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FM 21-18

DEPARTMENT OF THE ARMY FIELD MANUAL

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FOOT MARCHES

HEADQUARTERS, DEPARTMENT OF THE ARMY

NOVEMBER 1962

CHANGE }
No. 1 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 8 November 1966

FOOT MARCHES

FM 21-18, 9 November 1962, is changed as follows:

Page 2, paragraph 2b. At the end of line 1 add "tactical situation,".

Page 5, paragraph 6d. Change heading to read "*Length of Column (LC) (NATO Standardization Agreement (STANAG 2154))*."

Subparagraph *g* is superseded as follows:

g. Column Gap (CG) (NATO Standardization Agreement (STANAG 2154)). The space between elements, measured from the rear of one element to the head of the following element, or the time which elapses between successive elements of a column as they move past a given point.

Page 7. Paragraph 6*ac* is rescinded.

Subparagraph *ad*, change heading to read "*Pass Time (PT) (NATO Standardization Agreement (STANAG 2154))*."

Page 8. Paragraph 7*c* is superseded as follows:

c. In addition to the distance to be marched, factors that affect marches include—

- (1) Tactical situation.
- (2) Terrain and weather conditions.
- (3) Effectiveness of planning and preparation.
- (4) March discipline and supervision.
- (5) The physical condition, state of training, and mental attitude of the troops.

Page 10, paragraph 12a. In line 9, the word "must" is changed to read "would normally."

Page 19, paragraph 27a. End of line 2, delete period and add "than that prescribed in day marches."

Subparagraph *c* is superseded as follows:

c. Because of reduced visibility, night marches require added safety measures to prevent accidents. All safety measures which the tactical situation permits should be taken. Unit and/or installation *SOP's* should provide for these measures. In garrison, the following measures are usually appropriate:

- (1) Use off-road trails or routes as much as possible in order to keep troops off roads used by vehicular traffic.
- (2) Place guards, marked and equipped as in (3) below and

- thoroughly instructed, at the front and rear of the column and on the flanks when vehicular traffic may approach from that direction. (For duties of traffic guards, see para 36.)
- (3) Mark moving or static traffic guards and other key personnel with reflective or luminescent materials, such as reflective fabric or tape, vests, caps, mittens, hat bands, and traffic ensembles. Equip guards with appropriate warning devices, such as illuminated or reflective signs, red lights, flashlights, traffic control batons, reflective flags, and lanterns.
 - (4) Disseminate warnings to vehicle operators of the presence of troops on or near the roadway, and restrict speeds as appropriate. (For further details on military police traffic control, see FM 19-25.)
 - (5) Provide for the exclusive use of selected routes by foot troops, or restrict foot troops to specified routes. Appropriate safety measures must also be taken, even when troops are assigned exclusive use of routes which vehicles (wheeled or tracked) can negotiate.

Page 28, paragraph 39b, line 2. After the word "forces" add "physical condition and training of troops,".

Page 29, paragraph 39d(2). Change lines 4 and 5 of first sentence to read "areas, and selects the exact locations for the battalion command and administrative installations based on the general location of these areas selected by the S3."

Page 30, paragraph 29e(3). Change lines 2 and 3 to read "and rate of march, march unit pass times will be computed. The pass times of the marching columns, plus".

Page 31. Paragraph 40 *b, c, and d* is superseded as follows:

b. Length of Column (LC). The length of column is used to determine the pass time (PT) of a column and consists of two parts: the space occupied by the men alone (including the distance between men), and the sum of the distances between the elements of the foot column (column gap); then, the total length of column is the sum of the two parts.

- (1) The length of column of the *men alone* is determined by multiplying the number of men by the appropriate factor selected from the table below (LC men = No. of men \times factor)—

LENGTH OF COLUMN (LC)—FOOT TROOPS

(Does not include distances between units)

Formation	2m/man distance	5m/man distance
Single file.....	2.4	5.4
Column of twos.....	1.2	2.7

- (2) The total distance (meters) *between* units is obtained as follows:
- (a) Determine the number of serial distances (total serials minus one).
 - (b) Determine the number of march unit distances (total march units minus one, minus the number of serial distances).
 - (c) Multiply the number of distances obtained in (a) and (b) above by the length, in meters, between respective units.
 - (d) Add the results.

EXAMPLE

A battalion foot column is organized into 12 platoon-size march units and three company-size serials. Required: *total column gap distances* when there are 100 meters between serials and 50 meters between march units.

$$\text{Serial distances} = (3-1) \times 100 = 200$$

$$\text{March unit distances} = 12-1-2) \times 50 = 450$$

$$\text{Total column gap (CG)} = 650 \text{ meters}$$

c. *Pass Time (PT)*. For foot columns, the pass time is determined by applying the following formula:

$$\text{PT (minutes)} = \text{LC} \times \text{Factor (for appropriate rate of march)}.$$

PASS TIME FACTORS—FOOT TROOPS

.0150 for 4.0 kmph

.0187 for 3.2 kmph

.0250 for 2.4 kmph

.0375 for 1.6 kmph

EXAMPLE

Determines the pass time of a unit whose length of column is 1,500 meters and is marching at a rate of 4 kmph.

$$\text{PT (min)} = 1,500 \times .0150 \text{ (the factor for 4.0 kmph)} = 22.5 \text{ min.}$$

d. *Completion Time*. Completion time is determined by using the following formula:

$$\text{Completion Time} = \text{SP time} + \text{TD} + \text{PT} + \text{Scheduled Halts (other than normal hourly halts)}.$$

EXAMPLE

A column's SP time is 0700 hours. The time distance is 6 hours and 40 minutes. Pass time of the column is 30 minutes. A 35-minute lunch halt has been scheduled. What is the completion time of the march?

Employing the 24-hour clock system, the formula can be applied as follows for simplified addition of the times:

	<i>Hr</i>	<i>Min</i>
SP time-----	07	00
TD -----	06	40
PT -----	00	30
Lunch halt-----	00	35
Completion time-----	13	105 or 1445 hours

The march will be completed at 1445 hours.

Page 33. Paragraph 40*e*, line 3, "time lengths" is changed to read "pass times."

Page 34. Paragraph 41*b*(4), line 1, "time lengths" is changed to read "pass time." Subparagraph 41*b*(5), line 6, "time length" is changed to read "pass time."

: Page 35. Figure 5 is superseded as follows:

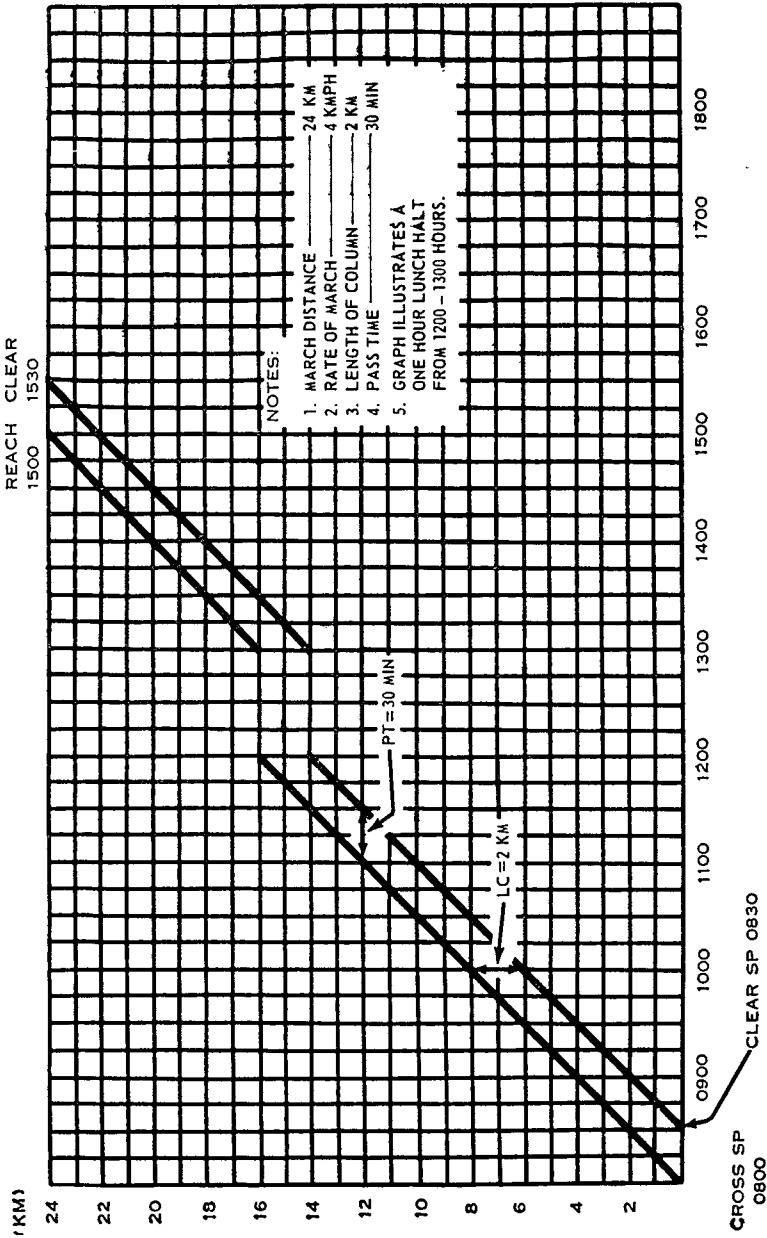


Figure 5. Road movement graph.

Page 38, appendix I. After FM 8-35 in the Reference list add:
FM 19-25. Military Police Traffic Control.

Page 39. At bottom of Reference list add:

NATO Standardization Agreement (STANAG) 2154, "Definitions and Regulations for Military Motor Movements by Road."

Page 40, appendix II, paragraph 2a(2) (a). Change to read: Commander—reconnaissance or scout platoon leader.

Page 42, appendix III. Change line 2 to read "(No change from verbal orders)". Paragraphs 2 and 3, change "1/66" to read "1-66."

Page 45, Control of Movement chart. Change heading of third column from "TL" to "PT."

Page 48, Annex B (Strip Map) to OPORD 7 is superseded as follows:

Annex B (Strip Map) to OPORD 7

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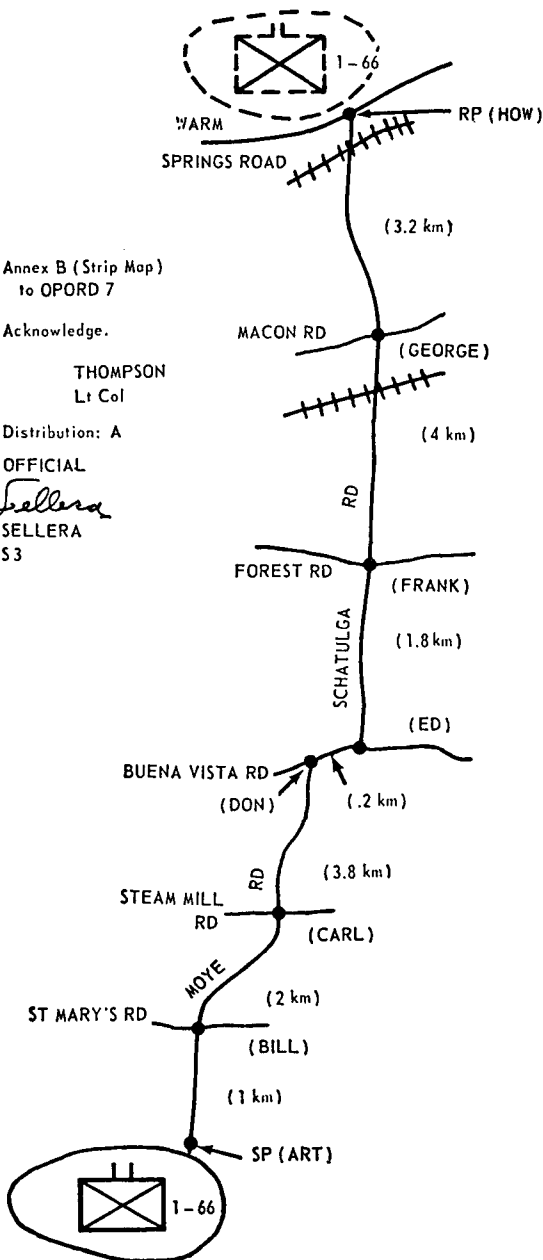
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FIELD MANUAL }
No. 21-18 }

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., 9 November 1962

FOOT MARCHES

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* This manual supersedes FM 21-18, 21 July 1958.

CHAPTER I

GENERAL

1. Purpose and Scope

a. This manual is a guide to commanders and staffs in the procedures and techniques of foot marches. It describes the march mission, characteristics and types of foot marches, and march training to include planning procedures, duties of commanders, march discipline, march hygiene, and march safety.

b. This manual is designed to be used in conjunction with other field manuals where modification of foot marching procedures and techniques to specific regions of the world is required. Details concerning operations in desert, jungle, northern, and mountain areas are contained in FM's 31-25, 31-30, 31-70, 31-71, and 31-72. Tactical foot marches are discussed in FM's 7-11, 7-15, and 7-20. See appendix I for a detailed list of references.

c. The term "company" as used herein can also mean *battery* or *troop*.

d. The material presented herein is applicable without modification to nuclear, nonactive nuclear, and nonnuclear warfare.

e. Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded direct to the commandant, United States Army Infantry School, Fort Benning, Ga.

2. The March Mission

a. A successful foot march is one in which the troops arrive at their destination at the prescribed time and in condition to execute their tactical mission.

b. Factors which influence the success of a foot march are the distance to be marched, terrain and weather conditions, effectiveness of planning and preparation, march discipline, adequate march supervision, and the physical condition, state of training, and mental attitude of the troops.

c. The ability to execute the mission upon completion of the march cannot be overemphasized. This is normally accomplished through conditioning and acclimatization of the troops to the area of operations, and includes physiological and psychological adjustment and accommodation by the individual soldier. Commanders must be constantly on the alert to keep the amount and type of equipment carried, the rate of march, and the length and number of rest periods in line with the physical endurance of the men. To get troops to the proper place at the proper time and in condition to successfully accomplish the mission requires proper planning and leadership on the part of the commander.

3. Characteristics of Foot Marches

a. Troops may march on foot when the tactical situation requires it; when transportation or transport fuel is not available; when the terrain, weather, or the enemy situation prevents the use of vehicles; and when the distance to be marched is within the capabilities of the troops. The foot march is also used to enhance physical conditioning and tactical training.

b. Foot marches are characterized by combat readiness, ease of control, adaptability to terrain, lack of dependence on roads, relatively slow rate of movement, and increased fatigue to personnel.

4. Classification of Foot Marches

Foot marches are methods of moving troops from one place to another. They are classified as tactical or administrative.

a. Tactical. A tactical foot march is a movement of troops and equipment with a tactical mission under combat conditions when not in direct ground contact with the enemy. It based upon the anticipation of early ground contact with the enemy, either en route to or shortly after arrival at the march destination. Troops are fully or partially deployed. The march ends when ground contact with the enemy is made or when the march destination is reached.

b. Administrative. An administrative foot march is one which is made when no enemy interference, except by aircraft or long-range weapons, is anticipated. It is based upon the assumption that ground contact with the enemy is a remote possibility, both en route to or shortly after arrival at the destination.

5. Types of Foot Marches

Tactical and administrative foot marches are further classified by type. The aspects discussed in this paragraph are common to both administrative and tactical marches.

a. *Day Marches.* In the absence of enemy threats, day marches are preferred since they permit more expeditious movement and are less fatiguing for troops. They are characterized by dispersed formations, ease of control and reconnaissance, and increased vulnerability to enemy observation and air attack.

b. *Night Marches.*

- (1) Night marches are characterized by closed formations, more difficult control and reconnaissance, slower rate of march, and better concealment from hostile observation and air attack. In addition to providing better concealment for movement, night marches may be made to avoid excessive heat and to exploit the darkness and achieve surprise. Difficulty of control requires more detailed planning; stringent control measures; thorough training; and enforcement of march, light, and communication discipline (par. 26).
- (2) If concealment is required, movement before dark is restricted to small detachments and the march is completed by daybreak. Under these circumstances, when movement is in proximity to the enemy, noise suppression is a consideration. Other measures will be observed, as appropriate, to conceal our operations from the enemy and prevent him from obtaining information concerning the march.

c. *Forced Marches.* A forced march requires the expenditure of more than the normal effort in speed, exertion, hours marched, or a combination of these. Forced marches normally are accomplished by increasing the marching hours per day rather than by increasing the rate of march. Forced marches are undertaken only when necessary because they decrease the efficiency of units. In order to insure maximum effort, it is advisable to inform the troops concerning the reason for a forced march (par. 27).

d. *Shuttle Marches.* There will be occasions when foot and motor marches are combined by means of shuttling. Under these circumstances, vehicles pick up troops at a specified point and transfer them to a specified unloading point; and return to pick up additional elements of the foot column. Such a march is termed a shuttle march. Shuttling is used when—

- (1) The distance to be moved is too great or the time available is too short for a foot march.
- (2) The available transport cannot move the entire unit in one trip.

The vehicles make two or more trips and transport the foot element by shuttles. A part of the foot element may march while awaiting its transportation or may be detrucked short of its destination to complete the movement on foot. If time is available, and greater coordination is assured by waiting in the initial location, this portion of the foot element may not move by foot.

6. Explanation of Terms

a. Arrival Time. The time the head of a column, or elements thereof, reaches a designated point, line, or object.

b. Clearance Time. The time at which the tail of a column, or elements thereof, passes a designated point, line, or object.

c. Column. Formation in which elements are placed one directly behind the other.

d. Column Length. The length of roadway occupied by a column, or element thereof, measured from front to rear inclusive.

e. Completion Time. The time the tail of a column passes the release point (RP).

f. Critical Point. A selected point along the route of march used for reference in giving instructions; any point along the route of march where interference with the troop movement may occur (the SP and RP are always critical points).

g. Distance. The space between elements, measured from the rear of one element to the head of the following element.

h. Guard. An individual who marches to the front or rear of a column to slow or stop traffic approaching or passing the column; or who is placed at an intersection to stop traffic while the column crosses. A guard at an intersection may function as a guide in addition to his other duties.

i. Guide. An individual who leads or directs men or vehicles over a predetermined route. Guides are placed at critical points to provide direction to movement and to assist in preventing accidents.

j. March Collecting Post. Location on the route of march at which casualties who cannot continue to march are given medical treatment and then moved to medical stations in the rear.

k. March Control Point. A point along the route at which personnel are stationed to supervise the progress of the movement, and from which orders and instructions controlling the movement can be issued to the commanders of the elements of the column.

l. March Discipline. The observance and enforcement of the rules that govern a unit on the march. March discipline includes (but is not limited to) specific types, such as water discipline, light discipline, and communication discipline.

m. March Outpost. Observation posts and patrols established for the protection of a command during a halt in the march.

n. March Unit. A unit which moves and halts at the command of a single commander.

o. Marker. A flag, stake, or some other object posted at a point to show the location of a unit, a direction or procedure to be followed, a danger point, or an obstacle.

p. Pace Setter. An individual who precedes the marching column, or element thereof, to maintain the rate of march.

q. Rate of March. Average marching speed per hour, including short, periodic halts.

r. Release Point (RP). A clearly defined point on a route at which specified elements of a column revert to the command of their respective commanders.

s. Road Movement Graph. A time-space diagram used in planning and controlling both foot and motor marches and in preparing or checking road movement tables.

t. Road Movement Table. A composite list showing the general organization and time and space schedule for march movement. It is generally published as an annex to an operation order for road movement.

u. Road Space. The length of roadway allocated to and/or actually occupied by a column on a route. Road space is expressed in meters (m) or kilometers (km).

v. Route Reconnaissance. Careful survey of a route for military purposes. The reconnaissance may be accomplished by ground and/or aerial elements.

w. Serial. One element or a group of elements, usually a battalion or larger unit, within a series which is given a numerical or alphabetical designation for convenience in planning, scheduling, or control of movements by land, sea, or air. A serial consists of one or more march units.

x. Shuttling. The transportation of personnel, equipment, or supplies by a series of round trips of the same vehicles. It may be done by hauling a load the entire distance and then returning for another load, or by carrying successive portions of the marching force for short distances while the remaining portions continue on foot.

y. *Speed*. The actual rate at which a column or vehicle is moving at a given time.

z. *Start Point (SP)*. Any designated place at which a column or element thereof is formed by the successive arrival of its various subdivisions, and comes under the control of the commander ordering the move.

aa. *Strip Map*. Sketch of a route of march which may or may not be drawn to scale, but which should include identifying landmarks such as towns, bridges, outstanding buildings, or cross-roads.

ab. *Time Distance (TD)*. The time it takes the head of a column, or any single element thereof, to move from one point to another at a given rate of march.

ac. *Time Interval (TI)*. The time which elapses between successive elements of a column as they move past a given point. Time interval is usually employed with respect to motor columns.

ad. *Time Length*. The time required for a column, or elements thereof, to pass a given point.

CHAPTER 2

FACTORS AFFECTING THE MARCH

7. General

a. On occasion, tactical success may depend largely upon the marching capability of troops. The requirement for soldiers to move rapidly and effectively by foot is an important consideration in both nuclear and nonnuclear warfare. Mobility is a prerequisite to success. It can be best achieved through careful planning, training, and the use of specialized equipment and techniques.

b. Nuclear warfare will emphasize greater dispersion between units; therefore, dismounted troops must be able to move for greater distances with weapons, ammunition, and equipment, and be ready to fight upon arrival. Troops must be physically and mentally conditioned to conduct arduous marches during their early training, and this proficiency must be maintained during all subsequent training.

c. In addition to the distance to be marched, factors that affect foot marching include—

- (1) Terrain and weather conditions.
- (2) Effectiveness of planning and preparation.
- (3) March discipline and supervision.
- (4) The physical condition, state of training, and mental attitude of the troops.

8. Effects of Weather and Terrain on Foot Marches

a. The varying types of terrain over which troops will be required to march will present different problems for commanders, depending on the specific area of operations. In all cases, the season of the year and its weather conditions combine with terrain to affect the mobility of marching troops. This manual should, therefore, be studied in conjunction with other manuals which deal with operations in specific regions of the world such as northern, mountain, desert, and jungle areas (app. I).

b. Foot marching under adverse climatic conditions follows the same basic principles as under normal conditions. The differences lie in the physical limitations imposed by the adverse conditions and in the use of special equipment to overcome them.

c. Restrictions imposed by extremes of climate and terrain constitute the major change from operations in temperate areas. These restrictions may, unless proper provisions are made for them, present major obstacles to the successful conduct of operations.

d. Movement in many areas of the world must be calculated in terms of *time* rather than *distance*. The problem is *how long* it will take to get from one place to the other rather than *how many kilometers* it is between those places. This is especially applicable in northern, mountain, or jungle areas where trails are either limited or nonexistent, and cross-country movement may be slow and difficult.

9. Plans and Orders

Success of a march depends on thorough plans. The commander of a unit involved in a march must prepare complete, accurate, and realistic march plans. They must be translated into timely orders and must provide for security, control, the minimizing of march losses, and the uninterrupted march of the unit. The commander bases his march plans on the best available intelligence of the enemy, the terrain, the weather, and the capabilities of his unit. He plans his march so the unit, including necessary equipment, arrives at the destination in the most suitable order and formation and in a condition appropriate to its probable employment.

10. March Discipline

March discipline is the observance and enforcement of the rules that govern a unit on the march. It especially involves obedience to march instructions, to include formation, distances between elements, speed, and the effective use of concealment and cover. It must also include specific controls and restrictions such as water discipline, light discipline, noise discipline, and communication discipline. March discipline is the culmination of effective training, and results in willing teamwork between all individuals of the unit.

11. Water Discipline

a. Water discipline must be observed by all members of the unit to insure best health and marching efficiency. Generally, water discipline consists of the following rules:

- (1) Drink only treated water from approved sources.
- (2) Drink small amounts of water frequently, rather than large amounts at one time.
- (3) Drink water slowly to prevent cramps and/or nausea.

b. Water may be conserved by avoidance of spillage and care in use of water for bathing purposes.

c. The body will not operate efficiently without adequate water. When individuals are engaged in any strenuous exercise or activity, an excessive amount of water and salt is lost through perspiration. Additional water is lost through respiration and urination. This excessive loss creates an imbalance of liquids in the body; and unless the loss of liquids and salt is replaced immediately and individuals allowed sufficient rest before continuing their activities, dehydration may occur. Deficient fluid and salt intake during hot weather may also cause heat exhaustion.

d. It is important to realize that the danger of dehydration is as prevalent in cold regions as it is in hot, dry areas. The difference is that in hot weather the individual is conscious of the fact his body is losing liquids and salt through perspiration. In cold weather, it is difficult for an individual who is bundled up in many layers of clothing to realize this condition exists, since perspiration is rapidly absorbed by the heavy clothing or evaporated by the air and is rarely visible on the skin.

e. Salt in food makes up for a portion of the daily salt requirement. In hot weather, when salt diet is limited or when perspiration is excessive, the salt intake must be increased. This can be done by taking salt tablets or by drinking water with salt in solution. Salt tablets should be taken with water to avoid the possibility of nausea. A salt water solution can be obtained by adding one-fourth teaspoon of salt or two 10-grain salt tablets to a canteen of water; or one-third pound of salt to a lyster bag (36 gallons) of water.

f. If pure water is not available, water in canteens can be treated by adding water purification tablets. See FM 21-10 for methods of purifying water.

12. Physical Condition and Mental Attitude

a. Men must be physically and mentally conditioned to effectively participate in foot marches. The varying types of terrain and climate areas throughout the world require varying conditioning and acclimatization procedures for successful operations. Ideally, troops should be trained to operate in all of the areas with a minimum of preparation; however, each area has specific conditioning and acclimatization requirements which must be accomplished prior to operating in it. For example, troops scheduled for operations in mountains must participate in high altitude training for a period of 10 to 14 days prior to engaging in full-scale mountain marches. March training which is effectively ac-

complished in normal terrain and weather areas will facilitate conditioning and acclimatization for special areas of the world.

b. Psychological adjustment will eliminate preconceived notions and fears about specific areas and climates. The adjustment is facilitated by educational programs which gradually introduce the men to the new terrain features or climate. The men are encouraged to progressively develop their confidence until they can operate in the new areas with ease and assurance. As an example, training which is conducted in a logical, realistic manner will cause most men to lose previously held fears of height, cold, or isolation.

c. Specific adjustment factors and techniques are discussed in field manuals which deal with operations in northern, mountain, desert, and jungle areas (app. I).

13. Morale

Morale affects the marching efficiency of troops to a great degree. Low morale can be contagious and will magnify any discomforts the men may have. Leaders can improve morale by applying proper march and leadership techniques, some of which are as follows:

a. Inform the unit of the march in advance so troops can make adequate preparations for it. During early training, it is a good policy to provide more advance warning than usual.

b. Do not form the unit too early. The formation should be held early enough to allow sufficient time to inspect the troops and make last minute checks.

c. During the march, avoid delays that keep the men standing. Such delays increase fatigue and cause the men to stiffen, making it more difficult to resume the march. A route reconnaissance prior to the march will provide information of conditions that might cause delays so advance action may be taken to overcome them.

d. Prescribe and maintain a reasonable rate of march. Too rapid or too slow a rate induces fatigue.

e. During the march, hold passing vehicles to a reasonable speed to promote safety and prevent dust, rocks, or mud from being thrown on the men. If dust conditions are extremely offensive, move the troops to the upwind side of the road to reduce the discomforting effect.

f. Trucks which are used to transport stragglers or march casualties should not be allowed to overtake the column unless absolutely necessary.

g. Insure that the men at the rear of the formation receive the full amount of break time.

14. Self-Confidence

Self-confidence is a direct result of effective psychological adjustment. It allows the men to achieve the full benefits of training by giving them a belief in their capabilities. Self-confidence in foot marching is developed by strong leadership and progressive training. As the men's muscles harden and as marching techniques are learned and applied, their self-confidence increases and they take greater pride in their marching ability. Leaders can further stimulate this pride by building a unit spirit within each man, and a determination by him not to let his unit down. A well-planned and conducted march is an excellent method of developing and demonstrating the numerous attributes of a good soldier, a good leader, and a good unit.

CHAPTER 3

PROCEDURES AND TECHNIQUES OF FOOT MARCHES

Section I. GENERAL

15. Organization for the March

A command executing a march is basically organized into march units and, as is necessary for control, into march serials or march columns.

a. A *march unit* is a unit of command which moves and halts at the command of a single commander. The march unit normally corresponds to one of the smaller troop units such as a squad, section, platoon, or company.

b. A *march serial* (normally referred to as a *serial*) consists of one or more march units organized under the senior officer and given a specific numerical or alphabetical designation to facilitate control. The march units of the serial normally possess the same march characteristics. A serial is usually a battalion or larger unit, but may be a company if the battalion is marching alone.

c. A *march column* (normally referred to as a *column*) is composed of elements of a command moving over the same route. It may be composed of one or more serials. To facilitate control, a column commander is designated. A column is normally a brigade or larger unit, but may be a battalion if it is marching alone.

d. The order of march is dependent on the mission, terrain, and probable order of commitment of units into action.

16. Control and Coordination Measures

a. The commander establishes initial control of the march by designating control measures in his road movement order. See paragraph 6 for explanation of terms. Examples of control measures normally used are as follows:

- (1) Start point (SP) and release point (RP).
- (2) Other critical points along the march route.
- (3) Time at which the head or tail of the column is to pass the SP and critical points.
- (4) Rate of march.

- (5) Order of march.
- (6) Route of march.
- (7) Assembly or bivouac areas.
- (8) Location of command post (CP).
- (9) Communications to be used during the march.

b. To facilitate control, the commander provides for advance and quartering parties, guides, the marking of routes, and traffic control. Army aviation and military police units are particularly suitable for traffic control purposes. See chapter 4 for a detailed discussion of control and coordination measures in movement planning.

17. Security

a. A force in movement protects itself against enemy action by employing security elements in front of the march column, and by flank and rear guards when appropriate. These security measures provide for adequate warning against enemy threats. The force adopts a march formation appropriate to its mission and to the enemy capabilities.

b. Passive and active measures are planned against attack by enemy aircraft or long-range weapons during movement. Passive measures include the use of concealed routes and assembly areas, movement on protected routes, night marches, increased interval between elements of the columns, and dispersion when under attack. Active measures include the use of organic and attached weapons in accordance with the unit air defense plan during marches.

18. Reconnaissance

Reconnaissance predetermines the critical points along the march route such as bridges, fords, defiles, and obstacles in order that congestion or delay may be prevented and local security provided. See paragraph 38 for the organization and missions of the reconnaissance party.

19. March Formation

The formation for foot marches will vary in accordance with the routes available and the enemy situation. The normal formation for tactical marches is a column of twos with one file on each side of the road. Other formations are single file and columns of twos, threes, and fours. The column commander designates the side of the road on which the troops will march, or whether both sides of the road will be used (fig. 1).

20. Communication

a. Communication means which may be utilized to assist in control and coordination during foot marches include radio, visual, sound, and messenger.

b. Man-portable radios are used to communicate between platoons and higher headquarters in the march column. Vehicular radios with the motorized elements of the column are also used when required.

c. Visual communication means include flashlights, lanterns, luminous markers, panel sets, flags, pyrotechnics, smoke, and arm-and-hand signals. The use and meaning of visual signals are normally prearranged to preclude misunderstanding. The road movement order will contain instructions for use in specific situations.

d. Sound communications include voice, whistles, horns, and gongs. These may be used to assemble troops upon completion of halts, or to warn troops in event of an enemy air or chemical attack. Sound signals are normally prearranged and may be included in the unit SOP if their use is routine.

e. Messengers are used in conjunction with other means of communication, especially during radio listening silence, periods of reduced visibility, or when other communication means are not as suitable as messengers.

21. Length of March

The length of march will vary, depending on the terrain and weather conditions, enemy situation, and the physical and mental condition of the troops. The normal length of march for a 24-hour period is from 20 to 32 kilometers, marching from 5 to 8 hours at a rate of four kilometers per hour. A march in excess of 32 kilometers in a 24-hour period is considered a *forced march* (par. 27).

22. Rate of March

a. Factors which affect the rate of a foot march are similar to those which affect foot marches in general (par. 7). They include the mission, terrain and weather conditions, equipment to be carried, the physical and mental condition of the troops, and the length of the march. The commander considers all of these factors and selects a rate which will place his unit at its destination in the shortest time and in a condition to effectively accomplish its mission. The unit standing operating procedures (SOP) usually state the rate for marches on roads and cross-country,



Figure 1. A tactical march formation.

over normal terrain, day or night (app. II). The column commander modifies this rate as the situation requires. The rate of march selected will vary widely in mountain, jungle, desert, or northern areas.

b. Rates of march usually prescribed for normal terrain are as follows:

	<i>Roads (kmph)</i>	<i>Cross-country (kmph)</i>
Day	4	2.4
Night	3.2	1.6

23. Pace and Cadence

a. The normal pace is 30 inches (76 cm). A *pace* of 30 inches and a *cadence* of 106 steps per minute result in a *speed* of 4.8 kilometers per hour (kmph) and a *rate* of four kmph if a 10-minute rest halt is included. Since the pace of each man may vary, the cadence will have to be increased or decreased accordingly in order to maintain the prescribed rate of march.

b. In marching, the ground slope and footing will affect the length of the pace. For example, the length of the step will decrease when marching uphill or on steep downhill slopes. A normal cadence is maintained without difficulty on moderate, gently rolling terrain except when the footing is muddy, slippery, or rough.

24. The Pace Setter

a. The pace setter is an experienced individual, carrying the same load as the majority of the men, and marching from 4 to 10 meters at the head of the column (fig. 2). The pace of the column must be governed by the most heavily loaded element. The pace setter's primary duty is to maintain the rate of march ordered by the column commander. He does this by establishing his *pace* (length of step) and *cadence* (number of steps per minute) to obtain the prescribed *rate of march*.

b. The pace setter should be of medium height so normal strides will be taken. Overstriding or understriding tends to tire the leg muscles quickly and affects the efficiency of marching troops. The officer marching at the head of the column supervises the pace setter to insure that he takes normal strides and maintains a uniform cadence.

25. Accordion Effect

a. An accordion effect in marching occurs when the column alternately lengthens and shortens. It is caused by sudden changes in the rate of march by the lead elements. A change in the rate of march will increase as it passes down the column, so that the rear elements must either double time to maintain the distance or be left far behind. Thus, a minor change of rate at the head of the column becomes magnified by the time it reaches the tail of the column.

b. The best method of reducing the accordion effect is to have the lead elements, after passing a slowing obstacle, to slow their rate of march for a sufficient length of time to permit rearward elements to maintain distances without having to run. The accordion effect can also be reduced by lengthening or shortening the step gradually in accordance with the changes in terrain conditions, or by maintaining the prescribed distances between men and taking up the slack by increasing or decreasing the distances between units.

c. Because of the accordion effect, marching at the tail of the column is more difficult than at the front. For this reason, the order of march should be rotated periodically so the same men or units do not always march at the rear.



Figure 2. The pace setter maintains the rate of march.

26. Distances Between Men and Units

Terrain, weather, and the enemy situation influence the determination of distances between men and units. They should be sufficient to promote march efficiency and to minimize the effects of accordion action which usually results when marching over hills or difficult terrain. Normal distances are usually included in the unit SOP as a guide to commanders.

a. Distances Between Men. When marching on roads during daylight, the distances between men may vary from 2 to 5 meters to provide dispersion and sufficient space for marching comfort. A distance in excess of 5 meters will increase the length of the column and make control more difficult. At night, the distances should be reduced to 1 to 3 meters between men to assist in maintaining contact and facilitating control. The tactical situation may necessitate a variation of the above distances. For example, if the march route is within range of enemy artillery fire, the maximum of the stated distances should be used.

b. Distances Between Units. Normally, distances are 100 meters between companies and 50 meters between platoons. At night or during periods of reduced visibility, the distances may be decreased to 50 meters between companies and 25 meters between platoons to facilitate control. In daylight, when the terrain is extremely rugged, or when the column is marching within the range of enemy artillery, the distances should be increased commensurately in accordance with the situation and the amount of control required. The above distances are sufficient to permit vehicles to pass the column (fig. 3).

27. Night Marches

a. Night marches are characterized by closed formations, more difficult control and reconnaissance, and a slower rate of march. Darkness provides concealment from hostile observation and air attack (par. 5).

b. Control is increased by reducing the distances between men and units, and by using connecting files to maintain contact between platoons and companies (app. II). Guides may be increased over those normally used, depending on the suitability of the roads or trails used. Flashlights, lanterns, luminous markers, and pyrotechnics (consistent with light discipline) are examples of visual communication means which may be used.

c. Because of the difficulties caused by reduced visibility and less effective control and coordination procedures, the rate of march is reduced over that normally prescribed for day marches (par. 21).



Figure 3. Distances between units should provide sufficient space for vehicles to pass the column.

28. Forced Marches

a. For planning purposes, a normal foot march day is 8 hours, covering 32 kilometers at a rate of 4 kilometers per hour. A *forced march* will usually exceed this distance by increasing the number of hours marched rather than by increasing the rate of march; however, there will be occasions, depending on the situation, when the rate of march will also be increased (par. 5).

b. Although forced marches impair the fighting efficiency of a unit, urgent conditions on the battlefield may require a maximum effort. Full advantage should be taken of those periods when the troops are most rested, to increase the rate of march. Rest periods

should be scheduled to avoid marching at extremely hot times of the day and to insure the arrival of the unit in effective condition to fight.

c. The maximum distances recommended for forced marches are: 56 kilometers in 24 hours; 96 kilometers in 48 hours; or 128 kilometers in 72 hours.

d. A time breakdown for a forced march of 52 km (four km less than the maximum recommended distance), assuming the march began at first light, is as follows:

	<i>Hours</i>
First phase: 20 km at four kmph (daylight, on roads) -----	5
Noon meal and rest period -----	2
Second phase: 20 km at four kmph (daylight, on roads) -----	5
Supper meal and rest period -----	6
Third phase: 12 km at 3.2 kmph (night, on roads) -----	3.84

Total time ----- 21.84 Hours
The above breakdown is a guide only, and can be modified as required.

29. Halts

a. Halts during a day's march are taken at regular intervals to rest personnel and adjust equipment. Halts are regulated by SOP or by the road movement order. Unit commanders are promptly notified of the time and approximate length of unscheduled halts.

b. Day marches should be terminated early in order to provide troops with rest and time to prepare for the next day's activities. Midday heat or enemy action may force the adoption of long daylight halts or night marches. At long halts, each unit moves to a previously selected location near the route of march.

c. Under normal conditions, a 15-minute halt is made after the first 45 minutes of marching. Following the first halt, a 10-minute halt is made after each 50 minutes of marching. Variations of this time schedule are made as required in the event a halt time occurs when passing through a built-up area, or when concealment or cover are required by the tactical situation and none is immediately available. On extended marches or marches of long duration, variations in the time schedule should be held to a minimum. Observation posts and patrols are established as required for security of the unit during halts.

d. All units in the column should be halted at the same time. At the halt signal, troops should move to the sides of the road, staying within the immediate vicinity of their unit. The men should remove or loosen their gear and sit or lie down with their

feet elevated to obtain maximum relaxation. Commanders inspect their men and equipment during halts, and aidmen administer medical treatment as required.

e. Men who relieve themselves should dig individual pits and cover them immediately after use. Straddle trenches will be dug during noon halts and while occupying bivouac or assembly areas.

Section II. DUTIES OF INDIVIDUALS

30. General

This section deals with the minimum duties of individuals at the company level, to include the company commander, executive officer, platoon leaders, platoon sergeants, guides, and traffic guards. Duties of specific unit staff and special staff officers at battalion or brigade level are contained in chapter 4.

31. Duties of the Company Commander

a. Before the March.

- (1) Issues warning order in time to allow the subordinate leaders and their men to prepare for the march.
- (2) Checks the route to the SP to determine the length of time it will take the company to arrive there from its present area. (If the company is marching alone, the commander selects the route of march and directs a reconnaissance of it.)
- (3) Prepares a march plan.
- (4) Issues the road movement order. The order is based on the order received from battalion; however, if the company is marching alone, the order is prepared by the company. The order may include, but is not limited to, the following:
 - (a) Enemy situation.
 - (b) Participating units.
 - (c) March objective.
 - (d) Purpose of the march.
 - (e) Uniform and equipment, to include water and rations to be carried.
 - (f) Formation time, based on time distance to SP.
 - (g) Order of march.
 - (h) Rate of march.
 - (i) Route of march.

- (j) SP and SP time.
- (k) RP.
- (l) Instructions concerning march, water, light, and/or communication discipline, as appropriate.
- (m) Location of march collecting posts.
- (5) Issues instructions concerning personnel who will not march with the unit, to include personnel in poor physical condition who will either be left behind or transported to the destination by motor.
- (6) Supervises preparation for the march.
- (7) Forms his company at the scheduled time and conducts an inspection to insure that the uniform and equipment are as prescribed and worn properly.

b. During the March. At this time, the company commander normally marches at the head of the company to the SP, after which he moves to a point in the area of the column where he can most effectively supervise the march. (Normally, the company executive officer marches at the head of the column.) During the march, he supervises the rate of movement, the company formation, the appearance of the troops, and the adjustment of packs, weapons, and other equipment. The commander maintains control by using voice, messenger, and radio communication. Periodically, he checks the march rate and distances between men and platoons to reduce the effects of accordion action (par. 25). He checks the number and condition of stragglers, and insures that they have received permission from their platoon leaders to fall out of the column.

c. During Halts. At this time, the company commander supervises foot inspections, water discipline, sanitation, safety, and adjustment of loads at one or more of the platoon areas. When the company resumes the march, he remains in place to observe the column as it passes.

d. After the March. Just prior to the completion of the march, the company commander moves to the head of the column to lead the company into the assembly area. He insures that movement of platoons into their respective assembly areas is rapid and without delay. He visits the platoon areas and supervises the platoon leaders in their inspections and execution of other duties.

32. Duties of the Company Executive Officer

The executive officer assists the company commander as directed. When the commander is not marching at the head of the column, the company executive officer leads the unit over the

designated route at the prescribed rate of march. He supervises the pace setter, assists in supervision of the platoons during halts, and resumes the march according to the time schedule. He posts and supervises company traffic guards and guides. Upon completion of the march, he supervises the establishment of the company command post (CP) and latrine facilities.

33. Duties of the Platoon Leader

a. Before the March. Informs his platoon of information contained in the road movement order so adequate and timely preparations can be made. He checks the physical condition of his men, the condition and fit of their boots, and insures that the troops will wear clean socks and carry an extra pair of socks. During the company formation, just prior to the march, he inspects the wearing and adjustment of clothing and equipment. He supervises his squad leaders in the performance of their duties.

b. During the March. As the platoon marches to the SP, he insures that the prescribed distances within his platoon and between his and the platoon ahead are maintained. He checks compliance of the announced restrictions, such as water and march discipline, and controls straggling by examining march casualties in consultation with the medical aidmen prior to granting them permission to fall out of the column. He encourages mental relaxation by allowing the men to converse and sing within the limits of propriety and security. After leading his platoon across the SP, he moves to the rear of the platoon where he remains until the RP is approached. When he is at the rear of the platoon, the platoon sergeant marches at the head of it (par. 44).

c. At Halts. During halts, the platoon leader directs the men to clear the road and get maximum relaxation by getting off their feet and loosening their equipment. He checks the physical condition of his men and enforces water and food discipline and field sanitation measures. He forms the platoon approximately 1 minute before the march is to resume so the resumption of the march will not be delayed.

d. After the March. Upon crossing the RP, he insures that the platoon moves promptly to its assigned area. In the assembly area, the platoon leader disperses his unit and utilizes available concealment and cover. He sees that the men obtain food, water, shelter, and rest. In a tactical situation, he checks his men to insure that they are ready to accomplish the assigned mission. He supervises his squad leaders in the performance of their duties, devoting particular attention to foot inspections. He insures that medical attention is obtained for those men who require it (par. 45).

34. Duties of the Squad Leader

a. Before the March. The duties of the squad leader are similar to those of the platoon leader in relation to his platoon. Upon receipt of the warning order, he provides detailed instructions to the men and gives individual attention where necessary. He inspects the men's boots to see that they are serviceable, well-fitted, and properly broken-in. He inspects each man's socks to see they are clean and have no holes or badly mended sections that could cause blisters. He directs each man to carry an extra pair of socks for use after the march. He may prepare a kit containing foot powder, gauze, adhesive tape, salt tablets, and other appropriate items for use by his squad during the march. Just prior to the march, the squad leader inspects his men to insure that they have the proper equipment, that it is properly adjusted, and that their canteens are full of water.

b. During the March. The squad leader marches at the head of his squad, maintaining the prescribed distance from the squad ahead, and periodically checking his men to see that they maintain the proper distance and rate of march. He assists the platoon leader in the enforcement of march discipline and other march control measures.

c. At Halts. The squad leader assists the platoon leader in the accomplishment of his duties by moving his squad off to the side of the road and allowing the men to obtain as much relaxation as possible. He may shift crew-served weapons and other heavy loads from tired men to others. He inspects the physical condition of his men.

d. After the March. He leads his men to the squad's sector of the assembly area and disperses them, utilizing all available concealment and cover. He conducts a foot inspection and reports the physical condition of his men to the platoon leader upon its completion. He prepares for the continuation of the unit mission and informs his men of those details required to facilitate its accomplishment.

35. Duties of Guides

a. Guides are used to lead or direct a unit over a predetermined route and into or out of a selected area. They may be placed at points along the march to control direction.

b. Guides are given detailed instructions as to their duties, to include pertinent information of the march and, if prepared, a strip map of the march route.

c. If conditions prevent the posting of guides ahead of the column, they accompany the lead element and are posted at critical points to provide direction for the remainder of the column. Examples of critical points are road or trail junctions, especially those where a new direction is taken. The guides either join the tail of the column as it clears their posts, or are picked up by unit transportation following the column.

d. Guides are used at the RP to lead units to their assigned sector of the assembly area.

36. Duties of Traffic Guards

Traffic guards are placed approximately 50 meters to the front and rear of the column to slow or stop oncoming or passing traffic. In addition, the column commander is responsible for placing guards at road intersections or other critical points where no guide is provided, to stop traffic while the column crosses. At such times, the traffic guards also act as guides. During night marches, when the tactical situation permits, traffic guards use flashlights or lanterns to control traffic.

CHAPTER 4

MOVEMENT PLANNING

37. General

The basic considerations in planning a foot march are the mission, tactical situation, terrain and weather, and the units to participate. The success of the march will depend largely upon the thoroughness with which it is planned. A successful march is characterized by the adherence to prescribed routes and time schedules, the efficient employment of the means available, and the ability of the unit to accomplish its assigned mission upon arrival at the destination.

38. Movement Orders

Movement planning culminates in the preparation and issuance of an operation order prepared in the standard five-paragraph format. Necessary annexes are attached to furnish detailed information required for the movement. Written movement orders are rarely prepared at company level. A discussion of the annexes is contained in this chapter. An example of a road movement order is contained in appendix III.

39. March Planning

March planning, as discussed in this chapter, is based on that planning conducted at battalion level. March planning may be organized into the following steps—

a. Preparation and Issuance of the Warning Order. In order to afford subordinate units the maximum possible time to prepare for a pending move, a warning order containing all readily available information about the march is issued. The amount of planning time available will determine the time of issuance and the content of the warning order.

b. Estimate of the Situation. In the operation estimate, the S3 considers the mission, weather, terrain, time and space factors, available routes, available transportation for the movement of

equipment and/or shuttling of troops, enemy capabilities, disposition of own forces, and courses of action available to the command.

c. Organization and Dispatch of a Reconnaissance Party. Every march plan is based on as thorough and complete ground reconnaissance as time and the situation will permit. Map and aerial reconnaissance are of value in formulating a plan, but are not a substitute for ground reconnaissance. Route reconnaissance is accomplished by a reconnaissance party which usually consists of a reconnaissance element, an engineer element from the attached or supporting engineer unit, and a traffic control element. Unit SOP generally establishes the basic composition of the reconnaissance party. It is modified as necessary to meet the requirements of a particular march. The minimum information required by the S3 from the reconnaissance party is—

- (1) Available routes and conditions. (Route(s) may be specified by higher headquarters.)
- (2) Recommended rate of march.
- (3) Selection of SP and RP, or confirmation of the suitability of SP and RP previously selected by map reconnaissance.
- (4) Confirmation of location of the assembly or bivouac area.
- (5) Location of critical points on the route.
- (6) Distance between critical points on the route and total distance from SP to RP.
- (7) Location of obstacles and estimation of necessary men and equipment needed to repair and maintain routes.
- (8) Number of guides required and their location on the route. A recommended method of reporting information obtained by the route reconnaissance party is shown in figure 4.

d. Organization and Dispatch of a Quartering Party. The new area is prepared for the orderly arrival of units by members of a quartering party.

- (1) A battalion quartering party consists of a commander (usually the S1), a representative(s) from each company, a representative of the S4, and communication, security, and medical personnel.

ROUTE RECONNAISSANCE REPORT

Route	Kilometers from SP	Recommended rate of march (kmph)	Remarks
SP: RJ 8th Div Rd—Superhighway	-----	4	Bridge; hard surface; two guides.
RJ Jamestown—Hersey Rd -----	2.25	4	Traffic heavy; two guides; Jamestown Rd bears to right.
RJ Jamestown—Yankee Rd -----	7.10	4	Two guides
RJ Jamestown—Lightning Rd -----	10.50	4	Two guides
RJ Jamestown—Sunshine Rd -----	12.40	4	Light traffic; one guide Sunshine Rd; gravel, poor traction when wet.
RP; RJ Sunshine—Sedan Rd -----	14.80	4	Two guides

Figure 4. Example of route reconnaissance report.

- (2) The quartermaster party commander indicates the location of major subordinate units on the ground, formulates a plan to receive and guide units from the RP to their areas, and selects locations for the battalion command and administrative installations. Company representatives select locations for company headquarters, platoons, feeding areas (kitchen areas, if mess is under company control), and latrines. Communication personnel install necessary equipment to insure immediate control of units as they arrive in their assigned areas. Medical personnel in the quartermaster party advise other quartermaster party personnel on sanitation measures, and select a site for the aid station. Based on the order of march, a plan is prepared to guide each unit over a designated route from the RP to the unit's new area. It is imperative that guides be thoroughly familiar with this plan to prevent congestion or delay in the vicinity of the RP. The actual dispatch of the quartermaster party may follow the issuance of the movement order.

e. Development of Detailed Movement Plans.

- (1) *Organization of the column.* To facilitate control and scheduling, units will be organized into serials and march units and given an order of march. In determining the order of march, the march planner must consider the enemy situation and the desirable order of arrival of the units at the destination. Where dispersion is required,

a unit may be organized into two or more columns, each assigned a different route.

- (2) *Use of reconnaissance information.* Results of the route reconnaissance will be used to select route(s) ; determine the SP, critical points along the route(s), and the RP; and select the rate of march.
- (3) *March computations.* Based on the strength, formation, and rate of march, march unit time lengths will be computed. The time length of the marching columns, plus necessary time distance computations, will be used to determine the completion time of the march.
- (4) *Draft of road movement table.* Using the completed march computations, a draft road movement table is completed.
- (5) *Check of the plan.* Using the draft road movement table and a road movement graph (par. 40), the movement plan is checked to insure that it conforms to the directive of the higher headquarters' and the battalion commander's instructions.

f. Preparation and Issuance of the Road Movement Order. After the plan for the move has been checked and approved by the commander, an operation order is prepared and issued. The operation order may be in written form or issued orally, and is accompanied by a road movement table, overlay, and/or strip map, and appropriate administrative details (app. III).

- (1) A road movement table, prepared as an annex to the operation order, provides serial commanders with arrival and clearance times at critical points along the route of march and provides the column commander with information as to the proposed location of elements of the column at various times.
- (2) An overlay serves the normal purpose and should show as a minimum the present location of units, route of march, critical points, and the new location of units at the destination.
- (3) A strip map is a schematic diagram of the route of march and shows landmarks and critical points with the distances between them. A strip map may be issued as an annex to the road movement order, in addition to, or in lieu of an overlay.
- (4) An administrative order or an administrative annex may be cited or included in the operation order when

the administrative details are too lengthy for inclusion in the body of the order.

40. March Computations

Prior to issuance of the operation order, the S3 must make certain time and space computations to provide him with the necessary data for the preparation of a road movement table (see par. 6 for explanation of terms).

a. *Time Distance (TD)*. Time distance is determined by dividing the distance to be traveled by the rate of march—

$$TD \text{ (hours)} = \frac{\text{Distance (kilometers)}}{\text{Rate (kilometers per hour)}}$$

b. *Road Space (RS)*. The road space of a foot column is used to determine the time length of a column, and consists of two parts: the space occupied by the men alone (including the distance between men), and the sum of the distances between the elements of the foot column. Thus, the total road space is the sum of the two parts.

- (1) The road space of the *men alone* is determined by multiplying the number of men by the appropriate factor selected from the table below (RS men = No. of men x factor)—

ROAD SPACE — FOOT TROOPS

(Does not include distances between units)

Formation	2m/man distance	5 m/man distance
Single file -----	2.4	5.4
Column of twos-----	1.2	2.7

- (2) The total road space *between* units is obtained as follows:

- (a) Determine the number of serial distances (total serials minus one).
- (b) Determine the number of march unit distances (total march units minus one, minus the number of serial distances).
- (c) Multiply the number of distances obtained in (a) and (b) above by the length, in meters, between respective units.
- (d) Add the results.

EXAMPLE

A battalion foot column is organized into 12 platoon-size march units and three company-size serials. Required: road space of

unit distances when there are 100 meters between serials and 50 meters between march units.

$$\text{Serial distances} = (3-1) \times 100 = 200$$

$$\text{March unit distances} = (12-1-2) \times 50 = 450$$

$$\text{Total road space of unit distances} = 650 \text{ meters}$$

c. *Time Length (TL)*. For foot columns, the time length is determined by applying the following formula expressed in terms of meters and minutes—

$$\text{TL (minutes)} = \frac{\text{Road space (meters)} \times 60 \text{ (minutes in an hour)}}{1,000 \text{ (meters in a kilometer)} \times \text{rate (kilometers per hour)}}$$

In this case, both the number of meters in a kilometer and the number of minutes in an hour are constant while the rate of march is variable. Since foot movements are usually conducted at prescribed rates of march, it is possible to arrive at a constant factor for each rate of march and thus reduce the formula to the following factors—

TIME LENGTH FACTORS FOOT TROOPS

.0150 for 4.0 kmph

.0187 for 3.2 kmph

.0250 for 2.4 kmph

.0375 for 1.6 kmph

The simplified formula is now stated—

$$\text{TL (min)} = \text{RS (meters)} \times \text{factor for appropriate rate of march.}$$

EXAMPLE

Determine the time length of a unit which occupies a total road space of 1,500 meters and is marching at a rate of four kmph.
 $\text{TL (min)} = 1,500 \times .0150 \text{ (the factor for 4.0 kmph)} = 22.5 \text{ minutes}$

d. *Completion Time*. Completion time is determined by using the following formula—

$$\text{Completion Time} = \text{SP time} + \text{TD} + \text{TL} + \text{Scheduled Halts (other than normal hourly halts)}$$

EXAMPLE

A column's SP time is 0700 hours. The time distance is six hours and 40 minutes. Time length of the column is 30 minutes. A 35-minute lunch halt has been scheduled. What is the completion time of the march?

Employing the 24-hour clock system, the formula can be applied as follows for simplified addition of the times—

	<i>Hr</i>	<i>Min</i>
SP time -----	07	00
TD -----	06	40
TL -----	00	30
Lunch halt -----	00	35

Completion time ----- 13 105 or 1445 hours

The march will be completed at 1445 hours.

e. Experience Tables. Based upon previous movements made by a unit, data is accumulated to facilitate march planning. Such data includes approximate time lengths for various elements of the battalion. The S3 can utilize these data rather than computing them each time a march is scheduled. Such experience tables serve to reduce the time required to complete the computation phase of march planning. Matter appropriate to the unit SOP should be integrated therein.

41. Road Movement Graph

a. A road movement graph is a time-distance diagram used in planning, preparing, or checking road movement tables, and for controlling marches. The graph provides an easily used device for visual representation of a march plan so conflicts and discrepancies may be prevented in the planning stage, before congestion occurs on the route. It is not usually issued as a part of the order. Road movement graphs may be applied to small units, to movements of a single column, or to a large organization scheduling separate elements, moving by various means, with different rates of march, over one or more routes.

b. To construct a road movement graph, use the following steps—

- (1) Determine the number of hours available for the march. Designate the lower left corner of a sheet of graph paper as the SP time or the earliest even hour before the march is to begin. Select a scale and plot the hours available in sequence from the left on the horizontal axis.
- (2) Determine the distance to be moved in kilometers. Indicate the SP at the lower left corner of the graph sheet and, using an appropriate scale, plot the number of kilometers on the vertical scale from the SP to the RP. Indicate the location of critical points on the vertical scale.
- (3) At the proper distance from the SP, draw a horizontal line indicating the location of the RP. Indicate by a vertical line the hour when the movement must be completed. Plot lines representing route restrictions, if any, at the proper distances and times on the graph.

- (4) Determine the time lengths of foot and motor elements of the column.
- (5) Starting at the SP at the specified hour, plot the movement of the head of the leading element. If the rate of march is three kmph, the lead element will have moved $1\frac{1}{2}$ km in 30 minutes, three km in 1 hour, etc. Plot the trace of the lead man to the RP. The last man will cross the SP in time length after the lead man. Measure this time on the graph and plot the trace of the last man of the column. The lines describing the head and tail of a march serial are parallel. Indicate the time subsequent serials reach the SP and plot the trace of the head and tail. Check to see that the plan complies with all restrictions and orders. If there are any violations or conflicts, the plan may be made to conform by changing the order of march, the starting time of the serials, the planned rate of march, or the organization of the column.

c. A sample road movement graph is shown in figure 5.

42. Conversion to the Metric System

a. The adoption of the metric system for expressing linear distances requires a simplified means of conversion. To accomplish this, use the following tables:

- (1) Multiply *inches* x 2.54 to obtain *centimeters*.
Multiply *centimeters* x .39 to obtain *inches*.
- (2) Multiply *yards* x .91 to obtain *meters*.
Multiply *meters* x 1.1 to obtain *yards*.
- (3) Multiply *miles* x 1.6 (or 8/5) to obtain *kilometers*.
Multiply *kilometers* x .62 (or 5/8) to obtain *miles*.

b. Linear distances can be accurately measured on maps which have been converted to the metric system by using a straightedge graduated in centimeters (cm). The centimeter scale can be used in lieu of the graphic scale when the scale of the map is known as follows:

Map scale	One centimeter equals:
1:500,000	5,000 meters
1:250,000	2,500 meters
1:100,000	1,000 meters
1:50,000	500 meters
1:25,000	250 meters

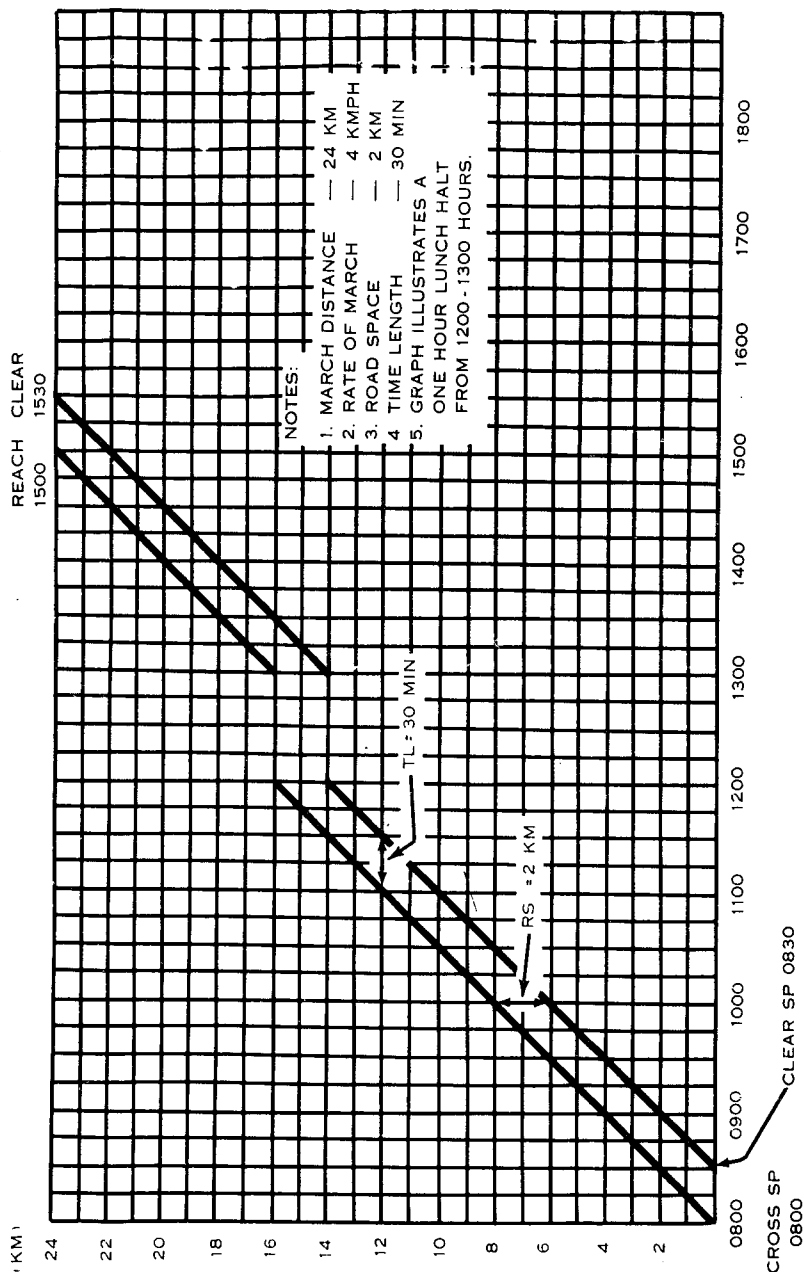


Figure 5. Road movement graph.

CHAPTER 5

TRAINING

43. Training Objectives

a. Training in foot marches is conducted to develop a unit which will be capable of marching to its destination and arriving in condition to accomplish its assigned mission.

b. Regardless of the degree to which a force may be mechanized, much of the success in combat will depend upon troops who possess the capability to move dismounted cross-country, covering a great distance in the shortest possible time.

c. Training objectives are achieved through the development of unit discipline, leadership, teamwork, morale, health, endurance, and mental and physical stamina.

44. Physical Conditioning

Physical conditioning is an important element of foot marching. It must be progressive and carefully supervised. Best results are obtained from cross-country marches, although physical training and the negotiation of obstacle courses are also useful. Loads should be light and distances short at the beginning of training. As training continues, distances, equipment loads, and difficulty of terrain should be progressively increased. By the end of training, troops should have become accustomed to conditions as rigorous (if not more so) as those likely to be encountered in subsequent operations.

45. Training in March Discipline

March discipline must be stressed throughout training. Aspects requiring special considerations are maintaining the rate of march and distances between men and units, and proper timing and utilization of halts and rest periods. Troops must be trained not to drop cigarette butts or candy wrappers and other refuse along the trail and to observe, meticulously, prescribed sanitation procedures. At halts, all material which might direct attention to or identify a force should be carefully removed or buried. When contact with the enemy is imminent, silence at all times is a prerequisite to security.

46. Training in Occupation of Assembly Areas

a. Since tactical marches frequently end with occupation of a forward assembly area, troops must be trained to apply tactical procedures and techniques to reduce vulnerability to enemy observation and fire, and to provide maximum security.

b. Advantage is taken of available concealment and cover, and maximum use is made of camouflage. Elements of the unit occupying the assembly area are dispersed to permit all-round defense, if required. Individual shelters are dug, security is posted to prevent surprise by enemy ground or air action, and antitank weapons are positioned to provide protection against enemy armored attack.

47. Integrated Training

Every opportunity should be taken to integrate previously learned subjects with foot marches in order to maintain overall proficiency and inject realism in the training. The type subjects to be integrated and the emphasis each is to receive will depend on the area of operations in which the training is conducted. A list of subjects applicable to most areas is as follows:

- a.* Camouflage.
- b.* Reconnaissance and security.
- c.* Map reading.
- d.* Use of the compass and other navigational aids.
- e.* Air defense.
- f.* CBR defense.
- g.* First aid and hygiene.
- h.* Field sanitation.
- i.* Occupation of bivouac and assembly areas.
- j.* Tent pitching.
- k.* Preparation of individual and small group rations.
- l.* Evacuation of casualties.
- m.* Care of clothing and equipment.

48. Indoctrination Training

Training should consider the terrain and climate of the area in which the unit will subsequently conduct operations. The training program must include familiarization with special equipment and the application of specialized techniques to tactical principles. Specialized training procedures for desert, jungle, northern, and mountain areas are found in manuals dealing with those areas of operations (app. I).

APPENDIX I

REFERENCES

AR 220-58	Organization and Training for Chemical, Biological, and Radiological Operations.
AR 320-5	Dictionary of United States Army Terms.
AR 320-50	Authorized Abbreviations and Brevity Codes.
AR 385-63	Regulations for Firing Ammunition for Training, Target Practice, and Combat.
AR 600-66	Report of Casualties Originating in Combat Areas.
AR 735-35	Supply Procedures for TOE Units, Organizations, and NonTOE Activities.
FM 1-100	Army Aviation.
FM 3-5	Chemical, Biological, and Radiological (CBR) Operations.
FM 5-20	Camouflage, Basic Principles and Field Camouflage.
FM 5-22	Camouflage Materials.
FM 7-11	Rifle Company, Infantry, Airborne Infantry, and Mechanized Infantry.
FM 7-15	Infantry, Airborne Infantry, and Mechanized Infantry Rifle Platoon and Squads.
FM 7-20	Infantry, Airborne Infantry, and Mechanized Infantry Battalions.
FM 7-30	Infantry, Airborne, and Mechanized Division Brigades.
FM 8-15	Division Medical Service, Infantry, Airborne, Mechanized, and Armored Division.
FM 8-35	Transportation of Sick and Wounded.
FM 19-40	Handling Prisoners of War.
FM 21-5	Military Training.
FM 21-6	Techniques of Military Instruction.
FM 21-10	Military Sanitation.
FM 21-11	First Aid for Soldiers.
FM 21-15	Care and Use of Individual Clothing and Equipment.
FM 21-20	Physical Training.
FM 21-26	Map Reading.

FM 21-30	Military Symbols.
FM 21-40	Small Unit Procedures in Nuclear, Biological, and Chemical Warfare.
FM 21-41	Soldier's Handbook for Nuclear, Biological, and Chemical Warfare.
FM 21-48	Chemical, Biological, and Nuclear Training Exercises and Integrated Training.
FM 21-50	Ranger Training and Ranger Operations.
FM 21-60	Visual Signals.
FM 21-75	Combat Training of the Individual Soldier and Patrolling.
FM 21-76	Survival.
FM 21-77	Evasion and Escape.
FM 22-5	Drills and Ceremonies.
FM 22-100	Military Leadership.
FM 25-10	Motor Transportation Operations.
FM 30-5	Combat Intelligence.
FM 31-15	Operations Against Irregular Forces.
FM 31-25	Desert Operations.
FM 31-30	Jungle Operations.
FM 31-70	Basic Cold Weather Manual.
FM 31-71	Northern Operations.
FM 31-72	Mountain Operations.
FM 100-5	Field Service Regulations ; Operations.
FM 101-5	Staff Officers Field Manual; Staff Organization and Procedure.
FM 101-10	Staff Officers Field Manual; Organization, Technical, and Logistical Data (Part I).
TM 10-405	Army Mess Operations.
TM 21-200	Physical Conditioning.
DA Pam 8-16	Training in Emergency Medical Care.
DA Pam 27-10	Military Justice Handbook.
DA Pam 108-1	Index of Army Motion Pictures, Filmstrips, Slides, and Phono-Recordings.
DA Pam 310 Series	Military Publications Indexes (as applicable).
DATC 3-10	Defense Against V-Agents.
ASubjScd 21-22	Marches and Bivouacs.
ATP 21-114	Basic Combat Training Program for Male Military Personnel Without Prior Service.

APPENDIX II

UNIT STANDING OPERATING PROCEDURES (SOP) FOR FOOT MARCHES

1. General

a. A unit SOP prescribes routine methods to be followed in operations.

b. To provide for expeditious and efficient movement, individual and unit training in preparation for, and conduct of, all forms of movement is desirable. The unit SOP should include those standard methods and techniques for each mode of transport which the unit may be expected to employ.

2. Extract

An extract of a type battalion SOP prescribing foot marching procedures follows:

—5. OPERATIONS

a. Movements.

(1) Reconnaissance—battalion conducts the following, supplemented as required by personnel from units:

- (a) Route reconnaissance.
- (b) Reconnaissance of assembly, bivouac, and staging areas.
- (c) Traffic control.

(2) Reconnaissance party.

- (a) Commander—reconnaissance platoon leader.
- (b) Composition of reconnaissance party designated separately for each march and will include:
 - 1. Reconnaissance element from reconnaissance platoon.
 - 2. Traffic control element as designated.
 - 3. Engineer element, if available, from attached or supporting engineer unit.

(3) Quarters party.

- (a) Commander—S1 or headquarters commandant.

- (b) Composition—communication officer and communication platoon elements; necessary security personnel; representatives from each company, the S4 section, and the medical platoon.
- (4) Foot marches (walking elements).
 - (a) Rates: Day —4 kmph roads; 2.4 kmph cross-country.
Night—3.2 kmph roads; 1.6 kmph cross-country.
 - (b) Halts: Lead unit of column regulates halts. First halt 15 minutes after first 45 minutes of marching; thereafter, 10 minutes each hour. Meal halts—1 hour.
 - (c) Organization: Battalion will be organized with companies as follows—
 - Rifle company—4 platoons.
 - Headquarters and headquarters company—1 composite platoon (when directed) march as 2d march unit; co (—) with motorized elements.
 - (d) Attachments: Frontline ambulance to each company.
 - (e) Distances: Between companies—100 meters day; 50 meters night.
Between platoons—50 meters day; 25 meters night.
 - (f) Formation: Column of files on each side of road; 5 meters between men day; 2 meters night. Two or more connecting files to be used between march units at night or during periods of reduced visibility; files to be furnished from rearward unit.
 - (g) Motorized elements: Integrated with or follow main body by bounds.

APPENDIX III

EXAMPLE OF A BATTALION ROAD MOVEMENT ORDER

(Classification)

(No change from oral orders)

Copy No. 2
1st Bn, 66th Inf
(FM 980876)
151000 Apr 19__
PRT8

OPORD 7

Reference: Map, GEORGIA, 1:50,000, COLUMBUS Sheet.

Task organization: Annex A, Road Movement Table.

1. SITUATION

a. Enemy forces:

(1) Enemy has withdrawn across MULBERRY Creek (FM 9918).

(2) Indications are that enemy will continue to delay on successive positions.

b. Friendly forces: 1st Bde moves by foot and motor commencing at 160700 Apr to assembly area vicinity MIDLAND (GMO106).

c. Attachments and detachments: None.

2. MISSION

1/66 Inf moves by foot and motor commencing 160700 Apr to assembly area vicinity FLAT ROCK (FM9903).

3. EXECUTION

a. Concept of operation: 1/66 Inf moves by foot in 4 march units, crossing SP at 160700 Apr and closing new area by 161209 Apr. Motorized elements follow main body by bounds.

b. March Unit 1.

c. March Unit 2.

d. March Unit 3.

e. March Unit 4.

f. Coordinating instructions:

(1) Quartering party assemble Bn CP at 151500 Apr.

(2) Formation: column of files on each side of road.

(Classification)

(Classification)

(3) Annex A, Road Movement Table.

(4) Annex B, Strip Map.

4. ADMINISTRATION AND LOGISTICS

a. Materiel and Services:

Supply: C1 I. Individuals carry 1/3 C ration for noon meal 16 Apr.

b. Medical: March collecting posts will be located at critical points BILL through GEORGE (Annex A, Road Movement Table).

5. COMMAND AND SIGNAL

a. Signal:

(1) SOI, Index 1—7.

(2) Listening silence except for emergencies.

b. Command: Command Group and March CP at head of March Unit 2.

Acknowledge

THOMPSON

Lt Col

Annexes: A—Road Movement Table.

B—Strip Map.

Distribution: A

OFFICIAL:

[S] Sellera

[T] SELLERA

S3

(No change from oral orders)

Copy No. 2

1st Bn, 66th Inf

(FM 980876)

151000 Apr 19__

PRT8

Annex A (Road Movement Table) to OPORD 7

Reference: Map, GEORGIA, 1:50,000, COLUMBUS Sheet.

1. Rate of March: 4 kmph.

2. Distances: Between men, 5 m; between plat, 50 m; between co, 100 m.

3. Halts: SOP.

4. Routes: MOYE Road; BUENA VISTA Road; SCHATULGA Road.

5. Route Classification Restrictions: None.

(Classification)

(Classification)

6. Critical Points:

- a. SP: Jct MOYE Rd and 2d ARMD DIV Rd (FM 988882) (ART).
 - b. RP: Jct SCHATULGA Rd and WARM SPRINGS Rd (FM 998035) (HOW).
 - c. Other critical points:
 - Jct MOYE Rd and ST MARY'S Rd (FM 987896) (BILL).
 - Jct MOYE Rd and STEAM MILL Rd (FM 998908) (CARL).
 - Jct MOYE Rd and BUENA VISTA Rd (FM 998940) (DON).
 - Jct BUENA VISTA Rd and SCHATULGA Rd (GM 001942) (ED).
 - Jct SCHATULGA Rd and FORREST Rd (GM 001963) (FRANK).
 - Jct SCHATULGA Rd and MACON Rd (GM 000002) (GEORGE).
7. Main Route to Start Point: MOYE Rd.
8. Main Route from Release Point: Unnamed Trail (as designated by guides).
9. March Units:

(Classification)

Control of Movement

MARCH UNIT	ORG & COMDR	TL (Min)	CRITICAL POINTS	ARRIVAL TIME	CLEARANCE TIME	REMARKS
1	Co A (Capt May)	7	SP—ART	160700 Apr	160707 Apr	Includes 1/4-T Amb
			BILL	0711	0718	
			CARL	0733	0740	
			DON	0836	0843	
			ED	0838	0845	
			FRANK	0910	0917	
			GEORGE	1010	1017	
			RP—HOW	1050	1057	
2	Hq & Hq Co (—) (Capt Perkins)	3	SP—ART	0724	0727	Includes 1/4-T Amb and Bn March CP and Comd Gp
			BILL	0735	0738	
			CARL	0757	0800	
			DON	0900	0903	
			ED	0902	0905	
			FRANK	0934	0937	
			GEORGE	1034	1037	
			RP—HOW	1114	1117	
3	Co B (Capt Gilbert)	7	SP—ART	0748	0755	Includes 1/4-T Amb
			BILL	0759	0806	
			CARL	0821	0828	

(Classification)

(Classification)

Control of Movement—Continued

MARCH UNIT	ORG & COMDR	TL (Min)	CRITICAL POINTS	ARRIVAL TIME	CLEARANCE TIME	REMARKS
4	Co C (Capt Russell)	7	DON ED FRANK GEORGE RP—HOW SP—ART BILL CARL DON ED FRANK GEORGE RP—HOW	0924 0926 0958 1058 1138 0812 0823 0845 0948 0950 1022 1122 1202	0931 0933 1005 1105 1145 0819 0830 0852 0955 0957 1029 1129 1209	Includes 1/4-T Amb

(Classification)

(Classification)

(Classification)

Acknowledge

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[T] SELLERA
S3

NOTE: Paragraph 9 of the Road Movement Table may also contain columns to designate present and new locations of the units concerned. These were not applicable in this situation.

(Classification)

Annex B (Strip Map) to OPORD 7

CLASSIFICATION

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1st Bn, 66th Inf
FM(980876)
151000 Apr 19__
PRT 8

Annex B (Strip Map)
to OPORD 7

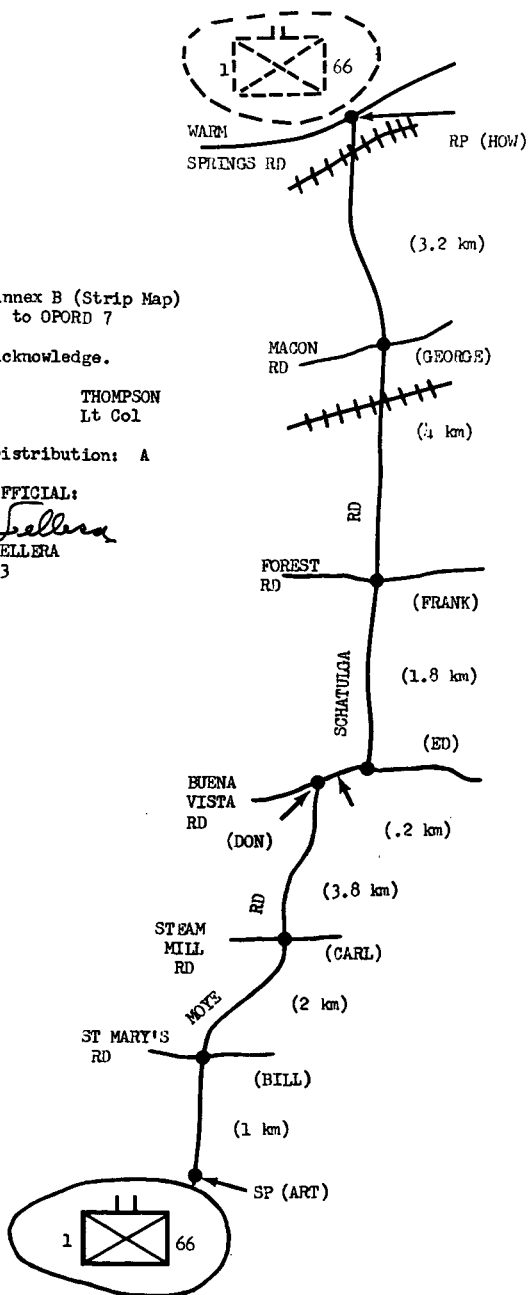
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CLASSIFICATION

APPENDIX IV

CARE OF THE FEET

Section I. FOOT HYGIENE

I. General

Foot hygiene and sanitation are especially important because the feet are heavily and rigidly covered during most of the working hours. They are almost constantly in action. Minor care of the feet includes hygienic measures such as frequent bathing, the use of foot powder, the wearing of properly fitted footwear which allows sufficient ventilation, and proper trimming of the toenails (fig. 6).



TOE-NAIL PROPERLY TRIMMED

Figure 6. Keep your toenails trimmed.

2. Care of the Feet

The care of minor ailments of the soldier's foot is of great importance and should be given the utmost attention. Many major conditions necessitating hospitalization and disability have resulted from neglected or maltreated minor conditions.

a. Conditioning Process. Conditioning is accomplished by progressively increasing the distance to be marched. This may be done by lengthening marches from day to day. Marching is an excellent way to get the feet and legs in shape. Running (of itself) will not suffice. The arch, ankle, and calf can be strengthened by performing simple exercises such as rising high on the toes, or by placing the feet on towels and using the toes to roll the towel back under the arch.

b. Preventive Measures.

- (1) *Before marches.* Cut toenails short and square—straight across. Trim toenails regularly, every 2 or 3 weeks, depending on their growth. Keep the feet clean and dry. Use foot powder. Wear clean, dry, whole, unmended, well-fitting socks (preferably cushion sole) with seams and knots outside. Carry an extra pair of socks. Boots should be carefully fitted. When breaking in boots, alternate pairs. Soften the boots, using Neat's foot oil and saddle soap.
- (2) *During halts.* Lie with the feet elevated during a part of each halt. If time permits, massage the feet, apply powder, change socks, and treat blisters. Cover open blisters, cuts, or abrasions with absorbent adhesive bandages. Relief from swelling feet can be obtained by a slight loosening of the boot laces where they cross the arch of the foot. See paragraphs 3 through 7, this appendix.
- (3) *After marches.* Repeat care of feet, wash and dry socks, dry boots and treat with Neat's foot oil or saddle soap. Treat blisters, abrasions, corns, and callouses. Inspect painful feet for sprains and improper fitting of socks and boots. After prolonged marching, men often develop red, swollen, tender skin along the edges of the foot. This skin may blister. If this is the case, the foot requires aeration, elevation, rest, and, as a rule, wider footwear. Many major foot troubles may be prevented by keeping the feet clean. The formation of blisters and abrasions in the presence of dirt and sweat may cause infection and serious injury. A daily foot bath is important. In the field, cool water seems to allay the sensation of heat and irritation. After washing, the feet must be well dried.

Section II. COMMON INJURIES OF THE FOOT

3. Blisters and Abrasions

The most common causes of blisters and abrasions are: ill-fitting footwear and socks, improperly maintained footwear, heat, and moisture. These injuries are usually caused by friction, less often by impact, and in some cases by pressure. Wash carefully around the blister with soap and water, being careful not to break the skin if the blister is unbroken. Empty the blister, if unbroken, by pricking the lower edge with a needle or knifepoint which has

been held in a flame. Do not remove the skin, but cover the blister with an issue absorbent adhesive bandage or similar dressing smoothly applied with adhesive plaster extending beyond its edge. After applying the dressing, dust the outside and the entire foot with foot powder. Insure that not too much powder is used, as it will cake and become irritating. Foot powder lessens friction on the skin and prevents the raw edges of the adhesive plaster from adhering to the socks. Check the blister periodically to see that it is drying properly. After the blister dries, remove the adhesive plaster. Carefully inspect the foot for other points of trouble. Areas which are red and tender where no blister has yet occurred, or where a blister has been in the past, should be protected with adhesive plaster. Abrasions and cuts on the foot can be covered with absorbent adhesive bandages, under which they usually heal rapidly. The adhesive plaster should be absolutely smooth, so it can serve as a "second skin" (fig. 7).

4. Sweaty Feet

When the feet sweat profusely, the secretion decomposes and causes a foul odor. The skin between the toes usually becomes white and macerated. It rubs off easily and is prone to abrasions. Treatment consists of washing and thoroughly drying the feet, and carefully painting the affected area by means of a cotton swab with the following solution:

Formalin—one part
Rubbing alcohol—nine parts.

Allow this to dry. If the skin begins to burn, the excess solution should be washed off. This solution should be kept out of abrasions and cuts because of the pain it causes. Paint the entire area of the foot up to and including the ankle. Make sure the areas around the heel, the instep, and between toes are treated since these are particular trouble spots. The solution should be applied once daily until the perspiration is halted and the skin becomes hardened.

5. Athletes Foot

Athletes foot usually occurs between the toes, on the sole of the foot, and at points of contact between skin and footwear. This and other mild, chronic cases of fungus infection may respond to daily foot powder applications. If fungicidal ointment is available, it may be used in addition to foot powder. Use ointment as directed on the tube while the feet are at rest. If applications of foot powder and ointment do not clear up the infection, see your aidman or surgeon.

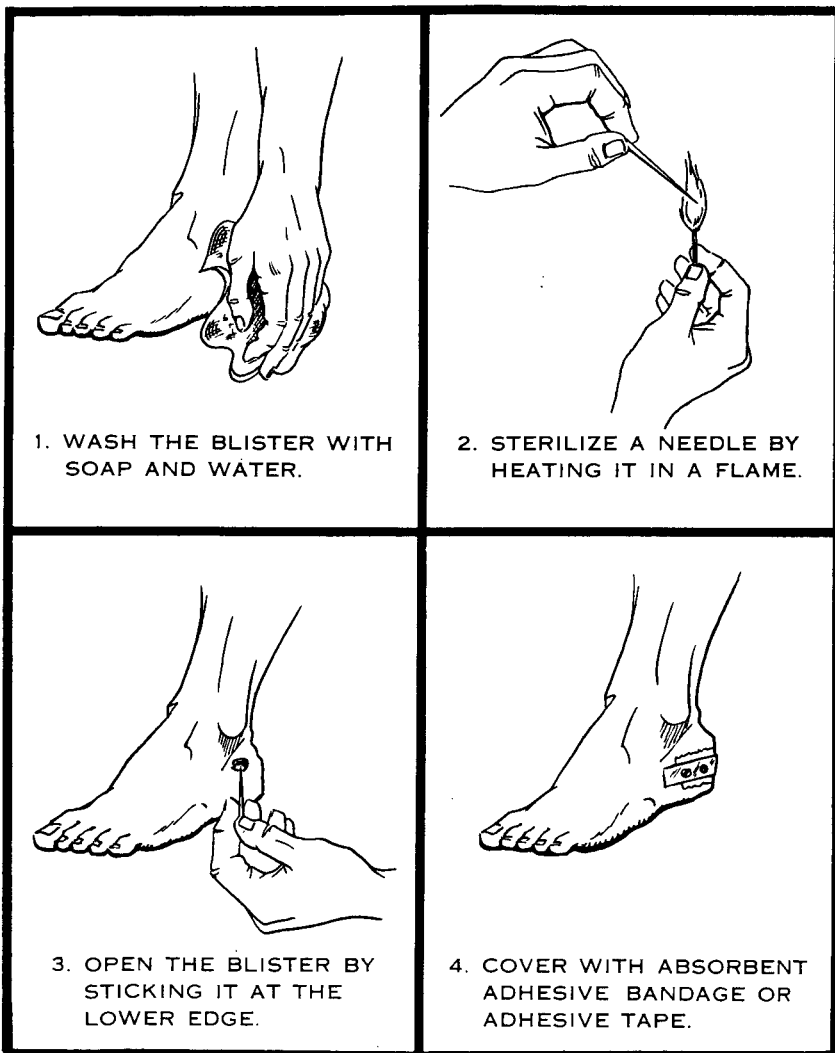


Figure 7. Treatment of a foot blister.

6. Trench Foot

Trench foot (sometimes called immersion foot) is caused by prolonged exposure to cold, not necessarily freezing, weather and the continuous use of wet socks and footgear. It is so named because it often follows prolonged standing in wet foxholes or trenches. The symptoms are burning pain and numbness. The skin becomes red and raw. To prevent trench foot: avoid standing in water, snow, or mud; exercise your feet; massage your feet at least once daily; clean and dry your feet at least once daily and dry your footwear; avoid tight footwear, socks, laces, or tie-downs which would interfere with blood circulation.

7. Frostbite

The symptoms of frostbite are initial redness of the skin followed by sudden blanching, which may be accompanied by a momentary tingling. If, in severe cold, the face, hands, or feet stop hurting, investigate immediately; frostbite is probable. To treat superficial, limited areas of frostbite, loosen clothes over the area if there is pressure, and thaw the affected part by putting it next to a warm part of your or your buddy's body. *Do not massage, walk, use open fire, cold water, or snow to treat frostbite.* Do not apply ointments or vaseline gauze. Do not open any blisters which might occur. If more than limited superficial frostbite is present and medical care is within a 24-hour evacuation distance, do not thaw the frozen part. Evacuate to a medical facility immediately. With small isolated units where, due to combat conditions or inaccessibility of medical facilities, evacuation is not possible for prolonged periods, *do not* thaw frozen feet and hands because this immediately immobilizes the casualty. Allow the part to remain frozen until evacuation is possible or the casualty can walk to help. Only by allowing the part to remain frozen is a man's mobility and comfort maintained. Discourage the casualty from smoking, since smoking increases the injury. Do not allow alcohol intake. Keep the body "core" warm by use of clothes, blankets, and hot liquids or food. A man with a frozen extremity is not a litter case unless he has accompanying or attendant injuries, or the extremity is thawed.

Section III. CARE OF FOOTWEAR

8. Oiling of Boots

Where boots may get wet, it is important to keep them well-oiled or saddle-soaped. This does not insure waterproofing, but keeps the leather soft and pliable. The upper portion of the boot should not be heavily oiled in hot, dry weather as it may interfere with

the natural evaporation of sweat and cause the feet to be constantly hot and moist.

9. Fitting of Boots

The two most important considerations in fitting boots are length and width. Two important criteria in fitting boots are: the space between the end of the great toe and the toe of the boot should be the width of the thumb; in the unlaced boot, there should be sufficient space under the lower edge of the tongue to admit an index finger. Improperly fitted boots cause blisters, abrasions, callouses, and corns. These may be caused by boots being too small, thus causing pressure: or by boots which are too large, causing friction. If the tops of the toes are involved, the cap is too low or too stiff. If the ends of the toes are affected, the boot is too short or too loosely laced. The sides of the big and little toes become irritated when the boot is too narrow. Irritation at the heel is due to a boot which is too long, too loosely laced, or which has too wide a heel space for the foot (fig. 8).

a. To prevent boots from getting out of shape and the leather from hardening, they must be carefully dried after use. This can be done by placing warm cloths in the boot, or any other method which precludes rapid drying. Too rapid drying will harden the leather. During winter, be especially careful that the moist leather in the boot does not freeze. Place them inside your sleeping bag or use them as a headrest.

b. Proper lacing of boots not only prevents blisters, but will prevent improper circulation in the foot. Laces may assume a seesaw action across the instep and produce a long blister across the instep. The laces over the instep may be skipped in lacing to prevent irritation. Broad laces should also be used. Carry an extra pair of laces at all times. Remember, the improperly laced boot will cause foot injury.

10. Socks

To check the fit of socks, stand with the weight evenly distributed on both feet. No tightness or fullness will show if the fit is correct. In a new sock, allow $\frac{3}{8}$ of an inch for shrinkage. See the chart below for proper fitting of socks. Socks which are too large wrinkle inside the shoe, rub the feet, and cause blisters and abrasions. Socks which are too small wear quickly and reduce the free circulation of blood in the foot. When wearing two pairs of socks, wear an outer pair at least a half-size larger than your normal size. Change socks daily. Dirty socks are conductors of heat and allow warmth to escape. Wash them regularly in lukewarm water for cleanliness and to preserve the fiber of the sock. *Hot water causes*

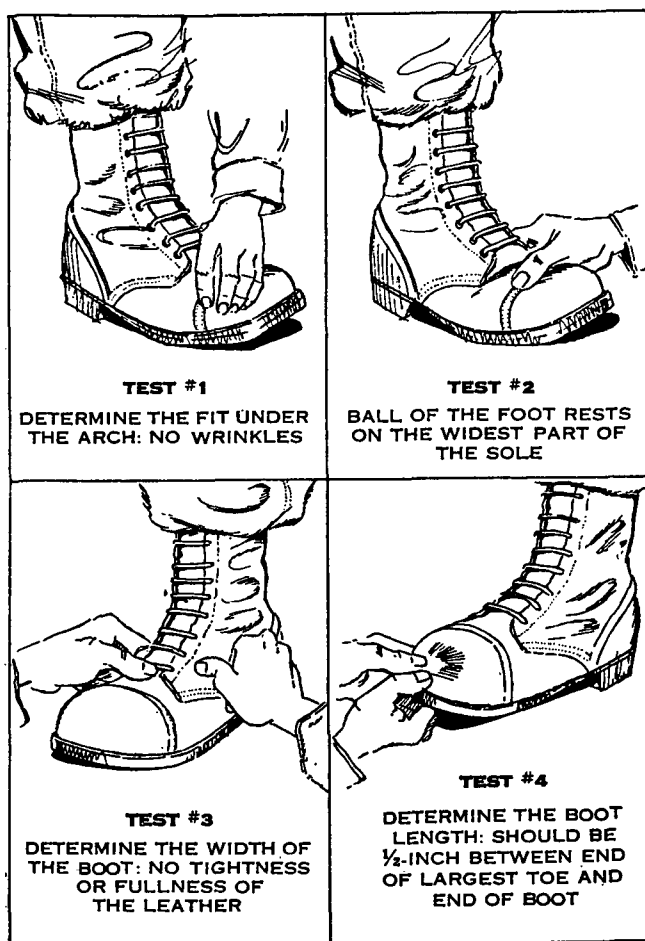


Figure 8. Test boots for correct fit.

excessive shrinkage. When socks become damp, they can be dried by placing them inside your shirt next to your body. Make sure socks are thoroughly dried before wearing. If it is not possible to wash the socks, they should at least be changed and dirty ones dried and kneaded with the hands to remove dirt and hardness. The wool cushion-sole sock is the type recommended for your use. It offers good protection for the foot and also may help alleviate any defects in the boot.

TABLE OF SIZES, WOOL SOCKS

BOOT SIZE	5-5½	6-6½	7-8	8½-9	9½-10½	11-11½	12-13	13½-14	14½-15
Socks*	10	10½	11	11½	12	12½	13	13½	14

* Cotton socks one-half size smaller.

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For explanation of abbreviations used, see AR 320-50.

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