CHAPTER 3

Movement Planning for FOOT MARCHES

The success of the march depends upon thorough planning that must consider the mission, tactical situation, terrain, weather, and participating units. A successful march requires the unit to adhere to prescribed routes and time schedules, to effectively employ all available means of transportation, and to execute assign tasks immediately upon arrival at the destination. Movement planning culminates in the preparation and issuance of a standard operation order with required annexes—written movement orders are rarely prepared at company level.

This chapter implements STANAG 2154 (Edition Five).

3-1. PLANNING

March planning is based on that planning conducted at battalion level and may be organized IAW with the following sequence.

a. **Receive the Mission.** The unit receives the mission to conduct a road march. The planning process begins with the commander and staff conducting a hasty mission analysis to determine critical times and tasks to accomplish.

b. **Preparation and Issuance of the Warning Order.** To allow subordinate units the required time to prepare for a pending move, a warning order is issued, which contains all available information about the march. The planning time available determines the time of issuance and the content of the warning order.

c. **Estimate of the Situation.** In the operation estimate, the S3 considers the mission, weather, terrain, time and space factors, available routes, available transportation, enemy capabilities, disposition of own forces, physical condition and training of troops, and courses of action available. The S3 then recommends to the commander which course of action to accept. Based upon the commander's decision, the staff then prepares the movement order. *(See FM 101-5-1 for a detailed discussion of the estimate of the situation.)*

d. **Development of Detailed Movement Plans.** After the commander has selected a course of action, an OPORD is prepared. In developing these plans, the commander or staff must consider the following.

(1) *Column organization.* To facilitate control and scheduling, units are organized into serials and march units, and are given an order of march.

(a) A march unit is a unit of command that 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 (referred to as a serial) consists of one or more march units that are organized under the senior officer and are 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 can be a company if marching alone.

(c) A march column (referred to as a column) consists of elements of a command that are moving over the same route and can consist of one or more serial. A column commander is

designated to facilitate control. A column is normally a brigade or larger unit but can be a battalion if marching alone.

(2) *Order of march.* In a tactical march, the order of march depends on the mission, terrain, probable order of commitment into action, and mobility of units. March units and serials are placed in the desired order of march by scheduling the arrival of march units at the start point.

(a) If tanks and infantry units are included in the march, they are interspersed throughout the column to facilitate integrated entry into combat.

(b) Artillery and mortars are placed forward and throughout the column to ensure the support of the security forces and the initial action of the main body.

(c) Air defense weapons are deployed throughout the column or are moved by bounds to protect passage of critical points.

(d) Engineer units are located well forward to facilitate the movement of the force through obstacles along the march route.

(e) Antitank weapons can be disposed to provide protection throughout the column. Some antitank weapons may be employed in support of security forces.

The integration of these and other combat, combat support, and combat service support assets may have an adverse impact on the movement of forces.

(3) *March formations.* The formation for foot marches varies depending on the routes available and the enemy situation. The usual formation for tactical marches is a column of two files with one file on each side of the road or in single file. The column commander designates the side of the road on which the troops are to march, or whether both sides of the road are to be used. Based on the enemy ground threat, the column forms into a route column, tactical column, or approach march.

(a) Route column. A route column is enforced when the likelihood of ground contact with the enemy is remote.

Administrative considerations govern movement; therefore, units are grouped administratively for ease of movement and control. Commanders normally move at the head of their units. This formation is sometimes called an *administrative column.*

(b) Tactical column. A tactical column is enforced when ground contact is possible. Units are grouped tactically to permit prompt adoption of combat formations. Movement is usually conducted over roads or trails and by the fastest means available. March units establish local security to the flanks. Dispersion depends on the enemy situation.

(c) Approach march. An approach march is enforced when ground contact with the enemy is imminent. Tactical considerations govern; therefore, elements whose contact with the enemy is likely adopt suitable combat formations. The commander's main concerns are to quickly bring superior combat power to bear against the enemy and to protect his force against surprise. The column establishes guards to the front, flanks, and rear, but larger forces should establish a covering force to ensure unimpeded movement.

(4) *March computations.* Based on the strength, formation, and rate of march, march unit pass time is computed. The pass time of the marching columns, plus necessary time-distance computations, is used to determine the completion time of the march.

(5) *Road movement table draft.* Using the march computations, a draft of the road movement table is completed.

(6) *Command and control.* The commander establishes initial control of the march by designating control measures in his road movement order. Examples of control measures are:

- Start point and release point.
- Other critical points along the march route (checkpoints, passage points, and so on).
- Time at which the head or tail of the column is to pass the SP and critical points.

- Rate of march.
- Order of march.
- Assembly or bivouac areas.
- Location of command post.
- Communications for use during the march.

The commander provides for advance and quartering parties, guides, route marking, and traffic control. Army aviation and military police units are particularly suitable for traffic control.

(7) *Plan check.* Using the draft road movement table and a road movement graph, the movement plan is checked to ensure that it conforms to the directive of the higher headquarters and the battalion commander's instructions.

(8) *Tactical situation.* The march order should also contain a statement of enemy situation, weather, and visibility conditions, and if applicable:

- Road restrictions.
- Information obtained from route reconnaissance.
- Actions on enemy contact (ground and air).
- Actions at halts and for disabled vehicles.
- Actions in the assembly area.
- Procedures for resupply, maintenance, and feeding.
- Location of leaders.
- A communications plan.

Most of the information should be part of the unit's SOP; therefore, only exceptions to the SOP should be stated in the OPORD.

e. **Issuance of Road Movement Orders.** The march order is prepared either as an OPORD or as an annex to an OPORD. (An example of a road movement order is contained in Appendix D.) The OPORD is either written or issued orally, and is accompanied by a road movement table, operation overlay, or strip map.

(1) A road movement table, prepared as an annex to an OPORD, provides serial commanders with arrival and clearance

times at checkpoints along the route of march. It provides the column commander with information as to the proposed location of elements of the column at various times.

(2) An operation overlay shows the location and strength of friendly forces involved in an operation and should show 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 checkpoints with the distances between them. It can be issued as an annex to the road movement order and in addition to or in lieu of an overlay.

(4) An administrative order or annex can be cited or included in the OPORD when the administrative details are too long for inclusion in the body of the order.

f. **Organization and Dispatch of a Reconnaissance Party.** Each march plan is based on a thorough ground reconnaissance, time permitting. Map reconnaissance and aerial reconnaissance help formulate a plan but are not substitutes for ground reconnaissance. A reconnaissance party performs the route reconnaissance and usually consists of a reconnaissance element, engineer element from an attached or supporting engineer unit, and traffic control element. When the situation dictates, NBC survey teams may be included in the reconnaissance party. The unit SOP establishes the composition of the reconnaissance party, which can be modified to meet the requirements of a specific march. The information required by the S3 from the reconnaissance party includes:

(1) Available routes and conditions (routes may be specified by higher headquarters).

(2) Recommended rate of march.

(3) SP and RP selections or confirmation of their suitability, which was selected by map reconnaissance.

(4) Confirmation of the assembly or bivouac area location.

(5) Checkpoint locations on the route.

(6) Distance between checkpoints on the route and total distance from SP to RP.

(7) Location of obstacles and estimation of soldiers and equipment needed to repair and maintain routes.

(8) Number of guides required and their route location.

g. **Organization and Dispatch of a Quartering Party.** Quartering party members prepare anew area for the systematic arrival of units.

(1) A battalion quartering party consists of a quartering party commander (usually the HHC commander); an S4 representative; company representatives to include supply and NBC personnel; and communication, security, and medical personnel.

(2) The quartering 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 exact locations for the battalion command and administrative installations based on the general location of these areas selected by the S3.

(3) Company representatives select locations for company headquarters, platoons, feeding areas (kitchen areas, if mess is under company control), and latrines.

(4) Communications personnel install equipment that will ensure immediate control of units as units arrive in their assigned areas.

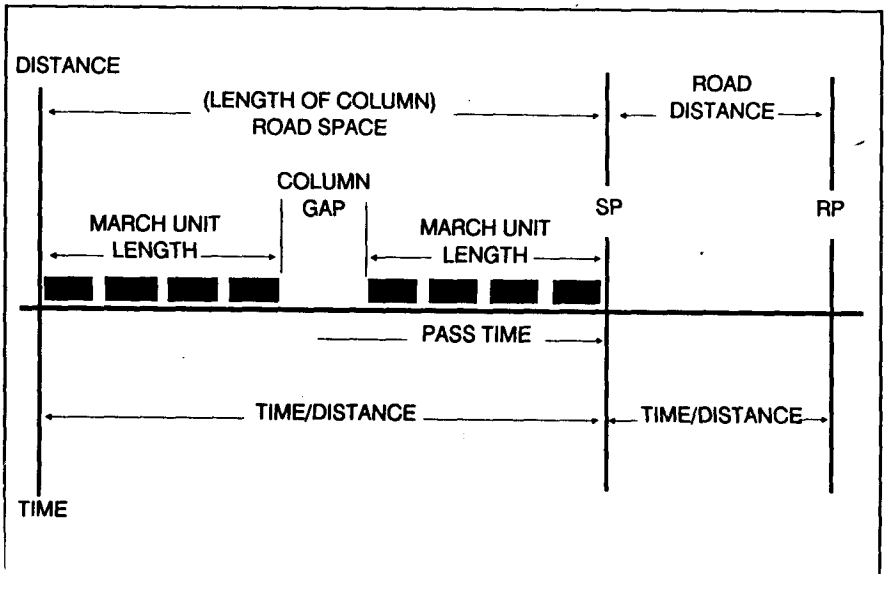
(5) Medical personnel advise other quartering party personnel on sanitation measures and select a site for the aid station.

(6) Based on the order of march, a plan is prepared to guide each unit over a designated route. This route begins at the RP and extends to the unit's new area. Guides must understand and must rehearse the plan. This prevents congestion or delay near the RP. The actual dispatch of the quartering party can follow the issuance of the movement order.

3-2. TIME-DISTANCE TERMS AND FACTORS

The planner must understand march terms to develop detailed movement plans. These terms, along with basic factors of distance, rate, and time, are transformed into movement formulas. Then, formulas are applied to known data to obtain information needed to prepare a time schedule. The time schedule is used to regulate departures and arrivals of march elements.

a. **Time-Distance Relationship.** Relationships between time and distance are the basis for march planning. The planner must determine how far the column is to travel *(distance)* and how long it will take to make the move *(time).* He must know the space *(length of column)* the column will occupy on the route. He must also include in his computation the safety factor of distance *(road gap)* or time *(time gap)* that must separate march columns and their elements. Each term used for distance has its corresponding term for time. The length of a column in kilometers has an equivalent pass time in minutes; the road distance in kilometers or miles has a corresponding time-distance (Figure 3-1).



AVERAGE RATES OF MARCH FOR:	KMPH				KM DAYS
	ON ROADS		CROSS-COUNTRY		
	DAY	NIGHT	DAY	NIGHT	
FOOT TROOPS	4	3.2	2.4	1.6	20-32
TRUCKS, GENERAL	40	40 (LIGHTS) 16 (BLACKOUT)	12	8	280
TRACKED VEHICLES	24	24 (LIGHTS) 16 (BLACKOUT)	16	8	240
TRUCK-DRAWN ARTILLERY	40	40 (LIGHTS) 16 (BLACKOUT)	12	8	280
TRACTOR-DRAWN ARTILLERY	32	32 (LIGHTS) 16 (BLACKOUT)	16	8	240

Figure 3-1. Time-distance relationships.

b. **Checkpoint.** Checkpoints on a route are those points used for reference in providing instructions, or places where timing might be a critical factor. The route reconnaissance report or a map study should provide the march planner with information to designate checkpoints along the route of march and distances from one checkpoint to another. Once identified, guides and signs are usually sufficient. The commander may want to be present at the passing of some checkpoints. Start points and release points are checkpoints that are always designated.

c. **Start Point.** SPs provide all units of a march column a common point for starting their movement. When units use more than one route, each route has a SP. The SP is a place along the route of march that is easily recognizable on the map and on the ground such as a road intersection. The SP should not be in a defile, on a hill, or at a sharp curve in the road. It should be far enough away from the assembly areas to allow units to be organized and moving at the prescribed speed and interval when the SP is reached. No element of a march column should be required to march to the rear or through another unit in order to reach the SP.

d. **Release Point.** The RP provides all units of the march column a common point for reverting to control of their parent

unit. The RP should be on the route of march and easily recognizable on the map and on the ground. Units do not stay at the RP. Guides meet units as they arrive at the RP and lead them to the new areas. Multiple routes and cross-country movement to assembly areas enable units to disperse rapidly. In selecting the RP, units should avoid hills, defiles, and sharp curves. Units should not be required to countermarch or pass through another unit to reach its new position.

e. **Distance Factors-Foot or Motor Marches. The** battalion is normally organized into company-size march units to facilitate control and to maintain unit integrity. The normal march formation is a column of twos. Normal distance is 2 to 5 meters between soldiers (1 to 3 meters at night), 50 meters between platoons (25 meters at night), and 100 meters between companies (50 meters at night).

(1) Vehicle/individual distance is the space between two consecutive vehicles/individuals of an organized element of a column.

(2) Column gap is space between two organized elements following each other on the same route. It can be calculated in units of length or in units of time as measured from the rear of one element to the front of the following element.

(3) Traffic density is the average number of vehicles that occupy 1 mile or 1 kilometer of road space, expressed in vehicles per mile (vpm) or vehicles per kilometer (vpk).

(4) Length of a column is the length of roadway occupied by a column to include gaps in the column measured from front to rear, inclusive.

(5) Road gap is the distance between two march elements—it is the length aspect of column gap. Since it is more significant when the column is moving than when it is halted, road gap becomes a factor of time rather than distance.

f. **Rate Factors.** Speed indicates actual rate of speed of a vehicle or foot column at a given moment as shown on the speedometer (in kph or mph).

(1) Pace is the regulated speed of a column or element that is established by the lead vehicle or an individual in the lead element to maintain the prescribed average speed. For a foot march, the normal pace is 30 inches at a cadence of 106 steps per minute.

(2) The commander considers all of the factors that affect marches and selects a rate that will place his unit at its destination in the shortest time and combat-ready condition. The unit SOP usually states the rate for marches on roads and cross-country, over normal terrain, and day or night. (See Appendix A.) The column commander modifies this rate to suit his needs, which varies greatly in mountain, jungle, desert, or arctic areas. Rates of march usually prescribed for normal terrain are as follows:

	Roads (kph)	Cross-Country (kph)
Day	4.0	2.4
Limited Visibility	3.2	1.6

Marches conducted in mountains, jungle, desert, or northern areas, are characterized by the following:

- Physical effort of individual soldier increases.
- Soldier's load should decrease.
- Potential for injury increases.

g. **Time Factors.** The measurement of time includes the total time needed for the unit to complete the march or to pass a leader point along the designated route. Time is usually measured in minutes or hours.

(1) Arrival time is when the head of the column arrives at a designated point or line.

(2) Clearance time is when the tail of a column passes a designated point or line.

(3) Completion time is when the tail of a column passes the release point.

(4) Pass time (PST) is actual time between the moment the first element passes a given point and the moment the last element passes the same point.

(5) Road clearance time is the total time a column requires to travel over and clear a section of road. Road clearance time equals time distance plus column pass time.

(6) Time distance (TDIS) is time required to move from one point to another at a given rate of march. It normally represents the movement of the head of the column from the start point to the release point.

(7) Time gap is time measured between rear and front of successive elements as they move past a given point. It is the time aspect of column gap or the conversion of road gap to time. There are no prescribed time gaps. Gaps depend on the size of serials and march units, time available for movement, and tactics required for protection against air and nuclear attack.

3-3. MARCH COMPUTATIONS

Before issuing the OPORD, the S3 must compute required time and space measurements to prepare a road movement table.

a. Distance, rate, and time are the factors for movement computations. If two of these factors are known, the third can easily be determined by dividing or multiplying one of the known factors by the other.

- Rate is determined by dividing distance by time:

$$R = \frac{D}{T}$$

- Distance is found by multiplying rate by time:

$$D = R \times T$$

- Time is calculated by dividing distance by rate:

$$T = \frac{D}{R}$$

The march planner must determine pass time, time distance, arrival time, and completion time.

b. Time distance (TDIS) is determined by dividing distance to be traveled by the rate of march. TDIS does not include time for long delays or extended scheduled halts.

$$\text{TDIS (hours)} = \frac{\text{Distance (km)}}{\text{Rate (kph)}}$$

A time distance table is a valuable source for the march planner. It provides a listing of factors used to calculate time required to travel certain distances at specified speeds, either by vehicle or on foot. Travel rates are expressed in vehicle/foot speeds and corresponding rates of march. Travel factors are derived from rate of march, which includes time for short periodic halts and other minor delays that could occur.

c. The length of column (LGTHCOLM) is used to determine the pass time (PST) of a column and consists of two parts: the space occupied by the soldier alone (including the distance between soldiers) and the sum of the distances between the elements of the foot column (column gap). The total length of column is the sum of the two parts.

(1) *Foot elements.* The length of a column of soldiers only is determined by multiplying the number of soldiers by the appropriate factor selected from Table 3-1. This does not include distances between units.

TROOPS LGTHCOLM * = (NUMBER OF SOLDIER'S X FACTOR) + COLUMN GAPS (BETWEEN UNITS)

FACTOR TABLE

FORMATION	2m/MAN	5m/MAN
SINGLE FILE	2.4	5.4
COLUMN OF TWOs	1.2	2.7

* LENGTH OF COLUMN IN METERS

Table 3-1. Determination of length of column (soldiers only).

(2) *Total distance.* The total distance (column gap) 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 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.

Serial Distances = (3-1) x 100 = 200
March Unit Distances = (12-1-2) x 50 = 450
Total Column Gap = 650 meters

d. Pass time (PST) for a serial is determined by adding march unit pass times to include time gaps between march units. For foot columns, the PST is determined by applying the following formula:

PST (minutes) = LGTHCOLM x FACTOR (for appropriate rate of march).

EXAMPLE

.0150 for 4.0 kph
.0187 for 3.2 kph
.0250 for 2.4 kph
.0375 for 1.6 kph

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

PST(min) = 1,500 x .0150 (factor for 4.0 kph) = **22.5 min**

e. In march planning, the RP is normally designated as the terminal point of movement. Arrival time (AT) at the RP is determined by adding time distance and any long or scheduled halts to the SP time.

EXAMPLE

Determine arrival time for a serial with a SP time of 0800 hours, time distance of 6 hours and 45 minutes, and scheduled halt of 1 hour.

	Hours	Minutes
SP Time	8	00
TDIS	6	45
Scheduled Halt	1	00
	15	45

Arrival time is 1545 hours.

f. Completion time is calculated by adding pass time to arrival time or by adding to the SP time the time distance, pass time, and any long or scheduled halts (other than normal hourly halts).

EXAMPLE ONE

Determine completion time for a serial with an arrival time of 1545 hours and a pass time of 41 minutes.

	Hours	Minutes
AT	15	45
PST	=	41
	15	86

Completion time is 1626 hours.

Note: Convert 86 minutes to 1 hour and 26 minutes, then add to 1500 hours.

EXAMPLE TWO

Determine completion time for a serial with a start point time of 0800 hours, time distance of 6 hours and 45 minutes, a pass time of 41 minutes, and a scheduled halt of 1 hour.

	Hours	Minutes
SP Time	8	00
TDIS	6	45
PST	–	41
Scheduled Halt	1	00
	15	86

Completion time is 1626 hours.

g. Based upon previous movements by a unit, data are accumulated to facilitate march planning. Such data include approximate pass time for various elements of the battalion. The S3 can use 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. Information that is appropriate to the unit SOP should be integrated.

3-4. ROAD MOVEMENT TABLE

A road movement table is usually an annex to a movement order. It is a convenient means of transmitting time schedules and other essential details of the move to subordinate units. The table is particularly useful in preventing complication of the OPORD or in creating an unusually long OPORD.

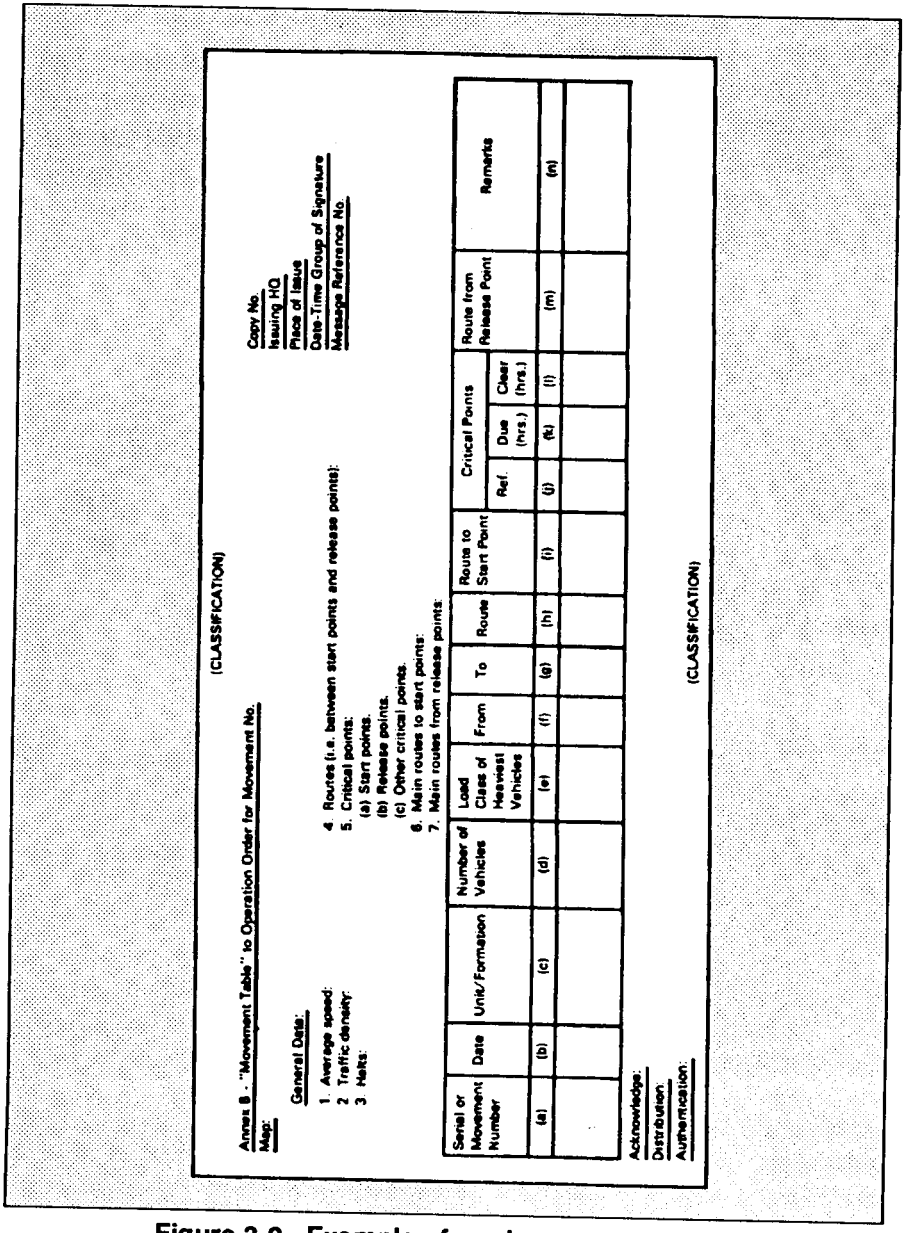
a. The road movement table consist of two parts (Figure 3-2):

(1) Data paragraphs that include general information common to two or more march elements; and a list of serials or march units along with all other required information, arranged in tabular form.

(2) Data transferred from the road movement graph. Of particular importance to the march planner are the times at which serials / march units arrive at and clear critical points.

b. Other information on the road movement table includes serial or march unit number, date of move, units involved, number of vehicles, load class of heaviest vehicle, routes to be used, and a remarks section for details not explained elsewhere.

(See FM 55-30 for a detailed discussion on the preparation and use of road movement tables.)



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Annex B - "Movement Table" to Operation Order for Movement No.

Map:

Copy No.
Issuing HQ
Place of Issue
Date-Time Group of Signature
Message Reference No.

General Data:

1. Average speed:
2. Traffic density:
3. Halts:
4. Routes (i.e. between start points and release points):
5. Critical points:
   (a) Start points.
   (b) Release points.
   (c) Other critical points.
6. Main routes to start points:
7. Main routes from release points:

Serial or Movement Number	Date	Unit/Formation	Number of Vehicles	Load Class of Heavest Vehicles	From	To	Route	Route to Start Point	Critical Points			Route from Release Point	Remarks
									Ref.	Due (hrs.)	Clear (hrs.)		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)

Acknowledge:
Distribution:
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Figure 3-2. Example of road movement table.

3-5. STRIP MAP

A strip map is a sketch of the route of march and is normally included as an annex to the movement order (Figure 3-3). Enough strip maps should be reproduced to give to key personnel, including vehicle commanders and road guides. The amount of detail depends upon the purpose of the strip map and the unit level at which it is prepared. A strip map should contain the SP and RP, restrictions, and critical points with the distance between them.

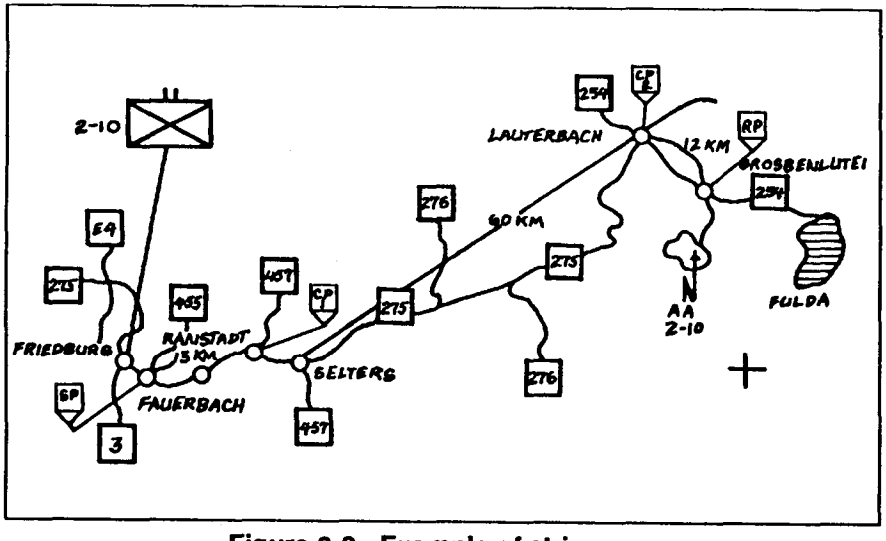

Figure 3-3. Example of strip map.