

AD 704946

Technical Report 70-5

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Developing the Critical Combat Performance Required of the Infantry Rifle Platoon Leader

by

Frank L. Brown and T.O. Jacobs

HumRRO Division No. 4 (Infantry)

April 1970

Prepared for:

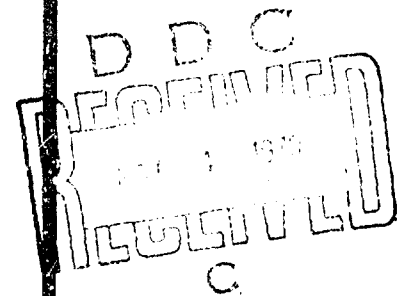
Office, Chief of
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HumRRO Division No. 4
Fort Benning, Georgia
HUMAN RESOURCES RESEARCH ORGANIZATION

Technical Report 70-5
Work Unit LEAD
Sub-Unit I

The Human Resources Research Organization (HumRRO) is a nonprofit corporation established in 1969 to conduct research in the field of training and education. It is a continuation of The George Washington University Human Resources Research Office. HumRRO's general purpose is to improve human performance, particularly in organizational settings, through behavioral and social science research, development, and consultation. HumRRO's mission in work performed under contract with the Department of the Army is to conduct research in the fields of training, motivation, and leadership.

The findings in this report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

Published
April 1970
by
HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street
Alexandria, Virginia 22314

Distributed under the authority of the
Chief of Research and Development
Department of the Army
Washington, D.C. 20310

FOREWORD

This research was performed by the Human Resources Research Organization under Work Unit LEAD, Development of Training for Improving the Combat Skills of Leaders in Small Infantry Units. The research was performed and most of the report preparation completed while HumRRO was part of The George Washington University.

The initial report under Work Unit LEAD was Technical Report 66-20, *The Effect of Programed Instruction Response Conditions on Acquisition and Retention*, by Thomas J. McCrystal and T.O. Jacobs. The objective of the research described in the initial report was to evaluate the effect on criterion scores of programed instruction requiring subjects to either write or not write their responses, under either constructed or prompted conditions. The instructional content dealt with military tactics. The execution of this work completed all work programed for Work Sub-Unit LEAD II.

The execution of the work reported herein under Work Sub-Unit LEAD I completes all work programed for Work Unit LEAD. The objective of LEAD I was to identify and record the critical combat performances, knowledges, and skills required of the Infantry Rifle Platoon Leader. This research was conducted at HumRRO Division No. 4, Fort Benning, Georgia, where the Director is Dr. T.O. Jacobs. Dr. Carl J. Lange was Director of the Division when Work Unit LEAD was initiated.

Personnel of the U.S. Army Infantry Human Research Unit provided military support for this effort. Those most directly involved were CPT James B. Walker, 1LT Robert G. Nivens, 2LT Richard A. Taylor, MSG David D. Sellers, MSG Johnnie O. Holder, PSG John D. Loomis, SFC Kenneth E. Perkinson, SP4 Joseph A. Moody, and SP4 Dennis I. Jarden.

LTC Chester I. Christie, Jr. is Chief of the Unit. CPT Harry K.L. Tom, LTC T.E. Lawrence, LTC Roger L. Miller, and LTC Ferdinand O. Barger, Jr., in the order cited, served as Chief during the course of the LEAD I research.

Members of the faculty and staff of the U.S. Army Infantry School reviewed and commented upon the initial subject areas and scopes encompassing the critical combat performances, knowledges, and skills required of the Infantry Rifle Platoon Leader. Members of this group of combat-experienced military experts also reviewed, commented upon, and contributed to the finalization of each of the LEAD I research by-products dealing with specific subject areas.

HumRRO research for the Department of the Army is conducted under Contract DAHC 19-70-C-0012. Training, Motivation, and Leadership Research is conducted under Army Project No. 2Q062107A712.

Meredith P. Crawford
President
Human Resources Research Organization

SUMMARY AND CONCLUSIONS

PROBLEM

It is commonly acknowledged and often strongly emphasized that victory for the combat commander at any level must stem primarily from the successes of his small units. Combat commanders constantly seek to increase the technical and tactical competence of their small-unit leaders through the development of more effective training. As a continuing part of this effort, U.S. Continental Army Command requested that HumRRO institute research to improve officer training in the critical skills required for effective combat leadership in small Infantry units.

The decision was made to focus the research effort upon the Infantry Rifle Platoon Leader for the following reasons:

(1) The Infantry Rifle Platoon Leader is the commissioned officer most frequently in direct contact with the enemy; he is also the commissioned officer directly responsible for command and control of the enlisted men in the Infantry Rifle Platoon, who bear the brunt of direct contact with the enemy. This leader's overall effectiveness is thus vital to the accomplishment of the Infantry mission.

(2) The number of officers required to lead Infantry Rifle Platoons far exceeds that of any other specific TOE assignment for commissioned officers within the Infantry battalion.

(3) Effective training as an Infantry Rifle Platoon Leader is of major importance in the development of officers for assignment to higher command and staff positions within Infantry units.

(4) The demand for training Infantry Rifle Platoon Leaders is consistently high as a result of promotions, assignment to higher positions of command, the completion of prescribed combat tours, the occurrence of casualties, and the return of junior officers to civilian life upon completion of obligatory tours.

The research objective established was to identify and record the critical combat performances, knowledges, and skills required of the Infantry Rifle Platoon Leader that lead to effective individual and unit performance in combat.

APPROACH

Some 200 detailed descriptions of small-unit combat actions were collected and analyzed in conjunction with the use of current military references directly pertinent to the combat requirements imposed upon the Infantry Rifle Platoon Leader. The time frames of these small-unit combat actions range through World War II and the Korean Conflict, and into the Vietnam War. As a result of this study, approximately 6500 performances, knowledges, and skills stemming directly from combat requirements were identified, recorded, and categorized into 41 major subject areas.

RESULTS

The critical combat performances, knowledges, and skills required of the Infantry Rifle Platoon Leader were identified and recorded in research by-products to cover each of 41 subject areas considered most critical by the U.S. Army Infantry School, the agency making primary use of the research.

The value of the contents of the research by-products in the development of training for noncommissioned officers within the Infantry Rifle Platoon was established during the research, and was made a matter of record with the major consumer to extend the overall usefulness of the research.

CONCLUSIONS

(1) The analysis of a large number of detailed descriptions of small-unit actions ranging through World War II, Korean, and Vietnam combat, when employed with the current military literature, was found to provide an effective source of data for the development of broadly relevant training requirements pertinent to effective combat leadership by the Infantry Rifle Platoon Leader.

(2) The critical combat performances, knowledges, and skills required of the Infantry Rifle Platoon Leader which were identified and recorded during this research are, in large part, directly applicable or adaptable to the development of effective combat training for the noncommissioned officers assigned to the Infantry Rifle Platoon.

(3) The critical combat performances, knowledges, and skills required of the Infantry Rifle Platoon Leader set forth in the by-products resulting from this research provide an advanced point of departure for continuing research toward the improvement of training within any of the subject areas covered by the research.

(4) The general methodology developed by this research may be applicable to the identification of combat requirements pertinent to other positions of military command or staff function around the world. The general methodology is also likely to be applicable to the identification of the combat requirements peculiar to a specific enemy within a limited environment such as the Viet Cong in Vietnam.

(5) The practice by major unit commanders of requiring unit historians to record *detailed* descriptions of small-unit combat actions, based upon extensive interviews with the leaders and men participating in each action, will provide useful sources of data from which critical performances, knowledges, and skills may be extracted and categorized toward the systematic improvement of training.

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**Developing the Critical
Combat Performance Required of
the Infantry Rifle Platoon Leader**

INTRODUCTION

MILITARY PROBLEM

The accomplishment of any military mission traditionally and legally is the primary responsibility of the leader of the unit to which the mission is assigned by higher headquarters. The basic combat mission of the Infantry small unit is: *To close with the enemy by means of fire and maneuver in order to destroy or capture him, or to repel his assault by fire and close combat.*¹ That this is an extremely difficult and hazardous mission is attested by the casualty figures for every war in which the United States has engaged. The majority of combat casualties invariably occur within the Infantry small units. Adequate training helps ensure mission accomplishment with a minimum of battle casualties.

Second only to the accomplishment of the assigned mission is the traditional and legal responsibility of the leader for the welfare of his men. Adequate training enhances human maintenance and reduces both battle casualties and non-battle casualties that result from deep fatigue, disease, and accidents.

The rapidly growing technology that characterizes the economy of the United States continually produces vast quantities of new materiel designed specifically for—or easily adaptable to—national defense. The current use of helicopters for rapidly transporting large numbers of troops and quantities of supplies over terrain obstacles that would prohibit or impede the use of surface transportation, and the use of helicopters as highly mobile weapons and reconnaissance platforms, are outstanding examples of the effect of our growing technology upon national defense. The result is that the Infantry small-unit leader of today has available on the battlefield an array of materiel and firepower which frequently exceeds that usually available to the battalion commander of two decades ago. In contrast to the policy of nations which rely for victory in war upon the commitment of huge masses of minimally trained, highly indoctrinated, and lightly equipped manpower, the policy of United States military leaders has been to win wars and at the same time conserve the lives of as many soldiers as possible by the effective use of machines and massive firepower placed in the hands of highly trained leaders and men. Adequate training is vital to the effective employment of the highly technical weapons, vehicles, aircraft, and equipment provided for national defense.

Infantry commanders at all levels constantly seek to increase the technical and tactical competence of their small-unit leaders in a direct effort to prepare them to accomplish combat missions as quickly as possible with a minimum of casualties. As a part of this continuing effort, the U.S. Continental Army Command (USCONARC) requested that HumRRO conduct research to improve officer training in the critical skills required for effective combat leadership in small Infantry units.

RESEARCH PROBLEM

The sponsor's request specifically limited the research to the roles of commissioned officers responsible for leading small Infantry units in combat. Within the

¹Department of the Army. *Rifle Platoon and Squads, Infantry, Airborne, and Mechanized*. Field Manual 7-15, March 1965.

Infantry line company, the commissioned small-unit leaders include the Rifle Platoon Leaders, the Weapons Platoon Leader, the Company Executive Officer, and the Company Commander. Within the Infantry battalion there are other commissioned leaders of small units, such as the Heavy Mortar Platoon Leader and the Reconnaissance Platoon Leader, who fall into the general category established by the sponsor's request. In view of the varied nature of these jobs, the initial step in the research was to establish a specific research objective.

The wide range of duties and responsibilities and the numerous and diverse types of weapons, vehicles, aircraft, equipment, and organizations involved stood as major obstacles to conducting research that would provide results directly applicable to all of the commissioned Infantry small-unit leaders embraced by the sponsor's request. After consideration and conferences with the sponsor, it was decided that the research effort would be focused upon the combat role of the Infantry Rifle Platoon Leader (IRPL) for the following reasons:

- (1) The IRPL is the commissioned officer most frequently in direct contact with the enemy, and he is responsible for command of the soldiers most frequently in direct contact with the enemy. His effectiveness is therefore vital to the accomplishment of the overall Infantry mission—at all levels of command—and to the prevention of unnecessary casualties among the Infantry soldiers in the friendly forces.
- (2) The number of IRPL job positions within the Infantry battalion exceeds that of any other specific officer assignment; for example, the ratio of IRPLs to Rifle Company Commanders is 3:1.
- (3) The acquisition of the critical combat performances, knowledges, and skills required of the IRPL is of major importance in developing Infantry officers for all positions of command and to the majority of staff and special staff positions within the Infantry battalion.
- (4) There is a continuing and consistently high requirement for the training and replacement of IRPLs because of casualties, promotions to higher grades, assignment to higher command and staff positions, the completion of prescribed combat tours, and the return to civil life of large numbers of junior officers upon completion of relatively short obligatory tours.

Based upon the foregoing reasoning, the objective of the research to be conducted under HumRRO Work Sub-Unit LEAD I was established: *To identify and record the critical combat performances, knowledges, and skills required of the IRPL that lead to effective individual and unit performance in combat.*

The standard HumRRO method for the development of effective military training is an ordered, seven-step process:

- (1) Analysis of the military system in which the job occurs.
- (2) Analysis of the particular job or jobs.
- (3) Specification of the requirements by identification of performances, knowledges, and skills.
- (4) Determination of training objectives.
- (5) Construction of the training program.
- (6) Development of job proficiency measurements.
- (7) Evaluation of the program.

The objective of the research, as established on the basis of mutual agreement among USCONARC, the U.S. Army Infantry School (USAIS), and HumRRO, limited the research conducted under LEAD I to completion of the first three steps of the process.

BACKGROUND

Earlier HumRRO research² had resulted in a detailed job description covering the combat behavior required of the Light Weapons Infantryman (LWI). This earlier research established 41 subject areas directly pertinent to the LWI and provided operational definitions and a format for reporting that had proved to be useful to the sponsor.

A second and more important pertinency is the fact that the IRPL is the commissioned officer most frequently in direct contact with the enlisted Infantry soldier and the non commissioned officer who must accomplish the Infantry mission. The IRPL is responsible for the discipline, training, welfare, control, and tactical employment of his platoon, and he is also responsible for all platoon equipment and its maintenance. Therefore, it was deemed essential to include the critical combat performances, knowledges, and skills required of the individual members of his platoon to ensure that the IRPL could explain, demonstrate, and supervise learning and practice during training and could competently direct and supervise application in combat during prosecution of the Infantry mission.

The relevance of the earlier research is apparent as it applies to the training and combat responsibilities of the IRPL. It is also relevant to the established military requirement for the *standardized* training that is vital to teamwork under fire in Infantry small units composed largely of a transitory population—the result of occurrences of both battle and non-battle casualties and the completion of prescribed combat tours of duty.

METHOD

DEFINITIONS

The following definitions were established to provide guidance to the staff members conducting the research and to aid the combat-experienced military personnel assigned to USAIS who were responsible for reviewing the work:

Critical: characterized by thoughtful comparative analysis; as a sound, *critical* estimate of the usefulness of a specific skill as compared to other skills within the same category. As used to describe the performances, knowledges, and skills required of the IRPL, *critical* will also be interpreted to mean vital to adequate combat leadership.

Combat Knowledge: factual information which the IRPL must have to execute a combat performance or to avoid a danger which, in the absence of the knowledge, would adversely affect the leader or other friendly personnel or interfere with adequate performance of the mission.

Combat Skill: a perceptual-motor ability essential to the adequate execution of a combat performance.

Combat Performance: an integration of skills and knowledges resulting in a complex physical act which produces a change in the situation and contributes to the fulfillment of the mission.

Battlefield Cue: an environmental change or a specific portion of the perceptual field which, as a direct result of realistic training or experience, serves as a signal for action. (During training, instructors frequently provide cues to action—such as oral promptings and written tests—which may be only remotely related to the battlefield. In combat there is no instructor, and often no physically present commander, to define

²Critical Combat Skills, Knowledges, and Performances Required of the 1962 Light Weapons Infantryman (MOS 111.0), HumRRO Research Memorandum by staff of Work Unit RIFLEMAN, January 1961.

problems and provide cues for action. Then it is vital for the small-unit leader and his men to recognize battlefield cues and react adequately to them as a direct result of learning and vicarious combat experience gained during realistic training, in which the instructor has presented faithful simulations of battlefield cues as often as possible.)

Materiel: In the LEAD I papers, materiel refers primarily to the weapons and items of equipment organic to the platoon or frequently available to the platoon from company or higher headquarters. Current Tables of Organization and Equipment (TOE) provide specific information for Infantry, Airborne, Airmobile, and Mechanized units. Locally procured materiel and special issue equipment such as logs or timbers in the paper covering the construction of field fortifications, will be listed under "materiel". Portable flamethrowers provide an example of special-issue equipment which may be employed by the IRPL and his men.

The following are basic distinctions to be taken into consideration in systems involving both machines and men and are essential to understanding the complexity of operation of the Infantry small unit as a military system in combat:

Machine-Ascendant System: a specific combination or group of men, weapons, and equipment held together during the performance of a common mission by a vehicle, craft (weapons platform), or other piece of equipment, with each member responsible for prescribed operations at what is usually a fixed station—that is, a "machine-dominated system." Close proximity of crew members to each other, electronic (e.g., interphone) communication, habitually occupied stations, and sharply delineated duties for each member facilitate the control of men and weapon firing in this system as compared to a *man-ascendant* system. Tanks, armored personnel carriers (APC), artillery pieces, and helicopter gunships, with their respective crews, are typical examples of *machine-ascendant systems*.

Man-Ascendant System: specific combinations of men (usually dismounted), weapons, and equipment wherein each man-weapon combination must deliver fire and maintain a working relationship with the leader and with other man-weapon combinations through the application of known and practiced procedures, such as might be used in a variety of irregularly spaced, dismounted formations. Formations specified by the leader to maintain control frequently are modified or disrupted by enemy direct and indirect firing, limited visibility (e.g., because of thick brush, darkness, or smoke), and the widely varying availability and usefulness of cover and concealment from enemy fire and observation. Lack of electronic communications between all members, constantly varying and frequently disrupted spatial relationships, semi-isolation of individual members resulting from limited visibility and terrain obstacles, increased exposure and vulnerability to enemy fire, and lack of a physical bond between members increase the difficulty of controlling men and weapon firing during accomplishment of the common mission in this system as compared to a *machine-ascendant system*. Any Infantry small unit (fire team, squad, platoon) fighting dismounted provides an example of a *man-ascendant system*.

It is significant to note that the training objectives for the members of a *machine-ascendant system* may be ascertained largely from an analysis of the functions of the machine; also, a criterion of satisfactory performance is readily available—that is, the machine either works or does not work. To achieve the same ends for the members of the Infantry small unit's *man-ascendant system* is clearly more complex. The number of knowledges, skills, and performances essential for effective performance in a man-ascendant system usually will exceed those required in a machine-ascendant system with a comparable level of mission complexity.

NEED FOR BROADLY RELEVANT DATA

While job analysis and system analysis have long been successfully applied through direct observation in industrial settings and in military settings not involving direct

contact with the enemy, the direct observation of man-ascendant Infantry small units actively engaged in the exchange of fire with an aggressive enemy is not yet a highly practical matter for the researcher. This is true primarily because the effort required to attempt to survive would largely prohibit the detailed and objective observation and recording essential to adequate analysis. The fluidity of man-ascendant systems, the limiting of visibility by thick brush or darkness, and the use of cover and concealment by friend and foe alike are also very real obstacles to direct observation.

Inability to predict the occurrence of contact with the enemy is another important factor making observation difficult. On the basis of tape-recorded interviews with Infantry small-unit leaders in Vietnam, it was conservatively estimated that contact with the Viet Cong occurred approximately once in each 20 attempts at night ambush.³ An observer might spend many days and nights with an Infantry small unit without witnessing enemy contact.

Finally, even if direct observation of an ongoing conflict at small-unit level were entirely feasible for the researcher, the results often might be so narrow in scope that it might be exceedingly dangerous to use them later as the sole guide to the conduct of small-unit operations in a different environment with a different enemy. To obtain data that would be broadly relevant, it was apparent that it would be necessary to study the combat behavior of small-unit leaders and members ranging from World War II through the Korean Conflict and including the Vietnam War.

This decision was based upon the belief that certain critical combat knowledges and skills are likely to stem directly from a specific enemy operating in a given environment. For example, land navigation becomes extremely critical for Infantry small-unit leaders fighting in jungle-covered terrain lacking in man-made landmarks, and any use of the existing roads and trails in such an environment demands constant attention to the avoidance of mines, boobytraps, and enemy ambushes when operating against guerrillas.

The availability of helicopters for troop transport, reconnaissance, fire support, evacuation, and resupply in support of Infantry units and the availability of armored personnel carriers to Mechanized Infantry units also demanded attention to the operation of Infantry small units, in machine-ascendant systems as well as in the more complex man-ascendant systems, as an additional step toward attaining current world-wide relevancy.

SOURCES OF DATA

Because of the foregoing considerations, varied sources of data were used. A primary source was a group of more than 200 detailed descriptions of small-unit combat actions (SUCAs) and analyses collected by the LEAD I Staff. A large number of detailed descriptions of small-unit combat actions, with analyses, produced on the basis of firsthand experience by veterans of World War II, were found at the USAIS Library in Fort Benning. This collection of monographs had come into being as a result of requirements established for veteran combat leaders attending the Advanced Infantry Officers Course, USAIS.

The format employed in the original USAIS student monographs was adapted to the collection, recording, and analysis of additional SUCAs which were produced on request by combat leaders recently returned from Vietnam.⁴ Additional SUCAs were also obtained from books (e.g., *Pork Chop Hill*⁵ by S.L.A. Marshall) and military periodicals (e.g., *Infantry* magazine).

³ Work Unit ACTION, in progress at HumRRO Division No. 4.

⁴ An outline and written guidance produced to aid Vietnam veterans to record and analyze SUCAs for use by the LEAD I Staff was expanded into a paper that subsequently was accepted for publication by *Army* magazine to encourage returning Vietnam leaders to record and analyze their combat experiences and thus share their professional knowledge. See "Pass On That Combat Lore" by Frank L. Brown, *Army*, vol. 16, no. 9, September 1966, pp. 56-61.

⁵ Marshall, S.L.A. *Pork Chop Hill*, William Morrow and Company, New York, 1956.

In addition, field manuals, technical manuals, training circulars, Department of the Army pamphlets, USAIS publications, letters and after-action reports from Vietnam, interviews with Vietnam veterans, and research reports were used as sources of information during the research.

The format employed in preparation of the SUCAs is described in the following section. One example of a completed SUCA is shown as Appendix A. The sources of the SUCAs by geographical area are shown in Table 1.

In addition to the sources shown above, during the later stages of the LEAD I research some 180 Work Unit ACTION interviews, which had been obtained from more than 400 small-unit leaders in Vietnam by a HumRRO research team, were used by the LEAD I Staff for study.

From all sources, some 6500 roughly identified performances, knowledges, and skills were extracted and carded as raw data.

Many of the descriptions of combat actions from which raw data were extracted were recorded with widely varying time lapses occurring between the time of the action and the recording of the soldiers' observations. It is a well-accepted fact that forgetting and rationalization tend to distort reports of past experiences and that such distortions tend to increase with the passage of time. These difficulties were fully recognized at the outset of the research. However, the need for data with the broadest possible relevance left the research staff no choice but to employ these sources.

A further limitation was that in the coverage of World War II and the Korean Conflict records of combat actions at regimental, division, corps, and higher levels were found to be far more numerous than were detailed descriptions of action at individual, squad, platoon, and company level. In this respect, the student monographs covering World War II and the descriptions and analyses of combat actions obtained from recently returned Vietnam veterans were invaluable because the authors had been made aware of the purpose of their work. Some reports of small-unit combat actions were rejected because they appeared to be insufficiently objective.

It is to be hoped that unit commanders and unit historians in Vietnam will continue the current trend toward early recording of descriptions of small-unit combat actions in adequate detail, as a useful source of data that later may be applied toward increasing the effectiveness of training.

Table 1

Sources of Small-Unit Combat Actions

Geographical Area	Sources
Europe and North Africa, World War II	96
Pacific Theater, World War II	31
Korean Conflict	38
Philippine Huk Campaign	1
British Experience in Malaya	6
Cuban Revolution (Ambush by Castro's Guerrillas)	1
Vietnam War	28
Total	201

CATEGORIZATION OF RAW DATA

The analysis of the content of the SUCAs demanded a detailed study of the doctrine and techniques peculiar to the operation of Infantry small units as set forth in

official military publications. Within the body of the SUCAs, specific application of obviously critical performances, knowledges, and skills focused attention upon and facilitated categorization into broad but readily identifiable areas such as the employment of organic weapons, small-unit tactics, use of indirect supporting fires, communications, observation and reporting, land navigation, tactical movement, human maintenance, and first aid and evacuation of casualties.⁶ Broad categories, such as small-unit tactics, were then subdivided into more specific subject areas—offensive operations, defensive operations, retrograde operations, airmobile operations, and patrolling. HumRRO research under Work Unit RIFLEMAN, cited previously, also served as an aid to the establishment of specific subject areas, particularly regarding the employment of organic and special-issue weapons and materiel.

Description of SUCA Format

The Small-Unit Combat Actions (SUCA) are divided into the following sections:

I. Situation

At the outset, a brief description of the events leading up to the action provided a frame of reference. The date, place, type of action, information on friendly and enemy forces, and descriptions of the weather and terrain were included within the limits of availability imposed by the original author.

II. Description of the Action

This section presents straightforward reporting of action as it occurred, including descriptions of orders from higher echelons, planning, preparation, execution, and results of the operation. Accounts of actions of the unit(s) as a whole and significant actions of individuals were highly pertinent. Emphasis was upon detailed descriptions of the behavior of small-unit leaders and upon the guidance and support of these small units by higher levels of command. Where available, maps and sketches were obtained to assist in following the account of the action.

III. Analysis of the Action

The analysis is divided into two parts:

A. Evaluation of the Situation, Decisions, and Actions Taken

This subsection consists of a critical analysis of what happened in the light of current doctrine and technical knowledge. The student monographs provided a first hand

⁶ It is significant to note that information developed early during the categorization of the raw data proved to be of immediate usefulness to USAIS in two instances. Tracking (i.e., the interpretation of footprints and other visible trail signs left by men during movement) was not covered in detail in the official military literature, but the knowledges and skills involved were directly pertinent to the pursuit of Viet Cong guerrillas and to the avoidance of ambush by our own troops in Vietnam. A useful body of information pertinent to tracking appeared during the categorization of LEAD I data. Further, route plotting and navigation by combat patrols was a recognized problem for Infantry small units operating in the often monotonous and undeveloped terrain in Vietnam. Accurate navigation by combat patrols is vital to obtaining effective fire support, reinforcement, resupply, and evacuation and to the accurate reporting of intelligence information. When the availability of this detailed information was made known to USAIS officials through direct liaison, the Patrolling Committee, Ranger Training Command, USAIS, requested HumRRO Technical Advisory Service (TAS). A detailed paper was prepared covering each of the two specific areas of interest. The paper on route selection and land navigation served to supplement current military instruction and the paper on tracking facilitated the establishment of a specific block of new instruction for Ranger students. Both of these papers subsequently were published in *Infantry* magazine. See "Fundamentals of Tracking" by Frank L. Brown, *Infantry*, vol. 56, no. 4, July-August 1966, pp. 28-33, and "Combat Patrols" by Frank L. Brown, *Infantry*, vol. 58, no. 1, January-February 1968, pp. 51-56. The contents of the paper on tracking subsequently were incorporated in a forthcoming edition of Department of the Army Field Manual, FM 21-75, *Combat Training of the Individual Soldier and Patrolling*.

analysis, as did the monographs from combat veterans of Vietnam. These analyses were supplemented by LEAD I staff members and the Unit's Military Advisor. If a question arose, the Infantry School Liaison Officer from the department concerned (Weapons, Company Tactics, etc.) was contacted directly and his views were sought as an aid to analysis. Descriptions of action taken from books were analyzed by LEAD I staff members aided, as needed, by USAIS Liaison Officers.

B. Training Implications

Throughout the description of the action and in the analysis of the situation, decisions, and action taken, both knowledges and skills were stated or implied. Each paragraph of training implications was placed under a descriptive heading, such as *Use of Supporting Fires*, *Dissemination of Information*, *Development of Resistance*. During the derivation and formulation of training implications, attention was focused upon the knowledges and skills involved in:

(1) The platoon leader's initial responses to the orders and instructions of his commander and appropriate staff officers (e.g., the S2 in patrolling situations) and the platoon leader's subsequent actions and orders to his subordinates in furtherance of the assigned mission.

(2) The responses of subordinate leaders and other platoon members to the orders, instructions, and exemplary behavior of the leader. (Here it was assumed that the leader's behavior is usually exemplary in the eyes of his subordinates. The effect of the leader's example may be desirable or undesirable, but it was assumed that it will rarely go unnoticed, particularly in critical situations on the battlefield.)

(3) The responses of personnel within small Infantry units, and personnel supporting these small units, to enemy action, terrain, and weather as these elements appeared to have critical effect on assigned missions and individual survival.

(4) The interactions of individuals in adjacent and supporting units with members of the platoon as their behavior critically affected the accomplishment of missions assigned to or by the platoon leader.

(5) The identification of decision-forcing situations likely to be encountered by the Infantry platoon leader, with major emphasis on the identification of battlefield cues leading to the best possible decision in terms of accomplishment of the assigned mission.

(6) The prediction—and failure of prediction—of behavior in terms of human capabilities and limitations under the stress of battlefield conditions, including apparent training failures and successes as indicated by behavior observed in combat.

(7) The application or failure of application of knowledge of the technical characteristics, capabilities, and limitations of both enemy and friendly weapons, equipment, and tactics that may critically affect combat operations at the small-unit level.

(8) The use of battlefield techniques and field expedients suitable for employment by the Infantry platoon leader, including identification of routine procedures that can be successfully accomplished under SOP in a well-trained platoon.

(9) The design and supervision of realistic training for the platoon leader by his supervisors and by the platoon leader for the members of his platoon, including training of replacements received in combat and critique of combat performance to increase proficiency.

Identification of Subject Areas and Knowledge Gained

Categorization of the LEAD I data resulted in the identification of 46 tentative subject areas, and knowledge gained from study of the data permitted a tentative scope to be written to encompass the critical combat performances, knowledges, and skills required of the IRPL for each of the subject areas. A foreword was written for the tentative subject areas and scopes, and the compilation served as a basis for continuing

the research, that is, as a guide to the recording and review of the performances, knowledges, and skills pertinent to each subject area.

DEVELOPMENT AND REVIEW OF THE RESEARCH BY-PRODUCTS

Review of the Tentative Subject Areas and Scopes by USAIS

In view of the broad scope of the research (46 tentative subject areas) and the obvious amount of work that would be required to develop the LEAD I research by-products at a level of detail that would prove useful to USAIS designers of training and instructors, it was decided to submit the tentative subject areas and scopes for review and comment. Copies were submitted to the Director of Instruction, USAIS, in sufficient quantity to permit distribution within the Instructional Departments. The relationship of the tentative subjects and scopes to the organization of the USAIS Instruction Departments, Committees, Teams, and other units was such that, within USAIS, a group of military experts with specific proponentcy for the design and administration of instruction existed for each of the 46 subject areas identified by the LEAD I research.

The tentative subject areas and scopes were revised in accordance with USAIS recommendations; it was evident that, as the research progressed, additional changes in the tentative subject areas and scopes might be required.⁷ The 46 subject areas and scopes encompassing the critical combat performances, knowledges, and skills required of the IRPL are shown in Appendix B.

Development of the Research By-Products

With tentative subject areas and scopes having been reviewed and concurred in by USAIS, the next step in the research was to establish a format that would facilitate recording of the categorized data to make it most useful to the military personnel within the USAIS Instruction Departments.

As mentioned earlier, the format used under Work Unit RIFLEMAN in presenting the LWI combat requirements had proved to be readily adaptable to military needs. On the basis of the successful military use of this earlier HumRRO research, the RIFLEMAN format was adapted by the LEAD I staff with only minor modifications (see Appendix C).

In general, this method of recording requires two major subdivisions within each subject area paper. Under "General Considerations," the first major subdivision, an *introduction*, the *scope*, *materiel*, and *battlefield cues* are recorded in the order cited. In the second major subdivision, "Performances, Knowledges, and Skills," *performances* are set forth in capital letters and the *knowledges* and *skills* are recorded in logical or chronological order, as applicable, under the encompassing *performance*.

Within the LEAD I papers the subject and verbs "He must" and "He will" were used interchangeably insofar as meaning is concerned. Both "must" and "will" indicate a necessity, an obligation, or strong, purposive intent to know or to perform. "He must" or "He will" was used to (a) preface each performance statement, (b) preface the initial statement of a knowledge or a skill immediately following the statement of a performance, and (c) thereafter, preface the initial statement of a knowledge or skill where transition was made to a new series of knowledges and skills being listed under the same performance. Each performance, knowledge, and skill within each subject area was numbered or lettered for ready referencing during review and use.

⁷ Later developments led to agreement between USAIS and HumRRO Division No. 4 to reduce the original list of 46 areas to 41.

Because of the increase in guerrilla operations in underdeveloped countries, a governing rationale pertinent to guerrilla activity was established as it would be likely to apply to the development of the content of each subject area. In view of the avowed continuation of the so-called "wars of liberation" by Communist nations and organizations throughout the world, an assumption was made that the IRPL is likely to encounter guerrilla resistance in any war in which he participates. The IRPL should, therefore, learn to perform adequately in a combat environment of discontinuous fronts and dispersed warfare characterized by frequent contact between friendly and enemy units varying from patrol to brigade strength. It appeared that any "front" likely to exist under such conditions would be that formed by a perimeter defense, and that the World War II concepts of "front lines" and "safe rear areas" would be invalid. Further, in any estimate of the situation, the IRPL is likely to be required to consider the effects of the *indigenous population* within his sector or zone of action just as he gives consideration to the effects of the *enemy*, *weather*, and *terrain*. The content of the material covering each subject area was prepared with these views in mind.

The military literature pertinent to the combined LEAD I subject areas is voluminous. For example, Appendix I of FM 7-15, *Rifle Platoon and Squads, Infantry, Airborne, and Mechanized*, March 1965, lists approximately 100 references pertinent to the combat behavior of the IRPL. These and other military references are in frequent use by military instructors familiar with the content. However, in many cases it was found that critical combat performances, knowledges, and skills developed during the research were not recorded in the official military literature. Therefore, the level of detail required in each annex depended upon the availability and clarity of detail in the current military literature.

For example, *intersection* and *resection* are described in clear detail in FM 21-26, *Map Reading*, March 1965. Thus, in the LEAD I paper on *Land Navigation* it was necessary merely to specify the use of these skills through the citation of the *key words* in the prescribed format. There was no need to list each step of the procedure.

On the other hand, there is no officially published, integrated, and ordered description of the knowledges and skills required to identify and select checkpoints and to measure and record the magnetic azimuths, distances, and checkpoint descriptions required to navigate planned cross-country routes by dead reckoning. So it was necessary to list and describe these critical knowledges and skills in sufficient detail to permit an instructor to determine training objectives and to develop effective instruction. If there was doubt as to the clarity or level of detail available in the official U.S. Army literature, the detail recorded within each LEAD I by-product paper was consistently made explicit at a level that would make it adequate for instruction. This procedure was followed, too, if the descriptions of closely related knowledges and skills were widely scattered within one publication or among several publications.

To ensure the use of a format acceptable to USAIS instructors and designers of training and to ensure the presentation of an adequate level of detail, the research by-product covering *Land Navigation* was completed as a prototype paper and forwarded to the Director of Instruction, USAIS, for detailed review and comment on the acceptability of format, criticality of content, adequacy of detail, and technical accuracy. Upon review and approval by USAIS, the prototype paper on *Land Navigation* served as the example for the production of the initial drafts of all of the research by-products by the LEAD I Staff.

Intra-Unit Review of the Research By-Products

Within HumRRO Division No. 4, a Review Panel was constituted from the Director, the Chief of Infantry Human Research Unit, the Military Advisor, and other combat-experienced staff members selected for their expertise in the subject area involved in the

specific drafts of the research by-products. As deemed necessary, this Panel reviewed the initial drafts of the research by-products for criticality of content, adequacy of detail, and technical accuracy. When necessary, specific changes, deletions, and additions recommended by the Review Panel was incorporated.

USAIS Review of the Research By-Products^a

USAIS review of the subject areas and scopes and review of the initial research by-product, *Land Navigation*, established the precedent, channels, and procedure for USAIS review of all of the LEAD I research by-products. This review was deemed vital toward ensuring the highest possible degree of usefulness of the research by-products, for the following reasons:

(1) Since the HumRRO research was to encompass only the first three steps of the standard, seven-step process mentioned earlier in this report, a detailed review by the combat-experienced military experts within the USAIS Instruction Departments who were to complete the seven-step process tended to ensure the practical usefulness of the materials prepared to meet the HumRRO research objective.

(2) Review by USAIS instructors helped ensure that the coverage of recently developed weapons, ammunition, equipment, and military concepts was adequate and current on the date of completion of each paper.

(3) An objective review by military experts independent of the HumRRO staff engaged in the research was deemed useful toward increasing the validity of the research by-products.

(4) Review of each research by-product by USAIS staff members and instructors kept the planned primary user abreast of progress throughout the research.

Five copies of the HumRRO draft of each research by-product were therefore forwarded to the Director of Instruction, USAIS, for review and comment prior to final publication. Within USAIS, the drafts were reviewed in detail by military experts assigned to the departments having proponentcy for the specific subject area or having a major interest in it. For example, separate reviews were conducted on the M14A1 automatic rifle research by-product by Weapons Department, Company Operations Department, Brigade and Battalion Operations Department, and Ranger Training Command.

Copies of the USAIS comments on each draft were provided to the LEAD I staff member responsible for completing the final manuscript. The comments were reconciled through direct communication between the reviewers and the staff member, who then incorporated the comments and prepared the research by-product for final publication.

RESULTS

The critical combat performances, knowledges, and skills required of the IRPL were identified, recorded, and published in research by-products to encompass each of the 41 subject areas deemed most critical by USAIS, the planned prime user of the research. An alphabetical listing of the titles of the documents is shown in Table 2. The subject areas and scopes of the Research By-Products are shown as Appendix B.

^aNo major changes resulted from reviews by USAIS either on the sample by-product or on subsequent volumes.

Table 2
LEAD I Research By-Products

Title
Airmobile Operations
Antitank Weapon, 66mm HEAT Rocket, M72
Antipersonnel Mine, M18A1 (Claymore)
Armored Personnel Carrier
Bayonet Knife and Hand-to-Hand Combat
Code of Conduct, Evasion, and Escape
Counterintelligence
Cover, Concealment, and Camouflage
Defensive Operations
Demolitions and Boobytraps
Emplacements, Shelters, Obstacles, and Fields of Fire
Grenade Launcher, 40mm, M79
Hand Grenades
Human Maintenance Under Campaign Conditions
Infrared Weaponsight and Image Intensification Devices
Land Navigation
Maintenance of Clothing and Equipment
Machinegun, 7.62mm, M60
Messenger Communication
Mines, Antitank and Antipersonnel; and Warning and Illuminating Devices
Mission, Organization, and General Operation of the Rifle Platoon
Mounted and Dismounted Platoon Combat Formations
Observation, Combat Intelligence, and Reporting
Offensive Operations
Patrolling
Physical Conditioning
Portable Flamethrowers
Protection Against CBR Warfare and Nuclear Explosions
Protection Against Mines, Boobytraps, and Warning and Illuminating Devices
Radio Communication
Retrograde Operations
Rifle, 7.62mm, M14
Rifle, 7.62mm, M14A1
Rifle, 5.56mm, M16
Self-Aid, First Aid, and Evacuation
Squad Formations, Battle Drill, and Elementary Fire and Maneuver
Tactical Movement
Technique of Fire of the Rifle Squad
Use of Indirect Supporting Fires
Visual, Sound, and Tactual Communication
Wire Communication

DISCUSSION

Since the inception of LEAD I research, the Vietnam War effort has increased to involve more than half a million members of the United States Armed Forces. An opinion that appears to be unanimous among combat commanders at all levels who have served or are serving in Vietnam is: "This is a small-unit leader's war."

While the IRPL must control and employ his men and fires effectively as an integral part of the company in large actions, the organization and equipment of the platoon are such that he frequently must conduct semi-independent, patrol-type missions such as raids, ambushes, and continuing searches for guerrillas and guerrilla base areas and supply caches. Such missions require the IRPL to perform adequately at fairly great distances from the parent unit without the presence and the immediately available guiding influence of any leader senior to himself. This responsibility for conducting semi-independent, small-unit operations at a distance from the parent unit often extends to the squad leader, particularly during the conduct of ambushes. It is not unusual for this responsibility to extend to the fire-team leader when the latter is charged with leading small security and reconnaissance patrols, although lesser distances usually are involved.

It is, therefore, apparent that the initial decision to focus upon the critical combat performances, knowledges, and skills required of the IRPL during the LEAD I research was particularly appropriate since the role of the small-unit leader, both commissioned and noncommissioned, has so greatly increased in military significance as the Vietnam War has continued.

There is ample, experimentally based evidence to substantiate the effectiveness of the ordered, seven-step HumRRO process for developing effective military training.⁹ By identifying and recording the critical combat performances, knowledges, and skills required of the IRPL, HumRRO's LEAD I research team, with the direct aid and cooperation of USAIS, has completed three of the seven steps required toward significantly increasing the effectiveness of combat leadership in small Infantry units.

Throughout the LEAD I research, attention was focused continually upon the responsibilities of the IRPL for training his own small-unit leaders and men. As a result, a significant fact was brought to light that is directly pertinent to the training of noncommissioned small-unit leaders: While the numbers of men, numbers of organic weapons, amounts of materiel, areas of terrain, and degrees of coordination for which the rifle squad leader and the fire team leader, respectively, are responsible usually represent fractions as compared to the like responsibilities of the IRPL, *the critical combat performances, knowledges, and skills required of each of the three leaders tend to differ more by degree of responsibility for resources than by type or skill level of critical behavior.* This is because of the nature of the Infantry mission and the difficulty of effectively controlling men and fires in a man-ascendant system under continually changing conditions of environment, role, and organization.

For example, the requirement to select, measure, and record a route for cross-country movement and then to navigate accurately over the route to the assigned objective requires no less ability when executed by a noncommissioned officer than when executed by the IRPL; the critical combat performances, knowledges, and skills are exactly the same for all leaders regardless of rank. In fact, the commissioned leader has the advantage. Assuming that he will probably execute the requirement more often than the noncommissioned officer, he is likely to maintain a higher level of skill through applicatory practice than the noncommissioned officer will if both were originally trained

⁹For a specific example, see *Advanced Land Navigation, Development and Evaluation of a Prototype Program of Instruction* by Theodore R. Powers, HumRRO Technical Report 89, April 1964.

at the same level of skill. Further, the IRPL can choose the best-qualified compass and pace men from among the members of a larger group than can the noncommissioned officer.

Other parallels are easily cited, such as the use of organic weapons, indirect fires, first aid, and human maintenance. Thus, the direct relevance of the LEAD I research by-products to the establishment of training requirements for all of the Infantry Rifle Platoon's noncommissioned officers is apparent.

This relevance has been formally recognized by USAIS.¹⁰ In this consideration of training requirements for small-unit leaders, one may note that the long-range return from investments in the formal training of *career* noncommissioned officers may extend over 15 to 20 years or more to retirement, whereas the return for investments in a similar level of training for junior officers often terminates upon the completion of relatively short obligatory tours.

The LEAD I research by-products, at least in part, are deemed likely to prove useful also in designing training for both Junior and Senior ROTC cadets, and in designing training for National Guard and U.S. Army Reserve units.

It is likely that some of the performances, knowledges, and skills set forth in the research by-products ultimately will be recorded in fully developed detail in the official military literature. For example, the fundamentals of tracking, a primitive but recently rediscovered skill area, might appropriately be considered for inclusion in a future edition of FM 21-75, *Combat Training of the Individual Soldier and Patrolling*, July 1967.

Route selection, measurement, and recording in preparation for navigation over cross-country routes in monotonous terrain during limited visibility is another critical skill area not fully and systematically covered in any official field manual. Consideration might be given to covering these pertinent navigation knowledges and skills as employed by the Infantry small-unit leader in a future edition of FM 21-26, *Map Reading*, March 1965. USAIS has formally acknowledged the usefulness of the LEAD I research by-product covering the Claymore antipersonnel mine as a source of material for official training literature.¹¹

The identification, ordering, and recording of critical performances, knowledges, and skills is prerequisite to the application of orderly experimental methodology in the development of training. Therefore, the LEAD I by-products may prove to be useful as basic documentation, or as an advanced point of departure, for any research organization charged with improving training in any of the subject areas covered by this research.

Further, the methodology presented in this report is likely to be helpful in identifying the performances, knowledges, and skills required of other individuals within military organizations. Probably more than ever before, high-level combat commanders have recognized the value of officially recording the details of small-unit combat actions as soon as practicable after the action occurs. Such reports now serve as sources of distilled knowledge, as evidenced by the widely published "Lessons Learned," and by the

¹⁰A letter, AJIIS-D-EPRD, HQ, USAIS, 14 March 1968, Thru CG, USCONARC, ATTN: ATIT, to Chief of Research and Development, DA, subject: Request for Human Factors Research, requested... "that a project be initiated to prepare a detailed list of the skills and knowledges needed by fire team and squad leaders who are being trained in the new Noncommissioned Officer Candidate Course, 010, 11B40-I... It is expected that the majority of the material in the 41 annexes to Work Unit LEAD can be adapted to the NCOC Course with little additional research...."

¹¹A DF, AJIIS-W, Weapons Department, USAIS, 17 August 1967, to AC, USAIS, ATTN: Director of Instruction, USAIS, subject: Review of Annex 24, Antipersonnel Mines, Hum^o Work Unit LEAD, stated, in part: "This department feels that Inclosure 1 is an outstanding piece of work and that the material should be in the subject matter presented to student personnel. Request that a copy of completed work be provided this department for absorption into training literature and training programs."

frequency of after-action critiques aimed at guiding combat leaders at all levels toward capitalizing upon successes and failures alike in future encounters with the enemy.

Currently, unit historical officers in Vietnam are recording the details of small-unit combat actions that will be available to the research scientist in the future. They will be a source of raw data to facilitate a continuing effort toward increasing the effectiveness of combat training, in close cooperation with commanders of service schools, training centers, and tactical units throughout the Army. The basic structure of the technical research plan governing the current HumRRO Work Unit ACTION research stemmed from the researchers' recognition of the usefulness of raw data emanating directly from the participants of combat actions at the lowest level, that is, at the point of contact with the enemy.

The outstanding cooperation and assistance obtained from the USAIS military experts during the LEAD I research was evidence of the increasing recognition that systematic analysis of a specific job, or jobs, is a primary step in the design of effective training.

APPENDICES

Appendix A

A TYPICAL SMALL-UNIT COMBAT ACTION

Preface

Following is one of a collection of over 200 small-unit combat actions compiled by the staff of Work Sub-Unit LEAD I, HumRRO Division No. 4 (Infantry). A standard format was employed. Within each small-unit combat action, the situation and the description of the action were derived from the author's original manuscript. The analysis of each description of action was made by the LEAD I Staff with frequent reference to the material provided by the author and to pertinent official military training literature.

SMALL-UNIT COMBAT ACTION NO. 182

Title: *The Operations of Company B, 12th Infantry Regiment (4th Infantry Division) in the Hurtgen Forest, West of Gey, Germany, 28 November - 5 December 1944 (Rhineland Campaign). [Personal Experience of a Company Commander]* (pp. 8-34)

Author: Frederic N. Oettinger, Jr.

Publisher: Unpublished Monograph, U.S. Army Infantry School Library, Fort Benning, Georgia (AIOC No. 1, 1948-1949)

I. SITUATION

On 28 November 1944, First Battalion, 12th Infantry, attacked northward along the Renn-Weg road in Hurtgen Forest. Company A captured Hill 90 north of Grosshau after severe fighting and took 35 prisoners. The area was cleared along the road northward from Hill 90 for a distance of about 2,000 meters to a road junction with the east-west road that slants southeasterly to the village of Gey. It is the road toward Gey that B Company was to be tried in the fire for the next six days. Gey lies some 500 meters in the open, on lower ground, from the eastern edge of Hurtgen Forest. Within the forest the ground rises rapidly to the west and thus overlooks the whole countryside in the direction of Gey.

Although the battalion had attacked northward to the road junction, the American main line of resistance ran north and south, facing eastward into Germany toward the Roer River. So the battalion CO designated a section of the north-south Renn-Weg road from the road junction southward as the battalion front. Company B fell heir to the

foremost position and the remainder of the battalion occupied a sector behind B Company. The entire area was heavily mined and no vehicles were allowed on the Renn-Weg road until the engineers cleared it. Hurtgen Forest, with its dark evergreens, snow, mines, and limited visibility, demanded the constant alertness that breeds bone-deep fatigue and offered little opportunity for rest.

II. DESCRIPTION OF THE ACTION

The B Company CO was killed by an antipersonnel mine just before the company closed into its assigned sector about 1300 hours on 28 November 1944. With an attack scheduled for the following day, the battalion commander sent a captain from his own headquarters to assume command of the company.

The new CO of B Company arrived in the company area about 1330 hours. The men had begun to dig holes for the night, and it was quickly apparent that the entire company was both nervous and extremely fatigued. The first indication was a machinegun crew which had not occupied its assigned area to furnish planned final protective fires. There were several German hand grenades on the ground at the position and the squad leader indicated that he felt that the position was boobytrapped. Inspection revealed no boobytraps.

An inspection of the 60-mm mortar tubes made it apparent that they had not been fired recently, and the platoon sergeant confirmed that this was true despite a plentiful supply of mortar ammunition. The mortar crewmen were told that they would deliver fire on the first suitable target.

The company continued to prepare positions, and a layer of logs, covered with earth, was placed over each double foxhole to stop shell fragments. Double foxholes tend to raise morale.

About 1510 hours battalion headquarters called and ordered B Company to reconnoiter the routes and enemy dispositions east of the company's positions. A patrol was to advance eastward on the north side of the road to Gey for some 900 meters to a junction with a north-bearing secondary road, then return, before dark, by a trail that ran just south of the Gey road. Because of the fatigued condition of the men, the 2d Platoon Leader was designated to lead the one squad patrol from his platoon. The patrol moved out at 1525 hours.

At 1600 hours the company supply sergeant moved into the area over the recently cleared Renn-Weg road with hot C-rations, bedding rolls, and 10 reinforcements. Among the reinforcements were some former members of the company; the remainder were new men with no combat service. The former members of the company were returned to their own platoons, and the new men were divided among the rifle platoons.

Just prior to dark the patrol returned. The 2d Platoon Leader reported that he had covered the entire sector assigned to the patrol. No enemy were encountered; the patrol had drawn no fire. But the Germans had made the road to Gey impassable by felling trees across it every few feet. Some of the felled trees were inspected, and each one inspected was mined or boobytrapped. He also reported the location of a single dead American about 100 meters east of the company position. The information collected by the patrol was reported by wire to battalion headquarters.

After darkness fell, the B Company CO continued to circulate among the men within the close perimeter defense which the companies now formed habitually each night. B Company had been in the lines for 21 days and had suffered heavy casualties. Normally, even in combat, it is not difficult to draw a soldier into conversation. But most of B Company's men refused to talk, and when they did their conversation was listless and without spirit or seemingly made with great effort. The mood of the recently arrived reinforcements differed. They were extremely talkative - they had never been shelled or fired upon and they were yet to know the shock of battle.

About 2100 hours battalion headquarters telephoned instructions for the B Company CO to receive an attack order. Accompanied by his messenger, the CO of B Company reported at the designated time.

The battalion CO issued an oral attack order demanding an attack eastward, parallel to and north of the road to Gey, at 0900 hours on 29 November. The north-south Renn-Weg road would be the line of departure. First Battalion was to attack in a column of companies in the order B, C, A. B Company was to seize the high ground 250 meters north of the Gey road, overlooking the village. The distance to the objective was about 1,300 meters as shown on the 1:25,000 topographical map given to the company commander. The battalion CO had an aerial photograph of the attack area, and he instructed the company commander to commit it to memory.

On return to his CP, the B Company CO assembled his platoon leaders and issued the attack order. The company was to attack in a column of platoons in the order 1st, 2d, Weapons Platoon, 3d Platoon. There would be no artillery or mortar preparations. The CO was to move with the leading 1st Platoon; the remainder of the company command group would follow Weapons Platoon. After the order was issued there were no questions and no comments.

At 0400 hours the following morning the company supply sergeant delivered a hot breakfast, extra ammunition including 30 rounds of 60-mm ammunition, and one day's issue of K-rations to B Company. It was SOP for the supply sergeant to remain in the company area until the entire company cleared. The supply group would then thoroughly search the company area and recover any equipment left behind by the men.

At 0900 hours, the 1st Platoon crossed the Renn-Weg road in a column of squad columns and plunged into the extremely dense woods followed by the remainder of the company. The leading platoon advanced about 100 meters and halted. There had been no firing, but the body of the American reported earlier by the patrol brought home the stark reality of war. When the column halted, the CO moved forward at once to where 1st Platoon had reached the edge of a clearing. Here the road to Gey cut diagonally across the front of the company toward the southeast. The CO decided to turn north to cross this road, then proceed east toward the objective. The platoon leader had halted the platoon because of the road and adjacent open ground to the front.

The 1st Platoon Leader moved to the edge of the Gey road, hesitated a moment and rushed across. The CO followed as soon as the platoon leader reached the far side. As the CO cleared the center of the road, a short burst of enemy automatic fire was directed at him from a position about 300 meters down the road in the direction of Gey. The platoon sergeant placed several men in position and had the remainder of the platoon cross the road in squad rushes. The platoon completed the crossing without drawing additional enemy fire.

Using the SCR 536 radio, the CO ordered the 2d Platoon to remain on the south side of the Gey road to avoid the possibility of being pinned down on the enemy side of the open danger area. The enemy had been alerted and was aware of American movement to his front. But from the direction of the firing, the CO, Company B, concluded that it would be impossible for him to determine the strength or the objective of the company's movement.

On reaching the far side of the Gey road, 1st Platoon resumed movement to the east. The 2d Platoon was ordered to cross the road and follow. About 150 meters ahead, 1st Platoon received fire from automatic weapons and other small arms. The platoon returned fire immediately, showing excellent fire control and discipline—a characteristic reaction the company had developed and always employed on receipt of fire. The men were never afraid to fire their weapons, and the recently joined reinforcements caught on quickly. The 1st Platoon Leader and several men worked their way around to the enemy's right flank. Then the platoon leader rushed the enemy position alone and was killed. The enemy withdrew northward, leaving several of their dead in their half-finished positions.

Meanwhile the enemy which had first fired on the CO engaged 2d Platoon as it was crossing the road. The 2d Platoon Leader reported that he had been hit in the leg and two other men were hit, but that 2d Platoon was across the road and 3d Platoon was following. The 2d Platoon Leader was ordered to the rear because he was too badly wounded to continue the attack.

Attention was now focused on the enemy automatic weapon that had caused 2d Platoon's casualties. The CO, feeling that the attack was in danger of being slowed, employed 3d Platoon because they had as yet suffered no casualties. The 3d Platoon Leader, waiting his turn to cross the road, had a definite idea as to the location of the enemy automatic weapon. He moved out alone and located the enemy on the north side of the Gey road about 200 meters from the company column. Singlehandedly, he grenaded the enemy position, knocked out the machinegun, and killed the crew of four. Then the Weapons Platoon and CP group crossed the road and now all of B Company was past the initial danger area. At 1115 hours, B Company continued the advance eastward just north of the Gey road with 3d Platoon leading. The company had moved less than 500 meters forward of the LD in over two hours at a cost of one platoon leader dead, another wounded and evacuated, plus three additional men wounded.

Communication within the company was perfect. Even in the heavily wooded area the SCR 536 radios were working well. Wire was laid as the company advanced, so battalion could be reached by wire and by SCR 300 radio.

Some 200 meters of movement brought B Company to another clearing which was about 150 meters wide. The clearing terminated at a tall stand of typical Hurtgen evergreens. No enemy activity was apparent, yet the CO anticipated enemy resistance and concluded that the open ground and woods beyond were critical terrain. He felt very strongly that the sector of woods on the opposite side of the clearing was occupied by the enemy. He decided to assault the woods with the company's organic firepower plus D Company's machinegun platoon which was available to him.

The 3d Platoon, already in the lead, was selected to make the assault. The three 60-mm mortars were brought up and ordered to place 18 rounds 50 meters within the

woods with a ten-second interval between each volley of three rounds. The light and heavy machineguns were positioned to fire into the woods if resistance developed. The 2d Platoon took up positions to support the advance of the 3d Platoon by fire.

The 25 men in the 3d Platoon knew the entire plan. This platoon had to clear the open ground and reach the far edge of the woods as the last three mortar rounds landed one minute after the firing commenced. There was to be no firing by riflemen unless the enemy opened fire first. If the enemy were in the woods, he would not expect an infantry follow-up directly on top of the mortar fire.

The mortars opened fire and the 3d Platoon moved out quickly. As soon as the platoon entered the woods it opened fire. The 3d Platoon Leader reported by radio that the Germans were dug in about 50 meters within the woods. He was ordered to keep his platoon firing to maintain fire superiority. The CO signaled 2d Platoon forward and moved out with them across the clearing, notifying 3d Platoon that 2d Platoon would pass through 3d Platoon to assault. As 2d Platoon entered the woods, 3d Platoon Leader was seen moving among his men, encouraging them to fire.

On entering the woods it became apparent that the Germans had constructed an elaborate trench system like those used in World War I. The trench system extended some 200 meters across the front of the assaulting Americans, then curved around to the enemy's rear. In less than a minute the 2d Platoon passed through 3d Platoon, and the men were in the trench and engaged in hand-to-hand combat. The 2d Platoon seized about 150 meters of the trench, but the Germans were still in the curved section. As the Americans attempted to close on this curved section, the Germans opened fire with panzerfausts (antitank rockets) and banked the shaped-charge rounds off the trench walls. Several rounds apparently exhausted their supply of this type of fire. The 3d Platoon assaulted on order only to find that the enemy had withdrawn from the far end of the trench. B Company suffered no casualties in taking this position. German losses were 10 dead and 15 captured. At 1530 hours the company reorganized and moved toward the far edge of the woods, with 400 meters of its final objective. The woods had become less dense and the CO's 1:25,000 map indicated open ground.

The company was advancing along a trail north of and parallel to the Gey road. The CO altered his formation and moved out at 1540 hours with two platoons abreast: 2d Platoon on the right, moving south of the fire trail; 3d Platoon on the left, north of the fire trail. The 1st Platoon, generally astride the trail, followed 100 meters to the rear of the two leading platoons. The Weapons Platoon and the company CP group followed to the rear of the 1st Platoon.

After about 250 meters of advance, the right squad of 2d Platoon was taken under fire from a position about 150 meters to its right front, and enemy fire soon swept the ground occupied by 2d Platoon. The enemy occupied high ground and had excellent fields of fire. The 3d Platoon leader again showed his aggressiveness. His platoon had not yet been taken under fire, and he moved up on the left flank of 2d Platoon leading his platoon in a spirited assault of the enemy position on the enemy's right flank. There was a sharp encounter that inflicted a number of American casualties, but 3d Platoon took 19 Germans, including killed and wounded, and reduced three machineguns. The company was ordered to reorganize, and at this point the CO realized that about 15 minutes of daylight remained.

Leaving 3d Platoon Leader in command to reorganize the company, the CO moved north for a personal reconnaissance of the company objective. Finding the objective unoccupied, he returned to the company, led them forward to close on the objective and just after dark to begin to dig in for the night. A second fire trail ran through the objective area from east to west.

To the rear, A Company occupied the trench system captured earlier by B Company, and C Company occupied the ground nearby. On the objective, B Company was placed in a close perimeter defense. The 2d Platoon occupied the north sector; the 1st Platoon occupied the east sector and part of the south sector, and 3d Platoon occupied the remainder of the south sector and the entire rear. It was a tight defense with no open ground between platoons. There was no way for the enemy to take the company by surprise. The Weapons Platoon and the CP group occupied the center of the perimeter.

The morning of 30 November came in cold and damp. Battalion had not been able to bring up ammunition, water, or food during the night. The Gey road, about 200 meters south of the B Company perimeter, was heavily mined, and aggressive enemy patrols were working from the north toward Gey road. These enemy patrols would lay in wait, fire a few rounds on any moving Americans, then withdraw into the woods to reappear and repeat the same tactics at another point.

Because of the rocky soil, the men experienced extreme difficulty in digging positions. They dug double foxholes. This allowed one man in each hole to remain awake and alert at all times and aided in maintaining morale except when one of the two men became a casualty.

About 1000 hours the battalion CO called and told B Company CO that the company had done a fine job. B Company was ordered to support by fire an attack on the village of Gey. B Company was within shouting distance of Gey. Elements of the company had advanced to the edge of the woods, just short of the first house in Gey, on the previous day.

The morning fog commenced to lift from the B Company positions and for the first time the Americans could see the surrounding country and the tactical value of the positions they held. From the B Company positions there was observation to the areas of Strab, Untermaubach, Winden, Kufferath, Berzbun, Birgel, Lendorsdorf, Krauthausen and portions of Duran. This observation included the wooded area between the towns and all roads in the area.

Soon, Germans could be seen in many places. There were couriers on motorcycles, white ambulances, trucks delivering ammunition and supplies, groups of German soldiers moving in and out of clusters of houses, and columns of Germans with full field equipment moving on the roads and across fields. It was not a question of availability of targets; it was one of priority.

B Company CO called battalion and reported the situation. Battalion indicated that the 81-mm mortar observer, a field artillery forward observer, and the 4.2-inch mortar observer would be sent to B Company CP at once, but warned that there was a serious shortage of artillery ammunition. The forward observer arrived about 1330 hours and immediately set to work. The acute shortage of artillery ammunition was made apparent by the trouble the artillery observer encountered in obtaining concentrations. The

observers continued fire as long as ammunition was available. B Company was on the nose of a ridge that jutted forward into German occupied area. Somewhat surprisingly, the enemy had not as yet reacted to B Company's occupation of this critical piece of ground.

B Company CO made a personal reconnaissance of the area to the north and west of his position during the afternoon. He moved northward for 200 to 300 meters to a point where the ground sloped down steeply to the northwest. Then he backtracked and took a trail westward toward the rear of his company area. Following a fire trail that ran through his area, he moved about 250 meters west of his unit's position. Suddenly a German patrol appeared, working its way in from the north, to pass within 100 meters in front of the CO. After a brief exchange of fire, both sides discreetly retired.

Dusk came at 1630 hours and B Company closed into perimeter for the night. Battalion called and ordered a patrol from B Company to C Company, which was now on high ground about 400 meters to the north. B Company was to patrol on the odd hours commencing at 1900; C Company would send the contact patrols out on the even hours. The rifle platoons furnished the patrols equally with orders to vary the exact times of departure.

Dawn came a little after 0730 hours on 1 December. The supply sergeant, with his carrying party, was still on the B Company position. The haul from the Renn-Weg road had taken almost three hours. The bulk of his load had been badly needed ammunition with a short supply of K-rations and water.

Some 50 meters to the rear of the B Company positions stood a wooden fire tower. The company CO decided not to disturb the tower as long as the enemy did not shell the position. Once shelling commenced, he planned to have the tower knocked down to prevent its use as an adjusting point for enemy forward observers.

The S-3 from battalion visited B Company area just after 1400 hours. He made no statement as to future plans for the company, but he did emphasize the fact that B Company held an extremely vital piece of ground.

The point Hof Hoherbach, lying some 1,400 meters east of B Company's positions, was kept under observation for some time. The CO felt that this installation, which included a cluster of houses, was the location of at least one enemy battalion's command post. There was constant enemy movement in and around the buildings. On several occasions motorcycle couriers entered and departed the main building. The installation and activity were described to battalion. The result was a flight of P-38 aircraft from the IX Tactical Air Command. These planes dive-bombed the target and scored direct hits on the buildings. Later in the afternoon medium artillery registered on the same buildings, and no more enemy activity was observed at this point. The remainder of the day passed quietly and night closed in on the position bringing with it a cold rain.

This night brought much more enemy activity than the previous one. The road west of Gey was interdicted by enemy artillery during most of the night. Several enemy patrols attempted to pass through the B Company position. B Company security men dispersed these patrols with hand grenades. Enemy tanks were using the roads in the vicinity of Gey. American artillery interdicted Gey with white phosphorous (WP). Compass azimuths were taken on the flashes of enemy artillery and furnished to battalion headquarters as shell reports.

The morning of 2 December found the tactical situation of B Company largely unchanged. Enemy patrols had been driven off during the night, and the telephone wire running back to battalion had been cut. Battalion reported that extreme caution be taken in using the Gey road. The Germans were attempting to cut this road, but battalion had succeeded in keeping it open. Battalion also seemed overly concerned about enemy reaction to B Company's position. The observation post set up in the company position was in continuous use. All men in the company were alerted for a possible enemy counterattack 30 minutes prior to dawn. The anticipated counterattack never occurred.

Shortly after 1000 hours the enemy hit 1st Platoon without firing any artillery preparation. The Germans drove up the wooded area from the east and also engaged the right sector of 2d Platoon. American machineguns and small arms immediately opened fire to send a deadly hail of bullets into the woods to the fronts of the engaged elements of the company. Within 15 minutes the enemy attack had been driven off and all firing ceased. CO, B Company, immediately ordered 2d Platoon to send out a combat patrol in the direction from which the attack had been launched. The mission of the patrol was to capture enemy wounded and to locate enemy dispositions to the front of the 2d Platoon. The patrol reported receipt of intense enemy fire from enemy located about 200 meters to the front of 2d Platoon. The patrol also captured several wounded Germans, one straggler, and counted 10 dead. The wounded prisoners stated that their company, numbering about 70 men, attacked with the mission of seizing B Company's position. No American casualties were suffered during this action.

Enemy artillery was first placed on the B Company positions about noon on 2 December. The enemy concentration lasted about 30 minutes, and two men were hit. At 1345 hours the enemy again attacked with indirect fires, and the bulk of the shells fell in the company area. Both 88-mm and 122-mm artillery were employed—the 88's coming in with a sharp crack and the 122's lumbering in behind them. The German fire was accurate. The pungent smell of burned powder filled the area, and branches and tree tops plunged earthward as tree bursts occurred. For the first time on this position, the sickening cry of "Medic!" was echoed throughout the position.

A second German attack came at 1400 hours. In a single coordinated attack, the enemy hit 2d Platoon on the north, 1st Platoon on the east and south, and the eastern portion of 3d Platoon. It seemed obvious that the enemy was trying to take the position by sheer weight of numbers. The sound of German machine pistols, rifles, and machineguns filled the air. Again each B Company soldier held his ground and poured round after round of rifle and machinegun fire into the approaching enemy. There was nothing the CO of B Company could do; the weight of the fight was squarely on the shoulders of the individual riflemen. B Company men were being hit, but now there was no cry of "Medic!"

This attack stopped suddenly, leaving the same quietness as had the morning attack. The men stayed in their holes for some time. The CO left his foxhole to determine the dispositions and casualties within the company. An estimated 30 men were killed or wounded as a result of the artillery concentration and the direct assault. Included was the Weapons Platoon leader, evacuated with a bullet wound.

Battalion was notified of the enemy assault and was requested to pick up B Company's litter cases. It was not tactically sound to use B Company fighters to evacuate casualties. The effective strength of the company was now 60 men and two officers. The

artillery forward observer was called to the rear to be decorated, but his enlisted assistant remained on position as forward observer, and both the 81-mm and 4.2-inch mortar observers remained with the company.

About 1600 hours the battalion CO called and wanted to know the situation. He was informed that the company was receiving rather heavy enemy artillery shelling. B Company CO felt that his position could not be held against repeated attack, so reinforcements were requested. Further, a request was made to move the company to another position. The battalion CO stated emphatically, "You will hold the piece of ground you now occupy at all costs." He also promised to reinforce the company with a platoon of tank destroyers (self-propelled, turret-mounted guns) from the 803d Tank Destroyer Battalion as soon as the Gey road was cleared of obstacles and mines. Finally the battalion CO instructed E Company CO to tell his men that they would be relieved on the next day. Knowing the effect on morale if relief were delayed, B Company CO did not tell his men of the possible relief.

Shortly after 1515 hours the enemy shelling ceased. Twenty minutes later, intermittent shelling from a single 50-mm mortar began. The maximum range of this weapon was about 500 meters. No casualties were suffered, although approximately 20 rounds fell on position and rounds dropped within 10 meters of some B Company men.

During the afternoon a sergeant belonging to the 81-mm mortar observer team asked for permission to go to the rear because of a premonition that he was about to be killed. He was a combat veteran who had been with the regiment since D-day. He did not appear to be suffering from combat fatigue, so he was told to return to the OP. Five minutes after returning to his position he was killed by a shell fragment.

One of the platoons sent another soldier to the CP as a combat fatigue case. He was allowed to remain at the CP and his subsequent actions left no doubt as to his condition. He had discarded his equipment, including his helmet. He made no attempt to take shelter in his hole when the company was shelled. He simply sat on the edge of the hole shaking and staring into space. He was evacuated because his behavior was affecting other men in the company.

The cold, damp weather was having a telling effect on the men of B Company. Most of the men had not retained their long overcoats because the coats were so bulky that freedom of action was limited. These long coats absorbed water and became increasingly heavy. Many men discarded them in favor of a series of jackets. The nights were especially bad because a combination of snow, sleet, and the inactivity of a fixed position brought increased suffering and hardship from the cold. Care had to be exercised in issuing the K-rations. The breakfast ration containing soluble coffee was most in demand. If ration issue was not closely supervised, a few men would draw all of the breakfast rations to obtain the coffee for use as a hot stimulant.

A Company had followed the progress of the enemy attack by monitoring radio and telephone conversations. During the attack 12 reinforcements and supplies en route to B Company had been halted in the A Company area pending the outcome of the attack. Now A Company wanted a readily given clearance to send the men and supplies forward. These welcome additions arrived on the B Company position at 1600 hours.

Darkness fell as the tank destroyer platoon closed into a defiladed assembly area 200 meters west of B Company's position. With darkness, the patrols commenced again

on the odd hours to maintain contact with C Company to the north. A Company remained in the trench system west of B Company's forward position.

The Germans continued their shelling during the night, but shortly after midnight there was a lull in the firing. The sound of engines being warmed-up came from the defiladed location of the tank destroyers. B Company CO moved to this position immediately. The platoon leader explained that he had orders to take his platoon to the rear to "gas-up." The CO could not stop the withdrawal, but he did report it to the battalion CO. The battalion CO stated that the tank destroyers had no authority to leave the position and would be ordered to return at once. The sound of engines carries great distances, particularly on a quiet night. The usual enemy reaction was to throw quantities of steel in the estimated direction of sounds of moving armor. As expected, the methodical Germans increased their barrages on the B Company positions on the basis of the engine noises.

At 0200 hours 3 December, battalion called B Company CO. Interrogation of prisoners captured in the afternoon attack revealed that B Company had repulsed a battalion attack against its position. Further, the enemy was just as determined to take the position as the Americans were to hold it. Battalion ordered that all B Company men be alerted in their holes in anticipation of a night attack.

At 0330 hours the machinegun located in the southwest corner of 3d Platoon's sector opened fire, and the 3d Platoon men commenced firing toward the southwest. Moving to 3d Platoon area, B Company CO learned from the machinegunner that "A lot of Jerries are in the woods." The enemy would only fire occasionally, whereupon he would immediately be taken under fire. The CO ordered, "Cease fire." After waiting about 15 minutes he called to the men in the next hole to follow him. He reconnoitered the area from which enemy fire had been received and found 15 German casualties. Most of the Germans were dead. The wounded were brought back to the company position. One of the wounded was a Pole who talked freely. He stated that his company had just been moved into the line for this night attack.

At 0400 hours, battalion CO telephoned to inform B Company CO that a platoon of tanks from 70th Tank Battalion would be in direct support of the company commencing about 1000 hours. The senior commander was inquiring about supply needs when another heavy enemy artillery concentration fell on B Company and severed the wire line to battalion. This was the fourth time the wire line had been knocked out. On the night of 1 December, B Company CO had requested that battalion install an alternate line, and the alternate line was in operation by noon on 2 December. A three-man wire team, attached to B Company to maintain the wire lines, had been missing since the night of 1 December when they moved out to repair a line. Later, American equipment had been found close by a cut in the line. But with the alternate line in, the communications sergeant switched the telephone to it, and wire contact with battalion was maintained despite the enemy artillery.

Shortly before dawn on 3 December the enemy artillery on the B Company positions increased in intensity. Every man in B Company realized what was about to happen. The machinegunners had reloaded belts by hand. The 12 reinforcements had brought up large quantities of ammunition, and each two-man foxhole was a virtual arsenal. Each man waited for dawn.

Just after dawn the artillery stopped. Within a few minutes there was a great amount of singing in the woods northeast of 1st and 2d Platoons. It was instantly

apparent that the Germans were again attacking. This time the singing was the cue that alerted B Company rather than the crack and whine of enemy bullets. The men remained quiet until the enemy was observed within about 15 meters of 2d Platoon. The 2d Platoon, commanded by a fearless staff sergeant, blasted the enemy with magnificently controlled fire. The enemy was stopped dead in his tracks.

Almost immediately 1st Platoon received heavy fire from the enemy attacking on the double from the east. The first wave was easily dispatched, but the second wave advanced within hand grenade distance and commenced heaving hand grenades into the 1st Platoon positions. A number of these grenades found their mark. Among the casualties was the 4.2-inch mortar forward observer. When this attack against 1st Platoon was stopped, bodies of the German dead lay within arm's reach of the Americans' foxholes.

Coincident with the attacks against 2d and 1st Platoons, the enemy emerged from the woods to the south in an attack against 3d Platoon. The 60-mm mortars fired constantly on likely avenues of approach. Each of the three mortars covered the ground in front of one platoon sector, dropping rounds less than 150 meters in front of the perimeter.

As soon as the enemy infantry attacks had been beaten off, German tanks commenced firing on B Company from positions in the village of Gey. Two tanks were engaged in this firing, but it was impossible to locate them exactly because German indirect fire was also falling on B Company's positions.

B Company CO requested ammunition from battalion and received an immediate reply that American tanks should arrive soon with both food and ammunition. Shortly after 1100 hours the tanks halted in defilade to the rear of the company and the men received their first full allotment of water and K-rations since 1 December.

The tank platoon leader sent his platoon sergeant to provide liaison between the tank platoon and B Company CO. The sergeant remained with the rifle company and rendered valuable assistance. For example, the enemy opened with small arms fire on 1st Platoon on the southeast portion of the perimeter at 1300 hours. The tank platoon sergeant was told to bring a tank up a fire trail from the defiladed position to fire on the enemy in front of 1st Platoon. Within a few minutes this mission was accomplished.

Battalion called and said that C Company was to move into a position to the left rear of B Company after dark to protect the north flank of the battalion. The enemy's excellent observation and fire coverage of the entire sector demanded that C Company's move be made under cover of darkness.

The remainder of the afternoon of 3 December was spent jumping in and out of the foxholes in attempts to escape enemy 120-mm mortar fire. These shells came in without any prior warning, making shallow shell craters, but the concussion and blast effect were terrific. One of the shells landed just outside a double foxhole occupied by 3d Platoon Leader and his runner. The blast killed the runner instantly and the platoon leader was dazed. Later both the CO and 3d Platoon Leader were hit by shell fragments. The CO was only slightly wounded, but the seriousness of 3d Platoon Leader's wounds demanded evacuation. A total of ten casualties was suffered from the shelling, and evacuation of 3d Platoon Leader left the CO as the only officer with B Company.

At 1430 hours, 27 enemy aircraft flew over B Company's position. They came in from the east and turned south toward Hurtgen without attacking.

CO, B Company felt strongly that he occupied an untenable position and lacked the men to hold the position against another attack. Again permission was requested of battalion to move to another position. Battalion told B Company CO to hold his present position.

Along about dusk a German soldier walked into B Company's position waving a safe conduct pass. He appeared to be a serious combat fatigue case. Shells were falling every few minutes, but he wore no helmet. One of the men brought the German over to the CO. There was no evacuation to the rear at the time, so the CO ordered the German to get into a hole. The prisoner was irrational; he would stay in a hole only if the CO occupied the hole. When the CO left the dug-in CP to check positions, or for any reason, the German prisoner followed him.

At 2100 hours, both wire lines from B Company to battalion were knocked out. The CO walked back to A Company to contact battalion and ask for more officers and men. The German prisoner followed and was left at A Company to be evacuated.

En route back to his own position, the B Company CO passed through the defiladed tank assembly area and instructed the tank liaison sergeant to knock down the 100-foot fire tower that stood to the rear of the company. In a few minutes the high wooden tower was on the ground.

Dawn of 4 December found the remnants of B Company still holding the position. The entire night had been spent in the foxholes to escape enemy shelling. There were no medical aid men left in the company. All of them had been killed or wounded. The CO counted his men and found 34 remaining. The 1st Platoon had 8 men; 2d Platoon had 2 men; 3d Platoon had 10; and Weapons Platoon and company headquarters had a total of 14 more. Two light machineguns and one mortar were left in Weapons Platoon. Two of the company's 60-mm mortars had been knocked out by direct hits. Then battalion called to inform B Company CO that a platoon, one officer and 32 men, from C Company were being sent to reinforce the position.

By 1200 hours, enemy shelling had hardly left a tree standing. The shelling diminished shortly after noon, and the CO ordered the men to stack the dead in the area to the rear of the demolished fire tower. The walking wounded were sent back. There were a number of litter cases and the CO decided to evacuate them on the tank that was bringing supplies up to B Company.

The tank arrived at 1300 hours. The supplies had been unloaded and the first wounded were being loaded on the back deck when German 88-mm fire hit the front armor of the tank. Part of the tank crew abandoned the vehicle. The CO immediately called for smoke in front of the position and it was delivered promptly. The tank engine was still running so it was put in reverse and the tank was backed over the hill into defilade.

At 1500 hours, 18 men arrived from C Company. The remainder of the original 33-man platoon had become casualties before they moved the full distance to reinforce B Company. The new arrivals were placed in 2d Platoon's positions on the northern portion

of the perimeter. An engineer squad from 4th Infantry Division arrived and was ordered to place barbed wire and antipersonnel mines in front of 1st Platoon and 2d Platoon.

The shelling continued unabated the rest of the day. The enemy fired everything from 50-mm mortars to 150-mm artillery on the B Company position. All of the forward observers had been either killed or wounded. This included observers from the 81-mm mortars of D Company, the 4.2-inch mortars of the 87th Chemical Battalion, and the 105-mm artillery of the 42d Field Artillery Battalion.

On the night of 4-5 December 1944, B Company was ordered to withdraw from the position. Twenty-two survivors walked out and some of them were wounded who had fought on despite their wounds.

III. ANALYSIS OF THE ACTION

A. Evaluation of the Situation, Decisions, and Actions Taken.

1. The situation throughout this action was one of discontinuous lines with semi-independent attacks of company strength and defense from a perimeter in thickly wooded terrain. Because of a shortage of artillery ammunition, thickly wooded terrain and enemy strength in antitank weapons, the success gained was largely with the weapons organic to the infantry company and battalion. Outstanding in the defensive phase was the aggressive delivery of fire by the individual soldier which defeated several probing actions, one fully supported enemy attack of battalion strength, and an enemy night attack of company strength. Support of B Company by battalion was continuous and effective within the limits under which the battalion CO was operating. There was a lack of counterbattery fire, but the ammunition shortage apparently was beyond the control of the infantry battalion CO who substituted mortar fire and close air support with some success. B Company's casualties apparently resulted largely from enemy indirect fires. To have reinforced the position earlier would have resulted in exposing an unnecessary number of men to these fires at a time when B Company was effectively defending the objective without urgent need for manpower. When it became apparent that B Company was threatened from the north as well as from the southeast, C Company was drawn in to the left rear of B Company to protect the north flank of the battalion sector. A Company's position was some 400 meters to the left rear of B Company. A platoon of tank destroyers, and later a platoon of tanks, occupied positions between A Company and B Company against a threat from the south and southeast. There is no doubt that B Company occupied the most critical position. A salient which provides dominant observation constitutes critical terrain. Such a terrain must be strongly held or abandoned because exposure on three sides makes it difficult to defend. The most economical and the most flexible strengthening of such a position is by supporting fires immediately available on call in heavy volume, including counterbattery fires. The planning of extensive concentrations covering the likely approaches to the position was a problem for the battalion S-3 and the artillery and mortar observers, as well as for the CO of B Company. Air support may be too inaccurate for very close support of a salient position, particularly when observation and location of the flanks of the salient are obscured by woods. From 29 November to 5 December, B Company held critical terrain overlooking a huge segment of the enemy's battle positions and inflicted heavy casualties on numerically superior enemy forces. Had American supporting fires been more adequate even greater losses would have been suffered by the enemy. B Company accomplished its mission despite decimation.

2. During the period from 28 November, when the original CO was killed by a mine, to 3 December, when 3d Platoon Leader was seriously wounded by a shell

fragment, all four of B Company's officers became casualties. The replacement CO was slightly wounded. All of the forward observers from three separate units were killed or wounded in the B Company sector. Only the original company commander was replaced. This emphasizes the necessity for developing leadership in depth within the rifle platoon and rifle company and the need to train all infantry leaders to request and adjust supporting fires.

3. The newly assigned CO of B Company made an estimate of the situation on arrival at the unit area. Note the attention to the supporting machineguns and mortars. These were weapons he could control directly to support his rifle platoons and he made it clear that he expected available support to be rendered.

4. Double foxholes, suitable for two men, were prepared and overhead cover was provided. In wooded areas, overhead cover is relatively easy to prepare if standing timber can be cut. Overhead cover is vital because of fragments from tree bursts and the probability of injury from falling branches and tree tops blasted off by artillery. Note that hardly a tree was left standing on the B Company positions when the unit finally was relieved. Increased protection is obtained if single foxholes are dug in pairs with about one meter between holes. Men are close enough together to give mutual support, yet the increased dispersion and reduction of the size of the foxhole openings reduce exposure.

5. The mission assigned to the B Company patrol was specific as to route, destination, time of return, and information desired. The patrol was told specifically to stay on the north side of Gey road, not on the road itself. The order to reconnoiter the trail on the return trip should have been interpreted in the same manner. All roads and trails in any enemy area may be mined, boobytrapped, covered with small arms fire, or under surveillance by security forces. Reconnaissance patrolling during unlimited visibility is highly susceptible to enemy detection. In this case, the woods limited visibility to some degree. The commander was preparing for an attack and seeking to regain contact, so use of a reconnaissance patrol during daylight was justified. Note that the CO selected a rifle squad for the patrol and thus maintained unit integrity. The platoon leader from the platoon furnishing the patrol served as patrol leader "because of the fatigued condition of the men." Under ordinary circumstances, the squad leader should have been competent to lead the patrol. Unnecessary exposure of competent leaders results in wasteful losses.

6. An additional effort toward the maintenance of team integrity is shown by the CO's assignment of men who had recovered from wounds to their original platoons. In turn, the platoon leaders should have placed them in their original squad and fire team assignments, if possible, thus minimizing the adaptation required.

7. When the patrol returned, the information collected was transmitted by wire to battalion on the basis of the patrol leader's report. The S-2 or his representative should have debriefed the patrol. Time permitting, the patrol action should have been critiqued because each combat action exposes men to a different learning situation. The veteran campaigner seeks knowledge, skill, and critical evaluation of experience as a means toward survival.

8. Note that the Germans were not satisfied merely to fell trees across the road every few feet as obstacles. Each tree inspected by the patrol was mined or booby-trapped. The trees alone may have been cut into sections with a gasoline-powered saw or merely pushed aside with a bulldozer by the Americans. Obstacles should be covered with

fire to deter removal. If this is not possible, logical action is to mine and boobytrap them heavily. Even when obstacles can be kept under surveillance with readily available fire planned for delivery, mines and boobytraps can serve as cues to deliver fire, particularly on roadblocks during limited visibility.

9. After darkness, the CO of B Company continued to circulate among the men of his recently acquired command. This served at least four purposes: it made his interest in his men as individuals evident to the men; to some degree it helped him to get acquainted with his men; it probably increased the alertness of men manning security positions on the perimeter; and he gained a basis for judging performance when he found that the men were battle-weary.

10. A full hour warning prior to reporting to battalion for the attack order for the following day indicates advance planning by battalion. The order was brief and straightforward. Attacking into an undeveloped situation in a thickly wooded area demanded control, so the order was to attack in a column of companies. As resistance was developed on a narrow front by the leading company, two additional companies would be available to attack forward or to either flank.

11. B Company's attack order followed the examples set by battalion; a column of platoons, 1st, 2d, Weapons Platoon, then 3d Platoon, was given as the initial formation. There was a lack of emphasis on security because both of the company's flanks were uncovered and the Germans would have had 12 to 15 hours in which to occupy the area reconnoitered earlier by the American patrol. Further, both mortars and machineguns should have been well forward, probably in rear of the leading platoon. The availability of supporting weapons was particularly important in view of an attack plan that called for no mortar or artillery preparations. A forward observer should have been placed in support of the leading platoon.

12. Perhaps the fact that the CO had just assumed command of B Company accounts for the complete lack of questions and comments on termination of the order. The availability of supporting fires should have been questioned. Further, contact had not yet been reestablished, so the attack was being launched against an enemy whose strength and disposition were completely unknown. Basically this constituted a compression of the development of resistance and attack into a single operation. It chanced a blow in the air or the selection of an axis of advance highly vulnerable to enemy attack from either flank. Against a defeated enemy who is fighting a rear guard action, use of such tactics may not be badly punished. But with wide open combat based on discontinuous front (as is visualized for the future) it would be extremely risky. The reconnaissance patrol had located no enemy positions and battalion had indicated no intent to send out combat patrols to regain contact. Contrast this "attack" with the systematic German development of resistance which permitted the enemy to fully localize the B Company position before an all-out attack was launched.

13. Note the supply of hot rations, bed rolls, and ammunition. Two consecutive hot meals were served—supper and breakfast. But breakfast was delivered at 0400 hours with an attack scheduled at 0900 and the company located in close proximity to the line of departure. Up to two and one-half hours of additional rest might have been afforded B Company by scheduling the meal for 0630. Clean, dry socks should have been delivered for each man with each meal. Cold, damp weather, with snow and ice underfoot, demands regular care of feet to avoid trenchfoot.

14. Search of the company area by the supply sergeant was and should be SOP. But squad leaders and fire team leaders must check their men to ensure adequate weapons, ammunition, grenades, rations, water, and clothing. Search of the area should include looking carefully for letters, marked maps, messages, overlays or any similar information of possible value to an alert enemy patrol.

15. The leading 1st Platoon crossed the line of departure (LD), a road, in a column of squad columns and advanced to another road bounded by an open area and halted on the near side. Both roads were danger areas furnishing excellent field of fire into the company's flanks. Prior to crossing the LD, these roads should have been scouted and secured on both flanks and the enemy side by buddy pairs or fire teams. There is no indication that security, at least a squad-strength point, preceded the company column. The platoon leader was acting as point.

16. When the CO crossed the second road behind the leading 1st Platoon Leader he drew enemy fire. Not until then were men placed to cover the road while the remainder of the platoon crossed the danger area in squad rushes.

17. The 2d Platoon was ordered to cross the road without action against the automatic weapon that had fired along the road on the CO. This cost the company a platoon leader, shot in the leg (grazing fire along a road), and two men. Smoke should have been placed between the enemy and the crossing point the moment the fire was open and at least a squad detached to locate and destroy the enemy weapon. Had the 60-mm mortars been closer to the front of the column they might have been employed effectively against this flanking automatic fire.

18. The 1st Platoon (apparently still moving without security forward or on the flanks) was ambushed with automatic weapons. The almost reflexive return of fire, followed by a maneuver of part of the force to the flank, forced the enemy to withdraw. Here the 1st Platoon Leader, leading the maneuver force, rushed the position alone and was killed. Fire superiority is vital to an upright assault; fire and movement, led by a squad or fire team leader, should have been employed. Again, the 60-mm mortars might have been used effectively to save a young officer who demonstrated great courage, but ultimately lost his life and thereby denied his platoon badly needed leadership.

19. Only after the CO had drawn fire and a platoon leader and two infantrymen had become casualties was positive action taken to eliminate the enemy machinegun that fired grazing fire along the Gey road to strike B Company in the flank. Again a platoon leader, acting in the role of a fire team leader, advanced 200 meters alone to knock out the enemy weapon with grenades. The CO's instruction that the 60-mm mortars would deliver fire on the first suitable target had twice been passed over because the leaders involved ignored available supporting fires.

20. Even though the SCR 300 radios in the company and battalion net were working perfectly, CO, Company B, had wire laid as his unit moved forward in the attack. Note that a telephone was attached to the running end of the wire to provide immediate communication. By providing wire as an alternate means, radio interception by the enemy was prohibited and there was no threat of loss of communication should the heavy woods or terrain mask radio signals.

21. Despite the excellent communications, there is no indication in the record that CO, B Company, reported initial contact with the enemy or the results of the

contact. B Company had encountered organized resistance at the point where 1st Platoon Leader was killed. This was indicated by the partly completed emplacements. The Americans were driving in the covering forces in front of a planned defensive position.

22. Apparently the CO learned a valuable lesson at the danger area to his rear. On reaching the next clearing he recognized it as a possible field of fire. He employed this recently acquired learning by planning an assault on the far side of the clearing some 150 meters distant. He preceded the assault with well-timed 60-mm mortar fire and provided machineguns in a supporting role. This fire plan, plus skillful use of his rifle platoons, permitted him to rout the enemy from a 200-meter, deeply entrenched front without the loss of a man at a cost of 10 enemy dead and 25 captured.

23. The conclusion during planning that if the enemy were in the woods across the clearing, "he would not expect an infantry followup directly on top of mortar fire" was baseless. An assault must always be anticipated after the delivery of indirect fire. Even in open areas, smoke may permit an approach over relatively bare terrain, so either smoke or other indirect fire preparations delivered on a defensive position give forewarning of a probable assault.

24. When the Americans assaulted the German trench system, the Germans held momentarily and forced the situation to hand-to-hand combat. At such times the soldier who is skillful in the use of pointing (quick) fire has a definite advantage over an enemy who had been taught to choose between aimed fire and use of the bayonet. In such situations a fraction of a second in timing can weigh the decision in favor of the fastest weapons handler. Further, a soldier may encounter multiple targets at extremely close range. Accurate fire delivered from the hip or underarm position by pointing (not aiming) permits the soldier to keep his head up and both eyes open to detect and engage targets almost reflexively.

25. B Company attacked initially in a column of platoons in squad column. In dense woods this formation facilitated control. Some 400 meters from the objective the CO again studied his map and noted that it indicated open ground ahead. Looking about him, he could see that the trees were becoming less dense. So he changed his formation from column to two rifle platoons abreast forward, on either side of the trail, with the other rifle platoon astride the trail. This increased dispersion in the more open terrain without greatly diminishing control.

26. The 2d Platoon, on the right, came under enemy fire just short of the objective from enemy on high ground with excellent fields of fire. The 3d Platoon, on the left and abreast of 2d Platoon, immediately assaulted the enemy's right flank and overran it. This subjected the enemy in front of 2d Platoon to enfilade fire on the right flank of his line and made his position untenable. This immediate reaction to enemy fire with superior fire occurred without order, reduced exposure time for the Americans, and effected a measure of local surprise. The 3d Platoon Leader reacted to a battlefield cue, and it cost the Germans 19 killed and wounded and routed them from their positions.

27. Note the definite pattern of thinking that seems to have held both the Americans and the Germans to routes and positions on existing lines of communication. When the west-east Gey road was blocked, mined, and boobytrapped, the American commander designated an approach route north of and parallel to the blocked road. A fire trail paralleled the Gey road on the north and thus provided a route to the objective.

So it was more than mere coincidence that the Americans encountered resistance at four separate points along their route. They elected to use an obvious route. Following the same line of thinking, the enemy placed his defenses on the same route. Thus, the Germans could strongly anticipate a frontal attack and were vulnerable to surprise only as to the time of contact. Conversely, the Americans did not know where or when contact would be made. In three out of four contacts en route to the objective, the element of surprise became an advantage that worked largely for the Germans. To achieve surprise as to both direction of attack and time of attack, resistance must be developed to fix enemy locations, a route other than the obvious one must be used to avoid contact with security forces, and a stealthful approach must be executed. So the value of reconnaissance patrols, capable of accurate navigation and skillful in the use of stealth during limited visibility, is emphasized. A few men are thus exposed to the enemy to locate his positions and routes to them that will permit surprise to be gained in both time of attack and direction of attack against the enemy positions.

28. After the fourth contact with the enemy, B Company was within some 150 meters of the objective. At this point the CO moved northward on reconnaissance, leaving 3d Platoon Leader in command to reorganize the company. Two questions are raised by his action. Was 3d Platoon Leader the next senior officer in the chain of command (or was he selected because of the initiative and aggressiveness he had displayed during the day)? Secondly, what force accompanied the CO to deal with resistance that might be encountered? Reconnaissance of the objective with only 15 minutes of daylight remaining demanded a rapid firsthand surveillance. But, in view of the resistance encountered up to that point, at least a deployed platoon should have advanced on the objective. Reorganization was important after an encounter that "inflicted a number of American casualties." Further a change in direction by the entire command was demanded. The company had attacked generally eastward, but, as indicated by the direction taken by the CO on his reconnaissance, the objective was to the north of the company's position. By delegating one vital duty, the B Company CO was able to perform another concurrently.

29. The German commander erred in not having occupied the critical terrain that was B Company's objective. He apparently placed too much faith in the successive security positions on the approach route to the position. The B Company fighters killed, captured, or routed these forces and thus eliminated the possibility that the enemy might withdraw to and defend the critical terrain to the rear. The fourth contact with the enemy, 150 meters south of the objective, resulted in another enemy defeat because of aggressive action and superior American fire. Thus the aggressive elimination of the enemy en route uncovered critical terrain that was not occupied.

30. Note that B Company occupied the objective after dark and formed a tight perimeter that employed all three rifle platoons with no open ground between platoons. The Weapons Platoon and the CP group occupied the center of the perimeter, thus gaining protection and adding to the depth of the platoon positions simultaneously. Both of B Company's flanks were exposed, the perimeter defense effectively refused the flanks. A Company and C Company were located at the German trench system some 400 meters to the rear of the objective. So B Company's rear was exposed in wooded terrain that offered excellent cover and concealment to any enemy combat patrol that might scout the objective for an attack from the rear. Where lines are discontinuous, the company operating as a semi-independent force must defend from a perimeter. In a heavily wooded area, gaps cannot be covered effectively by surveillance devices or fire, so to leave gaps between platoons invites attack by infiltration. If wide gaps are left between platoons in

such a situation, the platoons have little choice but to employ a platoon perimeter, thus subjecting them to possible defeat in detail. Limited visibility (darkness, dust, smoke, vegetation) may often make it difficult or impossible to cover large gaps effectively with fire. If the ground is both open and flat, surveillance devices may be helpful in covering gaps. But basically, every unit must maintain an all-round defense unless it is integrated into a larger unit perimeter without unduly large gaps. The enemy who habitually employs smoke to screen an advance makes all-round security and defense especially important.

31. Consideration probably was given to the formation of a battalion perimeter, but this would have decreased dispersion and made the battalion more vulnerable to enemy indirect fires at a time when an acute shortage of artillery ammunition would have prohibited or severely limited American counterbattery fires. Further, the Gey road was destined to become the battalion's main route of supply and evacuation as the engineers cleared it. A Company's disposition aided to block this route and protect it from seizure by the enemy to isolate the battalion from its support to the rear. So a balance between security and control seems to have been achieved by the battalion commander.

32. Occupation of the objective after dark seriously limited preparation of the objective for defense during limited visibility. Had the unit gained the objective during daylight, the siting of weapons, clearing of fields of fire, and placement of stakes and supports to ensure delivery of grazing fire during limited visibility would have been greatly facilitated. Note that a heavy fog shrouded the objective until after 1000 hours on the day following initial observation. The enemy failed to take advantage of this long period of limited visibility that handicapped the Americans in preparing their defenses.

33. While the main attacks against the B Company objective came from the east and southeast, note that probing combat patrols approached from the north and even appeared on the rear (west) of the company to fire, draw fire in return, and withdraw. Apparently this was a methodical development of B Company's positions prior to any major attack. And the enemy patrols were avoiding obvious approach routes by coming in from an exposed flank and the rear.

34. Only after the morning fog lifted were B Company officers and men aware of the wide and deep observation of the enemy area afforded from their position. Earlier map study should have foretold this advantage for B Company leaders as well as for planners at battalion and higher echelons. But there were no forward observers for artillery and mortars attached to B Company. Apparently B Company CO reported the acquisition of numerous targets shortly after 1000 hours, but it was 1330 hours before the forward observers arrived and set to work. The observers should have been with the company when it crossed the line of departure. Even without observers the leaders within B Company should have been capable of requesting and adjusting fires.

35. Apparently neither B Company nor the rifle companies to the rear had deployed local security outside their perimeters. On his reconnaissance to the north and west, the CO encountered an enemy patrol and drew fire 250 meters to the rear of his own position and only about 150 meters east of A Company's front.

36. Note that as patrolling persisted from the north, the battalion CO moved C Company into position 400 meters north and abreast of B Company.

37. The variation of departure time for the contact patrols between B Company and C Company on the north prevented the establishment of a pattern of patrol movement by the enemy.

38. Supply on the first night was not forthcoming. On the second night ammunition was given first priority and water and food were short. Note that supply was by carrying party from the north-south Renn-Weg road. Engineer support to clear the west-to-east Gey road should have been given a higher priority, if possible, or an alternate route might have been marked.

39. The 100-foot wooden fire tower, jutting from the trees 50 meters to the rear of the B Company positions, should have been destroyed as soon as possible after occupation of the objective. It was not essential for American use because the view from the B Company positions furnished more targets than could be engaged with the ammunition available. On the other hand, it was a permanent structure, probably accurately plotted on the German maps. It was certainly an obvious adjusting point for enemy artillery observers. It was an error to leave the tower standing as a reference point for use by the enemy. Further, the timbers in the fire tower might have been used for constructing overhead cover for foxholes and gun emplacements. Cutting trees for overhead cover is a slow, laborious task with the tools normally available to front-line infantry.

40. The visit of the battalion S-3 to the B Company area on 1 December was direct evidence of the value of the terrain held by the company and of the commander's desire to support the company commander.

41. Apparent identification of an enemy command post from the interpretation of observations over time resulted in destruction of the installation when CO, B Company reported the identification and location to battalion. Note battalion's use of an air strike against this target when artillery ammunition was in short supply and a follow-up with artillery when it became available.

42. On 2 December B Company was alerted for a dawn attack which never materialized. Attack at first light, after the development of resistance by patrolling during limited visibility and following a close approach to an objective under cover of darkness, is sufficiently common to demand SOP alert 30 minutes prior to the beginning of morning nautical twilight.

43. The immediate return of heavy, accurate fire broke up the German morning attack on 1st and 2d Platoons on 2 December. The aggressiveness of the CO in pushing out a combat patrol against the withdrawing enemy netted prisoners that otherwise would have escaped. Information from prisoners setting the strength of the attack at 70 men indicates that it was probing action, perhaps a reconnaissance by fire that might have been exploited except for the heavy, accurate fire. That no American casualties occurred indicates preparation of adequate fighting positions.

44. The disadvantage of occupying positions in a wooded area is made apparent by the initial artillery attacks with resultant tree bursts which produced casualties from fragments as shells burst overhead and additional casualties from tree tops and branches cut off by shell bursts. In this connection, telephone wire placed overhead in a defensive area is probably more likely to be torn out by tree bursts and falling branches than if it is laid on the surface with liberal slack to prevent breaks if men trip over it.

45. The German attack at 1400 on 2 December hit three sides of the B Company perimeter simultaneously after earlier preparatory fires. The triple directions of attack and the precise coordination indicate the value of patrolling and the earlier reconnaissance by fire conducted by the Germans. Despite outstanding work by the men of the company, 30 casualties resulted from the carefully developed and coordinated attack. Among the casualties was Weapons Platoon Leader, the third officer casualty in four days.

46. With the strength of the company reduced to 60 men and two officers, the CO asked for aid in evacuation of casualties from battalion. To have used fighters from the company to evacuate wounded men would have left the objective highly vulnerable to a second German assault.

47. The CO's request for permission to move the company at 1600 hours on 2 December was not practical. The company was well dug in on critical terrain and, although it had suffered casualties, it was holding its ground. Note that the battalion CO refused permission to move, but promised a full platoon of tank destroyers as soon as they could be gotten forward to support the company.

48. Three apparent cases of combat fatigue are described in this incident. The American who sat exposed to fire, shaking, and staring into space obviously had lost contact. The German prisoner, too, was seriously disturbed. The condition of these two men should have been recognized earlier and they should have been evacuated as promptly as possible. They were of no use to their units—not a pleasant sight for the other men who were also under heavy stress—and early evacuation might have contributed to recovery. The veteran sergeant with the obsession that he would be killed momentarily probably was also seriously disturbed. The fact that he recognized his behavior as irrational and controlled it to the point of returning to his post of duty was no indication that he was regaining control or that his condition was less serious than the more obvious cases that occurred later. His death, occurring five minutes after he requested permission to go to the rear, might have been a coincidence due to mere chance. On the other hand, he might have exposed himself to fire because he had lost control. Such decisions are difficult for the layman to make.

49. The desire to obtain rations containing coffee during cold, wet weather emphasizes the necessity to supervise the issue of rations. This is an administrative job, but it warrants the attention of the platoon leader. Food and drink in combat serve more purposes than merely furnishing energy. Eating, fixing coffee, trading and sharing rations become important social actions that undoubtedly reduce tension and decrease anxiety. Particularly in cold weather, hot liquids such as coffee, cocoa, and soup aid men to keep warm and are a welcome supplement to the solid food provided by packaged rations. Men may prefer these hot liquids to rations, but both hot drinks and rations can often be supplied by aggressive supply and mess personnel spurred by demands from frontline leaders.

50. Blankets are valuable in defense in cold weather. A soldier on alert status can drape a blanket around his shoulders, gain protection from its cover, and let it drop instantly if he needs to fire or throw a grenade. But the assaulting infantryman is at a serious disadvantage if he is burdened with a bedroll or blanket in addition to his weapons, ammunition, and rations. He should attack with a minimum combat load and be provided with blankets or bedrolls on the defensive position by either motor transport

or hand-carrying parties from reserve units. In combat, the supply and mess personnel frequently function under the S-4 in rear areas. It is the leader's responsibility to ensure that mess and supply personnel maintain a strong identification with their parent unit and develop an aggressive pride in their ability to support the fighters. The real test of their ability is the support furnished in fast-moving situations. Unless supply and mess personnel learn to furnish support during field training, the alternative is to suffer lack of support in combat until they gain the requisite knowledges and skills.

51. The movement of the tank destroyers without coordination with the company commander was an error and a violation of noise discipline. The CO, contrary to his statement, could have stopped the move. The weapons were in his area and, while the record does not indicate whether they are attached to him or in support, control of them within his defensive area was his responsibility. The platoon leader of the tank destroyers could have arranged to move one section at a time under cover of the noise of shelling. Once one section had refueled and returned, the other section and the platoon leader's vehicle could have moved to the rear to refuel. Thus some support would have been available at all times. The engine noises drew enemy fire and the unauthorized absence robbed B Company of support for a time.

52. The frequent day and night activities of the CO, Company B, coupled with continued shelling of his position, indicate that he got very little sleep for several days and nights. To a lesser degree this was probably true of the other personnel in B Company. The leaders in combat units must anticipate continuous, 24-hour-a-day operation, but they must train subordinate leaders to take over during noncritical periods so that much needed rest can be obtained. Sleep loss reduces individual efficiency, and prolonged loss of sleep can produce irrational thinking.

53. Interrogation of the prisoners captured when the Germans hit three sides of the B Company perimeter revealed that the attack had been by a full German battalion and further establishes that the previous enemy fire and movement had merely been a development of the American position prior to a full-scale attack. Based on the interrogation of these prisoners, the battalion S-2 was able to predict a probable night attack, alert B Company for such an attack, and see it beaten off as a result of heavy and accurate fire. Again, CO, Company B, aggressively followed up the enemy withdrawal to capture prisoners.

54. The platoon of tanks placed in direct support of B Company on 3 December is another example of support by higher echelons, as was the installation of alternate wire lines and the attachment of a wire repair team.

55. Cutting a wire line, then setting an ambush to capture repairmen is a frequently practiced technique. It is common practice for wire men to grasp the line and let it run through the fingers as they proceed along it in search of a break. Unless a great deal (at least 20 percent) of slack is left when laying wire, the ambusher need only hold the ends of the wire at the cut to be signaled of the approach of the repair party. Communications are essential to control, particularly of supporting fires. Wire men must use stealth to avoid being ambushed. Stopping periodically to listen may permit detection of an ambush. In a party of three wire men, at least one should be armed with an automatic weapon. When a wire line is disrupted in the absence of artillery fire or tank movement in the vicinity of the line, this may be indication of an ambush. In a situation where battle lines are discontinuous, it may be necessary to send a full fire team with a wire repairman for protection.

56. The increase in intensity of German artillery shortly before dawn on 3 December was recognized as indication of enemy attack. Both the time and the prolonged delivery of indirect fire were specific cues.

57. The practice of shouting during an attack—except to shout essential orders—is controversial. On the morning of 3 December the Germans sang as they approached the B Company positions. The 2d Platoon's answer to this behavior was to wait quietly and deliver devastating small arms fire at a range of about 15 meters. This fire stopped the enemy, but the sergeant (acting platoon leader) should not have permitted the enemy to get within hand grenade range. From any distance under 40 or 50 meters the Germans could have thrown grenades into the American positions. In regard to singing (or shouting), noise undoubtedly aids target detection, location, and identification. Even after surprise is lost, unnecessary noise may draw individual attention in the form of aimed or well-directed fire. A great deal of shouting may frighten green defenders, but for the seasoned soldier noise merely aids the delivery of accurate fire.

58. The effectiveness of the 60-mm mortars—one delivering fire 150 meters in front of each rifle platoon—is significant. Similar, but more effective, close supporting fires are now available from the rifle company's 81-mm mortars.

59. When enemy direct fire was received by B Company from tanks located in Gey, the American defenders were unable to locate the tanks because of enemy indirect fire which was also falling on the objective. All members of an infantry unit must be trained to observe for, recognize, and report targets suitable for engagement by supporting weapons. Target acquisition for supporting fires should not be limited to forward observers and company officers. When a direct fire weapon cannot be located exactly enough to deliver crippling counterfire, smoke can sometimes be placed to deny observation by the enemy gunner. This will not always be effective because trained gun crews will record data to permit continued fire delivery despite visibility limited by smoke, dust, or darkness.

60. Battalion's use of tanks to transport food and ammunition to B Company's perimeter over a route infiltrated by the enemy is significant. Note, too, that the tanks were later used to evacuate wounded.

61. The supporting tank platoon was given little opportunity to aid B Company by fire delivery. Use of a single tank in front of 1st Platoon is the limit of support recorded, other than knocking down the fire tower. Routes forward to firing positions offering hull-defilade protection should have been selected to permit the tanks to move up, deliver fire against assaulting Germans, then seek a fully defiladed position when fire was no longer needed. Plans for use of the tanks as a counterattack force should have been effected. The use of a single tank as a mobile pillbox destroys unit integrity and fails to utilize the mobility, fire power, and shock action of the tank platoon.

62. When 3d Platoon Leader was hit by a shell fragment on 3 December, the CO was the lone officer leader left with B Company. This emphasizes the need to maintain a chain of command and to develop leadership in depth.

63. The effect of prolonged combat probably is emphasized by the CO's second request to move to another position on 3 December. He had seen all of his officers killed or wounded and he had lost the major part of his men. At such times it is vital that the leader focus his thoughts primarily on his mission. Despite losses, B Company was accomplishing its mission. The mission left the battalion CO little choice but to leave B Company on the critical terrain.

64. The German prisoner who was suffering from severe combat fatigue should not have been escorted to the CP or permitted to follow the CO to positions within the perimeter. He should have been restrained and evacuated as soon as possible.

65. Note that when both wire lines were knocked out the CO walked back to A Company and contacted battalion to ask for more officers and men to hold the position. Apparently he used wire communication. There is no record in the report to indicate that his radio was not operative. But a plea for replacements broadcast by radio would have been valuable to the enemy if intercepted. He might have sent a messenger and thus remained on his position with his men. But the distance to A Company was less than 400 meters and he probably felt that a personal request would have more effect than a message.

66. Note that the CO made a dawn check of his positions again on 4 December. His men had been under fire continually since 29 November. They had been shelled throughout the previous night. He counted his strength (34 men), let them see that he was vitally interested in them, and alerted them against the always possible dawn attack.

67. The 88-mm fire received on the tank while casualties were being loaded could have been avoided merely by having the tank in defilade. Armored vehicles almost invariably draw heavy fire and should habitually be kept in defilade when not engaging the enemy.

68. The effectiveness of the German fire on units other than B Company is shown by the loss of 15 of 33 men en route from C Company to reinforce B Company.

69. The engineer squad that arrived at 1500 on 4 December to install wire and mines in front of 1st and 2d Platoons should have been sent forward to do this work on the night of 29 November when the objective was first seized. Possibly they had been at work clearing obstacles and mines from supply routes to the rear. Oftentimes the success of a rifle unit may hinge upon the priorities established for aid from engineer troops. Too frequently, the infantryman must install wire and mines without aid or defend without them. As helicopters become more generally available for resupply missions, less engineer effort may be required to establish and maintain surface communication routes. When possible, any such gain in manpower should accrue to units in contact with the enemy in the form of direct support.

70. One of the major difficulties in fighting in densely wooded areas is the acquisition of targets and the adjustment of supporting fires on the enemy. B Company's seizure and holding of a critical vantage point on the edge of Hurtgen Forest eliminated this difficulty to the front of 1st Battalion. Only the CO and 22 of his fighters—some of them wounded—withdrawed on order from their stubbornly held positions. Such losses in a company should be avoided when possible. B Company faced a difficult task of reorganizing around a small nucleus of survivors. But every infantry leader and soldier must face the hard fact that the unit's mission dominates all other considerations.

B. Training Implications.

1. **Security in Perimeter Defense.** Use of a perimeter defense does not reduce the need for local security. If a unit withdraws into a tight perimeter, particularly during limited visibility, the initiative to develop the dimensions of the perimeter is given to the

enemy. Post local security—including listening posts and necessary road blocks—within supporting distance of the perimeter. During training, detail individuals to attempt to infiltrate the perimeter to test the effectiveness of local security. Aim to prevent the enemy from approaching undetected to within hand grenade range of the squad positions on the perimeter. Should an attack drive the local security into the perimeter, ensure that security is again posted as soon as possible after the attack terminates. A patrol of fire team strength may follow a withdrawing enemy to capture wounded left behind and to maintain contact and pursue by fire from positions forward of the perimeter. Security posts must be provided communication, preferably wire, to facilitate prompt reporting and to aid in calling for and adjusting supporting fires.

2. **Use of Supporting Fires.** When an attack is scheduled without preparatory fires to achieve surprise, a fire plan should be made. Loss of surprise or acquisition of targets warranting expenditure of rationed ammunition should find fire on call for immediate use. Teach all leaders how to request and adjust indirect fires, including use of the close method of adjustment. Teach all personnel how to recognize and designate targets suitable for engagement by supporting weapons. Emphasize the value of accurate surprise fire delivered in heavy volume. In defense, consider the use of indirect fire dropped on and behind the enemy to cut off withdrawal by use of the close method of adjustment.

3. **Evaluation of Capabilities of Newly Acquired Unit.** By informal inspections and conversation with members of your new unit, gain knowledge of their capabilities and of the numbers and conditions of weapons and equipment as soon as possible. Make a written list of any essential weapons, equipment, clothing, or supplies needed by the unit and request them without delay. Ensure that a chain of command exists and is known to unit members. Assuming command of an unfamiliar unit in combat permits no reticence on the part of a new leader. Action must be prompt, firm, and tactically sound. There is no time for easy transition such as occurs in garrison. In training, the company commander frequently should designate platoon leaders to assume command of the company for brief periods without forewarning. Platoon leaders must give NCOs the same opportunity. This practice forces subordinate leaders to keep abreast of the situation at the level of the next command echelon and aids in preparing them to assume command when casualties occur in combat.

4. **Preparation of Foxholes in Defense.** The primary purpose of a foxhole is to provide maximum protection for the occupant during the delivery of fire on an attacking enemy. Two-man foxholes aid morale by keeping buddy pairs together, but increasing the size of the hole also increases vulnerability to shell fragments from time fire and tree bursts. Further, it is much easier to throw a hand grenade into a two-man foxhole. Use one-man foxholes, "tailored" to fit the occupant, with a firm fire step and a grenade sump. Separate the two single foxholes of the buddy pair by a distance of one meter. Use a short length of communication wire with a loop in each end to connect the foxholes. One man may rest while the other is alert. A jerk on the connecting wire will awaken the sleeping occupant in the event of an attack. When possible, add overhead cover to foxholes for protection against shell fragments, tree bursts and falling branches in wooded areas, fallout, and hand grenades. Ask for engineer support with power saws to cut lengths of log for covering foxholes. Use pioneer tools (axes, shovels, etc.) from unit vehicles and pioneer kits to increase speed of defense preparations. In training, take time to permit the digging of completed foxholes so men develop the skill and muscular coordination required for constructing positions. Training regulations usually demand that foxholes be filled after an exercise. Accept this work as added physical exercise, but do not use the regulation as an excuse for digging token positions.

5. **Use of Organic Supporting Weapons.** The platoon's automatic and antitank weapons and the company's mortars and antitank weapons are useful only when delivering effective fire on the enemy. Ensure that the fire plan keeps these weapons in positions to deliver supporting fires with minimum delay. Both antitank weapons and mortars may be displaced by alternate bounds so that at least one weapon is emplaced to furnish supporting fire at all times during movement. Keep a forward observer available to the leader of the leading unit at all times so supporting mortar and artillery fires are constantly planned ahead of the advance. When supporting fires are immediately available from both organic and supporting weapons, use the supporting weapons and thus conserve the ammunition supply that required the most effort to get it forward. For example, if both 81-mm mortar fire and artillery are immediately available, use artillery and conserve the 81-mm mortar ammunition for a future use. Artillery ammunition usually is much easier to deliver to the guns than is mortar ammunition because the latter is closer to the front and often must be hand-carried to the guns.

6. **Specificity of Patrol Missions.** Only one primary mission should be assigned to a patrol. This mission should be clearly stated so that all patrol members know exactly where to go and what to do. If alternate or secondary missions are assigned, the conditions under which these missions are to be accomplished must be explicit. Enemy information collected by patrols often is highly perishable. Transmit collected information with a minimum of delay and, when the patrol is limited by time, plan carefully to work within the time limitations. Never depart a patrol briefing until the mission is completely understood. If it appears difficult to understand, describe what you plan to do and ask if the planned action will fulfill the mission. Patrolling skills can be learned only by practice under widely varying conditions of visibility, terrain, weather, and realistically represented "enemy" situations. Maintain a roster to ensure that all units from fire team to company learn patrolling skills. In combat, avoid repeatedly selecting men who have been successful on previous patrols; all small units must be well qualified for all types of patrol missions.

7. **Maintaining Unit Integrity.** The small unit develops and employs SOP's that often are never made explicit, especially between the individuals of the buddy pair. In training and in combat, maintain unit integrity to include the buddy pair. When men return from special schools or from the hospital, reassign them to their original positions when possible. In selecting men for patrols, security positions, and even for administrative work such as kitchen police and fatigue details, use buddy pairs, fire teams, and squads as opposed to selecting men at random from the larger unit.

8. **Use of Roads, Trails, and Line-Type Terrain Features in Combat.** Roads and trails are obvious approach routes and usually will be covered with fire, mined, or both. Ambushes usually occur on obvious approach routes. Streams, hedgerows, power lines, ridge lines, wood lines, and similar linear terrain features—either natural or man-made—often mark routes toward an enemy objective. Use of such routes invites ambush on terrain specifically selected by the enemy to give him the advantage. Movement parallel to existing routes merely demands added surveillance by the enemy, plus communication that will permit forewarning and shifting of an ambush group to a preselected position on the appropriate side of the route. Movement along or parallel to line-type terrain features often will be anticipated by the enemy. Except where terrain is extremely rough or where the mission requires movement on an obvious route the enemy may best be evaded en route to an objective to his rear by plotting a dead reckoning route cross-country between well defined checkpoints. Even when the mission demands

reconnaissance of a route or clearing of a route, advantage may be gained by moving cross-country on the outgoing route and striking or observing an enemy from the rear on a return route. In training, emphasize navigation cross-country under limited visibility conditions by dead reckoning. Once dead reckoning procedures are mastered, the junior leader is less likely to select an obvious route to avoid disorientation.

9. Use of Stealth. Stealth pertains to secret procedure or actions, specifically the accomplishment of a mission undetected by the enemy or detected by the enemy only after it is too late for him to react effectively. The use of camouflage, cover, concealment, quiet movement, and the selection of unlikely approach routes increase stealth, as does the delivery of surprise fire in heavy and accurate volume. The individual soldier, buddy pair, or small unit may maintain surprise after it has been lost by the larger unit of which they are a part. To avoid surprise completely, an enemy must know the location, strength, disposition, and intent of the adversary. Too frequently stealth is associated only with the small reconnaissance patrol operating under limited visibility. Stealth is vitally important in any situation where any degree of surprise is an advantage. Quiet movement with full equipment is an essential skill that must be learned by practice, particularly during limited visibility. Camouflage, which demands that exposed skin surfaces be darkened at night and that man-made silhouettes (skylining) be avoided, is even more demanding during unlimited visibility when colors, texture, and form aid detection, location, and identification. Demand that leaders master stealth procedures early in training and hold them strictly responsible for light and noise discipline and use of camouflage, cover, and concealment during all unit training. The soldier who can be seen, heard, smelled, or otherwise perceived by the enemy, is knowingly or unknowingly violating stealth procedures. Members of a long-range patrol, for example, should refrain from smoking or warming food when an enemy downwind may detect the odors of tobacco smoke or hot food. To judge the effectiveness of stealth in training, require men to move undetected within hand grenade range (about 40 meters) of an alert observer during visibility limited by natural darkness or moderately heavy vegetation. Buddy pairs may alternately move and observe along infiltration lanes 35 to 45 meters apart, or one squad may attempt to infiltrate a defensive perimeter held by the remainder of the platoon. Use of silent weapons demands an even greater degree of stealth. On arrival in an area where vegetation and ground surface are different from the area in which stealth was learned, new learning and practice is demanded. In training and in combat, habitually demand that subordinate leaders enforce stealth procedures as a matter of SOP. Maintain ability to use stealth by weekly practice. Emphasize the value of stealth in night attacks, reconnaissance patrolling, installation and repair of wire lines, the delivery of messages, and in attack by infiltration during all levels of visibility.

10. Debriefing of Patrols. When the staff officer or commander who dispatched the patrol fails to debrief the patrol as a group, do it yourself to obtain maximum information. Make careful notes during debriefing, reorganize the notes, and use them as a basis for reporting and for critiquing patrol performance. Demand real evidence, as opposed to baseless assumptions, for all information reported. Pin the patrol down as to the specific route followed. Emphasize collection of quantitative information coupled with specific time and location factors.

11. Critique of Training and Combat Actions. As soon as possible after training or after a combat action, critique the action with participants and men who may have joined the unit subsequent to the action. In combat, it may be possible to assemble only key leaders for critique of an operation. Ensure that the gist of the critique is passed on to subordinates.

12. Covering Obstacles With Fire. Obstacles such as barbed wire or trees felled across a road cut, are removed with relative ease unless they are covered with fire. When obstacles cannot be covered with observed fire, use mines and boobytraps, including Claymores. If only a few obstacles can be mined and boobytrapped, select the ones most likely to be cleared first by the enemy to make him suspect that all of the others are also mined. Once mines or boobytraps are located, a rope, cable, or wire may be attached to explode them by pulling from a covered position. When practicable, use armcred vehicles for power to pull roadblocks aside after probing for antitank mines.

13. Availability of Time for Planning. As soon as a higher echelon indicates the existence of a plan for an operation, issue a warning order unless ordered to maintain secrecy. Issuance of a warning order may permit both preparation and rest, as opposed to unplanned random activity, prior to an operation. Habitually issue fragmentary order as information becomes available as opposed to waiting until the last minute to issue a complete order. During training, brief for one operation (e.g., defense), then order another (e.g., attack) with minimum time for preparation so that subordinates learn to accept and cope with last minute changes that may be forced by enemy action.

14. Use of Combat Formations. Learn the prescribed combat formations for the platoon and squad and the inherent capabilities and limitations of the formations to facilitate control, maintain dispersion, and deliver a maximum of effective fire on the enemy during and after development of resistance. Emphasize freedom of movement of subordinate units as opposed to rigid centralized control. Use fire teams and squads moving by alternate bounds with the stationary rearward unit covering the moving forward unit to develop resistance. This exposes a few men to locate and fix the enemy and permits the remainder of the unit, plus supporting fires, to be employed effectively against specific resistance.

15. Human Maintenance. Rest, rations, and water are no less essential in combat than in training, but enemy pressure or the opportunity to exploit an enemy weakness often will demand that ammunition supply be given priority over water and rations, and attack or defense may delay opportunity to rest. Do not abandon the standards of three meals a day, eight hours of rest, and adequate water for drinking and minimum hygiene practices. Try aggressively to maintain the standards secondary only to the unit combat mission. Seek to use armored vehicles and aircraft for resupply of ammunition, water, and rations in the order listed. Use returning supply transport for evacuation of casualties and prisoners, thus limiting loss of fighters from the line. Have clean socks sent up with rations as SOP, particularly in damp, freezing weather when trenchfoot is likely to occur. In training and in combat, time small-unit operations under varying conditions of terrain and visibility to gain useful estimates of what your unit can accomplish within specific time limitations. Permit troops to use time gained by efficient work for rest or to exploit unexpected opportunity to cause enemy losses. Time that could be used for needed rest often is wasted in "hurry up and wait" action scheduled by incompetent leaders.

16. Search of Unit Area on Departure of Troops. Whether after a rest halt by a patrol or the departure of the unit from a defensive position, ensure that subordinate leaders check men for adequate weapons, ammunition, clothing, and equipment, and check the area for abandoned materiel and information of value to the enemy. Excess materiel in defensive positions should be stacked in a specified central location for recovery by the supply sergeant. On patrols, ration packages and even tracks (footprints) may disclose existence of the patrol and facilitate ambush. In training, a detailed search of your own and other troop training areas immediately after departure of troops often

will permit valuable government property to be reclaimed. Encourage your men to recover useful items to avoid shortages within the unit. When enemy equipment and supplies are located, report the facts to your CO. Enemy property not salvageable for friendly use should be destroyed to prevent possible recapture. Demand—in training and in combat—that individual weapons be kept in hand for immediate use and that individual web carriers be kept as fully loaded and as immediately available as practicable.

17. Action at Danger Areas. Open areas, roads, streams, and defiles are good examples of danger areas. Any area occupied by the enemy, likely to be occupied by the enemy, or covered by enemy observation and fire is a danger area. Prior to movement, study available maps and aerial photographs to identify danger areas and plan tentatively how to cross or by-pass them. Remember that a platoon in a column of two's with five meters between men is over 100 meters long. Use a formation that will minimize total exposure time and still maintain dispersion at danger areas. For example, after the point has scouted the flanks and far side of an open area, each squad may cross in line covered by the other two squads. Prior to crossing, the scouts must reconnoiter sufficiently far ahead to provide some maneuver room on the far side. If the scouts draw fire, battle drill may be used to close with and assault the enemy or the enemy may be by-passed, depending upon the demands of the mission. Streams, roads, trails and small valleys often may be crossed on the elbow of a bend to reduce enemy changes of observation. All members of the rifle platoon must be qualified to act as point men with the leading element and so must be able to recognize, report, and reconnoiter danger areas. Unless danger areas are recognized and by-passed or crossed methodically under immediately available covering fires, ambush is likely to result. In training designate a squad to ambush the platoon at an unspecified danger area on a preselected route. Observe and critique the recognition and crossing of each danger area, including the one at which the ambush was laid. If stealth is not required and a situation favors it, reconnaissance by fire alone may often draw hostile fire and thus uncover enemy locations. Such development of resistance, where practical, may be a useful preliminary to the exposure of men by movement under immediately available covering fire. But reconnaissance by fire will not always draw return fire. A seasoned enemy will withhold return fire and seek, by waiting, to develop an ambush situation. The designation of checkpoints along a route and keeping a forward observer near the head of the column will facilitate the rapid use of indirect fires against the enemy on contact.

18. Platoon Leaders in Fire Team Leaders' Roles. Except at extremely critical times—such as during an assault at night or when troops think they are pinned down—the platoon leader should not lead the assault on critical enemy positions. This is a job for a fire team, led by its own leader. When platoon leaders attempt to assault enemy objectives singlehandedly, the result too frequently is loss of the leader to enemy fire. In an emergency when the platoon leader leads an assault element, he must employ covering fire and movement or covering fire and maneuver. In training, stress aggressiveness based upon fire and movement or fire and maneuver with the fire team leader acting as a fighter-leader. Keep covering fire from selected elements of the platoon on the objective as long as possible to facilitate the assault of specific positions by fire teams and larger units. Emphasize teamwork as opposed to dramatic (but often fatal) charges by individuals. The well-trained platoon leader will master combat skills in training to a degree that will give him confidence in his ability in battle. By so doing he avoids an apparent necessity to prove his ability to himself or others by reckless behavior in combat. An experienced combat leader is a valuable asset not to be sacrificed lightly. Particularly when he has established his courage and gained the confidence of his men, he should not expose himself uselessly. Critical exposures should be limited to times of crisis when men must have additional encouragement to ensure success of the mission.

19. **Maximum Delivery of Effective Fire.** Prior to World War II, leaders assumed that almost 100 percent of their men would deliver fire in combat. Battlefield investigations during World War II revealed that 25 percent or less were firing their weapons. In Korea, an estimated 60 percent of the men in rifle units consistently delivered fire during attacks and assaults. There are several reasons for failure to fire. The most commonly cited one is that men fear that by firing they will disclose their positions and draw enemy small arms fire. Such thinking ignores the danger from the enemy's indirect fire weapons which, in fact, cause some 65 percent of battlefield casualties. If a soldier takes cover and fails to fire, he is inviting wounds or death from indirect fire. If he moves and fires with his unit to overrun the objective and the observers who are directing fire, he takes the only course that will increase the probability of survival of himself and his comrades. He may fail to fire because he sees no clearly distinct targets that bear even faint resemblance to the targets he engaged during training. So training demands practice in engaging fleetingly glimpsed targets and suspected positions at widely varying ranges as opposed to firing at clearly distinct targets at known distances. A third problem is the individual's veneer of civilization that discourages—indeed, prohibits—the destruction of human life. But the man who will not kill to save his own life often will do so to protect the lives of his fellow soldiers. He must understand that every man who fails to fire is surviving at the expense of his comrades' efforts while contributing nothing in repayment. Once convinced of this, group opinion operates as a terrific force on the man tempted to shirk. Knowledge of these facts must be coupled with training and practice in the use of cover, concealment and camouflage; extensive practice in crawling and rushing under covering fire; realistic practice in target detection and weapons handling; and continual physical exertion to build and maintain physical stamina and self-confidence. Lacking this indoctrination and training, men must learn in combat the skills and knowledges they are entitled to master before being brought under fire. In combat, have squad and fire team leaders identify men who fail to fire and, when possible, help these non-firers to detect, locate, and effectively engage enemy and suspected enemy positions. As reinforcements join the unit, emphasize the need for every man to deliver effective fire in every fire fight. The delivery of supporting fires is no less important. Preplan concentrations for delivery on call. Designate checkpoints to facilitate indirect fire delivery. Insist that all leaders learn to request and adjust indirect fire and that all personnel know how to designate targets for supporting fires. Cover the effectiveness of fire delivery in all critiques.

20. **Use of Pointing (Quick) Fire.** Pointing fire is effective fire delivered on a close target without aiming. It may be delivered from the hip, underarm, or shoulder position. All men have some capacity for delivering effective pointing fire. When assaulting—particularly within hand grenade range—little or no time is available for careful aiming and squeezing. Hasty dispatch of the enemy with minimum exposure of attacking troops will result from effective use of pointing fire. To give the learning soldier the feel of the rifle when he has it properly aligned, run a piece of white engineer tape from the muzzle to the target. Have him shift the rifle until the engineer tape is directly in prolongation with the barrel and then trigger a shot while looking over the barrel at the target with both eyes open. He must concentrate on the target while learning to position the weapon by proprioceptive feedback. Afford sufficient practice to give each soldier some definite idea of his own capabilities and limitations. Most men can deliver lethal pointing fire at distances exceeding bayonet range with a minimum of training. It must be kept in mind that even the most skillful bayonet fighter is neither faster than a bullet nor invulnerable to a bullet from an enemy other than the one he is engaging with the bayonet. Use of pointing fire may be taught in conjunction with bayonet training and should be given at least an equal amount of training time.

21. **Reloading the Rifle in Combat.** The 20-round magazine has no external indicator to show how many rounds are available to the firer at a given time. When the last round is fired the bolt remains to the rear, but there is no audible indication that the weapon is empty. In range firing, with no appreciable stress, men often waste precious seconds fumbling with an empty weapon before they see the open bolt. The problem becomes more acute during limited visibility. It is not feasible under combat stress to count the rounds as they are fired. But necessity to reload must be anticipated or men will be caught unexpectedly with empty weapons at critical moments. Loading a tracer round as the seventeenth round to be fired may furnish visual indication that only three rounds are left. Teach men to charge or reload with full magazines when time and cover permit to ensure maximum possible fire at critical times. Reloading must be done by tactual discrimination; the eyes must be kept on the field of fire. So practice is required. Ensure that magazines are loaded in web carriers so the magazine is always grasped and removed in the correct position for loading without necessity for visual inspection. In training, use many partially filled magazines (as opposed to a few full ones) to force reloading and anticipation of necessity to reload. Another basic fault is holding the rifle so that it blocks part of the field of view and hinders target detection. This happens most frequently from foxhole positions when fire is suspended temporarily due to lack of obvious targets. Force practice in reloading, continuous search for targets over a clear field of view, and charging to refill magazines commencing with initial training with the rifle.

22. **Communication and Control.** Teach all personnel in the platoon how to install, operate, and maintain all communications equipment organic to the platoon, including location of breaks and wire splicing, siting of radio sets, and recognition of most commonly used pyrotechnics. During training, deliberately select and deny the use of one or two means of communication for periods of several hours to force use of other means. Habitually consider the effect of terrain and vegetation on radio communication when making map or terrain reconnaissance. Install dual wire lines over covered and concealed routes in defense; seek aid from company and battalion to accomplish this end. Habitually connect control and security positions with a "hot loop" in defense. Rotate radio operators to give practice in operation to all platoon members. Insist that wire crews follow stealth procedures to avoid ambush when installing or repairing wire lines. Train every man in the platoon in the knowledges and skills of foot messengers.

23. **Deployment Prior to Exposure to Enemy Fire.** Through the use of point and flank security, including small patrols, seek to deploy the platoon and obtain maneuver space before contact is made with the enemy. Seek a balance between dispersion that will reduce the effects of enemy fire, and control that will permit rapid, effective engagement of the enemy. Effective communication facilitates control and permits increased dispersion. During training, explain the reason for changing formations each time a change is ordered.

24. **Auditory and Visual Location of Enemy Supporting Weapons.** During limited visibility both muzzle flash and sound may indicate the location of enemy mortars and guns. To localize sound, keep the head and eyes fixed initially toward the sound. Turn slightly to the right or left until you are sure that you are looking directly toward the sound. Pick up a visible steering mark, such as a small tree trunk, directly on line between you and the sound source. Use the compass to obtain a magnetic azimuth from your position to the visible steering mark. Two such azimuths, each taken from a different known point on the same sounds of firing, will intersect when plotted on a map to give a reasonable estimate of the location of the weapons. Azimuths to muzzle flashes

obtained in a like manner may furnish even more accurate information. Such reports can furnish data for counterbattery fires and thus reduce the enemy indirect fire capability. These techniques can be demonstrated and practiced in conjunction with firing scheduled for the 81-mm mortars.

25. Accurate and Timely Reporting. Habitually report initial contact and results of contact with the enemy to facilitate support and planning by higher and adjacent units. Prompt reporting of targets facilitates engagement with indirect fires and permits time to coordinate close air support when such support is available and the target warrants its use. Target acquisition is facilitated when all members of the platoon recognize and report targets suitable for engagement with indirect fires. Leaders and attached forward observers rarely will be able to see in detail all of the terrain for which the unit is responsible. Dust, smoke, darkness, precipitation, vegetation, and variation in elevation demand target designation by all personnel to ensure security of the entire sector.

26. Preparation of Objective for Limited Visibility Defense. Whenever possible, site weapons, mark fields of fire with stakes, prepare range cards, plot concentrations, and provide firm rests for weapons' butts and forearms by day to facilitate delivery of overlapping bands of grazing fire during limited visibility. These preparations apply equally to defense by day during visibility limited by smoke and dust. Use machineguns and automatic rifles to cover wide areas of relatively level terrain with grazing fire. Cover gulleys and similar narrow approach routes with rifle fire and mines and noisemakers. Cover defiladed areas with hand grenades, grenade launchers, and artillery or mortar fires. If a defense must be established during limited visibility, inspect and improve it at first light or as soon as visibility and enemy pressure permit. Know the locations and identifications of key concentrations and barrages planned for your sector and disseminate pertinent locations and identifications to subordinates through assigned leaders.

27. Variation of Activities of Contact Patrols. Vary the departure times and routes of contact patrols to prevent the enemy from fixing an ambush or infiltration as to time and place. Demand use of stealth and frequent halts to observe from concealed positions by contact patrols.

28. Effect of Tree Bursts. When practicable, avoid defending in wooded areas that will permit the enemy to obtain tree bursts over defensive positions. If 150-200 meters of clearance can be obtained from the edge of a wooded area, enemy indirect fires will be less effective, and danger from falling treetops and branches will be avoided. Communication wire placed overhead within wooded areas is likely to be broken by tree bursts and falling branches. In wooded areas, lay the wire on the ground away from most-used routes. Leave 20 percent slack to avoid breaks when men trip over it. Bury it at least six inches deep at trail crossings. Provide overhead cover for foxholes within wooded areas to reduce danger from tree bursts.

29. Treatment and Evacuation of Casualties. When any mission—such as an attack against a strongly defended position—indicates unusually high casualty rates, seek litter bearers, additional medical corpsmen, and medical supplies to accompany the attacking unit. En route forward look for and designate routes for resupply and evacuation. Designate a covered and concealed position on defended objectives where casualties can receive treatment and be kept as quiet as possible pending evacuation. Seek a central location, away from the fighting holes, CP-OP, and aid station, for placing bodies pending recovery by graves registration personnel. Some men will object to seeing the bodies of

their comrades placed with enemy bodies; maintain a separation. Do not expose men to fire to collect bodies, but remove them from the battlefield when the situation permits for the sake of sanitation and morale.

30. **Recognition and Treatment of Combat Fatigue.** Prompt treatment is the key to preventing losses due to combat fatigue. This demands recognition of symptoms. Leaders must become acquainted with their men as soon as possible so they recognize changes in behavior that indicate need for professional attention. If the platoon clown ceases to make jokes and spends most of his time in a hole, the change in behavior is apparent. The quietly efficient soldier who becomes overly talkative and tends to laugh too loudly at events that might at most evoke a smile probably is displaying serious symptoms of anxiety. Constant complaints about the same subject, verbalized "fore-warnings" of death, complaints of dizziness, difficult breathing, impaired vision, and heart palpitations may be indications of increasing fatigue. All of these are short of hysterical running away or the loss of contact that lets the soldier ignore danger completely and finds him numb with anxiety. Detected early, combat fatigue in the soldier may be overcome with a day or two at the division clearing station, one or two nights of sleep (possibly aided by a sedative) some hot food, clean clothes, and a firm explanation that his "nerves" are not "shot" and that he is capable of doing his part. All leaders should be alert for unusual behavior, using everyday observed behavior of the individual as a standard. Remember that early treatment facilitates recovery, but consider, too, that three or four days of severe combat, with deprivation of sleep, food, and water, will place an entire unit in an extremely fatigued condition. Some of the members may behave irrationally. Given an opportunity to eat, sleep, bathe, and change clothes, most of these men will be ready to fight again. Each individual must be considered as a separate case. If the man's behavior is a hazard to himself or to other members of the unit, he should be evacuated, even when fighters are at a premium. There is always the question as to whether a man is malingering. The man who feigns illness is often afflicted beyond his own awareness and is a hazard to himself as well as others around him. He cannot be relied upon in dangerous situations and he often will be a burden. There is no place for him in a rifle company. The leader who is plagued with persistent feelings that his unit always gets the toughest assignments, that his unit is "falling to pieces," that supplies are being distributed unfairly, etc., will do well to voice his feelings to the unit surgeon, too, for these may be indications of combat fatigue. A combat fatigue casualty, upon recovery and return to duty, should be treated as warmly as a man who suffered a bullet or fragment wound and returned.

31. **Supervision of Issue of Rations and Water.** Have subordinate leaders issue rations and water to their own men, particularly when a short supply exists. Ensure that the men on patrols and on security positions are accounted for and supplied. Presence of the leader not only should ensure equitable distribution but should enforce dispersion against enemy fire at the distribution point. Leaders should habitually see that their men receive rations and water before taking their own share.

32. **Effect of Sleep Loss.** Loss of sleep causes lapses in performance, interferes with recall of recently received orders and instructions, and contributes to combat fatigue. Loss of one night's sleep may affect performance on the following day only when the individual has an opportunity to relax. Then the natural tendency is to go to sleep. Two successive days and nights without sleep will increase the difficulty of concentration and cause irrational but short-lived periods of anger. Some form of activity, movement, or a demand for attention (such as an attack) are required to keep him awake. Placed on a listening post, he would very likely be asleep in a few minutes despite

an earnest desire to stay awake. As the day after the second night of sleep deprivation wears on, speech lapses and unreasonable statements may occur. He may have hallucinations. Even so, he can react reasonably well to an attack, return fire, and respond to specific orders as long as motivation is both direct and intense. But it becomes more and more difficult for him to keep his eyes open. He may continue this pattern for a third and even a fourth night, but the severity of the symptoms increases and increasing amounts of activity are demanded to keep him awake. A full night of sleep will largely restore him to his usual level of performance. Food—particularly with a high sugar content—provides energy and aids men to remain awake despite sleep deprivation. Hot coffee, tea, chocolate, soup, and issue ration supplements aid wakefulness, particularly at night. Men who must stay awake throughout a night need extra food. Contact with leaders will also help a man to keep awake, as will harassing fire from the enemy. The alert security in a well-trained unit permits men not on alert status to relax and gain needed sleep. Short reliefs at security positions work against sleep, as do electronic checks by telephone and radio. Fortunately, most combat soldiers learn to snatch sleep at every opportunity, so rarely will the soldier have to go without any sleep for several successive days and nights. Keep only one or two men awake in each squad, except when there is a direct threat of attack. Keep reliefs short and encourage men to sleep when action permits. During training, cause men to lose sleep for two consecutive nights so they learn to recognize the effect of sleep loss and experience the necessity to gain sleep when possible. Emphasize the necessity for maintaining alert and efficient security posts so that men not on alert status can relax with confidence that they will be awakened if the enemy attacks. Many men require several minutes after awakening before they are alert enough to react effectively. The ability to awaken to almost instant alertness is often vital to survival in combat and it can probably be developed in training. Have squad and fire team leaders identify men who are slow to react at first call and ensure that they "hit the deck" in minimum time. Early morning small-unit alert practices, though unpopular, may make the difference between unit survival and defeat in combat.

33. Use of Tanks in Defense. Effective use of tanks demands employment of an entire platoon, or at least a section with a mission that utilizes the mobility, armor-protected firepower, and shock action characteristic of tanks. Avoid use of a single tank as a mobile pillbox. Based on the recommendations of the tank leader, assign each tank a hull-defilade position and a principal direction of fire. Tanks may be kept in defilade to the rear of preselected individual positions and moved forward over carefully reconnoitered routes to the positions when this fire is required. As soon as the enemy attack is beaten off, the tanks back down into defilade to avoid drawing long-range, direct fire. In addition to furnishing general support from preselected hull-defilade positions, tanks may be used as a mobile counterattack force, preferably to strike the attacking enemy in the flank. The line of departure for the tanks is usually marked by the infantry unit's frontline positions. Again, routes forward for each individual tank must be carefully reconnoitered and cleared of mines. Each tank commander must know the location of friendly troops. Commit the tanks against enemy threat to penetrate the position to defeat the enemy in front of the position. The tanks may attack alone toward a specified objective or merely make a sweep and return via a flank to defiladed positions to the rear of the company to resume support by fire. Or, as the tanks cross the frontline positions, infantry may join them to make a coordinated, limited objective attack. Tanks may use white phosphorous (WP) smoke to cover withdrawal provided the smoke is not blown toward friendly positions to cover a possible enemy advance. When a tank platoon is employed, two tanks (section) may support the attack from hull-defilade within the company perimeter. If tanks attack alone, use air bursts over them during the attack as protection from enemy tank killer teams and antitank gunners. In heavily wooded areas,

tank support may be limited to support by fire from hull-defilade positions. In a perimeter defense, include the tanks within the perimeter in defilade, if terrain permits, to protect them from dismounted enemy. In training, seek opportunity to conduct infantry tank training through liaison with local tank units so men learn firsthand the capabilities and limitations of tanks.

34. **Use of Armored Vehicles for Resupply and Evacuation.** Speed, load-carrying capacity, armor protection, and availability of automatic fire in heavy volume combine to make armored vehicles useful for resupply and evacuation over routes subject to enemy infiltration, observation, and fire. Load and unload in concealed, defiladed positions to avoid enemy fire. Even during limited visibility engine sounds may draw fire.

35. **Enemy Artillery as a Warning of Attack.** Receipt of artillery fire over all or the major part of a defensive position frequently will be followed by an attack by infantry, or tanks, or both. A shrewd enemy may halt delivery of artillery for five or ten minutes to lure men into upright positions, then resume delivery hoping to catch men exposed and unaware. Americans are prone to emerge from their foxholes and congregate in groups to be caught in the open by indirect fires. Demand that men stay in their holes and improve them. When enemy concentrations signal a possible attack—particularly if the defensive position is smoked—designated alert personnel must watch for a follow-up attack while other members of the unit wait, protected in their holes, for either an attack or a resumption of indirect fires. Delivery of small arms fire by friendly or enemy troops is the cue to take firing positions and engage attackers. Use artillery simulators during training to simulate enemy preparatory fires and harassing fires.

36. **Use of Smoke to Deny Enemy Observation.** When the source of enemy fire cannot be determined to permit accurate counterfire, place smoke between your position and the enemy to deny observation. Do not use smoke if wind direction (toward you) would aid the enemy to advance under cover of the smoke. Use sound and any indication of projectile path to locate direct fire weapons for delivery of retaliatory fire. A combination of WP and high explosive, point detonating shells placed on suspected enemy weapons positions may destroy the position, drive the gunners to shelter, or mask their observation. All personnel must habitually seek to locate and designate the positions of enemy direct fire weapons by reporting to their leaders.

37. **Coordination With Attached and Supporting Troop Units.** To control supporting units it is essential that their status is made clear to both leaders—the supported leader and the supporting leader. Weapons and crews may be placed in *general support*, *direct support*, or *attached* status to the supported unit. For example, the 81-mm mortars usually provide general support for all or a major part of the rifle company. The company commander controls the mortars through the weapons platoon leader and support ideally is furnished to all rifle platoons from a central position. Thus the rifle platoon leader receives supporting mortar fires without any concern for supply, movement, or control of the mortar crews. The forward observer for the 81-mm mortars, however, may be *attached* to the rifle platoon. So control and supply of the forward observer is a responsibility of the platoon leader. If a fire support element is placed in *direct support* of another unit, the supporting unit is responsible for selecting firing positions and controlling movement to provide the support desired. Attachment is the most frequently occurring status of troops working directly with the rifle platoon. The platoon leader is responsible for control, tactical employment, and supply of attached personnel and weapons. Ensure that appropriate attached or supporting personnel are present when orders are issued and information is disseminated. Treat attached personnel

as members of your unit and, when supporting units do either an outstanding job or fail to furnish adequate support, report the facts to your CO. Seek the recommendations of attached and supporting leaders or their representatives in planning, but exercise control in accordance with the status of the supporting unit. In training, and in combat, seek an informal arrangement to obtain the same individuals repeatedly as forward observers and medical corpsmen so they learn platoon SOP. Ensure that all leaders know the characteristics of weapons and vehicles that most commonly support the platoon so that maximum efficiency and coordination will result.

38. Communications Security. Neither wire nor radio are secure means of transmitting information of value to the enemy in the clear. In training, use brevity codes provided by the SOI when transmitting "classified" information. If security is not maintained by following prescribed procedures during training, the security violations or a slowed message transmission may result in combat. Frame messages mentally, or in writing, prior to transmission and examine the contents of each message from an enemy point of view. For example, a desperate plea for both officer and enlisted replacements indicates a weakness if the enemy intercepts the message. Use of wire eliminates radio intercept, but clear text may be intercepted by line tapping by infiltrators.

39. Installation of Wire and Mines in Defense. Both of these tasks often must be initiated at platoon level in the absence of supporting engineers. All riflemen must know how to site, install, fire and salvage Claymores and how to install barbed wire. Teach men to use tripwired hand grenades as substitutes for antipersonnel mines when installing obstacles. In training, require two squads to install barbed wire, practice mines, and practice boobytraps, then have the other two squads breach the position by using fire and movement. Reverse the roles for additional learning.

Appendix B

SUBJECT AREAS AND SCOPES ENCOMPASSING THE CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE PLATOON LEADER

Foreword

A research by-product was produced to describe the critical combat performances, knowledges, and skills required of the IRPL for 41 of the subject areas shown on the following list. It was anticipated that the Infantry Rifle Platoon Leader (IRPL) may serve in any type of combat environment under conditions characterized by discontinuous fronts and dispersed engagements, including engagements with guerrilla forces as well as regular units. It was further anticipated that in addition to the consideration given to the effects of the *enemy*, *weather*, and *terrain* upon operations, like consideration must be given to the role of the *indigenous* population when planning and conducting operations.

The IRPL must live under the same primitive conditions, face the same enemy, and endure the same hardships and stresses as do his men. He must plan, initiate, direct, and supervise the employment of his men and weapons and make effective use of all support available to him. He must closely observe the performance of his men as they react to battlefield cues and correct errors, specify effective procedures, and overcome technical difficulties with weapons, communication equipment, transportation, and all other materiel organic to or frequently available to his unit. His movement under fire is likely to exceed that required of any other member of his platoon because of his need to gain information at forward vantage points and move to forward locations of subordinate leaders to issue orders and instructions. He must lead his platoon effectively while fighting as part of a larger force or when operating as a detached and isolated unit engaged in patrolling. Thus, he must master all of the performances, knowledges, and skills required of his men as well as those required of him as a leader. Tactically and technically he must be the best qualified Infantryman in his platoon if he is to survive, set the example, control his men and fires effectively to accomplish his mission with minimum losses, and pay due attention to the training and welfare of his men.

It is *not* anticipated that the IRPL will acquire all of the performances, knowledges, and skills recorded in the research by-products while he is a resident student at the U.S. Army Infantry School. The intent was to record all critical combat performances, knowledges, and skills required of the IRPL to aid in planning his training prior to, during, and after attendance at USAIS.

1. Mission, Organization, and General Operation of the Rifle Platoon

Platoon

This paper covers the platoon mission, organization, and major duties of platoon members; troop-leading procedure; estimate of the situation; operation order; fundamentals of employment; effects of nuclear weapons; tactical operations in nuclear warfare; chemical and biological operations; action against enemy aircraft; use of assembly areas; intelligence; communication; fire support available from higher echelons; and the critique of combat operations. The contents of this paper relate directly to all other LEAD I papers.

2. Offensive Operations

This paper is concerned with the performances, knowledges, and skills required of the IRPL in planning, coordinating, and supervising the offensive operations of his platoon. Few of these performances are peculiar to offensive operations. Most are equally essential in other combat operations. For example, troop-leading procedure is necessary in every situation; proper use of camouflage, cover, and concealment is required whether attacking, defending, or patrolling; and the assembly area is organized for defense just as is any other position occupied. Similarly, the knowledges and skills necessary for these performances are acquired, applied, and perfected in all combat areas. Because of this close relationship to other combat areas, the performances, knowledges, and skills required of the IRPL in offensive operations cannot be isolated from those required in the other areas. Therefore, all papers in this series relate to offensive operations, the most directly involved being *Mission, Organization, and General Operation of the Rifle Platoon; Defensive Operations; Tactical Movement; Squad Formations, Battle Drill, and Elementary Fire and Maneuver; Technique of Fire of the Rifle Squad; Mounted and Dismounted Platoon Combat Formations; Patrolling; Radio Communication; Visual, Sound, and Tactual Communication; Use of Indirect Supporting Fires; Observation, Combat Intelligence, and Reporting; and Cover, Concealment, and Camouflage.*

3. Defensive Operations

The performances, knowledges, and skills listed are required for an IRPL to know the mission of a rifle platoon in defense, types and echelons of defense, and the fundamentals of defense; to employ a forward rifle platoon in defense, including troop-leading procedures, preparation for defense under conditions of limited and unlimited visibility, and use of rifle and weapons squads in defense; to employ the rifle platoon as the reserve of a forward rifle company in defense, on the combat outpost, in a reverse slope defense, in a perimeter defense, in the defense of a river line, in the defense of a road block, in defense against tanks, in a relief in place, and as a mechanized rifle platoon in defense; and to conduct the types of defense listed above under conditions of limited and unlimited visibility.

4. Retrograde Operations

This paper covers the performances, knowledges, and skills required for the IRPL—whether commanding an Infantry, Airborne Infantry, or Mechanized Infantry platoon—to plan, prepare for, direct, and supervise his platoon's employment in voluntary withdrawals; as a forward platoon, or as the reserve platoon, in involuntary withdrawals; in delaying actions; and in retirements.

Directly related material is contained in the papers on *Mission, Organization, and General Operation of the Rifle Platoon; Offensive Operations; Defensive Operations; Tactical Movement; Squad Formations, Battle Drill, and Elementary Fire and Maneuver; Technique of Fire of the Rifle Squad; Mounted and Dismounted Platoon Combat Formations; Patrolling; Land Navigation; Use of Indirect Supporting Fires; Mines, Anti-tank and Antipersonnel, and Warning and Illuminating Devices; Cover, Concealment, and Camouflage; and Emplacements, Shelters, Obstacles, and Fields of Fire.* Mastery of the material contained in these papers is necessary and is assumed, and is repeated only as required for clarification and maintenance of continuity of thought. In like manner, undue repetition is avoided of the material contained in *FM 7-15, Rifle Platoon and Squads; FM 7-11, Rifle Company; and FM 7-20, Infantry Battalions.* The reader is specifically referred to these publications.

Except as specifically indicated and explained, the performances, knowledges, and skills discussed here are equally applicable to both the Infantry rifle platoon and the Mechanized rifle platoon.

5. Airmobile Operations¹

This paper presents the performances, knowledges, and skills required of the IRPL to plan, coordinate, and execute airmobile operations when his platoon is operating as an integral part of his parent company and when operating as a separate, reinforced unit directly under battalion or higher control. Coverage includes the characteristics, capabilities, and limitations of commonly employed aircraft; the reverse planning procedure; the establishment of SOP and the conduct of staging, loading, air movement, and air landing; the selection, defense, clearing, marking, and operation of emergency LZs/PZs for aeromedical evacuation, resupply, extraction, and reinforcement, including the content of requests for support; and the control and planning of aerial fire support, including aerial illumination, for offensive, defensive, retrograde, and patrolling operations. Throughout the paper heavy emphasis has been placed upon the knowledges and skills that will increase safety for airmobile personnel during combat operations. Because airmobile operations are still in the formative stage, effort was made to show the reasoning underlying the performances, knowledges, and skills recorded herein.

The availability of airmobile resources is likely to affect virtually every facet of combat operations. Therefore, the content of this paper is directly related to the content of all other papers comprising the LEAD series, with particular emphasis upon *Offensive Operations*; *Defensive Operations*; *Retrograde Operations*; *Patrolling*; and *Use of Indirect Supporting Fires*.

6. Tactical Movement

This paper covers the critical combat performances, knowledges, and skills required of the IRPL when directing the tactical movement of the platoon, both when acting alone and as part of a larger force. The coverage includes security and control measures; night movement; the rifle platoon as advance party, flank guard, and rear guard for the battalion; the rifle platoon as part of the advance guard or main body; the rifle platoon as part of a motorized column movement; the rifle platoon as a motorized or mechanized advance party or as a mounted flank guard for the battalion; and the rifle platoon attacking from a march column, reacting to counter an ambush and attacking against roadblocks.

An assumption is made that if the IRPL has mastered the knowledges and skills required of his subordinates, he can instruct them and supervise their activities to ensure an acceptable performance.

Closely related material will be found in the papers on *Mission, Organization, and General Operation of the Rifle Platoon*; *Offensive Operations*; *Airmobile Operations*; *Squad Formations, Battle Drill, and Elementary Fire and Maneuver*; *Mounted and Dis-mounted Platoon Combat Formations*; *Patrolling*; *Land Navigation*; *Radio Communication*; *Messenger Communication*; *Visual, Sound, and Tactual Communication*; *Use of Indirect Supporting Fires*; *Observation, Combat Intelligence, and Reporting*; *Counter-intelligence*; *Cover, Concealment, and Camouflage*; and *Protection Against Mines, Booby-traps, and Warning and Illuminating Devices*.

¹Originally the scope of this subject area also included *airborne* operations. In view of application to the larger segment of the IRPL population, the available research time was focused upon *airmobile* operations.

7. Squad Formations, Battle Drill, and Elementary Fire and Maneuver

This paper covers fire team and squad formations, the application of effective fire and maneuver with a minimum of orders from leaders, and the proficiency the platoon leader must demand from his squad leaders, fire team leaders, and fire team members during tactical operations.

Closely related material is presented in the papers on *Mounted and Dismounted Platoon Combat Formations; Patrolling; Mission, Organization, and General Operation of the Rifle Platoon; Tactical Movement, and Technique of Fire of the Rifle Squad.*

8. Technique of Fire of the Rifle Squad

The performances, knowledges, skills, habits, and attitudes covered in this paper are those the IRPL must possess to train and lead in combat the rifle squads of the rifle platoon. Where the knowledge or skill in question is one which must be possessed by members of the rifle squad, it is assumed that the IRPL is also qualified and motivated to train his squads to an acceptable standard of proficiency.

This paper deals in greater detail than normal with the precombat training of the rifle squad since combat conditions will often preclude the IRPL's direct control, making precombat training of increased importance.

The combat control of the IRPL of the delivery of fire by his rifle squads includes leadership and supervision in the assignment of firing missions, positions and tactical objectives, instructions relative to initiation and maintenance of fire, including the supervision and control of fire once opened through his squad leaders.

The material in this paper is directly related to all of the papers on tactical operations, especially those papers covering tactical movement and squad formations, battle drill, and elementary fire and movement. Directly related information will be found in the papers on *Mission, Organization, and General Operations of the Rifle Platoon; Offensive Operations; Defensive Operations; Mounted and Dismounted Platoon Combat Formations; and Patrolling.*

9. Mounted and Dismounted Platoon Combat Formations

This paper covers the standard mounted and dismounted platoon combat formations, including integrated infantry tank formations, that must be employed by the IRPL to control his men and fires in combat. The material contained in this paper is directly related to the material covered in the papers on *Tactical Movement; Offensive Operations; Retrograde Operations; Patrolling; Squad Formations, Battle Drills, and Elementary Fire and Maneuver; Land Navigation; Use of Indirect Supporting Fire; and Cover, Concealment, and Camouflage.*

10. Patrolling

This paper covers the performances, knowledges, and skills necessary for the IRPL to employ his platoon effectively in the conduct of patrolling operations under all conditions of weather, terrain, and visibility in both conventional and counter guerrilla operations. It differentiates the responsibilities the IRPL incurs in the various command roles he may assume and, concurrently, emphasizes the unavoidable overlapping of these responsibilities. Because patrolling requires the proficient execution of *all* of the performances, knowledges, and skills of the IRPL, all material contained in other papers is directly related. (Additional details covering patrolling techniques are contained in Part Two, FM 21-75, *Combat Training of the Individual Soldier and Patrolling.*)

11. Land Navigation

The performances, knowledges, and skills are given which are necessary for the IRPL to use the compass and maps or map substitutes to obtain knowledge of the terrain; to receive and transmit orders, instructions, and intelligence information; to select routes and checkpoints and prepare quantitative route descriptions for his own use and for use by subordinates; to supervise the performance of compass men and pace men during navigation over all types of terrain during all levels of visibility; and to navigate over unfamiliar terrain by map-terrain association when the existence of distinct terrain features and the level of visibility will permit.

Directly related material is presented in *Observation, Combat Intelligence, and Reporting* and *Use of Indirect Supporting Fires*.

12. Radio Communication

Performances are cited outlining the technical proficiency required of the IRPL to plan, coordinate, and supervise radio communication; to perform and supervise user maintenance; to site, operate, pack, and transport the radio sets and accessories organic to the rifle platoon and those accessories available from company headquarters for special missions; and to fabricate and use expedient antennas including the vertical half-rhombic, long-wire, and field-expedient ground plane antennas. Transmission security (including authentication), netting of radio sets, use of SOI and SSI, use of simple coding systems, and use of radio-telephone procedure (including use of the phonetic alphabet), numerals and the military time system, required to operate communications equipment are set forth under operation. Destruction of communications equipment is listed as a leader and operator responsibility. Closely related material is presented in *Wire Communication; Messenger Communication; Visual, Sound, and Tactual Communication; and Cover, Concealment, and Camouflage*.

13. Wire Communication

This paper outlines the technical proficiency required of the IRPL to plan and coordinate wire communication and to supervise installation, operation, safeguarding, maintenance, and recovery of wire communications equipment organic to or available to the platoon. Field wirelaying and recovery, splicing, and the installation and operation of field telephones, including field-expedient use of the TA-1/PT and TA-312/PT telephones, are covered. Transmission security (including authentication), use of the SOI and SSI, use of simple coding systems, use of the phonetic alphabet, numerals, and military time system, and the destruction of communications equipment to prevent capture are set forth in *Radio Communication* and are not repeated herein. Closely related material is presented in *Land Navigation; Observation, Combat Intelligence, and Reporting; Cover, Concealment, and Camouflage; Protection Against Mines, Boobytraps, and Warning and Illuminating Devices; Antipersonnel Mine, M18A1 (Claymore); Demolitions and Boobytraps; Messenger Communication; Maintenance of Clothing and Equipment; and Counterintelligence*.

14. Messenger Communication

Included in this paper are the knowledges, skills, and performances required of the IRPL to write messages and to instruct and supervise the performance of messengers. Procedures for delivery of written and oral messages, messenger briefing, destruction of messages when capture appears imminent, and necessity for speed are covered in this paper. Use of the challenge and password appears in *Observation, Combat Intelligence, and Reporting*. Additional closely related material appears in *Land Navigation; Cover,*

Concealment, and Camouflage; Protection Against Mines, Boobytraps, and Warning and Illuminating Devices; Radio Communication; Wire Communication; Counterintelligence; and Physical Conditioning. The production of map overlays is covered in *Land Navigation* and is not repeated herein.

15. Visual, Sound, and Tactual Communication

This paper describes the knowledges, skills, and performances required of the IRPL to control men and fires in combat with visual, sound, and tactual means of communications. Use of standard arm-and-hand, flag, and panel signals, initiation of and response to prearranged and SOP sound signals, use of pyrotechnic signals, and the use of tactual communication techniques are covered.

Closely related material is presented in *Patrolling; Mounted and Dismounted Platoon Combat Formations; Offensive Operations; Defensive Operations; Airmobile Operations; Squad Formations, Battle Drill, and Elementary Fire and Maneuver; and Cover, Concealment, and Camouflage.*

16. Use of Indirect Supporting Fires

This paper covers the knowledges, skills, and performances required of the IRPL to detect, locate, and identify targets suitable for engagement with mortar and artillery fires; the adjustment, care, and use of binoculars to aid target acquisition, measure horizontal and vertical angles, and spot bursts; the formulation and transmission of calls for fire, the spotting of bursts, application of the mil relation to determine corrections, transmission of corrections, and the surveillance of fire for effect as these procedures apply to the *target-grid* method of fire control. Range estimation; use of the *creeping* and *bracketing* methods of adjustment; the adjustment of deviation, range, and height of burst during illuminating missions; use of WP shell; and the application of combat-tested techniques of fire planning and employment are covered. In addition, the employment of the 81-mm mortar without an FDC is covered to ensure adequate performance by the IRPL when an 81-mm mortar crew is attached to the rifle platoon during semi-independent operations. Directly related material is contained in the papers on *Observation, Combat Intelligence, and Reporting; Land Navigation; Mines, Antitank and Antipersonnel, and Warning and Illuminating Devices; Radio Communication; Wire Communication; Visual, Sound, and Tactual Communication; and Infrared Weaponsight and Image Intensification Devices.* The material pertinent to fire planning is directly related to all of the papers on tactical operations, including *Patrolling.* (The designation of targets for attack by armed helicopters and fixed-wing aircraft is covered in detail in *Airmobile Operations.*)

17. Rifle, 7.62-mm M14

This paper sets forth the knowledges, skills, and performances required of the IRPL to use and supervise the use of the M14 rifle as an individual, semiautomatic weapon. Inspection, the engagement of targets from point-blank to maximum effective range during all levels of visibility, reloading, maintenance, safety, and destruction to prevent capture are covered in adequate detail. An assumption is made that if the IRPL masters the knowledges, skills, and performances required of his men, he can instruct them and supervise their activities to ensure an acceptable performance. Target detection is covered in the paper on *Observation, Combat Intelligence, and Reporting.* Additional directly related material is covered in the papers on *Bayonet Knife and Hand-to-Hand Combat; Technique of Fire of the Rifle Squad; Mounted and Dismounted Platoon Combat Formations; Infrared Weaponsight and Image Intensification Devices; Cover, Concealment, and Camouflage; Physical Conditioning; and the LEAD papers covering tactical operations.*

18. Rifle, 5.56-mm, M16

This paper covers the critical combat performances, knowledges, and skills required of the IRPL when using and supervising the use of the M16 rifle as an automatic or semiautomatic weapon to include zeroing, firing positions, delivery of fire, rapid reloading, maintenance, immediate action, safety, and destruction. It is assumed that if the IRPL masters the knowledges, skills, and performances required of his subordinates, he can instruct them and supervise their activities to ensure acceptable performance.

Closely related material will be found in *Squad Formations, Battle Drill, and Elementary Fire and Maneuver; Patrolling; Technique of Fire of the Rifle Squad; Offensive Operations; Defensive Operations; and Infrared Weaponsight and Image Intensification Devices.*

19. Rifle, 7.62-mm, M14A1

This paper sets forth the knowledges, skills, and performances required of the IRPL to use and supervise the use of the M14A1 rifle to deliver effective automatic and semiautomatic fire. Inspection, zeroing, sight-setting, the engagement of stationary and moving targets from point-blank to maximum effective range during all levels of visibility, fire distribution, reloading, maintenance, safety, and destruction to prevent capture are covered in adequate detail. The IRPL is cast in the role of the automatic rifleman for the purpose of this paper and it is assumed that his mastery of the critical knowledges, skills, and performances will ensure the adequate training and supervision of the automatic riflemen assigned to his platoon. Target detection is covered in the LEAD paper on *Observation, Combat Intelligence, and Reporting.* The use of binoculars and night-vision devices to aid target acquisition and the adjustment of fire are covered in *Use of Indirect Supporting Fires (binoculars) and Infrared Weaponsight and Image Intensification Devices.* Additional directly related material is covered in *Technique of Fire of the Rifle Squad; Mounted and Dismounted Platoon Combat Formations; Cover, Concealment, and Camouflage; Physical Conditioning; and the LEAD papers covering tactical operations.*

20. Grenade Launcher, 40-mm, M79

This paper outlines the knowledges, skills, and performances required of the IRPL to use and supervise the use of the 40-mm, M79 Grenade Launcher. It presents information on the Grenade Launcher's capabilities, the delivery of accurate direct and indirect fire, the employment in tactical situations, safety procedures, maintenance, and destruction to prevent capture. An assumption is made that if the IRPL masters the knowledges, skills, and performances of his men, he can instruct them and supervise their activities to ensure an acceptable performance. Closely related material is presented in *Mission, Organization, and General Operation of the Rifle Platoon; Offensive Operations; Defensive Operations; Retrograde Operations; and Technique of Fire of the Rifle Squad.*

21. Machinegun, 7.62-mm, M60

This paper covers the critical combat performances, knowledges, and skills required of the IRPL when using and supervising the use of the M60 machineguns of the platoon during the precombat preparation of his platoon for combat and in the combat employment of the machineguns in offensive and defensive combat under good and limited visibility conditions. It is assumed that if the IRPL masters the knowledges, skills, and performances required of his subordinates, he can instruct them in these areas and supervise their activities to ensure acceptable performance.

Closely related material will be found in the papers dealing with *Squad Formations, Battle Drill, and Elementary Fire and Maneuver; Mission, Organization, and General*

Operation of the Rifle Platoon; Offensive Operations; Defensive Operations; Retrograde Operations; Tactical Movement; Mounted and Dismounted Platoon Combat Formations; Use of Indirect Supporting Fires; Cover, Concealment, and Camouflage; and Emplacements, Shelters, Obstacles, and Fields of Fire.

22. Recoilless Rifle, 90-mm, M67²

This paper covers the knowledges, skills, and performances required to serve as gunner and loader, including user maintenance, recognition of suitable targets and firing positions, and delivery of effective fire. The IRPL is cast in the role of gunner and it is assumed that his mastery of the critical performances, knowledges, and skills will ensure adequate performance by his assigned gunners and loaders.

23. Hand Grenades

This paper presents the performances, knowledges, and skills required of the IRPL to be technically and tactically proficient in the use of hand grenades under all levels of visibility and to ensure increasingly effective use of hand grenades by his men. Because of the similarity of the external characteristics of hand grenades, such as safety pin, safety lever, etc., performances are limited to the M34 WP grenade, the AN-M14 incendiary grenade, the M7A2 CS riot-control grenade, and the M26A2 fragmentation grenade, including use of the M217 fuse which causes the M26A2 grenade to detonate on impact.

Use of colored smoke grenades for signaling is covered in the paper on *Visual, Sound, and Tactual Communication*. Additional, directly related material is presented in the papers on *Protection Against Mines, Boobytraps, and Warning and Illuminating Devices; Demolitions and Boobytraps; Mines, Antitank and Antipersonnel, and Warning and Illuminating Devices; Physical Conditioning; and Antipersonnel Mine. M18A1 (Claymore).*

24. Antipersonnel Mine, M18A1 (Claymore)

The performances, knowledges, and skills contained in this paper describe the tactical and technical proficiency required of the IRPL to inspect, pack, transport, site, install, fire, recover, maintain, and safeguard the Claymore as a controlled, one-shot weapon; to employ it as a mine or a boobytrap; and to supervise the employment of the weapon by his men in any of the three roles cited.

The material in this paper is directly related to all of the papers on tactical operations, with special emphasis on the papers pertaining to defensive operations, retrograde operations, and patrolling. Target detection, location, and identification are covered in the paper on *Observation, Combat Intelligence, and Reporting*. Directly related information will be found in the paper on *Wire Communication (splicing); Mines, Antitank and Antipersonnel, and Warning and Illuminating Devices; Demolitions and Boobytraps; Protection Against Mines, Boobytraps, and Warning and Illuminating Devices; Hand Grenades; and Infrared Weaponsight and Image Intensification Devices.*

25. Antitank Weapon, 66-mm HEAT Rocket, M72

This paper outlines the technical proficiency demanded of the IRPL to prepare, fire, and maintain the light antitank weapons issued to his platoon under all conditions of

²No research by-product was produced to cover this subject area since USAIS deemed current training to be adequate. Available research time was devoted to subject areas deemed to be more critical to combat performance by mutual agreement between HumRRO and USAIS.

visibility. Closely related material is presented in the papers on *Cover, Concealment, and Camouflage; Observation, Combat Intelligence, and Reporting; Squad Formations, Battle Drill, and Elementary Fire and Maneuver; Technique of Fire of the Rifle Squad; Emplacements, Shelters, Obstacles, and Fields of Fire; Maintenance of Clothing and Equipment; and Physical Conditioning.*

26. Machinegun, Caliber .50, HB, M2³

This paper describes the technical and tactical proficiency required of the IRPL to maintain the weapon, deliver effective fire from the vehicular (APC) mount or the ground (M3) mount, select sites for the vehicular- or ground-mounted weapon, and supervise user maintenance and delivery of effective fire by selected members of his platoon.

27. Mines, Antitank and Antipersonnel, and Warning and Illuminating Devices

This paper outlines the technical proficiency required of the IRPL to supervise the administration, installation, maintenance, and recovery of antitank and antipersonnel mines and warning and illuminating devices, including improvisation of the latter from locally available resources. Closely related material is presented in the papers on *Hand Grenades; Protection Against Mines, Boobytraps, and Warning and Illuminating Devices; Cover, Concealment, and Camouflage; Defensive Operations; Retrograde Operations; Demolitions and Boobytraps; Protection Against CBR Warfare and Nuclear Explosions; Antipersonnel Mine, M18A1 (Claymore); and Emplacements, Shelters, Obstacles, and Fields of Fire.*

28. Demolitions and Boobytraps

This paper identifies the knowledges, skills, and performances required of the IRPL in the areas of demolitions and boobytraps. It presents procedures on the inspection, emplacing, priming, and detonating of explosive charges together with discussions on the types of explosives, types of targets, and the administrative considerations involved in such work. Closely related material is presented in *Hand Grenades; Antipersonnel Mine, M18A1 (Claymore); Mines, Antitank and Antipersonnel, and Warning and Illuminating Devices; Protection Against Mines, Boobytraps, and Warning and Illuminating Devices; Offensive Operations; and Defensive Operations.*

29. Bayonet Knife and Hand-to-Hand Combat

The performances, knowledges, skills, habits, and attitudes covered in this paper are those the IRPL must possess to train and lead a rifle platoon in combat. Where the knowledge or skill in question is one which must also be possessed by other members of the rifle platoon, it is assumed that the IRPL is also trained and motivated to ensure that his men are trained to an acceptable standard of proficiency.

In combat the bayonet will most often be employed upon the individual initiative of the user without command guidance once the bayonet has been fixed. Precombat training in the combat employment of the weapon is, therefore, *of more than usual importance to the IRPL.*

The material in this paper relates to all the papers on tactical operations, especially those dealing with physical conditioning, patrolling, and offensive combat. Other directly related information will be found in the papers on *Mission, Organization, and General Operation of the Rifle Platoon; Defensive Operations; Mounted and Dismounted Platoon*

³The scope of this originally identified subject area was covered in the *Armored Personnel Carrier* paper.

Combat Formations; Squad Formations, Battle Drill, and Elementary Fire and Maneuver; and Technique of Fire of the Rifle Squad.

30. Portable Flamethrowers

This paper covers the critical combat performances, knowledges, and skills required of the IRPL when directing the employment of portable flamethrowers by members of his platoon or by attached personnel in combat operations employing flame. Closely related material will be found in the papers on *Offensive Operations; Defensive Operations; Squad Formations, Battle Drill, and Elementary Fire and Maneuver; Cover, Concealment, and Camouflage; Observation, Combat Intelligence, and Reporting; and Physical Conditioning.*

31. Pistol, Automatic, Caliber .45, M1911A1⁴

This paper includes the knowledges, skills, and performances required of the IRPL to supervise user maintenance and ensure effective employment of the pistol by the men of his platoon who are armed with it. The IRPL is cast in the role of operator of the weapon for the purpose of this paper.

32. Rifle Grenades⁴

The technical and tactical proficiency required of the IRPL in the employment of rifle grenades as antitank and antipersonnel weapons and as screening and signaling devices is covered in this paper. The IRPL is cast in the role of the operator to ensure that he gains the ability to supervise effective use of the weapons combinations by selected riflemen within his platoon, should rifle grenade launchers and M15 sights have been retained.

33. Rocket Launcher, 3.5-inch, M20A1B1⁴

This paper presents the performances, knowledges, and skills required of the IRPL to select sites for the rocket launcher, perform user maintenance, load the weapon, engage suitable targets, and effectively supervise the rocket launcher teams within his platoon.

34. Infrared Weaponsight and Image Intensification Devices

This paper covers mounting, zeroing, operation, user maintenance, and techniques of employment, including adjustment of indirect fires, of the infrared weaponsight and image intensification devices by the IRPL and his supervision of the same performances by selected personnel within his platoon. The IRPL is cast in the role of operator, firer, and supervisor for the purpose of this paper.

Directly related material is presented in the papers on *Offensive Operations; Defensive Operations; Retrograde Operations; Airmobile Operations; Tactical Movement; Patrolling; Land Navigation; Visual, Sound, and Tactual Communications; Use of Indirect Supporting Fires; Rifle, 7.62-mm M14; Rifle, 5.56-mm M16; Rifle, 7.62-mm, M14A1; Machinegun, 7.62-mm M60; Antitank Weapon, 66-mm HEAT Rocket, M72; Observation, Combat Intelligence, and Reporting; Counterintelligence; Cover, Concealment, and Camouflage; and Emplacements, Shelters, Obstacles, and Fields of Fire.*

⁴No research by-product was produced to cover this subject area since USAIS deemed current training to be adequate. Available research time was devoted to subject areas deemed to be more critical to combat performance by mutual agreement between HumRRO and USAIS.

35. Armored Personnel Carrier

This paper outlines the pertinent performances, knowledges, and skills required of the IRPL to maintain assigned vehicles and components in a serviceable condition under all conditions of visibility. Other material related to the armored personnel carrier is presented in *Offensive Operations; Defensive Operations; Retrograde Operations; Tactical Movement; Mounted and Dismounted Platoon Combat Formations; Radio Communication; and Visual, Sound and Tactual Communication.*

36. Observation, Combat Intelligence, and Reporting

This paper is concerned with the technical and tactical proficiency required of the IRPL to detect, locate, identify, and designate hostile targets suitable for engagement by organic, attached, and supporting weapons; the collection, evaluation, interpretation, use, dissemination to his own men, and reporting to higher and adjacent units of all available military information pertinent to the enemy, weather, terrain, and indigenous population as these elements are likely to affect military operations or pacification programs or both; and the supervision of platoon members to ensure vigilant observation and accurate, quantitative reporting of military information perceived by them. Dark adaptation and the preservation of night vision; use of night-vision devices; the detection and localization of sounds, including the effect of wind and thermal drift; tracking; and the use of SOP signals to avoid the delivery of fire from friendly sources are also covered. Directly related material is covered in *Counterintelligence; Patrolling; Land Navigation; Emplacements, Shelters, Obstacles, and Fields of Fire; Cover, Concealment, and Camouflage; Infrared Weaponsight and Image Intensification Devices; and Use of Indirect Supporting Fires.* Communications security is covered in *Radio Communication.*

37. Counterintelligence

The skills, knowledges, and performances required of the IRPL to deny the enemy access to military information, to detect and counter enemy attempts to penetrate security, and to deceive the enemy as to our true intentions and plans are given. The paper also covers prevention and exposure of security violations, destruction of items of intelligence information when capture is imminent, value of personal letters, etc. to the enemy, danger involved in the use of "personal codes," and necessity to take advantage of enemy laxity in practicing counterintelligence measures. Closely related material is presented in *Cover, Concealment, and Camouflage; Observation, Combat Intelligence, and Reporting; Code of Conduct, Evasion, and Escape; Mines, Antitank and Antipersonnel, and Warning and Illuminating Devices; Protection Against Mines, Boobytraps, and Warning and Illuminating Devices; Radio Communication; Wire Communication; Messenger Communication; and Visual, Sound, and Tactual Communication.*

38. Cover, Concealment, and Camouflage

This paper deals with recognition and use of natural and manmade objects for protection against bullets, fragments, and blast, including nuclear fire and CBR agents; with concealment against enemy ground and aerial observation through use of natural and artificial camouflage, including the camouflage of exposed skin surfaces; and with the maintenance of light, noise, and odor discipline. Use of stealthy movement techniques; reaction to enemy flares or other illumination; action against enemy ground radar, infrared illumination, and image-intensification devices; and the use of weather and battle noises to cover movement are included. Observation of enemy use of cover, concealment, and camouflage and dissemination of the information gained to aid in improving friendly practices, to aid in target detection, and to guide the effective selection of weapons and

ammunition types for use against enemy in cover are also included. Directly related material is presented in *Infrared Weaponsight and Image Intensification Devices; Observation, Combat Intelligence, and Reporting; Counterintelligence; Protection Against CBR Warfare and Nuclear Explosions; Emplacements, Shelters, Obstacles, and Fields of Fire; and Human Maintenance under Campaign Conditions.*

39. Protection Against Mines, Boobytraps, and Warning and Illuminating Devices

The detection, location, identification, avoidance, marking, and reporting of enemy and unrecorded friendly mines, boobytraps, and warning and illuminating devices, and similar incapacitating devices are covered by this paper, as is the use of one metallic mine-detection set. The IRPL is cast in the role of the mine-detection set operator, and an assumption is made that if the IRPL can operate and maintain this equipment he can train and supervise operators to meet the demands of his unit missions. The neutralization of explosive and nonexplosive devices or the destruction of the devices, as demanded by the assigned mission, are also covered. Directly related material is presented in the papers on *Demolitions and Boobytraps; Mines, Antitank and Antipersonnel, and Warning and Illuminating Devices; Antipersonnel Mine, M18A1 (Claymore); Hand Grenades; Wire Communication; Mounted and Dismounted Platoon Combat Formations; Observation, Combat Intelligence, and Reporting; and Cover, Concealment, and Camouflage.*

40. Protection Against CBR Warfare and Nuclear Explosions

This paper covers the performances required of the IRPL to detect, recognize, and report the employment of CBR and nuclear attacks and to supervise the activities of his men when faced with such hazards. Also included are protective measures against attack, decontamination after exposure, protective measures preceding friendly employment of tactical nuclear weapons, and the use of this type of warfare in friendly tactical operations.

Closely related material is presented in the papers on *Self-Aid, First Aid, and Evacuation; Human Maintenance Under Campaign Conditions; Emplacements, Shelters, Obstacles, and Fields of Fire; Cover, Concealment, and Camouflage; Observation, Combat Intelligence, and Reporting; Hand Grenades; Mines, Antitank and Antipersonnel, and Warning and Illuminating Devices; Offensive Operations; and Defensive Operations.*

41. Emplacements, Shelters, Obstacles, and Fields of Fire

This paper covers the performances, knowledges, and skills required of the IRPL to plan, direct, and supervise the construction of individual hasty emplacements, open and covered foxholes, emplacements for organic and attached crew-served weapons, fighting trenches, hasty shelters, barbed wire entanglements and other passive obstacles; and the clearing of fields of fire.

The IRPL also will be required to plan, direct, and supervise the installation of all types of minefields and, therefore, must be technically proficient in all aspects of mine warfare doctrine and mine equipment. The performances, knowledges, and skills encompassing this technical proficiency are, however, beyond the scope of this paper and are contained in the paper on *Mines, Antitank and Antipersonnel, and Warning and Illuminating Devices.*

The principal functions of the IRPL are to plan, direct, and supervise; however, on occasion—usually for brief periods—his actions are primarily those of the individual, e.g., when enemy contact requires the immediate digging of a skirmisher's trench or other hasty individual emplacement for his own protection, when preparing or assisting in preparing the foxhole he will occupy or share, or when clearing or assisting in clearing fields of fire for his foxhole. Whatever the situation—whether personal participation is

prolonged, brief, or nonexistent—proper direction and supervision by the IRPL is contingent on mastery of all of the knowledges and skills required of his subordinates, plus mastery of the knowledges and skills peculiar to his position.

Closely related material is presented in the papers on *Cover, Concealment, and Camouflage*; *Protection Against CBR Warfare and Nuclear Explosions*; *Rifle, 7.62-mm M14*; *Rifle, 7.62-mm, M14A1*; *Machinegun, 7.62-mm, M60*; *Antitank Weapon, 66-mm HEAT Rocket M72*; *Antipersonnel Mine M18A1 (Claymore)*; *Demolitions and Booby-traps*; *Physical Conditioning*; *Use of Indirect Supporting Fires*; and *Grenade Launcher, 40-mm M79*.

Specific details beyond the scope of this paper covering construction of emplacements and obstacles are contained in *FM 21-75, Combat Training of the Individual Soldier and Patrolling*; *FM 5-15, Field Fortifications*; and *FM 20-32, Landmine Warfare*.

42. Physical Conditioning

This paper sets forth performances, knowledges, and skills necessary for the IRPL to physically condition himself and his men to perform the missions of a rifle platoon. Included also are the standards of physical achievement which underlie the performances presented in other papers. Those standards which are not Army doctrine are considered to be within reason.

Additional closely related material appears in *Offensive Operations*; *Defensive Operations*; *Airmobile Operations*; *Tactical Movement*; *Squad Formations, Battle Drill, and Elementary Fire and Maneuver*; *Mounted and Dismounted Platoon Combat Formations*; *Patrolling*; *Messenger Communication*; *Hand Grenades*; *Bayonet Knife and Hand-to-Hand Combat*; *Cover, Concealment, and Camouflage*; *Emplacements, Shelters, Obstacles, and Fields of Fire*; *Self-Aid, First Aid, and Evacuation*; and *Code of Conduct, Evasion, and Escape*. The paper *Human Maintenance Under Campaign Conditions* is directly related.

43. Self-Aid, First Aid, and Evacuation

The performances, knowledges, and skills required of the IRPL to treat himself or his men and to supervise treatment and evacuation are covered in this paper. Skills and knowledges include the lifesaver steps; treating wounds requiring special first aid measures, such as chest, head, belly, and jaw wounds and fractures; administration of morphine; treatment for common emergencies, such as snake bites, foreign objects in eye, ears, nose, and throat, blisters, unconsciousness, drowning, electric shock, minor cuts and burns; treatment for severe burns; administration of artificial respiration; administration of closed chest cardiac massage; and evacuation of wounded.

Self-aid, while not extensively covered in this paper, is of major importance and should be included in all instruction. While self-aid is impracticable with many serious wounds and injuries, it is feasible in the majority of cases, and is highly desirable, especially from the viewpoint of preserving the firepower of those who otherwise might have had to render first aid during critical stages of combat. In general, the procedures used in first aid are applicable to self-aid with minor modifications. Practical training in self-aid, which covers the area of the four lifesaving steps for suitable wound and injuries, will save many lives.

Closely related material is covered in papers on *Human Maintenance Under Campaign Conditions*; *Physical Conditioning*; *Protection Against CBR Warfare and Nuclear Explosions*; and *Code of Conduct, Evasion, and Escape*.

This paper is written with the IRPL always applying the skills and knowledges indicated as needed. However, it is necessary, unless otherwise stated, that the individual soldier be equally proficient in administering both self-aid and first aid. Further, there are some knowledges and skills, e.g., 159-165, which constitute "preventative" first aid, and

which require practice by platoon members which must be closely supervised by the IRPL under difficult conditions to ensure compliance with good practice. While these are not always explicitly identified, they must be recognized by the IRPL as a leadership responsibility.

44. Human Maintenance Under Campaign Conditions

This paper covers the performances, knowledges, and skills demanded of the IRPL to maintain an organized and effective fighting unit under campaign conditions and to set an example as a leader for his men. It covers personal hygiene and field sanitation; the maintenance of minimal fighting and existence loads; water supply and consumption; combat feeding and nutrition; sleep requirements and the effects of sleep loss; prevention of malaria; prevention and treatment of motion sickness; prevention and recognition of combat exhaustion; maintenance of vigilance under fatigue and stress; the control of fear and panic; the orientation, assignment, and guidance of replacements; care of the dead; and the recognition of individuals and units whose performance in combat or combat support roles is worthy of recommendation for an award or decoration.

Human maintenance is vital to all successful military operations, thus the material presented in this paper is directly related to the material presented in all other papers and cannot be separated from the other critical combat performances, knowledges, and skills in practice. Care of wounded has been omitted deliberately since a separate paper (*Self-Aid, First Aid, and Evacuation*) thoroughly covers this material.

45. Maintenance of Clothing and Equipment

This paper deals with the knowledges, skills, and performances required of the IRPL to enable him to ensure the proper maintenance of clothing and equipment issued to his men, including special cold weather and tropical equipment, and the proper procedures for requesting replacement items. Almost all of the methods referred to in this paper and indicated as "prescribed" are dealt with in detail in various Army publications and training devices, including *FM 21-15, Care and Use of Individual Clothing and Equipment*, January 1966; *FM 31-70, Basic Cold Weather Manual*, February 1959; and *FM 31-30, Jungle Training and Operations*, September 1965. Because of this factor, the details of those procedures are not repeated in this paper unless of particular importance. Specific references are included in the major headings where applicable. Related material is presented in *Cover, Concealment, and Camouflage*; *Self-Aid, First Aid, and Evacuation*; and *Human Maintenance Under Campaign Conditions*. Knowledges, skills, and performances pertinent to the maintenance of weapons and communications equipment are presented in separate papers.

46. Code of Conduct, Evasion, and Escape

This paper sets forth the knowledges, skills, and performances required of the IRPL to exemplify adherence to the *Code of Conduct* and to instruct and indoctrinate his men in the knowledge of and need for adherence to it. The paper also presents basic techniques for survival, evasion, and escape and instruction in resisting enemy interrogation, indoctrination, and exploitation for propaganda purposes. Directly related and vitally useful knowledges, skills, and performances will be found in LEAD papers on *Offensive Operations*; *Retrograde Operations*; *Airmobile Operations*; *Patrolling*; *Land Navigation*; *Radio Communication*; *Visual, Sound and Tactual Communication*; *Use of Indirect Supporting Fires*; *Observation, Combat Intelligence, and Reporting*; *Cover, Concealment, and Camouflage*; *Physical Conditioning*; *Self-Aid, First Aid, and Evacuation*; *Human Maintenance Under Campaign Conditions*; and *Maintenance of Clothing and Equipment*.

Appendix C
**TYPICAL RESEARCH BY-PRODUCT
(LAND NAVIGATION)**

Research By-Product

CRITICAL COMBAT PERFORMANCES,
KNOWLEDGES, AND SKILLS REQUIRED OF THE
INFANTRY RIFLE PLATOON LEADER

Land Navigation

by

Frank L. Brown

14 March 1966

Work Unit LEAD: Work Sub-Unit I

This document does not represent official opinion or policy
of the Department of the Army.

HumRRO Division No. 4
(Infantry)

The George Washington University
HUMAN RESOURCES RESEARCH OFFICE
operating under contract with
THE DEPARTMENT OF THE ARMY

FOREWORD

Work Unit LEAD has as its objective the improvement of officer training in the critical skills required for effective combat leadership in small infantry platoons, and is being conducted by the Human Resources Research Office at Fort Benning, Georgia, under the sponsorship of the U.S. Continental Army Command.

In Sub-Unit I, performances, knowledges, and skills required of the leader of an infantry rifle platoon are being identified and categorized according to 46 comprehensive subject areas. This document details the requirements in the area of land navigation.

The LEAD research is being performed at HumRRO Division No. 4 (Infantry), Fort Benning, Georgia. The present Director of Research of the Division is Dr. T.O. Jacobs, who is also the Work Unit Leader. Dr. Carl J. Lange was the Director of Research when the research was begun.

Military support for the study was provided by the U.S. Army Infantry Human Research Unit, Fort Benning, Georgia. LTC Ferdinand O. Barger, Jr. is the present Unit Chief.

HumRRO research is conducted under Army Contract DA 44-188-ARO-2 and under Army Project 2J024701A712 01, Training, Motivation, and Leadership Research.

Meredith P. Crawford
Director
Human Resources Research Office

LAND NAVIGATION

General Considerations

Introduction

The IRPL must maintain orientation, control direction of movement, and note distance moved during reconnaissances, attacks, occupation of defensive positions, retrograde movements, patrols, and similar tactical movement. His instructions as to route and destination may vary from electrically transmitted fragmentary orders to complete and detailed briefings with maps, terrain models, and route data (azimuths, distances, and descriptions of checkpoints). He must use maps and map substitutes to receive orders and information from his commander and adjacent leader; to transmit orders and information to small-unit leaders and others (e.g., messengers and wire men) within the platoon; to report intelligence information; and to request support from the commander. He must select routes and prepare or check route data for his own use and for the use of subordinates. He must closely supervise the performance of enlisted navigators (compass men and pace men) to ensure accurate navigation over varied terrain under all levels of visibility, often when in close proximity to or in contact with the enemy. He will also use his maps and compass to obtain data required to request and control indirect supporting fires and to coordinate resupply by air, evacuation of casualties, and close air support.

An assumption is made that if the IRPL has mastered the knowledges and skills required of his subordinates he can instruct them and supervise their activities to ensure an acceptable performance. He may be forced to execute all of the cited performances himself in survival situations, such as evasion or escape, or in returning to a rallying point after enemy disruption of a patrol.

There are 12 compasses issued for use in each rifle platoon. A compass is issued to the platoon leader, the platoon sergeant, each squad leader, and each fire team leader.

Scope

The performances, knowledges, and skills are given which are necessary for the IRPL to use the compass and maps or map substitutes to obtain knowledge of the terrain; to receive and transmit orders, instructions, and intelligence information; to select routes and checkpoints and prepare quantitative route descriptions for his own use and for use by subordinates; to supervise the performance of compass men and pace men during navigation over all types of terrain during all levels of visibility; and to navigate over unfamiliar terrain by map-terrain association when the existence of distinct terrain features and the level of visibility will permit.

Directly related material is presented in Observation, Combat Intelligence, and Reporting and Use of Indirect Supporting Fires.

Materiel

Maps (1:50,000), map substitutes, and supplements.

Compass, magnetic, lensatic, 1-5/8-inch diameter.

Route data card.

Pace cord or substitute.

Odometers on military vehicles.

Battlefield Cues

Orders and instructions from commanders which require accurate movement.

Maps, aerial photographs, sketches, sand table effects, etc. related to specific missions.

Terrain features, natural or man-made, previously designated on maps (substitutes) or pointed out on the ground as objectives, checkpoints, phase lines or similar references designated to aid control of tactical movement.

Loss of orientation or loss of contact with friendly individuals or elements during accomplishment of a mission; for example, during a night attack, disruption of a patrol by enemy action, evasion or escape.

Need to establish accurate location of objects or activity when collecting and reporting intelligence information; when requesting and adjusting indirect fires; and when arranging for resupply by air or the evacuation of casualties.

Obstacles or enemy action requiring deviation from a planned route.

Steering marks, absence or loss of view of steering marks while moving.

Inadequate performance by subordinates serving as pace or compass men.

Inadequate performance by subordinates using maps or map substitutes.

Lack of knowledge of individual pace count of self or subordinates upon arrival in an area of operations where terrain differs widely from terrain in which pace counts were previously established.

Inaccuracies in route data compiled by subordinates.

Absence of distinct terrain features or limited visibility that precludes use of distinct terrain features or checkpoints.

Light tables and weather predictions that indicate onset of limited visibility.

Performances, Knowledges, and Skills

1. THE IRPL WILL ASSOCIATE A GIVEN AREA ON A MAP (OR MAP SUBSTITUTE) WITH THE CORRESPONDING AREA ON THE GROUND AND USE THE MAP TO DETERMINE LOCATIONS, DIRECTIONS, AND DISTANCES WHEN RECEIVING, IMPLEMENTING AND TRANSMITTING ORDERS AND INSTRUCTIONS.

He will : orient a map with the compass, utilizing the correct GM angle obtained from the bottom margin of the map and corrected to reflect any annual change. 1

He must: recognize specific prominent man-made terrain features on the map and on the ground, such as roads and trails, railroads, buildings, bridges, power lines and power stations, fences and hedgerows, churches and cemeteries, orchards and cultivated areas, mines and quarries, and cuts and fills. 2

: recognize specific prominent natural terrain features on the map and on the ground, such as wooded areas, permanent streams, lakes, ponds, etc., intermittent streams, lakes, ponds, etc., marshes and variations in elevation. 3

: refer to the legend in the bottom left margin of the map to identify topographic symbols with which he is unfamiliar. 4

: know that the vertical distance (contour interval) between contour lines is standard for each map and is recorded in the bottom map margin, usually under the distance scale. 5

: interpret contour lines and layer tint colors (when available) on maps to determine general configuration of ground forms, the relative elevation of terrain, and to estimate the elevation of specific points. 6

: identify hills, ridges, saddles, valleys, and depressions by interpreting contour lines. 7

: familiarize himself with the major terrain features on a map to facilitate recognition of terrain pertinent to specific missions. 8

He must:	know the location and characteristics of major terrain features with respect to his own position or route and the relationship to his mission.	9
:	recognize probable obstacles to movement of dismounted personnel and vehicles.	10
:	identify and guide on previously unseen terrain features under all conditions of visibility, depending on map information to aid identification.	11
He will :	measure the straight line distance between any two points on a 1:50,000 map by using the map scale in the bottom margin and obtain accuracy within 25 meters.	12
:	measure distance along roads and trails varying in direction by using the map scale in the bottom margin of a 1:50,000 map and obtain accuracy within 25 meters.	13
:	write the coordinates of any designated point (bridge, road junction, etc.) on a 1:50,000 map accurately within 30 meters.	14
:	given the correct eight-digit coordinates for a specific point on a 1:50,000 map, locate the point on the map within an accuracy of 30 meters.	15
He must:	fold maps to facilitate use in the field and protect maps and map substitutes from the effects of weather.	16
:	safeguard maps and map substitutes when classified information is placed upon them to avoid loss or capture.	17
:	avoid placing classified information on maps or map substitutes to be used in areas not controlled by friendly troops.	18
He will :	know that the amount of terrain information that can be gained by using maps and aerial photographs together is greater than that from using either alone.	19
:	recognize <u>vertical</u> aerial photographs, <u>high oblique</u> aerial photographs, <u>low oblique</u> aerial photographs, and <u>photo maps</u> and interpret and use each type within the limits imposed by the type and quality of reproduction.	20

- He will : face the light source and orient the vertical aerial photograph so that the shadows of features shown on the photograph fall toward him to facilitate correct interpretation of features. 21
- : orient the oblique aerial photograph so that his eyes are in the same relative position as the lens of the camera at the time the photograph was taken. 22
- : apply all five factors of recognition (size, shape, shadows, tone and relative position) to aid in the identification of features on aerial photographs. 23
- : determine the scale on vertical aerial photographs by comparing the measured distance between two points on the aerial photograph with the measured map or ground distance between the same two points. 24
- : determine the scale on a vertical aerial photograph by using the focal length-flight altitude method with specific attention to the absolute altitude. 25
- : plot a magnetic north (compass) direction line on a vertical aerial photograph by orienting the photograph to a map or to the ground and transferring a direction line from the map or from the ground to the aerial photograph. 26
- : construct a point designation grid on a vertical aerial photograph in accordance with instructions from a supervisor and use the grid only to designate points on the photograph. 27
2. THE IRPL WILL MEASURE DIRECTION IN DEGREES (MAGNETIC AZIMUTH) FROM ONE POINT TO ANOTHER ON MAPS (OR MAP SUBSTITUTES) AND ON THE GROUND WITH THE LENSATIC COMPASS UNDER ALL CONDITIONS OF VISIBILITY.
- He must: periodically inspect the compasses issued to the members of his platoon for serviceability, accuracy, and night clarity and obtain replacements for compasses found to be defective. 28
- : know the approximate limits within which electrical fields and ferrous metal will attract the compass needle and cause inaccurate readings. 29

He must:	avoid taking compass readings near high tension power lines, radios, vehicles, or any ferrous metals, including his helmet, weapon, flashlight, grenades, etc., that may cause inaccuracy.	30
:	level and steady the compass in a position for sighting or measuring azimuths on maps and ensure that the dial is parallel to the rim of the cover glass and rotating freely.	31
:	read the inner (360-degree) scale directly under the index line to the nearest five-degree mark referring to the numbered 20-degree increments, and the unnumbered five- and 10-degree marks.	32
:	reduce glare by shading the movable crystal.	33
He will :	use the <u>line-over-arrow</u> , <u>center-hold technique</u> when navigating on <u>prescribed</u> route azimuths under all conditions of visibility.	34
:	set and use the long (broken) luminous line on the movable crystal as an index mark for the luminous north arrow when navigating.	35
:	rotate the compass until the <u>prescribed</u> route azimuth is directly under the black index line, then without disturbing the reading, turn the movable crystal until the long (broken) luminous line is directly over the luminous north arrow.	36
:	use a diffused red light under a poncho or a similarly secure means to avoid detection when setting the long (broken) luminous line over the north arrow.	37
:	to face a prescribed azimuth, assume the <u>center-hold</u> position and turn his body until the correct tick mark lies directly under the index line and the luminous north arrow lies directly under the long (broken) luminous line.	38
He must:	to sight the compass during <u>full visibility</u> when detouring or measuring an azimuth to a <u>visible point</u> or a sound source, hold the compass slightly below eye level, look through the sight slot (eyepiece) and along the vertical sight wire (front cover), then read the azimuth on the inner scale directly under the index line by using the focused eyepiece.	39

- He must: to sight the compass during darkness when detour- 40
ing or measuring an azimuth to a visible point or a sound
source, hold the compass slightly below eye level, look
over the sight slot and along the imaginary line formed by
the two luminous sighting dots on the extended front cover,
then read the azimuth on the inner scale directly under the
index line by using the focused eyepiece. (If the compass
has no luminous sighting dots on the extended front cover,
look over the sight slot and along an imaginary line formed
by vertically bisecting the luminous area on the damping
shell [bowl], then read the azimuth directly under the index
line by using the focused eyepiece.)
- He will : inspect his compass for serviceability prior to departure 41
on a mission and obtain a replacement if necessary.
- He must: use the map and compass method of intersection to 42
locate unknown points, including the location of sound
sources (e.g., enemy mortars being fired), under all
levels of visibility.
- : use the map and compass to locate his own position 43
by resection or modified resection.
- : use polar coordinates to designate locations. 44
3. THE IRPL WILL USE FIELD EXPEDIENTS TO DETERMINE DIRECTION
DURING ESCAPE AND EVASION WHEN NO COMPASS IS AVAILABLE.
- He will : determine direction during unlimited visibility by 45
use of the shadow-tip method.
- : determine direction during limited visibility by ref- 46
erence to the North Star (Northern Hemisphere) or the
Southern Cross (Southern Hemisphere).
4. UNDER ALL CONDITIONS OF VISIBILITY, THE IRPL WILL MAINTAIN HIS
ORIENTATION AND DIRECTION OF MOVEMENT WHILE MOVING FROM
ONE POINT TO ANOTHER OVER UNFAMILIAR TERRAIN.
- He must: know that steering marks provide a specific visible 47
point toward which to move within the distance to be
traveled, and may be a tree, stump, boulder, hilltop,
or any prominent mark easily kept in view.

- He must: know that steering marks are selected when moving from one checkpoint to another with or without a compass when the next checkpoint or the objective cannot be kept in view for the entire distance because of heavy vegetation or masking by other terrain features. 48
- : know that distinct steering marks ensure recognition during movement, are most easily kept in view, and reduce the number of references to the compass. 49
- He will : select as a steering mark the most distant, distinct, and high point lying within the distance to be traveled. 50
- : select steering marks that can be reached physically, if possible; however, when no steering marks exist on the prescribed azimuth, select one off-course and use it as a guide or maintain direction by frequent reference to the compass. 51
- : on losing sight of a steering mark, immediately resight with the compass and select a new steering mark. 52
- : during limited visibility when no useful steering marks are visible, maintain direction by frequent reference to the compass using the center-hold, line-over-arrow technique. 53
5. THE IRPL, UNDER ALL CONDITIONS OF TERRAIN AND VISIBILITY, WILL MEASURE AND RECORD DISTANCE WHEN NAVIGATING FROM ONE POINT TO ANOTHER.
- He must: know the number of his paces required to traverse a standard distance (100 meters) under varying conditions of unfamiliar terrain and visibility and ensure that each man in his platoon has been given opportunity to establish an individual pace count suitable for use in the current area of operations. 54
- : count each pace as each foot strikes the ground. 55
- : knot a pace cord or otherwise record each 100-meter distance traveled; estimate and record distances less than 100 meters by a rough conversion of paces to the nearest 25 meters (e.g., if an individual's pace count is 120 paces per 100 meters, 30 paces will equal 25 meters; 60 paces will equal 50 meters, etc.). 56

He must: make a mental note of the pace count at halts, detours, etc.; say the count aloud if practical to avoid "dropping the pace count."	57
: when the normal pace is altered by slope, underbrush, fatigue, etc., compensate by altering his pace count to reflect the straight line distance.	58
: compensate for a pace count altered by difficult terrain as he progresses along the route rather than at the end of a route leg or 100-meter increment.	59
: when possible, progressively average his pace count with that of other pace men to increase accuracy.	60
: commence a new pace count at the end of each 100 meters, at each checkpoint, and upon departure from the objective.	61
: on failure to recognize a checkpoint at the end of a route leg, make a brief reconnaissance and proceed on the next leg of the route from his estimate of the terminal point of the last leg traversed.	62
: detour around minor obstacles to clear vision or access to a steering mark by sidestepping, and on reaching the steering mark, sidestep back to the original course counting only <u>forward</u> paces en route.	63
: when confronted with a major obstacle to be bypassed, detour and maintain direction and distance by (1) selecting a steering mark on the far side, if practical, or (2) moving laterally, at a right angle to the route, until the obstacle is cleared, maintaining a <u>separate</u> pace count for the lateral move; resuming his original azimuth, continuing his original pace count, until the obstacle is cleared forward; returning to his original course by another right angle turn and application of the <u>separate</u> lateral pace count. (When an adequate steering mark is available on the far side of an obstacle, the separate lateral pace count is not required. Only <u>forward</u> paces are added to the route distance.)	64
: when moving by surface vehicle, use the vehicle odometer to measure distance to the nearest tenth of a mile; estimate lesser distances to obtain usefully accurate point designations (e.g., a tenth of a mile equals 160 meters; a twentieth equals 80 meters, etc.).	65

6. THE IRPL WILL MAKE TERRAIN ANALYSES, SELECT ROUTES AND CHECKPOINTS, AND MEASURE AND RECORD THE MAGNETIC AZIMUTHS AND DISTANCES REQUIRED TO NAVIGATE ROUTES BY DEAD RECKONING UNDER ALL CONDITIONS OF TERRAIN AND VISIBILITY.

He must: know that navigation by map-terrain association is impractical during movement over terrain lacking in easily identified terrain features (checkpoints), particularly during limited visibility. 66

: know that the accuracy of locations specified in intelligence information collected during movement is directly dependent upon the accuracy of navigation of the reporting unit. 67

: know that rapid response and accurate delivery of indirect supporting fires to aid a moving unit is directly dependent upon the accuracy of navigation of the requesting unit. 68

He will : recognize and know the advantages and disadvantages of each of the three types of checkpoints (line, point, line-point combinations). 69

He must: upon receipt of a mission, accurately plot the locations of the starting point and the final objective on the map. 70

: plot on the map the locations of known or suspected enemy positions lying between the starting point and the final objective. 71

: analyze the terrain shown on the map between the starting point and the final objective, with due consideration to the effect of present and predicted weather, and estimate the effects of the terrain and weather upon personnel, equipment, visibility, and trafficability along tentatively selected routes. 72

: select and plot checkpoints at intervals (e.g., approximately 700 meters in length for foot movement) along the tentatively selected routes with due consideration to the mission, time available for movement, clarity of the checkpoints, and the effect of the enemy, weather, and terrain upon use of available routes connecting the checkpoints. 73

: connect the starting point, successive checkpoints, and the final objective with straight lines to clearly mark the best route to be followed and to facilitate the measurement of each leg (straight segment) of the route. 74

He must: when indicated by the mission, select and mark an alternate route from the objective to the starting point by following the same procedure applied to the selection and marking of the best route to the objective.

75

: number the legs of the route serially toward the objective, then continue numbering the legs along the return route to the terminal point; record the leg numbers in the left column of the route data card. (See figure.)

76

ROUTE DATA CARD			
LEG NUMBER	DEGREES	METERS	CHECKPOINT
1	335	600	HILLTOP
2	345	975	TRAIL
3	310	200	OBJECTIVE
4	195	500	STREAM FORK
5	175	800	STREAM
6	105	775	HILLTOP

He must: measure the magnetic azimuth (degrees) of each leg of the route (to the nearest five degrees) in the direction of movement; record the azimuth in the second column of the route data card. (See figure.)

77

: when moving on foot, measure the distance along each leg of the route to the nearest 25 meters; record the distance in the third column of the route data card. (See figure.)

78

: enter a brief description of each checkpoint in the fourth column of the route data card. (See figure.)

79

- He must: when moving to an objective that constitutes a point on a line (e.g., a building on a road), deliberately plot an azimuth to a predetermined side of the point (offset) to ensure orientation as to direction of the point from the junction of his route with the line when this action will aid the mission. 80
- He will : when moving by wheeled or tracked vehicles, measure the distance along each leg of the route in miles to the nearest tenth of a mile; enter the cumulative distances in the third column of the route data card; and use the vehicle odometer to measure distance moved. 81
- He must: upon completing the entries on a route data card, check each entry himself or have an assistant check each entry to ensure accuracy. 82
- : prepare a duplicate copy of the route card for the supervisor who will monitor the platoon (patrol) activity and provide or coordinate support during movement, and plot the starting point, objective, checkpoints and terminal point on the supervisor's map if necessary. 83
- : prearrange to communicate the location of his platoon (patrol) to the supervisor during movement by transmitting the leg number and the distance traveled from the last checkpoint along the designated leg. 84
- : prearrange to use polar coordinates en route to report the locations of objects or activity of intelligence interest and targets for supporting indirect fires, i.e., report his own location by citing the leg number and distance traveled from the last checkpoint, then designate the target location by reporting the magnetic azimuth and the estimated range to the target from his own location. 85
- He will : instruct all leaders and potential leaders in his platoon in the knowledges, skills, and procedures required to: make terrain analyses, select routes and checkpoints, measure and record magnetic azimuths and distances between checkpoints, and prepare route data cards required to navigate routes by dead reckoning under all conditions of terrain and visibility. 86
- : estimate distance (range) by visual examination of the terrain within 10 per cent of the measured distance involved to ensure accurate reporting of intelligence information and the rapid adjustment of supporting indirect fires. 87

He will : instruct all leaders, potential leaders, and communications personnel in his platoon in how to report locations during movement on a route and in how to report locations of targets and intelligence information near the route by the use of polar coordinates. 88

7. THE IRPL WILL DESIGNATE, BRIEF, AND SUPERVISE NAVIGATORS TO ASSIST HIM IN MAINTAINING ORIENTATION, DIRECTION, AND DISTANCE MOVED DURING NAVIGATION UNDER ALL CONDITIONS OF VISIBILITY AND TERRAIN.

He must: know that if he acts as compass man or pace man during tactical movement it will interfere with his control of his unit, reduce time available to supervise security, and limit his ability to conduct effective battlefield reconnaissance en route. 89

He will : designate two pace men to measure and record distance moved between checkpoints and during deviation from the planned route. 90

: separate the pace men within the formation to avoid either influencing the pace count of the other. 91

: instruct the pace men as to the distance in meters from each checkpoint to the next checkpoint. 92

: require the pace men to report their individual pace counts at each checkpoint, at halts, and on order during movement. 93

: average the two reported pace counts to increase accuracy of distance measurement. 94

: require the pace men to commence a new pace count at each checkpoint and to maintain separate detour and forward pace counts when deviating from the planned route. 95

He must: record the total distances traveled, time required for movement, and brief descriptions of the terrain and visibility to gain experience factors that will aid him to make accurate estimates of movement time required when planning future missions under all conditions of terrain and visibility. 96

He will : appoint a compass man (other than the point man) to maintain direction during movement on prescribed azimuths and during deviation from the route. 97

- He will : instruct the compass man as to the magnetic azimuth to be followed on each leg of the route and during detours around obstacles, and describe each checkpoint for him. 98
- : require the compass man to direct the movement of the point man to ensure that the point man adheres to the prescribed route while providing security to the front. (A point security man cannot serve as compass or pace man and provide adequate security, particularly when fatigued and under the influence of battlefield stress.) 99
- : require the compass man to report immediately upon recognizing a prescribed checkpoint. 100
- : study the terrain at the end of each leg (checkpoint) and designate the starting point for commencing navigation to the next checkpoint or objective. 101
- He must: when forced to deviate from a prescribed route (other than a normal detour around an obstacle), require the compass man to record the direction and distance (obtained from pace men) moved on each new azimuth so the data can be used at the first opportunity to fix the location of the unit accurately on the leader's map and on the ground. 102
- He will : when time, visibility, and the availability of easily identified terrain features permit, use map-terrain association as a check against the accuracy of navigation by the compass man and pace men and make corrections in navigation when necessary. 103
- He must: during movement cross-country by wheeled or tracked vehicle, designate a compass man to aid the vehicle driver to adhere to the prescribed azimuth and to measure distance moved by reference to entries on the route data card and distance recorded by the odometer. 104
- : in preparation for movement by wheeled or tracked vehicles on roads, prepare a strip map showing checkpoints, turns, and cumulative odometer readings for use by a designated navigator and supervise the navigator during movement. 105
- He will : during aerial reconnaissance, coordinate a flight plan, checkpoints, and flight time between checkpoints with the aircraft commander prior to takeoff; maintain interphone communication with the aircraft commander during flight; and seek the aid of the aircraft commander as an observer in gaining the information required during the flight. 106

- He will : during tactical troop movement by air, keep abreast of the location of the aircraft during flight by the use of a strip map prepared prior to takeoff or through information obtained from aircraft crew members to ensure orientation upon landing, including an emergency landing or emergency bail out. 107
8. THE IRPL WILL PREPARE MAP OVERLAYS, SKETCHES, STRIP MAPS AND TERRAIN MODELS AND USE THEM TO TRANSMIT PLANS AND INTELLIGENCE INFORMATION TO SUPERVISORS AND SUBORDINATES.
- He must: know that information of friendly forces is usually shown in blue on operations maps and overlays. 108
- : know that information of the enemy is usually shown in red on operations maps and overlays. 109
- He will : draw and identify the military symbols required to represent the tactical deployment and operations of the military units, weapons, vehicles and equipment organic to infantry, airborne, mechanized, and air mobile battalions and the military units, weapons, aircraft, and equipment most commonly attached to or placed in support of these battalions, including the symbols representing command and communications, weapons and fields of fire, artillery and mortar concentrations and barrages, boundaries and control lines and points, field fortifications, obstacles, medical installations, and supply installations. 110
- : write and interpret the common abbreviations used in preparing map overlays and operations orders. 111
- : prepare map overlays for transmitting information (e.g., platoon fire plans and patrol reports). 112
- : prepare strip maps showing directions of movement, turns, checkpoints, distances between checkpoints, obstacles, danger areas, etc., for use by drivers and commanders of wheeled and tracked vehicles operating on unfamiliar roads and trails during all levels of visibility. 113
- : prepare terrain models (e.g., sand table effects) for briefing subordinates on operational plans. 114
- : prepare rough sketches for use by subordinates as map substitutes. 115

He must: instruct subordinate leaders and selected individuals (e.g., messengers and wiremen) in the preparation and interpretation of simple map overlays, strip maps, terrain models, and rough sketches. 116

9. THE IRPL WILL, WHEN VISIBILITY AND THE EXISTENCE OF EASILY IDENTIFIED TERRAIN FEATURES PERMIT, MAINTAIN ACCURATE ORIENTATION AND DIRECTION OF MOVEMENT BY ASSOCIATING EASILY IDENTIFIED FEATURES ON UNFAMILIAR TERRAIN WITH THE SYMBOLS REPRESENTING THE SAME FEATURES ON THE MAP.

He will : orient the map by inspection; check map orientation with the compass if doubt exists. 117

: accurately (within 30 meters) locate his own position on the ground and on the map. 118

: select a tactically useful route which will permit him to reach the assigned objective within the time limits imposed by the mission and, simultaneously, to remain within sight of easily identified terrain features (checkpoints) that will ensure continuously accurate orientation by map-terrain association over the entire route. 119

: use eight-digit coordinates to report accurately (within 30 meters) his own location, the location of visible objects or activity of intelligence interest, and visible hostile targets at any time during movement. 120

: confirm his location at selected terrain features (checkpoints) en route. 121

: confirm his location as soon as the objective is clearly visible through a detailed analysis of the terrain features on the ground and an analysis of the corresponding features shown on the map. 122

: in the event he becomes disoriented (unable to fix and report his position accurately) en route, return to the last confirmed ground location and apply navigation techniques, including dead reckoning, to ensure that he reaches his objective within the time limits imposed by the mission. 123

He must: in the absence of distinct terrain features or when threatened by limited visibility as indicated by light tables, current or predicted inclement weather or the presence of tall thick brush along the route, select a route and measure and record quantitative route data prior to departure on a mission to ensure accurate navigation.

124

He will : habitually use map-terrain association to the maximum at selected checkpoints and in the vicinity of the objective to confirm the coincidence of map-ground locations regardless of the system of navigation being employed.

125

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) Human Resources Research Organization (HumRRO) 300 North Washington Street Alexandria, Virginia 22314		2a. REPORT SECURITY CLASSIFICATION Unclassified
		2b. GROUP
3. REPORT TITLE DEVELOPING THE CRITICAL COMBAT PERFORMANCES REQUIRED OF THE INFANTRY RIFLE PLATOON LEADER		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Technical Report		
5. AUTHOR(S) (First name, middle initial, last name) Frank L. Brown and T.O. Jacobs		
6. REPORT DATE April 1970	7a. TOTAL NO. OF PAGES 92	7b. NO. OF REFS 6
8a. CONTRACT OR GRANT NO. DAHC 19-70-C-0012	8b. ORIGINATOR'S REPORT NUMBER(S) Technical Report 70-5	
b. PROJECT NO. 2Q062107A712		
c.		
d.	9b. OTHER REPORT NO.(S) (Any other numbers that may be assigned this report)	
10. DISTRIBUTION STATEMENT This document has been approved for public release and sale; its distribution is unlimited.		
11. SUPPLEMENTARY NOTES Work Unit LEAD, Development of Training for Improving the Combat Skills of Leaders in Small Infantry Units		12. SPONSORING MILITARY ACTIVITY Office, Chief of Research and Development Department of the Army Washington, D.C. 20310
13. ABSTRACT This paper describes the methods employed in Work Unit LEAD to identify and record the critical combat performances, knowledges, and skills required of the Infantry Rifle Platoon Leader. From over 200 small-unit combat actions ranging from World War II to Vietnam, some 6,000 performances, knowledges, and skills were extracted, categorized into major subject areas, and finally recorded in 41 research by-products. The general methodology developed by this research may be applicable to the identification of the combat requirements of other military command or staff functions. The practice by major unit commanders of requiring unit historians to record detailed descriptions of small-unit combat actions will provide useful sources of data for other performance, knowledge, or skill research.		

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1 NOV 68

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