldiers' coats so that the men would not interfere with one another while loading in ranks, and reducing the firing line to three ranks, Frederick trained his troops to fire faster than any other troops in Europe.

The following observation with reference to Frederick's infantry is significant as it shows the rate of fire and the fire discipline of the period:

> "One of the most notable points about Frederick's infantrymen was their great fire power. This was due to their constant drill, and to the use of iron ramrods . . . The Prussians could fire six rounds a minute in drill, although it is to be doubted whether they could fire more than four in the field. The range of the musket was under

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[6] The experience of the Continental Army, in the American Revolution with Major General Frederich von Steuben, a product of the school of Frederick the Great, does not seem to confirm this statement. His writings in his Blue Book, at Valley Forge, are replete with references to the kindness with which the commander must treat his soldiers. Von Steuben, the Prussian drillmaster, established the disciplinary pattern for the US Army which survives today.

200 yards. At close range, the volleys of the Prussians were terribly effective; and the bayonet charge clinched the victory."
(Ref. 17, pp. 321-322)

UNIT COMMAND AND CONTROL IN THE PRUSSIAN ARMY - 1745
(Source: Falls)

The use of drill by Frederick, as the basis for unit control on the battlefield is well-stated in the following quotation:

"The whole strength of our troops lies in the attack, and we act foolishly if we renounce it without good cause . . . The one aim of our drill is to enable them to maneuver and form up more quickly than the enemy, to attack him with energy while he is unprepared, and to settle the affair more speedily than has hitherto been the custom."
(Ref. 4, p. 386, emphasis added)

Frederick is, perhaps, more famous for his contribution to the formation of the general staff. While the general staff is the highest military unit level, its influence does reach down to the lowest-ranking soldier in the army. The staff, as an agency of the commander and as a collective intellect for his use does have a direct effect upon unit control. In staffs at all levels of command, the control of the units involved is one of the primary considerations. The basic facet of unit control exerted by all staffs is in their planning function. Well-conceived and orderly military planning begets unit control at all levels of military organization. Another facet of staff functioning is communication. Without communication with the troops, the general cannot function. In the most ancient times, the general, of necessity, had to lead his troops personally in order to communicate his orders and point out objectives. (Ref. 24)

Radical changes in organization and formation were brought about by the introduction of new tactics which, in turn, were of necessity engendered by advancement in weaponry. The fact that Frederick's troops could deliver fire more rapidly than any contemporary army made retention of the old mass, phalanx-like formation too costly in human lives. Dispersion of troops over the terrain then was a direct answer to the problem of high rate of fire and its consequent lethality. But dispersion was not accepted with good grace by the professional soldier until weapons technology forced him to adopt dispersed formations over one hundred years later. His reluctance to accept such innovations was based upon his well-grounded fears that unit control would be lost with their adoption. At the time of Frederick there were no tactical fire units smaller than a platoon and each platoon required a commissioned officer to command and lead (control) it in battle. The solution of breaking the platoon into self-sufficient combat units of squad size, eight to ten men, under command of a corporal or sergeant did not become a fact of military life until after the American Civil War (1861-1865). (Ref. 17, p. 314)

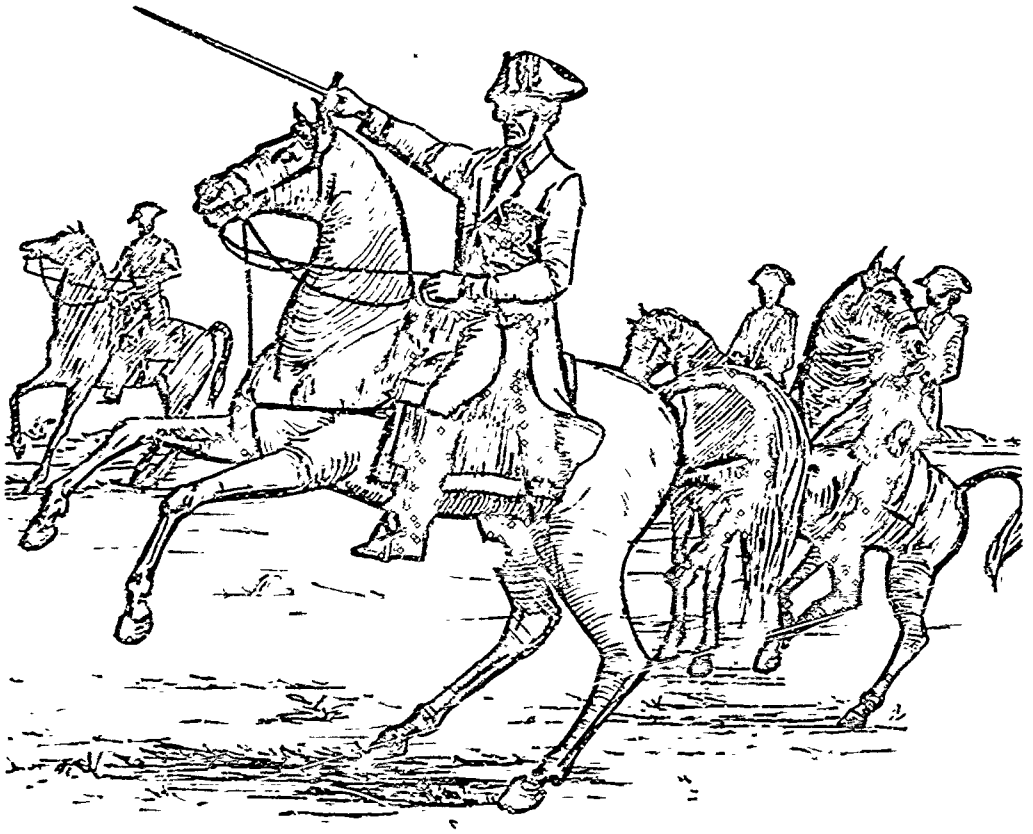
In his military classic Instructions For His Generals, Frederick is explicit and concise in his establishment of doctrine for his senior commanders in order to insure unit control and to win battles. His idea of cantoning the troops, that is, segregating them by units, as they are to appear in the order of battle for the prospective campaign or operation, is a definite and deliberate step in the direction of insuring unit control. Frederick's comment is quoted for the significance it has in the matter of the issuance of field orders:

> "Before taking the field, troops are put in cantonments. From that time the brigade order of battle should be formed and the troops should be in cantonments as if they were ranged under banners, placing the cavalry of the right under a general who receives the orders, the two lines of infantry of the right under a general, the infantry of the left under another and finally, the last commands the cavalry of the left. This shortens the orders so that whatever you want done will be executed with more exactness."
> (Ref. 26, p. 193)

The following order of battle is taken from Frederick's Instructions For His Generals. It includes a march order which contains provision for designation of objectives.[7] This is an early example of the designation of definite terrain features and geographical areas as objectives:

Frederick's contributions to unit control on the battlefield are found in the areas of discipline and his control of the officer Corps.

FREDERICK THE GREAT WITH STAFF



[7] See Appendix B for a copy of a march order issued by Frederick the Great.

PART I

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PART II

THE MODERNS: MILITARY ORGANIZATION, DISCIPLINE, AND UNIT CONTROL

"Fight on, my men," Sir Andrew says,
"And never flinch before the foe;
And stand fast by St. Andrew's cross,
Until you hear my whistle blow."
Anonymous

The French Revolution introduced the modern era in the art of warfare on land. The levée en masse of the Revolution mobilized the entire population and began the era of mass conscript armies. The rigid formations of the old, pre-Revolutionary French army were discarded in favor of the more informal and individualistic skirmish lines and advance guard tactics. This resulted in weakening of the old unit controls and the replacement of the aristocratic officer corps by those of humble origin.

The advent of Napoleon Bonaparte and his "whiff of grapeshot" changed the course of France and the world. Bonaparte introduced the corps d'armée as a means of unit control into the higher levels of military organization. His so doing was not only motivated by a need for a combat unit larger than a division but by his desire to better control his generals. The army corps of Napoleon survived to become a most important tactical unit in the American Civil War, World War I, World War II, and the Korean War. His tactics, as exemplified by General Antoine Henri Jomini in his writings influenced the conduct of the American Civil War.

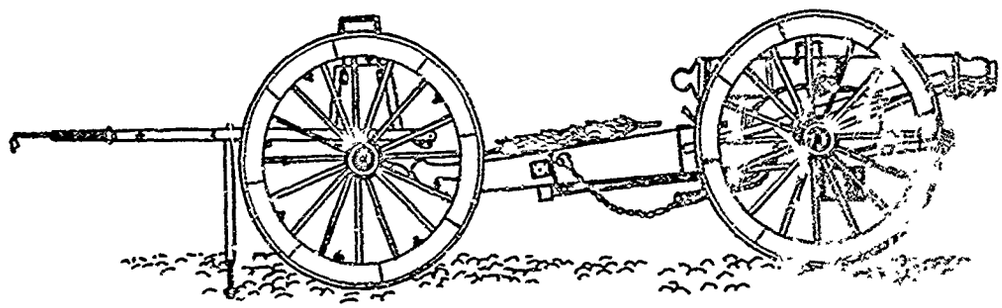
From the earliest times through the Napoleonic period, the primary means of transmitting orders on the battlefield was either by runner or by mounted aide; semaphoric and later rudimentary electrical means were employed only between the army in the field and the seat of government. But early in our own Civil War the Union Army took the lead in the adoption both of the mobile field telegraph, connecting armies, corps, and divisions, and of Major Myer's visual signalling system which extended to smaller units. (Ref. 1)

NAPOLEON BONAPARTE
(1769-1821)

"You know, we French stormed Ratisbon:
A mile or so away
On a little mound, Napoleon
Stood on our storming day."
Robert Browning

Napoleon was a professional soldier who by his competence became an emperor. His contributions to the art of war are well known and do not require recounting here -- except those contributions which affected unit control in battle. As an artillerist, Napoleon understood the working of the infantry, artillery, cavalry combination. The "Little Corporal" massed

his artillery and his infantry. The infantry formation of the French Army of the Napoleonic period was based eventually upon massed battalions of grenadier-type heavy infantrymen firing smoothbore caliber .69 flintlock muzzle-loading muskets of the Charleville and St. Etienne Armory patterns. Accompanying artillery was either six or twelve pounder brass tube, muzzle-loading cannon. The cavalry of Napoleon's army consisted of dragoons, curiassiers, huzzars, and chasseurs burdened with the principal mission of providing the physical shock of horse, rider, and saber colliding with infantry. In his famous "Maxims," Napoleon gives little hint as to the actual methods he employed to gain and assure unit control. Within the units of the Napoleonic period, there were found the usual forms of unit control. The formation, itself, the command structure, the leadership of the various noncommissioned and commissioned ranks, and the discipline and drill -- all these did not differ essentially from those of other armies.



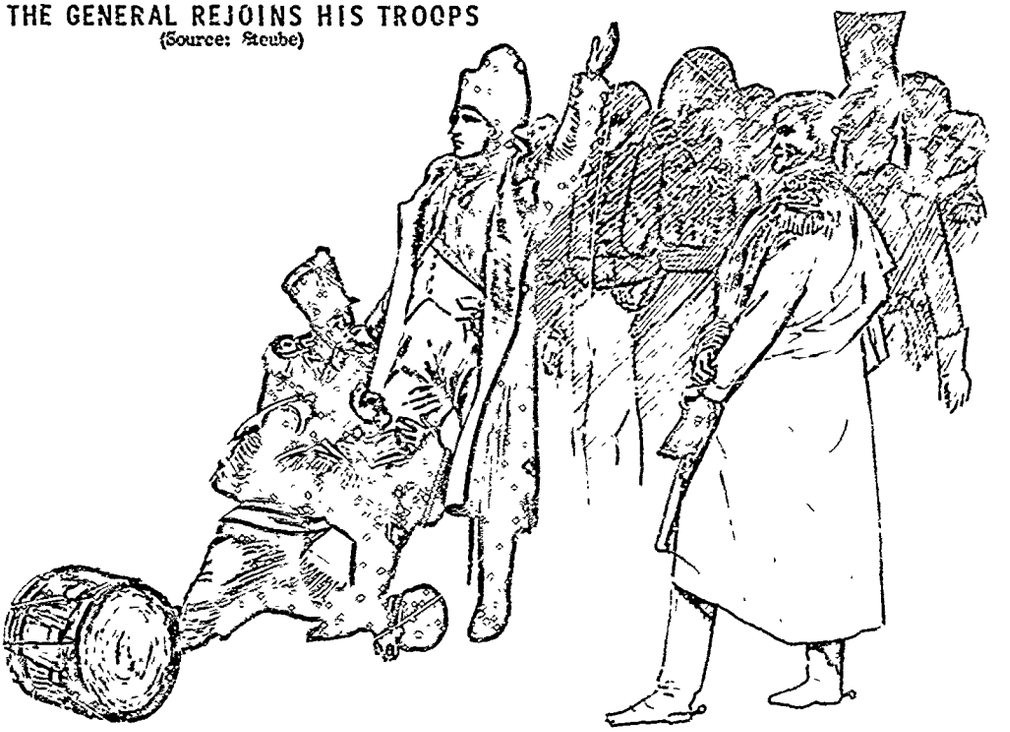
FRENCH LIGHT GUN - 1804
(Source: Mitchell)

On the highest level of command at his headquarters Napoleon utilized a general and special staff organization. His key staff officer was his chief of staff who directed the staff and supervised the operations of the Emperor's headquarters. Always a prolific writer, Napoleon generally dictated his operations plans and battle orders to one of his numerous military secretaries. Written orders were carried to the unit commanders by courier or staff officer. In the heat of battle, staff mounted officers dashed about over the field carrying written orders and oral directives. Stationed on an elevated terrain feature, the Emperor did not lead the troops in person, but rather functioned as the overall commander, or manager, of the battle. The mobile command post of Napoleon was established in a covered chaise or horse-drawn carriage in which the soldier-Emperor lived while on campaign. Earlier in his career Napoleon had successfully led his troops in person at the Battle of Arcola. His reputation for bravery was well-established with the troops and did not require reaffirmation with each battle. In addition to all the intellectual and physical requirements for the practice of his profession, Napoleon possessed what in modern terms is defined as charisma.

> "Few men like him could carry away the common soldier by the charm of their personality. He knew how to inspire his masses with a devotion that defied death.

'His appearance electrified the troops . . . Rarely did any wounded pass him without crying out: Vive l' Empereur! Even the mutilated, who would in a few hours be the prey of death, paid him this homage."
(Ref. 2, pp. 446-447)

THE GENERAL REJOINS HIS TROOPS
(Source: Raabe)



The belief of his troops that Napoleon had the ability to solve any and all their problems created a mystique for him that has persisted to this day. What effect this quality had upon unit control in the Imperial Army is difficult of assessment. There is ample evidence that it existed, that is, the attachment of the "Old Guard" to the person of the Emperor. Charismatic military leadership is not the purpose of this study. However, it may not be gainsaid that the belief of the troops in the military ability of their commander is an elusive but powerful element in any combat leadership situation.

Napoleon's greatest talents were demonstrated in the planning and conduct of the battle and campaign. The control of the units engaged was based upon competent leadership at all unit levels and a high degree of subordination and discipline. These latter qualities were observed by the Emperor's officers and men alike. The use by Napoleon of decorations and battlefield promotions for valiant service was another feature indirectly affecting unit control.

The marshals and generals of the Napoleonic army were most significant factors in assuring the maximum unit control. By virtue of the organization of his army, Napoleon added a new dimension to the tactical

chain of command. This addition consisted of the corps -- until Napoleon, an almost unknown military formation. The corps d' armée organization gave the Emperor an extra and most valuable link in the chain of command. The corps commander, either a general or marshal of the Empire, was directly responsible to Napoleon for the effective employment of the infantry divisions within the corps under his command. Thus, Napoleon was relieved of the problem of directly commanding innumerable division commanders. Instead, he commanded a small group of corps commanders. The following comment is significant:

> "Bonaparte had understood perfectly the disadvantages of the division system and the grouping of divisions when he commanded the Army of Italy in 1796-97.
>
> "After he became First Consul of France, Napoleon gave himself over to working out a new echelon of command. To designate it, he made use, quite naturally, of the word "corps." In January 1800 he directed General Louis A. Berthier, the Minister of War, to establish a "Reserve Army." This army, Napoleon said, was to be composed of three corps and "each one of these Corps will be composed of 18,000 to 20,000 men, inclusive of 2 regiments of huzzards or chasseurs and 16 pieces of artillery." (Ref. 3, p. 56)

The Reserve Army thus constituted, gave Napoleon a force which he could employ at his own discretion. With the 80,000 men available he organized four army corps each of two weak infantry divisions of about 5,000 men strong, together with one brigade of cavalry and one battery of horse-drawn artillery. While Bonaparte did not command any of these corps in person, the plan did give him a strong general reserve which he could use as a tactical pawn in dealing with his generals. Thus, their independent spirit was reduced to dependence upon the Emperor for extra troops in times of crisis. The corps organization tightened the hold and control that Napoleon exerted over his division commanders. (Ref. 3, p. 57)

Napoleon had a further use for the corps organization which he sponsored and that was in the field of logistics. Rather than supplying the divisions directly, he utilized the corps structure for the receipt and distribution of all supplies including ammunition and food. Medical supplies were also furnished through the agency of the corps. But the basic reason for the corps was unit control and by 1815 the corps was established as a high level form of centralized unit control.

> "The corps by grouping the divisions, coordinating their maneuver, and combining their efforts in battle, had permitted a more centralized control to be exercised and had prevented a dispersion of efforts from taking place. It was the latter which had wrecked the division organization when it had been applied to mass armies. The corps organization facilitated and lightened the army commander's task;

it possessed a certain character of permanence and, consequently, a personality."
(Ref. 3, p. 59)

In connection with the introduction of the army corps by Napoleon, it should be noted that the French influence exerted by certain interpreters and translators of French manuals carried the corps d' armee over into the United States Army of the Civil War period. For the second time in American military history, the United States Army was to possess a tactical organization larger than a division. The first instance was in the post-Revolutionary War organization of the United States Army into legions after the Roman pattern -- as advocated by Marshal Maurice de Saxe in his Reveries on the Art of War.

"Headquarters, Nice, 7th Germinal IV

"Soldiers', -- You are naked and ill fed; the Government owes you much but can give you nothing. Your patience, your valour among these rocks have been admirable, but they bring you no glory; not a ray falls upon you. I will lead you into the most fertile plains on earth. You will conquer rich provinces and large towns, there you will find honour and glory and wealth. Soldiers of Italy, will you be wanting in courage or endurance?"
(Ref. 4, p.25)

The above proclamation issued by Napoleon to the Army of Italy on the 27 of March 1796, as he took command, illustrated the basic unit control exerted by the young general. At this point in his career, Napoleon first became important to history. By this proclamation was established part of the mystique and the legend surrounding his person. What effect this type of leadership had upon unit control cannot be accurately estimated but subsequent history has immortalized the achievements of the Army of Italy and later units under his command. From the beginning of his generalship, Napoleon demonstrated a phenomenal grasp of the principles of war and the theory and practice of the art of command. Indefatigible, he was assisted by a staff which evidenced the highest degree of personal devotion to their commander who was to become their emperor. As in all studies of a staff, surrounding a great commander, the responsible head, Chief of Staff, must be subjected to the scrutiny of history. Von Wartenburg describes Louis Alexander Berthier as follows:

"At the head of the staff was General Berthier, forty-three years old, the man who was to retain this post thenceforward during all Napoleon's campaigns . . . he possessed an inexhaustible capacity for work, . . . he was untiring both at the work-desk and in the field, and an experienced master of all the details of military affairs but . . . he was entirely lacking in the gift of

understanding the great thoughts he had to convey to the army."
(Ref. 4, p. 28)

MARSHAL BERTHIER, CHIEF OF STAFF, AT BORODINO

However, it should be noted that, in a sense, General Berthier was more an adjutant general, an expediter of correspondence, than a Chief of Staff. Napoleon performed personally much of the work in person that normally falls to the staff. The other members of the staff were a Chief of Artillery, a Chief of Engineers,and a Chief of the Quartermaster Department. Each of these chiefs had his own staff. Napoleon prescribed the duties of every staff officer at his headquarters. Among his famous Maxims may be found definitions of duty to be performed. The dispatching of orders does not appear to be the function of a chief of staff in a modern-day, military context, but under such a system strict control over units and intimate knowledge of their movements was always available to the commander-in-chief.[8]

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[8] "To know the map well, to understand the function of reconnaissance, to attend the dispatching of orders, to present with simplicity the most complicated movements of an army, these are the things that distinguish an officer qualified to be chief of staff."
Maxims of Napoleon. Paris: Librairie Militaire de J. Dumaine, 1874. (Translated by Colonel S. C. Vestal and First Lieutenant F. J. Brunow, USA. Washington, May 1930.)

Mitchell describes the operation of Napoleon's headquarters in the following extract:

> "When Napoleon traveled, he was surrounded by a suite of aides and orderly officers whose duty it was to carry his orders. He was accompanied in his carriage or on horseback by Berthier or Murat. Two mounted chasseurs carried the most necessary maps and papers in leather portfolios; and a detachment of Chasseurs of the Guard acted as escorts and personal guards . . . In headquarters, he generally found his study ready for him . . . map marked by coloured pins showing the location of the troops . . . was kept posted by the Director of the Survey Department. In the four corners of the room stood tables for his four private secretaries, who were the real transmitters of his orders. While in the field, Napoleon usually went to bed early in the evening and rose about one o' clock in the morning to dictate his orders for the day. This method had great advantages. If he had sent out his orders at eight o' clock, the commanders would have received them in the middle of the night and their rest would have been disturbed. By waiting until one o' clock, Napoleon had the advantage of later information received during the night, and his commanders received their orders soon enough."
> (Ref. 5, pp. 349-350) (emphasis added)

Napoleon was well aware of the need for a system of communications in order that unit control, through the medium of his orders, be effected. In the Napoleonic Army, a system of semaphore signaling devices was used for the long-distance transmittal of messages.[9] However, mounted messengers, both enlisted and commissioned, were considered by Napoleon to be the most reliable for the carrying of his orders to the troops. Antedating Professor Lowe and his American Civil War period balloon were military balloons but their usages and successes were limited. (Ref. 5, p. 352)

The Napoleonic Army was in essence a product of the French Revolution. In this spirit, discipline and organization were initially somewhat informal. The development of the idea of the infantry skirmisher and his action in battle stemmed upon the breaking away of the common man from the rigidity of the old pre-Revolutionary Army. This independence was instrumental in

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[9] See Plum, William R., The Military Telegraph, Chicago: Jansen, McClurg & Company, Publishers, 1882, pp. 15-17 and pp. 21-24, for historical accounts of balloons and semaphore signal systems used in warfare.

the development of new infantry tactics. The splitting up of the battalion square into smaller combat units such as platoons was the inevitable result. Unit controls were exercised by minor officers and non-commissioned officers and there was the beginning of a degree of maneuver away from the parent unit.

> "The French liked column formations, heralded by swarms of skirmishers. They found that their heavy columns would often go through an enemy line like a steamroller. This did not work against the British, especially under the Duke of Wellington. He met the enemy skirmishers with his own light infantry, concealed his line, usually on a reverse slope, until the last possible moment, and protected his flanks with natural obstacles, guns or cavalry. He relied on firepower to repulse the action of the French columns."
> (Ref. 6, p. 300)

FRENCH INFANTRY MUSKET- NAPOLEONIC PERIOD
(Source: Lejeune)

As the campaigns and wars of Napoleon expended more and more of France's manpower, the Emperor was forced by the poor quality of the conscript replacements to return to the old concept of combat, that is, massed, infantry battalions supported by artillery and with cavalry on the wings. Unit control then returned to simplicity of the ancient phalangial mobile human wall. Unfortunately, for the troops engaged in the American Civil War this mass tactical pattern, as reported by Jomini , and compounded by Halleck, was adopted as the best solution to the problem of nineteenth century warfare. Von Wartenburg cites the condition of the Imperial troops at the battle of Dresden in 1813 to be as follows:

> " . . . the qualities of the Emperor's troops were anything but satisfactory, and Napoleon himself was well aware of this, for a few days later, when Monthion, regretting Vandamme's annihilated corps, exclaimed: "It was one of the finest corps of the army," the Emperor answered: "Yes, with

respect to numbers, but with respect to their military qualifications, they were louts, like all the rest. Now only am I beginning to feel the full extent of the losses which I sustained during the last campaign."
(Ref. 2, p. 236)

Lieutenant General Sir John Winthrop Hackett of the British Army in his work, The Profession of Arms has this comment upon the effect of the French Revolution upon the tactics of the times and, hence, the matter of unit control in the Napoleonic period:

"Under the growing threat of invasion . . . conscription was introduced into the French Army in 1793. The nature of the French armies, which were now raised, largely dictated their methods. Masses of ill-trained men could not hope to operate in the closely disciplined linear formations of Frederician mercenaries. The inclination of French Revolutionary troops was to attack. When French columns charged with the bayonet, their aim was total destruction of the enemy, and humanitarian scruples were few. The age of limited war was over."
(Ref. 7, p. 39)

One of the most effective methods of unit control employed by Napoleon was his constant study of unit muster-rolls. Submitted to the Emperor on a monthly basis, these documents were read by him on a priority basis. By comparison with previous reports, the validity or invalidity of the muster-rolls was established. Literally, the Emperor maintained a primitive personnel accounting system in which all fighting units of the army were counted. There were account books for general officers, staffs, and special troops. In effect, Napoleon instituted a personnel accounting system as a strict method of unit control from the administrative point of view. That errors were discovered is seen in the following:

"In spite of the care with which the muster-rolls were made out, Napoleon discovered errors in them and did not fail to point these out to the Minister of War. 'I have found in the muster-rolls,' he wrote on February 2, 1812,' seventeen companies of the train of artillery back from Spain, but you find only nine. That shows the error committed by the office which draws up the muster-rolls when they set down as carried out movements which are only ordered. I have already several times pointed out similar errors, and this shakes my confidence in the work of this office.[10] I approve and I desire that it should write its observations

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[10] Napoleon to General Clarke, Minister of War, February 2, 1812, as quoted in Vachée, Colonel, Napoleon At Work, (Trans. by G. Frederick Lees) London: Adam and Charles Black, 1914, p. 161.

and the indications of orders given in red ink, but it must risk nothing and only set down in black ink what exists." (Ref. 8, p. 161)

Theodore Ropp in his War in The Modern World discusses the quality of the Grand Army of 1805 and concludes that it was Napoleon's best. From the point of view of command and control, Professor Ropp indicates the age factor as it pertained to the leading marshals and generals of the Empire. The oldest, Massena was fifty years of age and Marmont, the youngest, was but thirty-two. Six of the nine marshals had been officers of general rank since 1793. Their combat leadership potential was therefore impressive -- not only from the factor of length of service but of experience in war. In spite of the command and staff system as established, Napoleon, according to Jomini,

> " . . . was his own chief staff officer. Provided with a pair of dividers opened to . . . the scale of from seventeen to twenty miles in a straight line . . . bending over and sometimes stretched at full length upon his map where the positions of the enemy were marked . . . he decided in a moment the number of marches necessary for each of his columns to arrive at the desired point by a certain day. Then, . . . he dictated those instructions which are alone enough to make any man famous."
> (Ref. 9, Jomini's Art of War, pp. 139-140 as, quoted in Ropp, Theodore, War in The Modern World Durham: Duke University Press, 1959, p. 101)

Napoleon, notwithstanding the staff organization mentioned, did not develop a proper staff system. His greatest fault in this respect was his inability or unwillingness to delegate authority to his subordinates. This latter failure is fatal to the continuation of a successful military organization. It was so in the case of Napoleon. Eventually, the Emperor found himself surrounded by a group of military adventurers whose love for glory was equalled by their love of gold. (Ref. 9, p. 107)

In the French Army under Napoleon much was added to the quality of control by the establishment of elite units, such as, the "Old Guard," the "Middle Guard," and the "Young Guard." Their places in the line of battle were always those traditionally reserved for the best troops. Their post of honor was found generally where the hottest fighting raged. Their motto was, "The Old Guard Dies, but It Never Surrenders." The primary mission of these elite units was to protect the person of the Emperor. At Waterloo June 16-18, 1815, the "Old Guard", the "Middle Guard", and the "Young Guard" units were all committed in a last desperate measure to stem the inevitable disaster. But they were too late to save Napoleon.

> "He had raised the stakes by committing at least a part of the Old and Middle Guard, this added force must have turned the scales. Instead, Wellington was granted a respite in which to reorganize his line and

NAPOLEON AND THE OLD GUARD
(Source: Mitchell)

fill the gaps. Moreover, Zieten's corps came up belately on the left, thus releasing two cavalry brigades to strengthen the centre. When soon after 7 p.m., the Guard did advance, it was too late; the chance had gone. The French first echelon was repulsed by Colin Halkett's brigade and a Dutch-Belgian brigade; the remainder were seen off by Maitland's Guards . . . The Young Guard valiantly held Plancenoit until nightfall, so preventing Blucher from cutting Napoleon's line of retreat. Three squares of the Old Guard -- General Cambronne to the fore -- resisted for a while, and covered the Emperor's departure; but the rest of the Armée de Nord fled in great disorder . . ."
(Ref. 6, pp. 150-153)

Vachée in his definitive volume Napoleon at Work concludes his penetrating analysis of the motivations and performances of Napoleon and his command group, or staff in the following words:

"The Commander-in-Chief must not cease to exercise in the course of the battle the superintendence indispensable to ensure a concordance of efforts and the afflux of superior forces to the decisive point. He must constantly set his subordinates right concerning the

general situation, the development of the action and his intentions. He must watch over the execution of his orders which are often counteracted by a thousand unforeseen circumstances, put right errors of direction and quicken or slacken the movement of one or the other army. On their side the subordinates must keep the commander acquainted with their particular positions, the movements they have in view, and any serious or imminent events. These constant communications will alone establish unity in the command."
(Ref. 8, pp. 300-301)

The cogent observations made by Vachée, after his study of the operation of Napoleon's headquarters are as valid today as then. The impetus for effective unit control comes down from the top to the bottom level of the military hierarchy. Napoleon Bonaparte exemplified this vital principle in his exercise of command in battle and or campaign. His pre-occupation with multitudinous details was a fault of Napoleon as a commander. There were other failings, but the two mentioned stand out as the most significant. His inability to use his staff for many of the details occupied precious planning time which could be ill-spared. Yet, there were areas of staff usage wherein Napoleon was generations ahead of his time. Among these were: communication and the transmission of field orders. These areas were all vital to Napoleon's ability to exercise unit control, at every level of command. They are applicable today.

UNIT CONTROL AT WATERLOO
(Source: Quatre Bras)

General J. F. C. Fuller of the British Army in his Conduct of War 1789-1961 analyzes the Napoleonic concept of command and control. Fuller's general thesis is that the wars of Napoleon became so protracted, drawn out and complex that they were no longer capable of being controlled or managed by one commander – genius or not. This comment points up the lack of full participation on the part of Napoleon's staff in his planning and plans.

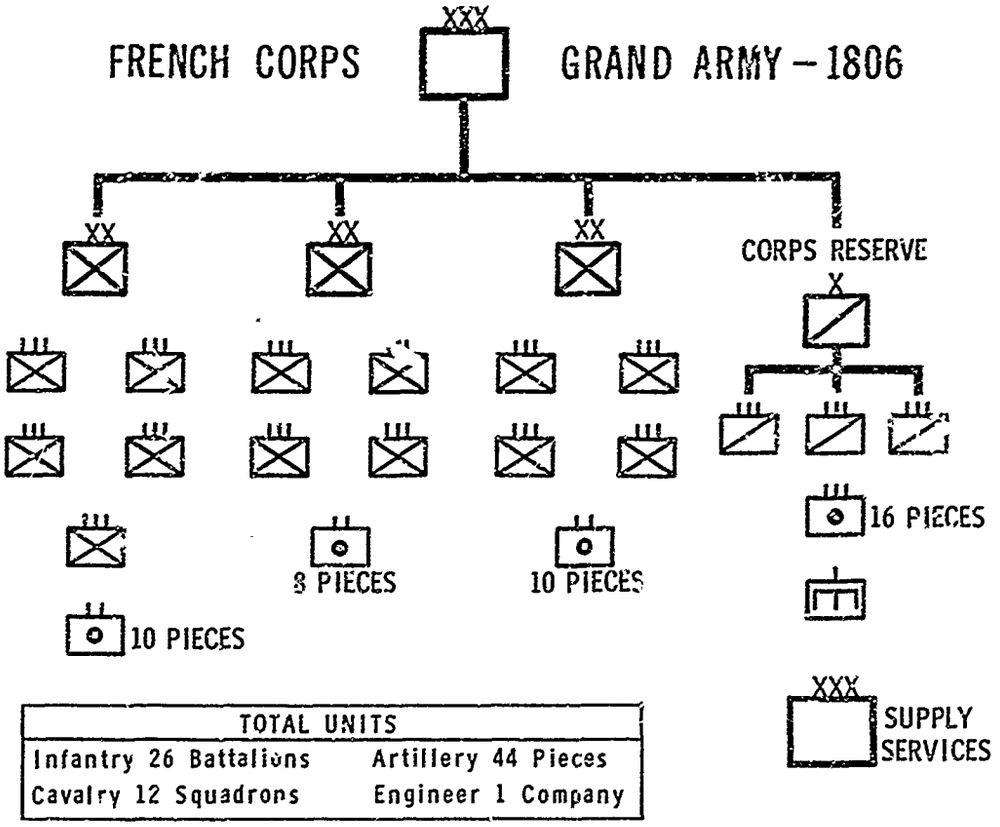
Colonel Vachee as quoted by Fuller corroborates this thesis with his notation that:

> "The staff in no way participated in the Emperor's intellectural work; it was never taken into his confidence; it had but to obey scrupulously. 'Keep strictly to the orders which I give you; I alone know what I must do.' Such were Berthier's orders (as Chief of Staff.)"
> (Ref. 10, pp. 53-54, parentheses added)

The contributions of Napoleon to the concept of staff control and operations were basic and fundamentally sound – as far as they went. As noted, he never developed a staff in the modern sense. His penchant for doing the various staff functions himself and his failure to delegate authority eventually led to his downfall as a military commander and abdication as Emperor of France. In the area of unit control, Napoleon's establishment of the army corps as a major combat unit was his most significant contribution.

In the chain of command, the corps commander was responsible directly to Napoleon for the conduct and operations of the division commanders under the corps. This relieved the commanding general of time-consuming details and gave him overall management of the battle. Napoleon retained control of a small but powerful reserve force for use of the corps when requested or when the Emperor saw fit. This was a good ploy for use against division and corps commanders. The corps, as envisioned by Napoleon, has survived to the present time. This survival, in itself, is something of a tribute to the man who devised it and to its effectiveness as an organizational means for unit control.

> "In 1805, during the Ulm Campaign, Napoleon was at the peak of his powers as a field commander. This was attested to by the fact that he personally commanded a military force consisting of six army corps, a cavalry reserve, and the Imperial Guard. At this time, he was thirty-six years of age and possessed full mental and physical vigor. His subordinates were those whom he could trust with the carrying out of his plans. Because of these important conditions, he could function successfully as a commander exercising control over a span of eight subordinates.
>
> "Later at Waterloo, the Emperor had available five corps plus a large cavalry corps and a very large Imperial Guard. But he was now 46, worn by 20 years of campaigning and political intrigues, and lacked complete confidence



TOTAL UNITS	
Infantry 26 Battalions	Artillery 44 Pieces
Cavalry 12 Squadrons	Engineer 1 Company

"in some of his subordinates and in his new chief of staff. For these and perhaps other reasons, Napoleon divided his army into two wings so that he controlled directly only these two wings and the reserves. In the same battle, it might be noted, Wellington directed two corps, a cavalry corps, and a reserve, while Blucher's Prussians were organized into four corps. It is a fair summary of the Napoleonic period to note that early in this era the average commander controlled from five to seven or more subordinate elements, while near the end of the period, perhaps through accumulated experience, the average span of control was nearer four subordinates."
(Ref. 1)

THE AMERICAN CIVIL WAR

(1861-1865)

> "One glance at the eager face and familiar black horse and they knew him and, starting to their feet, they swung their caps around their heads and broke into cheers as he passed beyond them: and then gathering up their belongings started after him for the front, shouting to their comrades farther out in the fields, "Sheridan! Sheridan!"
>
> General G. W. Forsyth

The American Civil War (1861-1865) was the first major war fought with modern and scientific inventions and improvements. The electric telegraph, the railroad, the steamship, armor plate, balloons, and the use of novel and highly effective weaponry distinguished the conflict known also as The War Between The States. (Ref. 11, p. 189)

In spite of the advancements made in the field of invention including the area of weapons, the tactics had not kept pace. The tactics of the Civil War were essentially Napoleonic in concept and the maneuver of the huge armies was based largely upon the tactical writings of Antoine Henri Jomini, the chief of staff of Marshal Michel Ney who was one of Napoleon's principal field commanders.[11]

"COME ON BACK, BOYS, GIVE 'EM HELL"

Jomini in his Summary of The Art of War which was carried in the saddlebags of most generals and colonels of the Civil War had this to say about the best formation for an infantry attack:

> "There are, in fact, only five methods of forming troops to attack an enemy: (1) as skirmishers:

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[11] Jomini, Antoine Henri, Summary of The Art of War, Harrisburg: Military Service Publishing Company, 1952.

(2) in deployed lines, either continuous or checkerwise; (3) in lines of battalions formed in column on the central divisions; (4) in deep masses; (5) in small squares . . . numerous improvements have been made in the arms of both infantry and artillery, making them much more destructive. The effect of this is to incline men to prefer the shallower formations, even in the attack. We cannot, however, forget the lessons of experience. Notwithstanding the use of rocket-batteries, shrapnel-shot, and the improved musket, I cannot imagine a better method of forming infantry for the attack than in columns of battalions. Some persons may perhaps desire to restore to infantry the helmets and the breastplates of the fifteenth century, before leading them to the attack in deployed lines." [12]
(Ref. 12, p. 149)

In the above extract from Jomini it will be noted that the Napoleonic use of columns and masses for unit control in the attack was continued. There was no provision for more effective unit control by the organization of the eight-man infantry rifle combat squad as accomplished by Major General Emory Upton after the American Civil war. The only suggestion of any type of individual control was contained in Casey's Tactics which recommended that:

" . . . The interval between skirmishers depends on the extent of the ground to be covered; but in general, it is not proper that the groups of four men should be removed more than forty paces from each other. The habitual distance between men of the same group in open grounds will be given paces; in no case will they lose sight of each other.
(Ref. 13, p. 184-185)

The regular army infantry regiment of the Civil War period was organized into two and sometimes three battalions. There were eight companies authorized for each battalion. The strength of the infantry company was 100 men, and three officers each, hence, the strength of the battalion totalled 800 men and 25 officers including the battalion commander --- a major. The total strength of the regiment was 2,020 as a minimum and 2,452 as a maximum.

In the Volunteers, or state troops, the regiment comprised a total of ten companies. There were no battalions as such and the colonel, as regimental commander, was assisted by a lieutenant colonel as his second-in-command. In the regiment, the staff shown below functioned to command, control, and administer the unit.

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[12] Armor breast-plates were purchased privately and worn by soldiers in the Civil War.

THE COLONEL FILLS A GAP
(Source: Castaigne)

Staff of the Regiment [13]

1 Colonel	1 Chaplain
1 Lieutenant Colonel	1 Sergeant Major
1 Major	1 Quartermaster Sergeant
1 Adjutant, in charge of the rolls	1 Commissary Sergeant
1 Quartermaster	1 Hospital Steward
2 Assistant Surgeons	2 Principal Musicians

The span of control of the regimental commander extended to the ten company commanders of the regiment. However, it should be noted that the regimental staff served to assist the regimental commander with the problems of administration. The rather extended span of control was compensated for in the fact that the regimental commander had face-to-face contact with his principal subordinates.

The company of the volunteer infantry regiment was organized on the basis of a maximum strength of 82 privates. The minimum strength in privates was established at 64. The company was commanded by a captain who was assisted by a first lieutenant and a second lieutenant. The noncommissioned officers and assigned musicians included a first sergeant, 4 sergeants,

[13] As observed by General F. V. A. de Chanal of the French Army during his tour with the Union forces.

8 corporals, 2 musicians. A wagoner was assigned with the responsibility for maintenance and repair of the company wagon. The span of control of the company commander actually extended to his first sergeant and the two lieutenants who were platoon commanders. The rifle squad as known today was not then in existence. The drill manuals of Casey, Hardee, and others written before the Civil War suggested that in the company the soldiers stay together in battle in groups of four. Casey's Tactics provided:

> "Whenever a company is to be deployed as skirmishers, it will be divided into two platoons, and each platoon will be subdivided into two sections; the comrades in battle, forming groups of four men, will be careful to know and to sustain each other."
> (Ref. 13, pp. 184-185)

From the above, it will be seen that in battle the company commander had a span of control of two principal subordinates -- the two platoon commanders. Within the platoons, which were formed for skirmish drills, the lieutenants commanded a maximum of 41 men each. With two sergeants and four corporals assigned to each platoon, even without the formal squad organization of the post-Civil War period, the one-half squads, or groups of four "comrades in battle" received a modicum of command supervision. The span of control of the lieutenant in each platoon covered two sergeants and four corporals.

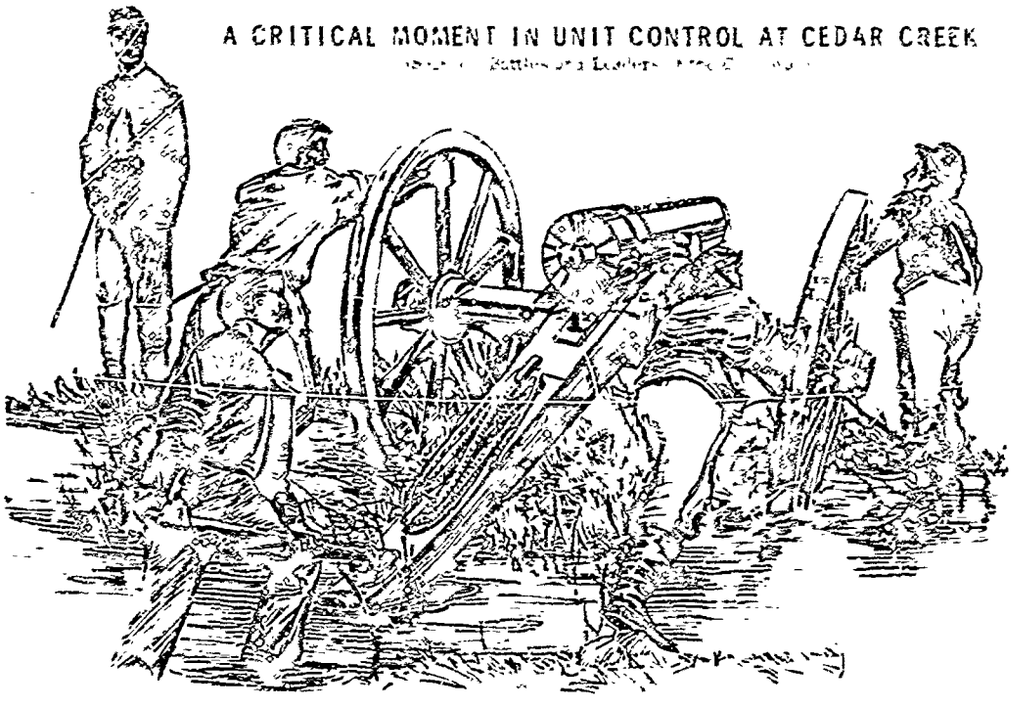
In April 1863, the War Department prescribed that the artillery regiment of the Volunteer service would comprise 12 batteries. The regiment was commanded by a colonel who was assisted by the following staff:

1 Lieutenant Colonel	1 Chaplain
3 Majors (1 for each 4 batteries)	1 Sergeant Major
1 Adjutant	1 Quartermaster Sergeant
1 Quartermaster	1 Commissary Sergeant
1 Surgeon	1 Hospital Sergeant
2 Assistant Surgeons	2 Principal Musicians

From the above table of organization, it will be noted that the artillery regimental commander's span of control included four principal subordinates. The function of the artillery was somewhat more technical than that of the infantry. Contact with the enemy was indirect. Personal action by the artillery commander was not as frequent as that of the infantry commander whose unit was engaged face-to-face with the enemy. Artillery in the support of the infantry could count upon the supported unit for protection. However, when the infantry gave way, the artillery was often overrun with the gunners fighting to protect their pieces, or to withdraw them under fire.

Infantry units were armed with .58 caliber, muzzle-loading rifled muskets which fired the improved and highly accurate Minie bullet. The infantry of both armies stood up, in formation, and slaughtered each other at distances ranging from thirty paces to one hundred yards. The following extract is significant of the times.

A CRITICAL MOMENT IN UNIT CONTROL AT CEDAR CREEK



"In the heat of the conflict, no changes were made in regimental organization, despite the fact that it was soon recognized as unsuitable. Improved firearms forced regiments and their companies to disperse to such an extent that officers could not effectively exercise control over them. Once a regiment deployed, it was too big for one man and his staff to control. This fact helped to cause a high casualty rate among general officers, since the only way they could influence an assault, or rally a broken line, was to place themselves where everyone in the command could see them. At such times the enemy's sharpshooters saw them equally well." [14]

(Ref. 14, p. 23, emphasis added)

In the United States Army, in 1861, there was not an officer who had experience in commanding large brigade or division type troop units in the field. The exception to this statement was General Winfield Scott, the hero of the Mexican campaign, who was the senior officer of the Army but was too aged and too ill to exercise field command. General Irwin McDowell, the

[14] Alexander and Caesar were noted for fighting in the ranks in an emergency. See Appendix F for copy of an order directing that Army Corps Commanders personally supervise certain combat operations.

Union commander at Bull Run in 1861, testified afterwards that:

> "There was not a man there who had ever maneuvered troops in large bodies. There was not one in the Army. I did not believe there was one in the whole country. At least, I knew there was no one there who had ever handled 30,000 troops. I had seen them handled abroad in reviews and marches, but I had never handled that number, and no one here had."
> (Ref. 15, pp. 256-257)

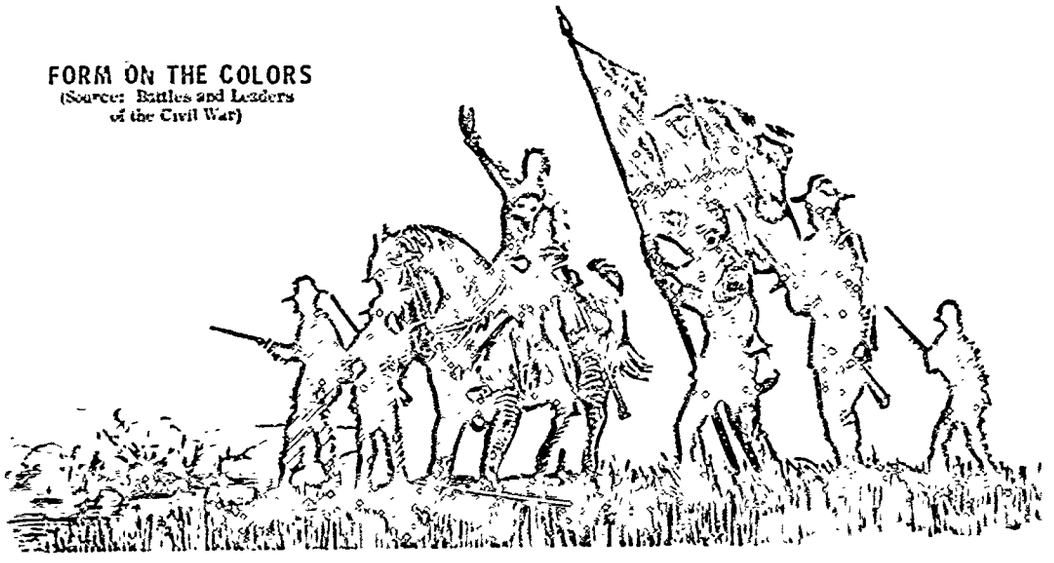
Brigade, division, and corps commanders had to be trained to command and maneuver their troops in the hard school of combat. This was costly in human lives and materiel. In spite of the complicated mass tactics of the day many generals became skilled as higher unit commanders. Often, due to the tactics then in vogue, their leadership was most direct and personal. There was a modicum of staff activity at each higher level with a chief of staff who, much in the Napoleonic manner, was in reality an adjutant general. The division of staff labor into its modern G-1, G-2, G-3, G-4, and G-5 sections had not as yet appeared in a definitely recognizable form. At first, there was little evidence of what is termed today "completed staff work" but as the war wore on staffs improved and so did the quality of the written combat orders emanating from their commanders. See Appendix D for Staff Organization of the Army of the Potomac.

In the United States before and during the American Civil War, writers on tactics and strategy were influenced by the French school of thought in these matters. Translations of French army manuals and training literature perpetuated the Napoleonic tactical patterns. Thus, the corps d' armee organizational concept was adopted by the military establishments of the United States and the Confederacy. A French Army observer noted that:

> "Our methods have been copied very exactly. It will be readily seen that the American troops having been continually in a state of war, can not in matters of drill be compared to European troops. Those organizations, however, which were drilled in the various forts and depots before joining the army, are well enough instructed.
> (Ref. 16, p. 26)

The addition of the army corps, of three or more divisions, to the order of battle of the United States Army was unusual from several points of view. First, and perhaps foremost, there was no suitable general officer rank for the commander of a corps. Normally, the corps command would call for a general officer rank above major general, that is, lieutenant general. This was impossible as the highest general officer rank in the United States Army at that time was lieutenant general. Therefore, the command of an army corps was given to a senior major general. However, the needs of the service often precluded the assignment of the senior officer present

FORM ON THE COLORS
(Source: Battles and Leaders of the Civil War)



to the post. As a result, there was much dissatisfaction and hard personal feelings among the higher echelons of command. The haggling over seniority and rank became so serious that certain generals refused to serve as division or corps commanders under corps or army commanders whom they ranked. The following message is significant:[15]

> HDQRS. 20th ARMY CORPS, ARMY OF THE CUMBERLAND,
> Near Atlanta, Ga., July 27, 1864
>
> Brigadier-General Whipple:
> SIR: I have just learned that Major-General Howard, my junior, has been assigned to the command of the Army of The Tennessee. If this is the case, I request that I be relieved from duty with this army. Justice and self-respect alike require my removal from an army in which rank and service are ignored. I should like to have my personal staff relieved with me.
>
> JOSEPH HOOKER,
> Major-General

Following precisely the French tradition of the organization of the corps d'armee as advocated in Jomini, Halleck, Casey, Mahan, and Hardee, the Union and Confederate armies were to fight the war and assure unit control by means of the corps formation. The corps, brigade, and division as constituted in the Union Army were as follows:

> ". . . the regiments, each of which, when full, contain 1,046 men; four of these composed a

[15] Records of The Rebellion, Series I, Vol. XXXVIII, Part V, p. 273.

> brigade; three brigades were taken to form a division, and three divisions constituted a corps. This system was not always rigidly adhered to. Sometimes a corps had a fourth division, but such a case would be a deviation, and not the regular plan. So, too, a division might have an extra brigade."
> (Ref. 17, p. 179)

With reference to the above, it should be noted that the organization as cited was that of the Army of the Potomac commanded by Major General George B. McClellan. The usual organizational structure for the brigade was three, rather than four regiments.

In the Civil War, the armies and corps did not always operate in accordance with the book. The modern term "span of control" had not as yet been invented to explain how far the influence of a single commander could extend under the uncertain conditions of combat. The number of subordinates who can be successfully commanded by the senior officer determines the basic span of control. The factors of organization and communication must be in favorable relationship to the human factor of leadership -- if military control of individuals and units be maintained. However, it should be noted that the span of control has not depended historically and entirely upon the factor of communication. Lack of means and methods of battlefield communication simply meant that more direct and personal leadership was required if the commander was to communicate his desires to his troops. In spite of the new and unusual communications media in use during the Civil War, division and Corps commanders in the field often had to revert to the direct and forceful leadership of an Alexander or a Caesar as observed by General de Chanal:

> "During the attack on the heights of Fredericksburg, General Meade . . . who commanded the right wing, had pierced both of the enemy's lines and nearly reached his trains. At this point, his soldiers, perceiving that they were alone and that the center and left had been repulsed, took to their heels and fled in disorder. General Meade made vain efforts to reform them between the first and second lines, and furious at their conduct, charged upon them and broke his sword over their heads. One month later a deputation of these very soldiers presented itself at the general's tent and begged him to accept, in exchange for the weapon which he had lost through their disobedience, a magnificent sword which they had obtained by a subscription of no less than eighteen hundred dollars. Upon the guard was engraved the date and place of the battle.
> (Ref. 16, p. 228)

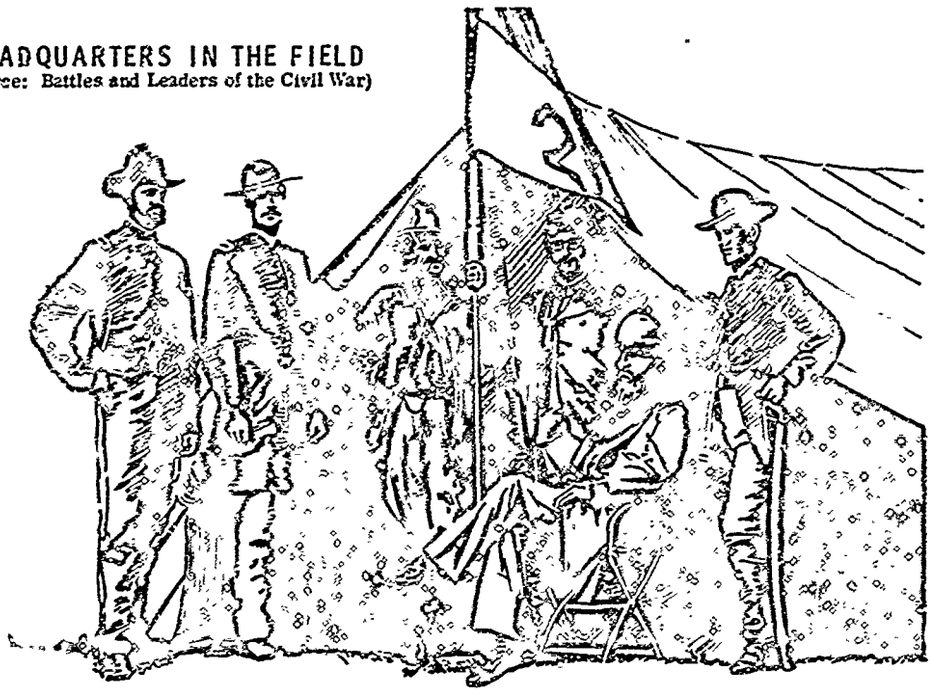
General George B. McClellan, the commander of the Army of the Potomac, commanded an army of seven corps. This was an almost Napoleonic span of control. General McClellan was called, by some, "The Little

Napoleon!" Its considerable burden may have accounted for the indecision and slowness of the general. Direction of seven subordinate corps commanders was a tremendous personal responsibility which demanded military leadership of the highest order. The verdict of history has given General McClellan a secure place as a military organizer. His position as a troop-training leader is unimpeachable. His ability to communicate his desires and wishes to his troops in combat has been questioned. The following extract explains by historical example the effect of the human factors upon the span of control of a commander in the field:

> "McClellan believed in a large span of control; and upon his relief from command, he turned over to General Burnside an army of seven corps. Burnside had been a capable division and even corps commander, but he greatly feared his own limitations in command of an army. One of his first moves was to reduce his span of control by reorganizing the army into 3 "grand divisions" of 2 corps each, plus a reserve corps, which gave him 4 immediate subordinates. Despite this organization, Burnside failed at Fredericksburg, and in turn gave way to General Hooker, a man of mediocre talents but of boundless self-confidence. Hooker scoffed at the grand divisions and reorganized the army into its original seven corps. Hooker was not the tactician he thought he was; and at Chancellorsville, he lost control of the battle completely, ruining a good strategic plan through ineffective tactics and failure to utilize and control all his corps. Thus, in 6 months the Army of the Potomac had been under 3 commanders, had experienced no significant changes in signal methods, and yet had seen the Army span of control decreased and increased for purely human reasons -- ability (real or imagined), self-confidence, and confidence or its lack in the commander's staff and his subordinates." (Ref. 1)

The next higher unit in the military organizational structure of the period was the field army. This unit was the largest tactical formation in both armies. In the Federal Army, field armies were named after geographical features such as rivers, that is, The Army of the Potomac; the Army of the James. With the exception of the Army of the Potomac, field armies were comprised generally of three army corps. The average strength of an army corps in 1863 was about 16,000 men. In the Confederate service, Corps were numbered but divisions and brigades were often named after the general commanding. (Ref. 18, p. 57)

HEADQUARTERS IN THE FIELD
(Source: Battles and Leaders of the Civil War)



The Army Corps of the Civil War period was one of the first military tactical formations of the United States Army to adopt badges for purposes of identification and unit control. Corps badges of colored cloth were cut in various designs and shapes – each symbolic of some facet of the corps tradition or battle history. The value of the corps badge in unit control as worn by the individual soldier lay in its identification function. The soldier, as he became a veteran campaigner, prided himself in his right to wear the badge of his corps. Psychologically, the badge functioned to keep the soldier from committing acts such as cowardice or desertion which were disgraceful to the reputation of his unit – as symbolized by the badge.[16] General Philip Kearney of the Union Army is credited with the idea of the unit identifying badge. Tradition has it that General Kearny furnished a red blanket from which the badges for his unit were made. (See Appendix E for Army of the Potomac circular.) (Ref. 17, pp. 181-182)

In addition to the creation of unit badges, each brigade, division, corps, and army eventually devised distinctive unit flags. These were strictly for identification of the unit in action and were generally carried with the

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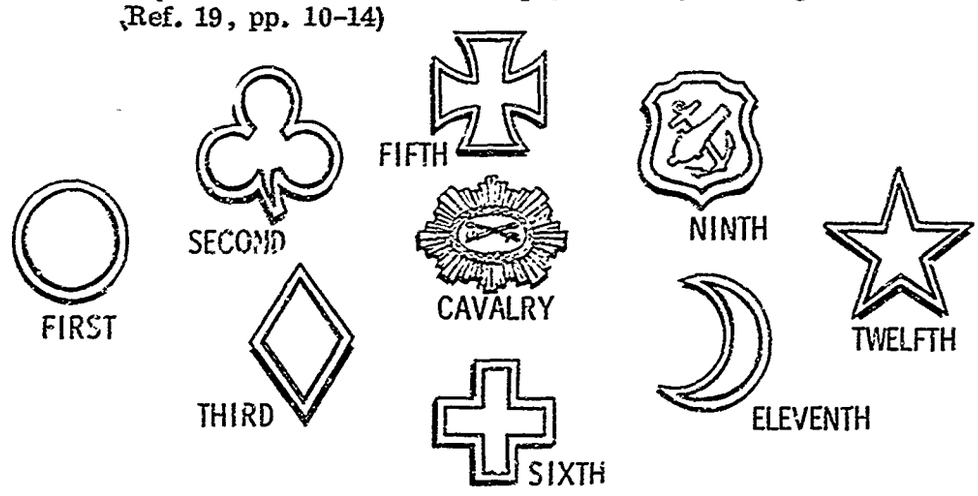
[16] An order issued at Falmouth, Virginia by order of General Hooker is quoted: "Provost-marshals will arrest as stragglers all other troops found without badges, and return them to their commands under guard."

commanding general's command group or staff. While not as symbolic, as the national and regimental battle colors, these banners did carry upon their surfaces something representative of the unit. Often it was merely the unit number upon a multi-colored background. The use of these flags was limited to headquarters identification and location. In actual practice, they were termed "designating flags." The following extract will explain the variations among the flags of the armies:

> "Among these variations might be considered the field of designating flags of the Union armies. Flown in both camp and field at headquarters and carried near the commanding officer in battle, these multi-colored flags, guidons, pennants, and standards distinguished the various corps of an army and that corps subordinates from those of another corps, and within the corps distinguished the headquarters of the three major levels of command: corps, division, and brigade." (Ref. 19, pp. 10-14)



In essence, the "designating flags" performed the same function for the higher units as the individual patches, or badges performed for the officer and soldier. Thus, the control function on high unit level was established and strengthened by the physical designation of the exact location of the post of the responsible commander. Knowing that the battle position of the commander was where the unit flag was flying created a degree of confidence and hope for those subordinates who were looking to him for leadership and decisions. General Order No. 102, Headquarters Army of the Potomac, 24 March 1862, Paragraph XI reads that the flags prescribed therein would be:

> ". . . habitually displayed in front of the tent or from some prominent part of the house or vessel occupied as the headquarters which they designate, and on the march shall be carried near the person of the officer commanding the corps, division,

brigade, or regiment it is intended to designate."
(Ref. 19, p. 10)

The most prominent military theorist and writer on the American scene before the Civil War was Henry Wager Halleck a West Point graduate who had resigned from the service and engaged successfully in the practice of law. His published writing in the military field had been concerned with an interpretation of Jomini and a learned treatise on the subject of international law and the law of warfare. His military writings earned Halleck the nickname of "old brains" and a reputation as a military intellectual of the first rank. On this basis, he was appointed a Major General in the regular army and brought to Washington by President Abraham Lincoln. Halleck's function was to be the Chief of Staff in replacement of the ailing and aging old soldier Winfield Scott who had asked to be relieved from all military duties due to the infirmities of age. The appointment of General Halleck as Chief of Staff was the first direct step taken to establish a degree of centralized unit control in Washington. Halleck with his reputation for military sagacity was to control the forming armies which would eventually grow into huge sprawling masses of volunteers. (Ref. 20, pp. 1-10)

Halleck was essentially a theorist of the Jominian school. His concepts were of war on the grand scale with interior and exterior lines, etc., much of which served only to impress the strategists and tacticians of the day. Yet, Halleck's contribution to the subject of unit control during the Civil War was invaluable.[17] In essence, he became, in a modern sense, a manager of violence, rather than a dashing commander leading his troops in person. His presence in Washington, while not appreciated by many, served to bring order to the chaotic military situation existing in the initial stages of the war.

The following quotation from Ambrose is revealing:

> "He (Halleck) was certain that he understood war and could control the course of the conflict; he knew that he would command respect in Washington. Business man, lawyer, politician, statesman, soldier - he spoke the language of all. The army officers and Washington leaders considered him the foremost exponent of the art of war in America. Halleck never doubted that the war would be a limited one, fought along the lines he had so carefully absorbed from Jomini!"
> (Ref. 20, p. 10, parentheses added)

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[17] Halleck in his Elements of Military Art and Science published first in 1846 and later reissued in 1861, had the following comment upon the subject of infantry:

> "The infantry of the line acts in masses, and, on the field of battle, constitutes the principal fighting force."
> (Ref. 21, p. 260, emphasis added)

For the greater part of the Civil War, the infantry fought in mass formations and as a result sustained terrible battle losses. Unit control under such circumstances was essentially that exerted by the voice of the immediate commander. Signals for the subordinate units were transmitted by bugle or drum. In essence, the mass formation was rigidly adhered to because of the need for unit control. How units could be controlled on the battlefield in other than a mass formation was not stated in Jomini or Halleck.

A contemporary of Henry Wager Halleck was Dennis Hart Mahan a West Point graduate who had become Professor of Military and Civil Engineering, and of The Art of War at The United States Military Academy. As a military theorist, he had produced in 1847 a volume entitled Advanced-Guard, Out-Post and Detachment Service of Troops With the Essential Principles of Strategy and Grand Tactics. This small book republished in the Civil War period exerted considerable influence upon the subject of unit control in the field. While not as widely used as Jomini, Mahan's writings were influential as they were sought after and employed by his former cadets at the Military Academy, many of whom had risen to general officer rank in the struggle between the states. Mahan in his chapter "Manner of Placing and Handling Troops" had this to say in relation to the formation of a unit:

> "On the field of battle, whether the object be to attack, or defend, the infantry is divided into three bodies; an advanced-guard, the main-body, and a reserve. Their relative proportion will depend upon the total force, and the character of the position occupied. The advanced-guard must be of sufficient strength to hold the enemy in check, but, at the same time, the main body, upon which the brunt of the action should fall, must not be left of insufficient force, by unnecessarily increasing the advanced-guard; and the reserve should be strong enough to repair any disaster that may befall the main body; or to profit by its success in accomplishing the complete overthrow of the enemy."
> (Ref. 22, p. 48)

Mahan recognized that the terrain influenced to a marked degree the amount of interval to be prescribed between the elements indicated above. On undulating ground which would mask the troops from hostile fire, he believed that intervals could be reduced from 150-300 paces to 80 or 100 paces. Such reduction of the intervals on account of the nature of the terrain would contribute effectively toward better unit control.

In the infantry attack, Mahan prescribed the same formations, as for the defense. One caution, however, the advance guard skirmishers should not be deployed until they were near enough to the enemy to deliver fire. As the skirmishers engaged the hostile line, they would be strongly supported by the other elements in the attacks. The skirmisher, in battle, becomes one of the most important elements of the advance. Being semi-independent, it is important for the understanding of unit control that something of the

skirmisher's nature and employment be mentioned. Farrow in his Military Encyclopedia defines the skirmisher in the following:

> "The employment of skirmishers dates from the wars of the French Revolution, when France, assailed on all sides, supplied great numbers of conscripts, who, from want of instruction and practice in discipline, were thrown out to fight where coherence and precision were not so much wanted as intelligence and courage . . . To prepare for the final charge, by crushing the enemy with their fire, is the first aim of the skirmishers; to support them when weakened, to push their line by successive bounds, till they reach the enemy's positions, is the duty of supports. The reserve follows in rear, becoming in its turn supports, according to circumstances, ultimately joining the skirmishers in the last attack, assisting in penetrating the enemy's position, striking the final blow, and in pursuing the enemy with its fire."
> (Ref. 23, p. 116)

Professor Mahan was among the early writers in the military art to assign unit frontages in terms of yards. This determination of frontage was predicated upon the size of the unit and upon the conformation of the terrain. This arrangement was a fundamental basis for unit control. The extent of the position according to Mahan should provide that, "after deduction of the advanced-posts, and of the reserve, its front and flanks shall present an unbroken line of troops, from which a close and well-sustained fire can be brought upon all points by which these can be approached." (Ref. 22, p. 64)

In his estimate of the front, in yards, of a position Mahan stated:

> "In estimating the front of a position, an allowance of about 180 yards may be made for each battalion, from 600 to 700 strong; about 60 yards for each squadron of horse of 48 files, the necessary intervals between these units being included in this estimate; and from 12 to 20 yards for the interval between the pieces of a battery."
>
> "In estimating the depth, an allowance of 600 to 800 yards at least, should be made from the front to the rear in order that the two lines and the reserve may be posted in suitable relative positions for good support."
> (Refs. 22, p. 64 and 18, pp. 71-73)

In the American Civil War, the formation of the unit was of paramount importance in its control by its commander, or by higher headquarters. With reference to infantry and the other arms, cavalry and artillery in a corps formation, the situation was about as follows:

> "The infantry of the battle corps marches in front with its organizational artillery. If the ground permits, a detachment of cavalry precedes the head of the column to support the advance guard and cover the deployment.

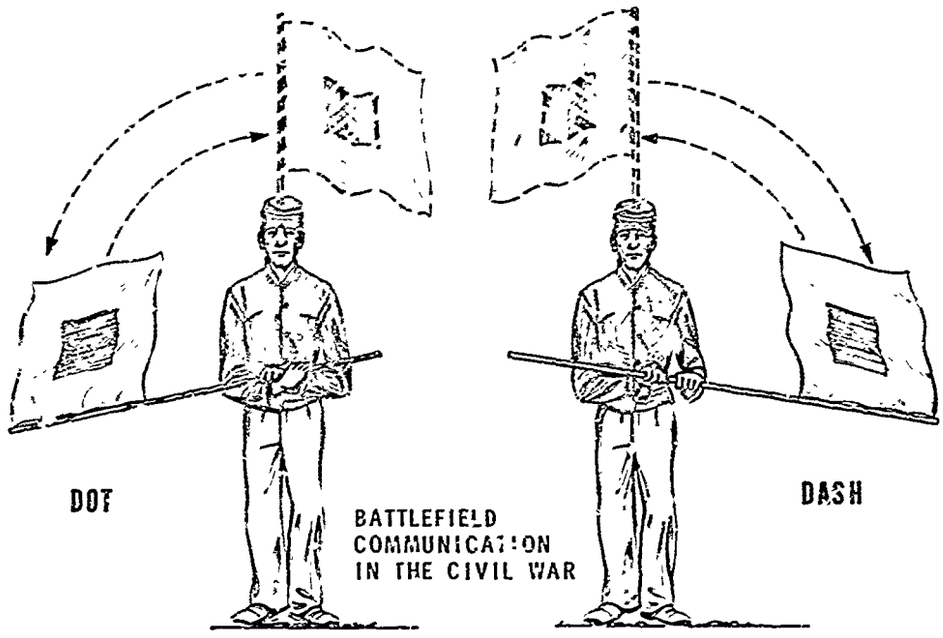
"The mounted artillery follows immediately after the leading infant y regiment, so that on signal, the artillery can take up position. After the infantry comes, the main body of the cavalry and the reserve, followed by the trains. The rear guard brings up the rear.

"On encountering the enemy, the commanding general, forewarned by the advance guard which is distant from the main body about a half day' s march, hastens forward to the place of encounter. The advance guard takes a defensive position, and holds the enemy in check by a determined fire fight, while the main body is deploying for battle. The commanding general conducts a personal reconnaissance of the enemy and the terrain, and dispatches members of his staff to the heads of the columns to give the generals instructions for their deployment."
(Ref. 13, pp. 72-73)

The answer to the dilemma was swift in forthcoming, it was simply --- dispersion. Dispersion upon the battlefields of the Civil War meant loss of basic control of the troops by those whose duty it was under the old French system to control them.

" . . . Heightened fire power more than ever demanded skirmishers in front of the battle line. These the regimental organization was able to supply simply by assigning any of its companies to the duty. Likewise, regimental organization lent itself well to the attack formation which became characteristic of the Civil War. This was a succession of lines. Each line was composed of two ranks with a prescribed distance of thirty-two inches between them. Of course, the lines varied greatly in length, and in the distance at which they followed each other. Some were as long as a whole brigade lined up in two ranks, others only a company. If there was a usual length, it was that of a brigade, since attacks by divisions in column of brigades were most frequent. In any case, regiments as organized were easily utilized in that type of attack formation, as they were in others."
(Ref. 14, p.24)

In order to assure unit solidarity and control on brigade or division level, signal flags were employed extensively in the Civil War. Using a pre-arranged code, or the Morse code, the signallers could transmit messages rapidly across great spaces by means of wig-wag type flags. These flags were operated by signal troops at signal relay stations. These stations were located generally upon high terrain features and distant observers



could read and record their messages through powerful telescopes. Of great value in the area of large unit control, these visual signal stations enabled units to maintain contact and to receive and transmit orders and information from and to higher headquarters. Transmitted down to subordinate units by staff officers, couriers,and messengers, these messages served to establish, increase,and maintain unit control. The influence of the improved communication in the battle area was noted indirectly in the infantry arm. Primarily, this influence was most useful in the area of intelligence, or information, of the enemy.

On regimental, battalion and company levels, in the infantry, the drum was used for signalling purposes. All commands and combat orders were capable of being transmitted to the troops by drum taps. In the mounted services, the bugle or trumpet was used for control and command signals. With the limited range of the drum the unit thus controlled was, of necessity, small. However, within a battalion the drummers of each company would relay the order or signal by taking up the proper beat in turn. See Appendix C for Drum and Bugle Signals.

In consonance with the Napoleonic tactics of the day, as explained by Jomini, the commanders of all units, both Union and Confederate, from army corps to infantry company or artillery battery, were in direct physical contact with the enemy. So great was the influence of Jomini's Art of War that many combat orders were based upon troop dispositions patterned after classical battles of the Napoleonic period. In many cases, Napoleonic parallels to the actions of the Civil War commander were sought as solutions to the battle situation. Brigadier General Thomas Jordan, Adjutant General of the Confederate Forces at the battle of Shiloh, Tennessee (April 1862) made the following comment concerning his formulation of the order for the battle.

"As I framed this order, I had before me Napoleon's order for the battle of Waterloo, and, in attention to ante-battle details, took those of such soldiers as Napoleon and (Marshal) Soult for model--a fact which I have mentioned because the ante-Shiloh order has been hypercriticised."[18] (Ref. 24, pp. 594-603)

The military telegraph was actually employed in the Crimean War (1854-55) at least six years before the American Civil War. However, the use of this new and instantaneous means of communication was confined in the Crimea to inter-communication between higher headquarters and was not used tactically, or for control of units--as in the American Civil War. Later in India, outposts were connected by telegraph with wires laid over the ground or hung in trees. Often uninsulated wire was used and hence the lines were not too reliable during the rainy season. The ability to control units at great distances from headquarters by means of the telegraph was given much credit for British military successes in the Indian campaigns. By 1876, the British Inspector General of Fortifications said "at the present time (1876), the telegraphs were essential in warfare, and that not even the smallest war could be carried on successfully without them." (Ref. 25, pp. 26-27)

In the American Civil War, both the Union and Confederate forces showed the practicability of the telegraph in warfare. The telegraph was especially demonstrated as not only valuable as a communication service but that it was of strategical and tactical value. The control of the dispositions and movements of troops by a remote headquarters was possible by the telegraphic transmission of field orders and instructions. Of considerable importance was the ability of the telegraph to keep the troops on the front informed upon the enemy situation. The records of the Civil war are replete with copies of messages to commanders with intelligence which they could not have obtained by means other than telegraphic. Thus, directly, the telegraph influenced unit control to a marked degree. On higher levels, such as Corps and Army, it was necessary that units be controlled by remote means. At division and regimental levels, the commander could often exert control by his presence on the battlefield. At higher echelons of command because of size, geographical location, and the conformation of terrain, the commander was forced to exercise control of his units by indirect means. Among these were flag signals and the military telegraph. Couriers, staff officers,and dispatch riders could not compete with the speed of the telegraph. In moments of peril and high decision, the instantaneous response of the telegraph gave the commander a new dimension of control. (Ref. 26)

Examples of Civil War control of units at distant points by means of the telegraph are to be noted in the following quoted telegrams sent from Major General George B. McClellan, Commanding General, U.S. Army in Washington.

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[18] See Official Records, Vol. X, pp. 392-395 for copy of battle order.

Headquarters, October 21, 1861.

To General Stone:

Hold your position on the Virginia side (of) the Potomac at all hazards. General Banks will support you with one brigade at Harrison's Island, or the other two at Seneca. Lander will be with you at daylight. Change the disposition of General Bank's, if you think it necessary, so as to send two brigades to Harrison's Island instead of one.

(Signed) G. B. McClellan

McClellan's Headquarters, Oct. 21, 1861.

To Gen. Stone, Edward's Ferry:

Entrench yourself on the Virginia side and await reinforcements, if necessary.

(Signed) Geo. B. McClellan, Maj. Gen. Comdg.

McClellan's Head-quarters, Oct. 21, 1861.

To Gen. Stone, Edward's Ferry:

I repeat to you, under no circumstances abandon the Virginia shore, but entrench yourself. Hold your own, if you can make your men fight. You will be supported by General Banks.

(Signed) G. B. McClellan, Maj. Gen. Comdg.

Headquarters of McClellan. Oct. 21, 1861

To General Stone:

As General Banks will join you, his rank will entitle him to the command, and he has been instructed accordingly.

(Signed) Geo. B. McClellan, Maj. Gen. Comdg.

Headquarters of Gen. McClellan, Oct. 21, 1861.

To Brig. Gen. Stone, Edward's Ferry:

An advance from Drainsville cannot be made tomorrow morning, so that you must rely exclusively upon the support of General Banks can give you.

(Signed) Geo. B. McClellan, Maj. Gen. Comdg.

Headquarters of Gen. McClellan, (no date)

To General Banks, Edwards Ferry:

You will entrench your command on the Virginia side of the river, observe the movements of the enemy closely, and report to me often, but make no movements without first communicating with me.

(Signed) Geo. B. McClellan, Maj. Gen. Comdg.

Headquarters, Washington, Oct. 23.

To: Gen. McClellan, Edward's Ferry:

I have ordered Generals McCall, Porter and Smith to be ready to make a movement on Drainsville early tomorrow morning. Have also ordered reconnaissance by Generals McDowell, Smith and Franklin towards Fairfax Courthouse and Annandale. All quiet in front.

(Signed) R. B. Marcy

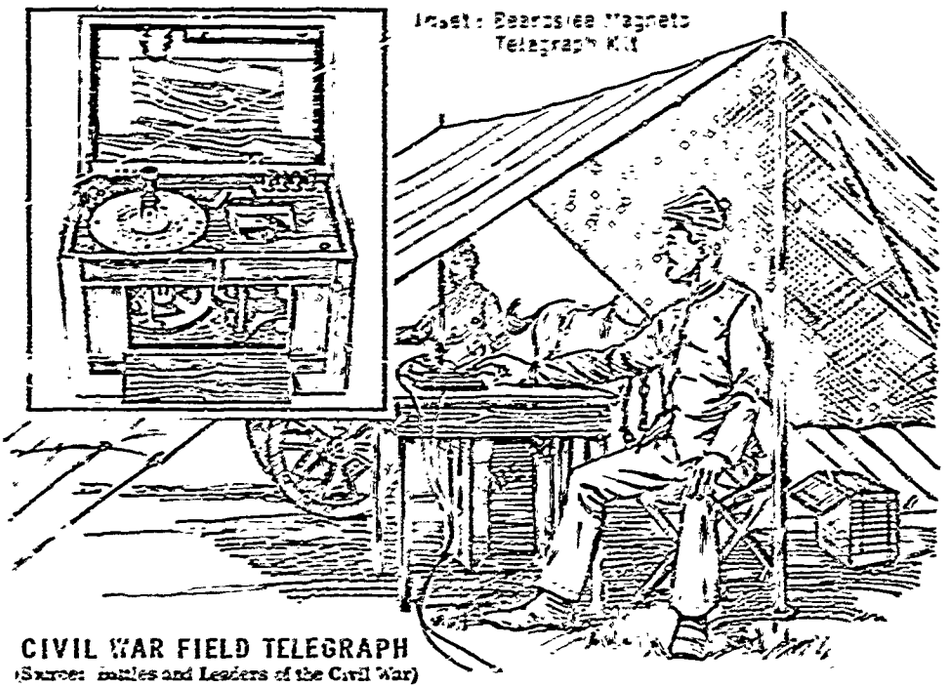
The above-quoted exchange of telegrams between headquarters of the commanding general and troops in the field, even at this early stage of the American Civil War, prior to the Federal disaster at Ball's Bluff, Virginia, demonstrates the extent of the control of units by means of the telegraph. As the war progressed and techniques of signalling improved, the United States Corps Military Telegraph became an integral part of the Federal military establishment. Its contribution to military unit control on the battlefield and in campaign was significant of a new and developing concept of command and control in the field. Its effectiveness as such was to remain preeminent in its own right until the invention of the telephone, wireless and radio, all which have contributed significantly to the evolution of unit control in warfare. (Ref. 25, pp. 90-91)

Edward S. Farrow in his Military Encyclopedia commented upon the value of the telegraph in unit control during active operations:

> "The electric telegraph influences military operations by aiding the rapid communication of orders and the prompt transmission of intelligence. By its aid, the Commander-in-Chief may be informed about what is taking place along his whole front at any one time; he is thus enabled to make his dispositions more intelligently, as he can order the movement of his troops to meet all contingencies."
>
> (Ref. 23, p. 578, emphasis added)

On the larger operational scale, the telegraph placed the Commander-in-Chief in Washington within a moments reach of the wide-spread armies and corps. In effect, this meant more centralized control over the field forces. From the point of view of the commander in the field, such direct

contact hampered the field commanders in the exercise of their semi-independent command functions. There was a tendency to overcontrol from Washington. This was in opposition to the necessity for smaller units to function in a dispersed and often independent manner because of the improved weapons and rejection of the obsolete Napoleonic tactics.



CIVIL WAR FIELD TELEGRAPH
(Source: Battles and Leaders of the Civil War)

The overall effect of the field-telegraph upon the control of higher units, divisions, corps and armies was remarkable. Heretofore, commanders in the field had to rely upon the cavalry to be their eyes and to see the enemy and his location. The information thus secured became intelligence when it was studied and digested for use against the enemy. The time element which was formerly based upon the speed of a mounted courier, or of the railroad, or the wig-wag signal relay system, was eliminated by the instantaneous transmission capability of the telegraph. Thus, units could be ordered into action within minutes or hours as against the time required before employment of the field-telegraph. The telegraph wire gave the commander a much stronger control of his dispersed units. General de Chanal, an observer with the Union Forces commented upon this point as follows:

> "It is a great advantage for a general to be constantly kept in communication with the commanders of the corps of his army. If however, the facility leads him to remain at the central station and neglect to go in person over the scene of action, it may lead to serious results. No dispatch can be as useful as the

seeing of what takes place with one's own eyes."
(Ref. 16, p. 47)

The Commander's reaction time to enemy movements and situations and the issuance of orders was reduced in proportion to the time consumed in message transmission. Edward S. Farrow had this to say about the efficacy of this new, and at that time, remarkable, means of military communication and control:

> "The value of the magnetic telegraph in war cannot be exaggerated, as was illustrated by the perfect concert of action between the armies in Virginia and Georgia in 1864. Hardly a day intervened when General Grant did not know the exact state of facts more than fifteen hundred miles off, as the wires ran. During the operations at Spottsylvania, and on the North Anna, at Cold Harbor to City Point, and in the battles in front of Petersburg in June, the field-telegraph lines were worked with great success, and invaluable aid was rendered to the government. General Grant and Meade were kept in almost constant communication with each other and with the different corps of the Army. The field-telegraph lines have worked many times in the face of the enemy, exposed to fire, without shelter, have been kept up day and night whenever required, etc."
> (Ref. 23, pp. 578-579)

The American Civil War was noted for the introduction of new equipment into the arsenal of warfare. Among the most significant innovations was the use of the steam railroad for the rapid transport of troops and supplies to and from the battle fronts. Troop commanders were no longer dependent upon the foot power of the men for troop movement. In the area of long-distance supply, the horse and mule were replaced by the "Iron Horse." While it is factual that supplies and men were moved to the front more rapidly than they had been previously in the long history of war, muscle-power was still relied upon to move them for relatively short distances. In the immediate rear areas of many of the battlefields of the Civil War, the shrill whistle of the locomotive was heralding in a new age of warfare. (Ref. 27, pp. 81-82)

The employment of the railroads for military transport purposes must be considered strategical rather than tactical. The connection between rapid transport of troops and unit control may seem rather remote, yet there is an element of unit control involved. While this element was perhaps noticed most in the planning and operation of a method of troop shipment, it should be noted that a system of unit control while troops were en route was necessary. This was required especially when the trains were operated through regions where enemy guerrillas were active. (Ref. 18, p. 94 and 20, p. 73)

The contribution of the railroads to the area of unit control on the battlefield or in the campaign is well stated in the following extract:

> "The North discovered that the fighting power of her armies was increased by the strategic use of railways. The early arrival of reinforcements at threatened points, which was made possible by the railroads, gave strategic advantages otherwise unattainable. Expeditions were undertaken at distances from bases of supplies which would have been impossible without the use of the rail lines to bring up supplies.
> (Ref. 18, p. 93, emphasis added)

The Civil War in the United States witnessed the successful use of the balloon as an observation platform for the purpose of enhancing the quality of troop and unit control. Professor Thaddeus S. C. Lowe and his balloon "Intrepid" accompanied the army in the field and did successfully lift a general officer observer aloft. The unusual spectacle of the balloon hovering over the battlefield served to draw hostile fire upon it and the troops in the vicinity. For this reason, and others, the balloon was not a popular item of impedimenta. However, the scientist-balloonist, Lowe was years ahead of his time and future wars of the United States were to see his idea implemented and perfected as a means of observation and fire control.

> "McClellan permitted the addition of a telegraphic train to the aeronautic establishment, thus relieving it of dependence upon the Military Telegraph Corps for telegraphic equipment . . . When it was impractical to use the aerial telegraph, written messages, with a stone or weight or other weight wrapped up in them, were dropped to an officer below, who sent them by courier to their destinations. By means of the telegraph, Lowe participated in the first artillery fire direction with aerial observation in American history. A telegraph line was run from the balloon car to the gun positions and the effect of each shot was communicated to a general officer more than three miles distant from the point of observation.
> (Ref. 18, pp. 84-85)

The fate of the balloon was settled by the neglect of the government to provide funds for the operation of the balloon. While the balloon was not new in war, its neglect in the Civil War amply demonstrated that it was too novel for the times.

The framework of the military organization of both armies in the American Civil War rested upon the strong and sturdy cornerstone of discipline. Army regulations were definite and precise in their delineation of military offenses and the punishments prescribed. For the times, punishment was often severe and brutal -- ranging from company-type penalties for lighter offenses to execution by musketry for desertion in face of the enemy.

Frederick the Great believed that the Prussian soldier should be more afraid of his officers than of the enemy. By strict and brutal discipline, his army was controlled -- as no army had been before. The armies engaged in the Civil War were in essence armies of free men many of whom were volunteers. There were conscriptees enrolled under the Draft Act but the mass of the troops were there because they had volunteered.[19]

General Francois V. A. de Chanal, an officer - observer of the French Army attached to the Federal forces during the Civil War, noted that:

> " . . . the discipline of the American Army is as good as, if not better than, that of European armies; but it has not the external marks, and an observer who merely passes through the American army may thus be deceived. The very fact that these immense levies have either elected their officers or obtained them by appointments made by the local authorities, has transferred the social hierarchy to the army and made it also the military hierarchy. There has, therefore, been no need for surrounding it with all those precautions which are necessary for the preservation of a hierarchy which has no other foundation than the severity of the regulations. Few troops are as obedient to their commanders, and during the entire war, although more than two million soldiers entered the ranks, there were only seven military executions. (Ref. 16, pp. 228-229)

The officers of company grade of many of the state units were usually elected by their own units and the regimental officers were appointed by their respective state governors. Because of this system, military discipline was hard to enforce upon ones' old neighbors and friends and,hence, it was often most informal. But, as the war progressed and the men became veterans, the necessity for military discipline became apparent. The disciplined units survived the rigors of combat -- others did not.

General officers were often nominated by the state governor of the troops concerned but finally they had to be appointed by the President and confirmed by the Senate. Thus, there was some control on the quality of the leadership on the higher unit levels. The "political colonels and generals" did not usually survive the acid test of combat. Those who did learned well the lessons of war in the field often at great cost under the most unfavorable circumstances. The able and talented ones became in time excellent troop commanders and staff officers.

The Civil War in America was noted for exemplifying the three factors

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[19] See Ney, Virgil,"Volunteers" in Encyclopedia Britannica,Vol. 23 1957.

of unit control noted throughout this study. Organization, leadership, and communication all had their effects upon the ultimate control of the troop units at all levels. At the beginning, the organizational forms were primitive and because of their mass concept not adaptable to the lethality of the improved weaponry of the times. On higher levels, such as army, corps, and division levels, little was done to change the mass formation required by the Jominian school of war. As the war progressed, troop formations of the company and battalion levels adjusted themselves to some degree of dispersion almost automatically -- if they were to survive. Because of heavy losses, frontal attacks against entrenched hostile forces were too costly and on most of the battle fronts the skirmisher-probing attack and small group rushes replaced them.

Tactically, the rifle squad organization, as it is known today, had not as yet been conceived. In accordance with the manuals of Hardee and Casey, infantry soldiers did establish groups of four men which had some cohesion in combat. These half-squads were established primarily for survival and had no great tactical significance except in their quality of unity. But they did indicate forcefully the need for dispersion in small groups -- if the troops were to live. Further, they did have some positive effect upon the degree of unit control within the platoons and companies of the infantry battalions and regiments.

The most important organizational innovation, as far as units were concerned, was the establishment of the army corps within the structure of the United States Army. Borrowed from the French Army, the corps d'armée had been devised by Napoleon Bonaparte as a high-level unit control in combat. However, the organization of the army corps was not entirely satisfactory. The unit, itself, was sound enough organizationally and tactically but much was to be desired in the matter of its leadership.

WORLD WAR I

"The regiment of Sambre and Meuse marched to the cry of Liberty! Seeking the path of glory that leads to immortality. The regiment of Sambre and Meuse died to the cry of Liberty! Writing a page of glory that gave them immortality."

Marching song of the French Army

World War I was marked by the participation of huge mass armies in combat. The fighting was on a scale never witnessed since the days of Napoleon. Millions of men were drawn into the conflict on one side or the other. Coalition warfare came into its own again with nations taking sides and aligning their forces together as allies. Here as later, coalition warfare called for armies of different cultures and national aims to fight side by side against "the common enemy." Unit control became not a matter of divisions or corps or armies but of groups of armies composed of various nationalities. The problems of command and control on the highest level were national in scope. The need for centralized control of the struggling armies was recognized by the Allies in the appointment of a Supreme Commander who commanded a multi-national force. (Ref. 28)

At the beginning of World War I in 1914, the battle formations used by both the Central Powers and the Allies were those found to be successful in the preceding conflict. For France and Germany, this was the War of 1870 all over again and the French troops went into battle wearing the conspicuous red trousers of that earlier conflict. Their formations were essentially those of the company and battalion masses of the traditional Napoleonic order of battle. Horse cavalry and artillery were the traditional partners of infantry, the "Queen of Battles." Unit control was effected in both German and Allied armies in the usual military hierarchical manner. (Ref. 29, pp. 234-261)

On the German side there was the great General Staff tradition dating from the time of Frederick, the Great. Its reputation as a planning body and a military control agency gave it an omniscience which it probably did not deserve. Yet, traditional German General Staff efficiency in the planning and conduct of the invasion of Belgium and of France caught the Allies unprepared and ill-equipped to wage war against such a military machine.

". . . Schlieffen had envisaged a Commander-in-Chief who would be no Napoleon on a white horse watching the battle from a hill but a "modern Alexander" who would direct it from a house with roomy offices where telegraph, telephone and wireless signalling apparatus are at hand, while a fleet of autos and motor-cycles ready to depart, wait for orders. Here in a comfortable chair by a large table the modern commander overlooks the whole battlefield on a map. From here he telephones inspiring words

and here he receives the reports from army and corps commanders and from balloons and dirigibles which observe the enemy's movements."[20]
(Ref. 29, p. 242)

But the German planner's dream of modern warfare was complicated by the resistance of the Belgians who cut telephone lines and by the French who jammed his wireless with the powerful Eiffel Tower transmitter. Communication, that absolute and essential ingredient for unit control was weakened and hampered to the point where messages were delayed for as long as ten or twelve hours. The Germans relying heavily upon the most modern means of communication then available found that in war they were not as reliable as on maneuvers. The factor of civilian resistance and sabotage had not been counted when other factors were totaled. (Ref. 29, p. 242)

In 1914, the German army was equipped with machine guns and heavy siege artillery. In the employment of these weapons, the Germans were far in advance of contempory armies. Field telegraph and wireless, carrier pigeons, and signal flags and signal flares were used by both the German and the Allies in conducting communications for purposes of unit control. The tactical employment of machine guns by the German army was to have a marked effect upon the conduct of the war of 1914-1918. While other armies were marking time in weapon development, the Germans established doctrine and methods of employment of the machine gun which eventually changed the character of the War. By 1916, the Allies were facing the Germans in a positional, siege type of trench warfare. The machine gun ruled the battlefield and mobility had been sacrificed to safety in the trenches of the Western Front. Coordination of machine gun and artillery fires with massive, wave-like infantry attacks was only a partial solution to the stalemate. (Ref. 14)

General John J. Pershing, the Commander-in-Chief of the American Expeditionary Forces in France during World War I had this to say about the situation:

> ". . . the machine gun, as an infantry weapon, had been carried to a high degree of perfection, especially in the German Army . . . In this as in every other line of preparation, we were far behind all others . . . Not only were we without sufficient machine guns, but our organization tables did not anticipate their use in anything like the numbers employed by the enemy."
> (Ref. 23, p. 131)

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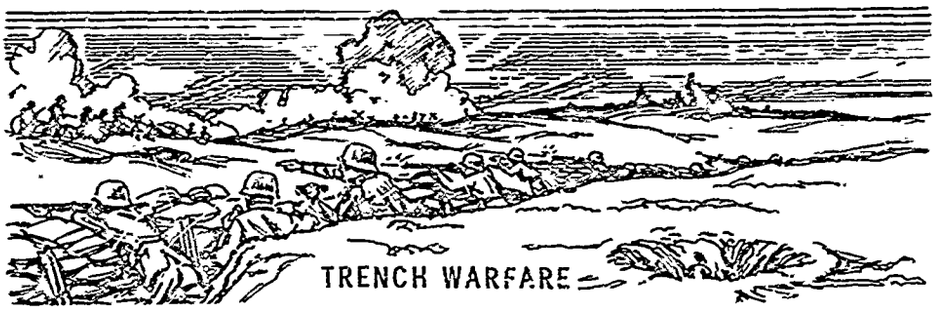
[20] General Von Schieffen, the great planner of the German General Staff, as quoted in Tuchman, Barbara, The Guns of August, p. 242.



TRENCH WARFARE

The static warfare thus conducted created an almost completely new set of tactics and unit controls. In the infantry, mobility was reduced to advancing few yards at a time. With terrific cost in casualties, the war degenerated into a war of static siege. As a result, there was no maneuver worthy of the name. The battlefield was parcelled up into barbed-wire sectors of responsibility for the units concerned. Frontages were laid out in accordance with unit strengths -- man for man. Larger areas and gaps where men were not available to cover with their fires were covered by interlocking bands of machine gun fires. Zones of responsibility, phase lines, and delineation of terrain objectives were all indicated as new means of unit control in both defensive and offensive combat. When the latter was undertaken, it was generally in the form of a gigantic, mass movement of troops out of the trenches toward definite sections of the enemy line. Preparatory to the "jump off" or the departure from the security of the trenches the troops were organized into "waves" consisting of echeloned lines of sections. Highly specialized tasks were allotted to the individual members of the section which had replaced the conventional infantry squad as it was known to the United States Army. Control was vested in the sergeants and chiefs of platoons and the company and battalion organization was almost purely administrative rather than tactical in its function. In the attack against the limited objectives of trench warfare or in the defense, unit control was maintained basically by means of the small unit or team concept. This was forced upon the military by the nature of the war it was fighting. With mobility and maneuver almost completely negated by the advent of the machine gun and highly concentrated artillery fires, unit control was on a shoulder-to-shoulder basis. (Refs. 30, pp. 1-34 and 31, pp. 189-234)

Lieutenant Colonel Paul Allan in his book Warfare Today, which served to interpret the meaning of trench warfare to the American soldiers of 1917-1918, comments upon the position, or location for purposes of unit control of the unit commander at the beginning of an attack:

> "The position of the commander at the start is indicated on the plan of engagement. This is no more unalterable than are the other dispositions, but it is governed by certain fixed rules. The only leader who can survey his whole unit at once is the section leader, and even this unit is split up into little groups, in which the bravest and best man takes command. The combat

"group should, therefore, be rather the platoon than the half-platoon; it is always under the command of a leader who commands and guides it. The platoon leader in a fighting wave marches in the second line; the platoon leader in a reinforcing wave marches at the head, in order to guide his men."
(Ref. 31, pp. 200-201)

The study of battle formation is the study of the disposition of troops in battle.

"The first wave or fighting line is preceded by an artillery barrage, which advances continuously and is intended to clear the enemy's trenches as much as possible. The rate of advance for this fire is precisely that specified for the infantry before the attack. This rate is determined by the difficulties of the terrain, so that the barrage shall not advance more rapidly than the infantry and give the enemy a chance to come out from his shelters. It is usually one hundred yards in three or four minutes, furthermore, the range of the preparatory fire on the position is not lengthened except as the infantry advances."
(Ref. 31, pp. 202-203)

In the above extract, another form of unit control is mentioned - that achieved by regulating the advance of the troops by the progression of the barrage toward the enemy position. Officers with the waves secured their watches upon their wrists in order that they might time their advance precisely in order that they and their troops would not run into their own barrage. Thus, the wrist watch was devised through sheer necessity. Control of the units and their troops was on a strict time schedule which called for perfect synchronization of all watches of all leaders and men who had responsibilities for unit control.

The flare pistol invented by Very and used basically for the firing of vari-colored rocket type signals at sea was easily converted to land use in World War I. This simple device became almost essential to the control of fires of artillery and trench mortars. As they were used to indicate signals to deliver and lift fires, they were also directly and indirectly used in the control of troops. Attacks were often launched upon the firing of a certain type rocket or flare which when perceived by the units concerned -- had the effect of a command.

In the static warfare of the trenches began the practice of designating unit zones of defense and zones of attack. In the attack the limits of the objective were indicated by definite map coordinates and compass bearings. For further unit control purposes in the attack, the attacking organization was given a line of departure and a magnetic compass reading as the general direction of advance. The objectives were generally established in sequence

as the 1st Objective; the 2nd Objective; the 3rd Objective. These were lines of enemy trenches or terrain features. In larger units, the size of a division, phase lines to be reached on a pre-determined time schedule were used in conjunction with the above objective designation system. (Ref. 30, p. 167)

The line of departure was a most important item in the control of the initial "jump off" of the attacking unit. In open warfare, this line was a natural terrain feature such as a stream line or a road or trail, or in the trench warfare perhaps an old trench line. The basic requirement for the line of departure was that it be parallel to the first line of the enemy position. Bertrand explains the requirements for the lines of departure as follows:

> ". . . lines of departure must be parallel to the first line of the enemy, not to your own, so that the assaulting troops will simply have to start in a perpendicular direction from the lines of departure to reach their objective. In other words, the assault is a simple frontal attack without maneuvers."
> (Ref. 30, p. 155)

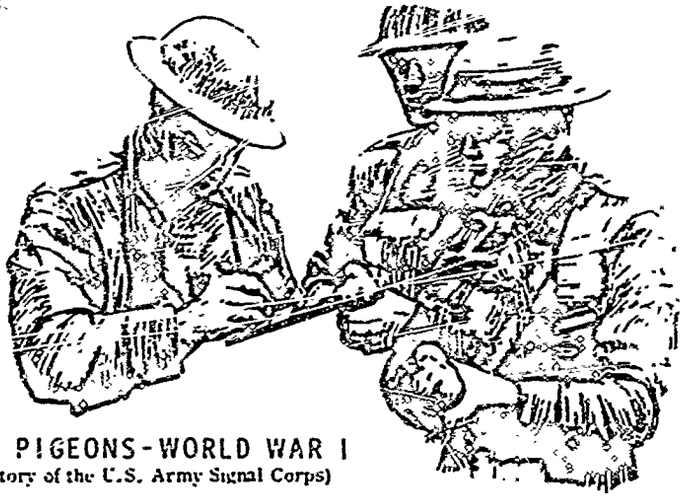
World War I experience proved that highly-detailed and comprehensive battle plans needed to be prepared. This was especially so for all units, the smaller units such as companies and battalions. See Appendix H.

The system of liaison, or contact, between the units and the commander was most important during the battle but it was especially so after the attacking units reached the enemy position. Without proper contact with the advancing units, the commander lost control of his units because of his inability to give orders to his subordinates and to secure information of the enemy for transmittal to higher headquarters. In view of the possibility of the loss of other liaison, the commander insured his maintenance of unit control by personal observation from the ground. The commander of the attacking unit selected a new observation post. Every time his unit advanced, this command post was always close by. This assured that the progress of the fighting was noted and that signals from the attacking troops were received and understood. (Ref. 31, p. 211)

WORLD WAR I INFANTRYMAN

In World War I, the captive balloon was to again appear as it did in the American Civil War as an elevated observation platform. Balloons were assigned to infantry divisions with missions of observing supporting artillery fires and the progress of the infantry units in the attack. Airplanes were used for the same missions, that is, there were both balloons and airplanes assigned to infantry and artillery liaison tasks. "Infantry" balloons watched the advance of the infantry and reported or relayed its signals, sometimes by wireless, to the responsible commander. (Ref. 32, pp. 331-344)

On the ground, liaison between the troops and the aircraft was established and maintained by the use of identifying panels of cloth laid out on the ground, or by means of reflecting mirrors or flashlights. World War I was unique in that the telephone and telegraph and wireless were all employed in the process of unit control through communication. In the attack of the infantry, telephone wires were laid along the ground connecting the advancing elements with their respective headquarters and the supporting artillery units. Tactical wireless networks connected higher headquarters for unit control purposes.



CARRIER PIGEONS - WORLD WAR I
(Source: History of the U.S. Army Signal Corps)

On battalion, company, and platoon levels hand-carried, lung-powered whistles were employed to control and alert the troops for purposes of unit control. Of considerable interest was the fact that whistles were supplied in different types with distinctive and identifiable tones. The "Thunderer" was the whistle identified with leadership below the battalion commander's level. The "Siren" with its peculiar wailing sound was established as the whistle of the field grade officer, that is, major, lieutenant colonel, and colonel. Basic uses of the whistle were for calling attention and forming the unit or for signalling a command of execution. In the infantry, fires were often controlled by whistle signals.

A World War I regimental commander gives the following account of the start of an attack:

> "Our officers and sergeants stood poised and ready,
> whistles in their teeth, counting off the minutes past five.

"Two minutes, Three. And now five. Our roaring guns suddenly lowered sights, and laced a blanket of exploding shells just in front of our line. "All ready, Casey?" I yelled into the ear of "F" Company's battalion commander, Captain Charles J. Casey. "Okay, Colonel," he said, and the whistles blew. "Up you go," I heard his ringing voice. "Keep alignment. Guide is right. Don't rush or you'll get your own barrage on your neck." I went over the top as fast as I could and scrambled forward. The blast was like a fiery furnace. For a dozen terrible seconds, I felt they were not following me. But then, without turning around, I knew how wrong I was to have doubted for even an instant. In a moment they were around me, ahead of me, a roaring avalanche of glittering steel and cursing men. We carried the enemy position." (Ref. 33, pp. 55-56)

Unit control and command were considerably affected by the organizational changes suggested by the French and British in the structure of the United States Army. In the infantry, which was the organizational basis of the army, the rifle company was completely reorganized and augmented. The rifle company was increased in strength from 150 men to 250 and from 3 officers to 6. This augmentation of the company strength caused a reorganization of all the higher units so that the organizational strengths were reflected as follows: [21]

Organizations	Enlisted Men	Officers
Company	250	6
Battalion	1,026	27
Regiment	3,755	100
Brigade	8,210	225
Division	27,152	975

In the World War I United States National Army organization, there were 4 companies of 250 men in each infantry battalion. The infantry regiment consisted of three battalions of approximately 1000 men each. The infantry brigade was comprised of 2 infantry regiments of 3000 men each and the infantry division consisted of 2 brigades with a division rifle strength of about 12,000 riflemen. The span of control of the infantry rifle company commander covered 5 lieutenants and his company first sergeant, mess sergeant, and supply sergeant. On battalion level, the battalion commander,

[21] Source: Ganoe, W. A. History of The United States Army. New York: Appleton, 1924.

a major, commanded four company commanders and his adjutant, or, second-in-command. The regimental commander's span of control encompassed three battalion commanders and a small regimental staff, the adjutant, the regimental executive officer and S-1 Personnel, S-2 Intelligence, S-3 Operations, S-4 Supply. There was generally a Chaplain assigned plus the necessary medical officers, including veterinarians.

On the higher unit level, such as division and corps and army, World War I required highly efficient and competent command and staff personnel. The influence of the French was again exerted upon our military organization, as it had been in the Civil War. In this connection, it must be recalled that the French and British had the advantage of three years front-line combat experience before the American forces landed in France. Limited as it was to siege warfare, this collective experience was the only guide available for the planners and leaders of the burgeoning American Expeditionary Forces. Unit controls and staff procedures were of necessity based upon the practices of the trenches. Colonel Oliver L. Spaulding in his The United States Army in Peace and War commented upon this point as follows:

> "For proper control, a very strong general staff had to be built up, on plans devised to meet the specific situation. Since we were to serve in such close relations with the French, the organization adopted showed strong traces of French influence. Ultimately, it included a Chief of Staff, with a Deputy Chief of Staff, and five Assistant Chiefs, supervising five sections, dealing, respectively, with personnel administration, intelligence, operations, supply, and training -- or, as they soon came to be called, G-1, G-2, G-3, G-4, and G-5. Similar general staffs, with modifications to meet special conditions, had to be provided for the S. O. S. (Services of Supply) and for all armies, army corps, and divisions. All available Leavenworth graduates were called for, to man these staffs, and in November, 1917, a General Staff College was organized at Langres, giving a three-months course preparing selected officers for this duty. (Ref. 34, p. 419, parentheses added)

On army, corps, and division levels, French troops were often brigaded with the American forces. American troops came under French control and French troops were sometimes under American command. General John J. Pershing, Commander-in-Chief of the American Expeditionary Forces, stood for open warfare with an independent American army under American command. This he was to achieve eventually with the breakout from the trenches.

On unit level below the regiment, control measures, in the trenches,

"OVER THE TOP AND GIVE 'EM HELL"

were centered around the weapon crews. In the French army, the section of two or more squads was the basic unit. This was in contrast to the American concept of the eight-man rifle squad controlled by the leadership of its corporal. The platoon, as the basic unit of fire for trench warfare, had been successful for the French and British in the static warfare of the trenches. However, open warfare demanded smaller units which were capable of fire and movement under the command of their own leaders. Once open warfare commenced, the infantry squad, as known to the United States Army, reappeared. While the gun crews were maintained and the section still existed, the infantry rifle squad was an integral though independent part of the section. It could operate with or without direct platoon or section control.

During the period from the Spanish-American war of 1898 to the entry of the United States into the European conflict in April 1917, there was little or no opportunity for the American army officer to command and control large troop units. With the exception of the Punitive Expedition to Mexico in 1916, the small regular Army and National Guard had rarely assembled in units above regimental size. The situation in this respect was somewhat similar to that just prior to the outbreak of the Civil War.

At that time, there were few officers who had commanded units larger than a regiment. However, in contrast to the Civil War situation, the senior officers of the pre-World War II United States Army had the benefit of advanced military education at the War College, the General Service School, and the various branch and arm schools of application. At these institutions they were schooled in the theory of higher command and control by detailed historical study of the campaigns of the Great Captains and noted American commanders. There was no opportunity for them to practice their profession as:

> " There was no actual tactical organization of the United States Army before the war (World

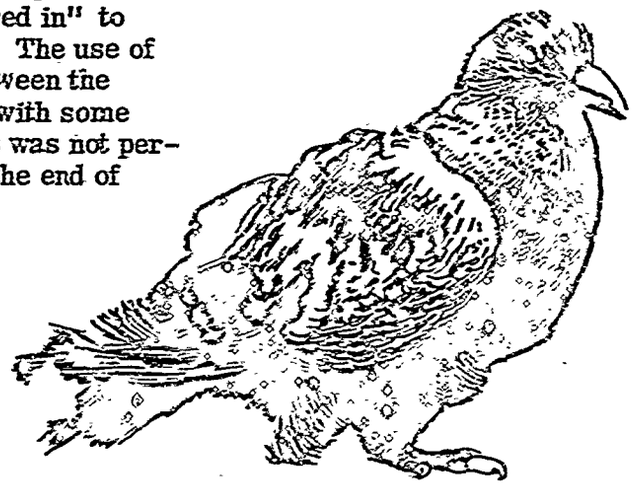
"War I). A theoretical paper organization into divisions based on a study of foreign armies was formulated before 1914. This formulation visualized the incorporation of the minor tactical units actually in existence, but it was self-evidently merely a makeshift necessary in a non-military country not yet animated by a national desire for provision against war."
(Ref. 35, parentheses added)

World War I presented a new problem in the area of combat communications. This problem was created by the introduction of the airplane into the weaponry and equipment of modern warfare. Air-ground communication with aircraft was accomplished by primitive means such as prearranged signals with mirrors, lights, and flares. As the war progressed and the speed of airplanes increased, there was a greater requirement for aircraft identification. Cloth panels of various colors (white was the usual color) were carried by ground units for purposes of communication from ground to air. Pre-arranged codes were utilized and information other than identification could be thus transmitted. The following extract from A History of The U. S. Signal Corps points out the usual methods of military communications then extant:

"The Signal Corps troops maintain their wire nets with telephone, telegraph and buzzer-phone instruments. Projector service, which is a means of visual signaling, supplements the wire circuits during the periods of their interruption by the enemy's shell fire and other activities . . . . The extensive radio net, throughout which each division on the front uses numerous types of radio equipment designed to meet the special needs of the regimental, brigade, division and corps headquarters; the artillery supporting groups; the aviation troops, including the forward aviation staffs and airplanes and balloons in the air; forward observation posts and the tanks. The systems are further augmented to preclude any interruption to communication by the pigeon service, special forms of fireworks for which the corps must devise secret codes, signaling panels used with airplanes and the "runners" (soldiers) to preclude an interruption to communication."
(Ref. 36, pp. 105-106, parentheses added)

Because of limited objectives of the World War I attack, communications of all types were brought into play to insure a maximum degree of unit control from the moment the attack "jumped off," or "went over the top." Telephone wires and field telephones closely followed the advancing infantry. Communications were established and maintained with the forward elements.

Headquarters, at each level of command, was not considered operational unless it was "wired in" to all its subordinate units. The use of wireless was general between the higher headquarters and with some aircraft. Voice wireless was not perfected for field use until the end of the war.



CHER AMI

WORLD WAR I HERO

"The use of homing carrier pigeons as means of communication between units was general throughout World War I. The carrying of messages by these trained birds was standard procedure. Units going into combat were provided with baskets of pigeons from the army or corps pigeon loft. Operated as an integral part of the Signal Corps, the pigeon service was vital to the establishment and maintenance of unit communications when all other means, i.e., telephone, wireless and runner were no longer available." (Ref. 36)

The importance of the homing pigeon to the American Expeditionary Forces may be judged from the following extract:

"In June 1917, General Pershing . . . sent an urgent cable from France ordering immediate mobilization of these birds. The American Racing Pigeon Union was the obvious group from which to seek help. . . . In weeks a homing pigeon corps was built out of nothing: 8 officers, 634 enlisted men, 10,000 young birds and lofts erected at 110 Army posts in the United States and the Panama Canal Department. . . . Even by mid-1918 . . . the A. E. F. possessed but a fraction of the carrier pigeon potential which the Allied forces could toss aloft -- no more than 6,000 birds, or 1/15 of the over-all feathered fleet. In the St.

Mihiel attack, 567 birds were used, and about the same number in the Meuse-Argonne."
(Ref. 36 , p. 118)

The field telephone was supplemented primarily by the carrier pigeon. One of the most ancient means of carrying written messages, the carrier, or homing pigeon was controlled by the Signal Corps of the Army. The breeding and training of pigeons to carry messages attached to their legs by tiny capsule containers occupied a sizeable segment of the Signal Corps in the United States and abroad. Mobile pigeon lofts operated by trained "pigeoneers" were attached to major combat units such as armies and divisions. Detachments were sent to lower units and functioned operationally with them in combat. In the area of unit control, the dependence placed upon the homing pigeon by the front-line troops of World War 1 was considerable. The most dramatic example of the reliability of the carrier pigeon as a means of communication and unit control is found in the story of the "lost battalion" of the 308th Infantry Regiment of the 77th Infantry Division of the American Expeditionary Forces in France. The following excerpt tells the heroic story:

" . . . at 4 p.m., at division headquarters, Cpl. Gault received another bird from the Charlevaux Ravine: Cher Amie. The pigeon, after his reluctant start, had ended his flight with spectacular heroism. One leg was missing, though the message capsule hung to the stump. A bullet had creased his breast, shattering the bone. The message carried by Cher Amie was from Major Whittlesey and it said: "OUR OWN ARTILLERY IS DROPPING A BARRAGE DIRECTLY ON US. FOR HEAVEN'S SAKE, STOP IT!"
(Ref. 36, pp. 118-122)

The history of the "Lost" Battalion dramatically points up the necessity for unit control measures and communication in combat. The carefully-timed and regulated advance plus the contact established with units on the right and left of Major Whittlesey's battalion broke down at some point in the attack. Generally, the "Lost" Battalion is credited for advancing too rapidly and paying the penalty of losing contact with the elements of adjacent units.

What actually happened during that confused and trying period of American combat history is best explained in terms of the immediate combat situation and in the words of the Commanding Officer's official Operations Report:

" . . . after seven day's continuous fighting in the Argonne (Forest) the 77th Division on October 2, 1918, found its advance checked before the heavily entrenched German positions. The success of the American operations depended upon breaking through

the enemy line. In the face of this impasse, the then Major Whittlesey, commanding the First Battalion of the 308th Infantry (Regiment), received from his commanding officer, Colonel (Cromwell) Stacey, an order to attack which contained this sentence: ' The general says you are to advance behind the barrage regardless of losses.' How strictly the heroic major complied with his orders is testified to in the undramatic language of his official Operations Report written October 9th, the day following his relief. He writes: ' The advance was continued to the objective stated, which was reached at 6 p.m. with about 90 casualties from M.G. (machine gun) fire. Two German officers, 28 prisoners and 3 machine guns were captured. His trench system was crossed, one heavily wired.' "
(Ref. 37 , pp. 54-56, parentheses added)

Major Whittlesey was confronted with a situation which was difficult of solution. His unit had reached its objective which he was under strict orders to hold until the elements on his flanks came abreast of the objective. But they did not come, the German fires had prevented their continuous advance. Taking advantage of the lull in the forward movements of the American unit, the Germans infiltrated through on each flank and closed the gap behind the First Battalion of the 308th Infantry Regiment. The Americans were trapped but they were not lost.

Major General Robert L. Alexander, the Commanding General of the 77th Division had the following to say with reference to the attack of the First Battalion of the 308th Infantry in the Argonne Forest:

" . . . Major Whittlesey conducted his command to the objective designated for by the division commander, occupied the position assigned him and held that position until the remainder of the Division was able to move up to him. He held it with the indomitable determination which has characterized the work of the American soldier wherever he has been called upon to perform a task. This command was neither " lost" nor " rescued." It suffered heavy losses; it was subjected to fire from both enemy and supposedly friendly artillery -- (The French, in spite of my determined protest placed artillery fire on this ravine the morning of the 7th of October, being quite convinced that the command must have surrendered.) Notwithstanding all of this, Major Whittlesey and his command held the position to which they had proceeded under my order and were found by me, when I visited them on the very early morning of October 8, an organized command, in good order, and in excellent spirits.

> It may be noted that a demand for surrender, made on the morning of the 7th when the command was under its most disadvantageous circumstances, was repelled with scorn -- the command feeling perfectly competent to look out for itself even then." (Ref. 38)

The control of troops in combat by means of orders is as old as warfare. Combat orders range from a simple "Follow me" uttered, or shouted, by a squad leader to the complex and detailed written order of the general for the advance of an army. Without orders an army has no purpose. Without a purpose, an army does not move. Control of units in motion, or static, is achieved by the issuance of orders. The commander exercises control by various methods and means but the usual way is through the medium of his orders. The larger the organization, the more complex and indirect is the issuance and receipt of orders. Historically, in past military experience, the issuance of orders has been a slow and often laborious process. With modern means of transmission, beginning at the time of the American Civil War, battlefield communication has become instantaneous with the inclusion of the telegraph as a means of military communication. Later, in World War I, wireless and the telephone became the principal communication agents in combat.

The will of the commander is expressed in innumerable ways but the most basic method is through the medium of orders. Orders may be oral, written, complete or fragmentary. Orders may be expressed in the form printed, published standing operating procedures. Combat Orders published by the Command and General Staff School at Ft. Leavenworth in 1939 had this to say about the responsibility of the commander with reference to the control of his unit:

> "The commander of any unit is alone responsible to his immediate superior for everything the unit does or fails to do. Although he may be provided with a staff to assist him in the exercise of his command functions, he cannot avoid responsibility for all policies, decisions, plans and orders which affect the morale, training, or employment of his command." (Ref. 39)

The Field Service Regulations, United States Army, 1923 summed up the command experience of the American Expeditionary Forces of World War I. The definition of command, as included therein, stands as a clear explanation of basic American military doctrine pertaining to the exercise of unit control through the medium of the military command function and structure. The American military professional in the wars since the founding of the country had developed a philosophy of command. While authoritarian and hierarchical the command structure of the United States Army was first and foremost an expression of the will of the sovereign "We the people". This is well said in the following extract from the Field Service

Regulations, United States Army, 1923 which set the pattern for the exercise of unit control through the principle of military command:

> "In the practice of his task, the commander must keep in close touch with all subordinate units by means of personal visits and observation; it is essential that he know from personal contact the mental, moral, and physical state of his troops, the conditions with which they are confronted, their accomplishments, their desires, their needs, and their views, and that he promptly extend recognition for services well done, extend help where help is needed and give encouragement in adversity, but never hesitate to exact whatever effort is necessary to attain the desired end. Considerate and devoted to those whom he commands, he should be faithful and loyal to those who command him."
> (Ref. 40, p. 4)

In all armies during World War I, unit leadership was a problem. This problem existed at all levels but especially in the regimental area. Professional soldiers were in sufficient numbers to fill the high commands but civilians had to carry the heavy burdens of face-to-face combat leadership. Unit control on platoon, company, and battalion levels began with the training of the unit commander. In the United States Army the expansion of the small regular army into a huge national army required hundreds of thousands of new officers. Civilian candidates were enrolled in Reserve Officer Training Camps for the different arms at various military posts throughout the nation. In these camps intensified instruction was conducted for a period of ninety days. Every phase of military science was covered and the candidates were graduated in grades from second lieutenant to major. The range of command potential of the graduates was from a platoon to a battalion. The magnitude of the task of training new officers for the National Army may be noted in the following extract:

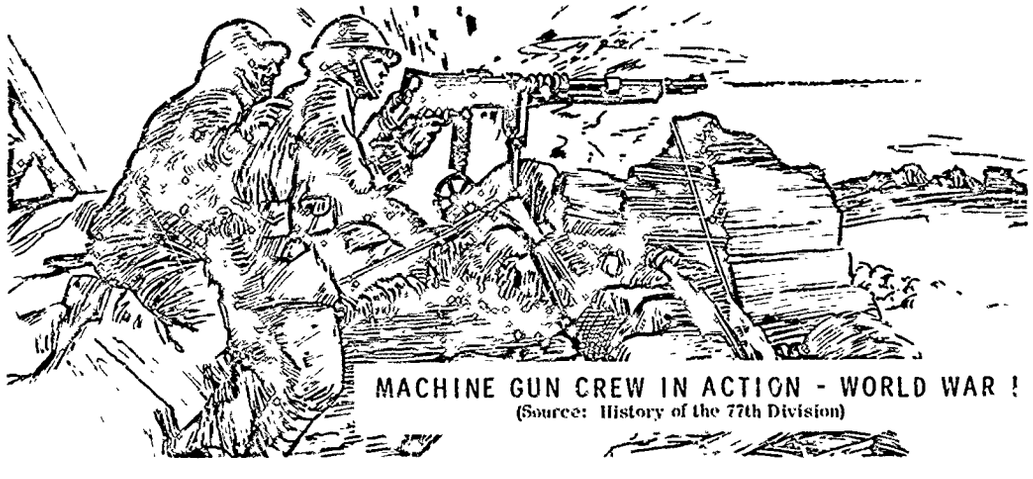
> "Three days before the President signed the bill, making the Selective Draft Act a law, 40,000 civilian candidates appeared in sixteen large cantonements throughout the country -- willing and green. At each camp there reported a group of 2,500. . . . Personality for leadership and a commensurate intelligence were the two qualities to be sought in the candidate. Either without the other would be valueless. . . . From each R. O. T. C. company were to come the officers of a regiment from major down, provisional second lieutenants for the regular army, additional reserve lieutenants, second lieutenants of the quartermaster corps, machine gun specialists, aviation candidates, ordnance lieutenants, and those recommended for a second camp."
> (Ref. 15, pp. 471-475)

World War I became the first national war emergency confronting the United States wherein army officers were trained from candidates taken directly from civil life. The standardization of their training was one of the great values of the Reserve Officers Training Camp and this fact was reflected in unit and troop control. The results obtained by the so-called "90 day wonders," as the graduates were termed, are integral parts of the combat history of the American Expeditionary Forces. Amateurs in the art of war, they were expected to perform in a professional manner. Generally, they did according to the record.

Prior to World War I, the United States Army initiated numerous attempts to standardize the form of the field order. The first step was taken in 1905 when the Field Service Regulations prescribed a set form and showed examples of proper field orders. The Regulations went on to classify orders as letters of instruction or field orders. The five-paragraph field order was then in the state of being conceived and in its elementary form, in 1905, contained the following: (1) information of the enemy or own troops in the vicinity, (2) intentions of the commanding officer, (3) orders for baggage trains and ammunition columns, and (4) location of commander and place for the delivery of messages. No paragraphs, as such, were prescribed by the Regulations.

World War I contributed much to the evolution of unit control in the United States Army. The experiences of the American troops in the trenches and the subsequent "breakout" into open warfare were reflected in the combat doctrine of the United States Army for the next two decades. The weapons of the trenches were machine guns, mortars, and automatic rifles retained within the infantry units. Emphasis was placed upon training the soldier to act as a team member of his squad, or section. The rifle squad of the post-war army of the 1920's was the same squad with which we finished the war in 1918.

Leadership at all levels was retained in a status quo and the corporal continued to be one of the most important commanders in the infantry arm. Doctrine for the composition of field orders carried over from World War I days. The five-paragraph field order, as conceived at Fort Leavenworth



MACHINE GUN CREW IN ACTION - WORLD WAR I
(Source: History of the 77th Division)

General Service School and improved by wartime usage became the standard format for carrying out the functions of command and control in combat. The body of the standard five-paragraph field order as taught at Fort Leavenworth was most important because :[22]

> " . . . it contains the information and instructions most needed by the troops. In order that a command may function properly, its field orders must contain certain information data such as:
>
> (1) Information of the enemy and of our supporting troops.
>
> (2) The general plan or mission.
>
> (3) Detailed tactical instructions for the various units.
>
> (4) Instructions regarding supply and evacuation.
>
> (5) The means by which communication is maintained and the location of commanders."

(Ref. 41, pp. 16-17)

World War I with its stabilized, positional warfare saw the beginning of the written, well-organized battle plan and field order. Because of the complexities and tactics of trench warfare, troops were furnished with plans and orders in great detail. In the United States Army, field orders and letters of instruction followed generally the system and format developed by the General Service School at Ft. Leavenworth and amplified in the Field Service Regulations. With the advent of more modern means of communication, such as wireless (radio) and telephone, verbal orders could be delivered with electronic speed. The means of publishing written orders had improved so that by the end of World War I the typewriter, mimeograph, and other devices were important items of equipment in the headquarters at every level of command. These machines increased the speed with which orders could be reproduced and delivered to the troops who were to execute them. The following observation is of interest:

> "Written orders to coordinate action for a single military operation have come into prominence only in modern times. This is primarily because of the advent of mechanical devices for reproduction. It certainly would not have been possible to write a division operation order during the Civil War, prepare all the copies, and dispatch the order in time for it to be of value. The typewriter, mimeograph and ditto machine, spirit reproduction set, gelatin process, and other aids make this

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[22] See Appendix J for general form for a complete written field order, 1939.

not only possible, but the usual procedure for a division of today."
(Ref. 42)

In the Aisne-Marne Operation in World War I, an American Army Corps was to appear for the first time in World War I. As the army corps organization was relatively unknown to the majority of the United States officers and men, except those who had served in the Spanish-American war of 1898, its baptism of fire was important. How the corps organization was established, commanded, and controlled and operated in combat is described in the following passage:

"The I Corps headquarters had been in existence for several months, exercising administrative control over American divisions. On July 4, under command of Major General Hunter Liggett, it took over a sector in the region of Chateau-Thierry, relieving the French III Corps. In line on the corps front were the American 26th Division (Edwards) and the French 167th Division (Schmidt). The corps now came forward in the decisive attack. The French XXXVIII Corps, which included the American 3d Division (Dickman), bridged the Marne and came up on the right. The rest of the Sixth Army extended the active front. French and American units were used indiscriminately, relieving each other, as required; by the end of the month five other American divisions were actively engaged -- the 4th (Cameron), 28th (Muir), 32d (Haan), 42d (Menoher) and 77th (Duncan). On August 3 the American III Corps (Bullard) entered the line on the right of the I, taking command of the troops already there. The II Corps (Read), it should be remarked, was exercising administrative control over the American troops on the British front."
(Ref. 34, p. 429)

The siege warfare of the trenches caused boundaries, zones, salients, and other limiting areas to be most important to unit control in World War I. Zones of action as prescribed by the Field Service Regulations of 1923 were a direct result of the United States Army's experience in France in World War I. The Regulations provided that:

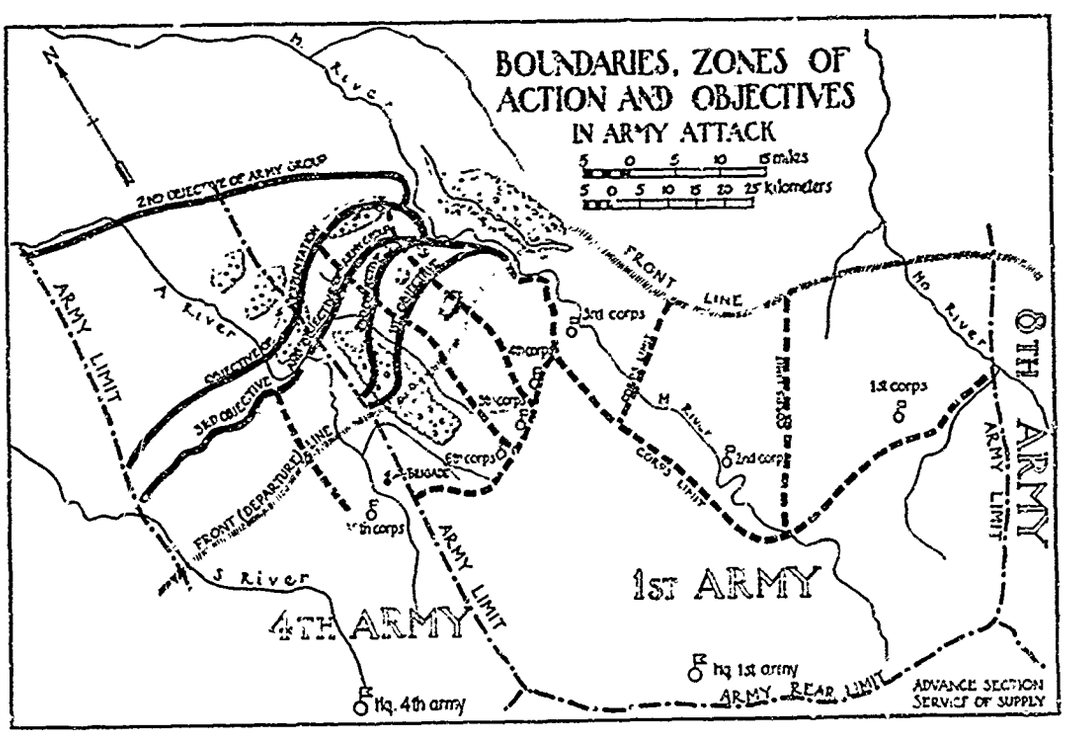
> "In deploying for attack, either from development or an assembly position, units are assigned zones of action and directions of attack.
>
> "Zones of action may be defined by designating their lateral boundaries or they may result from the assignment of a front of deployment and the designation of the lateral limits of the objective. Zones of action of units assigned to decisive attacks extend through the depth of the hostile position at least as far as the hostile artillery positions.
>
> "In order to take advantage of favorable routes of approach, units may temporarily move into adjacent zones. Such movement must not, however, interfere with the action of adjacent units or result in a dangerous massing of troops. The movement of machine guns in zones of action adjacent to the zone of the units they support is always permissible.
>
> "The battalion is ordinarily the smallest unit which is assigned a zone of action. Smaller units are usually assigned directions or objectives. In defense, units are assigned to sectors of the defensive position.
>
> "By varying the width of zones of action, the attacker is enabled to throw the weight of the attack against those points of the hostile front which constitute his principal objectives and to commit only minor forces to the attack of secondary fronts.
>
> "In general, the weak points in the hostile dispositions constitute the principal objectives of the attack. Zones of action in which such points are included are made relatively narrow, while zones including hostile strong points are more widely delimited.
>
> "For similar reasons, the defense assigns broad sectors to units holding the strong points of the position and narrow sectors to those holding the weaker features."

In summary, unit control in the United States Army was profoundly influenced by World War I service. The siege war of the trenches gave the Americans a new regard for the precision required in warfare. Although abandoned in favor of open warfare, upon General Pershing's insistence, the precise tactics of position war survived in the careful delineation of

boundaries, zones of operations, and objectives in combat orders.

Brigades, divisions, corps, and armies continued to be the principal formations for unit control on higher levels. The organizational structure of units was constantly reviewed and reorganized but, in the main, it remained much the same as it was in World War I. As the period of 1920-1939 wore on into World War II, many of these larger units were "paper" organizations of reserve personnel. The continental United States was divided geographically into nine army corps areas which were purely regular army administrative and command units. These areas in event of national mobilization were expected to furnish personnel from Reserve and National Guard and Selective Service sources for the organization of an army corps.

Thus, the small post-World War I Regular Army, The National Guard, and the Organized Reserve, were enabled to keep alive the military traditions of the country and to maintain a modicum of training standards. By their so doing, the military experience of World War I in unit control and command, preserved and improved, was used to prepare for participation in the global conflict which lay ahead.



(Source: Bond and Crouch, Tactics.

WORLD WAR II

(1939-1945)

> ". . . no body of armed men can be considered to be an army -- that is, an organized fighting force -- unless it reacts to the will of one man, for a multi-headed army is clearly a monster."
>
> General J. F. C. Fuller

World War II was a global conflict which involved most of the world powers and their hundreds of millions of people. This struggle was marked by several unique situations. Among these situations were those of climate, terrain, and air space. Troops fought in every type of climate from the frozen Arctic to the tropical jungles of the Pacific Ocean area. The armies involved ranged from those which subscribed to the normal restraints upon warfare, such as the Geneva Convention, to those who waged total war without regard to the rules.

> "During the second World War new terrains, new climates, strange weapons, and unfamiliar peoples acted upon the American infantrymen. These destroyed thousands of men, put a lifelong mark on others, and changed somewhat the techniques of fighting on foot, nevertheless, in spite of everything, the basic characteristics of the infantry hardly shifted. Foot soldiers continued to be the only carriers of weapons who, in theory were never exhausted, could always go another mile, and who could be counted upon to move across any terrain in every quarter of the globe."
> (Ref. 14, p. 57)

Because of the global nature of the war and the large geographical areas under operational control of the military, it was necessary for control at high levels to designate Theaters of Operations. These organizations were administrative, strategical, tactical, and political units. Specific area designations were European Theater, Middle-East Theater, African Theater, Pacific Theater, Mediterranean Theater, etc. Troop units serving within these areas came under the command of the theater commander. On the highest levels of command, overall unit control was the responsibility of the theater commander. The major unit commanders involved were directly responsible to the theater commander for the tactical control of their units and subunits.

At the entrance of the United States Army into World War II, the unit organization, at all levels, was based upon formal, published tables of organization and equipment. There were tables for peacetime and tables for wartime. At the regimental level, the wartime infantry regiment comprised battalions, each consisting of five companies. It should be noted that at this point in American history, the battalion was upgraded, as far as command was concerned, with a lieutenant colonel replacing the major as battalion commander. The World War I infantry battalion was commanded

by a major, but now the major was carried as the battalion executive officer, or second-in-command.

Serious and lengthy consideration was given to the subject of organization by planners at every level of the War Department and the Army. The search for an ideal formation to ensure maximum unit control and, hence, combat effectiveness was a continuing process. The perfect battle formation does not exist but the search is never ending.

Generally, throughout the United States Army there was a desire to reduce the bulk of units and to make them compact and more mobile. The first movement in this direction was when the old "square" infantry divisions were "triangularized." This meant that the four infantry regiments in a "square" division were reduced to three in the new divisions.

General Headquarters of the Army relinquished the overall control of organization and training to the newly formed Army Ground Forces Headquarters under the command of General Leslie J. McNair. General McNair was an expert artillerist and planner whose policy, with reference to personnel and military organization, was conservative. He believed in trimming excessive personnel strengths and eliminating what he considered unnecessary units. With a global war underway, his conservatism contributed to the maximum use of available manpower and to the overall efficiency of operations on all battle fronts. To General McNair is owed the fact that the United States Army ground forces, organization-wise, were highly adaptable to unit control and discipline. This was because they were trimmed down and organized for maximum control and effectiveness in combat.

From the point of view of military organization, World War II introduced novel and unheard of concepts. Because of the highly-specific types of warfare waged, organizations had to be developed and trained for specific tasks. This situation was especially so with reference to the warfare in the Pacific Ocean areas where the higher level unit objective was usually an island. Early in the game, it was found that the Tables of Organization and Equipment type units were not efficiently set up for such highly specialized operations. Hence, the term "task force" was born to describe normal and usual military units and weapons which had been combined temporarily to accomplish a specific mission.

> "Initial training of the 7th Division for the Marshalls' operation fell under the control of General Richardson's headquarters (USAFIGPA). The entire division spent a week at a jungle training center on Oahu, where it was put through battle conditioning courses and received instruction in jungle fighting, jungle living, booby traps and demolitions, sniping and infiltration, and defense against various types of tactics that might be employed against it in the forthcoming campaign. Each company conducted exercises in the attack of fortified positions involving the use of chemical mortars,

flame throwers, grenades, engineer infantry teams, tanks, and machine guns and rifles."
(Ref. 44, p. 183)

JUNGLE PATROL IN PACIFIC - WORLD WAR II
(Source: U.S. Army Photograph)

Combat was the acid test of any type of military unit and General McNair was among the first to suggest reorganization when it was made necessary by combat experience. This was done innumerable times during the conflict.

Generally, the World War II period was marked by a better understanding on the part of the military profession of control of the usual organizational structures than any previous period of military history. New weaponry, the high mobility engendered by the most modern airplanes and motor vehicles, instantaneous intra-unit communication via portable voice radio, down to platoon and squad levels, -- all influenced organization and leadership and unit control. The most desired military end product of all this was flexibility. Without doubt, World War II organizations were the most flexible as to employment, including interchangeability and adaptability, than any similar type organization in the long history of warfare. Units on every level were scrutinized from the point of view of efficiency and from field army to squad they were subjected to a continuous refining process.

"The problem resolved itself into the integration of new techniques of warfare with the old, but still basic principles of tactics and strategy. Many, including General McNair, insisted on keeping such principles

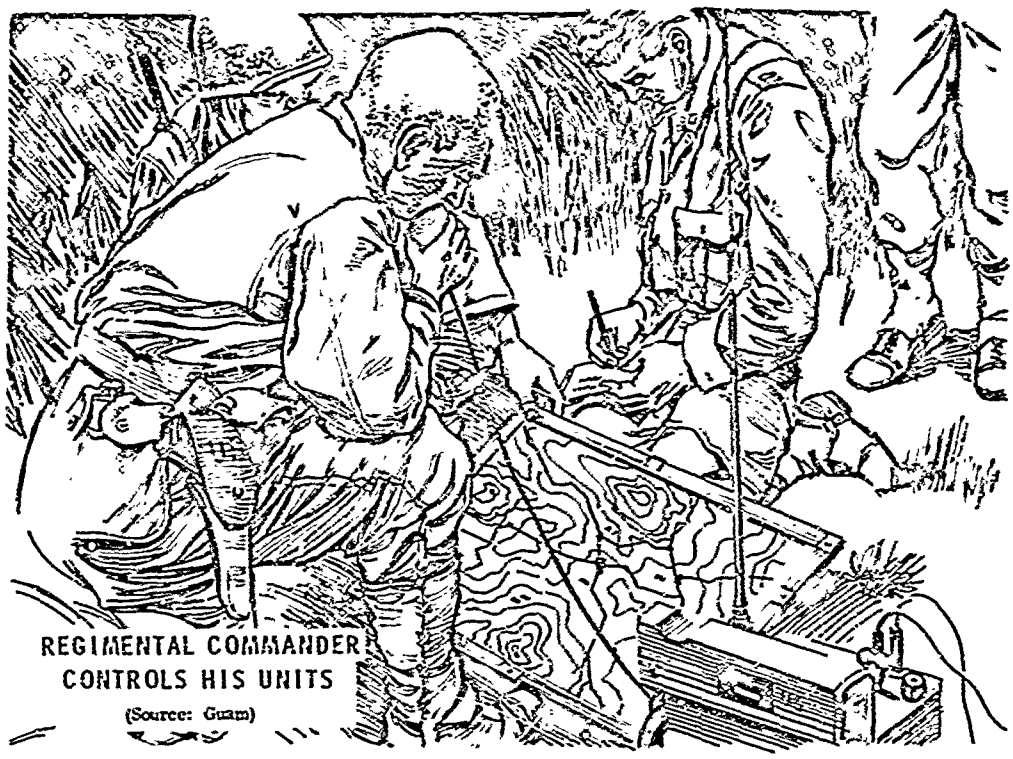
constantly in mind. Greater mobility gave new meaning to the old tactical ideas of surprise, flexibility, and concentration. The old idea of balanced forces became more important, rather than less, because of technical specialization and interdependence in the armed services.

"The need of unity of over-all command was more urgent rather than less, because of the freedom which had to be granted to specialists for the promotion of their chosen arms. Unity of command was also the more necessary as forces became more mobile, if all were to be engaged in fighting the same war. Economy of force remained a basic necessity even for a country priding itself on the superiority of its resources.
(Ref. 43, p. 388)

"The organization advanced by the Army Ground Forces did away with organic army troops and corps troops and made all nondivisional units organically GHQ Reserve. Army and corps retained no organic elements except those necessary for command -- chiefly headquarters and signal units. Troops were organized in interchangeable parts, in permanent units of the smallest size compatible with efficiency. For combat units, this was judged to be the battalion. From the mass of battalions, all organically GHQ Reserve forces would be assigned or attached to armies and corps as needed. There would be two kinds of permanent T/O units, divisions, and separate battalions. A corps would be a variable combination of divisions and battalions; an army, a combination of corps with additional battalions and perhaps divisions. The brigade disappeared as a fixed nondivisional unit, as it had already disappeared from the division. The fixed regiment likewise ceased to exist as a nondivisional unit, it was soon to disappear from the armored division as well, and remain, in general, as an echelon known only to infantry, mainly an infantry division. In its place was put the group."
(Ref. 43, p. 355)

The span of control of the regimental commander in World War II extended to his executive officer, a lieutenant colonel, and his regimental staff officers. These were the adjutant, the S-1 Personnel, S-2 Intelligence, S-3 Operations and Training, S-4 Supply. Functionally, the regimental staff operated in much the same manner as the general staffs of divisions and higher level units such as corps and armies and army groups.

The infantry division was commanded by a major general with an assistant division commander, a brigadier general, and a chief of staff, a colonel and the general staff of G-1, G-2, G-3, G-4 and sometimes G-5, at that time, Civil Affairs. The span of control of the division commander was limited to his assistant commander and the chief of staff. The chief of staff supervised personally the general staff section chiefs and the assigned unit commanders. It was his task to make the staff function as a collective



REGIMENTAL COMMANDER CONTROLS HIS UNITS
(Source: Guam)

intellect for the exclusive use of the division commander. Based upon its collective recommendations, the commanding general, if he saw fit, made his decision. At division level, all tactical unit control and command was initiated in the division commander's office or command post. Its implementation was the task of the lower unit commanders who were within the span of control of the higher commander. Perhaps, in all our military history there had never been a period comparable to World War II wherein unit commanders and staffs were selected and trained with such great care.

> "One of General McNair's principal goals was to hold down the size of headquarters staffs. Substitution of the group for the regiment, with the group headquarters handling four battalions and passing administrative matters on to army, was intended to economize headquarters overhead. The same objective was aimed at in elimination of the regiment from the armored division, in the general cutting of division staffs by the Reduction Board, and in the paring of headquarters companies at all levels.
>
> "General McNair's reasons for cutting all staffs applied especially to the staffs of higher headquarters -- those of armies and corps. One reason was to conserve manpower, the other to speed up operations. Higher staffs tended to absorb large numbers of the most experienced officers."
> (Ref. 43, p. 359)

In the European Theater, where the land combat was more conventional than it was in the Pacific areas, the task force concept was used with armor especially. Identification of the task force, especially in Europe, was by means of the name of the commander. This was not always so in the Pacific as task forces were often designated by geographical terms or in terms of the mission itself.

The composition of a task force was almost wholly dependent upon the nature of the intended mission and the resistance expected during its accomplishment. In essence, the task force was the answer to the planner's problem of "getting there fustest with the mostest." Based upon the best and most accurate intelligence available, the task force was constituted from those standard units present for duty. The nature of the mission, the objective, or objectives and the time available and the relationship of the operation to the overall plan were some of the prime considerations in task force organization. World War II was the first conflict to see large and autonomous armor units engage in combat. With the mobility and semi-independence of armor on the battlefield or area, its organization was perforce different.

> "Conceptions of the armored division passed through several stages during the war, largely as a result of the activity of the Germans, whose successes made it possible for various schools of American officers to get their ideas adopted. The American armored divisions were at first modeled on the German Panzer division of 1940 and were made up overwhelmingly of tanks with relatively little infantry support. Virtually, all tanks in the Army were placed in armored divisions. One school thought that these heavy armored divisions would operate well ahead of the mass of friendly forces. Divisions of foot infantry were left a modest role. "The triangular division," wrote the Chief of the Armored Force, on 18 July 1942, " has its place in the scheme of affairs to protect lines of communication, to hold ground, to assist the armored units in supply and the crossing of obstacles such as rivers, defiles, etc. They do not carry the spearhead of the fight and never will when tanks and guns are present." The belief that armored divisions were a kind of elite troops, capable of peculiarly decisive actions, was the basis for furnishing them so liberally with personnel and equipment."
> (Ref. 43, p. 322)

The armored division was the next higher level of unit organization. In the US Army, the armored division was divided into a smaller and more compact formation, the "Combat Command." There were two of these subunits in each armored division and they were designated "A" and "B", respectively. In a sense, they were akin to the brigade of the

old-fashioned infantry division of World War I. However, they were highly flexible as to troop strength and purpose. These battle-designed units were commanded by a brigadier general, or a senior colonel.

As an integral part of the armored division there was the armored infantry regiment which existed for the sole mission of supporting the tanks by ground action. Mounted in lightly-armored half-track vehicles, these units when dismounted functioned in combat as standard infantry.

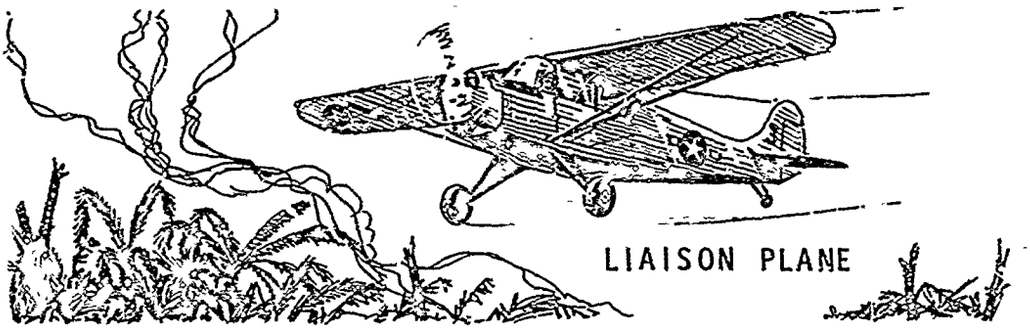
Prior to the United States Army's participation in World War II combat, organization and training occupied a large portion of the time allotted to each forming unit. The organizational patterns were based largely upon the experience of the French and British in combat with the Axis forces. However, there was much to be learned from actual combat. Lessons learned served as new patterns for reorganization.

> "The commander of an infantry battalion, for example, learned to handle his three rifle companies, to use the supporting fires of his antitank guns and heavy weapons company, to call for assistance from the additional weapons available in regiment and division, to carry on his administrative business with the personnel made available to him, and to draw upon agencies outside the battalion when necessary. At the same time, all personnel, from army commanders to members of antitank platoons and rifle squads, learned the part prescribed for them in the organizational scheme."
> (Ref. 43, p. 267)

Because of the geographical requirements of the various theaters of war, it was necessary for the United States Army to organize highly specialized units for service in specific areas. These were units given combat missions not coming within the scope of the standard unit. Some were comparable to the British long-range penetration units and were highly classified at the time. Their unit control, essentially based upon the conventional military system, was often tempered by the unconventionality of their mission. In the United States Army in World War II, there were numerous units of this type. Among these was the 5307th Composite Unit (Provisional) better known as "Merrill's Marauders." Another outstanding example was the Mars Task Force. Both of these units operated in Burma under the China-Burma-India Theater Commander.

> "The MARS TASK FORCE was one of two American Long Range Penetration Units which saw action in far-off Burma. With a mission to circle around and behind Jap lines through dense Burma jungles and over high mountains, it made history for itself which is matchless among the unique chronicles of World War II . . . Outside of radio for communication, airdrop for supply, and tiny liaison planes for evacuation here and there along its route, this Task

Force might well have been marching as a band of warriors out of ancient history books -- better still, from fairy tales or comic strips."
(Ref. 45)



The amphibious warfare conducted in both European and Pacific Theaters called forth another innovation in specialized unit organization, the Battalion Landing Team. The team consisted of:

> " . . . An infantry battalion normally reinforced by necessary combat and service elements; the basic unit for planning an assault landing."
> (Ref. 46, p. 62)

This was the beginning of the use of the term "team" in a unit tactical sense rather than exclusively with weapon operations. While teams were organized on an ad hoc basis, in the same manner as task forces, there was nothing informal about the regimental combat team. This more formalized grouping of combined arms gave the infantry regiment additional personnel but most importantly it provided additional, heavy fire power and extra mobility.

Generally, operations in the field were directed by no different methods than they had been conducted in World War I. The principal change was in the media used for the transmission of orders and instructions. The order of battle was new -- there were units of a kind that had not existed during the previous conflict. There were Army Air Corps units with their peculiar and particular combat requirements and there were amphibious units and airborne elements. Gliders and parachutes, used for the delivery of fighting men and supplies into combat and units, were to make their appearance for the first time on the battlefield. Coordination of the ground units with air units was to become one of the important facets of unit control during World War II. Air-Ground Training Bulletins including identification techniques were standard issue to all combat units which were dependent upon air support for their ground action. The following comment is significant not only from the point of view of training, but of unit control as well:

> "In the best of circumstances the integration of the new forces into a tactics of combined arms would have presented an exceptionally difficult problem of training.

> The relative novelty of the new forces together with the rapid change to which their doctrine and equipment were constantly subject, meant that higher commanders often did not understand how best to employ them in conjunction with other arms. Units trained initially in special branch establishments were in danger of acquiring a somewhat parochial outlook. Organization on a nondivisional basis or in divisions of special type (armored and airborne) meant that even after a unit passed to the field forces it might have infrequent contact with other elements of the Army."
> (Ref. 43, p. 410)

The control of air units in support of ground forces in combat is, of course, vested with the air commander. However, in order to obtain some degree of control over the quality of that support, the ground forces commander must exert influence using one method or another. How this was done in support of General Stilwell's command in Burma is well illustrated by the following:

> "By May 1944, Northern Sector Air Force, the AAF component of the Third Tactical Air Force, had worked out a technique for air support in siege or mobile warfare. For the former, A-2 and A-3 were responsible for joint planning with the task force G-2 and G-3. The latter two chose the targets, while the air staff 'planned the attack, determined the number and type of aircraft to be used, the types of bombs, the techniques of attack, the selection of the units . . . and the briefing of the crews.' For mobile warfare, Northern Sector Air Force provided the 'air party;'
>
> Personnel of an air party consisted of a team of one or two officers with six to eight enlisted men. Their station was with an advanced brigade at the front . . . They were in radio communication with the air office, giving immediate information on targets selected by the army and approved by the air party. They also served as guides to aircraft which were making the air strikes. Sometimes, when it was impossible to observe the tactical situation from the position of the air party, an L-5 was used for strike observation, which worked through the air party.
>
> Radio and photography were vital in the air-ground support mechanism. Of the several air elements in Burma, the Tenth Air Force reached the highest point in air-ground radio communication, using high-frequency SCR-117 or -118 for point-to-point transmission linking the air party with the air force's signal center, and very

high frequency radio for communication with the aircraft making the attack. "In cases of emergency, it took about twenty minutes for communications to be sent from the air party to fighter group headquarters. In some cases aircraft were over the target thirty minutes after the original request." The Tenth Air Force also made complete use of photographic facilities. Low-level verticals, reconnaissance strips, obliques, and pinpoint shots were used. Both air and ground personnel used photographs for target designation, briefing, and aerial identification of targets."

(Ref. 47, p. 89)

Training of all army units at the beginning of World War II was under the direction of General Headquarters of the Army until that function was taken over by the Army Ground Forces. Prior to the war, training was conducted usually by units in garrison and in the field. This practical field training was supplemented by individual training for officers and selected enlisted men at the various schools of the arms and the staff colleges and services. With the Army augmented by millions of citizen-soldiers who had not the slightest military backgrounds, it became necessary to establish a gigantic system of training camps and centers. The Army of World War II was, without a doubt, the best-trained military force ever assembled by the United States. Systematic and carefully planned training schedules were established and published by the War Department and The Army Ground Forces in connection with the various Service Schools of the arms and services.

Mobilization training programs, Subject schedules, Conference Course Training Bulletins and most importantly doctrinal and Technical field manuals were written and printed and distributed to the field units on a worldwide basis. During the course of the war, some of the burden of supervising these activities was taken over from the Army Ground Forces by the Replacement and School Command. The latter command was responsible for the supervision of the operations of replacement training centers and service schools.

At no time in our military history had control of training been so centralized as it was during the period of World War II. For the first time, a real effort was directed toward a standard of training to be applied from central headquarters such as Army Ground Forces and The Replacement and School Command. Unit organization for combat was constantly under scrutiny with a view toward making it more effective. In previous wars, including World War I, there had been attempts to make the formation and organizational structure fit the battle requirements. However, these suggested changes for better control and combat efficiency were often lost in the maze of the administrative superstructure.

The training conducted for all arms and branches of the United States Army during World War II sought to fit the soldier for combat as an

individual and a member of a unit team. Training schedules were replete with subjects all of which were by virtue of combat experience considered to be essential for the trained soldier. Further, there was strict insistence upon completion of all phases of training before the soldier was Port of Embarkation qualified. This fact, had to be certified by the responsible commander before the soldier could be deployed overseas. This was a far cry from the Civil War days when the raw recruits of the Volunteers were issued clothing, weapons, and equipment and formed up and marched to the war with training as they bivouaced along the way.

Discipline was the end-product of organization and training and as such was essential to the operation of unit control at all levels of organization. The discipline of the World War II Army was not as rigid and unbending as that of the discipline of the army of 1917. Essentially a citizen-soldier, the average World War II soldier accepted the logic of the necessity for discipline on the battlefield. But because of his educational level, he wanted more information than his predecessors of other wars. Through information and education programs, the Army endeavored to give him this -- when practicable.

One of the important features of World War II training which contributed to discipline and the quality of unit control was realism. Farseeing planners determined early that soldiers in training should be subjected to the sounds and environment of the battlefield including live small arms, rounds fired overhead or overhead machine gun fire. This latter training was effected by the requirement that each soldier crawl the Infiltration Course while live machine gun bullets were passing within inches of his head. This was a most effective method of giving the trainee an idea of facing gun fire in combat. Completion of the Infiltratration Course was a condition of being Port of Embarkation qualified. What effect this facet of training had upon unit control cannot be determined. However, there were personal psychological gains on the part of the individual soldier by successful accomplishment of the test.

Further, it was determined that:

> "Realistic training would also be needed to accustom troops to battle and jungle noises, for the average American unit, during its first night in the jungle on Guadalcanal, would nervously fire at the sounds made by birds, land crabs, creaking branches, and falling foliage. Rigid discipline and training in sanitation were likewise necessary. It was essential that soldiers be thoroughly indoctrinated in the need for disposal of all waste materials, and that malaria discipline, including the use of mosquito nets, complete clothing after dusk, killing of mosquito larvae, and the regular use of atabrine tablets, be strictly enforced."
> (Ref. 48, p. 318)

The personal leadership of the commander, at all command echelons, is the cornerstone of unit control. As a soldier, he must be above suspicion as to his fearlessness and courage. Further, he must demonstrate competence as a commander. In addition, he looks after his troops and their needs. His presence inspires confidence and his orders are obeyed promptly. His dedication to the mission carries the maximum weight with his unit. He communicates this dedication to his unit by his every action. He is seen by his troops at the front and elsewhere. He shares with his troops their dangers and often their hardships. To insure unit control, he checks and rechecks by visits to units at all levels of his command. The following is one commander's concept of how the commander maintains contact with his units for control purposes:

> "Commanders and their staffs should visit units two echelons below their own, and their maps should be so kept. In other words, Corps Commanders or their staffs should visit Division and Regimental Command Posts; the Division Commander should visit Regimental and Battalion Command Posts; the visits above referred to are for command purposes . . . The more senior the officer who appears with a very small unit at the front, the better the effect on the troops. If some danger is involved in the visit, its value is enhanced.
> (Ref. 49, pp. 354-355)

The burden of leadership of troops in combat is a heavy one. Aside from the necessity of maintaining professional competence, there is the need for the commander to develop a personal philosophy of combat. His sense of values must be geared to the winning of the war. This is paramount regardless of the level of command of the leader. General Omar N. Bradley states it well for all levels:

> "In time of war the only value that can be affixed to any unit is the tactical value of that unit in winning

> the war. Even the lives of those men assigned to it become nothing more than tools to be used in the accomplishment of the mission . . . Men must be subordinated to the effort that comes with fighting a war, and as a consequence men must die that objectives might be taken. For a commander, the agony of war is not in its dangers, deprivations, or fear of defeat but in the knowledge that with each new day men's lives must be spent to pay the costs of that day's objectives."
> (Ref. 50, p. 154)

A distinguished army and corps commander in the European Theater during World War II commented as follows upon the issuance of combat orders. His attitude reflects his thorough knowledge of the proper use of the span of control afforded him by his rank. It should be noted that he requires that confirmatory orders be made and issued to the officer who is to execute the orders.

> "The best way to issue orders is by word of mouth from one general to the next. Failing this, telephone conversation which should be recorded at each end. However, in order to have a confirmatory memorandum of all oral orders given, a short written order should always be made out, not necessarily at the time of issuing the order, but it should reach the junior prior to his carrying out of the order; so that, if he has forgotten anything, he will be reminded of it, and, further, in order that he may be aware that his senior has taken definite responsibility for the operation ordered orally."
> (Ref. 49, p. 337)

As a further caution, the general was careful to point out that the issuance of orders is only about five percent of the responsibility of a commander. The remaining ninety-five percent is to be found in the personal observation by the commander and his staff that they are carried out. He also notes that orders must be issued in time for them to be disseminated to the lowest unit to be involved in the operation.

Formal orders are usually preceded by letters of instruction and often by personal conferences. These steps assist the commander in clarification of questions as to the mission and purpose of the operation. By these means all commanders will know the main objective and can proceed with their mission -- even if communications fail in combat. Every combat order should be accompanied by an appropriate sketch indicating what is to be done but not how to do it. (Ref. 49, p. 400)

Training has always been one of the by-products of organization. In an activity such as preparation for war, combat training is an essential element

of unit control. Control is an absolute requirement for the combat application of the training. Without disciplined response to the orders of the commander, there can be no unit control. Without trained unit leaders at all levels of command, there can be no success on the battlefield. Leadership to be effective must be trained. This is especially true of the military leader at all echelons who must himself be a trainer in addition to being a commander.

In the United States Army of World War II, training for combat leadership was emphasized as never before in our military history. Past experience taught the lesson that military leadership cannot be assumed successfully by anyone without thorough training. The maximum degree of unit control, at every level, depended to a great extent upon the training the leader had received. A standard of military training which this nation had never before witnessed was established for both officers and enlisted men.

As noted in World War I, there was a vigorous and successful attempt made to standardize officer training. But it never reached the efficiency level of the training of World War II. The basic reason for the difference rested in the fact that the World War II training was more centralized, being controlled by Army Ground Forces and The Replacement and School Command. The service schools were the implementing agencies for training. For example, at the Infantry School at Fort Benning, Georgia, the Infantry Officers' Candidate School produced the bulk of the infantry lieutenants of the wartime army. The standards were highly competitive and the graduate carried the spirit of the Infantry School into his active service.

Concurrently with the Officers Candidate Schools, the service schools conducted short Refresher Courses for senior officers; Basic and Advanced Courses; and New Division Staff Courses. All these classes were aimed at one goal -- success in battle. The following extract from Procurement and Training of Ground Combat Troops is included for the overall picture it gives of the magnitude of the training mission performed by the service schools during World War II:

> "The service schools of the Army Ground Forces were agencies for training individuals -- officers, officer candidates, and enlisted specialists. Between July 1940 and August 1945 they graduated from their various courses nearly 570,000 officers and enlisted men to fill positions ranging from infantry battalion commander to anti-aircraft fire control electrician. Of the eight schools operated under the control of the Army Ground Forces, four, the Cavalry School, the Coast Artillery School, the Field Artillery School, and the Infantry School, had been in existence for many years as the schools of the statutory ground arms and were controlled until March 1942 by the chiefs of those arms. The remaining schools were relatively new, having been established for study and training in new techniques of warfare. These were the Armored, the Anti-aircraft Artillery, the Tank Destroyer, and the Parachute Schools." (Ref. 51, p. 246)

The United States Army of World War II was furnished with modern and efficient means of communication. World War II was a war wherein communication was as important and necessary as ammunition and rations. Without communication an army cannot operate successfully. Historically, this is so, regardless of the form or means of the communication involved. Communication media in World War II involved many of those used in World War I plus new and improved devices and instruments. The addition of the so-called "Walkie Talkie" and SCR 300 gave the infantry and other arms instantaneous voice communication. For the first time in our military history, there was radio communication between the elements of the infantry company. The Army Lineage Book comments:

> "Five hand radios were included in a company's equipment. These, and telephones, knit companies tighter together than had been the case since the Civil War; but it by no means made them act as one man. Dispersion to avoid the deadly effects of enemy fire threw squads, or fractions of squads, on their own in combat, particularly in dense foliage, in the mountains, and in night operations."
> (Ref. 14, p. 57)

All units employed voice radio, or CW (wireless) for communication purposes. The air space above every battle area was filled with messages directing combat operations of the units of both sides. How instantaneous communication was utilized to control units in combat is illustrated by innumerable after-action reports submitted by the participating units. In actual combat it was possible to "talk" the units forward and often to point out verbally new targets and areas of resistance. This ability increased the quality of unit control and command, especially when units were dispersed and operating over wide areas. Armored units with their high degree of long-ranging mobility were, of necessity, controlled to a maximum extent by radio. As with aircraft, and in armor, the intra-unit contact afforded by radio was a most valuable tool for control and command. See Appendix M for an example of control in combat via voice radio.

In combat, there were radio nets at all levels of unit organization. These were "tied" in with others to create a complete radio network. Field telephones, either battery-powered or sound-powered were also necessary adjuncts to radio. The carrier pigeon of World War I fame came into his own again as a bearer of messages in combat. Pigeon lofts were assigned to field armies and the birds were handled in much the same manner as they had been in the past. There was, perhaps, less dependence upon pigeons for communication in World War II. Yet, in the jungles of the Pacific islands, they did find their place in combat. When the more modern and sophisticated means of communication failed -- the ancient and primitive pigeon borne communications functioned. The Signal Corps noted in its official World War II volume The Signal Corps: The Emergency that:

> "Pigeon communication, an uncomplicated activity, had a secure if minor place in the

company of its intricate counterparts. In exercises and maneuvers, the ground arms habitually employed pigeons as a means of communication from small units theoretically located at inaccessible spots. The Camp McCoy maneuvers of 1940, for example, had developed "an immense respect" for them."
(Ref. 52, p. 221)

Throughout the war in Europe, or in the Pacific, communications on regimental level were dependent upon wire when radio would not function in a reliable manner. There were, of course, many reasons why radio sometimes failed to provide the necessary communications for unit control. Among these reasons were: abnormal atmospheric or static conditions; climatic conditions, that is, the heat and corrosive weather of the jungles; and lastly, enemy jamming. As a further inhibitor to radio communication, there was the necessity to maintain "radio silence" to avoid the disclosure of one's position to the enemy's scientific and highly accurate detection apparatus. While the immediate solution to the above problems was the use of wire -- wire had its limitations. On Guadalcanal, for instance:

"Voice radio sets were not functioning at full efficiency on Guadalcanal. Moisture and corrosion affected the circuits and metallic contacts, altered frequencies, and occasionally drowned out sets completely. The heavy jungle and deep valleys blocked the waves from some of the lighter sets. Some sets assigned to the infantry divisions were too heavy to move conveniently by manpower when trucks and roads were not available. The SCR's 194 and 195 (the "Walkie Talkie"), powered by dry batteries, possessed a range of from one to two miles. They served well enough in open and high ground, but were ineffective in the jungle. The battery-powered 6-pound SCR 536 ("Handy Talkie"), with a range of $1\frac{1}{2}$ miles, could be used only in open terrain and was very fragile.

"The 20-pound battery-powered SCR 511, with a range of five miles, was dependable if kept dry, and could readily be carried by one man. The most reliable set for infantry use was the portable, hand-generated SCR 284. This set, with a range of seven miles, weighed 110 pounds, and required several men to carry it. The SCR 284 could be transported in a jeep, but jolting over the rough roads was apt to damage it. The bulky, long-range

SCR 193 proved to be effective for ground-to-air communications, as well as for communication between division and corps headquarters."
(Ref. 48, p. 317)

Based upon his experience in World Wars I and II, one of the outstanding field combat commanders of the United States Army advanced the following observations upon combat communications. The techniques of radio have been vastly improved since World War II but the general's comment is included in order to show the appreciation of a high field commander for the need for effective communications in combat. The use of a communication medium to control the actions of units at a considerable distance is well-illustrated by this extract.

"In all attacks, make the maximum use of wire lines and use every effort to keep it up with the advancing units . . Radio, while theoretically efficient, is not as good as wire, and should be considered as a secondary means of communication. On one occasion we actually launched a tank attack by quite a large number of tanks at the end of seventeen miles of wire."
(Ref. 49, p. 347)

In modern combat communications, especially in the matter of radio and wireless transmissions, security is a most important consideration. Coded messages are essentially a safeguard against the enemy gaining vital information by monitoring the units radio traffic. But, in the interests of the urgency of the mission and in furtherance of unit control, there are times when transmissions must be made in the clear, or uncoded text. The criterion for this action is whether the period of action is shorter than the enemy's estimated period of reaction. If so, the messages may be transmitted in the clear, if not, code may be used. The estimate of the enemy's reaction time will, of course, be based upon the past experiences of the attacking force. If, for example, a combat team is ordered to attack at 1000 and past experience indicates that the enemy cannot react for at least an hour, clear transmissions may be used. (Ref. 49, p. 351)

Unit control in joint operations calls forth the highest degree of coordination of the organization and planning involved. This is particularly true when other services are cooperating in the joint mission. Ground, air, and naval forces often find themselves arrayed alongside one another in a common order of battle. How this mixed force is commanded and controlled does not concern the component units -- if the mission and objectives for each unit are clearly stated and indicated. But there comes a time when one service must control those forces of another. This time is seen in the movement of troops to an amphibious landing by naval vessels. In this instance, they come under command of the senior naval commander. When the beachhead is established, the ground commander takes over command and control. The assault upon Corregidor in Manila Bay in February 1945 by the Rock Force exemplifies this point:

"The 503d RCT had staged at Mindoro under the direction of Eighth Army. At dawn on the 16th

THE GENERAL RETURNS
(Source: U.S. Army Photograph)

the paratroopers boarded planes of the 317th Troop Carrier Group, a task completed quickly and without incident. Just as the troops making an amphibious assault are under control of the naval command from the time of staging until a beachhead is established, so the 503d RCT was under the control of the Commanding General, Fifth Air Force, from the time the troop-carrying C-47's took off until the drop was executed. Upon reaching the ground, the RCT passed to the control of Sixth Army and Hall's XI Corps. For the purposes of centralizing control of operations on Corregidor, General Hall had organized Rock Force -- the 503d RCT and the reinforced 3d Battalion, 34th Infantry. The organization of Rock Force, which was commanded by Colonel Jones of the 503d RCT, was to become effective when Jones reached Corregidor with the first lift from Mindoro."
(Ref. 53, pp. 340-341)

When radio communications were not reliable, wire communications were relied upon heavily by all units. This was especially so of the infantry

units from regiments down to battalions and companies. The ground laying of wire often resulted in the wires being broken by vehicles and men passing over them or enemy mortar and artillery fires. Overhead stringing of the wires prevented this breakage but it also exposed men to hostile fire in a disadvantageous position. In the Pacific campaigns, it was found that field telephones functioned best when they were connected to a ground return circuit superimposed upon a metallic circuit by the use of repeating coils. These circuits were more reliable than wholly metallic circuits. Their disadvantage was that they were subject to enemy interception. (Ref. 48, p. 317)

The airborne attack upon Corregidor in Manila Bay in February 1945 and the defeat of its Japanese defenders furnishes an excellent example of the importance of communications for troop unit control in the defense. The Japanese commander, General Itagaki had established his headquarters and communications center in Topside above the famous Malinta Tunnel. The 503d Regimental Combat Team and the reinforced 3d Battalion of the 34th Infantry, the Rock Force, had the primary mission of destroying Japanese communications. The following extract explains why:

> "Itagaki's ravine defenses had no communication with each other or with Malinta Hill. Wire communication from each strong point led back to a central location on Topside, but even so it would be difficult for Itagaki to move forces quickly from one position to another around the periphery of Topside. Moreover, the early destruction of the communications center would lead to complete disruption of control. Thus, while he commanded a strong and fairly well-armed force, Itagaki's means of controlling the operations of his troops were extremely precarious."
> (Ref. 53, p. 340)

In World War II, as in the past, the control of troop units in battle depended heavily upon the initial establishment and constant maintenance of communication. Without the ability, directly or indirectly, to communicate his orders and directives to his subordinate unit commanders, the responsible, overall commander could not control his units effectively. Without control, there is no exercise of command. However, the exercise of command does not always insure that there is the maximum of control present in a unit or units. The commander, by his skill and tactical ability, may enhance this condition in combat. New or raw troop units going into action for the first time are at a most critical point in their battle role. It is at this point that the personal communication of the commander decides the degree of unit control. General Omar N. Bradley, in his book, A Soldier's Story, has this to say about personal communication in the creation and nurture of unit control in new infantry divisions in World War II:

> "For the first few days in combat, most new divisions suffer a disorder resulting from acute mental shock. Until troops can acclimate themselves to the agony of the wounded

and the finality of death, they herd by instinct in fear and confusion. They cannot be driven into attack but must be led, and sometimes even coaxed, by their commanders. Within a few days, this shock ordinarily wears off, the division overcomes its baptismal panic, and troops respond normally to assured and intelligent command." (Ref. 50, p. 296)

In summary, World War II was a period in military history wherein the old techniques of World War I were improved upon, or discarded in favor of new and startling weapons. Among the old practices which survived were the strict limitation of unit operational activity by the use of boundaries and phase lines. The designation of objectives, a survivor from World War I and before, was retained and employed to the maximum extent in the control of units through combat orders of all types.

Because of the innovations in the field of armament, commanders were enabled to control their units by means unheard of in World War I. Dispersion of infantry and mobility of wide-ranging armor and airborne formations called forth new techniques in organization and command and control. Communications of the most modern types were available to and used by the combat arms. The use of the airplane, first in the artillery as a "spotter" plane, was enlarged to include its employment as a highly-mobile command vehicle or observation post. Higher commanders, on corps and division level, were enabled to move to the scene of trouble, or impending disaster, in minimal time. On the ground, visits with frontline units were possible by use of the small liaison type planes which could take off and land on a hastily-prepared air strip or road. The liaison plane plus the instantaneous communication afforded by all types of radio and telephone circuits gave the commanding generals of World War II advantages in the exercise of unit control. Such advantages were unknown to the commanders in the field in previous wars, including World War I.

From the point of view of organization, the United States Army of the World War II period was the most carefully and realistically formed of any the country had put into the field in its history. Tables of organization and equipment were trimmed of excess and useless personnel until they were functional with minimum strength. The infantry division and regiment was under constant study and innumerable reorganizations were effected. The most important reorganization of the division was in the triangularization process.

On squad level, the twelve-man squad proved to be the largest that one leader could control properly in combat. The span of control of the squad leader was actually one assistant squad leader who, in effect, commanded the other half of the squad. The automatic rifle team continued to be the base of fire of the squad and, protected by the riflemen, it functioned well. The squad as the smallest unit capable of fire and maneuver, under control of its own leader, continued to be the critical unit on the battlefield. As the platoon was composed of squads, the progress of the company was in direct relationship to the progress of the platoons at squad level. At no period in

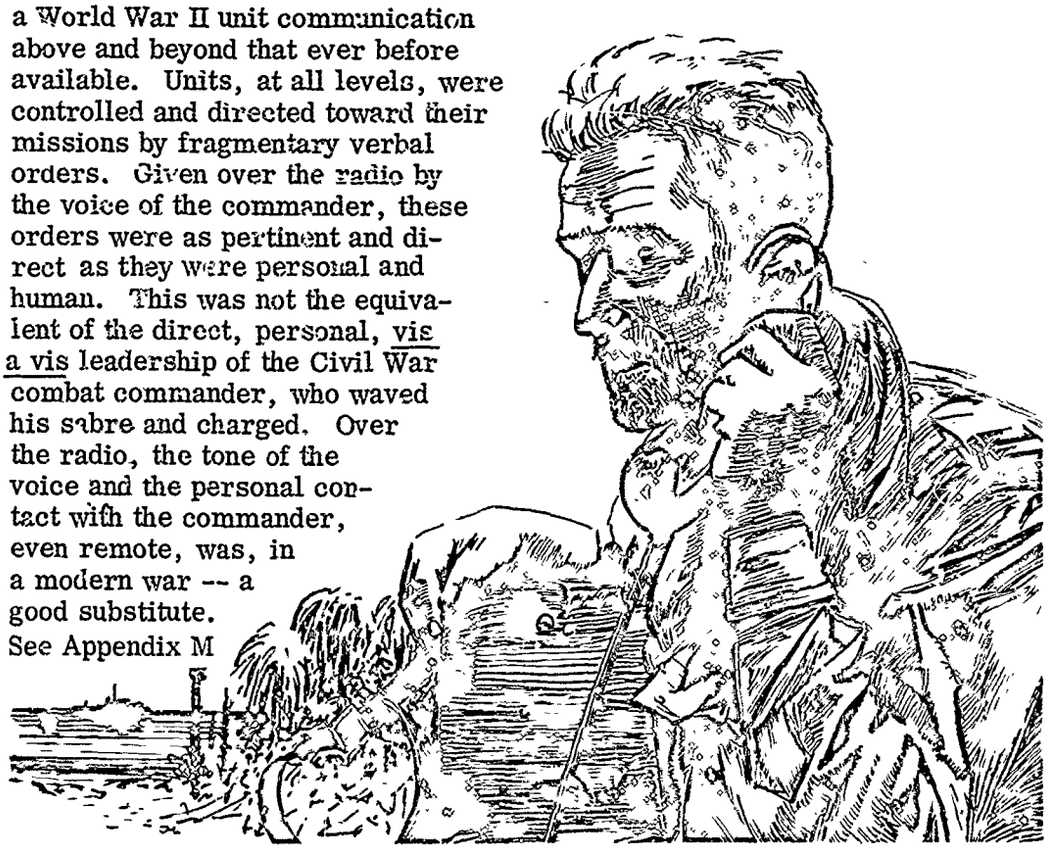
our past military history has the United States Army possessed a more efficient and functional rifle squad or armored rifle infantry squad. (Refs. 54 and 55)

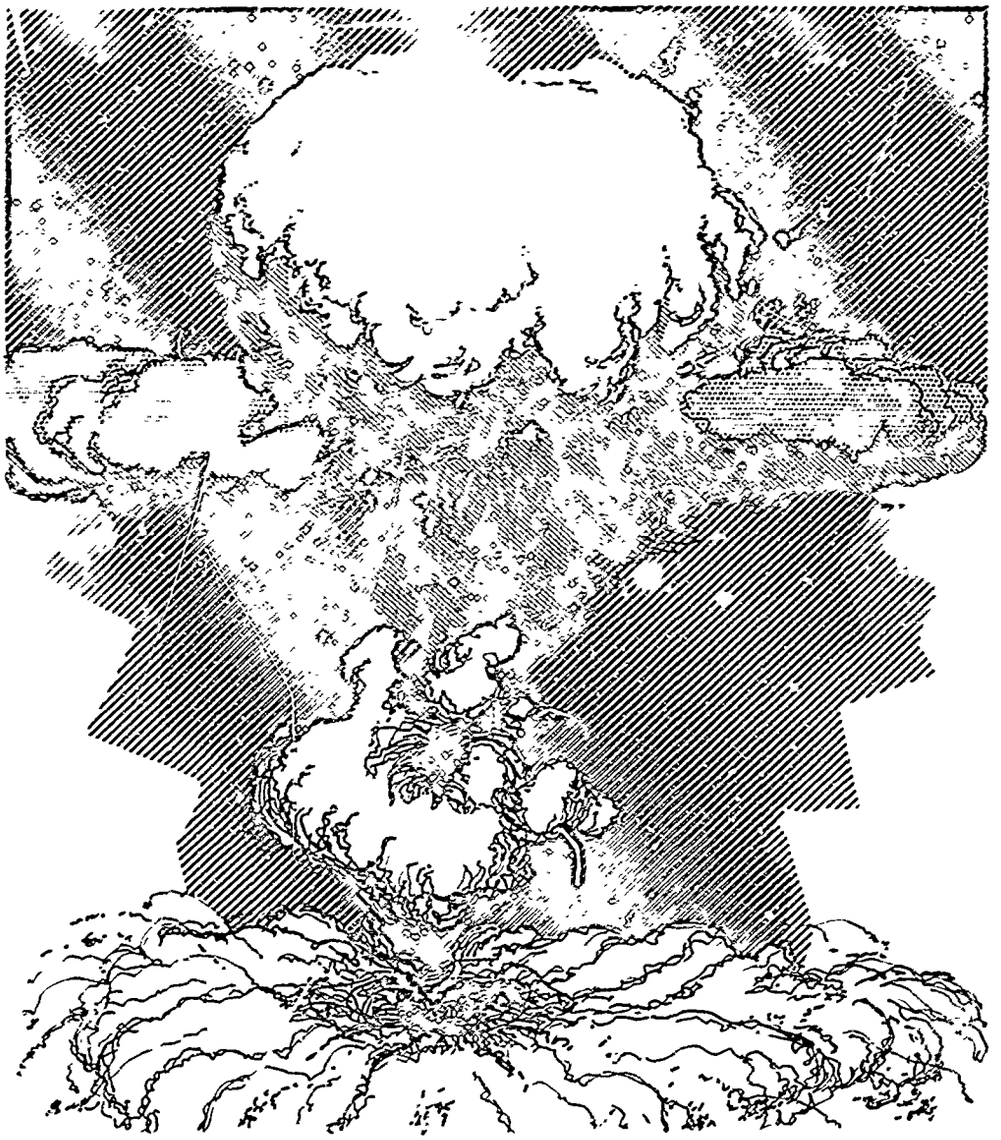
In order to assure the maximum degree of unit control at all levels of unit leadership, the Army and the Army Air Corps were engaged in the operation of schools of instruction. These schools ranged from high-level staff and command colleges to technical courses for radio operators and welders. World War II was outstanding for its officer training programs. Public and private educational institutions served in their own peculiar capacities to train officers for the Services. The officer candidate schools operated by the Army turned out thousands of second lieutenants to command the platoons which were scheduled for combat. At one time, at its peak load, the Infantry School at Fort Benning, Georgia enrolled a class and graduated a class of infantry officer candidates every day for twenty-four days a month. The standardization of the individual graduates helped to assure a degree of uniformity of control and leadership on the platoon, and later, company levels.

Radio telephone, wire telephone and other less technical means of communication gave the commander a World War II unit communication above and beyond that ever before available. Units, at all levels, were controlled and directed toward their missions by fragmentary verbal orders. Given over the radio by the voice of the commander, these orders were as pertinent and direct as they were personal and human. This was not the equivalent of the direct, personal, vis a vis leadership of the Civil War combat commander, who waved his sabre and charged. Over the radio, the tone of the voice and the personal contact with the commander, even remote, was, in a modern war -- a good substitute. See Appendix M

COMMAND COMMUNICATIONS
WORLD WAR II

(Source: Chief, Military History)





In 1945, at Hiroshima and Nagasaki, Japan, there occurred events that were to revolutionize warfare and civilization. The atomic bomb, as a new weapon in the arsenal of warfare, changed strategy and tactics as no force ever had before. The advent of the Nuclear Age changed, overnight, the concepts of unit control in a future struggle which might be waged with nuclear weapons. Thus was ushered in an age of experiment. The experimentation was centered around the type of organization and formation to be used to meet combat under the dispersal forced by nuclear conditions. Further, there was a great deal of thinking on how to use nuclear weapons of various sizes and capabilities and how to control the units employing them. This period of "cut and try" continues to the present time, 1965.

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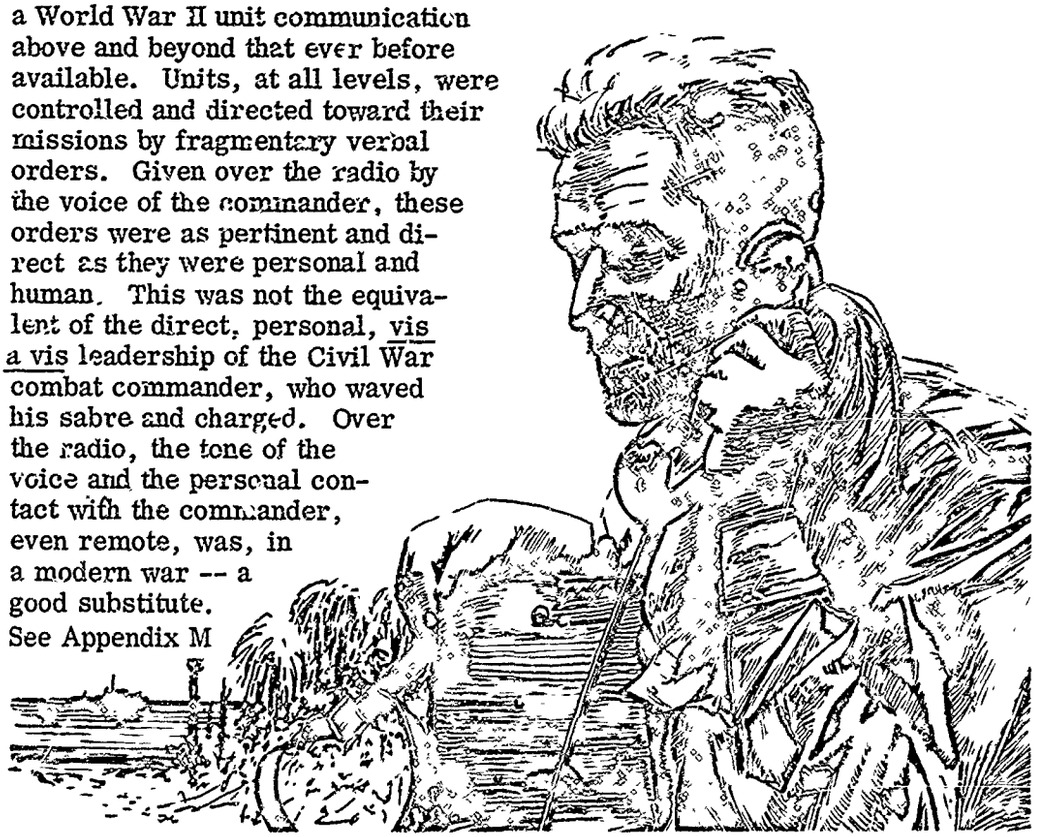

KOREA

(1950-1953)

The involvement of the United States Army in the Korean War began with the sending of a small task force to assist the South Koreans in their attempts to stop the invasion of their country by the Communists from the north. While it is not the purpose of this study to develop the political and other details behind this commitment, it must be indicated that eventually the United Nations became participants in this test to try their effectiveness.

The Korean Conflict, as it was termed by some, was essentially a war of maneuver. At the beginning, the hastily-mobilized and poorly-equipped South Korean Army fought along with the limited American units to delay the enemy's progress south. The plan was to mount a delaying action in order to permit deployment of additional American troops from Japan.

Using armored units and operating on the principle of the mass, the North Korean troops began pushing the South Koreans back from the 38th parallel boundary. General Douglas MacArthur, who had been appointed United Nations Commander by President Harry S. Truman, assigned operational control of all United Nations Troops to Lieutenant General Walton H. Walker, the commanding general of the Eighth United States Army which had been on occupation duty in Japan. General MacArthur, commanding general of The United Nations Command soon had a multi-national force furnished by United Nations member states. While contributions of men and materiels were made by some member nations in token amounts, the United States and Great Britain and South Korea furnished the bulk of personnel. From the point of view of unit control, the United Nations Command was the first attempt by the United Nations to mount collective military action under its own banner. (Ref. 56)

In the first months of the Korean Conflict, the American troops and their Korean and United Nations allies fought to stem the overwhelming Communist tide. At Taejon, where the 24th U. S. Infantry Division under the command of Major General William F. Dean fought a desperate action against massive enemy forces, the division was overrun and unit control was lost on division level. General Dean, as a fighting general, picked up a bazooka (rocket launcher) and, in the spirit of Alexander and Caesar, fought in the ranks destroying hostile tanks. Upon the disintegration of his headquarters, he wandered over the Korean countryside and was finally captured. For three years, General Dean resisted "brain washing" and the horrors of prison life in North Korea. For his brave action at Taejon, he was awarded The Congressional Medal of Honor. (Ref. 57)

General Dean's story is of interest because it demonstrates what happens to unit control when the headquarters of a military formation the size of a division is overrun. The actions of General Dean were based upon historical precedent as far back as Alexander and Caesar. When military disintegration replaces unit control -- survival becomes the paramount object. Survival in the sense of staying alive, inflicting damage upon the enemy, if possible, and returning to one's own lines. Escape and evasion training has since

Korea, become an important part of the training of the American soldier.

The United States Army units fighting in Korea were essentially the same types as those which had ended World War II eight years before. There were some changes in organization. These were noted especially on the small-unit level. The infantry rifle squad was reduced in 1947 to a total of nine personnel. The ammunition bearer and the two scouts had been eliminated from the 12 man squad of World War II.[23] Within the infantry rifle platoon, the three rifle squads had their fire power increased by the addition of a weapons squad of 1 staff sergeant, squad leader; 1 corporal, machine gunner; 1 private, assistant machine gunner; 2 privates, ammunition bearers. With the light machine gun, caliber .30 and the rocket launcher 2.36-inch, the weapons squad augmented the rifle platoon's fire power, especially against armor and armored vehicles. (Ref. 54, pp. 53-54)

The following comment is highly significant from the point of view of the infantry squad, its organization, equipment and above all, its leadership:

> "The Korean War, by reason of both geography and enemy action, was a unit commander's war. The fate of a regiment or of a division might and frequently did depend upon the ability of a platoon commander to solve his own particular problem in the heat of action. So -- perhaps vital as one considers the possibilities of the future in dispersement -- the necessity for trained, capable, and courageous small-unit commanders from the squad level up, was reaffirmed." (Ref. 54, p. 58)

The Korean conflict was marked by several distinct types of combat. First, the struggle began as a highly-mobile action with the North Korean Army generally overrunning the South Korean constabulary-type troops. With the advent of the Americans and the United Nations' troops, the "police action" aspect of the conflict was changed eventually into a full-scale conventional war by the entrance of the troops of The Chinese People's Army. With the appearance of the Chinese Communist hordes, the whole

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[23] "The backbone of our Army is the nine-man infantry squad. That is the basic fighting unit of our ground forces. It is the accumulated successes of a lot of these little teams that brings victory to an army. A general executing a plan of battle may find all of a sudden that he has had a victory. The reason is that these little squad teams have done their stuff."

General Mark W. Clark in From The Danube to The Yalu

character of the action was changed. In complete possession of the principle of the mass, the Chinese were able to overrun units by sheer weight of numbers.

The Korean conflict opened with the tactics and formations carried over from World War II. There had been some reorganization within the infantry, especially on squad level, as noted. However, the regimental, divisional, and corps structures were much the same as they had been in 1945. The high mobility of the North Koreans backed by ample armor from Soviet sources placed the early United Nations Forces on the defensive. While it is not the purpose of this study to recount the entire events of the Korean conflict, it must be stated that the Eighth United States Army was heavily engaged from the very start of the campaign.

Lieutenant General Walton H. Walker, a distinguished corps commander in Europe under General Patton, bore the initial brunt of the diffficult problems of unit control and command from the very beginning. His response was electrifying to his occupation-type soldiers hurriedly pulled from duty in Japan to face a cunning and ruthless enemy. The battlefield leadership of General Walker was displayed on many occasions:

> "As the commander of the first platoon came up the hill, General Walker stopped him and asked, "What are you going to do down there?" The lieutenant said, "I'm going to slug it out." You could see that the boy was certain that he was on his way to death. He'd heard what happened to other M-24 tanks against those heavy Russian-built tanks, but he had his teeth clenched and was going in. But General Walker said, "Now our idea is to stop those people. We don't go up there and charge or slug it out. We take positions where we can fire the first shots and still manage a delaying action." Right there on the battlefield he gave this man as fine a lecture in tanks tactics as you could hear in any military classroom."
> (Ref. 57, p. 26)

But General Walker was more than an instructor in tank tactics. As a battle leader, he demonstrated that he could control and command his troops in the checkerboard tactical moves of the early Korean conflict. At Pusan, he issued his famous order that there would be no withdrawals beyond the Pusan Perimeter and as the North Koreans attacked this desperate line of defense, General Walker moved his limited reserves in a fire brigade manner from point to point. These counterattacks were instrumental in inflicting heavy casualties upon the North Koreans and preserving the perimeter. (Ref. 11, pp. 468-469)

General MacArthur as the United Nations commander planned a surprise amphibious landing at Inchon about twenty five miles west of Seoul, the capitol of Korea. The landing as planned by General MacArthur was:

> ". . . to be followed by an advance on the capital city to cut the main routes of communications

over which most North Korean troops and supplies traveled south. In concert with this move, Eighth Army was to make a general northward advance. Enemy troops who survived the Eighth Army's attack and withdrew over the main road net would walk into the guns of the amphibious force that had come in behind them. In the east, enemy forces could make only a slow and difficult escape through the precipitous, almost trackless mountains."
(Ref. 11, p. 469)

The Eighth Army under the command of General Walker consisted of the U. S. I Corps, the U. S. IX Corps and two Republic of Korea (ROK) Corps, the I and II Corps. The envelopment made possible for the X Corps by the Inchon landing and the pressure exerted by the Eighth Army's frontal attack crumbled the North Korean positions. The Eighth Army pushed on vigorously until contact was made with General Almond's X Corps on 26 September. The numbers of prisoners taken by the Eighth Army totaled over a hundred thousand. Of interest later was the fact that remnants of six North Korean divisions hid in the mountains of South Korea and carried on the struggle as guerrillas. They were enough of a problem to cause General Walker to send IX Corps after them. So well had they hidden that many were still capable of resistance after the Armistice was signed in 1953 and were being cleared out of the Chiri San mountains as late as 1955. (Ref. 73, pp. 109-120 and 174-177)

The Korean conflict was to witness the maximum usage of the Army Corps organization. The flexibility of maneuver of the Corps was well illustrated by the Inchon landing and the attack of the Eighth Army. The control of the Corps by the Army Commander exemplified his thorough understanding and application of the principles of the offensive, objective, maneuver, and surprise. Divisions were, of course, in direct contact with the enemy and control was exercised by their commanders through radio and personal contact at all levels of command. The use of helicopters as command vehicles was not unusual and there were recorded instances when a corps commander dropped down into the area of a hard-pressed unit. Direct, personal observation of the immediate combat was thus available to the higher-level commander and many of them made excellent use of the opportunity to strengthen and bolster unit control. But there were those commanders whose organization had been overrun and disintegration as a military unit was taking place.

With the United Nations Forces ordered by General MacArthur to attack toward the Manchurian border in October 1950, the possibility of the advent of peace before winter looked most promising. But Chinese Communist troops in division-size units began attacking the United Nations units. By 8 November 1950, the Chinese withdrew suddenly and broke off contact. The U. N. Forces, Eighth Army and U. S. X Corps moved forward attacking to gain

favorable position from which to start the all-out offensive. On 25 November the Chinese forces hit the Eighth Army. Surprised, the Eighth Army commander ordered in his reserves but to no avail. The Eighth Army was almost enveloped by four additional Chinese armies which attacked on 27 November. Simultaneously, General Almond's X Corps was attacked in strength by two Chinese armies in the Changjin Reservoir area. This attack blocked the Hamhung withdrawal and supply route for two battalions of the Seventh Infantry Division and the 1st Marine Division. Breaking contact with the Chinese, the X Corps began withdrawal toward Hungnam where a fleet of ships would lift the troops off the beach to Pusan. The withdrawal of the Marines and the 7th Infantry Division from the Changjin Reservoir area was one of the great accomplishments of the Korean conflict. In bitter cold:

> "The Marines and the 7th Division's two infantry battalions . . . had to fight their way out. Supplied by air drops, the Marine-Army force of 20,000 men fought through successive Chinese roadblocks as it moved southeastward through steep, snow-covered mountains toward the port of Hungnam."
> (Ref. 11, pp. 474-475)

Desperate fighting marked the withdrawal of the troops along the icy, mountain trails and roads under the direct fire of the Chinese in the adjacent hills and in the road blocks athwart the route to Hungnam. It was here that unit control meant moving forward, bringing out the dead and wounded, and surviving by maintaining unit integrity.

In this situation, leadership came to the fore -- as opposed to the historical qualities of organization and communication. Leadership brought them through. The inspired example by Lieutenant Colonel Don Faith of the 7th Division 32nd Infantry Regiment enabled his men under his personal leadership to overcome every road block. At the last road block, the gallant commander was mortally wounded. His bravery in combat and skill in unit control was recognized by the posthumous award of The Congressional Medal of Honor. Colonel Faith in his brave actions exemplified the historical disregard of the span of control by the commander.

> "When the enemy launched a fanatical attack against his battalion, Colonel Faith unhesitatingly exposed himself to heavy enemy fire as he moved about directing the action. When the enemy penetrated the positions, Colonel Faith personally led counterattacks to restore the position. During an attack by his battalion to effect a junction with another United States unit, Colonel Faith reconnoitered the route for, and personally directed, the first elements of his command across the ice-covered reservoir and then directed the movement of his vehicles which were loaded with wounded until all of his command had passed through the enemy fire. Having completed this he crossed the reservoir himself. Assuming command of the force,

his unit had joined, he was given the mission of attacking to join friendly elements to the south. Colonel Faith, although physically exhausted in the bitter cold, organized and launched an attack which was soon stopped by enemy fire. He ran forward under enemy small-arms and automatic-weapons fire, got his men on their feet and personally led the fire attack as it blasted its way through the enemy ring. As they came to a hairpin curve, enemy fire from a roadblock again pinned the column down. Colonel Faith organized a group of men and directed their attack on the enemy positions on the right flank. He then placed himself at the head of another group of men and in the face of direct enemy fire led an attack on the enemy roadblock, firing his pistol and throwing grenades. When he had reached a position approximately 30 yards from the roadblock he was mortally wounded, but continued to direct the attack until the roadblock was overrun. Throughout the 5 days of action, Colonel Faith gave no thought to his own safety and did not spare himself. His presence each time in the position of greatest danger was an inspiration to his men. Also, the damage he personally inflicted firing from his position at the head of his men was of material assistance on several occasions."
(Ref. 58, p. 249)

With the Eighth Army reorganized along the 38th parallel with five army corps, that is, the U.S. I and IX west and north of Seoul, and the (ROK) III, II, and I, to the east of Seoul in that order, General Almond's X Corps was ordered into Army reserve.

On December 23, 1950, Lieutenant General Walton H. Walker, the Eighth Army commander was killed in a jeep accident and Lieutenant General Matthew B. Ridgway was flown immediately from Washington to take command. General Ridgway faced a military problem of the greatest magnitude and gravity as he took command of the Eighth Army on the battle line in Korea. His actions, at this point, illustrate the maximum use of the leadership principle in unit control. General MacArthur commented upon General Walker, his predecessor, in his Reminiscences as follows:

"On December 23rd, General Walker was killed in a freak jeep accident. It was a great personal loss to me. It had been "Johnny" Walker who had held the line, with courage and brilliant generalship, at the very

bottom of Korea, until we could save him by slicing behind the enemy's lines at Inchon. It had been Walker who, even in the darkest hours, had always radiated cheerful confidence and rugged determination."
(Ref. 33, p. 383)

With the advent of the new Eighth Army commander, Lieutenant General Matthew B. Ridgway, the ancient and traditional problem of the new commander in the field asserted itself. How would he function to carry on the policies of his predecessor, or would he inaugurate new methods and means of control of the army over which he recently assumed command? The answer was not long in forthcoming from General Ridgway as he visited his units in contact with the enemy. The Eighth Army commander set his pattern of unit control by starting at the highest levels of command. In his book Soldier, he recalls his remarks on his first visit to the battlefront:

". . . Then I talked a little about leadership. I told them their soldier forebears would turn over in their graves if they heard some of the stories I had heard about the behavior of some of our troop leaders in combat. The job of a commander was to be up where the crisis of action was taking place. In time of battle, I wanted division commanders to be up with their forward battalions, and I wanted corps commanders up with the regiment that was in the hottest action. If they had paper work to do, they could do it at night. The power and the prestige of America were at stake out here, I told them, and it was going to take guns and guts to save ourselves from defeat. I'd see to it they got the guns. The rest was up to them, to their character, their competence as soldiers, their calmness, their judgment, and their courage."
(Ref. 59, pp. 206)

Among other important points made by General Ridgway, as he took command of the Eighth Army was the one revolving around the basic responsibility of the field commander. This concept is so fundamental throughout military history that it is repeated here. It is simply -- the commander must anticipate where the crisis of battle will occur. In conformity with this, and in furtherance of unit control, the commander must be there when and if it develops. This means that the commander must be in his advanced command post and not in some rear area. (Ref. 59, p. 209)

The Chinese struck the Eighth Army, advancing in "human sea" attacks by the thousands. The principle of the mass was on their side and they were employing it to overwhelm the new command of General Ridgway. Here, he had the opportunity to put into practice his lifetime experience as a professional soldier and field commander. On arrival a few miles north of Seoul, General Ridgway found that the Eighth Army lines had been penetrated by the Chinese on a six-mile front and that the Korean Army had broken and had begun a headlong, panic-like retreat toward Seoul. This was the well-known "bug-out" as it was termed by the Americans. Leadership

of the strongest kind was needed to stop it and General Ridgway:

> " . . . headed for the front by jeep, toward the ROK sector, the point of deepest penetration. Only a few miles north of Seoul, I ran head-on into that fleeing army. I'd never had such an experience before, and I pray God I never witness such a spectacle again. They were coming down the road in trucks, the men standing, packed so close together in those big carriers another small boy could not have found space among them. They had abandoned their heavy artillery, their machine guns — all their crew — served weapons. Only a few had kept their rifles. Their only thought was to get away, to put miles between them and the fearful enemy that was at their heels."
> (Ref. 59, p. 210)

Historically, the leadership of the responsible commander vigorously asserted at the proper moment often has saved the day. There are many examples cited in this study where the direct and forceful leadership of the commander restored a deteriorating military situation. How this was done in the past has been detailed in numerous examples included in this study. The example of General Ridgway in the Korean conflict is valuable because it shows his possession of a practical knowledge of how to reestablish unit control -- once it has been eliminated by panic. The following tells the dramatic story:

> "I jumped from my jeep and stood in the middle of the road, waving them to a halt. I might as well have tried to stop the flow of the Han. I spoke no Korean, and had no interpreter with me. I could find no officer who spoke English. The only solution was to let them run -- and to set up road blocks far enough back where they could be stopped, channeled into bivouac areas, calmed down, refitted, and turned to face the enemy again. I went back immediately to order these straggler posts set up."
> (Ref. 59, p. 210, emphasis added)

The restoration of control by the measures taken by General Ridgway was effective and the dispirited troops were regrouped and reorganized and faced toward the enemy. The action taken in this instance by General Ridgway has many historical precedents. Among them the same accomplishment of General Philip Sheridan at Cedar Creek in the American Civil War. Perhaps in our military history there has been no more poignant story of how an American general in a foreign land was able to influence native troops to halt and make a stand against the common enemy. His approach to the problem was realistic and his calling upon the aged President Syngman Rhee to accompany him to address the troops in their hastily established bivouacs was no less than inspired leadership. General Ridgway explains the duties

of an army commander:

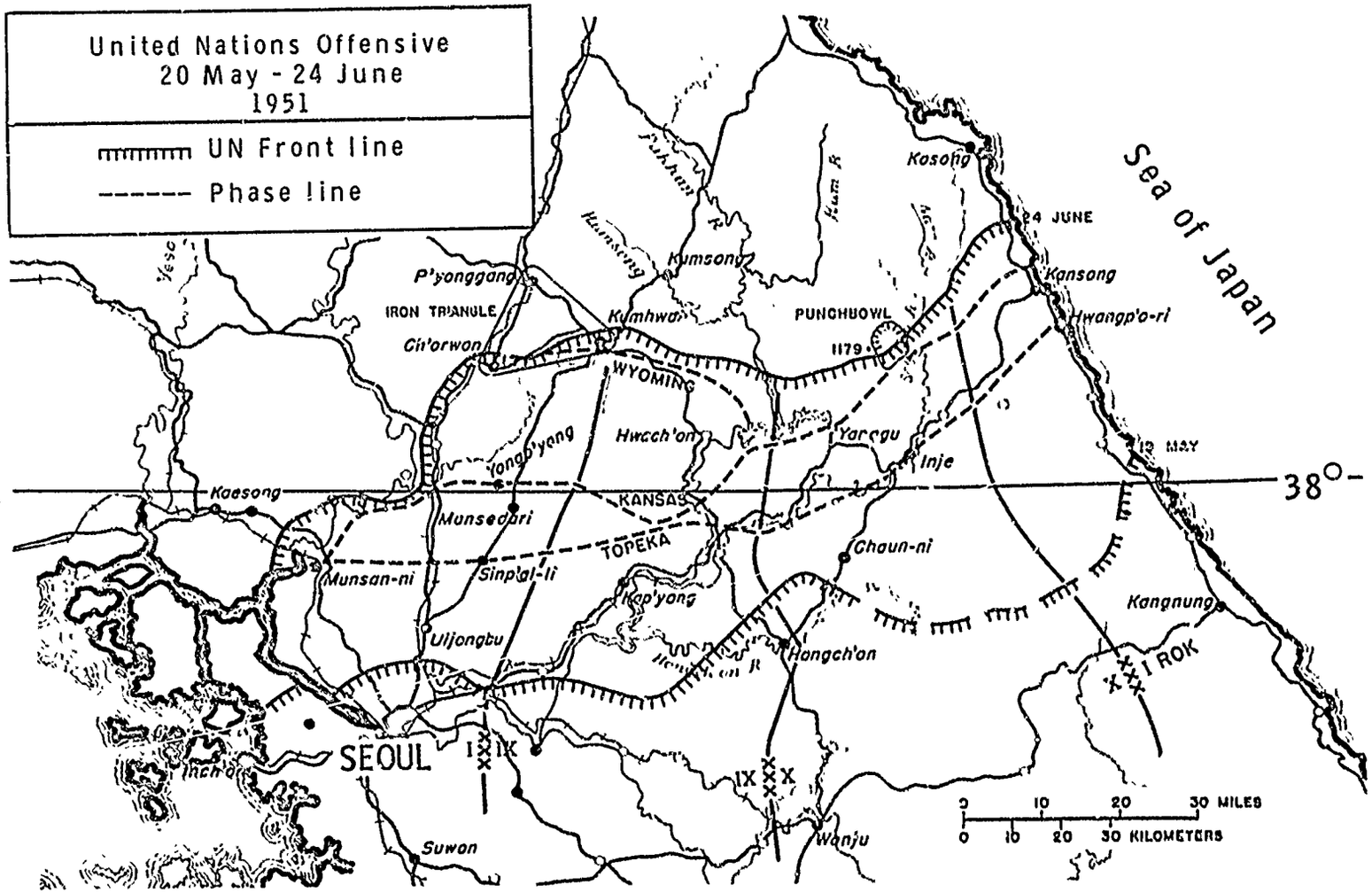
> "An army commander must be ambidextrous. With one hand he must guide and direct his corps commanders as they fight their divisions. With the other hand he must control the vast logistical complex which supplies the men in combat. For two days and nights, as we fought north of the Han, by jeep and light plane, I traveled the surging battle line, visiting each division in action. Our situation was precarious. In front of us was a fired-up, resolute enemy. At our backs was a broad, half-frozen river, its lower, tidal sections filled with floating ice that alternately froze solid and then broke under the rise and fall of the tides. And our only route of withdrawal was across the two fifty-ton floating bridges that spanned the Han at Seoul."
> (Ref. 59, p. 211)

The withdrawal of the Eighth Army and the ROK corps to the south of the Han River to ease the pressure of the overwhelming attack of the Chinese was accomplished successfully. The enemy quickly followed across the frozen Han River and General Ridgway ordered that Eighth Army and the ROK troops withdraw to a line south of Seoul running roughly through P'yongt'aek-Ansong-Wonju-Samch'ok. The Chinese, after the fall of Seoul, pushed light attacks toward the U. N. troops. General Ridgway then laid down his objective for his troops in the following words:

> "We are interested only in inflicting maximum casualties to the enemy with minimum casualties to ourselves. To do this, we must wage a war of maneuver -- slashing at the enemy when he withdraws and fighting delaying actions when he attacks."
> (Ref. 11, p. 508)

By constantly maintaining the pressure on the enemy and wiping out each pocket of resistance, Eighth Army was able to advance phase line by phase line. Eventually, by 1 March 1951, the lower bank of the Han River was retaken. By the middle of March, the Eighth Army reentered Seoul and the enemy concentrated his forces in the area above the 38th parallel. But General Ridgway did not wait for the enemy to mount his attack. Instead, he ordered an attack to the objective line Kansas, which was approximately ten miles above the 38th parallel and in the area of important enemy troop concentrations and supply installations. The use of phase lines by General Ridgway was not new as the practice had been carried over from World Wars I and II. Phase Line Wyoming was quickly designated as a further objective after Line Kansas had been reached.

On April 11, 1952 President Harry S. Truman relieved General Douglas MacArthur of the command of the Far East and General Ridgway was



(CORG-M-217)

Source: Korea -- 1951-1953, OCMH, DA, 1956)

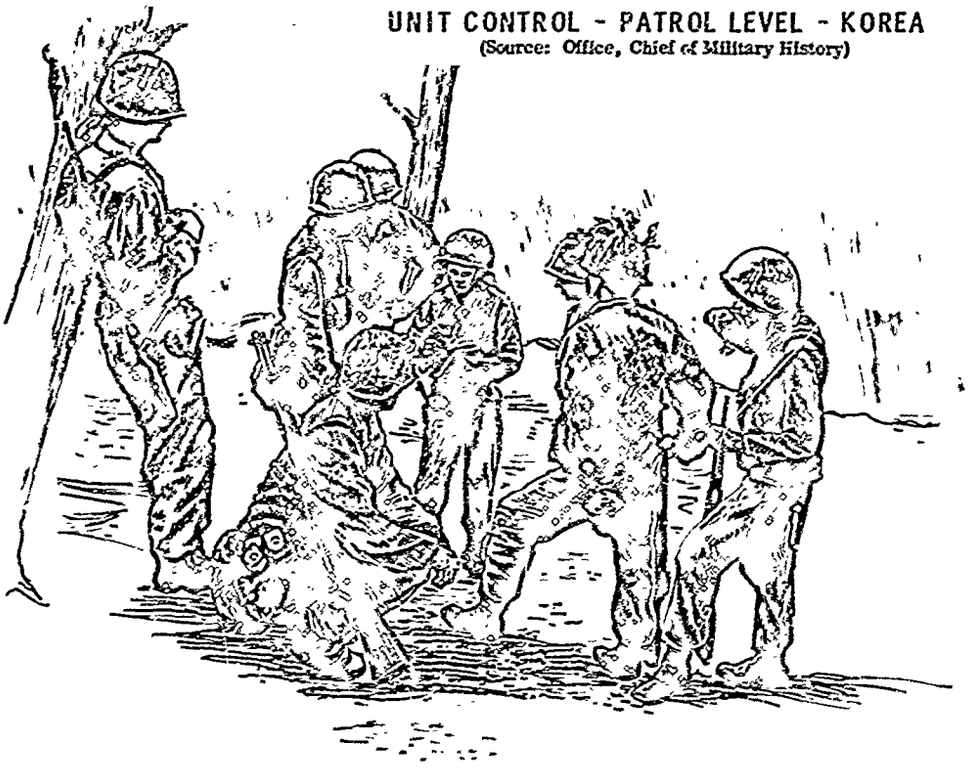
designated as his successor. Lt. Gen. James A. Van Fleet succeeded General Ridgway as commander of the Eighth Army. The enemy concentrated his attacks against Seoul and General Van Fleet withdrew his forces to a series of delaying positions. By the end of April, the enemy attack was halted along this line which ran northeastward across Korea a few miles above Seoul. In May, the enemy resumed his attacks against the defense line of the Eighth Army. The enemy attack which penetrated 30 miles into the Eighth Army's east-central position was met with artillery concentrations which caused heavy enemy casualties. General Van Fleet ordered an immediate counterattack and by May 31, the Eighth Army had almost reached Line Wyoming. (Ref. 11, p. 478-479)

With the movement of the United Nations toward a negotiated peace settlement, the Eighth Army commander was prohibited to make an advance beyond an east-west line generally following the 38th parallel. When Eighth Army reached Lines Kansas and Wyoming in June, General Van Fleet could only order that a strong defense line be established and maintained. This meant that the Korean conflict had changed from a war of mobility to one of position. Negotiations toward an armistice were begun on the 10th of July. General Van Fleet took the enemy intention to be the strengthening of his own forces for further advances and governed himself accordingly. He improved Eighth Army's position by ordering limited objective attacks above Line Kansas at Heartbreak and Bloody Ridges.

By October, these objectives were in possession of the U. N. Forces. Line Wyoming was by-passed by I Corps and new positions on commanding terrain were in I Corps possession by 12 October. During the peace negotiations, positional warfare, similar to that of the trench warfare of World War I, was carried on. But both sides sallied forth patrolling and ambushing from their bunkers and trenches. Artillery duels were commonplace and there were furious small-scale battles for the outposts Old Baldy, the Hook, Sniper Ridge, T-Bone, and Pork Chop Hill were geographical names of mountain ridges where all-out warfare was conducted by both sides. (Ref. 11, p. 481)

But the Chinese were not content with the static warfare and after General Maxwell D. Taylor succeeded General Van Fleet as Eighth Army commander, three Chinese divisions attacked the ROK II Corps along the Pukhan River. Delays and frustrations about prisoner of war exchanges and other matters complicated the armistice negotiations and gave the enemy another chance to gain as much ground as he could before the fighting officially stopped. On July 13, three Chinese divisions attacked and, aided by five Chinese armies, drove the ROK II Corps and a division of the U. S. IX Corps eight miles below the Kumsong River. Ordering a counterattack, General Taylor established the South Korean new main line of resistance on the south bank of the Kumsong River. There the U. N. held the line awaiting the armistice. On 27 July at 1000 each chief of the armistice delegation at Panmunjom signed the armistice terms that ended the war at 2200. (Ref. 11, p. 482)

From a study of the foregoing, it can be noted that the Korean Conflict served as a most critical test for the means and methods of unit control as developed up to that time by the United States Army. From all evidence, organizationally the units were organized to ensure the maximum of unit control under the circumstances of mobile or static warfare. Combat leadership, as noted by General Ridgway, was not always what it should have been. In his own way, he personally undertook by example to improve it. Obviously, this worked then as it always has throughout the long history of military leadership. Communications were much the same as World War II, pack radios and field telephones operated by wire circuits. Communication between the leaders of the United Nations Forces was, of necessity,



UNIT CONTROL - PATROL LEVEL - KOREA
(Source: Office, Chief of Military History)

through interpreter. Liaison officers from the Korean and other U. N. Forces facilitated united control at all levels of command.

On regimental and division and corps levels, the organization provided functioned smoothly. The squad, as reduced after World War II to nine men from twelve, survived the conflict without radical adjustment. But Korea brought out numerous requirements, that is, improved flexibility and more fire power and higher mobility for all combat units. Korea, in a sense, became a field laboratory for the study of combat. Numerous studies were made on the battlefield of the performance of units, men, and weapons in battle. The published reports and conclusions reached therein were to have

some effect upon future organization, leadership,and communication -- as the cornerstones of unit control. (Ref. 133)

The problem of the prisoner of war situation as it touched the United States Army is not within the purview of this study. However, it is important in its significance for the formulation of the Code of Conduct for all members of the Armed Forces of The United States. Basically, the reason for such a code, which the United States Army had never before possessed, was the tragic experience of some of our troops who were "brain-washed" ideologically while prisoners of the Communists. In fact, a number refused "repatriation" and chose to remain within the Communist territory. These deserters have been the subjects of numerous articles, books,and essays by various social scientists, psychologists, and analysts of human behavior. Historically, there have been few similar incidents involving the troops of the United States Army. The only one brought to mind was the San Patricio Battalion composed of American deserters who fought on the Mexican side against the United States during the Mexican War in 1847-48. When captured, they were tried and executed by the order of Brigadier General William S. Harney, the United States commander in the area.[24] (Ref. 61)

To reinforce unit control on the individual soldier's level, the United States, after the Korean experience, decided to give the serviceman some written guidance in the matter of his conduct in war. The Code of Conduct which is carried on the person of each member of the Armed Forces of The United States, at all times, reads as follows:

CODE OF CONDUCT

For Members of the Armed Forces of the United States

1. I am an American fighting man. I serve in the forces which guard my country and our way of life. I am prepared to give my life in their defense.

2. I will never surrender of my own free will. If in command, I will never surrender my men while they still have the means to resist.

3. If I am captured I will continue to resist by all means available. I will make every effort to escape and aid others to escape. I will accept neither parole nor special favors from the enemy.

4. If I become a prisoner of war, I will keep faith with my fellow prisoners. I will give no information or take part in any action which might be harmful to my comrades. If I am senior, I will take command. If not, I will obey the lawful orders of those appointed over me and will back them up in every way.

[24] See Chamberlain, My Confession, New York: Harper and Brothers, 1956, pp. 226-228, for an account of the execution of the San Patricio deserters.

5. When questioned, should I become a prisoner of war, I am bound to give only name, rank, service number, and date of birth. I will evade answering further questions to the utmost of my ability. I will make no oral or written statements disloyal to my country and its allies or harmful to their cause.

6. I will never forget that I am an American fighting man, responsible for my actions, and dedicated to the principles which made my country free. I will trust in my God and in the United States of America.

What effect this unusual step in the United States Armed Forces will have upon unit control from the personal, individual point of view remains to be seen. In combat with an enemy of the Communist camp, assumption must be made that prisoners of war will be subjected to Communist "brainwashing" and indoctrination. The Code of Conduct was established to help give the individual soldier guide lines for his own conduct when he is separated from the legal leadership and control of his unit commander. Regardless of the adversary faced -- the Code of Conduct will act as a direct reinforcement of unit control -- even at a remote and impenetrable distance. In summary, the Korean conflict emphasized the importance of the three basic cornerstones of unit control, that is, organization, leadership, and communication. A careful examination reveals of the three above, that leadership, at all levels, was the most crucial in bringing success out of chaos and failure in the Korean conflict. From the Army commander to the squad leader, leadership was the key to unit control under the most adverse conditions of warfare.

POST-KOREA

(1953-1965)

After the end of the actual fighting in Korea, the United States Army returned the bulk of its units to the United States for inactivation or demobilization. However, under the terms of the Armistice Agreement, United States and ROK troops were stationed along the 38th parallel to guard the Demilitarized Zone from North Korean incursions and infiltrators. Such duty occupied the full time of several American and Korean divisions and as of the present time -- they are still there on guard.

With the experience of the Korean conflict still fresh in the minds of the military professionals, there was a general movement toward assuring better unit control by reorganization of the unit structure. This was especially true of the division, both standard infantry and armored. The problem of reorganization centered about the prospect of combat under nuclear conditions. With nuclear combat experience an unknown quantity, the military planners were faced with the creation of a formation that would give them flexibility, mobility,and dispersion - in addition to high combat power and effectiveness. Under the aegis of General Maxwell D. Taylor, Chief of Staff, United States Army, the project was pushed with vigor and determination to the end that the United States Army would be capable of "flexible response" to the demands of modern, nuclear war.[25] General Taylor stated his point of view:

> "I have followed the reorganization of our divisions along pentomic lines with the keenest interest. On all sides, I sense the enthusiasm of our officers over the possibilities and the challenges posed by this new structure. I hope that this enthusiasm will never diminish but will occasion continuous creative thought directed at improving the effectiveness of these new divisions." (Ref. 62)

The Pentomic concept of reorganization was based upon the principle of reducing the army formations by dispersion into smaller units. This dispersion would serve to reduce the current (1958) formations in order that they would not be lucrative targets on the nuclear battlefield. Mobility in the Pentomic organization would serve to present only fleeting targets to the enemy. Physical protection against heat, blast,and radiation would be afforded personnel by the use of armored combat vehicles and personnel carriers.

General Clyde D. Eddleman who was Deputy Chief of Staff for Military Operations, Department of the Army when the Pentomic concept was implemented had this to say:

> "In looking to the future, and projecting the Pentomic concept beyond its present successful

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[25] See General Maxwell D. Taylor, The Uncertain Trumpet. New York: Harper & Bros., 1959.

start, we must continue to seek the best balance between selective firepower (atomic and conventional) and new mobility means. The trends in development of future firepower are reasonably evident. In the field of battlefield mobility, we must look largely to new forms of air vehicles for our greatest advances." (Ref. 62, p. 10)

In January, 1960, Colonel William E. DePuy writing in Army stated that:

> "The Army has no alternative: it must be ready for any type of war." Further, he stated: "There would seem to be merit in the idea of organizing heavy, perhaps medium and light combat forces in separate TOE building blocks which could then be assembled in various combinations within non-TOE divisions heavily supported with organic and supporting mobile nuclear weapons systems in order to fit more precisely any set of variants in the enemy or the mission, mode of movement, terrain and climate, and nuclear or conventional operations." (Ref. 63, p. 40)

The military thinking behind the constant experimentation with organizational bases, on regimental and division levels, can be seen as positive steps in the direction of meeting any and all threats to the security of the United States.

How unit control was to be effected with the regimental organization eliminated by the battle group of combined arms constituted a puzzle to the traditionalists. The regiment was an honored institution of our military establishment since the earliest days of the Republic. The battle group of the Pentomic Division, subjected to much testing and reorganization, did not establish itself for long as a permanent unit in the new Army Organization. Continual experimentation and tests under the heading Reorganization Objective Current Infantry Division (ROCID) brought forth a structure whereby the division commander controls and commands directly five infantry battle groups, a reconnaissance squadron, a tank battalion, and nuclear delivery means within the division. The division commander under this plan controls eight subordinate maneuver elements. The following comment in re span of control is pertinent at this point:

> " . . . it is accepted that the assistant division commander, in his role of brigade commander, may be interjected into the chain of command and thus reduce the division commander's span of control. However, this situation will obtain only under certain conditions, such as command of a striking force or of an

enveloping force; and even in such cases, the brigade rarely controls more than two maneuver elements reinforced, which reduces the division commander's span of control, at best, to 7 or occasionally 6 subordinate units."
(Ref. 1, p. 11)

While ROCID was continued under provisional Tables of Organization and Equipment, there were other organizational changes under consideration. General Taylor, as Chief of Staff and later as Chairman of The Joint Chiefs of Staff, had advocated in a most direct and vigorous manner his theory of "flexible response." In his book, The Uncertain Trumpet, the general laid down certain principles of organization which would not only improve unit control but unit combat function as well.

While the General's thesis was broad and all-inclusive on an inter-service basis, it influenced much study, discussion, and experimentation as to the proper organizational format for the divisions of the United States Army. Historically, the prime consideration was actually unit control on the battlefield of the present and future. Whether the tactical conditions would be nuclear or non-nuclear, there was according to the General the great need for the "flexible response" to either situation.

The period from 1953 to 1963 witnessed other experiments with organizational concepts for combat on division and regimental levels. These studies were conducted with the principal purpose of improving and of assuring effective unit control under the possible conditions of nuclear warfare.

The Reorganization Objective Army Divisions (ROAD) evolved out of the past and current attempts to secure the divisional structure that would give the Army the ability to meet various strategic and tactical requirements. According to The Army Information Digest of March 1962:

". . . A fundamental concept underlying the new structure is that of tailoring divisions to meet varying requirements. This is done with "building blocks" that are interchangeable within and between divisions. These building blocks are the COMBAT MANEUVER BATTALIONS that are assigned to a common DIVISION BASE. The DIVISION BASE contains the elements required for all divisions. It includes the command and control elements; the division artillery; other required combat and combat support units such as the reconnaissance squadron, an aviation battalion, a signal battalion, and an engineer battalion; a support command which provides administrative and logistical support of the division; and three brigade headquarters. The types of units that make up the division base are the same for all divisions; however, their equipment, organization, and methods of operating may vary depending upon the type of division and its mission."
(Ref. 64, p. 4)

Never before in United States Army history had there been such a universality of organization proposed, attempted, and accomplished. Built-in "flexible response" capability is present in the organization and is available to the division commander whatever his assigned mission may be.

Of considerable interest to the military professional is the return of the brigade to the organizational rolls of the Army. Of highly-significant value in World War I and in some branches in World War II, the brigade is essentially a headquarters existing primarily for unit control. The three brigade commanders constitute a most important part of the span of control of the division commander. The following comment describes the missions of the three brigade headquarters:

> "The three Brigade Headquarters control combat maneuver battalions and other units which may be assigned to them. These brigade headquarters are the principal subordinate control elements of the division. They are tailored for the combat mission and normally will control from two to five combat maneuver battalions each. They are ideally suited to the formation of combined arms task forces of less than division size. Brigades normally will be commanded by Colonels." (Ref. 64, p. 5)

The advantages of the ROAD concept of organization of the Army division are many. Basically, from the point of view of unit control, there is a reduction of the span of control of the division commander. Actually, he commands three brigade commanders, the division artillery commander, the combat support commander, the engineer battalion, the reconnaissance battalion, the signal battalion, and the aviation battalion commander.

The advantages gained by ROAD'S organizational structure are to be noted in the following:

> "Improved capability to tailor forces to meet global requirements.
>
> Increased non-nuclear capabilities and improved nuclear-non-nuclear balance.
>
> Greater internal flexibility.
>
> Improved capability for command control in battle and for training of units and commanders." (Ref. 64, p. 6)

With the organization afforded to the Army division by ROAD, unit control received tremendous reinforcement. The span of control of the division commander now encompassed nine subordinate commanders. In ROCID -- or the Pentomic concept, there were three additional elements, that is, two battle groups and one brigade headquarters.

The position of the Assistant Division in the ROAD Division has been discussed at considerable length in an article by Major Elvin R. Heiberg, III, in Military Review. Different points of view exist as to the need for the

Assistant Division Commander to be within the span of control of the division commander of a ROAD division. Needless to say there were as many different opinions as there were respondents. The article summarizes these positions and differences of opinion in the following: One way to approach these great differences of opinion is to relate the question of the need for two ADC's to the span of control within the ROAD division. One opinion is that the span of control on the nuclear battlefield will be such as to require two senior assistants to the division commander, whereas implicit in the other opinion is the feeling that the commander's span of control is not so great as to require the second ADC. (Ref. 65, p. 21)

The ROCID division actually added more subordinate units, or commands to the division commander's span of control. In combat, the divisional brigade provided by ROCID contained a two battle-group task force commanded by the Assistant Division Commander. The Division commander's span of control consisted of seven units: the brigade, three battle groups, the battalion of armor, the cavalry squadron, and the artillery. In practice, the ADC was directly under the division commander. If the brigade was not used, the ADC was relieved of active control of a maneuver unit. Hence, the division commander's span of control, in that case, would be eight units. (Ref. 65, p. 23)

The ROAD concept reduced the division commander's span of control from eight to five units. This was an achievement in assuring stronger and more effective unit control. In 1962, the ROAD organization consisted of three brigade headquarters, an armored cavalry squadron, and division artillery.

In 1964, under the provisions of TOE 7E, the ROAD Infantry Division consisted of the following units and personnel:

Officers - 974
Warrant Officers - 132
Enlisted - 14,488

Hq & Hq Co	Engr Bn	MP Co	Avn Bn
0-42	0-44	0-9	0-45
E-95	E-896	E-179	E-250
	W-2	W-1	W-23
Sig Bn	Div Arty	Bde Hq & Hq Co (3)	
0-24	0-191	0-23	
E-547	E-2308	E-94	
W-4	W-17	W-6	

Armd Cav Sqdn	Spt Comd**	Tank Bn	Inf Bn* (8)
E-749	0-141	0-34	0-37
0-45	E-1778	E-538	E-792
W-22	W-23	W-3	W-2

*Number of battalions shown represent a type division only. Compositions of divisions may vary.
**The Support Commander's responsibilities to the Administration Company are limited to tactical, security and movement aspects.
(Ref. 66)

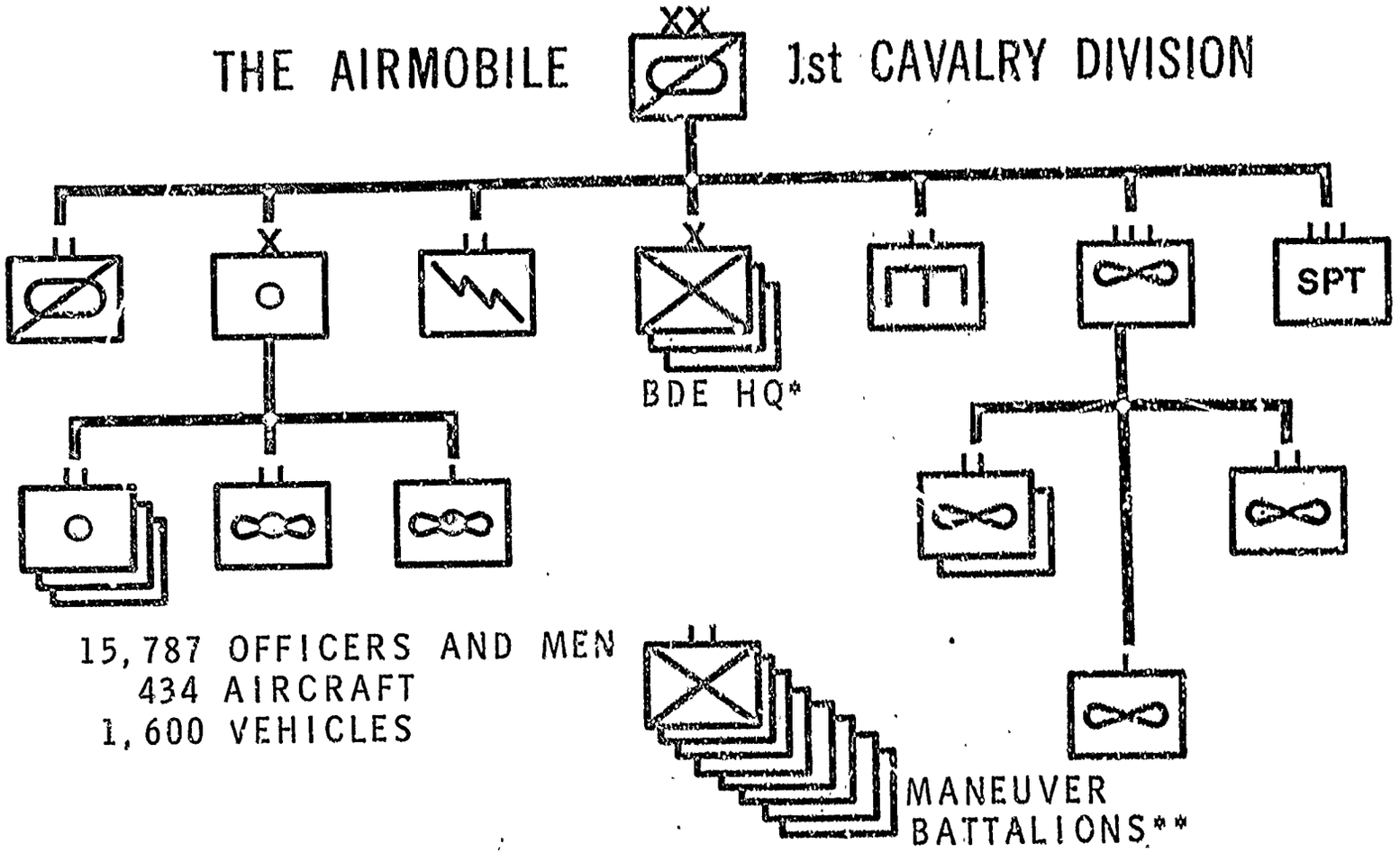
With the improvement in organization and leadership evidenced in the reorganization of the Army infantry division under the ROAD TOE, the matter of communication received considerable attention. The use of helicopters and light aircraft organic to the division and found within the Aviation Battalion gave the commander the ability to travel swiftly over and around the battlefield and to speak directly with his subordinates. Much of this improved and modernized control was effected by use of the UH-1B helicopter and the new group of frequency modulated radios. Because of the improved communications and the reduction of units, the division commander would appear to have less need for senior assistants than under ROCID. Major General B. E. Spivy, the commander of the 3d Armored Division had this comment to make:

> "I definitely feel . . . due to the vast land mass covered and the varied missions placed on a combat division that by normally using the ADC (Maneuver) in the forward area with the combat elements and the ADC (Support) often in the rear area with the support elements, the Commanding General will be able to make more rapid and timely decisions to decisively affect the outcome of the battle as well as maintain alternate command posts."
> (Ref. 65, p. 23)

In conformity with the most advanced concepts of what form present and future tactical operations may take, the United States Army has been experimenting for some years with the vital subject of mobility. Not only mobility on the ground, which had been improved by the addition of newer, faster, and more modern land combat vehicles but in the air.

With world political conditions in an almost permanent state of flux, the ability of the Nation's Armed Forces to move fast and to hit hard has never been more important to our national security than it is today. In 1962, the Secretary of Defense issued a directive requiring that the Army examine and report upon the subject of tactical mobility. The immediate result was the formation of a test board headed by General Hamilton H. Howze. After

THE AIRMOBILE 1st CAVALRY DIVISION



*One Bde Hqs, and 3 Inf Bns, will have an Airborne Capability.

**Maneuver Bns will be assigned to Brigades as required.

(Source: Army Digest; September 1965)

evaluation of the report which was submitted to the Joint Chiefs of Staff by the test board, the 11th Air Assault Division and the 10th Air Transport Brigade were formed for tests at Fort Benning, Georgia. After a three-year period of testing, the final result was the creation of the 1st Cavalry Division (Airmobile) the modern successor to the famous First Cavalry Division of World War II fame with the proud motto "First in Tokyo." (Ref. 67, pp. 31-32)

In his book, Airborne Warfare, Lieutenant General James M. Gavin, one of America's most distinguished airborne combat troop leaders of World War II and the foremost exponent of "Sky Cavalry" offered this comment:

> "The future of our armed forces is in the air. All fighting men and everything they need to fight with in the future and live on as they fight must be capable of movement by air. Only through flight can we wage a future war in accordance with the principles of surprise, mass, and economy of means. Only by exploiting to its utmost the great potential of flight can we combine complete dispersion in the defense with the facility of rapidly massing for counterattack which today's and tomorrow's Army must possess. Even without the power and use of atomic energy for war these things would be true. With the use of atomic energy they become axiomatic."
> (Ref. 68, p. 140)

The 1st Cavalry Division (Airmobile) has been deployed to Vietnam where it will enter combat for the first time. How it will operate in jungle and rice paddy terrain remain one of the questions to be answered by practical field service. Unit control, in this type of division, will be on optimum level. The latest radios, aircraft, and helicopters will ensure that communication will be maintained. The organization itself, although tested at great length at Fort Benning and elsewhere, will adjust to the conditions as they exist in Vietnam. The prospects for this new division are bright, based upon its tests and its highly trained personnel, both officers and enlisted personnel.

In addition, there is a historical factor not to be overlooked as this new unit goes into combat, it is the 1st Cavalry Division. Those who served in the Pacific in World War II know what that means. Officially and technically the following has been said about this new concept of warfare:

> "Airmobility brings to the Army the advantage of permitting the commander to apply decisive firepower and manpower in the most critical area of the battlefield at the most critical time of battle. The airmobility concept is practical today because of the several new factors: improvements in helicopter performance and maintainability/reliability, efficiency of aerial delivery methods, and decreased weight of Army equipment.

> In terms of strategic mobility (Air Force airlift), the airmobile division can be deployed almost twice as rapidly as the ROAD Infantry Division."
> (Ref. 67, p. 35)

Of interest is the comparison between the two type divisions:

	Airmobile	ROAD
Men	15,787	15,965
Aircraft	434	101
Vehicles	1,600	3,200

(Ref. 67, p. 34)

With reference to communications, the following comment has been made in the August 1965 issue of ARMY magazine:

> "The Airmobile unit commander need not fret that he is outrunning his line of communications. Supply helicopters can catch up with him wherever he goes. Unlike paratroopers, an air infantry assault force can fly out after a raid deep into enemy territory. In pursuit, it can be persistent and deadly. Its ability to surprise the enemy is a real advantage."
> (Ref. 69, p. 14)

The organization and reorganization of the units of the United States Army during the 1960's made possible the highly-efficient and maneuverable ROAD Division. There were those traditionalists who regretted the passing of the regimental system. Some of these dissidents were senior officers of distinguished service. ROAD, it is admitted by all, is the most flexible and mobile formation ever devised by the United States Army. Unit control is facilitated by a short and direct span of control within each unit of the division. "Flexible response," mobility, and appropriate fire power are assured the commander under conditions of nuclear, non-nuclear, and guerrilla, or unconventional warfare. (Ref. 70)

From the leadership point of view, the officer corps of the United States Army is, without doubt, the best educated ever in command at any period. Because of the proliferation of the officer corps, the sources of leaders are varied. The United States Military Academy at West Point furnishes a small segment of the total officers commissioned each year. However, the Military Academy with its traditions of over 163 years of service to the Nation, sets the standard for the officer corps. This is expressed in the Academy motto, "Duty, Honor, Country." Besides the Military Academy, hundreds of civilian educational institutions produce junior officers for the Army through the Reserve Officer's Training Program. In addition, the Army operates Officer Candidate Schools for certain Arms and Branches of the Service. The leavening effect of the officer trained in the civilian institution is noted in the Army. Various points of view are thus possessed by those in command.

Discipline in the present-day United States Army is based upon intelligent leadership of an informed soldiery. The legal interests of the soldier and officer are protected by the Uniform Code of Military Justice. Sentences are subject to judicial review by the civilian judges of the United States Court of Military Appeals.

The discipline instituted in the United States Army at Valley Forge by Major General Frederich Wilhelm von Steuben was a tempered form of the discipline of Frederick the Great translated into American usage and custom. The discipline of the American Army has always puzzled the foreign observer. As the expression of a free people, for the common good, the discipline of the private soldier and officer has been the mainstay of unit control in garrison or on the field of battle. "Pro Bono Publico" expresses the foundation of the discipline in the United States Army. Not severe, but firm, the discipline of the American soldier is in step with the times and the manners of the present age. Historically, it has always maintained and preserved our great American heritage.

In the 1960's, the United States Army witnessed tremendous advances in the area of communications. These were chiefly in the electronics field and industry. The adoption of many of these systems for possible use in command and control of units in the field formed numerous projects, which occupied the attention of the military and civilian research organizations.

Highly-improved radios and radio teletypes are available down to battalion levels. Other experiments were slanted in the direction of helmet-contained radio receivers for individual soldiers. Such apparatus would have been beyond the imagination of the most advanced signal officer of the World War I Army. Technical advancements in communications has kept abreast of weaponry and tactics. It is believed that the family of communications available to the United States Army are the most effective and efficient ever developed for military purposes. (Ref. 71, pp. S-2 to S-32)

From 500 B. C. to 1965 A. D. is a lengthy span of military history. Throughout the several thousands of years involved, Man has been the constant quantity in all military operations. The control of military units means simply -- the control of men. Weapons, tactics, climate, and terrain are the variables. The control of the constant and the variables might well be termed the science of war. Today, the constant is about the same as he was in ancient times. In Western society, he is better educated, better nourished and better sheltered than ever before. These factors must be considered whenever he is controlled, as an individual or as a member of a team or unit on the field of battle. Science has refined the variables to a marked degree of sophistication, yet, whenever unit control of a military unit is involved -- Man, the constant quantity will be the determining factor.

CONCLUSIONS

Weaponry at all times has dictated the form of military organization from the highest to the lowest echelons. Unit control, as the directing force exerted upon the military organization, rests upon the leadership principle. In the military profession, leadership and its functional aspect, command, are based upon the principle of hierarchical delegation of authority. In order to be functional, the individual exercising leadership and command must possess means of communication.

The size, shape, and composition of the military unit will determine, to a great extent, how the leader will exercise his command function. The perfect formation for military purposes has not, as yet, been devised. Each historical period, beginning with the most ancient times, brought forth military formations that were suitable for the weaponry of the period. Weapons, wielded by muscle power alone, demanded formations and organization that were adaptable to the use of the weapon by the individual. Collective mass use of the weapon was effected by the employment of a formation such as the phalanx. Once the battle was joined, the collective, mass assault of the phalanx-type formation became a series of combats between individuals.

With the advent of gunpowder and firearms, direct, muscular type combat was replaced by indirect violence remotely caused and delivered. The mass physical violence of the phalanx was replaced by violence and trauma delivered by missiles propelled and controlled by explosive force. Formations and organization were necessary for the purpose of delivering or repelling powder-driven missiles, bullets, or projectiles. The necessity to place fire upon the enemy in order to destroy or immobilize him and his materiel called for a new branch of the military art -- tactics. Fire and movement in order to close with the enemy became the primary reasons for the control of military units on the battlefield.

Throughout history discipline is shown to be the firm binder which holds military units together and causes individuals to function effectively under conditions of danger and possible loss of life. Discipline is instilled in the individual by training aided by personal morale and private motivation. Without discipline there can be no unit control in garrison or the battlefield. The commander of a unit sets the standard and the requirement for discipline. Presence for duty, absenteeism, and the willing and prompt obedience by all individual members of all orders or disobedience of orders of higher authority have always been the indices of discipline or indiscipline in a military unit.

Training is a product of organization and discipline. For the officer, training is essentially in the management of the delivery of violence upon the enemy. The commander knows how to deliver the violence but he does not, himself, perform the technical tasks associated with this activity. His main purpose is to train, discipline, and control his unit, regardless of its size, in order that it can effectively deliver the violence when ordered. Technical proficiency in the operation of weaponry then becomes the principal purpose of the soldier and non-commissioned officer. In order that

he do this efficiently and effectively -- he is organized into teams and units.

Over the centuries of military experience, it has been found that one leader can control a limited number of subordinate leaders. It is by commanding through them that he controls his unit or units. The span of control of the leader will be based upon the number of individuals to whom he must issue commands in order to accomplish the unit mission. Historically, it has been found that there is a limit to the number of principal subordinates a leader can effectively command. In order, to ease the burden of control upon the commander, the military staff system evolved from necessity. As a collective intelligence and authority for the commander, the staff symbolizes the ultimate in the delegation of authority. Its members, acting in accordance with the commander's wishes, desires, or orders, assist him in the establishment and maintenance of unit control.

In the most ancient times, communication of the commander with his troops was on a face-to-face basis. Direct, personal leadership on the part of the overall commander became indirect and impersonal as communications developed over the centuries. Despite the most modern communications, it is possible and often necessary for the commander to disregard them and to revert to direct vis a vis command techniques. Regardless of the remoteness of the resposible commander troops will "feel" his presence and influence through the communications available. But more communication is required -- the commander must be seen at the front by the troops.

The span of control and the communications afforded the commander have critical bearing upon his ability to exercise unit control. The time element in communication on the battlefield has been largely eliminated by the advent of electronic devices. The span of control in the infantry rifle squad has been reduced to two fire team leaders. The Army Commander's span of control has been established at two or more Corps Commanders. The communication available to the squad leader and to the Army Commander is comparable on each respective unit level.

Unit control, in garrison or in combat, is dependent upon human factors. Personal morale and motivation of troops toward the mission depend, in the final analysis, upon the leadership of the unit commander. Without organization with which to accomplish his mission, the commander cannot exercise leadership effectively. Further, without means of communicating with the individuals of his unit, the commander cannot motivate them toward fulfillment of the unit task or mission. Regardless of the advances made in the areas of weaponry and communication, the individual soldier will always be the constant factor in warfare. He is the one who pulls the lanyard, squeezes the trigger, or throws the grenade in the act of delivery of violence against the enemy. Organization, training, discipline, communication, and unit control exist only so that at the critical moment he performs his duty.

The size, shape, and composition of a military formation has direct bearing upon how it can be controlled in combat. The weapons within the formation will determine how the formation will be organized. The discipline and training of any military unit depends upon the motivation and standards

of the commander. Communication between the leader and his unit, or units, may be simple, primitive, or complex and technically advanced. The means of communication available will determine the ability of the unit to receive and to disseminate the commander's orders and instruction.

Centralized control of communications and staff procedures in warfare is one of the results of modern electronic progress. Such control has been sought after and achieved in varying degrees throughout military history. However, in connection with the exercise of unit control — centralized control of communications and staff procedures has its limitations. Mechanical breakdown, or destruction by enemy action, of complex devices and machines, which create such controls is to be expected and planned for under modern operational conditions. When centralized control of communications fails — operational inertia results. Alternate and decentralized systems of communications control must continue to furnish subordinate commanders with intelligence and operational directives and orders. Less-sophisticated and decentralized systems of communication control will be required to be able to function on the battlefields of the present and the future.

PART II

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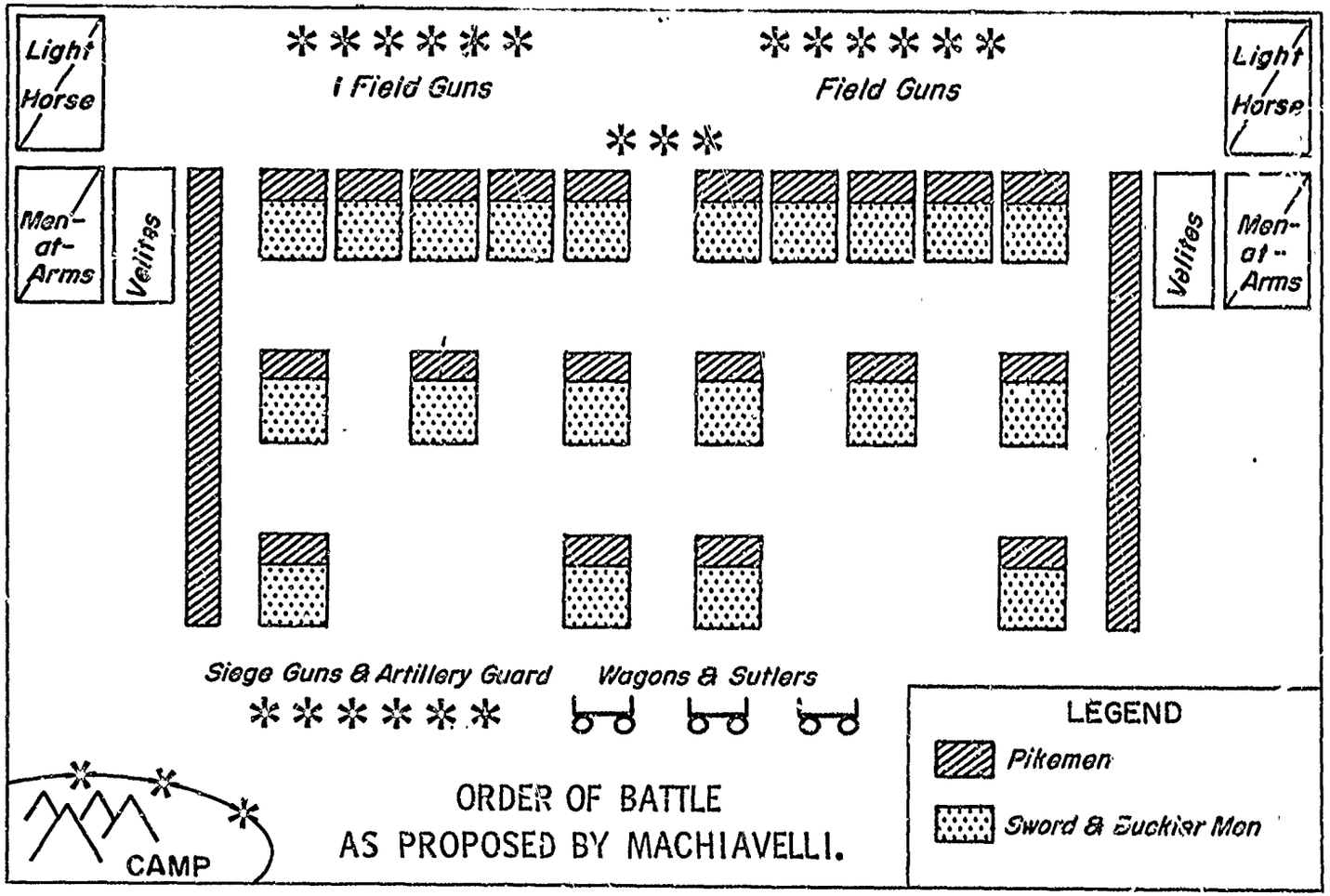
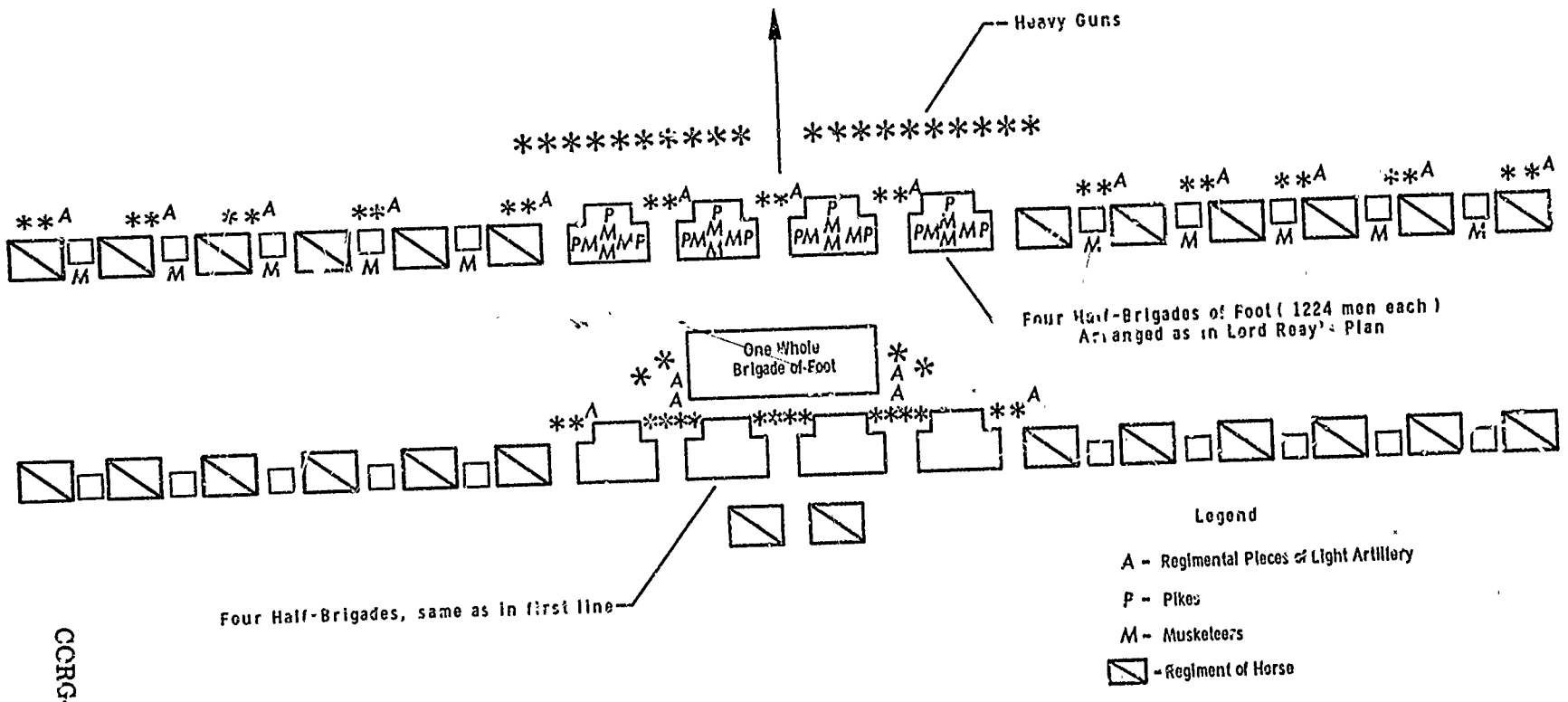
APPENDIX A

ORDERS OF BATTLE AND TACTICAL TABLES



ORDER OF BATTLE
AS PROPOSED BY MACHIAVELLI.

SWEDISH ORDER OF BATTLE
(1599-1634)



TACTICAL TABLES, SIXTEENTH CENTURY

From Cataneo, "Most Briefe Tables," London, 1588

i	ii	iii	iiii	v	vi	vii	viii	ix	x	xi	xii	xiii	xiiii	xv	xvi
	3	300	0	10	0	30		15	0			14	0		
	5	180	0	6	0			9	0	20		8	2	21	
900	7	128	4	4	2		0	6	3		0	6	0		18
	9	100	0	3	3	30		5	0	45		4	6	42	
	3	316	2	10	1	30		15	2			14	1		
950	5	190	0	6	1			9	2	20		8	5	22	
	7	135	5	4	3		20	6			10	6	1		4
	9	105	5	3	4	31		5	2	47		4	7	43	
	3	333	1	10	2			16	2			15	0		
2000	5	200	0	6	2	31		10	0	20		9	0	22	
	7	142	6	4	4		8	7	1		0	6	3		10
	9	111	1	3	5	32		5	5	50		5	0	45	
	3	366	2	11	0			16	2			15	2		
1100	5	220	0	6	3	33		10	0	22		9	2	23	
	7	157	1	4	5		11	7	1		9	6	5		19
	9	122	2	3	6	33		5	5	50		5	2	47	

These tables show the form of a "just bataille," using from 100 to 20,000 men. The following explanation of their use is condensed from the key given in the book.

Column
- i - Number of men considered.
- ii - Front of march formation, in files.
- iii - Depth of march formation, in ranks.
- iv - Number of supernumerary men.
- v - Number of sections into which the march formation should be divided, so that, moved up abreast of each other, they will form, as nearly as may be, a "man square" --that is, a formation with as many files as ranks.
- vi - Number of files to be formed from superfluous ranks, to complete the "man square."
- vii - (a) Depth and (b) front of resulting "man square."
- viii - Number of supernumerary men.
- ix - Number of sections into which the march formation should be divided, in order to form a "ground square" --that is, a formation occupying the same breadth as depth.
- x - Number of files to be formed from superfluous ranks, to complete the "ground square."
- xi - (a) Depth and (b) front of resulting "ground square."

Source: Spaulding, Warfare

APPENDIX B

MARCH ORDER, FREDERICK THE GREAT

"This evening at eight o' clock six battalions of grenadiers, a regiment of infantry, ten squadrons of dragoons, that is to say one or two regiments complete and two regiments of hussars, will form the advance guard, marching only with light baggage. The bulk of the baggage will remain with the army. They will march a mile ahead, where they will seize this defile, this height, this river, this city, or this village, and where they will wait until the army is close by to continue their march to the new camp.

"The army will march tomorrow at three o' clock in four columns. The detachments return to camp as soon as the troops are to be sent into battle. Cavalry of the two right lines, marching by file to the right, form the first column; the infantry of the two right lines, marching by file to right, form the second column; the infantry of the two lines to the left, marching by file to the right, form the third column; the cavalry of two lines to the left marching by file to the right, form the fourth column; such and such regiments of infantry of the second line and the regiment of hussars of N. will be the rear guard to cover the baggage and the artillery. These will take the two or three best roads to follow the army.

"The adjutants N. N. N. remain near the baggage columns and will be responsible that the wagons are not strung out, and the officer who commands the rear guard will notify the general in time if he believes that he needs support. Three wagons loaded with beams, joists and planks to make bridges over streams march at the head of the four army columns with the detachment of carpenters. Columns should not get ahead of each other, but advance on the same front as far as is possible. The officers should observe distances exactly, and the regiments should be kept closed. If, for example, one or both the two columns of cavalry had to traverse some woods, it would be necessary to place several battalions of grenadiers at their head and even, if necessary, the cavalry could be placed in the center, assuming it is open ground and the infantry move through the woods." (Ref. 27, pp. 62-63) (Emphasis added)

Source: Frederick, The Great. Instructions for His Generals, Harrisburg: Military Service Publishing Company, 1944.

APPENDIX C

INFANTRY DRUM AND BUGLE SIGNALS

The different daily beats shall begin on the right, and be instantly followed by the whole army; to facilitate which, the drummer' s call shall be beat by the drums of the police a quarter of an hour before the time of beating; when the drummers will assemble before the colours of their respective battalions: and as soon as the beat begins on the right, it is to be immediately taken up by the whole army, the drummers beating along the front of their respective battalions, from the centre to the right, from thence to the left, and back again to the centre where they finish.

The different beats and signals are to be as follows:

The General is to beat only when the whole are to march, and is the signal to strike the tents, and prepare for the march.
The Assembly is the signal to repair to the colours.
The March for the whole to move.
The Reveille is beat at day-break, and is the signal for the soldiers to rise, and the sentries to leave off challenging.
The Troop assembles the soldiers together, for the purpose of calling the roll and inspecting the men for duty.
The Retreat is beat at sun-set, for calling the roll, warning the men for duty, and reading the orders of the day.
The Tattoo is for the soldiers to repair to their tents, where they must remain till reveille beating next morning.
To Arms is the signal for getting under arms in case of alarm.
The Parley is to desire a conference with the enemy.

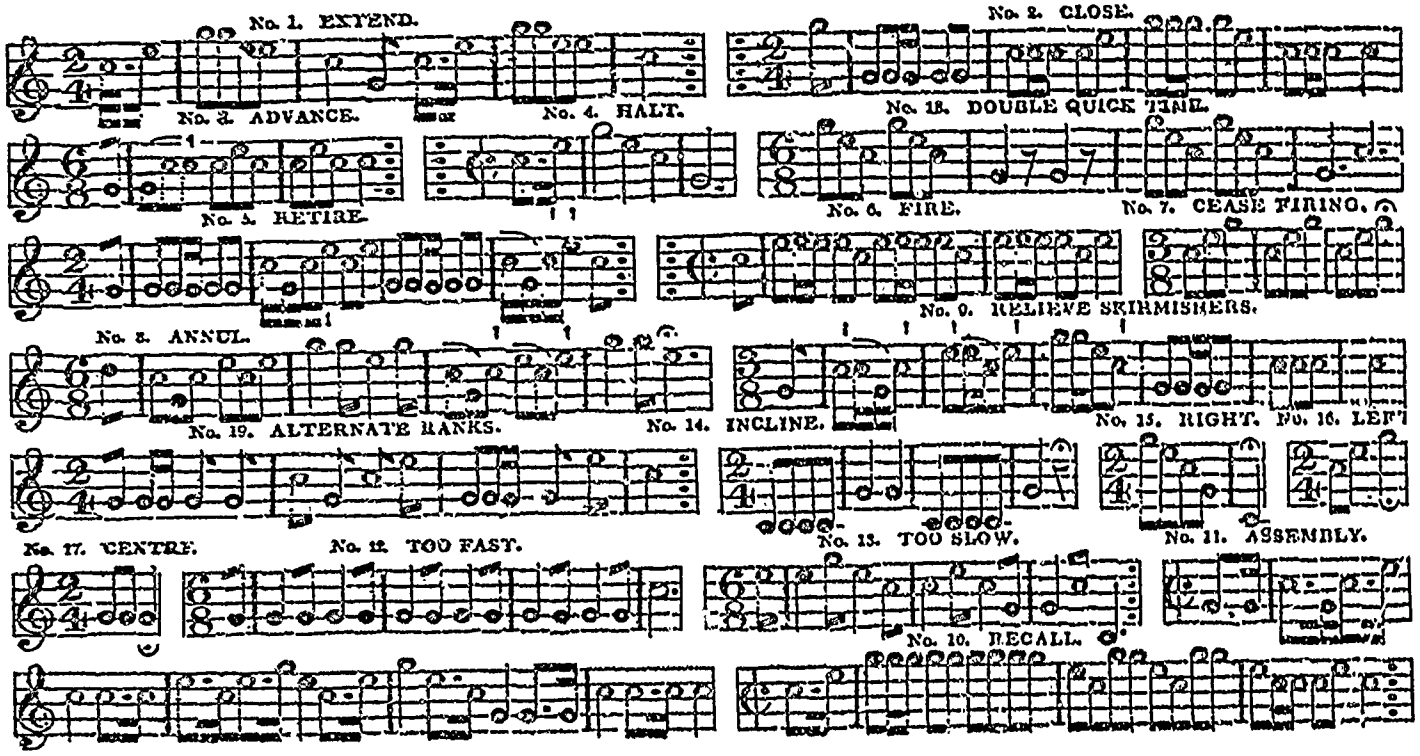
THE SIGNALS

Adjutant' s call --- first part of the troop.
First Sergeant' s call --- one roll and three flams.
All non-commissioned officers call --- two rolls and five flams.
To go for wood --- poi ng stroke and ten-stroke roll. Water --- two strokes and a flam. Provisions --- roast beef.
Front to halt --- two flams from right to left, and a full drag with the right, a left hand flam and a right hand full drag.
For the front to advance quicker --- the long march. to march slower--- the taps.
For the drummers --- the drummers call.
For a fatigue party --- the pioneers march.
For the church call --- the parley.

The drummers will practice a hundred paces in front of the battalion, at the hours fixed by the adjutant general; and any drummer found beating at any other time, except ordered, shall be punished.

Source: Regulations for the Order and Discipline of the Troops of the United States. Lancaster: Francis Bailey, 1802.

Light-Infantry and Rifle Bugle Signals.



(Source: Abstract of Infantry Tactics . . . 1830.)

APPENDIX D

STAFF OF THE ARMY OF THE POTOMAC

The staff of the Army of The Potomac was composed as follows:

1. A chief of staff, with the rank of brigadier general, who was occupied with purely military affairs.

2. An adjutant general, with the rank of brigadier general, charged with all the administrative duties, returns, and correspondence, which are attended to by the chief of staff of the French army. This division among two officers of duties, which in France are performed by a single officer, has given the best of results.

3. An aide-de-camp and several orderly officers.

4. A judge advocate general, charged with matters pertaining to the administration of military justice.

5. A chief quartermaster, with the rank of colonel.

6. A chief commissary of subsistence, with the rank of lieutenant colonel.

7. A chief of engineers, with the rank of lieutenant colonel.

8. A chief of artillery, with the rank of brigadier general.

9. A signal officer, with the rank of major.

10. An Inspector general, with the rank of colonel.

11. A medical director, a medical inspector, and two surgeons.

Source: General F. V. A. de Chanal, The American Army in The War of The Secession, Leavenworth, Kansas: George A. Spooner, 1894.

APPENDIX E

CORPS BADGES

HEADQUARTERS ARMY OF THE POTOMAC

Circular March 21, 1863

For the purpose of ready recognition of corps and divisions of the army, and to prevent injustice by reports of straggling and misconduct through mistake as to their organizations, the chief quartermaster will furnish without delay the following badges, to be worn by the officers and enlisted men of all the regiments of the various corps mentioned. They will be securely fastened upon the center of the cap. The inspecting officers will at all inspections see that these badges are worn as designated.

First Corps --- a sphere: red for First Division; white for Second; blue for Third.

Second Corps --- a trefoil: red for First Division; white for Second; blue for Third.

Third Corps --- a lozenge: red for First Division; white for Second; blue for Third.

Fifth Corps --- a Maltese cross: red for First Division; white for Second; blue for Third.

Sixth Corps --- a cross: red for First Division; white for Second; blue for Third. (Light Division, green.)

Eleventh Corps --- a crescent: red for First Division; white for Second; blue for Third.

Twelfth Corps --- a star: red for First Division; white for Second; blue for Third.

The sizes and colors will be according to pattern.

By command of
MAJOR-GENERAL HOOKER
S. Williams, A. A. G.

Source: Stern, Soldier Life in the Union and Confederate Armies.

APPENDIX F

CIVIL WAR COMBAT ORDERS

HAMILTON'S DIVISION AT CORINTH.

BY CHARLES S. HAMILTON, MAJOR-GENERAL, U. S. V.

The following order, issued about 9 A. M. on the first day of the battle of Corinth, fixed the position of my division:

> "CORINTH, Oct. 3d, 1862. BRIGADIER-GENERAL HAMILTON, Commanding Third Division. GENERAL: The general commanding directs that you cover with your division the Purdy road, from the swamp on the railroad to where the road runs through the rebel works. By command of MAJOR-GENERAL ROSECRANS. --- GODDARD, A. A. A. General."
>
> "P.S. You may perhaps have to move farther out, as Davies does not find good ground until he gets near the old rebel works, and he proposes to swing his right still farther around. By order of MAJOR-GENERAL ROSECRANS. --- GODDARD, A. A. A. General."

Again at 2 P. M. the same day the following circular was sent to both Hamilton and Davies:

> "For fear of a misunderstanding in relation to my orders, I wish it distinctly understood that the extreme position is not to be taken until driven to it. By order of MAJOR-GENERAL ROSECRANS. --- S. C. LYFORD, Acting Aide-de-Camp."

The extreme position mentioned was not understood by either Davies or myself, but probably meant an advanced position. But how we could be driven to it by an enemy in our front is difficult to understand. Just following the circular, this order was received by me:

> "The general commanding desires me to say to you not to be in a hurry to show yourself. Keep well covered and conceal your strength. The enemy will doubtless feel your position, but do not allow this to hasten your movements. --- S. C. LYFORD, Acting Aide-de-Camp."

About 3:30 P. M. the following was received:

> "GENERAL HAMILTON: Davies, it appears, has fallen behind the works, his left being pressed in. If this movement continues until he gets well drawn in, you will make a flank movement, if your front is not attacked, falling to the left of Davies when the enemy gets sufficiently well in so as to have full sweep, holding a couple of regiments looking well to the Purdy road. Examine and reconnoiter the ground for making

this movement. By order of MAJOR-GENERAL ROSECRANS. --- H. G. KENNETT, Colonel and Chief of Staff."

On the back of this order, I indorsed the following:

"Respectfully returned. I cannot understand it. --- C. S. HAMILTON, Brigadier-General."

Rosecrans returned it to me indorsed as follows:

"Ducat has been sent to explain it. W. S. ROSECRANS, Major-General. --- S. C. LYFORD, Acting Aide-de-Camp."

Now bearing in mind that Davies' s division was to the left and in front of mine, if this order meant anything it was that my division should abandon its position on the right of the army entirely, and pass either to the rear or front of Davies in order to reach the place indicated, and would therefore have destroyed every possible chance of attacking the enemy in the flank, and would also have left the right of Davies' s exposed. and the way into Corinth open to the enemy. Now this order, which is the one Rosecrans claims as his order to attack the enemy, was given as follows in his article on this engagement, in "The Century" for October, 1886 (see p. 746):

"Colonel Ducat, acting chief-of-staff, was sent with an order to General Hamilton, to file by fours to the left and march down until the head of his column was opposite Davies' s right. He was ordered then to face his brigade west-south-west and to move down in a south-westerly direction."

The order, as I have given it, is an exact copy of the original now in my possession, and General Rosecrans' s statement of it in "The Century" was made from a defective memory after twenty-three years had elapsed.

At 5 P. M. I received the following order:

"HEADQUARTERS, ARMY OF THE MISSISSIPPI, October 3d, 1862. GENERAL HAMILTON, Commanding Third Division: Rest your left on General Davies, and swing around your right and attack the enemy on their left, reenforced on your right and center. Be careful not to get under Davies' s guns. Keep your troops well in hand. Get well this way. Don' t extend your right too much. It looks as if it would be well to occupy the ridge where your skirmishers were when Colonel Ducat left, by artillery well supported, but this may be farther to right than would be safe. Use your discretion. Opposite your center might be better now for your artillery. If you see your chance attack fiercely. --- W. S. ROSECRANS, Brigadier-General."

As a simple order to attack the enemy in flank could have reached me by courier from General Rosecrans, any time after 2 P. M., in 15 minutes, the verbosity of the above is apparent. I construed it as an order for attack, and at once proceeded to carry it out. Sullivan's brigade of my division had been ordered some time previously to move toward the enemy's left in preparation for an attack, and Buford's brigade was now ordered down on Sullivan's right to support him.

The brigades were some distance apart, and having been concealed in the woods had not been discovered by the enemy. The moment that Buford began to move a detached force of the enemy was seen some distance in his front. They opened on him with a single piece of artillery, and he, taking it for granted he was beset by the enemy in force, moved to his front to drive them out of the way. In thus moving he went almost in an opposite direction to the one necessary to support Sullivan. I sent an officer with a positive order to change his course. His reply was, "Tell General Hamilton, the enemy is in my front and I am going to fight him." Meantime his brigade had been moving toward what he supposed to be the enemy, and was a half mile from Sullivan. I sent a second order to change his course instantly, and move to Sullivan's support. This order he obeyed, first detaching the 4th Minnesota regiment, under Colonel J. B. Sanborn, to attack the enemy. He then moved down to the position indicated, but, meantime, a precious hour had been lost, the sun had gone down, and the attack having to be made through a forest of dense undergrowth, it was too late to execute the flank movement with any chance of success. The enemy's fire on Davies' s division had ceased. Waiting a few moments in expectation of its renewal, night closed down upon us, and the battle for the day was over.

General Rosecrans first intended the troops to pass the night in the position now held, as shown by the following order, received about 7:30 P. M.:

> "HEADQUARTERS, ARMY OF THE MISSISSIPPI October 3d, 1862, 7 P. M. GENERAL HAMILTON: Throw out promptly vedettes, grand guards, scouts, and a line of skirmishers in rear of abatis on your front and flanks. Pick up all the prisoners you can. Get all the information possible, which report promptly and often to these headquarters. Furnish brigade commanders with a copy of this order as soon as possible. During the night and coming daylight, much will depend on the vigiliance of outposts and guards. Our cavalry is on the southwest front toward Bridge Creek. By order of MAJOR-GENERAL ROSECRANS. --- ARTHUR C. DUCAT, Lieutenant-Colonel, Chief of Grand Guards and Outposts."

Between 8 and 9 P. M. a staff-officer brought me the following order:

> "Place your batteries on the Purdy road at 10 P. M. and play them two hours in a north-west direction with shot and shell, where the enemy is massed, and at midnight

attack them with your whole division with the bayonet. --- W. S. ROSECRANS, Major-General."

I was astounded, and turning to the officer said: "Tell General Rosecrans I cannot execute that order till I see him personally, and explain to him the difficulties in the way and what the result must be if carried out." An hour passed, when the officer who brought the order returned, bringing General Rosecrans with him. General John B. Sanborn, of Minnesota, and others heard the following conversation which then took place:

General ROSECRANS savagely : "General Hamilton, what do you mean by disobeying my order to attack the enemy?"

General HAMILTON: "General Rosecrans, I am ready to execute your order, but there is too much at stake here to be risked by a night attack. The ground between us and the enemy is a dense forest, with a thick undergrowth in which the troops cannot move ten minutes without breaking their formation. It is dark in the forest --- too dark to distinguish friend from foe. If my division is once disorganized it cannot be re-formed until daylight comes. We are ignorant of the enemy's exact position and must feel around in the darkness of the forest to find him. Let me say that your lines are too long. My division is not in supporting distance of any other division, and when the town is assaulted in the morning your army will be cut in two and destroyed. Davies's division has withdrawn so far that the skirmishers of the enemy occupy his last position in line. Your position is a false one. The troops should be withdrawn and placed within the earth-works of the town. Place them within the fortifications and in support of each other. It is a strong position and insures a victory. But as we are now you cannot make a strong defense, and the battle which is certain for the morning will surely be a defeat for us."

General ROSECRANS after a few moments of reflection without reply : "Hamilton, you are right. Place your division as you suggest, and the others shall be placed accordingly."

The change of my division was accomplished by 3 A. M., and the troops sought their rest on the morrow's battle-field, full of hope and sure of victory. Thus closed the operations of the day. And thus was brought about the change that led to victory on the following day, but from that time to this

no public writing or utterance on the part of General Rosecrans has ever acknowledged the services so rendered.

(The "Official Records" do not contain this order or any allusion to the subject of it. --- EDITORS.)
Source: Battles and Leaders of the Civil War, Vol. II.

Lost Mountain Signal Station, Ga.,
July 1, 1864 --- 7:30 p.m.

Capt. C. R. Case,
Chief Signal Officer, Department of the Cumberland:
Have opened with Captain Daniels, chief signal officer, Twenty-third Army Corps, south 40 degrees east, seven miles distant. Had view of Atlanta this evening. See fires in Marietta. No other fires in sight.

HOWGATE,
Lieutenant, Acting Signal Officer

Source: Official Records, Series I, Volume XXXVIII, Part V.

NEAR CHATTAHOOCHEE RIVER, GA., July 12, 1864 --- 8:30 p.m.
(Received 9.20 p.m. 13th.)

Maj. Gen. H. W. Halleck,
Washington, D. C.:

Mark your maps Phillips' Ferry at mouth of Soap Creek; Powers' Ferry just above the mouth of the Rottenwood and Island Creeks; Pace's Ferry one mile below the mouth of Island Creek. General Dodge's corps is across at Roswell; General Schofield's corps at Phillips'; General Howard's corps at Powers'. All well.

W. T. SHERMAN,
Major-General, Commanding.

SHERMAN'S HEADQUARTERS,
July 12, 1864.

Major-General Thomas:

McPherson's pontoon train is on its way here. Where do you want it?

W. T. SHERMAN,
Major-General.

Major-General Sherman:

Please have the pontoon train sent to Powers' Ferry.

GEO. H. THOMAS,
Major-General.

HDQRS. MILITARY DIVISION OF THE MISSISSIPPI,
In the Field, near Chattahoochee River, July 12, 1864.

General Thomas:

Has anything been done with the pontoon bridge of the enemy of Pace's? We should either get full possession of it or destroy it altogether, for when we cross to the other side, leaving a mere guard of cavalry on this, the bridge might be most mischievous to us. Please order that it be got out at night, or the planking thrown off and boats scuttled.

W. T. SHERMAN,
Major-General, Commanding.

Source: Official Records, Series I, Volume XXXVIII, Part V.

SPECIAL FIELD ORDERS,) Hdqrs. Mil. Div. of the Miss.,
) In the Field, near Chattahoochee River,
July 14, 1864.

Preliminary steps having already begun, the following general plan will be observed and adhered to:

I. Major-General Thomas will prepare to cross his army at Powers' and Pace's Ferries, and take position out from the Chattahoochee River, until he controls the country from Island Creek to Kyle's Bridge, over Nancy's Creek, but will not move the whole of General Palmer's and General Hooker's corps across until he hears that General Stoneman is back from his present expedition. He will endeavor to provide General Stoneman enough pontoon boats, balks, and chesses to make one bridge. He will dispose of General McCook's cavalry and detachments of his own infantry to watch the Chattahoochee about the old railroad crossing.

II. As soon as General Stoneman returns, he will dispose his cavalry to watch the Chattahoochee at Turner's Ferry and about the mouth of Nickajack, connecting by patrols with General McCook, and will, if possible, procure enough pontoons to make a bridge ready on the first chance to cross the river about Howell's or Sandtown, and break the Atlanta and West Point railroad and telegraph.

III. Major-General Schofield, after having well secured his crossing-place at Phillips', will move out toward Cross Keys until he controls the ridge between Island and Nancy's Creeks and the road represented as leading from Roswell to Buck Head.

IV. Major-General Blair will immediately, on the return of Major-General Stoneman, move rapidly to Roswell and join his army. Major-General McPherson will then move his command out, either by the Cross Keys road or the old Hightower trail, until he is abreast of Major-General Schofield, and General Garrard, with his cavalry, will scout from McAfee's Bridge toward Pinckneyville, and if no enemy is there in force will picket McAfee's Bridge and take post on General McPherson's left, about Buchanan's.

V. The whole army will thus form a concave line behind Nancy's Creek extending from Kyle's Bridge to Buchanan's, but no attempt will be made to form a line of battle. Each army will form a unit and connect with its neighbor by a line of pickets. Should the enemy assume the offensive at any point, which is not expected until we reach below Peach Tree Creek, the neighboring army will at once be made, but no corps need move to any great distance from the river until advised that General Stoneman is back.

VI. Major-General Thomas will study well the country toward Decatur via Buck Head, Major-General Schofield to a point of the railroad four miles northeast of Decatur, and Major-General McPherson and General Garrard that toward Stone Mountain. Each army should leave behind the Chattahoochee

River, at its bridge or at Marietta, all wagons or incumbrances not absolutely needed for battle. A week's work after crossing the Chattahoochee should determine the first object aimed at, viz, the possession of the Atlanta and Augusta road east of Decatur, or of Atlanta itself.

By order of Maj. Gen. W. T. Sherman.

L. M. DAYTON,
Aide-de-Camp.

Source: Official Records, Series I, Volume XXXVIII, Part V.

City Point, Va., July 15, 1864.

Major-General Halleck,
Washington, D. C.:

In view of the possible recurrence of the late raid into Maryland, I would suggest that the following precautions be taken: First. There should be an immediate call for all the troops we are likely to require. Second. Washington City, Baltimore, and Harper's Ferry should be designated as schools of instruction, and all troops raised east of the State of Ohio should be sent to one of these three places as fast as raised. Nashville, Decatur, and Stevenson should also be named as schools of instruction, and all troops raised in Ohio and west of it should be sent to those. By doing this, we always have the benefit of our increased force, and they in turn improve more rapidly by contact with veteran troops. To supply Sherman, all the rolling-stock that can possibly be got to him should be sent. An effort ought to be made to transfer a large portion of stores now at Nashville to Chattanooga. This might be facilitated by withdrawing for awhile the rolling-stock from the Nashville and Reynoldsburg Railroad, and a large part of the stock upon the Kentucky roads. There is every indication now, judging from the tone of the Southern press, that, unless Johnston is reenforced, Atlanta will not be defended. They seem to calculate largely upon driving Sherman out by keeping his lines of communication cut. If he can supply himself once with ordnance and quartermaster's stores, and partially with subsistence, he will find no difficulty in staying until a permanent line can be opened with the south coast. The road from Chattanooga to Atlanta will be much more easily defended than that north of the Tennessee. With the supplies above indicated at Chattanooga, with, say, sixty days' provisions there, I think there will be no doubt but that the country will supply the balance. Sherman will, once in Atlanta, devote himself to collecting the resources of the country. He will take everything the people have, and will then issue from the stores so collected to rich and poor alike. As he will take all their stock, they will have no use for grain further than is necessary for bread. If the enemy do not detach from here against Sherman, they will, in case Atlanta falls, bring most of Johnston's army here with the expectation of driving us out, and then unite against Sherman. They will fail if they attempt this programme. My greatest fear is of their sending troops to Johnston first. Sherman ought to be notified of the possibility of a corps going from here, and should be prepared to take up a good defensive position in case one is sent --- one which he could hold against such increase. If Hunter cannot get to Gordonsville and Charlottesville to cut the railroad, he should make all the valley south of the Baltimore and Ohio road a desert as high up as possible. I do not mean that houses should be burned, but all provisions and stock should be removed, and the people notified to move out.

U. S. GRANT
Lieutenant-General,

Source: Official Records, Series I, Volume XXXVIII, Part V.

SPECIAL FIELD ORDERS,) Hdqrs. Left Wing, 16th Army Corps,
Near Atlanta, Ga., August 4, 1864.

1. In order to successfully carry out Special Field Orders, No. 88, Department and Army of the Tennessee, the following instructions will be complied with as near as possible by division commanders:

First. The skirmish line will be doubled, ready to advance before the appointed time. As good a knowledge of the ground will be obtained as possible, and when the advance is made, the batteries will open upon the skirmish line of the enemy and his rifle-pits carried; the move to be made in conjunction on the right with the Seventeenth Corps and on the left, if practicable, with the Twentieth Corps.

Second. After the enemy's line is carried and during the time batteries will continue to play upon the enemy's main works or any of his troops that may be discerned. Commanders of divisions will have an understanding with the division commanders on their right and left, so that the advance can be made in unison.

Headquarters of the general commanding will be on the hill near the signal station.

By order of Maj. Gen. G. M. Dodge:

J. W. BARNES,
Assistant Adjutant-General

Hdqrs. Military Division of the Mississippi,
In the Field, near Atlanta Ga., August 5, 1864.
(Received 11 a.m. 6th.)

Hon. E. M. Stanton,
Secretary of War:

The time has now come that we must have the exclusive use of the Northwestern road from Nashville to Reynoldsburg. It has been substantially done for some time, but Governor Johnson retains the management of it for some reason, under your former orders; but to be of service to use in the present emergency it must be in the control of Mr. Anderson, superintendent of military roads, that trains may run continuously from the Tennessee River, at Reynoldsburg, to our camp. This main road has been admirably managed, and has supplied this vast army so that not a man, horse, or mule has been for a day without food and abundant supplies of clothing and ammunition. Our progress may be slow to you all at a distance, but if you ever cross this ground you will not accuse us of being idlers

W. T. SHERMAN,
Major-General, Commanding

Source: Official Records, Series I, Volume XXXVIII, Part V.

SPECIAL FIELD ORDERS,) Headquarters Department and Army of
) the Tennessee,
Before Atlanta, Ga., August 4, 1864

IV. Major-General Schofield having been ordered to move his command, with the corps of Major-General Palmer, in order to throw himself across the railroad, commencing the movement at 3 o'clock this p. m., the following are the orders for this army:

1. At 2:30 p. m. today the line of skirmishers will be doubled, and the enemy pressed hard along the whole line.

2. All the men in the trenches will stand under arms during the demonstration, without their knapsacks.

3. Major-General Logan's division will be held where it now is, in readiness to move to any point at a moment's warning.

4. It is desirable that corps commanders personally superintend the movement of the skirmishers, using their artillery when and where they deem necessary with a view to keeping the enemy in his works and to deceive him as to the real movement.

5. The general or some of his staff will be at De Gress' battery near the right of line.

VIII. Brig. Gen. Morgan L. Smith, U. S. Volunteers, will as soon as able for duty proceed to Memphis, Tenn., and report to Maj. Gen. C. C. Washburn for assignment to the command of the District of Vicksburg. The major-general commanding takes this occasion to express his sincere regret that the failing health of General Smith has compelled him to leave the front, where during this campaign he has so gallantly distinguished himself, and added to his already brilliant reputation as a skillful and an accomplished officer, winning the confidence and esteem of his superiors and endearing himself to this whole command.

IX. Major-General Dodge, commanding Left Wing, Sixteenth Army Corps, will direct the Ninth Illinois Cavalry to establish their headquarters on the Green's Ferry road, and form a line of pickets from the right of the infantry or cavalry (if there be any cavalry on the right of the line) to the main Utoy Creek, keeping up their patrol, and reporting the result frequently to these headquarters. Major-General Dodge will cause his front to be reconnoitered by his engineer officer with a view to the establishment of a new advanced line to connect with the new line to be established in front of the Seventeenth Army Corps.

2. Major-General Blair, commanding Seventeenth Corps, will cause his front to be reconnoitered with a view to the establishment of a new line. He will direct his engineer officer to act in concert with the engineer officers of the Fifteenth and Sixteenth Corps, under the supervision of Capt. C. B. Reese, chief engineer.

3. Major-General Logan, commanding Fifteenth Army Corps, will cause his front to be reconnoitered, and will connect his advanced line with the Seventeenth Corps, directing his engineers to cooperate with the engineers of the Seventeenth Corps, directing his engineers to cooperate with the engineers of the Seventeenth Army Corps, under the direction of Capt. C. B. Reese, chief engineer.

4. The object being to advance as rapidly and as far as possible toward the enemy's position, corps commanders will act in concert, secure all vantage ground and every commanding position.

By order of Maj. Gen. O. O. Howard:

WM. T. CLARK,
Assistant Adjutant-General

Source: Official Records, Series I, Volume XXXVIII, Part V.

HDQRS. MILITARY DIVISION OF THE MISSISSIPPI,
In the Field, near Kenesaw, July 1, 1864.

A. Anderson,
General Supt. of Military Railroads, Nashville:

I hear Mr. Taylor, the new superintendent, spoken of very highly. Bear in mind that these are war times and all must incur some risk. We here will do our share, but if the road or wires to the rear are interrupted, the repair must come mostly from your end. Keep Colonel McCallum advised that he must be prepared to lose half a dozen or more trains every month by guerrillas and dashes at the road which cannot be prevented.

W. T. SHERMAN,
Major-General, Commanding.

Nashville, July 1, 1864.

Major-General Sherman:

We have made and continue to make large preparations for contingencies, loss of trains, and the like. We receive five to eight new engines per week and average over thirty cars per week. In July, the number of cars received will be much greater. No pains, effort, or expense will be spared on our part.

A. ANDERSON,
General Superintendent.

Source: Official Records, Series I, Volume XXXVIII, Part V.

APPENDIX G

BATTLE PLAN, TRENCH WARFARE, 1914-1918.

Mission of the unit in the attack front to be attacked, with definite limits.

Objectives, different lines to be taken.

Disposition of the unit attack; formation, intervals.

Disposition of the unit in the parallels of departure before the attack.

The day (D) and hour (H) of attack.

Direction of the attack; compass angle.

Position of the leader.

Tactical relation with the neighboring units during the advance.

Use of specialists; machine guns, trench cleaners, etc.

Support of artillery during the attack.

Unit liaison during the attack:

With neighboring units and leaders (runners, telephone, signalling, carrier pigeons).

With the support artillery (detachment of liaison, observatories, and rockets.

With air service (rockets, signalling, Bengal fires).

With balloon service (search lights).

Equipment for the attack.

Supply of ammunition and water; advanced supply points.

Evacuation of the wounded; dressing stations, routes of evacuation, auto ambulance points. Also, routes of evacuation for prisoners and assembling points for same.

This plan of battle is so drawn up that it may be executed any later day that may be designated in the order for the attack.

Source: Georges Betrand and Oscar N. Solbert, Tactics and Duties for Trench Fighting, New York: G. P. Putnam's Sons, 1918.

APPENDIX H

WORLD WAR I COMBAT ORDERS

203-32.7: Order [Contemporary Translation]

French Sixth Army,
FRENCH XXXVIII ARMY CORPS,

VIELS-MAISONS, AISNE, May 31, 1918---8 p.m.

[Extract]

P. C. Division: CONDE-en-BRIE
P.C. 5th Brigade: CELLES-les-CONDE * * *
P.C. 6th Brigade: St-EUGENE * * *

* * * * *

HS Fr. Files: 454-30.1: Order

Distribution of Elements of 3d Division

[Editorial Translation]

3d Section, General Staff

No. 1128/3 FRENCH XXXVIII ARMY CORPS,

VIELS-MAISONS, AISNE, May 31, 1918.

GENERAL OPERATIONS ORDER NO. 135

[Extract]

I. By order of the Commanding General, French Sixth Army, the Commanding General, French XXXVIII Army Corps is responsible for that part of the army front comprised between TRELOUP (inclusive) and CHATEAU-THIERRY (inclusive). Headquarters at VIELS-MAISONS.

II. The zone of the XXXVIII Army Corps will be limited:

On the east: By TRELOUP -----COURTHIEZY-----ST-AGNAN--- CONDE-en-BRIE --- MONTMANCON --- ARTONGES (these localties inclusive) --- MONTMIRAIL (exclusive).

On the west: By COUPETTES --- Hill 190 --- woods at PEUPLIER-SIGNAL --- pass in the main road south of Bois des ROCHETS --- VAUX --- peak southeast of Bois de la MARETTE --- Ferme MALASSISE --- Ferme de la GENETTE (these points exclusive) --- course of the stream between SAULCHERY and CHARLY.

Liaison: On the east with the French I Colonial Army Corps (French Fifth Army).

On the west with the French XXI Army Corps.

III. All troops located within the above described zone pass under the command of the XXXVIII Army Corps. These troops include the following units: French 10th Colonial Infantry Division, elements of the French 20th Division, French 4th Cavalry Division, French 5th Cavalry Division, elements of the French 22d Division (including those of the French 173d Territorial Infantry Battalion) already in position.

The American 3d Division which will arrive beginning May 31 . . . [Contemporary pencil deletion of one line] .

Nondivisional elements [corps troops] XXXVIII Army Corps (in course of detrainment).

IV. These troops will be distributed in two west and east divisional sectors separated by the line: MONT-St-PERE --- FOSSOY (included in the west sector).

a. The west sector is placed under the command of General MARCHAND, commanding the French 10th Colonial Infantry Division (C. P. at Ferme des ALLOIS, west of COURBOIN)

* * *

b. The east sector is placed under the command of General de la TOUR, commanding the French 5th Cavalry Division (C. P. Ferme JANVIER, northeast of MONTHUREL) * * *

c. At the disposition of the army corps commander: The remainder of the American 3d Division, General Renouard, commanding French 22d Division . . . and the elements of the 22d Division.

French 38th Heavy Artillery Regiment and 1st Battalion, French 82d Heavy Artillery Regiment (2 batteries of 155-mm. G.P.F.).

V. The mission of the troops of the XXXVIII Army Corps is the same as that already given by Commanding General, French XXI Army Corps to the generals commanding the divisions in position, namely: To defend the terrain with the utmost energy, no matter how great the violence of the enemy's effort. The tactical instructions given by the Commanding General, XXI Army Corps will remain in force.

* * * * * *

De MONDESIR,
General Commanding XXXVIII Army Corps.

2d Div.: 4th Brig.: 202-32.1: Order

Organization of Brigade Sector — 4th BRIGADE, U. S. M. C.,

FIELD ORDER — Ferme de la Loge; July 3, 1918.

No. 6

MAP: CHATEAU-THIERRY 1:20,000

1. The plan of defense of the division adopted under instructions from the French Sixth Army contemplates organization into three zones, roughly as follows: 4th Brigade:

(a) The Zone of Outposts:
North and east: Our present front line.
South and west: Through Hill 142, north edge of woods northwest of LUCY; LUCY-le-BOCAGE; woods southeast of LUCY-le-BOCAGE; ridge of Hill 201.

(b) The Zone of Principal Resistance:
North and east: The southern and western boundaries of the zone of outposts

South and west: Ridge of MARIGNY; la VOIE du CHATEL; woods north of Bois du CHATEL; woods west of MONTGIVRAULT.

(c) The Zone of the Reserves:

This zone is near a line known in the French orders as the Alarm Position of the Reserves, and is approximately on the front Hill 206; Signal d' ISSONGE; wood west of COUPRU.

2. The 4th Brigade sector is divided in two regimental sectors with battalions distributed in depth from the Zone of the Outposts to the Zone of the Reserves.

The 5th Marine Sector: Right boundary: BOURESCHES, exclusive, Ru GOBERT to culvert on LUCY-BOURESCHES road; along south and east of wood west of MONTGIVRAULT, thence along PARIS-METZ road, inclusive.

Left boundary: Northwest edge of Bois de la BRIGADE de MARINE (175.7-262.3 approximately) to point north of LUCY-le-BOCAGE (174.8-261.4 approximately), thence to ISSONGE Farm, exclusive.

The 6th Marine Sector: Right boundary: same as left boundary of 5th Marine Sector.

Left boundary: Same as left boundary of 2d Division.

3. TROOPS, ORGANIZATION AND DUTIES IN THE ZONE OF OUTPOSTS:

(a) In each regimental sector, the Zone of Outposts will be occupied by 1 battalion, 1 machine gun company, 1 37-mm. gun, and 2 Stokes mortars.

(b) The position will be organized for defense by strong points, numerous combat groups and machine-gun positions distributed in depth and placed checkerwise, covering all possible avenues of approach.

The stream lines particularly must be well covered to guard against enemy infiltration by small groups or individuals.

These positions will be carefully located and naturally or artificially camouflaged to enable their location and observation by enemy air service impossible or at least very difficult. The great safety of these small positions lies in perfect concealment.

The idea of occupying a well-defined line of trenches throughout its length must be abandoned.

The position will not be occupied in toto by the battalion, but a part of the battalion will be held out as reserve for local counterattacks.

The responsibility for the organization of this zone lies with the regimental commander under the supervision of the brigade commander. The most careful arrangements will be made with adjoining organizations to insure mutual support and the complete defense of that part of the zone on the sector limits.

(c) Duties in Zone of the Advance Posts:

1. To observe and maintain contact with the enemy at all times.
2. To prevent him from approaching close to and opposite our lines.
3. To offer the most obstinate resistance in case of a general attack.
4. In case of a general attack, every unit and combat group must defend itself on the spot to the utmost even if completely surrounded.
5. The first and primary duty in this zone is to stop or at least break up hostile attacks.

4. TROOPS, ORGANIZATIONS AND DUTIES IN ZONE OF PRINCIPAL RESISTANCE:

(a) In each regimental sector, the zone of principal resistance will be occupied by 1 battalion, 1 machine gun company, 2 37-mm. guns, and 4 Stokes mortars.

(b) The division engineer in consultation with the brigade commander is charged with the organization and construction of the defense work in this zone. The construction of trenches in the 6th Marine sector at the front of the zone of principal resistance is practically finished. It is being pushed for the 5th Marine sector. When finished, battalions in support will habitually occupy these trenches. Pending completion of the trenches, these battalions will be in the woods northwest of LUCY, but, if the zone of outposts

is attacked, it will at once man the line of trenches without further orders. They are not to be used forward of their zone, except on specific authority of the brigade commander.

(c) DUTIES IN THE ZONE OF PRINCIPAL RESISTANCE:

The mission in this zone is to defend it to the utmost and definitely check the enemy should he succeed in getting through the zone of the advance posts.

All regions favorable to infiltration of enemy groups and individuals, such as woods, ravines, stream lines, etc., will be particularly covered by small combat groups and machine guns and automatic rifles.

The zone will not be occupied by the entire battalion, but a portion will be held out as reserve to be used in counterattack, or in such other manner as the situation may demand.

Arrangements will be made with the neighboring organizations to insure complete communication and liaison and complete arrangements for cross-fire and mutual support.

5. TROOPS, ORGANIZATION, AND DUTIES IN THE ZONE OF THE RESERVES:

(a) Of the two battalions of the brigade available for this zone, the left, stationed in the woods near La VOIE-du-CHATEL is the brigade reserve. It will have with it the companies of the 6th Machine Gun Battalion not assigned to the two forward zones. The right battalion, stationed in the Bois near La LONGUE Ferme, with the 4th M. G. Battalion, constitutes the divisional reserve.

(b) The organization of the zone of the reserves is the duty of the army corps.

(c) The brigade reserve will be held in a state of readiness to move forward to the zone of principal resistance and to counterattack as occasion may require. The battalion commander will reconnoiter routes to be followed by his unit to points liable to be occupied by it in case of defense in the zone of the reserves, and the route of advance to the zone of principal resistance. All officers to include platoon chiefs, and senior sergeants in each platoon will familiarize themselves with these routes to enable them to proceed at night to designated points in their front.

(d) The division reserve will receive its instructions from division headquarters, but should be in the same readiness for probable employment, and have a similar knowledge of routes as prescribed for the brigade reserve.

6. In order to prepare barrages on those portions of our front which need them most, the following will be submitted:

(a) Ravines, woods, or exists from which the enemy is most likely to launch an attack.

(b) A tracing showing the location and extent of the lines on which a thick barrage is desired.

MEANS OF TRANSMISSION

I. AXES OF LIAISON see Par. 5 (a) (2), F. O. 20

* * * * * *

(b) The existing army network of telephone and telegraph lines will maintain the communication as far as corps headquarters. Each corps will arrange for the advance of these circuits along its axis of liaison according to the corps plan and after consultation with the Chief Signal Officer, First Army.

(c) The army radio net, with stations at army headquarters and at each corps headquarters, will be prepared to handle radio messages between these headquarters and also to adjoining corps and armies.

The characteristics, wave lengths and call letters will be issued separately by the Chief Signal Officer, First Army (radio officer).

* * * * * *

II. LIAISON BY VISUAL SIGNALING: Each corps will make its own arrangements for visual signaling. The call letters of visual stations will be the same as those of the corresponding radio stations. Communication by visual signaling from rear to front will be exceptional and stations so sending should be located so as to be invisible from enemy observation. * * *

III. LIAISON BY PIGEONS: Each corps signal officer will consult with the army signal officer as to the French pigeon lofts which will be at the disposal of the corps. Divisions will receive their allowance of pigeons according to the corps plan.

IV. LIAISON BY MOTORCYCLE AND AUTOMOBILES: The message center of the Army will arrange for a regular courier service every three hours between the P. C. of the Army and the P. C. of each corps during the entire attack. In addition, a squad of three motorcycle messengers will be held at each corps P. C. ready for emergency work in case the telephone or other communication methods fail to function properly. In the same way a detachment of six motorcycle messengers will be held at army P. C. for emergency work.

* * * * * *

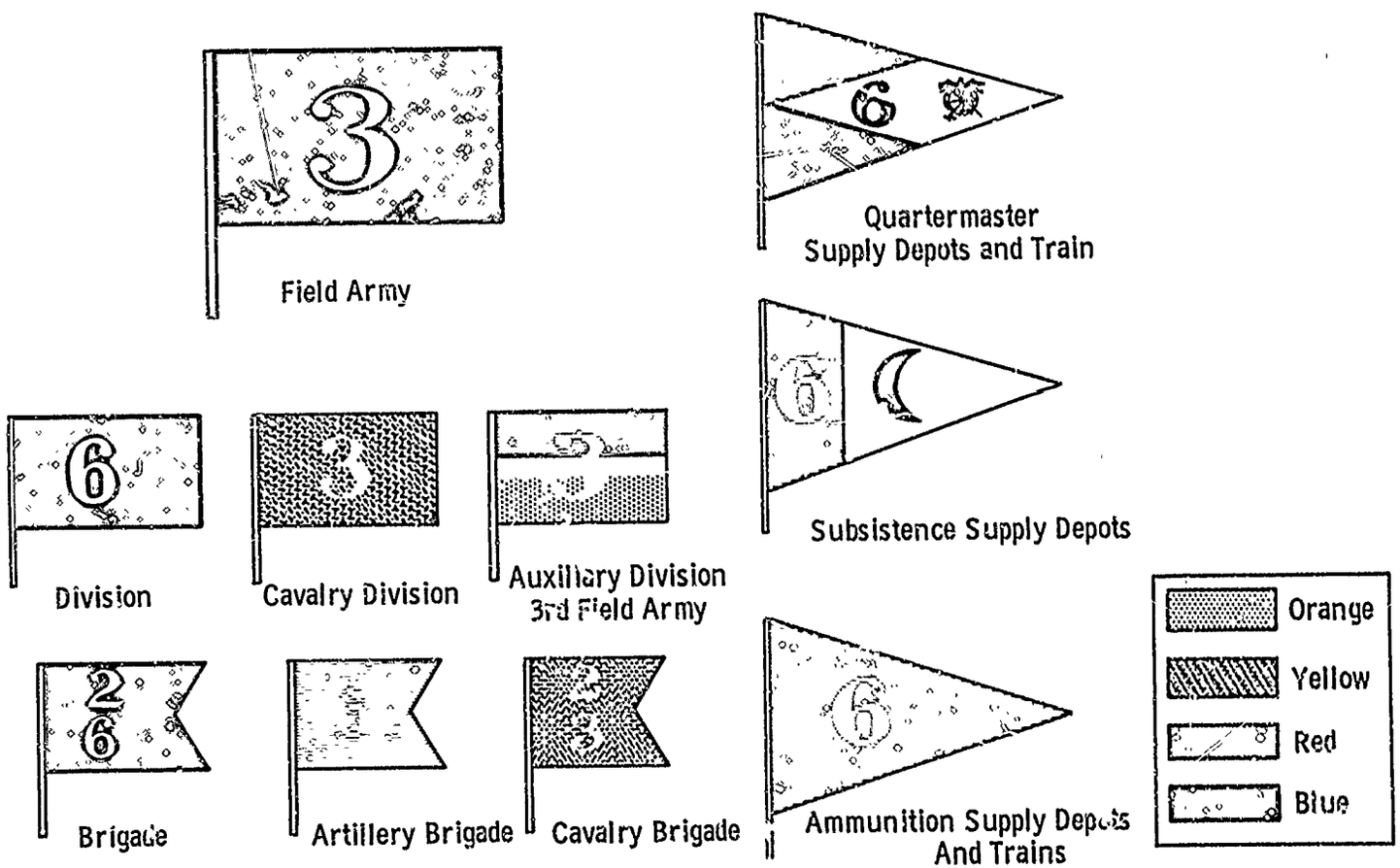
X. POSTS OF COMMAND ON D-1 DAY:

First Army -	First Echelon -	Souilly
" "	Second "	Ligny-en-Barrois
I Corps		Rampont
III Corps		Rarecourt
V Corps		Ville-sur-Cousances

By command of General Pershing:

H. A. DRUM,
Colonel,
Chief of Staff.

APPENDIX I
UNIT DESIGNATION FLAGS - WORLD WAR I



APPENDIX J

GENERAL FORM FOR A COMPLETE WRITTEN FIELD ORDER

Issuing unit
Place of issue
FO ---------- Date and hour of issue

Maps: Those needed for an understanding of the order.

1. INFORMATION. - Include appropriate information covering:
   a. Enemy. - Strength, location, composition, dispositions, and movements; identifications; capabilities; other deductions; refer to intelligence summary or report when issued.
   b. Friendly forces. - Missions or operations, and locations of next higher and adjacent units; same for covering forces or elements of the command in contact; support to be provided by other forces.
2. DECISION OR MISSION. - Decision, or mission; details of the plan applicable to the command as a whole and necessary for coordination.
3. TACTICAL MISSIONS FOR SUBORDINATE UNITS. - Specific tasks assigned to each element of the command charged with execution of tactical duties, which are not matters of routine.
4. ADMINISTRATIVE DETAILS. - Refer to administrative order, if issued. Essential instructions of interest to units having tactical missions regarding supply, evacuation, traffic, service troops and trains, and personnel.
5. SIGNAL COMMUNICATIONS AND COMMAND POSTS. - Include appropriate instructions concerning:
   a. Signal communications. - Orders relative to signal communications; refer to signal annex, if issued, or to signal operation instructions.
   b. Axes of signal communications. - For unit and major subordinate units.
   c. Command posts. - Initial locations of command posts of unit and major subordinate units; other places to which messages may be sent; times of opening.

Authentication: (on copies only) (Signature)
Annexes: (Listed in numerical order)
Distribution:

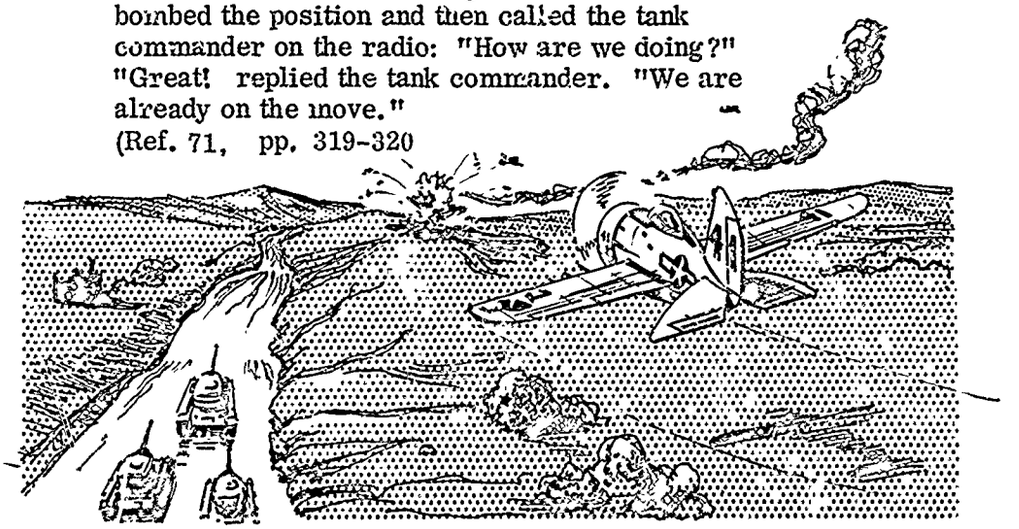
Source: Combat Orders, Command and General Staff School, Ft. Leavenworth, 1939.

APPENDIX X

AIR-GROUND SUPPORT IN COMBAT

The control of the air support available to the units on the ground was often informal. Coordination between air and ground was, in essence, unit control at its highest peak. Lieutenant General Lewis H. Brereton, one of the important air commanders in both the Pacific and European areas during World War II cites an example during the Normandy Campaign on 31 July 1944:

> " . . . A typical mission was a flight of four Thunderbolts flying in half-hour shifts over a tank column with two-way radio communication between the tank commander and the pilot. Sometimes the tank commander asked the pilot to scout the road ahead for signs of the enemy. Other times the tank's commanders would call for help.
> Outside of Givray a column of American tanks was held up by a German gun emplacement and unable to move. The road became clogged with vehicles. Lieutenant Leslie C. Boce, who was cruising the area in his Thunderbolt, reported he heard the following message come through on his radio several times.
> "Won't someone come and help? Everybody gets air support but me."
> Lieutenant Boce answered: "I'm on my way."
> "Is that you above me? the ground commander asked when he saw a Thunderbolt over head.
> "Yes, what can I do for you?"
> "There's a gun emplacement on my right. It's been holding up my column for hours."
> Lieutenant Boce and his flight of P-47's dive-bombed the position and then called the tank commander on the radio: "How are we doing?"
> "Great! replied the tank commander. "We are already on the move."
> (Ref. 71, pp. 319-320



APPENDIX L

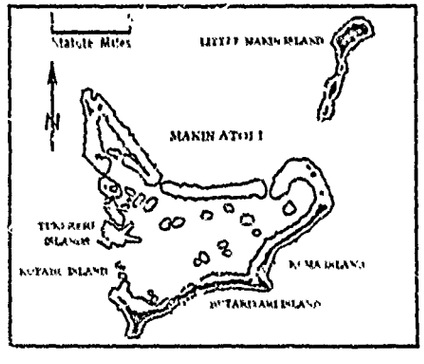
TASK FORCE ORGANIZATION – PACIFIC, WORLD WAR II

Major General Ralph C. Smith, Commanding
27th Division Task Force at Makin

DIVISION HEADQUARTERS AND HEADQUARTERS COMPANY

CHIEF OF STAFF .... COL A. K. STEBBINS, JR.
G-1 (ACTG) ..... LT COL CHARLES B. FERRIS
G-2 ..... LT COL W. M. VAN ANTWERP
G-3 ..... MAJOR HENRY F. ROCS
G-4 ..... LT COL CHARLES B. FERRIS

- DET, HQ CO, 193d TANK BN — MAJOR M. C. INSKEEP
- COS A, C, 193d TANK BN — LT COL H. L. EDMONDSON
- CO B, PROV CI RG CO W/SURG TEAMS ATTD 102d MED BN — LT COL ABRAHAM NORMAN
- 1st BN, 98th CA (AA) PATRYS K. L. 93d CA (AA) ATTD — COL ROBERT R. HENDON, JR.
- CO C, 102d ENGR BN (C) — LT COL HAROLD F. GORMSEN
- DET, 27th SIG CO — LT COL T. J. MURRAY
- DET, 75th SIG CO — CAPT FRED M. HAGER, JR.
- DET, 727th ORD CO — LT COL HANS S. BENDIXEN
- DET, 23rd BOMB DISPOSAL UNIT — CAPT GEORGE C. SARAW
- DET, 27th QM CO — MAJOR EUGENE F. CLEAVER
- RCT 165, WITH 3d BN, 105th INF ATTD — COL G. [illegible] CONROY* / LT COL G. W. KELLEY
  - AIR COMMAND
    - AIR-LIAISON PARTIES
  - BLT 165-1 — LT COL G. W. KELLEY / MAJOR JAMES H. MAHONEY
  - BLT 165-2 — LT COL JOHN F. MCDONOUGH
  - BLT 165-3 — LT COL JOSEPH T. HART
  - 105th FA BN — COL H. O. BROWNE
  - 152d ENGR BN (C) — COL BRENDAN A. BURNS
  - NAVAL GUNFIRE CONTROL
    - NAVAL SHORE FIRE CONTROL PARTIES



*COMMAND OF THE REGIMENT PASSED TO LT COL KELLEY WHEN COL CONROY DIED

APPENDIX M

UNIT CONTROL BY RADIO IN COMBAT
WORLD WAR II

The attack got under way the following afternoon after Mustang fighters had bombed and strafed the Japanese positions on the trail only 150 yards ahead. Shortly before 4:00 P.M., the battalion command net on the SCR 300's went into operation. The exchanges give an idea of how the unfolding action seemed to the participants:

Colonel Beach, commanding 3rd Battalion, to Major Lew, commanding the combat team on the trail: "The fatboys [the two howitzers] will open at 1600, your mortars at 1605 and the jump-off your decision."

Major Lew to Colonel Beach: "The fatboys are raising hell with the pillboxes on the right slope of the hill. A direct hit on one. Japs ran from another. Have the fatboys hit that machine gun firing 200 yards to the west of their present target, then swing their barrage up the slope of the hill. We are preparing to push off."

Major Lew to Captain Clarence O. Burch, commanding the company making the assault: "Shove off, boy, and good luck!"

Captain Burch to Lieutenant Theodore T. Chamelas, commanding the platoon on the right flank: "Shove off, Tom, and be sure to cover that little draw on your right with at least one squad."

Lieutenant Chamelas to Captain Burch: "Roger on that. The Japs are running from that pillbox to my front. Our snipers got one sure and we lobbed a 60-millimeter or two on them. Believe we got some more."

Captain Burch to Lieutenant Victor Weingartner, commanding the platoon on the left flank: "Did you hear my message to Tom? Same applies to you, Abie. Shove off and keep your eyes open for each other."

Lieutenant Weingartner to Captain Burch: "Roger, I understand you."

Captain Burch to Major Lew: "Have shoved off. Am now moving my command post forward with center platoon. No enemy firing yet."

Major Lew to Captain Burch: "Roger on that – and close in fast."

Major Edwin J. Briggs, commanding the combat team down the mountainside, to Colonel Beach: "Have Luke [Colonel George A. McGee, Jr., commanding 2nd Battalion at Nhpum Ga] fire three rounds of 60-millimeter 200 yards due west of his perimeter. I am close but can't locate him."

Colonel McGee to Colonel Beach: "I heard Boston [Major Briggs]. Will fire in three minutes. Japs are pressing us from the north. Ask the bombers to drop a few and strafe 400 yards north of Nhpum Ga on that little ridge."

Colonel Beach to Colonel McGee: "Roger on that."

Captain Burch to Lieutenant Chamelas: "The Japs are rolling hand grenades down on the squad near the trail. Can you throw some rifle grenades on them?"

Lieutenant Chamelas to Captain Burch: "We just threw three grenades on them. I don't believe these Japs are throwing them. I'll tell Bill [squad leader] to watch out. We're almost to the crest of the hill so don't fire on us."

Captain Burch to Lieutenant Chamelas: "Roger, old boy."

Major Lew to Captain Burch: "Your left flank is too far down the hill. The Japs are moving out so move that flank up fast."

Captain Burch to Major Lew: "Roger on that."

Major Lew to Colonel Beach: "How about that mortar ammunition? We need some 81 badly."

Colonel Beach to Major Lew: "The supply train is passing my command post now. Will be with you in a minute."

Major Lew to Colonel Beach: "Roger on that. Rogerrrr."

Lieutenant Chamelas to Captain Burch: "We're over the top of the ridge on the way down. Three pillboxes are blown to hell. Bloody Jap uniforms all over the place and one Nambu machine gun blown up. Looks as if the Japs are in strength on next hill. We're drawing inaccurate small-arms fire and a little knee-mortar. Put some fatboys on that hill for us, but be damn sure it's on the hill."

Colonel Beach to Lieutenant Chamelas: "Roger on those fatboys. Good work, fellow. Keep going."

Major Lew to Captain Burch: "Are you on the trail yet?"

Captain Burch to Major Lew: "We are 100 yards past the trail. There are no Japs on the east side of the trail. Japs have moved out of their positions. Will be at top of hill in five minutes."

Colonel Beach to Major Lew: "Have you moved anything up to occupy the ground you have taken?"

Major Lew to Colonel Beach: "I am moving a platoon up now. How about the ground we are leaving?"

Colonel Beach to Major Lew: "I'll occupy it with muleskinners."

Colonel Beach to Major Briggs: "Have you contacted Luke [Colonel McGee] yet?"

Major Briggs to Colonel Beach: "We've hit Jap perimeter. They have machine gun covering this area. Can't get at them with mortars. Am trying rifle grenades now. Looks like I may be held up here."

Colonel Beach to Major Briggs: "Tell Luke to put pressure on that spot. If necessary try farther south."

Major Briggs to Colonel Beach: "Roger on that. It's getting dark down here. We'll start digging in soon."

Lieutenant Chamelas to Captain Burch: "I am pinned down by heavy machine-gun fire from west side of hill. Artillery is hitting too high on hill to do any good. My flame-thrower is way round on my right flank trying to knock out that gun, but doubt if he can get close enough. Am going to pull up a little knoll ahead and dig in as it's almost dark."

Captain Burch to Lieutenant Chamelas: "Good work. We may be able to help you when we get our mortars set up. I see that machine gun. Roger on digging in."

Captain Burch to Major Lew: "I am held up by a position on the next hill, like the position we just took. Believe we'll have to have those fatboys in close again. It's almost dark, I am reorganizing and digging in."

Major Lew to Captain Burch: "Fine work. I am going up with the supply train now."

Captain Burch to Colonel Beach: "Have one and one [one killed and one wounded] that I know of."

Colonel Beach to Captain Burch: "Send him right back. We'll notify a plane to stand by."

Captain Burch to Colonel Beach: "[Major] Lew hit by Jap sniper. Suggest you come down at once. Our perimeter is set up and we're diggin in."[26]

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[26] The foregoing transcript, which, remarkably enough, was made of the transmissions, is taken from the official diary of the 5307th, compiled by Major John Jones, with procedural talk omitted.

COPY

APPENDIX N

STUDY DIRECTIVE

CDCRE

Directorate of Evaluation
1 March 1965

MEMORANDUM TO: Director, CORG

SUBJECT: Amendment Number 2 to Study Request: " CORG Program of Study in Military History" (The Evolution of Unit Control)

1. Reference. Memorandum from Director, Evaluation to Director, CORG, Subject: Combat Developments Study Request: " CORG Program of Study in Military History."

2. General. It is requested that CORG provide under its military history study program a comprehensive historical background tracing the development of control of military units in the field.

3. Objective and Scope. It will be the purpose of this project to cover the changing methods of control of units by commanders in the field, from ancient times to the present, showing when commanders first began to restrict units to specific zones of activity, separated them from other units by definite boundaries, and gave them a series of objectives to take or phase lines to which to advance in order to coordinate movements. Improvements in transportation, communications, and weapons should be treated insofar as they brought about some change in this control. The study should be made within the broad framework of centralized versus decentralized control of units.

4. Administration.

a. This study should be initiated on or about 1 March 1965 and completed on or about 15 July 1965. A draft report in four copies is required for staffing and coordination by 1 June 1965. Final report should be published by CORG in fifty copies by 15 July 1965.

b. The expenditure of four man-months of technical effort (for a rate of approximately one man-month per month) is authorized.

c. This activity is assigned CORG Project Number 13428.

/s/
ROBINSON

Coordination:
Plans Directorate/ s/ King for Bautz 24 Feb 65
ORS Division/ s/ Ansen 1 Mar 65

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UNCLASSIFIED
Security Classification

DOCUMENT CONTROL DATA - R&D
(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) Technical Operations, Incorporated Combat Operations Research Group Box 116, Fort Belvoir, Virginia	2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED 2b. GROUP N/A

3. REPORT TITLE

THE EVOLUTION OF MILITARY UNIT CONTROL, 500 BC – 1965 AD

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

Final Report

5. AUTHOR(S) (Last name, first name, initial)

Ney, Virgil

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
10 September 1965	209	97

8a. CONTRACT OR GRANT NO. DA-19-020-AMC-00525X b. PROJECT NO. CORG Project No. 13428 c. d.	9a. ORIGINATOR'S REPORT NUMBER(S) CORG-M-217 9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)

10. AVAILABILITY/LIMITATION NOTICES

Qualified requesters may obtain copies of this report from DDC.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
N/A	HQ, USACDC

13. ABSTRACT

Unit control has evolved over a period of several thousand years. The control of military units is based upon the organizational formation for combat and upon the weaponry then currently in common usage. Leadership at all levels and a system of battlefield communication are essential elements for the establishment and maintenance of unit control. Historically, the evolution of unit control falls into two distinct periods: The Ancient and Modern.

DD FORM 1 JAN 64 1473

UNCLASSIFIED
Security Classification

14 KEY WORDS	LINK A ROLE	LINK A WT	LINK B ROLE	LINK B WT	LINK C ROLE	LINK C WT
Command						
Span of control						
Organization						
Formation						
Communication						
Combat orders						
Unit						
Leadership						
Phalanx						
Legion						
Corps						
Order of battle						
ROAD						
Division						
Tactics						
Signal flags						
Carrier pigeons						
Military telegraph						
Radio						
Flares						
Whistles						
Signal pistols						

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It is highly desirable that the abstract of classified reports be unclassified. Each paragraph of the abstract shall end with an indication of the military security classification of the information in the paragraph, represented as *(TS), (S), (C), or (U)*.

There is no limitation on the length of the abstract. However, the suggested length is from 150 to 225 words.

14. KEY WORDS: Key words are technically meaningful terms or short phrases that characterize a report and may be used as index entries for cataloging the report. Key words must be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location, may be used as key words but will be followed by an indication of technical context. The assignment of links, rules, and weights is optional.

1 -4- -70,308—Ft Belvoir