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FM 3-50

DEPARTMENT OF THE ARMY FIELD MANUAL

CHEMICAL SMOKE GENERATOR BATTALION AND CHEMICAL SMOKE GENERATOR COMPANY

HEADQUARTERS DEPARTMENT OF THE ARMY
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FIELD MANUAL

CHEMICAL SMOKE GENERATOR UNITS AND SMOKE OPERATIONS

CHANGE No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *7 July, 1964*

FM 3–50, 7 January 1959, is changed as follows:

Change title of manual to read as above.

Page 127, figure 18 (As changed by C1, 22 Jan 63). Change "fuel supply section" to fuel supply platoon with two sections. Change "SCP" to CON PT.

1. Purpose

This manual is * * * it in, combat. **It also furnishes guidance in smoke operations to commanders and staff officers.**

2. Scope

This manual provides * * * smoke generator company. **It also covers miscellaneous smoke operations.**

a. (Superseded) Recommended changes or comments to improve this manual should be for-

*This change supersedes C 1, 22 January 1963; and Section II of Chapter 4 and Appendix II of FM 3–5, 13 September 1961.

warded direct to the Commanding Officer, U. S. Army Combat Developments Command CBR Agency, Fort McClellan, Alabama, on DA Form 1598.

b. (Added by C1, 22 Jan 63) The material presented in this manual is applicable to nuclear and nonnuclear warfare.

4. Chemical Smoke Generator Company

The chemical smoke generator company consists of a company headquarters, two smoke platoons of two sections each, and a fuel supply platoon *of two sections.*

a. Characteristics and Capabilities. The company can provide smoke **hazes** of approximately **1 to 8 kilometers** in width (at the line of smoke generators) and several **kilometers** in depth, depending on weather and terrain conditions. It is capable * * * completely air transportable.

b. Limitations. The platoons are * * * to smoke missions. Generators forced out of action **must be repaired by unit maintenance personnel. If this is not possible, these generators must be exchanged for repaired or rehabilitated generators at the maintenance facility or replaced through normal supply channels.**

* * * * * * *

12. General

(As changed by C1, 22 Jan 63) The headquarters and * * * TOE 3–266 (fig. 1). It currently consists of 5 officers, 1 warrant officer, 5 noncommissioned officers, and 11 enlisted men. The bat-

talion staff consists of the executive officer, the operations officer (S3), who also functions as intelligence officer (S2), the adjutant (S1), supply officer (S4), personnel officer, and sergeant major. The detachment is * * * motor pool facilities.

14. Duties of Executive Officer

(Superseded by C1, 22 Jan 63)

The executive officer is the principal assistant and adviser to the battalion commander. He coordinates and supervises the other staff sections, thereby enabling the commander to devote himself to the broader aspects of command. His specific duties are to—

a. Command the battalion in the absence of the battalion commander or when directed to do so.

b. Reconnoiter and move the command post as directed by the commander.

c. Direct operations of the command post under supervision of the battalion commander.

14.1. Duties of the Operations Officer

(Added by C1, 22 Jan 63)

The operations officer performs operations and intelligence activities as directed by the battalion commander. His specific duties are to—

a. Plan and execute the training program under supervision of the executive officer.

b. Prepare all operation orders.

c. Assign sectors of smoke lines, as directed by

the battalion commander, to subordinate companies.

d. Direct intelligence operations (S2).

e. Supervise the conduct of intelligence training (S2).

f. Obtain and distribute signal operation instructions (S2).

g. Maintain the unit journal.

h. Secure necessary cryptographic clearance for personnel who will operate or have access to classified cipher equipment (S2).

i. Supervise installation, operation, and maintenance of communications nets.

j. Maintain close contact with communications officers of supported units.

k. Plan and recommend the communications nets to be used in smoke operations and on bivouacs and motor marches.

l. Establish the command post and provide communication facilities for the command.

m. Study the tactical situation as affected by the status of equipment, supplies, and services; recommend priority of issue of regulated items.

14.2. Duties of Smoke Control Officer

(Added)

The smoke control officer guides and regulates the smoke unit in accomplishing its mission. The smoke unit commander performs various duties during the time that his unit is making smoke, such as reconnaissance for future operations, in-

spections of his troops on line, and liaison with the supported unit commander. The unit commander normally assigns the duty of smoke control officer to the operations officer to insure that screening units are immediately responsive to changing meteorological conditions, and thus are able to more closely support the tactical operations. The smoke control officer is located at the smoke control point. Thus, he is in contact with the supported unit, observation posts, meteorological reports, and subordinate units at all times. The smoke control officer performs the following duties: (1) directs the subordinate units to make smoke or to stop smoke, and (2) directs the subordinate units to displace along the smoke line as meteorological conditions change to insure successful accomplishment of the screening mission.

15. Duties of the Adjutant

The adjutant is * * * duties are to—

* * * * * * *

c. (As changed by C1, 22 Jan 63) Coordinate with operations officer (S2) and arrange for PW evacuation.

* * * * * * *

18. General

The chemical smoke * * * TOE 3–267 (fig. 2). It consists of a company headquarters, a fuel supply platoon, and two **smoke** platoons.

a. Company Headquarters. The company headquarters consists of a headquarters section and

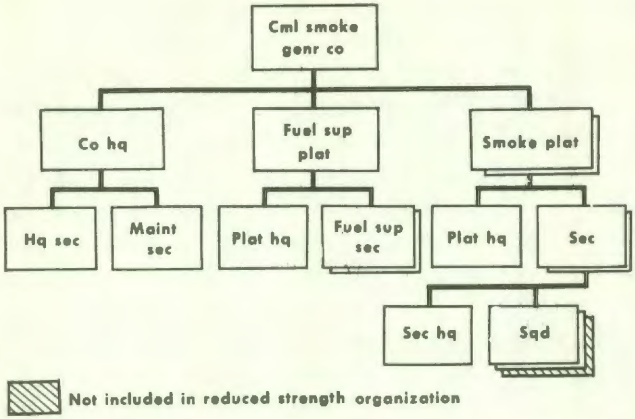

Figure 2. (Superseded) *Organization of chemical smoke generator company.*

a maintenance section, with functions as follows (see para. 86 for detailed functions):

* * * * * * *

(3) Rescinded by C1, 22 Jan 63.

b. Smoke Platoons. Each **smoke** platoon consists of a headquarters and two sections. (See para. 87 * * * light truck drivers.

c. Fuel Supply Platoon. (Added by C1, 22 Jan 63). The fuel supply platoon consists of a **headquarters** and two fuel supply sections. It transports, receives, stores, and issues fog oil and gasoline required in smoke operations. (See para. 86.1 for detailed functions.)

20. Duties of Company Officers

(As changed by C1, 22 Jan 63) The smoke generator * * * in corresponding positions. The com-

pany executive officer serves as the operations officer and S2. The company officers * * * are as follows:

a. (Superseded by C1, 22 Jan 63) *The executive officer* also serves as communications officer.

b. (Superseded by C1, 22 Jan 63) *The platoon leader of the fuel supply platoon* also serves as motor transport officer.

* * * * * * *

d. (Superseded by C1, 22 Jan 63) *Assistant platoon leaders*, one each to act as executive officer in assisting the platoon leader.

26.1. Employment of Smoke in Training for Chemical Attack

(Added)

Both artillery- and aircraft-spray-delivered smoke may be used in training to visually demonstrate the behavior of toxic chemical clouds. Such use of smoke in training is particularly valuable to those directly participating in planning and executing chemical attacks by demonstrating cloud travel.

27. General

Chemical smoke generator * * * on special missions.

a. Weapons. (Superseded by C1, 22 Jan 63). Organizational weapons include 7.62-mm semiautomatic rifles; caliber .45 automatic pistols; 7.62-mm machineguns; caliber .50 machineguns;

and 3.5-inch rocket launchers for defense against air, ground, and mechanized attack.

* * * * * * *

28. Mechanical Smoke Generators

The mechanical smoke * * * for large-area screening.

a. The M3-Type (As changed by C1, 22 Jan 63). Detailed data pertaining to the standard M3-type mechanical smoke generators, together with operating and maintenance instructions, are given in the TM 3–1040–202–series. The M3-type mechanical * * * normal required maintenance.

Figure 4. M2-type mechanical smoke generator. Rescinded

b. The M2-Type. Rescinded by C1, 22 Jan 63.

29. Smoke Pots

(Superseded)

There are two basic types of smoke pots—the burning-type (filled with HC smoke mixtures), and the thermal generator-type (filled with SGF fog oil). The M1 10-pound and the ABC-M5 30-pound smoke pots are HC munitions for use on land only; the M4A2 is an HC munition for use on water or land. The AN–M7 SGF2 and AN–M7A1 SGF2 floating smoke pots are oil-filled munitions that are suitable for use either on land or water. Both types of smoke pots are described in detail in TB CML 100. Figure 5 illustrates a floating smoke pot.

30. General

The effects of * * * a smoke operation. The

predicted weather for the area of operations is obtained periodically from the **CBRE, Air Weather Service (AWS), or the** intelligence section of the supported unit. **This is usually arranged through the chemical officer of the supported unit.** Local current weather data are obtained by the **operations** personnel of the smoke unit. The success of * * * on smoke clouds.

31. Effects of Wind

(As changed by C1, 22 Jan 63) The movement of * * * a smoke operation. To provide an effective smoke screen over the vital area, the smoke control officer must be able to apply weather data, as received, to the smoke operation.

a. Wind Speed. The prevailing wind * * * the vital area. Wind speeds ranging from **4 to 10 knots** are ideal for the production of smoke screens. At other wind * * * effective smoke screens.

* * * * * * *

32. Effects of Temperature Gradient

An estimate of * * * of the air. Temperature gradients are measured by subtracting the air temperature **0.3 meter** above the ground surface from the air temperature **2.0 meters** above the ground surface. With logistical limitations, * * * expressed as follows:

* * * * * * *

34. Effects of Temperature

(Superseded)

Temperature has no significant effect on smoke

Ⓐ **SMOKE BLANKET prevents enemy aerial visual observation.**

Ⓑ **SMOKE HAZE reduces enemy visual observation.**

Ⓒ **SMOKE CURTAIN prevents enemy ground visual observation.**

Ⓓ **OBSCURING SMOKE denies enemy ground visual observation.**

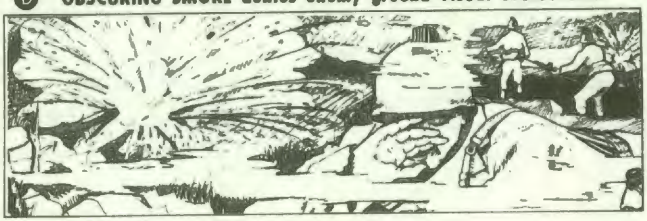

Figure 7. (Superseded) *Types of smoke screens.*

screens generated by HC smoke pots. At temperatures above 80° F., smoke screens generated by mechanical smoke generators are dissipated more rapidly than they are at lower temperatures. For smoke operations in cold weather areas, see paragraph 89.

38. Smoke Blanket

Smoke blankets are * * * as follows (fig. 8):

* * * * * * *

c. Uniform Phase. The end of * * * by meteorological conditions. Smoke clouds produced by mechanical generators may extend **1.6 to 6.4 kilometers**; smoke from pots is seldom effective for more than 300 to 500 **meters.**

* * * * * * *

40. Smoke Curtain

Smoke curtains are used mainly in the forward edge of the battle area to **obscure** or restrict enemy ground observation of friendly positions and activities. A smoke curtain * * * and friendly positions. Smoke curtains may also be produced by artillery, **mortars, or aircraft.**

41. Selection of Smoke Positions

(As changed by C1, 22 Jan 63) To provide an * * * shortest possible time. See table I for information on spacing of M3-series mechanical smoke generators and table II for information on spacing of smoke pots.

Table I. (Superseded). *Spacing Guide for M3-series Mechanical Smoke Generator.*

Type of terrain	Generator spacing (in meters) at wind speeds of:[1] [2] [3]		
	1–7 knots [4] [5] (1–13 km/hr)	8–13 knots (15–25 km/hr)	14–17 knots (26–32 km/hr)
UNDER LAPSE CONDITIONS			
Over Water	36	27	18
Open Terrain	45	36	27
Woods	63	54	45
UNDER INVERSION AND NEUTRAL CONDITIONS [6]			
Over Water	45	36	27
Open Terrain	54	45	36
Woods	72	63	54

[1] Spacings given are for a line of generators normal (perpendicular) to the wind direction.

[2] The distance between the near edge of the target and the smoke generator line should be at least nine times the spacing between generators.

[3] Spacings given are for producing smoke blankets. This spacing guide may be used for producing obscuring smoke on the enemy under favorable weather conditions (see para. 43.4*b*). For establishing smoke hazes, spacings twice those indicated in the table can be used, and generators should be placed farther from the target. To protect against aerial photographic reconnaissance from directly overhead, reduce the spacings by about one-third and place the generators closer to the target.

[4] When wind speed is very low, water-based generators may have to be worked back and forth along the line.

[5] See appendix XI for conversion table.

[6] See paragraph 32 for an explanation of temperature gradient conditions.

Table II. (Superseded). *Spacing Guide for Smoke Pots.*

Type of terrain	Smoke pot spacing (in meters) at wind speeds of:[1 2 3]								
	1–7 knots (1–13 km/hr)			8–13 knots (15–24 km/hr)			14–17 knots (26–32 km/hr)		
	AN–M7 and AN–M7A1 SGF2 floating smoke pots	M4A2 HC floating smoke pots	ABC–M5 HC smoke pots	AN–M7 and AN–M7A1 SGF2 floating smoke pots	M4A2 HC floating smoke pots	ABC–M5 HC smoke pots	AN–M7 and AN–M7A1 SGF2 floating smoke pots	M4A2 HC floating smoke pots	ABC–M5 HC smoke pots
UNDER LAPSE CONDITIONS[4]									
Over Water	23			18			14		
Open Terrain	27			18			14		
Woods	32			27			18		
UNDER INVERSION AND NEUTRAL CONDITIONS[4]									
Over Water	27			18			14		
Open Terrain	27			18			14		
Woods	36			27			18		

[1] Spacings given are for a line of smoke pots normal (perpendicular) to the wind direction.

[2] The distance between the near edge of the target and the smoke pots should be at least nine times the spacing between smoke pots.

[3] Spacings given are for producing smoke blankets. For establishing smoke hazes, spacings, twice those indicated in the table can be used, and smoke pots should be placed farther from the target. To protect against aerial photographic reconnaissance from directly overhead, reduce the spacings by one-third to one-half and place the smoke pots closer to the target.

[4] See paragraph 32 for an explanation of temperature gradient conditions.

Note. Spacings for M1 HC smoke pots must be determined by trial in the field.

43. Emplacement and Operation of Smoke Pots

Smoke pot emplacements * * * and other hazards. See **TB CML 100** for operating instructions.

Section IV. DETERMINING SMOKE AMMUNITION REQUIREMENTS

(Added)

43.1. General

This section is concerned with ammunition expenditures required to produce smoke screens by artillery shell. Smoke produced by bursting-type ammunition is different from smoke produced by mechanical smoke generators and smoke pots. Smoke from WP ammunition may pillar for 2 or 3 seconds after the burst and, under some conditions, may form a "mushroom" effect. This pillar collapses when it cools and may merge with other bursts to produce a cloud formation. PWP (plasticized white phosphorus) burns slower than does WP, producing smoke with less pillaring. For additional information on agents, see TM 3–215.

43.2. Smoke Ammunition Expenditures

Expenditures needed in smoke operations vary considerably with each specific mission. Although smoke ammunition expenditure tables II.1 through II.3 have been calculated for various artillery weapons under a variety of weather and terrain conditions, they are useful as a **guide only.** The amount of smoke ammunition required to maintain the smoke screen must be determined by observation rather than from the figures given

in any table. Trained observers are needed to just a large-scale smoke screen to the target, to alter the screen to fit changing conditions, to keep the screen free of holes and gaps, and to increase or decrease the expenditure of smoke ammunition when necessary.

43.3. Use of Tables

Tables II.1 through II.3 give the approximate number of rounds per minute required to maintain smoke screens on a 500-meter front. Under normal conditions, about 3 minutes are required to adjust fire on the target and about 1 minute is required to establish the smoke curtain. Smoke ammunition expenditures in these tables may be considered optimum for the stated conditions. The tables indicate the number of rounds that must impact in the target area. No allowance has been made for extra shell which, because of dispersion characteristics of the weapon, are needed to insure that the required number fall on the target. Additional ammunition required for this purpose must be considered by the commander of the firing unit, since dispersion varies with each type of weapon and increases with range.

43.4. Unit Capabilities

Unit capabilities to establish and maintain smoke screens vary widely according to the existing meteorological conditions in the target area. The size of an area over which a unit is capable of establishing and maintaining a smoke curtain can be determined by the use of two factors: (1)

unit capability to deliver smoke rounds to the target (rate of fire), and (2) ammunition requirements for a 500-meter front (tables II.1 through II.3). For example, a mortar unit of four 4.2-inch mortars can effectively screen an average front of about 600 meters; under favorable conditions it can screen three times its average front; under certain unfavorable conditions it can screen only one-eighth of its average front.

a. Smoke Curtain. A smoke curtain is established by employing volley fire, using twice the amount of ammunition during the first minute as is required to maintain the smoke curtain per minute thereafter.

b. Obscuring Smoke. This is a smoke concentration placed on enemy positions to deny enemy visual observation of friendly territory. Approximately twice as many rounds of smoke ammunition per minute are required to produce an obscuring smoke effect on a 500-meter front as are required to maintain a smoke curtain.

Table II.1. (Added). *Smoke Ammunition Requirements for 105-mm Howitzers.*

SMOKE CURTAIN				
Number of WP rounds per minute required to maintain a smoke curtain on a 500-meter front [1]				
WIND DIRECTION [2]				
Head	Tail	Flank	Quartering	
22	22	8	17	
OBSCURING SMOKE EFFECT				
Number of rounds per minute required to maintain an obscuring smoke effect on a 500-meter front				
50	39	8	33	
SMOKE CURTAIN USING HC BASE EJECTION SHELL [3]				
Maximum meters between points of shell impact (parallel to front)		Rate of fire per point of impact (rounds per minute)		
WIND DIRECTION		WIND SPEED		
Head or tail	Flank	3 knots	9 knots	13 knots
27	360	1.0	1.5	2.0

[1] To establish a smoke curtain, employ volley fire, using 2-minute ammunition requirement. Equally space rounds on the front to be curtained.

[2] Wind directions are with respect to the enemy target or smoke screen.

[3] To establish the initial curtain, fire two rounds per point of impact as quickly as possible; to maintain the curtain after that, fire at the rate indicated.

Table II.2. (Added). *Smoke Ammunition Requirements for 42-inch Mortars.*

A. SMOKE CURTAIN

Number of WP rounds per minute required to maintain a smoke curtain on a 500-meter front in flank winds.[1] [2] [3]

Relative humidity (percent)	Temperature gradient [4]	Wind speed (knots)						
		2	4	9	13	18	22	26
30	LAPSE	13	13	11	11	13		
	NEUTRAL	9	9	7	7	9	9	11
	INVERSION	6	6	4				
60	LAPSE	9	9	7	9	9		
	NEUTRAL	6	6	4	4	6	7	9
	INVERSION	3	3	3				
90	LAPSE	7	7	6	6	7		
	NEUTRAL	4	4	3	3	4	6	6
	INVERSION	3	3	3				

B. OBSCURING SMOKE EFFECT

The number of rounds per minute required to maintain an obscuring smoke effect on a 500-meter front is obtained by doubling the values in A above.

[1] To establish a smoke curtain, employ volley fire, using 2-minute ammunition requirement (but not less than 10 rounds). Equally space rounds on the front to be curtained.

[2] For quartering winds, multiply table values by 2; for tail winds, by 2; for head winds, by 2½. Values for head and quartering winds are based on curtain impact line of 500 meters in advance of enemy line. Wind directions are with respect to enemy target or smoke screen. If curtain impact line is closer than 500 meters, ammunition requirements will be considerably larger. CONTROLLED FIRE BY OBSERVERS IS NECESSARY AT ALL TIMES.

[3] Table quantites are for shell impacted on land. For water impacts, multiply table values by 1.4.

[4] See paragraph 32 for an explanation of temperature gradient conditions.

Table II.3 (Added) *Smoke Ammunition Requirements for 155-mm Howitzers and Guns.*

SMOKE CURTAIN			
Number of WP rounds per minute required to maintain a smoke curtain on a 500-meter front [1]			
WIND DIRECTION [2]			
Head	Tail	Flank	Quartering
7	7	3	6
OBSCURING SMOKE EFFECT			
Number of rounds per minute required to maintain an obscuring smoke effect on a 500-meter front			
17	11	3	11
SMOKE CURTAIN USING HC BASE EJECTION SHELL [3]			
Maximum meters between points of shell impact (parallel to front)		Rate of fire per point of impact (rounds per miunte)	
WIND DIRECTION		WIND SPEED	
Head or tail	Flank	3 knots	9 knots	13 knots
27	360	0.6	0.9	1.2

[1] To establish a smoke curtain, employ volley fire, using 2-minute ammunition requirement. Equally space rounds on the front to be curtained.

[2] Wind directions are with respect to the enemy target or smoke screen.

[3] To establish the initial curtain, fire two rounds per point of impact as quickly as possible; to maintain the curtain after that, fire at the rate indicated.

44. Responsibilities of Supported Unit Commander

The commander of * * * STOP SMOKE commands. **Control of smoke operators will be exercised by the supported commander through the fire support element (FSE) of the tactical operations center (TOC).** The supported unit * * * staff chemical officer.

49. Planning for Liaison

The smoke unit * * * staff chemical officer. Whenever possible the smoke unit commander makes personal contact with the supported, supporting, and adjacent units **to effect reconnaissance, insure selection of primary and secondary smoke positions, and coordinate communications nets.** Liaison with other * * * also be helpful.

51. Planning Medical Support

The smoke unit * * * of his casualties. When the tactical situation permits, arrangements should be made to speed up evacuation of casualties by the use of ambulances **or helicopters.** For large-scale operations * * * of his unit.

54. Subordinate Unit Positions

The vital area * * * as a reserve.

a. Overlay Diagram. (As changed by C1, 22 Jan 63) An overlay diagram * * * to be covered. An operation overlay (fig. 13.1) is then prepared which reflects the location of individual generators, as well as command and logistical elements of the smoke installation. This overlay is kept at

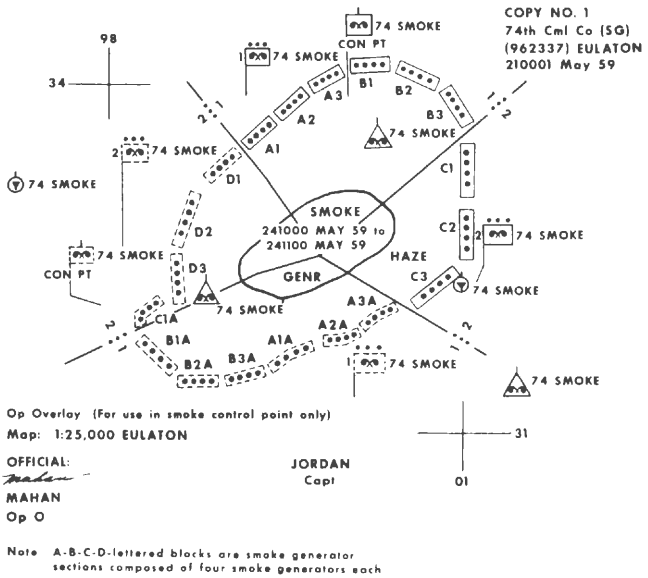

Figure 13.1. (Added) *Example operation overlay.*

the smoke control point for use by the smoke control officer; it aids him in directing the shifting of generators.

* * * * * * *

55. Communications

The communications net * * * link the following:

* * * * * * *

d. Rescinded.

* * * * * * *

57. Weather Stations

Rescinded

Table III. (Superseded) *Basic Load for the Chemical Smoke Generator Company.*

Weapon		Ammunition			
Type	No. per co.	Unit	Units per weapon	Total	
				Units	Pounds
Generator, smoke, mechanical, M3-series	48	55-gal. drums fog oil 5-gal cans (80 octane gas)	3 2	144 96	66,384 4,032
Gun, machine, cal. .50, Browning M2, heavy barrel.	3	Rounds (API and TR, 4 to 1, MLB).	530	1,590	620
Gun, machine, 7.62-mm light weight, general purpose.	5	Rounds (API and TR, 4 to 1, MLB)	2,200	11,000	880
Launcher, rocket, 3.5-inch, M20	4	Rocket (90% HEAT and 10% WP).	6	22 HEAT WP	425
Pistol, automatic, cal. .45	1	Round (Ball)	21	21 Ball	
Rifle, 7.62-mm, selective auto, semiautomatic, light barrel.	141	Rounds (80% Ball, 10% TR, and 10% API).	160	18,048 Ball 2,256 TR 2,256 API	1,624
*Smoke pot, HC, 30-lb, M5	--	Smoke pot	--	96	3,168

*2 per generator.

68. Types of Missions

Chemical smoke generator * * * use of smoke.

* * * * * * *

b. Small-Area Smoke Screens. Small-area screens are used to conceal—

* * * * * * *

(11) (Added) Landings of air assault units.

* * * * * * *

69.1. Employment of Signaling Smoke
(Added)

Signaling smoke is available in several colors and is used to—

a. Mark enemy or friendly positions by smoke emission on the ground.

b. Transmit specific messages by prearranged color codes. For further information, see FM 21–60.

70. Planning Operations in Battle Areas

Smoke operations in * * * to tactical operations.

* * * * * * *

b. Movement of Troops and Issuance of Orders. (As changed by C1, 22 Jan 63) Early planning and * * * to be issued. For the smoke generator company, this movement normally is controlled by the company fuel supply platoon leader.

* * * * * * *

(2) (Superseded by C1, 22 Jan 63) The smoke unit commander designates the

person or persons who will receive the unit orders. In a smoke generator company, these include platoon leaders and the first sergeant.

* * * * * * *

73. Reconnaissance

The smoke unit * * * *area of operations.*

a. Vital Area Study. He studies the vital area to determine—

(1) *Terrain which restricts the mobility of his unit.* Rough or mountainous * * * only short distances. Difficult terrain may require **the use of helicopters for transportation or** employment of smoke pots.

* * * * * * *

75.1. Employment of Smoke in Enemy Areas
(Added)

Smoke may be used in enemy areas to prevent hostile observation, to reduce the effectiveness of enemy aimed fire, to mark targets for attack, to designate fire support coordination lines (FSCL), and for signaling purposes. Smoke may also be used as a visual check on cloud travel when target meteorological conditions are marginal or uncertain for an otherwise highly desirable chemical attack.

a. Artillery. Small-area smoke coverage in enemy territory is best achieved by the use of WP and HC projected by mortars and artillery. The antipersonnel characteristics of WP produce a bonus effect. Smoke ammunition expenditure

tables and guidance for their use are given in paragraphs 43.1 through 43.4.

b. Aircraft. U.S. Air Force, Army, Navy, and Marine Corps aircraft can lay smoke screens by means of smoke tanks or smoke munitions. Smoke bombs are used to mark positions on the ground or to signal. Helicopters can be used to drop smoke pots from low altitudes to provide initial screening on land or water. The M4A2 floating smoke pot may be dropped out of the UH–1 or from bomb shackles on the OH–13. The pots will burn for 15 to 20 minutes if released at an optimum altitude of 50 feet and a speed of 40 knots. Although the pots will function when released up to an altitude of 100 feet and a speed of 65 knots, the burning time is less and smoke-producing time is reduced to about 12 minutes.

79. Smoke Screens Outside Battle Area

Smoke blankets and * * * overall smoke plan.

* * * * * * *

a. Primary Screens. A primary screen * * * may be used.

(2) *The outer line* * * * by wind shifts. **To mount a smoke generator and a barrel of oil in the ¼-ton truck, first remove the rear seat. With one smoke generator in the truck and one in the trailer, all 48 smoke generators are mobile for this type operation. Smoke may be produced from a generator mounted in a truck trailer while in motion. Caution:**

In these mobile operations, always have a serviceable fire extinguisher available with each generator.

b. Secondary Screens. Dummy screens are * * * locate the vital area. **In preparation of deception plans, employment of smoke is considered.**

86. Company Headquarters Organization

When the platoons * * * the following sections:

a. Headquarters Section.

(1) *Operations* (as changed by C1, 22 Jan 63). The executive officer is the coordinator of operations between the company and platoon headquarters. Operations personnel furnish * * * the company headquarters.

* * * * * * *

(5) *Meteorological.* Rescinded by C1, 22 Jan 63.

* * * * * * *

c. Fuel Supply Section. Rescinded by C1, 22 Jan 63.

86.1. Fuel Supply Platoon

(Superseded)

The platoon leader is responsible to the company commander for the fuel supply function in the company. The fuel supply platoon is organized into a platoon headquarters and two fuel supply sections. Normally the same fuel supply sections service the same smoke platoons. When the smoke platoons are detached on separate missions away

from the company, one of the fuel supply sections is attached to each smoke platoon to render fuel supply service. Personnel in the fuel supply platoon obtain, transport, and furnish fog oil and gasoline required for smoke operations. The fuel supply platoon supervises the storage and use of fuel by the smoke company. The platoon also maintains a record of fuel supplies for the entire company and submits required reports.

87. Smoke Platoon Organization

The platoon operating * * * company, as follows:

* * * * * * *

c. Mess. Mess personnel obtain * * * under special authorization. **When a smoke platoon is detached for a short period of time, it is economical to attach the platoon to the supported unit for messing.**

89. Cold Weather Areas

Smoke operations in * * * types of units. Detailed information on arctic and cold weather conditions is given in FM's 31–70, 31–71, 31–72, and 100–5. Preventive maintenance for * * * appropriate technical manuals.

a. Operations (as changed by C1, 22 Jan 63). Mechanical smoke generators * * * mixtures are used. For information on fuel mixtures and starting procedures in extreme cold weather, see the TM 3–1040–202–series.

* * * * * * *

90. Jungle Areas

Since the jungle * * * beds and gullies.

* * * * * * *

b. Transportation and Supply (as changed by C1, 22 Jan 63). Vehicle operations may * * * is generally unsatisfactory. Fuel may well be carried by helicopters in this situation, either by internal stowage or by external stowage using cargo nets. In any smoke operation where transportation is difficult, the possible use of helicopters should be considered.

93. River Crossings

During a river * * * of the bridgehead.

* * * * * * *

c. Employment of Smoke. Smoke for screening * * * to the enemy. **Figure 16.1 shows smoke used to support a river crossing.** Dummy smoke screens * * * may be necessary.

95. Airborne Operations

Normally, smoke units * * * areas and objectives. **In offensive air assault operations, screening smoke is planned and employed to deny enemy observation of the objective area during landing. Wind direction and the directions of approach and departure of aircraft are considered so that pilot visibility is not obscured. Concealing smoke is used to aid in accomplishing reliefs in overflying operations. Maximum benefit is gained from use of smoke if it precedes the arrival of heliborne forces over the landing zone by not more than 30 seconds. Care must be exercised when using smoke**

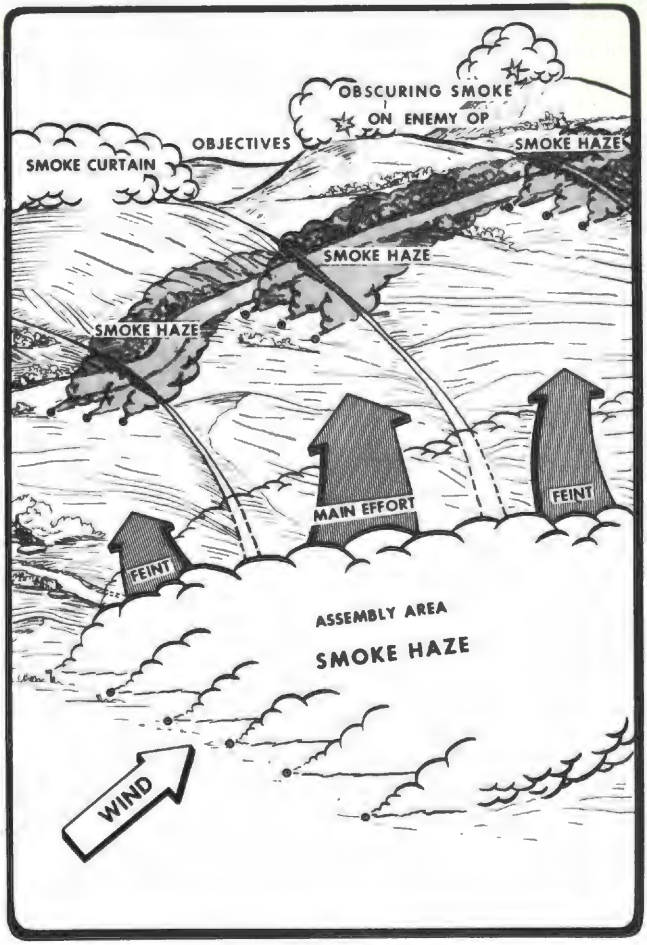

Figure 16.1. (Added) *Smoke used to support a river crossing.*

in counterinsurgency operations to insure that the reduced visibility does not benefit the guerrilla more than the friendly force.

95.1. Night Operations

(Added)

Smoke can be used advantageously in night operations. Obscuring smoke placed on the enemy at night interferes with his operations and his observation of our operations. Night vision devices will be adversely affected. Both infrared radiation and visible light are attenuated approximately the same amount by smoke. Efficiency of light intensification devices can be reduced by utilizing smoke to attenuate the usable light energy. The employment of smoke against armor materially reduces its movement, direct fire, and observation capabilities. This night employment of smoke must be judicious so as not to interfere with friendly night movement observation and fire.

96. General

(As changed by C1, 22 Jan 63). Administration involves personnel * * * orders, and memorandums. See AR 310–10 for details. Combat orders include * * * reports, and orders.

107. Medical Service

The smoke unit * * * of higher headquarters. See AR 40–5 and AR 40–554 for health and sanitation responsibilities.

116. Responsibility

(As changed by C1, 22 Jan 63) The smoke unit * * * within his unit. The unit signal communications system is normally controlled by the unit operations officer. This officer controls * * * and supported units.

* * * * * * *

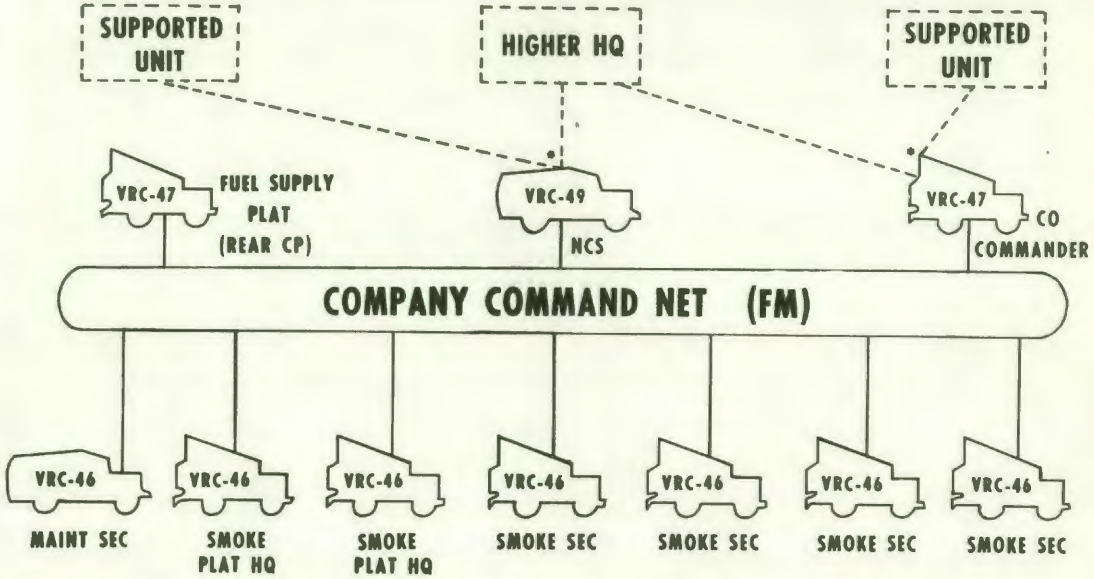

Figure 19. (Superseded) *Type smoke generator company radio communications net.*

APPENDIX I

REFERENCES

(Superseded)

Department of the Army pamphlets of the 310-series and DA Pam 108–1 should be consulted frequently for the latest changes or revisions of references given in this appendix and for new publications relating to material covered in this manual.

AR 40–5	Preventive Medicine.
AR 40–554	Prevention and Control of Communicable Diseases of Man; Venereal Diseases (Venereal Disease Epidemiological Report).
AR 55–355	Military Traffic Management Regulations.
AR 220–10	Preparation for Oversea Movement of Units (POM).
AR 310–10	Orders, Bulletins, Circulars, and Memorandums.
AR 320–5	Dictionary of United States Army Terms.
AR 320–50	Authorized Abbreviations and Brevity Codes.
AR 340–15	Correspondence.
AR 370–5	Qualification and Familiarization.

AR 380–5	Safeguarding Defense Information.
AR 385–63	Regulations for Firing Ammunition for Training, Target Practice, and Combat.
AR 600–20	Army Command Policy and Procedure.
AR 700–2300–1	Motor Vehicles.
AR 735–5	General Principles and Policies and Basic Procedures/ Property Accountability.
AR 735–11	Accounting for Lost, Damaged, and Destroyed Property.
AR 735–35	Supply Procedures for TOE Units, Organizations, and Non-TOE Activities.
AR 750–5	Organization Policies, and Responsibilities for Maintenance Operations.
FM 3–5	Chemical, Biological, and Radiological (CBR) Operations.
FM 3–8	Chemical Corps Reference Handbook
FM 3–12	Operational Aspects of Radiological Defense.
FM 5–15	Field Fortifications.
FM 5–20	Camouflage, Basic Principles, and Field Camouflage.
FM 6–20–1	Field Artillery Tactics.
FM 6–20–2	Field Artillery Techniques.

FM 7–20	Infantry, Airborne Infantry, and Mechanized Infantry Battalions.
FM 7–30	Infantry, Airborne, and Mechanized Division Brigades.
FM 11–8	Field Radio Relay Techniques.
FM 11–10	Infantry Division Signal Battalion.
FM 19–40	Handling Prisoners of War.
FM 20–32	Land Mine Warfare.
FM 21–5	Military Training.
FM 21–6	Techniques of Military Instruction.
FM 21–10	Military Sanitation.
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 Chemical, Biological, and Radiological (CBR) Operations.
FM 21–41	Soldier's Handbook for Chemical and Biological Operations and Nuclear Warfare.

FM 21–48	Chemical, Biological, and Nuclear Training Exercises and Integrated Training.
FM 21–60	Visual Signals.
FM 21–75	Combat Training of the Individual Soldier and Patrolling.
FM 22–5	Drill and Ceremonies.
FM 22–100	Military Leadership.
FM 24–17	Tactical Communications Center Operations.
FM 24–18	Field Radio Techniques.
FM 24–20	Field Wire and Field Cable Techniques.
FM 26–5	Interior Guard.
FM 27–10	The Law of Land Warfare.
FM 30–5	Combat Intelligence.
FM 31–12	Army Forces in Amphibious Operations (The Army Landing Force).
FM 31–15	Operations Against Irregular Forces.
FM 31–25	Desert Operations.
FM 31–30	Jungle Operations.
FM 31–60	River-Crossing Operations.
FM 31–70	Basic Cold Weather Manual.

FM 31–71	Northern Operations.
FM 31–72	Mountain Operations.
FM 41–5	Joint Manual of Civil Affairs/Military Government.
FM 55–30	Motor Transportation Operations.
FM 57–10	Army Forces in Joint Airborne Operations.
FM 100–5	Field Service Regulations; Operations.
FM 100–10	Field Service Regulations; Administration.
FM 101–5	Staff Officers' Field Manual; Staff Organization and Procedure.
FM 101–10, Part I	Staff Officers' Field Manual; Organizational, Technical, and Logistical Data.
TM 3–210	Fallout Prediction.
TM 3–215	Military Chemistry and Chemical Agents.
TM 3–220	Chemical, Biological, and Radiological (CBR) Decontamination.
TM 3–240	Field Behavior of Chemical, Biological, and Radiological Agents.
TM 3–304	Protective Clothing and Accessories.
TM 3–366	Flamethrower and Fire Bomb Fuels.

TM 3–400	Chemical Bombs and Clusters.
TM 3–500	Chemical Corps Equipment Data Sheets.
TM 3–1040–202–series	Generator, Smoke, Mechanical, Pulse Jet, ABC–M3A3.
TM 3–1040–221–12	Operator and Organizational Maintenance Manual; Service Kit, Portable Flame Thrower-Riot Control Agent Dispenser, M27 (End Item Code 620).
TM 5–700	Field Water Supply.
TM 8–285	Treatment of Chemical Warfare Casualties.
TM 10–260	Quartermaster Salvage in the Theater of Operations.
TM 10–405	Army Mess Operations.
TM 11–286	Radio Sets AN/VRC–8, AN/VRC–9, and AN/VRC–10.
TM 11–287	Radio Sets AN/VRQ–1, AN/VRQ–2, and AN/VRQ–3.
TM 11–295	Radio Receiving Set AN/GRR–5.
TM 11–2155	Telephone Set TA–312/PT.
TM 11–5805–262–series	Switchboards, Telephone, Manual, SB–22/PT and SB–22A/PT.
TM 11–5820–284–series	Radio Receiving Set AN/GRR–5.
TM 11–5820–401–series	Radio Sets AN/VRC–12 and AN/VRC–43, –44, –45, –46, –47, –48, and –49.

TM 38–750	The Army Equipment Record System and Procedures.
TM 57–210	Air Movement of Troops and Equipment.
DA Pam 108–1	Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.
DA Pam 310–1	Index of Administrative Publications.
DA Pam 310–2	Index of Blank Forms.
DA Pam 310–3	Index of Doctrinal, Training, and Organizational Publications.
DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Manuals, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
DA Pam 310–5	Index of Graphic Training Aids and Devices.
DA Pam 310–23	Index of Supply Manuals; prepared by U.S. Army Edgewood Arsenal.
DA TB CML 100	Smoke Pot, HC, 10-lb., M1; and 30-lb., ABC–M5; Smoke Pot, Floating, HC, M4A2; SGF2, AN–M7; and SGF2, AN–M7A1.
TOE 3–266	Headquarters and Headquarters Detachment, Chemical Smoke Generator Battalion.

TOE 3–267	Chemical Smoke Generator Company.
TA 20–2	Equipment for Training Purposes.
TA 21 (Mob)	Clothing and Equipment.
TA 23–100	Ammunition for Training.
ASubjScd 3–9	Flame Thrower and Miscellaneous Flame Fuels.
ATP 3–7	Chemical Organizations.

APPENDIX III

TYPE SMOKE PLAN

(CLASSIFICATION)

COPY NO. 4
10th Inf Div
BRIETENGUSBACH (8431)
101455 Jul 19--
Bde ----------

Annex G (Smoke Plan) to OpnO 12
Map: GERMANY, 1:50,000, BAMBERG, HASFURT.

* * * * * * *

3. Execution

a. Concept of operation. Cml Bn (SG) * * * to stop smoke.

(1) Provide one company to support operations of each forward **brigade.**

* * * * * * *

b. Coordinating instructions.

(1) Smoke control through div **FSE.**

* * * * * * *

APPENDIX VII

TYPE VEHICLE LOADING PLAN FOR A CHEMICAL SMOKE GENERATOR COMPANY

(Superseded)

Notes: 1. All vehicles carry the following: OVM, pioneer tools, decontaminating apparatus 1½ quart, flexible nozzle in toolbox, gas can mounted and filled, and goggles and flashlight in glove compartment.

2. Protective masks and individual weapons are carried by personnel.

3. Latest authorized item of issue is used in this loading plan.

TRUCK NO. 1 WITH TRAILER NO. 1

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Commanding officer
1 Company clerk
1 Radio-telephone operator

Equipment:

1 Radio set, AN/VRC–47, mounted in truck
1 Telephone set, TA–312/PT
1 Typewriter, nonportable
1 Compass, lensatic
1 Binocular, 6 x 30, military, reticle
3 Flashlight, right angle, 2-cell
1 Flag, guidon, bunting, with case
1 Stove, gasoline, 1-burner, 5,500 BTU
6 Panel marker, ground signal to aircraft

TRUCK NO. 2 WITH TRAILER NO. 2

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Executive officer
1 Communications chief
1 Ordnance supply specialist
1 Wireman

Equipment:

1 Reel equipment, CE–11
3 Tool equipment, TE–33
2 Charger, radiac detector, PP–1578/PD
3 Wire, WD–1/TT, MX–306/G
4 Wire, WD–1/TT, RL–159/U

TRUCK NO. 3

Truck, cargo, ¾-ton, 4 x 4

Personnel:

1 Senior wireman
1 Switchboard operator
1 Wireman
1 Wireman's helper
1 Radio-telephone operator

Equipment:

1 Radio set, AN/VRC–46, mounted in truck
2 Launcher, rocket, 3.5-inch
2 Detecting set, mine, AN/PRS–3
1 Switchboard, telephone, manual, SB–22/PT
3 Telephone set, TA–312/PT
1 Axle, RL–27
8 Flashlight, right angle, 2-cell
1 Reel unit, RL–31

3 Tool equipment, TE–33
1 Light set, field, portable, command post
1 Terminal strip, TM–184
1 Anemometer, ML–497/PM
4 Handset-headset, H–144/U
6 Panel marker, ground signal to aircraft
1 Table, folding
15 Wire, WD–1/TT, MX–306/G
4 Wire, WD–1/TT, RL–159/U

TRUCK NO. 4

Truck, cargo, ¾-ton, 4 x 4

Personnel:

1 First sergeant
1 Smoke generator control sergeant
1 Radio-telephone operator
1 Clerk-typist

Equipment:

1 Radio set, AN/VRC–49, mounted in truck
2 Telephone set, TA–312/PT
1 Typewriter, nonportable
1 Compass, lensatic
2 Flashlight, right angle, 2-cell
1 Stove, gasoline, 1-burner, 5,500 BTU
1 Stereoscope lens, with case
1 Safe, 26 inches high, 17 inches wide, 17½ inches deep
1 Anemometer, ML–497/PM
1 Scale, plotting, flat
1 Table, folding
1 Radiacmeter, IM–93/UD
1 Radiacmeter, IM–174/PD
1 Desk, field, plywood

TRUCK NO. 5 WITH TRAILER NO. 3

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with winch and with trailer, cargo, 1½-ton, 2-wheel

Personnel:

1 Mess steward
2 First cook
2 Cook
1 Cook's helper

Note. Also KP's as required.

Equipment:

1 Bag, water sterilizing, cotton duck
8 Can, corrugated, nesting, galvanized, with cover, 32-gallon
2 Can, corrugated, nesting, galvanized, with cover, 10-gallon
3 Can, gasoline, 5-gallon capacity
1 Clock, alarm
6 Container, food, insulated
6 Heater, immersion type, for cans, corrugated
1 Tent, kitchen, flyproof, with pins and poles
3 Range, outfit, field, gasoline, M–1937
1 Tube, flexible nozzle
9 Can, water, 5-gallon
1 Telephone set, TA–312/PT
1 Outfit, officers mess
3 Heater, water immersion, gas-operated

TRUCK NO. 6

Truck, cargo, ¾-ton, 4 x 4

Personnel:

1 Senior smoke generator mechanic

2 Smoke generator mechanic
1 Wireman

Equipment:

2 Tool kit, mechanical smoke generator

TRUCK NO. 7 WITH TRAILER NO. 4

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with winch and with trailer, tank, water, 1½-ton, 2-wheel

Personnel:

1 Senior light truck driver
1 Armorer

Equipment:

1 Tow chain
4 Shovel, hand, round point, long handle
3 Chair, folding
1 Screen, latrine, with cover
2 Stove, gasoline, 1-burner, 5,500 BTU
1 Tent, command post, with pins and poles
1 Detector kit, chemical agent
1 Tool kit, armorer's
1 Tool kit, carpenter's
1 Kit, barber, with case
1 Burner, oil stove, tent
10 Tube, flexible nozzle
2 Tarpaulin
1 Radiacmeter, IM–93/UD
1 Radiacmeter, IM–174/PD

TRUCK NO. 8 WITH TRAILER NO. 5

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Fuel supply platoon leader
1 Fuel supply platoon sergeant
1 Radio-telephone operator

Equipment:

1 Radio set, AN/VRC–47, mounted in truck
1 Table, folding
2 Radiacmeter, IM–93/UD

TRUCK NO. 9 WITH TRAILER NO. 6

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with trailer, cargo, 1½-ton, 2-wheel

Personnel:

1 Light truck driver
1 Supply sergeant

Equipment:

1 Tow chain
48 Can, gasoline, 5-gallon capacity
1 Tank and pump unit, liquid dispensing, truck-mounted

TRUCK NO. 10 WITH TRAILER NO. 7

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with winch and with trailer, cargo, 1½-ton, 2-wheel

Personnel:

1 Wheel vehicle mechanic
1 Mechanic's helper
1 Welder

Equipment:

2 Respirator, air-filtering, paint spray
1 Heater, duct type, 250,000 BTU
1 Tent, maintenance, with frame and pins

1 Telephone set, TA–312/PT
1 Typewriter, portable, with carrying case
1 Tool kit, organizational maintenance set, No. 5
1 Tube, flexible nozzle
1 Tool kit, welder's

TRUCK NO. 11 WITH TRAILER NO. 8

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with winch and with trailer, cargo, 1½-ton, 2-wheel

Personnel:

1 Light truck driver
1 Supply clerk

Equipment:

1 Tow chain
48 Can, gasoline, 5-gallon capacity
1 Tank and pump unit, liquid dispensing, truck mounted

TRUCK NO. 12 WITH TRAILER NO. 9

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with trailer, cargo, 1½-ton, 2-wheel

Personnel:

1 Light truck driver
2 Fuel supply handler

Equipment:

1 Dispensing pump, hand driven, rotary
1 Conveyor, gravity roller
16 Drum, oil, fog, SGF, 55-gallon capacity

TRUCK NO. 13 WITH TRAILER NO. 10

(Same as for truck No. 12 with trailer No. 9)

TRUCK NO. 14 WITH TRAILER NO. 11

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with trailer, cargo, 1½-ton, 2-wheel

Personnel:

1 Section chief
1 Light truck driver
1 Fuel supply handler

Equipment:

1 Dispensing pump, hand driven, rotary
1 Gun, machine, cal. .50, with mount
1 Conveyor, gravity roller
16 Drum, oil, fog, SGF, 55-gallon capacity

TRUCK NO. 15 WITH TRAILER NO. 12

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with trailer, cargo, 1½-ton, 2-wheel

Personnel:

1 Light truck driver
1 Wheel vehicle mechanic

Equipment:

1 Dispensing pump, hand driven, rotary
1 Conveyor, gravity roller
16 Drum, oil, fog, SGF, 55-gallon capacity

TRUCK NO. 16 WITH TRAILER NO. 13

(Same as for truck No. 12 with trailer No. 9)

TRUCK NO. 17

Truck, cargo, 2½-ton, 6 x 6, long wheelbase

Personnel:

1 Personnel administrative clerk
1 Light truck driver

Equipment:

1 Dispensing pump, hand driven, rotary
1 Conveyor, gravity roller
1 Gun, machine, cal. .50, with mount
16 Drum, oil, fog, SGF, 55-gallon capacity

TRUCK NO. 18 WITH TRAILER NO. 14

Truck, cargo, 2½-ton, 6 x 6, long wheelbase

Personnel:

1 Light truck driver
2 Fuel supply handler

Equipment:

1 Conveyor, gravity roller
1 Gun, machine, 7.62-mm
16 Drum, oil, fog, SGF, 55-gallon capacity

TRUCK NO. 19 WITH TRAILER NO. 15

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with winch and with trailer, cargo, 1½-ton, 2-wheel

Personnel:

1 Section chief
1 Light truck driver
1 Fuel supply handler

Equipment:

1 Gun, machine, cal. .50, with mount
1 Conveyor, gravity roller
1 Tow chain
16 Drum, oil, fog, SGF, 55-gallon capacity

TRUCK NO. 20 WITH TRAILER NO. 16

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with winch and with trailer, cargo, 1½-ton, 2-wheel

Personnel:

1 Senior light truck driver
2 Fuel supply handler

Equipment:

1 Tow chain
16 Drum, oil, fog, SGF, 55-gallon capacity

TRUCK NO. 21 WITH TRAILER NO. 17

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Platoon leader
1 Platoon sergeant
1 Radio-telephone operator

Equipment:

1 Anemometer, ML–497/PM
1 Radio set, AN/VRC–46, mounted in truck
2 Telephone set, TA–312/PT
1 Compass, lensatic
1 Binocular, 6 x 30, military, reticle
1 Detector kit, chemical agent
1 Galvanometer, blasting, with case and strap
1 Launcher, rocket, 3.5-inch
5 Flashlight, right angle, 2-cell
1 Stove, gasoline, 1-burner, 5,500 BTU
1 Scale, plotting, flat
1 Radiacmeter, IM–93/UD
1 Radiacmeter, IM–174/PD
1 Blasting machine, 50-cap capacity

TRUCK NO. 22 WITH TRAILER NO. 18

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Section leader
1 Radio-telephone operator
1 Smoke generator operator
1 Smoke generator operator helper

Equipment:

2 Generator, smoke, mechanical, with tools and fire extinguisher
2 Telephone set, TA–312/PT
1 Radio set, AN/VRC–46, mounted in truck
1 Gun, machine, 7.62-mm
1 Tool equipment, TE–33
1 Reel equipment, CE–11
1 Spool, DR–8

TRUCK NO. 23 WITH TRAILER NO. 19

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Squad leader
1 Smoke generator operator
1 Smoke generator operator helper

Equipment:

2 Generator, smoke, mechanical, with tools and fire extinguisher

TRUCK NO. 24 WITH TRAILER NO. 20

(Same as for truck No. 23 with trailer No. 19)

TRUCK NO. 25 WITH TRAILER NO. 21

(Same as for truck No. 23 with trailer No. 19)

TRUCK NO. 26 WITH TRAILER NO. 22

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Smoke generator operator

1 Smoke generator operator helper

Equipment:

2 Generator, smoke, mechanical, with tools and fire extinguisher

TRUCK NO. 27 WITH TRAILER NO. 23

(Same as for truck No. 26 with trailer No. 22)

TRUCK NO. 28 WITH TRAILER NO. 24

(Same as for truck No. 22 with trailer No. 18)

TRUCK NO. 29 WITH TRAILER NO. 25

(Same as for truck No. 23 with trailer No. 19)

TRUCK NO. 30 WITH TRAILER NO. 26

(Same as for truck No. 23 with trailer No. 19)

TRUCK NO. 31 WITH TRAILER NO. 27

(Same as for truck No. 23 with trailer No. 19)

TRUCK NO. 32 WITH TRAILER NO. 28

(Same as for truck No. 26 with trailer No. 22)

TRUCK NO. 33 WITH TRAILER NO. 29

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Assistant platoon leader

1 Smoke generator operator

1 Smoke generator operator helper

Equipment:

2 Generator, smoke, mechanical, with tools and fire extinguisher

TRUCK NO. 34 WITH TRAILER NO. 30

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Platoon leader
1 Platoon sergeant
1 Radio-telephone operator

Equipment:

2 Telephone set, TA–312/PT
1 Compass, lensatic
1 Binocular, 6 x 30, military, reticle
1 Detector kit, chemical agent
1 Galvanometer, blasting, with case and strap
1 Tape, measuring, steel, 50 feet long
1 Launcher, rocket, 3.5-inch
5 Flashlight, right angle, 2-cell
1 Stove, gasoline, 1-burner, 5,500 BTU
1 Scale, plotting, flat
1 Radiacmeter, IM–93/UD
1 Radiacmeter, IM–174/PD
1 Blasting machine, 50-cap capacity

TRUCK NO. 35 WITH TRAILER NO. 31

(Same as for truck No. 22 with trailer No. 18)

TRUCK NO. 36 WITH TRAILER NO. 32

(Same as for truck No. 23 with trailer No. 19)

TRUCK NO. 37 WITH TRAILER NO. 33

(Same as for truck No. 23 with trailer No. 19)

TRUCK NO. 38 WITH TRAILER NO. 34

(Same as for truck No. 23 with trailer No. 19)

TRUCK NO. 39 WITH TRAILER NO. 35

(Same as for truck No. 26 with trailer No. 22)

TRUCK NO. 40 WITH TRAILER NO. 36

(Same as for truck No. 26 with trailer No. 22)

TRUCK NO. 41 WITH TRAILER NO. 37

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Section leader
1 Smoke generator operator
1 Smoke generator operator helper

Equipment:

2 Generator, smoke, mechanical, with tools and fire extinguisher
1 Radio set, AN/VRC–46, mounted in truck

TRUCK NO. 42 WITH TRAILER NO. 38

(Same as for truck No. 23 with trailer No. 19)

TRUCK NO. 43 WITH TRAILER NO. 39

(Same as for truck No. 23 with trailer No. 19)

TRUCK NO. 44 WITH TRAILER NO. 40

(Same as for truck No. 23 with trailer No. 19)

TRUCK NO. 45 WITH TRAILER NO. 41

(Same as for truck No. 26 with trailer No. 22)

TRUCK NO. 46

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with winch

Personnel:

1 Motor sergeant
1 Senior wheel vehicle mechanic
1 Wheel vehicle mechanic
1 Mechanic's helper

Equipment:

1 Tow chain
5 Tool kit, general mechanic
1 Tool kit, organizational maintenance set, No. 7
1 Tool kit, organizational maintnance, No. 1, Common and Supplemental Set

TRUCK NO. 47 WITH TRAILER NO. 42

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Assistant platoon leader
1 Radio-telephone operator
1 Smoke generator operator
1 Smoke generator operator helper

Equipment:

2 Generator, smoke, mechanical, with tools and fire extinguisher
2 Telephone set, TA–312/PT
1 Radio set, AN/VRC–46, mounted in truck
1 Gun, machine, 7.62-mm
1 Tool equipment, TE–33
1 Reel equipment, CF–11

APPENDIX VIII

REORGANIZATION OF THE CHEMICAL SMOKE GENERATOR COMPANY INTO A PROVISIONAL FLAME FUEL MIXING UNIT

5. Equipment

(Superseded)

The following items of equipment, one per team, will be required:

AN–M4 3½ CFM flame thrower power-driven reciprocating compressor
M1A1 7 CFM power-driven reciprocating compressor
M1 drum tripod hoisting unit
M5 incendiary oil mixing and transferring unit or M4A2 flame thrower service unit
M27 portable flame thrower-riot control agent disperser service kit

APPENDIX X

CHARACTERISTICS OF SIGNAL EQUIPMENT

(Added)

Nomenclature	Description and use	Reference
Receiving set, radio, AN/GRR–5.	A portable or vehicle-mounted AM radio receiver providing for the reception of AM voice, CW or MCW signals within a frequency range of 1.5—18mc. Used by the headquarters section.	TM 11–295 TM 11–5820–284–series.
Radio set AN/VRC–46.	Same as radio set AN/VRC–43, except has manually tuned frequency selection and is not capable of remote selection frequencies. Includes receiver-transmitter RT–524/VRC. Frequency range is 30—79.95 mc. Used by the maintenance section, smoke company headquarters; smoke platoon headquarters, and the smoke sections.	TM 11–5820–401–series.
Radio set AN/VRC–47.	Same as radio set VRC–12, except has manually tuned frequency selection. Does not have intercom facilities and is not capable of remote selection of frequencies. Includes receiver-transmitter RT–524/VRC and auxiliary receiver R–442/VRC. Frequency range is 30—75.95 mc. Used by the company commander and the fuel supply platoon.	TM 11–5820–401–series.

Radio set AN/VRC–49.	Same as radio set AN/VRC–45, except has manually tuned frequency selection and is not capable of remote selection of frequencies. Includes two receiver-transmitters RT–524/VRC. Frequency range is 30—75.95 mc. Used as the Net Control Station (NCS) to higher headquarters, supported units, and the company command net.	TM 11–5820–401–series.
Switchboard, telephone, manual, SB–22/PT	A portable, local battery, monocord switchboard capable of connecting 12 local battery signaling lines or trunks, two of which may be one-way automatic-one-way ringdown trunks to civilian exchanges. Can be used for voice frequency teletypewriter circuits. Used by the headquarters section.	TM 11–5805–262–series.

APPENDIX XI

CONVERSION TABLE

(Added)

Miles per hour	Knots	Kilometers per hour	Miles per hour	Knots	Kilometers per hour
1	0.9	1.6	31	26.9	49.9
2	1.7	3.2	32	27.8	51.5
3	2.6	4.8	33	28.7	53.1
4	3.5	6.4	34	29.5	54.7
5	4.3	8.0	35	30.4	56.3
6	5.2	9.7	36	31.3	57.9
7	6.1	11.3	37	32.1	59.5
8	6.9	12.9	38	33.0	61.2
9	7.8	14.5	39	33.9	62.8
10	8.7	16.1	40	34.7	64.4
11	9.6	17.7	41	35.6	66.0
12	10.4	19.3	42	36.5	67.6
13	11.3	20.9	43	37.3	69.2
14	12.2	22.5	44	38.2	70.8
15	13.0	24.1	45	39.1	72.4
16	13.9	25.7	46	39.9	74.0
17	14.8	27.4	47	40.8	75.6
18	15.6	29.0	48	41.7	77.2
19	16.5	30.6	49	42.6	78.9
20	17.4	32.2	50	43.4	80.5
21	18.2	33.8	51	44.3	82.1
22	19.1	35.4	52	45.2	83.7
23	20.0	37.0	53	46.0	85.3
24	20.8	38.6	54	46.9	86.9
25	21.7	40.2	55	47.8	88.5
26	22.6	41.8	56	48.6	90.1
27	23.4	43.5	57	49.5	91.7
28	24.3	45.1	58	50.4	93.3
29	25.2	46.7	59	51.2	95.0
30	26.1	48.3	60	52.1	96.6

Miles per hour	Knots	Kilometers per hour	Miles per hour	Knots	Kilometers per hour
61	53.0	98.2	86	74.7	138.4
62	53.8	99.8	87	75.5	140.0
63	54.7	101.4	88	76.4	141.6
64	55.6	103.0	89	77.3	143.2
65	56.4	104.6	90	78.2	144.8
66	57.3	106.2	91	79.0	146.5
67	58.2	107.8	92	79.9	148.1
68	59.1	109.4	93	80.8	149.7
69	59.9	111.0	94	81.6	151.3
70	60.8	112.7	95	82.5	152.9
71	61.7	114.3	96	83.4	154.5
72	62.5	115.9	97	84.2	156.1
73	63.4	117.5	98	85.1	157.7
74	64.3	119.1	99	86.0	159.3
75	65.1	120.7	100	86.8	160.9
76	66.0	122.3	101	87.7	162.5
77	66.9	123.9	102	88.6	164.2
78	67.7	125.5	103	89.4	165.8
79	68.6	127.1	104	90.3	167.4
80	69.5	128.7	105	91.2	169.0
81	70.3	130.4	106	92.0	170.6
82	71.2	132.0	107	92.9	172.2
83	72.1	133.6	108	93.8	173.8
84	72.9	135.2	109	94.7	175.4
85	73.8	136.8	110	95.5	177.0

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

DCSPER (2)
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CNGB (1)
CINFO (1)
TIG (1)
TJAG (1)
TPMG (1)
CofCh (1)
TSG (1)
OPO (1)
CofEngrs (1)
USACDC Agcy (2)
except
USACBRCDA (10)
USACARMS-CDA (4)
USACECDA (6)
USCONARC (10)
USAMC (2)
USACDC (5)
ARADCOM (1)
ARADCOM Rgn (1)
OS Maj Comd (5) except
USAREUR (50)
LOGCOMD (2)
MDW (3)
Armies (5)
Corps (5)
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Div Arty (2)
Bde (2)
Regt/Gp/Bg (2) except
Cml Gp (10)
Bn (1)
Ft McClellan (10)
USAWC (10)
USACGSC (50)
Br Svc Sch (10) except
USAARMS (20)
USAIS (102)
USA Ord Sch (35)
USAOGMS (15)
USASCS (20)

PMS Sr Div Units (Cml) (1)
USACAG (1)
USACSSG (1)
USAIAS (1)
USACDEC (5)
USACDC SPWAR Gp (1)
USACDC Comd Con Info Sys Gp (1)
USA Corps (3)
MAAG (1)
Mil Msn (1)
Units org under fol TOE:
3–7 (8)
3–266 (5)
3–267 (5)
17–22 (1)

NG: State AG (3); Units—same as Active Army except allowance is one copy to each unit.

USAR: Units—same as Active Army except allowance is one copy to each unit.

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

FIELD MANUAL
No. 3–50

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *7 January 1959*

CHEMICAL SMOKE GENERATOR BATTALION AND CHEMICAL SMOKE GENERATOR COMPANY

* This manual supersedes FM 3–50, 30 June 1954, including C 1, 8 March 1957, and C 2, 27 May 1957.

CHAPTER 1
INTRODUCTION

1. Purpose

This manual is a guide for the commander and staff of the chemical smoke generator battalion and the chemical smoke generator company in preparing the unit for, and employing it in, combat.

2. Scope

This manual provides information pertaining to operations of chemical smoke generator units. It covers the mission, assignment, capabilities, limitations, organization, equipment, training, and techniques of smoke operations of the chemical smoke generator battalion and the chemical smoke generator company.

3. Mission

The mission of the chemical smoke generator company is to provide concealment for friendly troops, installations, and tactical areas by the use of smoke under all operating conditions. When the chemical smoke generator battalion operates as a unit, the mission of the battalion is the same as that of its companies.

4. Chemical Smoke Generator Company

The chemical smoke generator company con-

sists of a company headquarters and two platoons of two sections each.

a. Characteristics and Capabilities. The company can provide smoke screens of approximately 1 to 2½ miles in width (at the line of smoke generators) and several miles in depth, depending on weather and terrain conditions. It is capable of rapid emplacement and displacement of its 48 mechanical smoke generators. Its movements and tactical actions are coordinated with those of the unit it supports and with other smoke units. To accomplish its mission in combat, the company is equipped, organized, and trained to use weapons of close combat and to provide for its own administrative support. The company has the capability of defending itself and its installations against hostile ground attack. It is highly mobile and completely air transportable.

b. Limitations. The platoons are not organized to operate separated from the company. Consequently, platoons require special augmentation when required to operate on separate missions. If the company is employed in a secondary mission for prolonged periods, a period of retraining and readjustment may be required before the company is reverted to smoke missions. Generators forced out of action by normal wear and tear must be exchanged at the chemical supply point for repaired or rehabilitated generators if they cannot be returned to action by unit maintenance personnel.

c. Assignments and Attachments. The chemical

smoke generator company is normally *assigned* to a field army or communications zone as required. The company is *attached* to a chemical smoke generator battalion. The chemical smoke generator company may, and frequently does, operate separately and independently of the battalion. When this occurs, the company is *attached* to the unit it supports, normally a corps or division. Operational control and administrative support are provided by the unit to which the smoke company is attached unless the commander making the attachment orders otherwise.

5. Chemical Smoke Generator Battalion

The chemical smoke generator battalion is a flexible organization consisting of a headquarters and headquarters detachment and from 3 to 8 chemical smoke generator companies.

a. Characteristics and Capabilities. The battalion headquarters provides command and administrative support to its attached companies. The area that a battalion can cover with smoke is proportional to the number of companies in the battalion. The battalion is a mobile unit that can move rapidly and can operate over relatively wide areas. It is completely air transportable.

b. Limitations. The battalion has the same limitations that its companies have (par. 4*b*).

c. Assignments and Attachments. The chemical smoke generator battalion is normally assigned to a field army or communications zone as required. When assigned to a field army, the battalion may

be attached in whole or in part to a corps or division for the purpose of supporting a special mission. The battalion may be controlled by attachment to the chemical group operating under the supervision of the staff chemical officer of the army or comparable unit. Most missions require the attachment of several smoke generator companies to the major unit being supported, usually a corps or division.

CHAPTER 2

ORGANIZATION AND PERSONNEL DUTIES

Section I. CHEMICAL SMOKE GENERATOR BATTALION COMMANDER

6. General

The chemical smoke generator battalion is composed of a headquarters and headquarters detachment and attached, self-sufficient chemical smoke generator companies. The battalion headquarters and headquarters detachment is the command administrative unit, and the companies perform the mission of producing smoke. When the companies are operating as part of the battalion, certain administrative functions of the companies, such as the motor pool, personnel, and supply, may be consolidated under battalion control. The battalion commander is responsible for consolidation. He weighs the advantages of consolidation against the disadvantages of the loss of training of the company as a self-sufficient unit, keeping in mind that the company may be detached to function separately.

7. Command Responsibility

The battalion commander commands the battalion and attached chemical smoke generator companies. He is responsible for the technical supervision of chemical smoke generator com-

panies detached for special missions. His responsibilities are met by proper planning, timely issuance of orders, coordination, and his personal supervision. He must have a thorough understanding of all types of smoke operations and of the employment of smoke in the battle area or in support of operations in areas not immediately threatened by enemy ground forces. His knowledge must include an understanding of the employment and operations of combat forces; he must thoroughly understand the techniques of supporting these operations with smoke. He must have the ability to gain the confidence of supported units and to work with and complement the battle plans of these units. All these qualities are required to insure that the battalion commander's recommendations for the employment of smoke are sound and that they furnish the tactical commander with the maximum of support.

8. Relationship With Company Commanders

The relationship of the battalion commander to his company commanders is one of direct contact. The battalion commander stresses the responsibility placed on subordinate commanders from the standpoint of not only initiating necessary action but also supervising all activities within their responsibilities. The battalion commander delegates authority and develops a sense of trust and confidence in his company commanders. He expects compliance with orders and execution of his instructions, regardless of his own feelings or of the feelings of his subordi-

nates. This command relationship is flexible enough to permit the battalion commander knowledge of the abilities of junior officers and senior noncommissioned officers without violating the chain of command. This relationship is necessary to insure proper recognition and advancement of personnel.

9. Relationship With Staff

The battalion commander has a direct personal relationship with his staff and develops in them a sense of initiative and progressive thinking. He assures his staff of his support and develops a feeling of confidence in them. He uses his staff to perform details of his planning and orders and to advise him in various fields of study. The commander advises his staff that they exercise no command and act only in the name of the commander. He keeps his staff informed of his policies and expects his staff to learn his desires and to react to satisfy them without specific orders. The battalion commander makes certain that a feeling of mutual cooperation exists between his staff and the company commanders.

10. Relationship With Supported Units

The battalion commander establishes command liaison as soon as possible with the commander of the supported unit, or his representative, to promote understanding of mutual or individual problems. He submits recommendations concerning the employment of his battalion and advises the supported unit commander of the capabilities and limitations of the battalion. He complies with the

wishes of the supported unit commander to the limit of the capability of the battalion.

11. Action in Combat

The battalion commander coordinates the efforts of his companies to insure adequacy of support and successful completion of the smoke mission. He therefore positions himself in combat in the best place to command his companies and to control the operations of his battalion. This position may be at his headquarters, at the headquarters of the supported unit, or at the headquarters of one of his companies. Prior to absence from his headquarters, the battalion commander orients his staff on all pertinent matters.

Section II. HEADQUARTERS AND HEADQUARTERS DETACHMENT, CHEMICAL SMOKE GENERATOR BATTALION

12. General

The headquarters and headquarters detachment of the chemical smoke generator battalion is organized in accordance with the current TOE 3–266 (fig. 1). It currently consists of 4 officers, 1 warrant officer, 5 noncommissioned officers, and 12 enlisted men. The battalion staff consists of the executive officer, who also functions as intelligence and operations officer, (S2 and S3), the adjutant (S1), supply officer (S4), and personnel officer. The detachment is dependent on the supported unit or on attached units for certain administrative functions, such as messing and motor pool facilities.

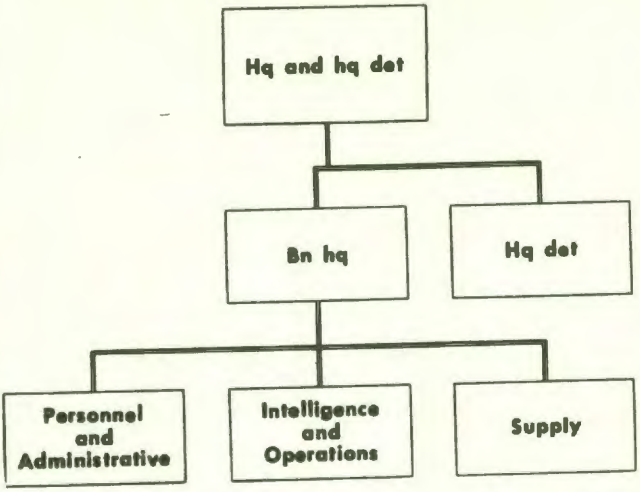

Figure 1. Organization of headquarters and headquarters detachment, chemical smoke generator battalion.

13. Responsibilities of Battalion Staff

The staff officer is an assistant to the commander. He often transmits his commander's orders to unit commanders or conveys the instructions or desires of his commander. During the absence of the commander, in emergency situations, the staff officer may be required to issue orders to subordinate units. These orders are based on the known policies of the commander, who is notified of the action taken as soon as possible.

a. Staff Functions. The staff relieves the commander of time-consuming and distracting details. Through timely estimates of the situation and summaries of reports from the companies,

the staff keeps the commander informed. After the commander's decision is made, the staff assists in translating the decision into orders and supervises their execution. The staff cultivates cooperative, friendly relationships with the commanders of the smoke generator companies by consulting them to determine their needs and by helping to solve their problems. Staff officers coordinate with the company commanders to insure a thorough understanding of the overall situation. When a staff visit is made to a subordinate company, the company commander is contacted personally at the beginning and end of the visit. If conditions are observed which are known to be at variance with the announced policies of the battalion commander, they are called to the attention of the unit commander. Oral or written reports of the facts are made to the battalion commander following the visits.

b. Coordination and Cooperation. Teamwork is essential between members of the staff and between the staff and company commanders. Prompt dissemination of all information, decisions, and orders promotes efficient functioning within the battalion and increases the effectiveness of the unit. Conferences and personal contacts are effective in obtaining coordination and cooperation with other headquarters.

14. Duties of Executive Officer

The executive officer is the principal assistant and adviser to the battalion commander. He coordinates and supervises the details of operations

and administration, thereby enabling the commander to devote himself to the broader aspects of command. The executive officer also functions as the S2 and S3 officer. His specific duties are to—

a. Command the battalion in the absence of the battalion commander, or when directed to do so.

b. Plan and execute the training program under supervision of the battalion commander.

c. Reconnoiter (as directed by battalion commander) sites for smoke lines, command and observation posts, supply dumps, motor parks, and meteorological stations.

d. Prepare all operation orders.

e. Assign sectors of smoke lines, as directed by the battalion commander, to subordinate companies.

f. Direct operations of the command post under supervision of the battalion commander.

g. Direct intelligence operations.

h. Supervise the conduct of intelligence training.

i. Supervise meteorological activities.

j. Study the tactical situation as affected by the status of equipment, supplies, and services; recommend priority of issue of regulated items.

k. Plan and recommend the communications nets to be used in smoke operations and on bivouacs and motor marches.

l. Establish the command post and provide communication facilities for the command.

m. Supervise installation, operation, and maintenance of communications nets.

n. Maintain close contact with communications officers of supported units.

o. Obtain and distribute signal operation instructions.

p. Maintain the unit journal.

q. Secure necessary crytographic clearance for personnel who will operate or have access to classified cipher equipment.

15. Duties of the Adjutant

The adjutant is concerned with the planning, coordination, supervision, and accomplishment of personnel functions. He publishes the orders of the battalion commander and advises the commander on administrative and personnel matters. He is also headquarters detachment commander. His specific duties are to—

a. Issue pertinent instructions on strengths, records, and reports. This includes time of submission, period covered, format, and channels.

b. Receive personnel replacements and arrange for their delivery to the units.

c. Coodinate with Executive Officer (S2) and arrange for POW evacuation to the next higher headquarters.

d. Coordinate and supervise burial and graves registration functions.

e. Recommend methods for building and maintaining morale; submit recommendations for citations, decorations, honors, and awards; supervise

the leave program; coordinate religious activities with the chaplains; plan, coordinate, and supervise the athletic and recreation program; and supervise other personnel services, such as postal and special services, as required.

f. Supervise the movement, internal arrangement, internal organization, and internal operation of the headquarters and arrange for quartering parties.

g. Act as civilian employee officer, to include procurement, utilization, and administration of civilian employees.

h. Process official correspondence.

i. Authenticate orders and instructions, except for combat orders and instructions.

j. Maintain records for the headquarters.

k. Assist the supply officer in preparation of the administrative order.

16. Duties of Supply Officer

The supply officer performs staff and supply duties as directed by the battalion commander and is responsible for the supply, maintenance, evacuation, and transportation services of the battalion. He keeps the commander informed concerning supply matters. He formulates and executes supply plans that will keep subordinate units at maximum efficiency for smoke operations. His specific duties are to—

a. Supervise all supply functions to insure sufficient procurement, maintenance of adequate stock levels, and proper distribution of supplies.

b. Keep detailed records of the status of ammunition, generator fuels, available supply points, available transportation, and information on road nets.

c. Provide for the proper maintenance and operation of all vehicles allocated to headquarters and headquarters detachment and attached units.

d. Advise the battalion commander concerning motor vehicles and preparation of the traffic plan.

e. Coordinate the evacuation of casualties, damaged equipment and weapons, salvage, and captured enemy materiel.

f. Prepare the administrative order.

17. Duties of Personnel Officer

The personnel officer directs the personnel activities within the battalion headquarters under supervision of the adjutant. He supervises the activities of personnel sections of attached companies and the headquarters detachment.

Section III. CHEMICAL SMOKE GENERATOR COMPANY

18. General

The chemical smoke generator company is organized in accordance with the current TOE 3–267 (fig. 2). It consists of a company headquarters and two operating platoons.

a. Company Headquarters. The company headquarters consists of a headquarters section, maintenance section, and fuel supply section with functions as follows: (See paragraph 86 for detailed functions.)

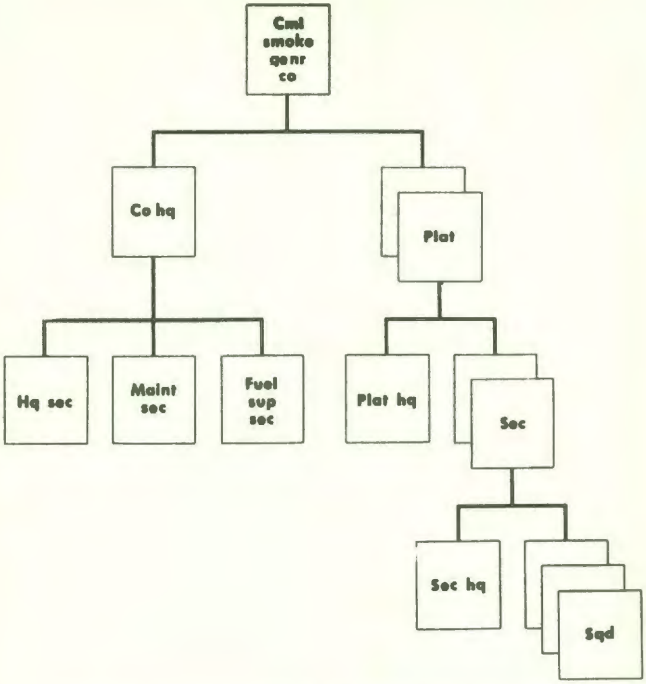

Figure 2. Organization of chemical smoke generator company.

(1) *Headquarters section* is responsible for operations, mess, supply (excluding generator fuels), personnel records, meteorological data, and communications.

(2) *Maintenance section* supervises and assists in first echelon maintenance; it performs second echelon organizational maintenance of generators, weapons, and vehicles.

(3) *Fuel supply section* transports, receives, stores, and issues fog oil, gasoline, and water required in smoke operations.

b. Platoons. Each platoon consists of a headquarters and two sections. (See paragraph 87 for detailed functions.) A section consists of a headquarters and three squads. The working unit of the platoon is the squad. It is composed of 5 men—the squad leader and 4 generator operators. When the situation permits, one man is assigned to each emplaced generator. Each generator operator is trained to perform first echelon maintenance on his generator. All generator operators are trained as light truck drivers.

19. Responsibilities of Company Commander

The company commander organizes his headquarters personnel as a company staff and utilizes them in a manner similar to that of the battalion staff. When the company operates separately from the battalion, the company commander has additional functions and responsibilities similar to those of the battalion commander.

a. Relationship With Company Personnel. Smoke operations require that individual smoke generator positions be separated by varying ground distances. Consequently, the advantages of close team support and comradeship are normally lost. The smoke generator operator is normally alone in a combat position for relatively long periods of time. For this reason the commander must devote considerable effort to developing a proper mental attitude in the personnel

of his command. Morale and esprit de corps take on an even greater meaning to the individual when he is alone and normally in an area of low visibility. His training must harden him physically and mentally for these conditions, and in this training his confidence in leadership at all command levels becomes a most important factor. The smoke unit commander must continuously foster this feeling of confidence by his own attitude of confidence in his subordinates and by his enthusiasm and aggressiveness.

b. Relationship With Supported Units. The relationship of the company commander to the supported unit commander is similar to that of the battalion commander (par. 10). In addition, the company commander stays as close to the supported unit commander as required. He frequently accompanies the supported unit commander, or members of his staff, to forward positions in order to acquire better information of his mission and to more fully understand the problems confronting the supported unit. He is responsible that liaison with the supported unit is continuous and that an adequate flow of information of the situation is furnished the unit.

c. Actions in Combat. The commander positions himself in combat in the best place to command his troops and to control the operations of his unit. This position may be with the supported unit or in forward observation posts. Other times his presence will be required at the smoke control point. The commander makes his presence

felt by personal visits to various smoke positions, regardless of their locations. In close proximity with enemy forces, he should coordinate closely with the supporting unit when visiting smoke positions. He must display courage and coolness under combat conditions and must impart these qualities of leadership to his subordinates. He must personally set the example in combat that he expects his troops to achieve.

20. Duties of Company Officers

The smoke generator company is currently authorized six officers in addition to the company commander. When the company is operating separately from the battalion, the duties of the company officers are similar to those of the officers on the battalion staff in corresponding positions. It is usually desirable for the operations officer to serve as company executive. The company officers and their duties are as follows:

a. Operations officer also serves as communications officer.

b. Fuel supply officer also serves as motor transport officer.

c. Platoon leaders, one each in command of a platoon.

d. Platoon executives, one each to assist the platoon leader.

CHAPTER 3
TRAINING

21. General

The ultimate purpose of training the chemical smoke generator battalion is to prepare the unit to fulfill its mission in combat—to conceal friendly troop operations and to deceive the enemy of intentions by the production of smoke screens. Personnel, therefore, are trained as technical specialists to operate as a team. In addition, troops are trained to fight as infantrymen to protect themselves and their installations. For detailed information on training, refer to FM's 21–5, 21–6, 21–20, and 21–75; Department of the Army Pamphlets 310–3 and 310–5; and references listed in appendix I.

22. Training Objectives

The objective of training the headquarters and headquarters detachment, chemical smoke generator battalion, is to develop the command and staff techniques for technically supervising and operationally controlling the chemical smoke generator companies. The objective of training the chemical smoke generator company is to qualify the unit to produce smoke as required, to move rapidly during combat, to defend its installations from enemy attack, and to operate as an independent unit. The training objective may be designated

by a higher headquarters to develop a unit to perform anticipated missions by a specified target date.

23. Training Management

Training management involves the planning and directing of training to develop a unit to accomplish its mission with the means available in a specified period of time. The quality and thoroughness of training are directly proportional to the amount of active and personal supervision given to training activities by the battalion commander, company commander, platoon leader, and noncommissioned officers.

a. Training Programs. The unit training programs and schedules are based upon the current Army training programs (ATP's), the unit commander's estimate of the training situation, and instructions from higher headquarters. In any training situation, there are a number of variables which affect the methods of training used, the subjects selected for instruction, the sequence of presentation of instruction, and the time allotted to each subject.

b. Training Cycles. The training of units and personnel is divided into the following phases: basic combat, advanced individual, basic unit, and advanced unit; and into field exercises and maneuvers.

c. Postcycle Training. Training continues after the unit completes the program given in the ATP

d. Cadre Training. During the training period,

each unit is required to train and maintain two equally qualified cadres, "A" and "B."

e. Training Records. Suitable training records are maintained to provide a basis for necessary review and/or retraining. Elaborate training records are not required.

24. Individual Training

The individual training phase includes basic combat training and advanced individual training. Advanced individual training in a smoke generator unit teaches the basically trained soldier his occupational skills and prepares him to function effectively as a member of the smoke generator unit. The current ATP gives suggested methods and procedures for specialist training. Commanders will emphasize small-unit leadership training. Maximum use will be made of on-the-job opportunities and schools for this training. Assignment of duties and responsibilities will be commensurate with the grade and abilities of the noncommissioned officers concerned.

25. Unit Training

The unit training phase provides team training which is subdivided and conducted in basic and advanced phases. Basic unit training provides opportunity for the soldier to learn the value of teamwork and to practice, as part of a small team, the skills he acquires in individual training. Advanced unit training in a smoke generator unit integrates the company headquarters and platoons into a coordinated company proficient in

operating as a separate unit and as part of the chemical smoke generator battalion.

26. Technical Training

Enlisted personnel receive technical training during the advanced individual training phase and during the unit training phase. This technical training consists of instruction in the following subjects:

a. Operations of Smoke Generators. This includes instruction in nomenclature, functioning, characteristics, operation, maintenance, and repair of mechanical smoke generators.

b. Generator Emplacement and Smoke Production. This includes instruction in how to select positions and prepare emplacements; the protection of equipment from hostile fire; variations required by the smoke plan, meteorological conditions, and areas to be screened; and camouflage requirements of smoke generator positions and emplacements.

c. Fuel Supply. This includes instruction in the grades and types of fuels used in smoke generators, necessary modifications for variation in temperature, storage methods in camps and at generator positions, fuel transfer, transportation of fuel, and safety precautions in the handling and storage of fuel.

d. Auxiliary Smoke Equipment. This includes instruction in nomenclature, functioning, methods of firing, smoke-producing capabilities, and limitations of smoke pots and grenades; and familiar-

ization with smoke-producing methods of other arms and components of the Armed Forces, including artillery and mortar smoke shell, smoke from aircraft, and Navy smoke-generating methods.

CHAPTER 4
TECHNIQUES OF SMOKE OPERATIONS

Section I. EQUIPMENT AND MUNITIONS

27. General

Chemical smoke generator units operate with the equipment authorized in the current TOE's. The equipment issued is governed by availability and is limited to actual need. Additional equipment may be obtained if units are separated or are detached on special missions.

a. Weapons. Organizational weapons include 7.62-mm selective automatic semiautomatic rifles; 7.62-mm machine guns; caliber .50 machine guns; caliber .45 submachineguns; and 3.5-inch rocket launchers for defense against air, ground, and mechanized attack.

b. Vehicles. Authorized vehicles provide complete mobility and include 2½-ton cargo trucks, ¾-ton cargo trucks, ¼-ton utility trucks, and trailers. Each company is provided water trailers.

c. Communications. Adequate communications equipment is provided for installation of necessary organic radio and telephone nets for communication with higher headquarters and for entry into the communications system of supported units. Additional communications equipment may be authorized for special missions.

d. Tools and Repair Parts. Chemical smoke generator units are authorized tools in accordance with current TOE's and repair parts in accordance with the Department of the Army supply manuals for maintenance of equipment.

28. Mechanical Smoke Generators

The mechanical smoke generator is a device that vaporizes fog oil and releases it to condense in the air as a white smoke useful for large-area screening.

a. The M3-Type. Detailed data pertaining to the standard M3-type mechanical smoke generators, together with operating and maintenance instructions, are given in TM 3–431 and TM 3–390. The M3-type mechanical smoke generator (fig. 3) is a pulse-jet engine that has only one moving part—a 16-petal engine valve. The engine uses approximately 3 to 5 gallons of gasoline per hour. Smoke is produced when fog oil is injected into the engine tube while the engine is in operation. Fog oil is atomized by the hot combustion gases that move past the fog oil injection nozzle at high velocity. The generator vaporizes 25 to 40 gallons of fog oil per hour. The generator may be operated on the ground, from a truck or boat, or on any other reasonably level base. Because of its simple construction, this generator may be operated continuously for extended periods with normal required maintenance.

b. The M2-Type. Detailed data pertaining to the limited standard M2-type mechanical smoke generator are given in TM 3–381. The M2-type

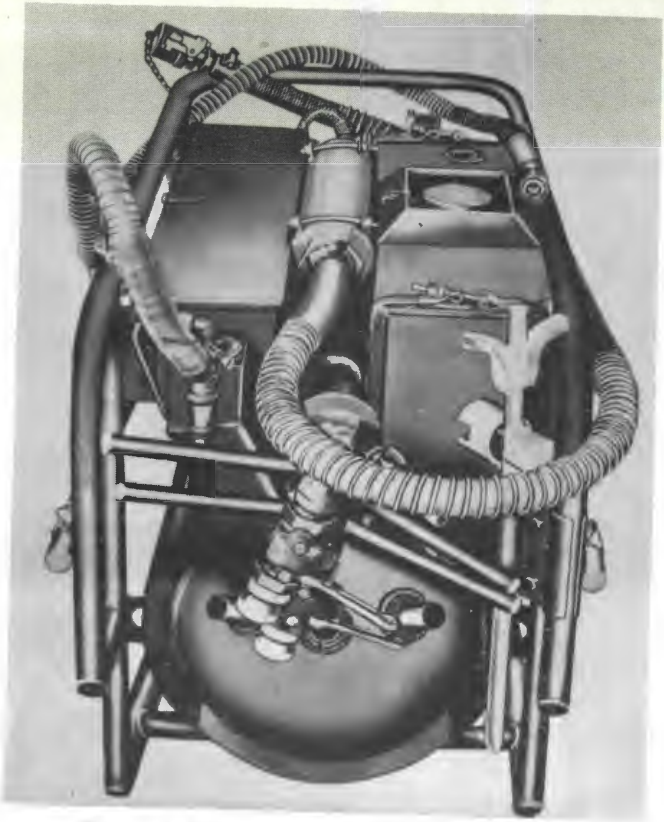

Figure 3. M3-type mechanical smoke generator.

mechanical smoke generator (fig. 4) is a device that consists of a power group, a heating group, and a smoke fuel group. Operation of this generator requires the use of four liquids—gasoline, engine oil, water, and fog oil. The gasoline is used to fuel the engine and the burner, the engine oil is used to lubricate the engine, and the water and

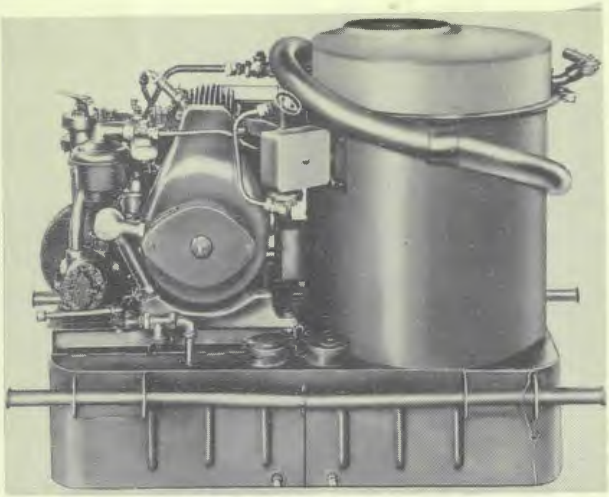

Figure 4. M2-type mechanical smoke generator.

fog oil are used to produce the smoke. The generator functions by forcing a mixture of fog oil and water through coils in the combustion chamber where the two liquids are vaporized. The generator vaporizes about 50 gallons of fog oil per hour. It requires careful and regular maintenance and periodic replacement of parts.

29. Smoke Pots

There are two basic types of smoke pots—those which contain HC as the smoke-producing agent and those which vaporize fog oil. The M5 30-pound smoke pot is an HC munition for use on land only; the M4A2 type is an HC munition for use in water. The AN–M7 SGF 2 floating smoke pot is an oil-filled munition that is suitable for use either on land or in water. Both types of

Figure 5. Floating smoke pot.

smoke pots are described in detail in TM 3–300. Figure 5 illustrates a type of floating smoke pot.

Section II. EFFECTS OF WEATHER AND TERRAIN

30. General

The effects of weather, particularly wind speed and wind direction, and terrain are important factors to be considered in smoke operations. Since a smoke screen must be continuous to be effective, those factors which tend to create gaps in the screen need to be evaluated carefully in setting up a smoke operation. The predicted weather for the area of operations is obtained periodically from the intelligence section of the supported unit. Local current weather data are obtained by the meteorological personnel of the smoke unit. The success of a smoke mission de-

pends greatly on correct interpretation of meteorological data, observation of the screen in relation to the terrain while the smoke-producing equipment is in operation, the subsequent estimate of the behavior of the smoke, and the ability of the smoke unit to maneuver the equipment into new positions as required. See TM 3–240 for additional data on the effects of weather on smoke clouds.

31. Effects of Wind

The movement of smoke depends upon the speed and direction of the wind. Wind direction and velocity are important factors in estimating the amount of smoke-producing equipment needed and the requirements for munitions and fog oil for a smoke operation. To provide an effective smoke screen over the vital area, the smoke control officer must be able to predict the speed and direction of the wind.

a. Wind Speed. The prevailing wind speed is an important factor in determining how far the smoke-producing equipment should be placed from the vital area. Wind speeds ranging from 5 to 12 miles per hour are ideal for the production of smoke screens. At other wind speeds, difficulties are encountered and more equipment may be necessary to establish and maintain an effective smoke screen.

b. Wind Direction. The direction of the wind determines the location of the smoke line to cover the vital area effectively. Requirements for smoke pots and fog oil are greater with quartering

winds than they are with flanking winds and are greatest with following winds.

32. Effects of Temperature Gradient

An estimate of temperature gradient conditions is used to predict the stability of the air. Temperature gradients are measured by subtracting the air temperature 1 foot above the ground surface from the air temperature 6 feet above the ground surface. With logistical limitations, smoke can be produced under any temperature gradient condition (fig. 6). The temperature gradient conditions are expressed as follows:

a. Lapse. A lapse condition exists when there is a decrease in temperature with an increase in height above the ground. The air is unstable with much air turbulence. During lapse conditions, smoke tends to rise and diffuse rapidly. Lapse conditions are favorable for the production of smoke curtains.

b. Inversion. An inversion condition exists when there is an increase in temperature with an increase in height above the ground. During inversion conditions, smoke spreads and diffuses slowly. Inversion conditions are favorable for the production of a smoke haze or a smoke blanket screen.

c. Neutral. During neutral conditions, the characteristics of the smoke screen vary between those of lapse and inversion conditions. A neutral condition tending toward lapse is good for the production of smoke curtains. When neutral condi-

Figure 6. Effect of temperature gradient conditions on smoke

tions tend toward inversion, a smoke haze or a smoke blanket screen may be produced.

33. Effects of Humidity and Precipitation

Humidity only slightly affects smoke screens generated by smoke generators. In high humidity HC smoke pots generate more effective smoke screens and produce denser concentrations than in low humidity. Light rains decrease visibility; therefore, less smoke is needed for concealment. Heavy rains and snow so reduce visibility that the use of smoke is rarely necessary to provide concealment.

34. Effects of Temperature

Temperature has no significant effect on smoke screens generated by HC smoke pots. At temperatures above 80° F., smoke screens generated by mechanical smoke generators are dissipated more rapidly than they are at lower temperatures. At temperatures below 25° F., condensation and subsequent freezing of the condensate will reduce or stop the flow of oil and will also cause loss of pressure. Clearing of fuel and pressure lines becomes necessary for continued operation.

35. Effects of Cloud Cover

When the sky is covered with clouds, the atmosphere is moderately stable and conditions are generally favorable for producing smoke. (An extensive smoke cloud may serve as a cloud cover to retain neutral conditions under itself.) On the other hand, as the amount of cloud cover decreases during the day, lapse conditions develop; as the

amount of cloud cover decreases during the night, inversion conditions develop.

36. Effects of Terrain

Terrain affects cloud travel. Since smoke is carried by the wind, it normally follows the contours of the earth's surface. On flat, unbroken terrain and over water, smoke streamers take longer to spread out and mix with other streamers. On the other hand, minimum obstructions on the earth's surface (such as trees and small buildings) tend to break up smoke streamers, causing them to re-form and cover a larger area and to create a more uniform screen. Large hill masses and very rugged terrain, however, cause strong cross currents which disperse smoke excessively and create holes and unevenness in the smoke screen.

Section III. EMPLOYMENT OF SMOKE GENERATORS AND SMOKE POTS

37. General

In friendly territory, smoke screens are normally produced by mechanical smoke generators supplemented by smoke pots. These generators and pots are emplaced around the area to be screened, which is usually called the vital area. They are positioned so as to give 360° coverage of the vital area. Communications are established so as to enable the generators to be maneuvered quickly into new positions to correct deficiencies in the smoke screen. A smoke generator unit can

produce three types of smoke screens: smoke blanket, smoke haze, and smoke curtain (fig. 7).

38. Smoke Blanket

Smoke blankets are used over friendly areas to hinder enemy aerial observation and visual precision bombing. Smoke blankets are formed by

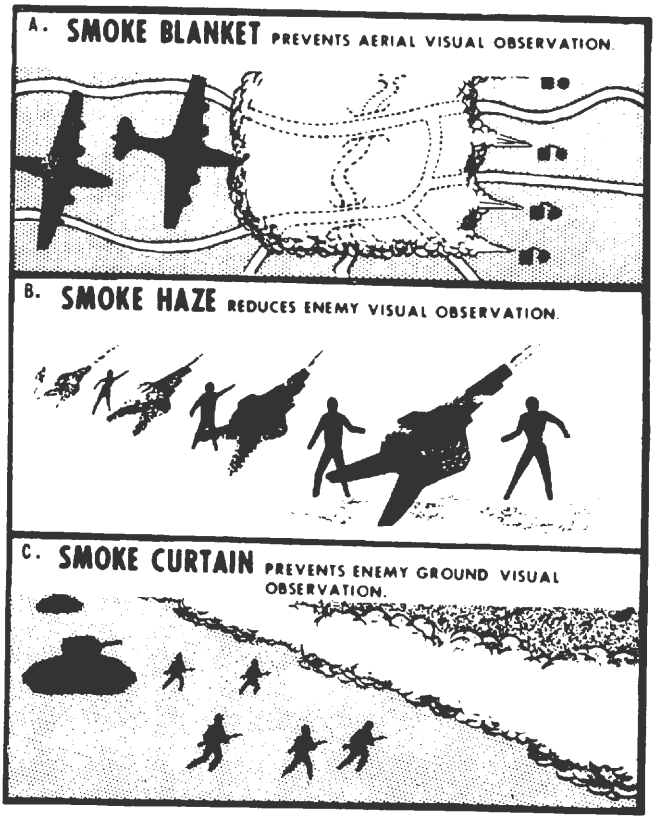

Figure 7. Types of smoke screens.

the gradual merging of individual smoke streamers downwind from the smoke line. The four phases of the formation of a smoke blanket are as follows (fig. 8) :

a. Individual Streamer Phase. For a certain distance downwind of the smoke line, the smoke from generators or pots travels as individual streamers. Each streamer eventually merges with other streamers. The distance traveled by the smoke before it merges depends on the speed of the wind, air stability, the relationship of the smoke line (line of generators) to the direction of the wind, and the distance between generators along the smoke line. Under average weather conditions, the spread of an individual streamer is approximately 20 percent of the distance traveled.

b. Build-Up Phase. When the smoke from the individual streamers begins to merge, the smoke blanket begins to build up in uniformity but does not take its final form immediately. For a distance downwind from the line of merging, the smoke shows a general unevenness of mixture.

c. Uniform Phase. The end of the build-up phase is characterized by a uniformly obscuring screen. The extent of the screen is determined by the quantity of smoke produced by each generator in a time frame with relation to the other generators, by the distance between generators, and by meteorological conditions. Smoke clouds produced by mechanical generators may extend 1 to 4 miles, and even farther under the most favorable meteorological conditions; smoke from pots is seldom effective for more than 300 to 500 yards.

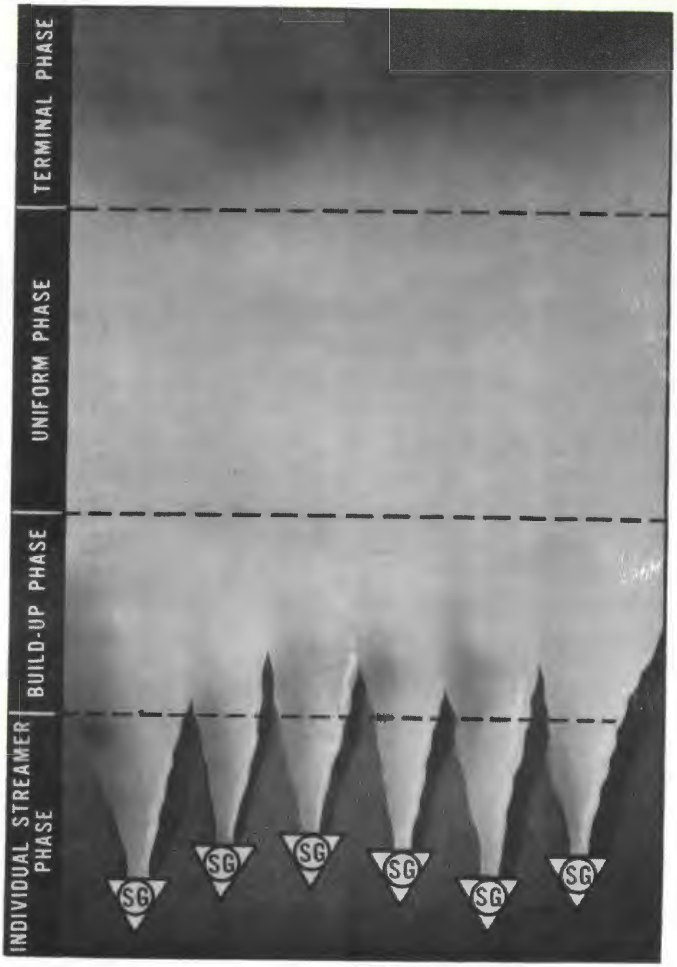

Figure 8. Formation of a smoke blanket.

d. Terminal Phase. As the smoke cloud moves downwind, it thins because of diffusion and settling out of the larger particles. The terminal phase is reached when no effective screening is obtained.

39. Smoke Haze

Smoke hazes are used mainly in the battle area to conceal friendly activities from observation and ground observed fire. They are formed in much the same manner as smoke blankets are formed. Since a haze is usually less uniformly dense than a blanket is, the positions of the generators in the smoke line are regulated to produce the quantity of smoke desired. Sometimes the generators are spaced farther apart, or more distant from the area smoked; usually they are placed in an irregular pattern. Generators may be placed so as to increase the density of smoke around installations that need more protection. The field behavior of a smoke haze (fig. 9) is essentially the same as that of a smoke blanket.

40. Smoke Curtain

Smoke curtains are used mainly in the forward edge of the battle area to blind or restrict enemy ground observation of friendly positions and activities. A smoke curtain is a dense vertical development of smoke rather than a horizontal blanket spread out over an area. It does not prevent enemy aerial observation, since it is placed between enemy positions and friendly positions. Smoke curtains may also be produced by artillery weapons.

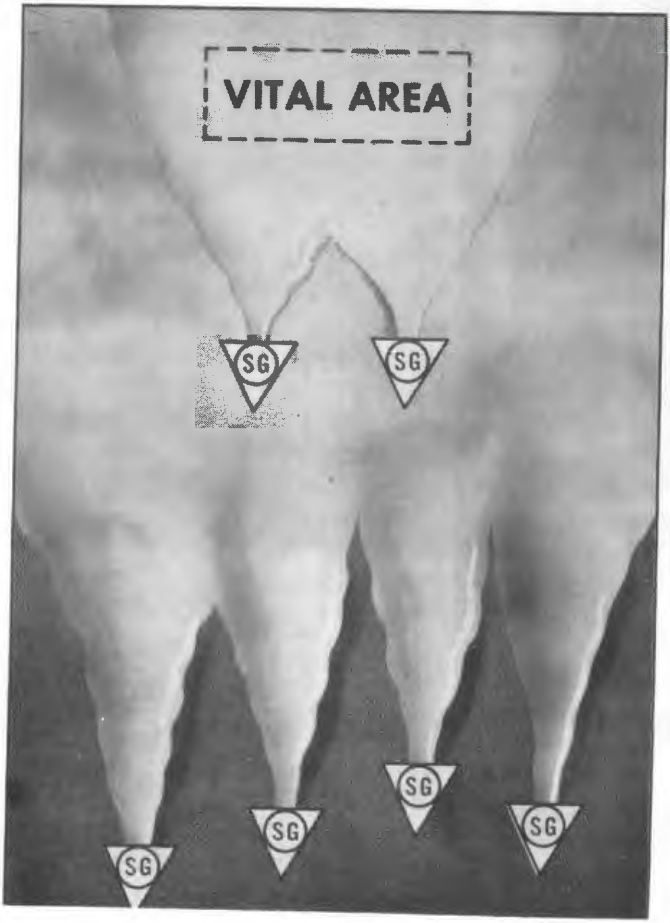

Figure 9. Formation of a smoke haze.

41. Selection of Smoke Positions

To provide an effective coverage of a designated area, generator positions must be selected to provide 360° coverage. The positions are selected after planning and reconnaissance have taken place (pars. 44–58). To obtain the most thorough coverage, two smoke generator lines may be set up as an inner and an outer ring around the area to be screened (fig. 10). The smoke line is a hypothetical line on the ground along which smoke generator positions and smoke pot positions are located. Because of variations in terrain configurations, the smoke line is not necessarily straight or uniformly curved around the vital area. The purpose of the inner ring is to provide a quick-cover screen for the vital area. Smoke pots are usually used for the inner ring because they can be ignited electrically and can establish a screen quicker than generators can. Generators are used in the outer ring and may also be used in the inner ring if time permits. Both rings are used when it is necessary to provide the most complete coverage in the shortest possible time. See table I for information on spacing of smoke generators and table II for information on spacing of smoke pots.

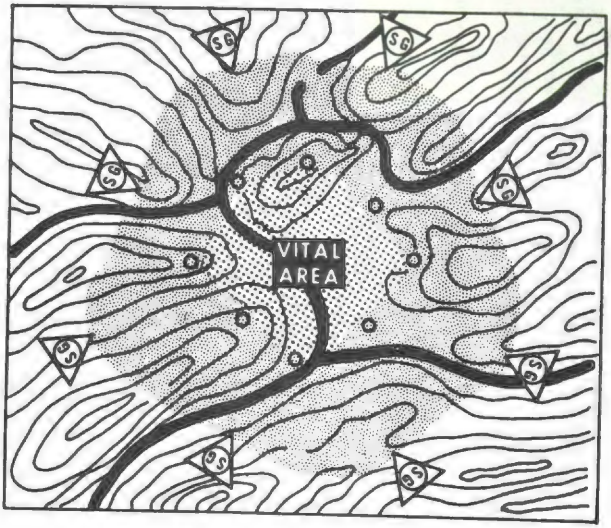

Figure 10. Designation of smoke positions.

Table I. Spacing Guide for Mechanical Smoke Generators

Type of Terrain	Generator spacing (in meters) at wind speeds of: [1] [2] [3]					
	1–8 mph [4]		9–15 mph		16–20 mph	
	M2-series [5]	M3-series	M2-series [5]	M3-series	M2-series [5]	M3-series
UNDER LAPSE CONDITIONS [6]						
Over Water	54	36	54	27	36	18
Open Terrain	81	45	54	36	36	27
Woods	108	63	81	54	54	45
UNDER INVERSION AND NEUTRAL CONDITIONS [6]						
Over water	54	45	54	36	36	27
Open terrain	108	54	81	45	54	36
Woods	108	72	81	63	54	54

[1] Spacings given are for a line of generators normal (perpendicular) to the wind direction.

[2] The distance between the near edge of the target and the smoke generator line should be at least nine times the spacing between generators.

[3] Spacings given are for producing smoke blankets. For establishing smoke hazes, spacings twice those indicated in the table can be used, and generators should be placed farther from the target. To protect against aerial photographic reconnaissance from directly overhead, reduce the spacings by about one-third and place the generators closer to the target.

[4] When wind speed is very low, water-based generators may have to be worked back and forth along the line.

[5] Limited standard—C.

[6] See paragraph 32 for explanation of temperature gradient conditions.

Table II. Spacing Guide for Smoke Pots

Type of terrain	Smoke pot spacing (in meters) at wind speeds of: [1] [2] [3]								
	1–8 mph			9–15 mph			16–20 mph		
	AN–M7 SGF2 floating smoke pots	M4A2 HC floating smoke pots [4]	M5 HC smoke pots	AN–M7 SGF2 floating smoke pots	M4A2 HC floating smoke pots [4]	M5 HC smoke pots	AN–M7 SGF2 floating smoke pots	M4A2 HC floating smoke pots [4]	M5 HC smoke pots
UNDER LAPSE CONDITIONS [5]									
Over water	23			18			14		
Open terrain	27			18			14		
Woods	32			27			18		
UNDER INVERSION AND NEUTRAL CONDITIONS [5]									
Over Water	27			18			14		
Open Terrain	27			18			14		
Woods	36			27			18		

[1] Spacings given are for a line of smoke pots normal (perpendicular) to the wind direction.

[2] The distance between the near edge of the target and the smoke pots should be at least nine times the spacing between smoke pots.

[3] Spacings given are for producing smoke blankets. For establishing smoke hazes, spacings twice those indicated in the table can be used, and smoke pots should be placed farther from the target. To protect against aerial photographic reconnaissance from directly overhead, reduce the spacings by from one-third to one-half and place the smoke pots closer to the target.

[4] Standard—B.

[5] See paragraph 32 for explanation of temperature gradient conditions.

42. Emplacement and Operation of Generators

Generators may be emplaced on land or on boats. Refer to the appropriate technical manual for operating instructions.

a. On Land. Generators are dug in whenever possible; they may be located in structures. The emplacement for a generator (fig. 11) should be no larger than necessary to hold the generator, oil drum, and gasoline supply and to allow the operator room to perform maintenance when required. Revetments should be constructed around the position if the soil is loose or if high blast pressure resistance is desirable. No part of the equipment should extend above the surface of the ground. If time permits, the generator should be emplaced deep enough to allow overhead cover strong enough to stop shell fragments. The cover should not extend above the surface of the ground. Holes for venting smoke and engine exhaust must

Figure 11. Emplacement for smoke generator.

be provided. Smoke pots are emplaced upwind to screen generator positions. In extended operations, alternate positions are prepared for each generator.

b. On Boats. Generators on boats can be concealed behind a smoke screen made by floating smoke pots dropped by fast-moving boats.

43. Emplacement and Operation of Smoke Pots

Smoke pot emplacements should be dug in whenever possible, and the pots should be burned in an inverted position to conceal their glare. Bricks, or similar material, should be put in the bottom of the emplacement so that the smoke pots can burn freely. If smoke pots are not dug in, it may be necessary to use flame shields around individual pots to hide their glare from the enemy. Flame shields can be improvised from scrap iron or pottery or from oil drums with the ends removed. When a screen of long duration is de-

Figure 12. Long-burning chain of smoke pots.

sired, pots can be placed end to end in a trench, or they can be stacked. The heat from one pot ignites the adjoining pot, thus providing a long-burning chain (fig. 12). Smoke pots can also be ignited by remote control electrical firing. The electrical wiring should be dug into the ground to protect it from shell fragments and other hazards. See TM 3–300 for operating instructions.

CHAPTER 5
FIELD OPERATIONS

Section I. PLANNING

44. Responsibilities of Supported Unit Commander

The commander of the unit being supported by the chemical smoke generator unit is responsible for the overall operation. He assigns and defines the smoke mission. He is responsible for coordinating the smoke operation with all units participating in or affected by the operation. He indicates the nature of the smoke plan to be prepared by the smoke unit commander and the time and place it is to be submitted for approval. He is responsible for initiating the smoke operations by MAKE SMOKE commands and for stopping the smoke operations by STOP SMOKE commands. The supported unit commander may delegate *operational control* of smoke units to any of his staff officers or subordinate commanders. If there is a chemical group in the field army, control of the smoke units is exercised by the chemical group commander. If there is no chemical group in the field army, control of the smoke units is exercised by the army chemical officer. Operational control of smoke units *attached* to corps and divisions is normally exercised by the staff chemical officer.

45. Responsibilities of Staff Chemical Officer

The staff chemical officer of the supported unit is responsible for technical supervision of smoke operations and for operational control of the smoke unit if it is attached to the supported unit. He keeps the supported unit commander informed of the capabilities of smoke and of logistical and operational requirements for smoke missions. He makes recommendations for the employment of smoke units. For supported units that do not have a staff chemical officer, the smoke unit commander is responsible for technical supervision and furnishes necessary information to the supported unit commander.

46. Responsibilities of Smoke Unit Commander

The smoke unit commander is responsible for all activities pertaining to establishing and maintaining the smoke screen. He makes a reconnaissance of the designated area (pars. 52–58) and prepares a smoke plan, usually an overlay of the area showing the locations of the generator positions (fig. 10). This plan is submitted to the supported unit commander for approval. An important factor to be considered in preparing a plan for screening a vital area is the time available in which to establish the smoke screen. In some forward area situations, the smoke screen must be established before daylight and must continue all day until night.

a. The following factors could affect the plan for screening a vital installation:

(1) The vulnerability of the vital area to

enemy observation, mortar, artillery, or rocket fire or air attack.

(2) The efficiency of the friendly air-raid warning system.

(3) The weather and terrain conditions.

b. A smoke plan covers the following:

(1) Selection and designation of the smoke lines.

(2) Supply and maintenance of the smoke installations.

(3) Control of smoke operations.

(4) Communications

(5) Security.

(6) Intelligence (meteorological data).

(7) Liaison.

(8) Road nets.

47. Planning Considerations

Planning for smoke missions will normally begin with the staff chemical officer of the supported unit. At levels of command where the staff chemical officer is not available, planning will begin with the smoke unit commander assigned to support the unit. Normally, planning is accomplished in three phases: the staff chemical officer makes a preliminary plan; the staff chemical officer and the smoke unit commander make a general plan; and the smoke unit commander and his subordinate leaders prepare a detailed plan (app. III). The smoke unit commander forwards this plan to the staff chemical officer for approval; the staff

chemical officer forwards this plan to the supported unit commander or G3 for final approval. To meet his requirements, the smoke unit commander obtains the following information from the supported unit commander: the type of smoke mission, location of the area to be screened, time to make smoke, duration of the smoke operation, and immediate support available to the smoke unit. Based on this information, the smoke unit commander plans a map, a ground, and, if possible, an air reconnaissance and initiates action to obtain and evaluate other necessary information that will affect the accomplishment of his mission. This additional information pertains to weather, terrain, supply, operational requirements, and effects of enemy action. The smoke unit commander must also plan the establishment of liaison, communications, and medical aid.

48. Planning Supply and Operational Requirements

During the planning phase, the smoke unit commander determines his requirements for supplies, equipment, and personnel to insure effectiveness of his unit during operations.

a. Supply Requirements. In planning his supply requirements, the commander must consider that the operation may last for the maximum time and that the most unfavorable weather may prevail. He must determine what type and how many smoke generators and vehicles will be required to accomplish his mission. In prolonged operations, some of the equipment may be forced out of action by normal wear and tear and by enemy ac-

tion. If this equipment cannot be repaired by the unit mechanics, it must be exchanged at the supply depots. Plans must be made for the resupply of this equipment to insure continuous smoke operations. The exchange and resupply of equipment should be closely coordinated with the staff chemical officer of the responsible command.

b. Operational Requirements. In developing his plan, the smoke unit commander determines his operational requirements that can be furnished by the supported unit. Such support may include additional or special communications equipment; transportation; control of the units supporting the smoke operations; special equipment, such as boats, barges, and fixed or rotary wing aircraft for observation of the smoke screen; medical support; periodic weather information; intelligence of enemy activities; and bivouac and forward assembly areas.

49. Planning for Liaison

The smoke unit commander plans for early liaison with the supported unit and with the unit staff chemical officer to discuss problems in connection with the operation The staff chemical officer of the supported unit is the adviser to the smoke unit commander and can furnish valuable assistance in technical, tactical, and administrative problems. The smoke unit commander is a source of information for the staff chemical officer. Whenever possible the smoke unit commander makes personal contact with the supported, supporting, and adjacent units. Liaison

with other chemical units in the general area may also be helpful.

50. Planning for Communications

In planning communications for a smoke operation, the smoke unit commander coordinates with the staff chemical officer of the responsible command or with the communications officer of the supported unit to determine what plans exist for his unit's communications and to insure that they are adequate. The smoke unit must depend on the supported unit for communications assistance and enters the communications system of the supported unit at the nearest area communications center. The smoke unit commander obtains items of current signal operation instructions and standing signal instructions that apply to his unit for each operation. These instructions are obtained as early as possible to permit necessary changing of radio frequencies and familiarization with radio call signs and telephone directory names of units. As soon as he is informed of his mission, the smoke unit commander makes, or causes to be made, a map reconnaissance and a tentative communications plan to include location of switchboards and radio and radio relay positions. His ground reconnaissance includes communications reconnaissance. With the assistance of his communications personnel, the smoke unit commander prepares a plan for signal communications. This information is included in paragraph 5 of the unit operation order.

51. Planning Medical Support

The smoke unit commander makes arangements for medical support from the supported unit or from the unit exercising administrative control. He also considers evacuation of his casualties. When the tactical situation permits, arrangements should be made to speed up evacuation of casualties by the use of ambulances to conserve the use of litter bearers. For large-scale operations involving the smoke battalion, the battalion commander may request a medical aid station for the support of his unit.

Section II. RECONNAISSANCE AND SELECTION OF POSITIONS

52. Planning the Reconnaissance

In order to complete his estimate of the situation, the smoke unit commander seeks information concerning the terrain, weather, and friendly and enemy troops, which can affect the accomplishment of his mission. Some of this information can be obtained from higher or supported units, from map reconnaissance, and from his unit's air and ground reconnaissance. Whenever possible a ground reconnaissance of the area of operations is conducted. The smoke unit commander plans his reconnaissance to make careful use of time so as to allow his subordinate commanders the maximum time for preparation of their plans after the issuance of his orders. In planning his reconnaissance, the commander makes a map reconnaissance to select the routes that will give

full area coverage without requiring him to retrace his path.

a. Mission. The smoke unit commander determines missions for his reconnaissance and decides how to employ his staff to assist him. Some situations may require the assignment of special reconnaissance responsibilities and the utilization of more than one reconnaissance party to accomplish the required results.

b. Reconnaissance Party. The commander includes those personnel he desires in his reconnaissance party. Normally, this includes the operations officer, security personnel, and messengers. It often includes representatives from the supported unit. When pressed for time, the battalion commander may request his company commanders to accompany him on all or part of his personal reconnaissance. The size of the reconnaissance party may be limited because of factors such as restrictions placed on movement.

53. Reconnaissance Objectives

The reconnaissance conducted, or directed, by the smoke unit commander provides him with the information required for the formulation of his smoke plan. Therefore, the reconnaissance is as complete as the time and the situation allow. After completing his reconnaissance, the commander utilizes information from all sources and completes his estimate of the situation and his smoke plan. The objectives of reconnaissance are to—

a. Locate Vital Area. The vital area is located to determine the extent of the smoke screen required.

b. Determine Subordinate Unit Positions. Based on the vital area and existing terrain and weather conditions, the smoke unit commander selects and designates areas of responsibility for subordinate units (par. 54).

c. Select and Designate Smoke Lines. Based on spacing requirements for generators, the smoke commander designates the general location and length of the smoke lines; the smoke lines may be inner and outer rings around the area to be screened (par. 41).

d. Locate Communications Positions. The nearest area communications center of the supported unit is located for entry into the communications system. Suitable sites are selected for radio installations (par. 55).

e. Locate Control Points. Sites are selected for smoke control points, observation posts, and weather stations (pars. 56 and 57).

f. Locate and Designate Supply Routes and Access Areas. Routes and access areas are selected and designated for supply of smoke generator positions.

g. Determine Local Weather Peculiarities. The area is studied to determine local weather peculiarities, such as unusual wind currents, lengthy neutral and inversion conditions, and tendency of the air to stabilize in layers, and other conditions

that may have a significant effect on the positioning of smoke generators.

h. Determine Security and Defense Requirements. The vulnerability of the area to enemy action is studied to assist in the development of defense plans. The terrain is studied for positions that offer good cover and concealment (par. 58).

54. Subordinate Unit Positions

The vital area is divided into appropriate sectors to provide for area coverage regardless of changes in the direction of the wind. Subordinate units may be assigned to cover each sector around the vital area, or they may be assigned to cover those sectors perpendicular to the direction of the prevailing wind. Some units may be designated as a reserve.

a. Overlay Diagram. An overlay diagram (fig. 13) of the vital area and the sector divisions is prepared and issued to subordinate units. The number of sectors varies with the number of subordinate units and the extent of the area to be covered.

b. Movement of Subordinate Units From Sector to Sector. If the direction of the wind shifts and a subordinate unit is directed to move to cover a new sector, the overlay diagram is used to designate new positions. For example, during deployment of the platoons of a smoke company, the direction of the prevailing wind is used as the dividing line of platoon areas of responsibility.

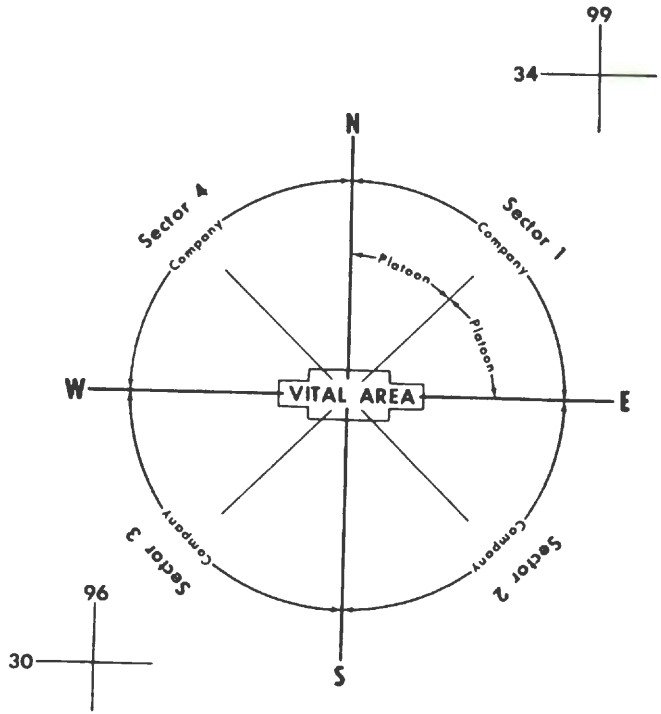

Figure 13. Example overlay showing designation of sector assignments.

55. Communications

The communications net control station is located at the smoke control point (the smoke unit's command post). Reconnaissance is required to select wire routes, switchboard locations, and locations for radio sets. A line route map is prepared by the communications officer or communications chief to speed installation of wire nets.

Radio sets should be located in positions that will afford protection from direct enemy fires and will provide a relatively unobstructed path in the directions of transmission. When terrain features prevent the selection of optimum locations, it must be borne in mind that effective communications receive priority consideration in selection of locations. The smoke unit's communications net should link the following:

a. Smoke generator positions with the unit control point.

b. Smoke unit control point with the area communications system of the supported unit.

c. Smoke generator unit with the nearest Air Weather Service unit (through the area communications system).

d. Smoke control point with the unit meteorological section.

e. The unit control point with the warning system net of the supported unit.

56. Control Sites

Sites are selected for the unit command post, bivouac area, supply point, and observation posts. Cover and concealment are important considerations in selection of these sites, but these considerations should not interfere with the accomplishment of the unit's mission. A site that is near definite landmarks shown on maps should be avoided.

57. Weather Stations

Weather stations are established by the smoke

companies in the best possible positions for obtaining wind direction and speed. Usually the most dominant position in the area—a hill or the top of a tall building—is the most suitable for the installation of meteorological equipment. Local weather data are obtained and recorded periodically as required by the smoke control officer—usually every half hour. If the smoke operation is under control of the battalion, weather data are also submitted to the battalion meteorological section. Refer to TM 3–240 for information on measurement of wind and other meteorological conditions.

58. Security and Defense

During his reconnaissance, the smoke unit commander considers the possibilities of organization for the defense of the smoke line. Defiladed and wooded areas offer good cover and concealment. The location of such areas should be noted as possible generator sites, and the information should be passed on to subordinate commanders for their use. The location of friendly forces and installations in the area should be noted for possible assistance in mutual defense planning.

Section III. MOVEMENT INTO AND OCCUPATION OF POSITIONS

59. Tactical Movements

Tactical movements are made under combat conditions within an active theater of operations when early enemy action is possible by ground forces or by air forces. Tactical movements may

be made on ground, in air, or on water. During ground movements in the combat zone, the smoke unit must be prepared for enemy air or ground action, including attacks utilizing mass destruction and mass casualty weapons. Many of the techniques used in administrative movements (par. 108), modified to meet security requirements, apply to tactical movements. In tactical movements, accomplishment of the mission is of primary importance. The possibility of enemy air or ground attack may affect the commander's decision to complete the movement of his unit with maximum speed and minimum fatigue. Tactical movements are generally accomplished by—

a. Infiltration. Infiltration is accomplished by the dispatch of individual vehicles or small groups of vehicles over a specified route at irregular intervals to give the appearance of casual traffic. This type movement is used to provide maximum security, deception, and dispersion as a means of passive defense against enemy observation and attack. It is therefore well suited to daylight marches. In order to prevent individual vehicles from getting lost, each driver is informed of the route. In addition, it may be necessary to mark the route.

b. Open Column. Open column is particularly applicable for daylight moves and for moving on routes when a moderate volume of higher or lower speed traffic may have to enter the column. In an open column, elements of the march unit are widely spaced to provide a means of passive

defense and to minimize the effects of dusty road conditions.

c. Closed Column. In a closed column, the vehicles follow at the minimum distance which safety, traffic conditions, and the tactical situation permit. The closed column does not provide dispersion for passive defense against enemy observation and attack. Closed column is employed when the road net must be utilized to the maximum capacity and is also employed for night moves under blackout conditions.

60. Security and Control During Movement

When the smoke unit cannot enter (or withdraw) from an operational area because of the enemy situation, protection escort may be requested from the supported unit.

a. Organic Security. During movement to new positions, it may be necessary for the smoke unit commander to send out security detachments to the front, flanks, and rear of the column. Security detachments operate sufficiently to the front and rear to prevent an enemy from ambushing or surprising the column. Within the column, one individual per vehicle is appointed as an air guard and one as a ground guard. Alerts of an approaching enemy attack must be spread immediately throughout the column, and the convoy commander must be informed as quickly as possible. Alert procedures and formations for combat should be covered in the unit SOP.

b. Control. Road clearance is coordinated and obtained by the smoke unit commander through

the unit to which it is assigned or attached. Positive control of the entire unit during movement into the operational area depends upon sound planning and adequate communication. All of the unit's communication facilities allowed by security requirements are utilized to assist in maintaining control.

61. Assembly Areas

The assembly area is in an area in which elements of a smoke unit assemble and prepare for further tactical action.

a. Selection of Assembly Area. The following factors should be considered in selection of an assembly area:

(1) Cover and concealment from hostile air and ground observation.

(2) Sufficient space for dispersal of unit personnel and equipment.

(3) Suitable routes of entrance and exit.

(4) Turn around and firm well drained ground suitable for parking vehicles.

(5) Natural obstacles for protection against enemy armor.

(6) Location as close to the current positions as the terrain and enemy activity permit.

b. Security. The smoke unit commander coordinates security measures to insure that his command is not surprised by enemy patrols or infiltrators. Air defense security measures are taken, and antitank weapons are positioned to provide protection against surprise armored attacks.

c. Preparation for Mission. In the assembly area, final preparation for the mission is completed to the fullest possible extent. While the smoke unit is in the assembly area, reconnaissance is completed, plans are formulated, and orders are issued.

62. Night Movements

Night motor movements may consist of tactical motor marches and resupply activities during sustained combat operations. Night movements have definite advantages over day movements, because they provide concealment from enemy observation and provide security from air attacks. Night movements generally are organized and conducted in the same manner as daylight movements are organized and conducted. However, lack of visibility creates special problems in maintaining control; this requires careful preparation and special measures that vary according to the degree of visibility. Special measures include reduced distances between elements, reduced speed, careful prior reconnaissance of routes and the area to be occupied, knowledge of prominent landmarks, use of guides, and route markers. The smoke unit commander is responsible for maintaining control, direction, and communications within the column.

63. Combat Load

The current basic load for the chemical smoke generator company is given in table III. This may vary from theater to theater. A loading plan, which may be used as a guide, is given in appendix VII.

Table III. Basic Load for the Chemical Smoke Generator Company

Weapon		Ammunition			
Type	No. per co.	Unit	Units per weapon	Total	
				Units	Pounds
Generator smoke, mechanical, M3-series or M2-series	48	55-gal. drums fog oil	4	192	87,520
		5-gal. cans (80 octane gas)	4	192	8,064
		5-gal. cans (water)*	4	192	9,600
Gun, machine, cal. .50, Browning, M2, heavy barrel	2	Rounds (API and TR, 4 to 1, MLB)	530	1,060	41
Gun, submachine, cal. .45, M3A1	15	Rounds (Ball)	90	1,350	77
Gun, machine, 7.62-mm, light weight, general purpose	4	Rounds (API and TR, 4 to 1, MLB)	2,000	8,000	544
Launcher, rocket, 3.5-inch, M20	4	Rocket (90% HEAT and 10% WP)	6	22 HEAT 2 WP	425

Rifle, 7.62-mm selective auto, semiautomatic, heavy barrel	5	Rounds (80% API and 20% TR)	500	2,000 API 500 TR	179
Rifle, 7.62-mm, selective auto, semiautomatic, light barrel	122	Rounds (80% Ball, 10% TR, and 10% API)	96	9,370 Ball 1,171 TR 1,171 API	889

* 5-gallon cans of water are not required for the operation of the M3-series generator.

64. Movement Into and Occupation of Positions

Before a unit moves into and occupies a position, some preliminary work can be done to make the movement efficient. Key personnel and equipment can be moved first to prevent congestion. Work to be accomplished may include the following:

a. Preliminary Work at Site. It may be necessary to take security measures, such as posting guards to protect the site from sabotage or from other enemy action. If the site is in an area previously controlled by the enemy, it may be necessary to check for booby traps and for chemical, biological, or radiological contamination. Roads can be laid out and marked with signs. If the area is to be occupied at night, it may be desirable to post suitable visible signs as landmarks.

b. Movement Into Positions. A unit moving into action in a situation where time is important is normally contacted initially by messenger or coded radio and directed to move forward to a designated control point to arrive at a given time. Personnel from the commander's party should meet subordinate units at this point and should guide them to their respective positions. There should be no halt or delay at this control point.

c. Occupation of Positions. Immediately after arrival at positions, all elements of the smoke unit prepare for action. The smoke unit commander is notified as soon as subordinate units are ready to make smoke. The fuel section unloads fog oil at each generator position immediately after its oc-

cupation. All elements of the smoke unit continue to improve their positions until they receive a warning order to displace.

65. Deployment of Smoke Generator Company

The deployment of the smoke generator company is made in accordance with sector assignments based on the current weather information and on a firing diagram. The firing diagram for the smoke company (fig. 14) shows the vital area divided into eight sectors. The diagram is used primarily by the smoke control officer to indicate the direction of the wind and the area to be occupied by the operating platoons. During deployment of the operating platoons, the direction of the prevailing wind is used as the dividing line of platoon areas of responsibility. As the wind shifts, the smoke control officer determines the movement of the platoons according to the firing diagram.

66. Defense of Positions

The smoke unit defense plans, including measures to be taken in defense against enemy attack, are integrated with the defense plans of the supported unit. However, unexpected situations may require the smoke unit, or a subordinate element, to defend itself.

a. Active Defensive Measures. A guard system and the use of obstacles are included in the active defensive measures to prevent penetration of the smoke generator position by the enemy. Refer to FM's 3–5, 5–15, 7–20, and 20–32 for detailed information.

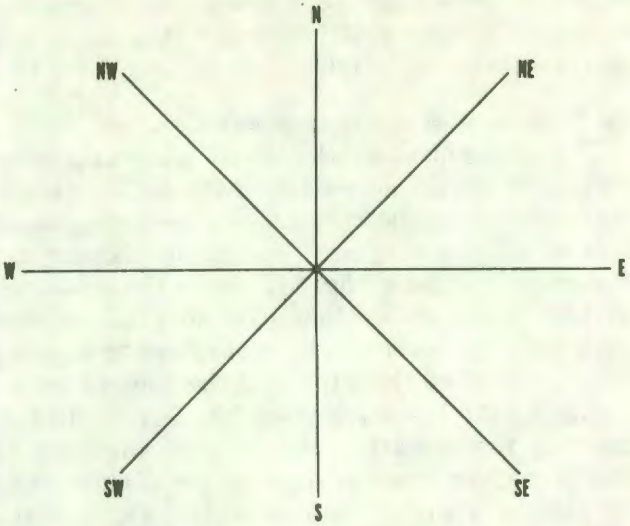

Figure 14. Firing diagram.

(1) Sentries may be stationed at outposts to cover road junctions and natural approaches to the smoke installation.

(2) Natural obstacles may be utilized and supplemented by artificial obstacles, such as barbed wire, traps, mines, and field expedients. Trip wires and the use of flame field expedients give warning of the approach of the enemy at night.

(3) When required by the tactical situation, a combat element of approximately one squad may be organized and trained to provide mobile security against guerilla and partisan attack.

b. Passive Defensive Measures. Deception, dispersion, concealment, and protection are the passive defensive measures that minimize the effects of an enemy attack. Information on the construction of foxholes and hasty field fortifications for individual protection is given in FM 21–75. The recommended fortification for the generator operator is the one-man foxhole. Such an emplacement will give the operator adequate protection against blast, prompt radiation, fallout, and conventional weapons effects and will provide him with relief from extended periods in the generator emplacement. This foxhole should be located close to the generator.

c. Defense Against CBR Attack. Refer to FM 21–40 for information on defense against CBR attack.

d. Destruction of Equipment. Tactical situations may arise in which it is impossible to evacuate equipment. All material that cannot be evacuated with the unit must be destroyed. Destruction of material is accomplished when directed by higher headquarters. Refer to the appropriate technical manuals for information on destruction of equipment.

Section IV. SMOKE OPERATIONS IN BATTLE AREA

67. General

The battle area is within range of enemy observed ground fire and is subject to tactical air attack. Based on current tactical doctrine, smoke screens can effectively interfere with enemy em-

ployment of observed ground-to-ground weapons and observed air-to-ground weapons. Current tactical doctrine calls for the use of highly mobile combat forces with massive supporting firepower and with the ability to disperse and mass rapidly for the attack. These forces seek to gain surprise and to preserve secrecy during maneuver by the use of cover, concealment, and deception. The mobile force commander uses smoke to conceal his unit's movements and to deceive the enemy of his intentions.

68. Types of Missions

Chemical smoke generator units are normally employed to conceal troops, operations, and installations and to deceive the enemy through the use of smoke.

a. Large-Area Smoke Screens. Large-area screens are normally employed to conceal—

(1) Road and bridge complexes along the main supply routes.

(2) Artillery positions (including gun flashes).

(3) Construction of battle positions.

(4) Supply and service installations.

(5) Troop and vehicular assembly areas.

(6) Troop movements (including attacks and withdrawals).

(7) River crossing sites and bridge construction.

b. Small-Area Smoke Screens. Small-area screens are used to conceal—

(1) Recovery of wounded personnel.
(2) Recovery of damaged equipment.
(3) Patrol activities (exit and entry through friendly lines).
(4) Assaults on strong points.
(5) Breaching of friendly or enemy minefields and barriers.
(6) Relief of combat units.
(7) Airstrips and helicopter pads.
(8) Areas of the main supply route subject to enemy ground observation.
(9) Road construction.
(10) Specific areas of the forward edge of the battle area.

c. Dummy Screens. Either large-area or small-area smoke screens may be used to provide deception. Screens are established over unoccupied areas in order to confuse the enemy regarding friendly positions and plans.

69. Types of Smoke Screens

The following types of smoke screens are most commonly employed in battle area operations by smoke generator units:

a. Smoke Haze. When it becomes necessary to place smoke on our own troops and installations, the smoke haze provides the necessary concealment. The haze has advantages over the blanket in that large friendly objects, such as trucks and tractors, are visible for distances up to 200 yards. Such visibility allows near normal operations to continue for friendly frontline units.

b. Smoke Curtain. The smoke curtain is employed when generator positions can be established between the edges of the battle area and when the wind direction allows screening parallel to the forward edge of the battle area with emplaced smoke. This type of smoke screen is desirable because it allows friendly operations, except observation and subsequent firing of weapons, to continue without being hampered by smoke.

70. Planning Operations in Battle Areas

Smoke operations in battle areas usually are performed for definite periods of time or for specific phases of tactical operations. When the front is moving rapidly, smoke installations are maintained for a few days or less; if the front is more stationary, these installations may be maintained for weeks. Smoke screening is continuous in battle areas as long as smoke screens are advantageous to tactical operations.

a. Unit SOP Plans. The smoke unit commander, following normal troop leading procedures, should have tentative plans of operations in his unit SOP. These plans provide his staff and subordinate commanders with a guideline for preliminary action so that they can begin designated tasks before the smoke unit movement order is issued.

b. Movement of Troops and Issuance of Orders. Early planning and early issuance of orders for the movement of troops facilitate the timely arrival of the troops at the designated location. The smoke unit commander plans where, when, and to

whom his order is to be issued. For the smoke generator company, this movement normally is controlled by the company fuel supply officer.

(1) The smoke unit commander designates the time when the order will be issued. In selecting this time, he considers the total time available, the time needed for adequate reconnaissance by subordinate unit leaders, and the time needed for the actual preparation of the position. He should allot enough time to subordinate units for preparing positions—even if the additional time allotted prevents a detailed reconnaissance on his part.

(2) The smoke unit commander designates the person or persons who will receive the unit orders. In a smoke generator company, these include the platoon leaders and others, such as the fuel supply officer and the first sergeant.

(3) Road clearances for movement are processed through the local Traffic Regulation Point well in advance of movement and in accordance with local supported unit SOP. The SOP of the unit through whose area the smoke unit must move should be evaluated; where unrestricted moves of small groups of vehicles (less than convoy size by SOP definition) are allowed, the formalities of clearance may be avoided. However, caution is advised in informal moves; all drivers must know where they are going.

71. Reconnaissance Planning

Upon receipt of information that his unit has been given a smoke screening operation, the smoke unit commander immediately proceeds to the unit to which his organization is being attached. The smoke unit commander reports to the staff chemical officer (if there is one with the unit to be supported). The staff chemical officer may require the smoke unit commander to also report to the G3. If there is no staff chemical officer, the smoke unit commander reports to the G3 of the supported unit. Having received a formal declaration of his mission by either the staff chemical officer or the G3 of the supported unit, the smoke unit commander plans his reconnaissance. Before starting his terrain reconnaissance, the smoke unit commander makes a brief map reconnaissance, determines the area to be covered, and selects the route. His reconnaissance is as detailed as time permits. He gives major attention to the more critical localities. He announces his route so that he can be located quickly.

72. Coordination With Other Commanders

Adjacent and supporting unit commanders may be present at the time the general plan for the use of smoke is discussed by the G3 (or S3) of the supported unit. At this time, arrangements for establishing and maintaining coordination are normally made with these commanders by the staff chemical officer.

73. Reconnaissance

The smoke unit commander leaves the area

where he received the mission and goes on his personal ground and/or air reconnaissance. Frequently he is accompanied by his operations officer, representatives of the supported unit, and such other persons as may be necessary. *He first positively identifies his area of operations.*

a. Vital Area Study. He studies the vital area to determine—

(1) *Terrain which restricts the mobility of his unit.* Rough or mountainous terrain may result in extensive supply routes, thus making resupply activities exceedingly difficult with organic transportation. Mechanical generators can be hand carried for only short distances. Difficult terrain may require employment of smoke pots.

(2) *Areas which give the enemy covered or concealed approaches to the position.* Where it is possible for the enemy to approach positions under cover of smoke screens, additional security may be required. This security may be provided by the supported units or by the smoke unit itself at the expense of the full capability of the unit screening operations. Any position to which the enemy has easy access should be manned by no less than two men and provided local security.

(3) *Commanding features of the terrain which can be occupied as hostile observa-*

tion posts. Such terrain and the vital area that would be exposed to hostile observation during periods of unfavorable wind shifts must be screened with projected smoke. This type of operation requires coordination with the staff chemical officer of the supported unit for employment of projected smoke.

b. Smoke Line and Vital Area Perimeter Study. He selects a smoke line and studies in detail the perimeter of the vital area to determine—

(1) *Routes of approach.* Cover and concealment are required for movement into positions in a battle area. When cover is not available, concealment may be obtained by the use of smoke (either emplaced or projected). Alternate routes should be selected when possible to afford concealment for withdrawal or movement caused by changing weather conditions. In selection of these routes, consideration should be given to holding lateral movement to a minimum.

(2) *Routes of communication.* The commander of the smoke unit coordinates with the supported unit for entry into its communications system at the nearest area communications center. Sometimes this coordination is accomplished through the staff chemical officer of the supported unit. In any event the smoke unit commander takes any action that

helps him in establishing communications.

(3) *The location of company smoke control point.* The smoke control point may also be the forward command post (CP) of the smoke unit. The rear CP is normally located in the bivouac area of the unit.

(4) *The location of the fuel supply point.* The fuel supply point is normally located close to the screening operation in a covered and concealed position. Firm well drained ground is sought to reduce transportation difficulties during periods of inclement weather.

(5) *Areas of responsibility.* The smoke unit commander assigns areas of responsibility in accordance with capabilities of each subordinate unit. The smoke unit commander selects areas of responsibility, and platoon leaders select areas for each of their sections. The section sergeants and squad leaders actually select the generator positions and alternate positions under the supervision of the platoon leaders. The platoon leaders also select their platoon CP and, on some independent missions, the fuel supply point.

(6) *Location of observation posts.* Existing observation posts already established by infantry and artillery units are usually

adequate for the ground observation requirements of the smoke unit. However, coordination with the supported unit staff chemical officer for the use of aircraft for aerial observation may be necessary.

(7) *Liaison to be established.* The smoke unit commander establishes liaison with the supported unit to provide the commander and staff with information of smoke operations. Timely information of smoke operations permits early warning to adjacent unit commanders so that they may take advantage of the smoke operations in their tactical planning.

(8) *Arrangements with adjacent units for mutual defense.* While the smoke unit performs its primary mission, its combat effectiveness is limited; it depends upon other units in the immediate vicinity for security. However, mutual defense plans may call for the smoke unit to take up defensive or blocking positions against enemy attacks during periods of low visibility (night attacks). Such action by the smoke unit may be required to release infantry elements for action in the main battle positions.

74. Issuance of Orders

After completing his reconnaissance, the smoke unit commander goes to the point previously designated for the issuance of his orders. He makes

such changes in his tentative plan as are required by his ground reconnaissance and by recommendations of his leaders. He then issues the unit orders and informs higher headquarters of the smoke unit's plan of operation.

75. Movement Into and Organization of Positions

After the orders are issued, the smoke unit commander supervises the organization of positions.

a. Movement Into Position.

(1) Daylight movements may be by infiltration to prevent the appearance of increased activity and to reduce the possibility of a target of opportunity for the enemy. In some instances such movement may require the unit to provide its own smoke cover; for example, concealing a main supply route over a mountain pass may be accomplished by infiltrating mobile generators into *marked* positions. Production of smoke may commence immediately without a formal command. Smoke pots are widely used to support this type maneuver because of their ability to produce smoke instantly.

(2) Night movements are normally conducted in convoy, with the exception of occupation of positions in the battle area. Control of night movements is extremely difficult. Reconnaissance by unit leaders may be required before the move-

ment, which must be executed swiftly to reduce noise and confusion to the minimum.

b. Organization of Positions. To provide a measure of security, generators are normally dug in at night. However, where movement and digging in are impractical because of enemy action, smoke screens produced by generators, smoke pots, or projected smoke munitions may be used to conceal the occupation and organization of positions. Additional security measures include:

(1) *Camouflaging generator positions.*

(2) *Digging in generators when possible and emplacing smoke pots upwind to screen generator positions.* Generators on the upwind edge of the smoke line are likely to be exposed; the enemy may seek first to destroy these generators and then may proceed downwind in an effort to knock out the other generators successively.

(3) *Using secondary smoke screens to protect generator positions.* Personnel designated to produce smoke by burning pots should have entrenched positions upwind of the emplacements.

(4) *Preparing alternate positions for each generator during extended operations.* Movement of generators to alternate positions is made at night, through a communications trench, or is concealed by smoke.

Section V. SMOKE OPERATIONS OUTSIDE BATTLE AREA

76. General

The area outside the battle area is beyond the range of observed ground fire but is subject to enemy air attack. The primary purpose of smoke employment in these areas is to interfere with enemy aerial observation and visual bombing. Smoke screens are employed in these areas to conceal vital installations and activities and to deceive and confuse the enemy. In addition, smoke can be used to attenuate the heat and blinding effects of nuclear weapons.

77. Attachment and Control

Smoke generator units outside the battle area may be attached to any command requesting smoke support. The operational control of smoke units may be delegated to the staff chemical officer of the supported command. The smoke unit may be attached to the specific unit requesting smoke support. No matter where the operational control rests, the staff chemical officer and the smoke unit commander are expected to give advice and plan the entire smoke operation.

78. Installations Outside Battle Area

Installations outside the battle area are often maintained for longer periods of time than those in the battle area, permitting the effectiveness of the smoke screen to be continuously improved. The two types of installations outside the battle area are—

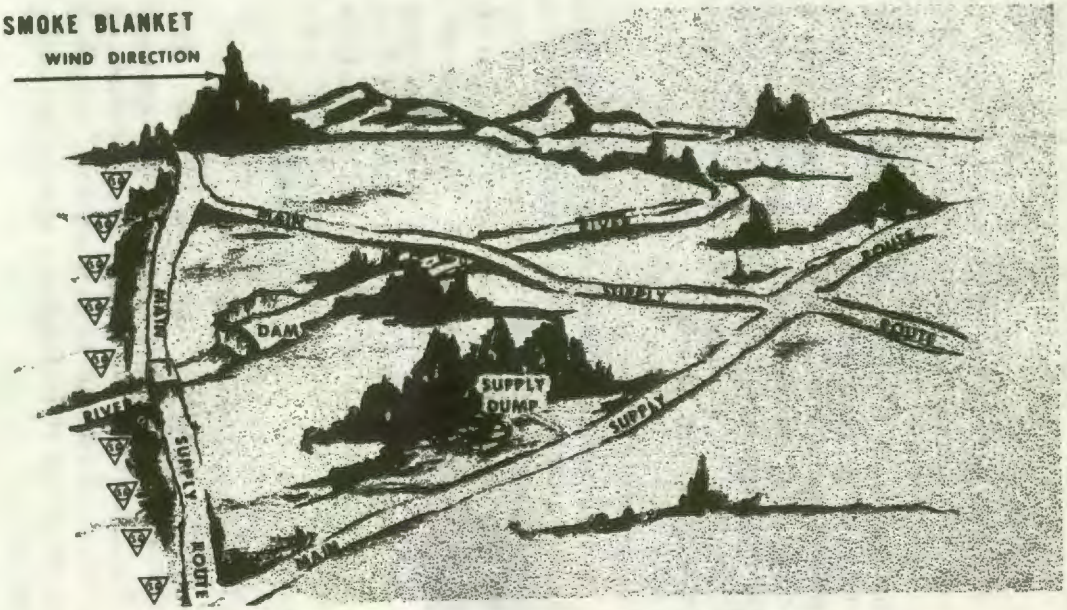

Figure 15. Type of land installation with smoke cover.

a. Land Installations. Land installations are those installations that are serviced directly by land transportation. Some examples of land installations are railroad marshaling yards, vital communications centers, and vital road and bridge complexes (fig. 15). Each land installation has its own peculiar smoke behavior characteristics due to the effects of local weather and terrain. The problems of establishing positions, communications, transportation, and resupply are basically the same for all land installations (pars. 67–75).

b. Land-Water Installations. Land-water in-

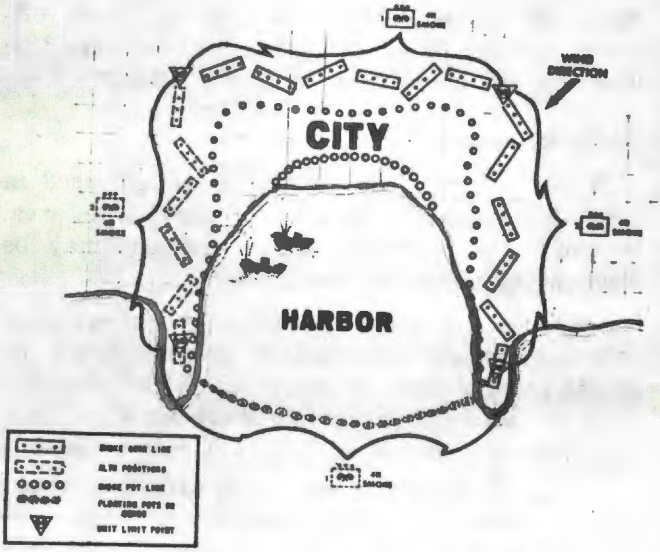

Figure 16. Type of land-water installation with smoke cover plan.

stallations consist of land and water elements (fig. 16). This type of installation may have some smoke units operating on land and some on the water; it may have all smoke units operating on land but may require boat transportation for personnel, supplies, and communications. Some examples of land-water installations are naval yards, ports, dams and canal locks, and beachheads. The smoke units that operate on the land portion function in the same manner as those on land installations. Amphibious smoke units usually consist of boats, barges, or amphibious vehicles carrying personnel, smoke generators, floating smoke pots, and communications equipment. Whenever possible, stationary objects offshore, like the breakwater in a harbor, should be used for establishing generator positions.

79. Smoke Screens Outside Battle Area

Smoke blankets and smoke hazes are used in screening installations outside the battle area. Primary and secondary smoke screens may be used in the overall smoke plan.

a. Primary Screens. A primary screen, produced by smoke generators supplemented by smoke pots, is used to screen the vital area. To cover the area effectively in a short period of time, two or more smoke lines (par. 41) may be used.

(1) *The inner line* may be composed of smoke pots or smoke generators, which are used to produce quick-cover smoke in a short period of time. For land installations smoke pots may be set off elec-

trically. The inner line is prepared and maintained completely around the vital area.

(2) *The outer line* is normally composed of smoke generators. If ample time is available to produce an effective screen over the vital area, the inner line need not be used. It is not necessary to maintain generators completely around the vital area, although generator positions are selected and plotted on the operations overlay. Smoke generator positions are maintained on the upwind side. Mobile generators may be used to fill in sectors affected by wind shifts.

b. Secondary Screens. Dummy screens are used to confuse the enemy as to the exact location of the vital area. They should be of the same type and size as the primary screen is. Dummy screens are never established at the expense of reducing the effectiveness of the primary screen. A larger size screen over the vital area is more effective than a dummy screen is. Prominent landmarks should also be screened so that enemy aircraft cannot use such landmarks to locate the vital area.

80. Planning Operations Outside Battle Area

The procedures for planning smoke operations outside the battle area are generally similar to those for planning operations in the battle area (pars. 70–72). If the mission is a land-water operation, additional equipment and supporting personnel may be required. The more important fac-

tors which should be considered in planning land-water smoke missions are—

a. Sectors of Operation for Each Boat.

b. Distance From Shore to Amphibious Smoke Source. Offshore projections such as land formations, wharves, and breakwaters should be used when possible.

c. Amphibious Equipment Needed to Transport Smoke Equipment and to Establish a Smoke Line. This may require support from other branches and technical services.

d. Means of Resupply.

e. Control of Boats.

f. Communications. This may require additional radio nets and establishment of visual types of communications.

CHAPTER 6

OPERATIONS UNDER SPECIAL CONDITIONS

Section I. INTRODUCTION

81. General

Special operations are those in which the characteristics of the area of operations, the nature of the operation, special conditions under which the operation may be conducted, or a combination of these factors, require special or specially trained troops; special techniques, materials, and tactics; or an emphasis on certain considerations.

a. The basic doctrines for the employment of smoke in support of tactical operations are contained in FM's 3–5 and 100–5.

b. Information for the tactical commander and the smoke unit commanders concerning the use of smoke in support of special operations is contained in the field manuals pertaining to these operations (app. I).

c. Technical information for the smoke unit commander concerning the use of smoke in support of special operations is contained in this chapter.

82. Special Operations Support

Chemical smoke generator units are not normally engaged in special operations, except in sup-

port of other units. The planning and preparations for special smoke operations should be done concurrently with the supported unit. The smoke unit commander should, therefore, be notified as early as possible of the plans for his unit's participation in a special operation to facilitate coordinated planning for the employment of smoke.

83. Planning Considerations

Upon receipt of information concerning his unit's participation in a special operation, the smoke unit commander must immediately familiarize himself with the specific type of operation. He and his staff begin their planning by considering the special problems involved. Planning includes all of the detailed steps previously discussed in this manual. The basic principles of smoke support planning are equally valid in special operations. However, modification of some of the techniques involved may be required to satisfy special circumstances.

84. Training

The greatest problems faced by a smoke generator unit designated to participate in a special operation will be in the area of training. Training may be either for a specific operation or for continued operations in an area of special conditions, such as in the arctic or jungle. Commanders must make the most profitable use of time to train personnel in their understanding of the problems involved in the special operation.

Section II. ORGANIZATION OF A SMOKE GENERATOR COMPANY FOR WIDELY SEPARATED OPERATIONS

85. General

The term "widely separated operations" refers to situations in which the smoke company platoons are not supporting the same mission and are located more than 20 miles from company headquarters. The platoon then becomes functionally independent except for administrative support, specialized maintenance support, and command control from company headquarters. The smoke generator company as presently organized operates best as a unit. When operations by separate platoons are required, augmentation of TOE equipment and personnel becomes necessary.

86. Company Headquarters Organization

When the platoons of a smoke generator company are widely separated, the company headquarters is manned by the minimum number of personnel operating the following sections:

a. Headquarters Section.

(1) *Operations.* The operations officer is the coordinator of operations between the company and platoon headquarters. Operations personnel furnish operational and administrative support to the platoons. They coordinate all personnel and equipment moved on the vehicle messenger runs, receive platoon operations reports and consolidate them into a company operations report for submission to

the next higher headquarters, prepare and distribute company operation orders, order the official movement of personnel, and control vehicles dispatched by the company headquarters.

(2) *Mess.* The mess steward supervises mess personnel. He is responsible to the company commander for records, rations, planning of meals, and maintenance of mess equipment at company headquarters.

(3) *Supply.* The supply sergeant is responsible to the company commander for all company TOE, TA, and specially authorized equipment and the records for this equipment. He reissues this equipment to the platoons. Individual clothing and equipment are issued directly from the company.

(4) *Personnel.* Personnel clerks carry out the normal administrative duties of the company.

(5) *Meteorological.* The meteorologist studies weather conditions in the area and compiles the weather log.

(6) *Communications.* Communications personnel establish telephone communications through locally established telephone nets whenever possible. Company and platoon headquarters normally depend on messenger service for communications with each other. When radio and

telephone equipment are used, security measures are taken to prevent the interception of information by the enemy.

b. Maintenance Section. The motor sergeant is responsible to the company commander for the operation of the company headquarters motor pool and the supervision of the platoon motor pools. On his inspection tour, the motor sergeant is usually accompanied by the welder. A parts clerk may be designated to keep the headquarters vehicle record jackets and the preventive maintenance roster and to supervise the records of the platoon vehicles. Organizational maintenance not available to the platoon is performed at company headquarters. All generators are distributed to platoons on the basis of platoon operational needs. Generators received for third echelon maintenance from platoons are given a technical inspection and prepared for field maintenance. In an emergency, the company may be authorized to perform third echelon maintenance. Records of the location and condition of all generators are kept at company headquarters. The motor and generator personnel maintain a stock level of generator parts for the platoons, requisition parts from depots, and supply parts to the platoons as needed. The senior smoke generator mechanic supervises platoon generator sections.

c. Fuel Supply Section. Personnel in the fuel supply section obtain, transport, and furnish fog oil and gasoline required for smoke operations to the platoons. This section maintains a record of

fuel supplies for the entire company and submits reports to higher headquarters. It supervises the storage and use of fuel by the company.

87. Platoon Organization

The platoon operating away from company headquarters in a tactical situation needs all of the specialized personnel found in a company headquarters with the exception of those from the personnel section. It needs mess personnel, motor maintenance personnel, and maintenance personnel for the unit's specialized equipment. Thus, the authorized TOE and TA must be augmented by special authorizations of personnel and equipment to insure the unit's ability to meet changing requirements of tactical operations. The platoon is manned by the maximum number of personnel available from the company, as follows:

a. Headquarters. The platoon headquarters includes the administrative personnel for the platoon. This headquarters functions in the same manner as company headquarters functions when the company is operating as a unit. The duties of the platoon leader parallel those of the company commander.

b. Motor and Generator. The motor and generator personnel supervise first echelon maintenance and perform second echelon maintenance on the platoon's equipment. Vehicle support above second echelon is furnished by the ordnance unit serving the platoon's area of operation. Generator support above second echelon is furnished through company headquarters.

c. Mess. Mess personnel obtain equipment from the company under special authorization.

d. Supply. The platoon leader, assisted by the platoon sergeant, controls platoon property. Rations and fuel are drawn locally.

e. Communications. Communications personnel normally establish telephone communication between platoon headquarters and generator positions. If the distance between generator positions is not too great, the platoon can lay its own wire. Radio is the primary means of communication during operations. After wire nets are installed, radios are placed on listening-silence for security reasons. Radio nets reopen as required when wire communication is interrupted.

f. Fuel. Fuel personnel determine, procure, and maintain the fuel requirements of the platoon. They operate and maintain the platoon dumps, the forward mission dumps, and the generator position dumps. They submit consumption reports to the company.

88. Security

Each platoon of a widely separated smoke company must establish its own security. The platoon organizes its defense to fit into the defense plan of the supported unit. In forward battle areas, platoon leaders must be ready to deploy their personnel in defense of the unit and its installations.

Section III. OPERATIONS UNDER SPECIAL CONDITIONS

89. Cold Weather Areas

Smoke operations in arctic regions or other cold weather areas present special problems that are common to all types of units. Detailed information on arctic and cold weather conditions is given in FM's 31–70, 31–71, 31–72, 31–73, and 100–5. Preventive maintenance for individual equipment in arctic or other cold climates is given in appropriate technical manuals.

a. Operations. Mechanical smoke generators are capable of producing effective smoke clouds under arctic conditions when proper lubricants and fuel mixtures are used. For information on fuel mixtures and starting procedures in extreme cold weather, see TM's 3–381, 3–390, and 3–431.

b. Meteorological Considerations. On clear days an inversion condition exists over snowy surfaces; this condition is strongest about sunrise. Smoke tends to remain near the surface and may travel for long distances before being dissipated. Under extreme cold conditions, smoke clouds last longer than under more temperate conditions. Snow or fog so reduces visibility that the amount of smoke ordinarily required for effective screening is greatly reduced.

c. Camouflage. Special consideration should be given to the problem of camouflage, since there is excellent observation for long distances over snow-covered terrain in dry, cold weather. The heat from generators and pots will melt the snow around the positions; therefore, it is important to

camouflage the positions when the generator is not in use. The use of white covering or suitable camouflage nets simplifies camouflaging of men, equipment, and supplies in snow-covered areas.

d. Transportation and Supply. See referenced field manuals in appendix I.

90. Jungle Areas

Since the jungle ordinarily affords concealment from air and ground observation, the value of smoke screening is extremely limited. In many instances the use of smoke may be limited to coastal regions to conceal landings; in other areas, smoke may be used to conceal river crossings or to provide coverage of rivers used as routes of communication. Smoke used in dense vegetation tends to spread slowly in a downwind and downslope direction and to follow creek beds and gullies.

a. Meteorological Considerations. In general, jungle weather is hot, humid and characterized by sudden changes. Within only a few minutes, clear, hot weather may change to torrential downpour. The humid heat of the day is often relieved by cool air from the mountains in the late evening. Wind speed in jungle areas normally does not exceed 2 miles per hour.

b. Transportation and Supply. Vehicle operation may be restricted to established roads or trails. Generator positions should be selected, when possible, to permit supply of fuel by vehicular means. Although fuel can be supplied by use of 5-gallon cans hand carried to the generator em-

placement, this arrangement is generally unsatisfactory.

91. Desert Areas

All deserts, regardless of latitude, have certain characteristics in common — lack of water, absence of vegetation, large areas of sand, extreme temperature ranges, and brilliant sunlight. Because of the extreme temperature conditions existing in the desert, it is often difficult to make profitable use of smoke units. Smoke may be employed to screen an installation or the breaching of barriers and minefields and to cover artillery positions at night to reduce muzzle flash.

a. Meteorological Considerations. The desert sands absorb heat from the sun and cause appreciable horizontal temperature differences which in turn may cause whirlwinds. Sandy soil is heated during the day to such an extent that smoke operations become extremely difficult because of the strong lapse conditions. Smoke is inclined to pillar because of the rising currents of air. High winds and duststorms approaching hurricane velocity occur throughout the year. The most favorable atmospheric conditions for the employment of smoke exist on clear, moonlight nights.

b. Transportation and Supply. There are few roads in desert areas, and these roads are very vulnerable to air and ground attack. Since transportation is extremely difficult over sandy areas, tracked vehicles or vehicles with low pressure tires are required.

92. Mountain Areas

Mountain operations are characterized by the difficulties encountered due to terrain. The inadequate road nets found in sparsely settled mountain areas enhance the military value of existing roads and add importance to high ground which dominates other terrain. Smoke generators are used to screen supply routes and preparations for installations and entrenchments and to reduce the enemy's capability of using high ground for observation. Small smoke units are often required to operate for extended periods with limited resupply in mountain operations because of the difficulties of transportation.

a. Meteorological Considerations. In mountainous regions, wind shifts of 180° within an hour are common. Steep hills split winds so that there is an eddying around the hill as well as over it. Thermally induced slope winds occur throughout the day and night. These conditions make it extremely difficult to establish and maintain a smoke screen. To maintain an effective smoke screen, it is necessary to observe the screen carefully and to shift the generators in accordance with shifting winds. Wind currents, eddies, and turbulence must be continuously studied and observed.

b. Mobility. In order that the smoke unit may have mobility to shift a smoke line to compensate for shifting winds, it is advisable that one of the two generators transported on each vehicle be operated from the vehicle and the other generator be emplaced. The emplaced generators are centrally

located, whereas the trailer-operated generators are placed at the ends of the line. If a wind shift in either direction takes place, the trailer-operated generators can be moved quickly to the opposite end of the line. Where terrain conditions prohibit rapid displacement of generators, it may be necessary to utilize smoke pots to accomplish quick coverage of the vital area. In planning, the use of helicopters should be considered for the placement of generators in positions normally inaccessible to other modes of transport.

c. Transportation and Supply. In forward operations, access to roads is a limiting factor in the resupply of fog oil to generator positions when missions require continuous daytime screening. Track vehicles are used where resupply cannot be made by truck. Under extreme conditions and when the priority of the smoke mission demands it, helicopters may be used for the supply of fog oil.

d. Communications. In mountainous areas, there is usually a scarcity of commercial wire lines and the laying of wire is difficult or impossible. Terrain may prevent line-of-sight radio communications. Helicopters, light aircraft, rocket launchers, and rifle grenades may be used to lay wire across difficult terrain. Remote control of radio sets and automatic retransmission features of radio relay sets provide a means of obtaining extended range communications in difficult mountainous areas. The establishment of such a communications system requires specially authorized equipment.

93. River Crossings

During a river crossing, the highest command directly concerned with the crossing usually assumes tactical control of smoke operations. Requests concerning the smoke operation are cleared through the overall tactical commander of the crossing operation. After the bridgehead has been established, smoke control at the bridgehead is relinquished by the crossing force and is passed to the unit or command in charge of the bridgehead.

a. Planning. For proper and efficient utilization of smoke equipment it is desirable that the smoke unit commander be informed of the overall tactical situation during phases of the smoke mission. The smoke unit should be included in the logistical planning as part of the assault team. This information will enable the smoke unit commander to obtain the necessary priority for men, equipment, and supplies to the far shore to maintain the screen, if necessary, from that shore. Plans for the smoke unit are coordinated with other elements of the assault team.

b. Placement of Smoke Generators. Except where the direction of the wind is nearly always toward the enemy, complete smoke coverage of a river crossing by generators or pots can be assured only by emplacement of generators and pots on both sides of the crossing. When there is a headwind in the initial stages of the assault, smoke projectiles are used to place smoke on the enemy bank. Behind this smoke, generators and

pots may be emplaced on the bridgehead side. Prior to or during bridge construction, smoke generator personnel, equipment, and supplies are transported in boats from one side of the stream to the other. When direction of the wind is upstream or downstream, it may be necessary to have generators in boats upwind of the vital area, especially when generator positions on each side of the stream are too far apart to be effective. With a flank wind, pots and generators are placed near the river bank on either side of the river; if necessary, floating smoke pots and smoke generators transported by boats may establish the screen. In some tactical situations, it may be necessary to install the entire smoke line on the friendly bank. Normally, smoke personnel do not cross to the enemy shore until a bridgehead has been established by the assault troops. Helicopters may be used to drop smoke pots from low altitudes to provide initial screening on the enemy side of the river.

(1) Generators and smoke pots should be grouped to produce a uniform screen along the entire front. A haze over the river can be increased in density as needed by land- or water-based generators or pots. Release of floating smoke pots into the stream, however, must be carefully coordinated with the engineer unit responsible for the bridge construction site.

(2) Boats or other amphibious means used by smoke generator units for generators

and floating pots must be obtained through the appropriate chemical officer from engineer or transportation units assigned or attached to the major unit performing the crossing operation.

c. Employment of Smoke. Smoke for screening river crossings is certain to draw enemy attention and, therefore, should extend over enough of the area so that the actual point of crossing will not be obvious to the enemy. Dummy smoke screens are used to draw fire and observation. When there is little likelihood of enemy aerial attack, a smoke curtain may be sufficient if it entirely obscures enemy ground observation. If the enemy has observation over a large area, a haze may be required. When air attacks are likely, a smoke blanket may be necessary.

94. Amphibious Operations

Command of smoke operations in support of landing operations is initially the responsibility of the naval commander and is transferred to the army commander when assault forces are established on shore.

a. Missions. Some of the missions of amphibious smoke operations are to—

(1) Screen the assault wave from aimed fire behind the landing beach.

(2) Screen the flanks and prevent enfilade fire.

(3) Screen demolition and reconnaissance units working on the beach.

(4) Deceive the enemy as to the place and direction of the landing.

(5) Interfere with the movements of enemy reinforcements.

b. Planning. During planning the following factors must be considered: supplementary means for making smoke, waterborne units, control of the smoke screen, and the overall tactical situation. During the concentration and specialized training periods, forces participating in the operation are assembled, organized into task forces, and trained jointly. The training includes operations of combat units in smoke screens. In supply planning, adequate initial supply to safeguard against possible delay in resupply must be considered. In most amphibious operations, adequate supplies must be carried by the boats that transport the smoke equipment. Additional boats must bring in the equipment and supplies necessary to maintain the screen after the beachhead is secured.

c. Means of Producing Smoke Screens. Floating smoke pots, mechanical smoke generators, and aircraft are used to establish and maintain smoke screens. Initial screens are made by boats carrying generators (fig. 17), pots, rockets, or mortars; by aircraft with smoke tanks or smoke bombs; or by any combination of these. A screen initiated by aircraft provides smoke protection for boats dropping smoke pots. Each boat carrying smoke pots usually has a mechanical smoke generator to strengthen the screen. On shore the initial

Figure 17. Smoke generator in operation on water.

screen is established by airplane, smoke tanks, bombs, and/or smoke projectiles fired from ships. After the first assault wave has secured a foothold on the beach, smoke pots are emplaced on the shore and used to maintain the screen. Mechanical smoke generators are landed as soon as it is feasible.

d. Types of Smoke Screens. In amphibious operations, smoke curtains may be used both frontally and on the flanks, as desired, depending on wind conditions. Smoke may interfere with the landings unless the smoke is accurately placed in proper volume and its downwind travel is considered. To be fully effective, the flank screens should cross the shore exactly at the ends of the landing beach and should never interfere with the landing craft. When the wind is blowing parallel to the beach, only frontal and downwind flank screens can be laid, since smoke from a windward screen would blow across the landing beach and its approaches. However, the first wave of the assault may be protected against fire on the windward flank by extension of the frontal screen upwind of the landing beach. The frontal screen should be placed on or close in front of the landing beach, and the downwind flank screen should be laid preferably at an angle of 45° to the beach. In any wind, screens are laid more easily when boats move against or across the wind.

95 Airborne Operations

Normally, smoke units will not accompany assault elements into the airhead; if planned for

employment prior to linkup, smoke units will be airlanded during the later stages of operations. Helicopters may be used to deliver smoke units for operations within the airhead and for missions of deception in areas designated as dummy landing zones in much the same way that dummy screens are used in river crossings. Such employment deceives the enemy as to the extent of operations and adds to the deception desired in early phases of operations. Helicopters are also useful for delivery of smoke-producing equipment to inaccessible positions and in resupply of these positions. Prior to ground contact with enemy units, smoke pots or generators may be used to deceive the enemy as to the actual location of assembly areas and objectives.

CHAPTER 7

ADMINISTRATION AND SUPPLY

Section I. RECORDS, REPORTS, AND ORDERS

96. General

Administration involves personnel management and record keeping and reporting. Record keeping and reporting involve organizational and individual records and reports. Orders consist of routine orders and combat orders. Battalion routine orders include court-martial orders, special orders, and memorandums. See AR 310–110 for details. Combat orders include operation orders and administrative orders. The unit commander is responsible for the unit's reports, and he should verify their accuracy to insure efficient administration. The smoke generator company is the basic unit having administrative functions; in this connection it publishes only company orders. See FM 101–5 for details of records, reports, and orders.

97. Records and Reports

Records and reports should be kept to the minimum, consistent with the requirements of the situation and instructions of higher commands. Records and reports are retained only until they have served their purpose, after which they may be destroyed unless they are filed with the journal

or the command report. Records and reports that may be used in a smoke generator unit include the following:

a. Journal. A journal is a permanent record. Other records, such as overlays, become permanent records when filed with the journal.

b. Command Report. This is a permanent record.

c. Unit Report. The unit report becomes a permanent record when filed with the executive's journal or with the command report.

d. Message Center Log.

e. Situation Map, Overlay, and Chart.

f. Work Sheet and Data Sheet.

98. Operation Orders

An operation order may be oral or written, but regardless of composition it is the commander's formal statement to subordinate commanders to effect the coordinated execution of a tactical operation. Operation orders must be clear, timely, and concise. They must contain as much information as possible by overlays and sketches and must be easily understood. Operation orders must be issued in sufficient time to allow subordinate commanders adequate time for reconnaissance planning and preparation and for issuance of their orders to subordinates. The smoke battalion normally prepares written operation orders. Company orders are normally oral orders or are prepared as overlay-type orders. Orders are based on the operation orders issued by the supported

unit. A type battalion operation order is illustrated in appendix IV.

a. Operation orders are classified as warning orders or orders of execution. Warning orders warn of impending operations and contain information as to actual time and method.

b. Operation orders follow the 5-paragraph form outlined in FM 101–5. Annexes and other material assist in clarifying and simplifying the order; however, brevity should always be considered. Clarity should not be sacrificed for the sake of brevity. Preparation of the operation order is the responsibility of the smoke unit commander and is normally accomplished by the operations officer.

99. Administrative Orders

Information concerning administrative support of an operation is contained in the administrative order. Administrative orders should be published at the beginning of an operation and as frequently as required thereafter to keep administrative instructions current. When the data are not too lengthy, administrative information may be contained in paragraph 4 of the operation order. Administrative orders are not normally prepared at company level. A type smoke battalion administrative order is illustrated in appendix V.

Section II. SUPPLY, MAINTENANCE, AND EVACUATION

100. General

The battalion commander is responsible for all phases of supply and evacuation, but he usually

delegates these functions to the battalion supply officer (S4). The S4 is in direct charge of procurement, storage, security, maintenance, and disposition of supplies involved in battalion administrative and technical operations. He also conducts inspections and makes inventories to determine that all authorized allowances of equipment, clothing, and supplies are serviceable and complete. The company commander is responsible for all phases of company supply, and he usually delegates supply functions to an officer designated as the company supply officer. When the companies are operating independently of the battalion, the duties of the company supply officer are similar to those of the battalion supply officer.

a. Logistical Data. See FM 3–8 for logistical data pertaining to smoke generator units.

b. Basic Load. See paragraph 63 for basic load, including ammunition data.

c. Ammunition. Training ammunition is authorized in accordance with TA 23–100.

101. Initial Stock and Replacement

It is a function of the battalion supply officer (S4) or the company supply officer to maintain an adequate flow of supply. In planning smoke operations, the supply officer should assume that the most unfavorable weather conditions predicted may prevail during the entire smoke operation. In coordination with the commander and the battalion executive (or company operations officer), the supply officer must determine the number of

generators, pots, and vehicles needed and the fuel requirements to fulfill the mission. Prior to the start of the smoke operation, generator positions and forward dumps are stocked as completely as possible. Resupply is undertaken on the basis of a schedule established before smoke operations begin. Expendable items and repair parts are listed in the Department of the Army supply bulletins.

102. Supply Discipline

It is the smoke unit commander's responsibility to see that his unit is completely equipped, that the equipment is effectively used, and that the equipment on hand is actually needed. The unit commander enforces supply discipline to promote unit efficiency through care, supervision, maintenance, preservation, and conservation of all types of supplies and equipment. Supply discipline includes proper maintenance, salvage, vehicle recovery, and evacuation of captured material; prevention of hoarding; and the indoctrination of personnel with the importance of supply. Supply discipline is acquired through training and enforcement by the officers and noncommissioned officers of the unit. This training stresses the proper use of food, clothing, weapons, fuel, and motor vehicles. The equipment issued to and carried by each man should be that which he actually needs. No one should be permitted to throw away equipment, to use transportation unnecessarily, or to handle supplies carelessly or wastefully.

103. Rations

Rations are issued to the smoke generator com-

pany automatically on the basis of strength returns. Distribution of rations is normally prescribed in the SOP's of higher commands. Packaged rations are normaly issued during combat situations. However, hot meals are served at the company mess whenever possible. The company mess is located as near to the troops to be fed as the tactical situation permits. The unit commander may arrange for hot food to be delivered to those troops who cannot come to the mess location. Individual mess equipment may be pooled for delivery with the food and returned after feeding for washing in the kitchen area. This procedure keeps the mess gear sanitary and makes it unnecessary to carry washing and rinsing water forward with the food.

104. Clothing and Equipment

The smoke generator unit draws clothing and equipment for its personnel under TA 21 and other pertinent directives. Replacement of clothing and equipment is obtained by requisition. The requisition for the replacement of lost or destroyed items, including class IV organizational equipment, is accompanied by a certificate of loss or destruction which states the circumstances. Damaged clothing and equipment are evacuated and repaired or replaced. Equipment that cannot be repaired by the unit's personnel is sent through the supply system for repairs or replacement.

105. Petroleum, Oils, and Lubricants (POL)

Class III supplies include fog oil, fuel oil, lubri-

cating oil, gasoline, and greases. Gasoline and oil for company vehicles are obtained by filling the gas tanks of the vehicles and by filling empty 5-gallon cans to be carried on the vehicles. A unit supply point is established for POL.

106. Maintenance

The smoke unit commander is responsible for the maintenance of all vehicles, generators, weapons, and equipment in the unit. Each individual is charged with care and preventive maintenance for his individual equipment. The driver of each vehicle and the operator of each generator are responsible for the care and preventive maintenance of their equipment. The unit commander discharges his responsibility by personal observation and frequent inspection of vehicles, tools, and equipment. See AR 750–5 for details of the maintenance system organization and functioning.

a. First Echelon. The user performs first echelon maintenance as prescribed by the appropriate technical manual.

b. Second Echelon. Using the prescribed tools, repair parts, supplies, and test equipment, the unit mechanics perform second echelon maintenance in accordance with the appropriate technical manual.

107. Medical Service

The smoke unit commander is responsible for the health and sanitation of his command. Medical service is provided by the supported unit or by the supporting area medical organization.

Medical evacuation is prescribed in operational or administrative orders of higher headquarters. See AR 40–205 and SR 40–210–11 for health and sanitation responsibilities.

Section III. ADMINISTRATIVE MOVEMENTS

108. General

Administrative movements are conducted by a smoke generator unit when ground contact with the enemy is remote, both en route to and shortly after arrival at the destination. The smoke generator unit must be prepared to plan and execute administrative movements by land, air, and water. In planning for a type movement, some of the factors that should be considered are—the mission, what is to be moved, the size and composition of the unit, the distance to be traveled, the speed required, and the security classification of the movement. A smoke generator unit is completely mobile and can complete a motor movement with its basic load without additional transportation attachments. When additional transportation is required, it is normally provided by the supported unit. Administrative movements are generally conducted in two basic formations —the open column or the closed column. See FM 25–10 for detailed information on motor movements.

109. Planning

Movement planning may be organized into the following phases:

a. Warning Orders. Warning orders are prepared and issued to subordinate units without delay.

b. Reconnaissance Party. The reconnaissance party is organized and its mission is assigned. A map and aerial reconnaissance may be made to assist in formulating a tentative plan, but a ground reconnaissance is made whenever time and the situation permit. The composition of a reconnaissance party varies with the requirements of the situation. When time does not permit the party to complete its reconnaissance of the entire route before the movement begins, it is dispatched as much in advance of the column as possible. Instructions to the reconnaissance party specifically state the extent and nature of the information required and the time and place the report is to be submitted. The reconnaissance party has four main missions, as follows:

(1) To obtain detailed information of the route.

(2) To locate obstacles and recommend alternate routes.

(3) To determine the number of guards and guides required and their location on the route.

(4) To recommend rates of march.

110. Detailed Movement Plan

The detailed movement plan may be developed as follows:

a. Organization of Column. Units are organ-

ized into serials and march units and are given an order of march so as to facilitate control and scheduling. Unit integrity is maintained in the designation of serials and march units.

b. Check of Reconnaissance Information. Results of the route reconnaissance are used to select routes and to determine the initial point (IP), critical points along the route of march, the release point (RP), and the rate of march.

c. March Computation. Based on the number of vehicles, formation, and rate of march, the serial time lengths are computed. See FM 25–10 for details.

d. Draft of March Table. Using the completed march computations, a draft march table is then completed.

e. Check of Plan. Utilizing the draft march table and graph, the movement plan is checked to insure that it conforms to the directive of the higher headquarters.

111. Quartering Party

The new area is prepared for the orderly arrival of smoke generator units by the quartering party. Organization and duties of the quartering party may be as follows:

a. Organization.

(1) *The battalion quartering party* ordinarily consists of a commander (usually SI or personnel officer) necessary communications personnel, a representative from each company, and security personnel.

(2) *The company quartering party* usually consists of the operations officer, communications personnel, and security elements.

b. Duties. The quartering party commander indicates the location of subordinate units, formulates a plan to receive and guide units from the RP to their area, and selects locations for the unit's command and administrative installations. Subordinate unit representatives select locations for the unit command post (CP), administrative facilities, and subordinate element areas. Communications personnel install necessary equipment to insure rapid control of units as they arrive in their assigned areas. Based on the order of march, a plan is formulated 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 the movement plan to prevent congestion in the vicinity of the RP. The actual dispatch of the quartering party may follow the issuance of the march order.

112. Trail Party

The trail party follows the march column. It may include the personnel and vehicles necessary to assist the trail officer in inspecting the departed area and correcting and reporting any deficiencies; placing necessary guards, flags, or lights to warn traffic approaching from the rear; picking up guides and route markers; and disposing of disabled vehicles and their loads.

113. Organization and Movement

The smoke unit commander may issue an oral or a written march order. A complete march order designates the route, critical points, destination, schedule, rate, time intervals, formations, organization of the column, serial commanders, and other details not covered by the unit SOP (app. II). A march table and strip maps may accompany the march order as annexes.

a. Organization for Movement. In the field, the battalion headquarters will normally be divided into two elements—a command post and an administrative echelon. Composition of these elements may vary, however, as covered in the unit SOP.

b. Movement of the Command.

(1) The quartering party moves to the designated area, selects exact sites, lays out CP and administrative locations, and begins installation of communications.

(2) All officers and enlisted men are informed of the destination and route to the new CP site prior to movement.

(3) The command post displaces by echelons. Upon completion of the quartering party's work, the first echelon CP moves forward. Upon establishment of the first echelon in the new location, the rear echelon (administrative echelon) moves forward.

(4) The executive officer notifies subordinate

and higher headquarters of the change in CP locations.

c. Communications. Communications within the column are regulated by unit SOP, supplemented by necessary special instructions. Communications on the move are normally maintained by radio and visual and sound signals.

d. Motor Column Halts. Halts may be in accordance with unit SOP, usually at stated intervals of time. When required, halts are made at previously reconnoitered locations where the standing is good and vehicles can move off the road. When trucks do not clear the road completely, guards are placed at the head and at the tail of the halted column to control passing traffic. When personnel detruck, they stay off the road.

e. Control of Motor Column. For purpose of control, the smoke battalion with its attached companies is divided into march units and serials when necessary. A commander is designated for each serial and for each march unit but has no fixed position within his unit. A control officer moves at the head of each serial and march unit and is responsible for leading his unit over the prescribed route at the correct rate.

(1) Serials and march units are separated by time intervals prescribed by the march order.

(2) Traffic control stations are established along the route to enforce march sched-

ules, to transmit orders to commanders and control officers, and to control other traffic.

114. Bivouacs

A bivouac area is located in the field where troops are assembled for rest, rehabilitation, or training or where a rear installation is maintained. The comfort and convenience of the troops are considered, and shelter is provided by existing construction, tentage, or improvised means. A battalion or company bivouac may be selected by the unit to which the battalion or company is assigned or attached.

a. Selection of Bivouac Area. The following factors should be considered in selection of a bivouac area: cover and concealment, sufficient area to permit dispersal of personnel and vehicles, proximity to an adequate water supply, suitable road net, and firm well drained ground for vehicles. Vehicles within the bivouac area are dispersed and camouflaged if the situation requires it. To prevent running over sleeping personnel at night, each vehicle moving within the bivouac area is preceded by a man on foot.

b. Security. An interior guard is organized to provide local security within the bivouac area. If necessary, the unit commander coordinates antiaircraft, antitank, and other security measures with the adjacent units. When the situation requires it, individual security measures are coordinated by the unit commander.

Section IV. COMMUNICATIONS

115. General

The role of the smoke generator unit is such that the demand on its communications system is constantly changing, and the commander must be prepared to reorganize his interior and exterior signal communications system to meet the varying needs. The equipment provided to establish this signal communications system is authorized in the current TOE's. Communications are established through the supported unit or through the nearest area communications center as directed. The smoke unit commander considers many things when preparing his communications plan to support operations. The following factors govern his employment of organic signal communications equipment and determine requirements for additional signal equipment:

a. Mission of supported unit.

b. Type of supported unit.

c. Duration of operation.

d. Requirement for dispersion.

e. Attachments.

116. Responsibility

The smoke unit commander is responsible for signal communications within his unit. The unit signal communications system is normally controlled by the battalion executive officer or by the company operations officer. This officer controls the operation of cipher machines for encoding and decoding messages and related security measures.

The following general rules govern the establishment and maintenance of signal communications between smoke units and supported units:

a. A smoke unit designated to support a unit establishes communication with the supported unit.

b. A smoke unit *attached* to a unit that it will support receives communications support from the supported unit.

c. All units are responsible for reestablishing interrupted communications from both ends of the interrupted system.

117. Communications Orders and Instructions

Signal operation instructions (SOI) are issued for technical control and coordination of communications within a command. Immediately upon attachment, a copy of each item of the SOI directly pertaining to communications of the smoke unit is furnished by the supported unit. The SOI contains items covering codes and ciphers, radio call signs and frequencies, telephone directories, and visual and sound signals. Standing signal instructions (SSI) contain information and instructions on use of the SOI and may be prepared separately or as part of the SOI. This document will also be made available to smoke units on attachment.

118. Standing Operating Procedure and Operation Order

The unit standing operating procedure (SOP) contains instructions of a permanent nature to insure proper unit operations. It outlines stand-

ard procedures that the unit follows during operations to assist in performance of its mission, to speed its operation, to insure security, and to assist in ease of operation. The unit SOP should contain adequate information applicable to signal communications, since many of the operations pertaining to the communications system are similar regardless of the type of operation. Paragraph 5 of the unit operation order, whether oral or written, contains orders and instructions relative to communications and command. Specific signal instructions not included in other documents are included in this paragraph.

119. Means of Communication

The smoke unit commander utilizes any available means to implement an effective and a reliable communications network. The smoke unit enters the area communications system of the supported unit at the nearest area center and thereby obtains a communications channel to any installation integrated into the system. Communications maintenance personnel at area centers perform necessary repair of smoke unit communications equipment beyond the capabilities of the smoke unit's communications personnel. The smoke unit commander utilizes the following means of communications:

a. Wire Communications. In relatively slow moving or stable situations, wire forms the basis of the signal communications system (fig. 18). Wire is the primary means of communication for chemical smoke generator units; therefore, wire

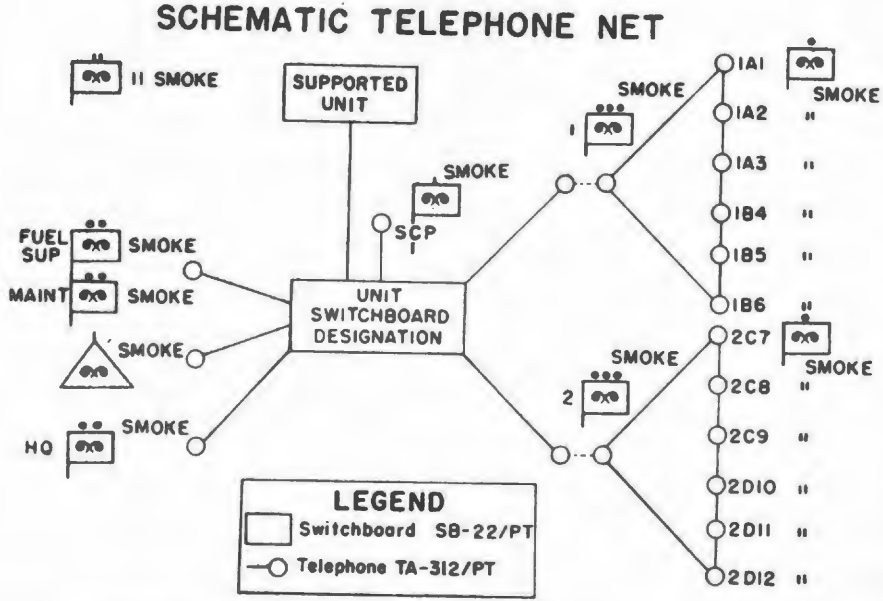

Figure 18. Smoke generator company wire communications net.

nets are installed as rapidly as possible after a position is occupied. Time of installation and recovery, vulnerability to damage by enemy fires and by movement of troops, and availability of equipment often limit the use of wire.

b. Radio Communications. Because of the speed and simplicity of radio installation, radio is the primary means of communication (fig. 19) prior to completion of the smoke unit's wire net. After completion of the wire net, radio is used to supplement wire communications. Radio sets normally remain on listening-silence after wire nets are installed, and radio nets are reactivated as necessary to supplement telephone communications. Radio is especially suitable to mobile situations. While not retaining the reliability of wire communications, radio is often the only means capable of continuous communication. When great distances are involved, radio relay can be used for entry into the area communications system of the supported unit. The vulnerability of radio communications to enemy interception, location, and traffic analysis must be constantly borne in mind by using personnel.

c. Messengers. Messengers provide the most secure means of communication and are the only means available for transmitting articles such as maps, overlays, and documents. Motor messengers are employed when extended distances are involved.

d. Visual and Sound. Visual signaling employs lights, panels, hand signaling, or pyrotechnics, in-

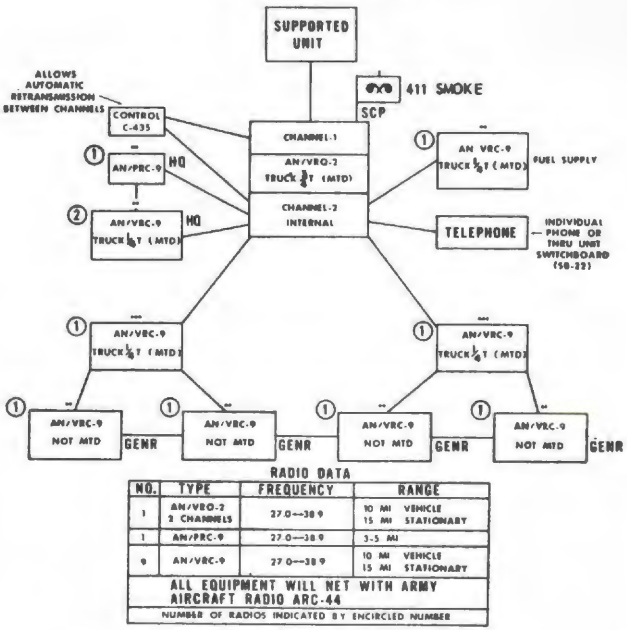

Figure 19. Smoke generator company radio communications net.

cluding colored smokes. Sound signals may be used in combination with visual means. Sound and visual signals are usually used to transmit short prearranged messages.

APPENDIX I

REFERENCES

Department of the Army pamphlets of the 310-series and DA Pam 108–1 should be consulted frequently for the latest changes or revisions of references given in this appendix and for new publications relating to material covered in this manual.

AR 40–205	Military Hygiene and Sanitation.
AR 55–355	Military Traffic Management Regulation.
AR 220–60	Battalions, Battle Groups, Squadrons; General Provisions.
AR 220–70	Companies; General Provisions.
AR 310–110	Orders, Bulletins, Circulars, and Memorandums Issued from Headquarters of Field Commands.
AR 320–5	Dictionary of United States Army Terms.
AR 320–50	Authorized Abbreviations.
AR 340–15	Correspondence.
AR 370–5	Qualification and Familiarization.

AR 380–5	Safeguarding Defense Information.
AR 385–63	Regulations for Firing Ammunition for Training, Target Practice, and Combat.
AR 700–2300–1	Motor Vehicles.
AR 735–2	Transfer of Property Accountability and Responsibility.
AR 735–11	Accounting for Lost, Damaged, or Destroyed Property.
AR 735–35	Supply Procedure for TOE Units, Organizations, and Non-TOE Activities.
AR 750–5	Maintenance Responsibilities and Shop Operation.
SR 40–210–11	Prevention and Control of Communicable Diseases of Man; Venereal Diseases (Venereal Disease Epidemiologic Report).
SR 55–720–1	Preparation for Oversea Movement of Units (POM).
FM 3–5	Tactics and Technique of Chemical, Biological, and Radiological Warfare.
FM 3–8	Chemical Corps Reference Handbook.
FM 5–15	Field Fortifications.
FM 5–20	Camouflage, Basic Principles.
FM 7–40	Infantry Regiment.

FM 11–8	Field Radio Relay Techniques.
FM 11–10	The Signal Battalion, Infantry Division.
FM 19–40	Handling Prisoners of War.
FM 20–32	Employment of Land Mines.
FM 21–5	Military Training.
FM 21–6	Techniques of Military Instruction.
FM 21–10	Military Sanitation.
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 Atomic, Biological, and Chemical Warfare.
FM 21–41	Soldier's Handbook for Nuclear, Biological, and Chemical Warfare.
FM 21–48	CBR Training Exercises.
FM 21–75	Combat Training of the Individual Soldier and Patrolling.
FM 22–5	Drills and Ceremonies.
FM 22–100	Command and Leadership for the Small Unit Leader.
FM 24–5	Signal Communications.
FM 24–18	Field Radio Techniques.
FM 24–20	Field Wire Techniques.
FM 25–10	Motor Transportation Operations.

FM 26–5	Interior Guard.
FM 27–5	United States Army and Navy Manual of Civil Affairs/Military Government.
FM 27–10	The Law of Land Warfare.
FM 30–5	Combat Intelligence.
FM 31–15	Operations Against Airborne Attack, Guerilla Action, and Infiltration.
FM 31–25	Desert Operations.
FM 31–60	River-Crossing Operations.
FM 31–70	Basic Arctic Manual.
FM 31–71	Operations in the Arctic.
FM 31–72	Administration in the Arctic.
FM 31–73	Skiing and Snowshoeing.
FM 57–30	Airborne Operations.
(C) FM 60–10	Amphibious Operations; Regiment in Assault Landings (U).
FM 70–10	Mountain Operations.
FM 72–20	Jungle Operations.
FM 100–5	Field Service Regulations; Operations.
FM 100–10	Field Service Regulations; Administration.
FM 101–5	Staff Officers' Field Manual; Staff Organization and Procedure.
FM 101–10	Staff Officers' Field Manual; Organization, Technical, and Logistical Data.

TM 3–205	Protective Masks and Accessories.
TM 3–220	Decontamination.
TM 3–240	Field Behavior of Chemical Agents.
TM 3–290	Individual Protective and Detection Equipment.
TM 3–300	Ground Chemical Munitions.
TM 3–366	Flame Thrower and Fire Bomb Fuels.
TM 3–381	Generator, Smoke, Mechanical, M2 (50 Gallon).
TM 3–390	Generator, Smoke, M3A1.
TM 3–400	Chemical Bombs and Clusters.
TM 3–431	Generator, Smoke, Mechanical, M3A2.
TM 5–295	Military Water Supply.
TM 8–285	Treatment of Chemical Warfare Casualties.
TM 9–2810	Tactical Motor Vehicle Inspections and Preventive Maintenance Services.
TM 10–260	Quartermaster Salvage in the Theater of Operations.
TM 10–402A	Mess Management Workbook.
TM 11–286	Radio Sets, AN/VRC–8, AN/VRC–9, and AN/VRC–10.
TM 11–287	Radio Sets, AN/VRQ–1, AN/VRQ–2, and AN/VRQ–3.
TM 11–2155	Telephone Set TA–312/PT.
TM 11–2202	Manual Telephone Switchboard SB–22/PT.

TM 57–210	Air-Movement of Troops and Equipment.
DA Pam 108–1	Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.
DA Pam 310–1	Index of Administrative Publications.
DA Pam 310–2	Index of Blank Forms.
DA Pam 310–3	Index of Training Publications.
DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
DA Pam 310–5	Index of Graphic Training Aids and Devices.
DA Pam 310–7	Index of Tables of Organization and Equipment, Tables of Organization, Type Tables of Distribution, and Tables of Allowances.
DA Pam 310–23	Index of Supply Manuals—Chemical Corps.
TOE 3–266D	Headquarters and Headquarters Detachment, Chemical Smoke Generator Battalion.
TOE 3–267D	Chemical Smoke Generator Company.
TA 20–2	Equipment for Training Purposes.
TA 21 (Mob)	Clothing and Equipment.
TA 23–100	Ammunition for Training.

ATP 3–267	Army Training Program for Chemical Company (Smoke Generator).
ATP 3–301	Army Training Program for Headquarters and Headquarters Detachment, Chemical Smoke Generator Battalion.
ASubjScd 3–9	Flame Thrower and Fire Bomb Fuels.

APPENDIX II

OUTLINE OF AN SOP FOR A CHEMICAL SMOKE GENERATOR UNIT

(CLASSIFICATION)

Issuing Headquarters
Place of Issue
Date

(The amount of detail will depend on the state of training of the unit. Omit paragraphs not applicable.)

1. General

a. Application. Pertains to operations, relation to prior SOP's, lower units to conform.

b. Purpose. Scope of SOP.

c. References. AR's, SR's, FM's, TM's, and SOP's of higher headquarters.

d. Responsibility for SOP. Preparation, changes, and revisions.

e. Effective date.

2. Organization

a. General. Instructions of general nature.

b. Normal. See TOE.

c. Special internal attachments and organization. See reduced strength column of TOE.

(CLASSIFICATION)

d. Normal and special; external attachments and support.

e. Command posts.

(1) *Normal location.*

(2) *Method of reporting change of location.* Coordinates and time.

f. Additional duties of personnel.

g. Liaison.

(1) *Duties of liaison personnel.*

(2) *Responsibilities for liaison* (with next higher, next lower, and adjacent units).

3. Administration

a. General. Channels.

b. Reports. Routine, special information concerning submission of reports.

(1) *Title and reports control symbol.*

(2) *Form for report.*

(3) *Date due.*

(4) *Number of copies.*

(5) *Negative report required or permissible.*

c. Replacements. Procedures for requisitioning.

d. Promotions (policies).

(1) *Battlefield.*

(2) *Normal.*

e. Courts-martial.

(1) *Local jurisdiction.*

(2) *Procedure for submitting cases.*

f. Burials and graves registration.

g. Mail.

(1) *Handling of official mail.*

(2) *Handling of personal mail.*

h. Leaves and passes.

(1) *Policy of command* (frequency, conduct, and VD policies).

(2) *Authority to grant.*

i. Journals and histories.

(1) *Unit journal.*

(2) *Unit history.*

(3) *Staff (company) section journals.*

j. Civilian employees.

(1) *Channels for requesting.*

(2) *Utilization.*

(3) *Clearances.*

(4) *Passes and identification.*

k. Awards and decorations.

(1) *Channels.*

(2) *Forms.*

(3) *Presentation.*

l. Orders—administrative preparation.

(1) *Combat* (overlay order type).

(2) *Routine.*

m. Billets and bivouacs.

(1) *Billeting policies* (occupation and vacating).

(2) *Quartering party* (organization and duties).

n. Internal arrangement.
- (1) *Duties of personnel.*
- (2) *Communications.*
- (3) *Location of facilities.*

o. Military government.

p. Special services.

q. Miscellaneous.

4. Intelligence and Reconnaissance

a. Reconnaissance and observation.
- (1) *Reconnaissance party.*
  - (*a*) *Composition.*
  - (*b*) *Duties.*
- (2) *Air.*
- (3) *Ground.*
- (4) *Air warning.*
- (5) *Information to be reported.*

b. Handling prisoners of war, documents, and materiel.
- (1) *See FM 27–10.*
- (2) *Special instructions for handling POW's.*
- (3) *Enemy documents.*
  - (*a*) *Document searches.*
  - (*b*) *Marking of documents.*
  - (*c*) *Disposition of documents.*
- (4) *Enemy materiel.*
  - (*a*) *Particular items desired.*
  - (*b*) *Disposition of items.*
  - (*c*) *Guarding of items.*
  - (*d*) *Reporting.*

c. Maps and aerial photos.

(1) *Request for maps and aerial photos.*

(2) *Basis of distribution.*

d. Counterintelligence.

(1) *Mail censorship.*

(2) *Blackout discipline.*

(3) *Extent of information given if captured* (code of conduct).

(4) *Signs and countersigns.*

(5) *Destruction of classified material.*

(6) *Civilian control.*

(7) *Security discipline.*

(8) *Escapees and evaders.*

e. Reports and distribution.

(1) *Special reports.*

(2) *Routine reports.*

(3) *Spot reports.*

(4) *Negative reports.*

5. Operations

a. General. Reference SOP's of higher headquarters; march orders and SOP's of supported unit.

b. Operations.

(1) *In the battle area.*

(2) *Outside the battle area.*

(3) *Amphibious.*

(4) *Operations under special conditions.*

c. Operational control.

(1) *Tactical.*

(2) *Technical.*

d. Reconnaissance, selection, and occupation of positions.

e. Operation and control of smoke installation.

(1) *Fuel supply section.*

(2) *Smoke line.*

(3) *Company headquarters.*

(4) *Smoke control point.*

f. Training.

6. Movements

a. General.

b. Tactical.

c. Administrative.

d. Motor movement.

(1) *Preparation of vehicles.* See detailed loading plan.

(2) *Motor marches.*

(*a*) *Strip maps.*

(*b*) *Route reconnaissance.*

(*c*) *Messing and refueling.*

(*d*) *Night marches.*

(*e*) *Order of march.*

(*f*) *Units and serials.*

(*g*) *Distances between vehicles.*

(*h*) *Speeds and rates of march.*

(*i*) *Posting of guards and guides.*

(3) *Maintenance on marches and movements.*
(4) *Trail officer.*
(5) *Security.*

e. Rail movement.

f. Air movement.

g. Water movement.

7. Security

a. General (policies and responsibilities).

b. Security during movement.
(1) *Air guards.*
(2) *Manning weapons.*
(3) *Camouflage during halts.*
(4) *Advance, flank, and rear guards.*
(5) *Action in case of attack.*
(*a*) *Air.*
(*b*) *Ground.*
(*c*) *CBR and nuclear.*

c. Security in bivouac.
(1) *Camouflage.*
(2) *Mines and boobytraps.*
(3) *Placement of weapons.*
(4) *Joint security.*
(5) *Security plans* (internal guard).
(6) *Sentry posts.*

d. Security for working parties.

e. Warning signals.
(1) *Air attack.*
(2) *Airborne attack.*

(3) *Ground attack.*
(4) *CBR attack.*

f. Fire safety and fire fighting.
(1) *Plan.*
(2) *Personnel and duties.*
(3) *Safety requirement.*

g. Alert plans.
(1) *Air.*
(2) *Airborne.*
(3) *Ground.*

8. Communications

a. Types of communication.
(1) *Wire.*
(2) *Radio.*
(3) *Visual.*

b. Communication between units.
(1) *Wire.*
(2) *Radio.*
(3) *Visual.*

c. Communication procedures.
(1) *Signal.*
(2) *SOI and SSI.*

d. Maintenance responsibilities.

9. Supply

a. Organization supply.

b. Rations and water.

c. Supplies and equipment.
(1) *Evacuation.*

(2) *Resupply.*
(3) *Service.*
(4) *Salvage.*

d. Fuel supply.
(1) *Basic load.*
(2) *Resupply.*

e. Transportation (mess and organizational equipment).

f. Maintenance of vehicles and equipment.
(1) *Responsibilities.*
(2) *Scheduling.*
(3) *Parts and equipment records.*

g. Medical evacuation.

BROWN
Lt Col

Annexes:
Distribution: A
OFFICIAL:
/s/ Martin
MARTIN
S3

APPENDIX III

TYPE SMOKE PLAN

(CLASSIFICATION)

COPY NO. 4
10th Inf Div
BRIETENGUSBACH (8431)
101455 Jul 19_____
BG_____

Annex G (Smoke Plan) to OpnO 12

Map: GERMANY, 1:50,000, BAMBERG, HASFURT.

1. Situation

a. Enemy forces. Annex A (Intel) and current items.

b. Friendly forces.

(1) OpnO 12 and Annex B (Opn Overlay) to OpnO 12.

(2) 14th Cml Bn (SG) will support V Corps bridge installations and marshaling areas for helicopter operations.

c. Attachments and detachments.

(1) One fixed wing aircraft from division aviation company.

(2) Attach one platoon to 1/87 Infantry.

(CLASSIFICATION)

2. Mission

11th Cml Bn (SG) GS furnish smoke coverage at all division crossing sites and support division deception plan.

3. Execution

a. Concept of operation. Cml Bn (SG) support division crossing by continuous smoke haze from 111200 until ordered to stop smoke.

(1) Provide one company to support operations of each forward battle group.

(2) Provide one company for deception mission in zone of 1st Inf Div. Direct communication authorized with CmlO, 1st Inf Div. Establish by 102400.

(3) Provide one platoon to 1/87 Inf for landing deception operation. Platoon attached effective 110400.

b. Coordinating instructions.

(1) Smoke control through div FSCC.

(2) Div avn company furnish one fixed wing aircraft for smoke surveillance and control.

(3) Maintain haze during hours of darkness.

(4) Crossing priorities established H–4 hr dependent on metro conditions.

4. Administration and Logistics

a. Div Class III (885 522) OPEN D–2 Div will provide fog oil for opn.

b. Class V (822 424) OPEN D+1.

5. Command and Signal

a. Signal. Index 1–1 current div SOI in effect.

b. Command. CP 11th Cml Bn (SG) located vic div CP.

Acknowledge.

DIGAN
Maj Gen

Distribution: A
OFFICIAL:
/s/ Benner
BENNER
G3

APPENDIX IV

TYPE OPERATION ORDER FOR A CHEMICAL SMOKE GENERATOR BATTALION

(CLASSIFICATION)

COPY NO. 5
811th Cml Bn (SG)
AICHKIRCHEN (QU017323)
GERMANY
022200 Jun 19_____
GA 107

Operation Order 56

Map: GERMANY, 1:100,000, REGENSBURG.

1. Situation

a. Enemy forces.

(1) Aggressor XXIV Rifle Corps continues defense of DONAU RIVER LINE.

(2) Enemy expected to continue use of chemical agents in zone.

(3) Continued use of nuclear weapons by aggressor expected.

(4) Aggressor capable of 285 fighter bomber sorties daily.

b. Friendly forces. 10th U. S. INF DIV attacks 052300 Jun in zone to force crossing of

(CLASSIFICATION)

DONAU RIVER and prepare for pass through of 301st Armd Div.

2. Mission

This battalion provides smoke support for 203d Inf Div along DONAU RIVER.

3. Execution

a. Concept of operation. 811th Cml Bn (SG) will provide a smoke haze in support of assault river crossing of 203d Inf Div. This unit will plan for 360° coverage of operational area.

b. 21st Cml Co (SG). Atch 1st Plat 51st Cml Co (SG). Provide continuous smoke over DONAU RIVER in zone of 2/87 Inf. Emphasis to crossing sites at QU145218 and QU148230 and bridge at 183232.

c. 620th Cml Co (SG). Atch 51st Cml Co (SG) (—). Provide continuous smoke haze over DONAU RIVER from KAPFELBERG (QU186243) to MINORITENHOF (TQ-828292). Estb Radio relay on Bn Cml Net Vic (QU185289).

d. 69th Cml Co (SG). Provide continuous smoke coverage over junction of DONAU—NAAB RIVER (TQ830366) South to Ferry site at SINZING (TQ840311).

e. 51st Cml Co (SG). 1st Plat atch 21st Cml Co (SG), CO (—) atch 620th Cml Co.

f. Coordinating instructions.

(1) Units plan 360° river line coverage.

(2) Priorities of crossing smoke equipment announced 050100.

(3) Maximum use of floating pots for position coverage.

(4) Companies establish initial positions after 031000 Jun. Prepare to make smoke by 040300 Jun.

(5) 57th, 103d, 272d furnish liaison to 2/87 Inf, 2/7 Inf, 1/19 Inf, respectively.

(6) Smoke haze continuous during hours of daylight, 50% operations during hours of darkness until moonset. 25% operation from moonset until daylight.

(7) Smoke control by this headquarters.

(8) Make and Stop Smoke on battalion order.

(9) Make smoke at 040300 in event of communications failure.

4. Administration and Logistics.

AdminO 14.

5. Command and Signal

a. Signal.

(1) SOI and SSI 203d Inf Div.

(2) Radio Silence until H plus 2 hr.

(3) Bn relay station (QU185289) ALT NCS.

b. Command.

(1) Bn CP FRAUENHAUSEL (QU130253).

(CLASSIFICATION)

(2) Smk positions complete by 040200.

(3) Report CP locations.

Acknowledge.

JONES
Lt Col

Annexes: A—Operations Overlay (omitted)

DISTRIBUTION: A
203d Inf Div
301st Armd Div
101st Cml Gp

OFFICIAL:
/s/ Adams
ADAMS
S3

(CLASSIFICATION)

APPENDIX V

TYPE ADMINISTRATIVE ORDER FOR A CHEMICAL SMOKE GENERATOR BATTALION

(CLASSIFICATION)
COPY NO. 3
812th Cml Bn (SG)
AICHKIRCHEN (QU017323)
GERMANY
031200 Jun 19_____
GB 106

Administrative Order 14
Map: GERMANY, 1:100,000, REGENSBURG.

1. Supply

a. Cl I.

(1) Div distribution point, THONCOHE (PV967348).

(2) Schedule for distribution:
All units—0145.

b. Cl II and IV. Army depots, all services, ZELL (PV920290).

c. Cl III.

(1) Army supply point for fog oil only: DEITFURT (PV890350).

(2) Div distribution point for all Class III,

(CLASSIFICATION)

less fog oil:
PAINTEN (QV060370).

d. Cl V. ASP 902, DEITFURT.

e. Maps. Unit distribution (SOP).

f. Water.

(1) Water supply point 1, ELCHOFEN (QU140334).

(2) Water supply point 2, NEVESSING (QV044240).

(3) Local water contaminated.

g. Captured materiel. Bn SOP.

h. Salvage. Bn SOP.

2. Evacuation and Hospitalization

Battle casualties evacuate through the facilities of the unit to which attached.

3. Transportation

a. Main supply route: WILLENHOFTEN (PV-995441)—DVERLING (QV124357); two-way traffic.

b. Highway WALDORE (QV095250) — HEMAU (QV035370); one-way.

c. Highway DUERLING—BERATZHAUSEN (PV050420); one-way.

d. Request clearance for all highway use through Bn S4.

(CLASSIFICATION)

4. Service

QM. 311th QM Co, AICHKIRCHEN. Shower and bath schedule:

21st Cml Co (SG);	
Hq 11th Cml Bn (SG)	1740–1810.
51st Cml Co (SG)	0940–1010.
620th Cml Co (SG)	1000–1030.
69th Cml Co. (SG)	1050–1125.

5. Personnel

a. Strengths. Personnel daily summary as of 1800 submitted by 2000.

b. Prisoners of war. Process through Hq, SPTD UNIT.

c. Morale and personnel services. Mail pickup on 0700–1900 MSGR.

6. Miscellaneous

Special reports.

Generator fire reports daily 1900.

Acknowledge.

SMITH
Lt Col

Distribution: A
OFFICIAL:
/s/ Jones
JONES
S4

(CLASSIFICATION)

APPENDIX VI
TYPE UNIT REPORT

(CLASSIFICATION)

HEADQUARTERS

(UNIT)

UNIT REPORT

From_____ To_____

(Supporting documents such as maps, sketches, overlays, or photographs are required for inclusion with this report to classify the subject discussed.)

Section I. GENERAL

1. References

(May be to a previous report.)

2. Organization

Indicate any organization changes made to facilitate operations. Note which type unit or TOE is being employed.

3. Personnel

a. This paragraph should include morale of unit and the number of personnel over or short,

replacements received, augmentations from civilian labor pools, anticipated losses, and attached allied military personnel.

b. Casualties. Briefly explain causes if known.
(1) Battle.
(2) Other.

4. Training

Relate purpose and the subjects stressed.

5. Troop Movements

Type of movement (administrative or tactical), difficulties encountered, security, organization, place, and time.

6. Operations

Describe in detail any action, activity, experience, or operation which applies to training or instruction and contributes a lesson learned, illustrates a success or failure, or points out a need for change in doctrines or techniques. This account may include all or parts of the unit. It should cover, *but not be limited to,* background and experience of the unit, assigned mission, orders, situation, supporting and adjacent units, plans of own operations, details of execution, and degree of failure or success. Append overlays of all operations. Describe tactical or technical improvisations, innovations, or expedients developed by the unit.

Section II. COMMANDER'S RECOMMENDATIONS

The commander may express and substantiate his views on any subject such as combined or joint operations, training, organization, weapons, equipment, tactics, techniques, doctrines, and procedures in the fields of personnel, intelligence, operations, supply, and civil affairs, within or affecting his command; new application of existing administrative or operational techniques and procedures; effectiveness, maintenance capabilities, durability, and simplicity in operation of weapons and equipment; subjects which should receive additional or less emphasis in training; and economies which can be effected in TOE. During the early stages of operations, information is of particular value describing techniques or tactics which were especially effective or which evidenced shortcomings, as well as gaps, successes, and failures in combat and support; and the effect of terrain and weather on operations.

Commanding

APPENDIX VII

TYPE LOADING PLAN FOR A CHEMICAL SMOKE GENERATOR COMPANY

(VEHICLE LOADING)

TRUCK NO. 1

Truck, utility, ¼-ton, 4 x 4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Company commander
1 Company clerk
1 Radio-telephone operator

Equipment:

1 Detector kit, chemical agent
3 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Compass, magnetic, unmounted, lensatic wet or dry
1 Machete, rigid handle, 18 inches long, with sheath
1 Shovel, hand, round point, D-handle, No. 2, open back
3 Bayonet-knife, with scabbard, carbine
1 Binocular, 6 x 30, military, reticle
1 Gun, machine, 7.62-mm, lightweight, general purpose
1 Mount, tripod, machinegun, 7.62-mm
3 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel

(Truck No. 1—Continued)

1 Can, gasoline, 5-gallon capacity
1 Can, water, 5-gallon
2 Goggles, M–1944
1 Panel, signal, VS–17 GVX
2 Tube, flexible nozzle
2 Flashlight, MX–991/U
1 Handset-headset, H–144/U
1 Radio set, AN/VRC–9, mounted in truck
1 Launcher, rocket, 3.5-inch

TRUCK NO. 2

Truck, cargo, ¾-ton, 4x4

Personnel:

1 Communications chief
1 Weather observer
1 Radio-telephone operator
1 Wireman

Equipment:

4 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Compass, magnetic, unmounted, lensatic, wet or dry
1 Mattock, pick, with handle, 5-pound
1 Battery, storage, lead, acid charged, wet, No. 2H
3 Bayonet-knife, with scabbard, carbine
1 Launcher, rocket, 3.5-inch
1 Rifle, 7.62-mm, selective automatic, semi-automatic, heavy barrel
3 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel

(Truck No. 2—Continued)

2 Can, gasoline, 5-gallon capacity
1 Can, water, 5-gallon
2 Goggles, M–1944
2 Tube, flexible nozzle
1 Amplifier, power supply, AM–598/U
1 Anemometer, ML–497 ( )/PM
2 Flashlight, MX–991/U
1 Radiac detector charger, PP–630/PD
2 Radiacmeter, IM–93/UD
2 Radiacmeter, IM–108( )/PD
1 Tool, equipment, TE–33
1 Telephone set, TA–312/PT
1 Radio set, AN/PRC–9
1 Radio set, AN/VRQ–2, mounted in truck

TRUCK NO. 3

Truck, utility, ¼-ton, 4x4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Operations officer
1 Operations sergeant
1 Radio-telephone operator

Equipment:

3 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Compass, magnetic, unmounted, lensatic, wet or dry
1 Magnifier, self-illuminated, 2-inch diameter
1 Scale, plotting, flat, rectangular, graduation yards meters, 1 to 20000 map ratio, 10 inches long

(Truck No. 3—Continued)

1 Shovel, hand, round point, D-handle, No. 2, open back
1 Stereoscope lens, 4½ inches focal length of lens
1 Tape, measuring, steel, ⅜ inches wide, graduated in eighths, inches, and feet, 50 feet long
3 Bayonet-knife, with scabbard, carbine
3 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
2 Watch, wrist, grade II
1 Can, gasoline, 5-gallon capacity
1 Can, water, 5-gallon
2 Goggles, M–1944
1 Lantern, gasoline, leaded fuel
1 Panel, signal, VS–17 GVX
1 Ruler, maple, brass edge, 18-inch
2 Tube, flexible nozzle
2 Flashlight, MX–991/U
1 Handset-headset, H–144/U
1 Telephone set, TA–312/PT
1 Radio set, AN/VRC–9, mounted in truck

TRUCK NO. 4

Truck, cargo, ¾-ton, 4x4

Personnel:

1 Senior wireman
1 Switchboard operator
2 Wireman
1 Wireman's helper

(Truck No. 4—Continued)

Equipment:

5 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
5 Belt, safety, industrial, lineman's, 49½ inches long, body belt 39½-inch waist size
1 Floodlight set, electric, portable, with double contact base, 6-volt
1 Mattock, pick, with handle, 5-pound
1 Shovel, hand, round point, D-handle, No. 2, open back
5 Bayonet-knife, with scabbard, carbine
1 Gauge, climbers, steel 2⅛ inches wide, 1 leg 1 1/16 inches long, 1 leg ⅝ inch long, 3-inch opening, 3 reference line markings
2 Rifle, 7.62-mm, selective automatic, semiautomatic, heavy barrel
3 Rifle, 7.62-mm, selective automatic, semiautomatic, light barrel
2 Can, gasoline, 5-gallon capacity
2 Can, water, 5-gallon
1 Carrier, wire cutter
1 Cutter, wire
2 Goggles, M–1944
2 Tube, flexible nozzle
1 Axle, RL–27
5 Climbers, LC–240/U
2 Flashlight, MX–991/U
5 Gloves, PH–46
3 Reel, equipment, CE–11

(Truck No. 4—Continued)

3 Reel, unit, RL–31
3 Spool, DR–8
1 Switchboard, telephone, manual, SB–22/PT
1 Terminal strip, TM–184
18 Wire, WD–1/TT, in wire dispenser, MX–306/G each
8 Wire, WD–1/TT, on wire reel, RL–159/U MI
1 Wire pike, MC–123

TRUCK NO. 5

Truck, cargo, 2½-ton, 6x6, long wheelbase, with winch, with trailer, tank, water, 1½-ton, 2-wheel

Personnel:

1 Mess steward
2 First cook
2 Cook
1 Cook's helper

Equipment:

6 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Mattock, pick, with handle, 5-pound
1 Shovel, hand, round point, D-handle, No. 2, open back
4 Shovel, hand, round point, long handle, No. 2
6 Bayonet-knife, with scabbard, carbine
1 Chain assembly, single-leg, ⅝ inch x 16 feet
1 Gun, machine, cal. .50 Browning heavy barrel, flexible

(Truck No. 5—Continued)

1 Mount, tripod, machinegun, cal. .50
6 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
1 Watch, wrist, grade II
1 Bag, canvas, water sterilizing, porous, complete with suspension ropes and cover
2 Bucket, general purpose, metal, galvanized, heavy weight, without lip, 14-quart
2 Can, corrugated, nesting, galvanized, with cover, 10-gallon
8 Can, corrugated, nesting, galvanized, with cover, 32-gallon
4 Can, gasoline, 5-gallon capacity
2 Can, water, 5-gallon
3 Container, food, insulated
6 Cookset, mountain
1 Goggles, M–1944
6 Heater, immersion type for cans, corrugated
1 Heater, water, immersion, gas operated
1 Lantern, gasoline, leaded fuel
1 Outfit, officers' mess
1 Range, field, A pack
3 Range, field, B pack
6 Stove, cooking, gasoline, 1-burner, w/case
1 Tent, kitchen, flyproof, complete w/pins-poles
5 Tube, flexible nozzle
1 Flashlight, MX–991/U
1 Telephone, set, TA–312/PT

TRUCK NO. 6

Truck, cargo, ¾-ton, 4x4

Personnel:

1 First sergeant
1 Personnel administrative clerk
1 Wireman
1 Supply sergeant

Equipment:

4 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Compass, magnetic, unmounted, lensatic, wet or dry
1 Mattock, pick, with handle, 5-pound
1 Shovel, hand, round point, D-handle, No. 2, open back
1 Toolkit, carpenter's, set 2, Engineer platoon, platoon, with case
4 Bayonet-knife, with scabbard, carbine
4 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
2 Watch, wrist, grade II
1 Bucket, general purpose, metal, galvanized, heavy weight, without lip, 14-quart
1 Burner, oil, stove, tent
2 Can, gasoline, 5-gallon capacity
2 Can, water, 5-gallon
1 Case, field, office machine, 18½ x 13¼ x 17 inches
2 Chair, folding
1 Clock, alarm
1 Desk, field, empty fiber, company

(Truck No. 6—Continued)

1 Desk, field, M–1945
2 File, paper, clipboard, 9 inches wide, 15½ inches long
1 Flag, guidon, bunting
1 Goggles, M–1944
1 Kit, barber, with case
1 Lantern, gasoline, leaded fuel
4 Panel, signal, VS–17 GVX
1 Perforator, nonadjustable, 2-hole
1 Safe, field, combination lock
1 Screen, latrine, complete with pins-poles
1 Stapler, paper, fastening, office-type, light duty
1 Stove, tent
2 Table, camp, folding
1 Tent, command post, complete with pins-poles
4 Tube, flexible nozzle
1 Typewriter, nonportable, 11-inch carriage
1 Typewriter, portable, with carrying case
1 Cipher, machine, TSEC/KL–7
2 Detector set, AN/PRS–3
2 Flashlight, MX–991/U
1 Telephone set, TA–312/PT
1 Tool, equipment, TE–33

TRUCK NO. 7

Truck, cargo, 2½-ton, 6x6, long wheelbase, with case

Personnel:

1 Senior wheel mechanic

(Truck No. 7—Continued)

1 Welder
1 Mechanic's helper
1 Armorer

Equipment:

4 Mask, protective, field
2 Respirator, air filtering, paint spray
1 Ax, single bit, 4-pound, 36 inches long
1 Mattock, pick, with handle, 5-pound
1 Shovel, hand, round point, D-handle, No. 2, open back
4 Bayonet-knife, with scabbard, carbine
1 Chain assembly, single-leg, 5/8 inch x 16 feet
1 Rifle, 7.62-mm, selective automatic, semi-automatic, heavy barrel
3 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
1 Tool kit, armorer's
1 Tool kit, organizational maintenance, No. 1, common
1 Tool kit, welder's
2 Can, gasoline, 5-gallon capacity
1 Goggles, M–1944
1 Tube, flexible nozzle
1 Flashlight, MX–991/U
1 Tool set, organizational maintenance (2d echelon), No. 7, hoist and towing

TRUCK NO. 8

Truck, cargo, 2½-ton, 6 x 6, long wheelbase, with winch, with trailer, cargo, 1½-ton, 2-wheel

(Truck No. 8—Continued)

Personnel:

1 Motor sergeant
3 Wheel vehicle mechanic
1 Mechanic's helper

Equipment:

5 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Mattock, pick, with handle, 5-pound
1 Shovel, hand, round point, D-handle, No. 2, open back
5 Bayonet-knife, with scabbard, carbine
5 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
1 Tool set, organizational maintenance (2d echelon), No. 5, oxyacetylene
3 Can, gasoline, 5-gallon capacity
1 File, paper, clipboard, 9 inches wide, 15½ inches long
1 Goggles, M–1944
1 Heater, tent, gasoline, 250000 BTU
1 Tent, maintenance, shelter, with frame and pins
2 Tube, flexible nozzle
1 Flashlight, MX–991/U
3 Toolkit, general mechanic

TRUCK NO. 9

Truck, cargo, ¾-ton, 4x4

Personnel:

1 Senior smoke generator mechanic
2 Smoke generator mechanic's helper

(Truck No. 9—Continued)

Equipment:

3 Mask, protective, field
2 Tachometer, mechanical, hand-held
2 Tool set, mechanical smoke generator
1 Ax, single bit, 4-pound, 36 inches long
1 Mattock, pick, with handle, 5-pound
1 Shovel, hand, round point, D-handle, No. 2, open back
3 Bayonet-knife, with scabbard, carbine
1 Rifle, 7.62-mm, selective automatic, semi-automatic, heavy barrel
2 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
2 Can, gasoline, 5-gallon capacity
1 Goggles, M–1944
1 Tube, flexible nozzle
1 Telephone set, TA–312/PT
1 Flashlight, MX–991/U

TRUCK NO. 10

Truck, utility, ¼-ton, 4x4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Fuel supervisor, officer
1 Supply handler

Equipment:

2 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Shovel, hand, round point, D-handle, No. 2, open back

(Truck No. 10—Continued)

2 Bayonet-knife, with scabbard, carbine
1 Launcher, rocket, 3.5-inch
2 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
1 Can, gasoline, 5-gallon capacity
1 Chair, folding
1 Cutter, wire
1 File, paper, clipboard, 9 inches wide, 15½ inches long
1 Goggles, M–1944
1 Table, camp, folding
1 Tube, flexible nozzle
1 Radio set, AN/VRC–9, mounted in truck
1 Telephone set, TA–312/PT
1 Flashlight, MX–991/U

TRUCK NO. 11

Truck, cargo, 2½-ton, 6x6, long wheel base, with winch, with trailer, tank, water, 1½-ton, 2-wheel

Personnel:

1 Fuel supply supervisor
1 Senior light truck driver
1 Supply handler

Equipment:

3 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Mattock, pick, with handle, 5-pound
1 Shovel, hand, round point, D-handle, No. 2, open back
3 Bayonet-knife, with scabbard, carbine

(Truck No. 11—Continued)

1 Chain assembly, single-leg, 5/8 inch x 16 feet
1 Gun, submachine, cal. .45
2 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
2 Can, gasoline, 5-gallon capacity
1 Goggles, M–1944
1 Heater, water immersion, gas-operated
1 Lantern, gasoline, leaded fuel
1 Tube, flexible nozzle
16 Oil, fog, SGF, in 55-gallon drums
12 Can, water, 5-gallon
1 Flashlight, MX–991/U
1 Watch, wrist, grade II
Part of basic load of ammunition

TRUCK NO. 12

Truck, cargo, 2½-ton, 6x6, long wheelbase, with winch, with trailer, cargo, 1½-ton, 2-wheel

Personnel:

1 Light truck driver
1 Supply handler

Equipment:

2 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Mattock, pick, with handle, 5-pound
1 Shovel, hand, round point, D-handle, No. 2, open back
2 Bayonet-knife, with scabbard, carbine
1 Gun, machine, 7.62-mm, lightweight, general purpose

(Truck No. 12—Continued)

1 Mount, tripod, machinegun, 7.62-mm
2 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
17 Can, gasoline, 5-gallon capacity
1 Goggles, M–1944
1 Tube, flexible nozzle
16 Oil, fog, SGF, in 55-gallon drums
50 Pot, smoke, HC, M5
12 Can, water, 5-gallon
1 Flashlight, MX–991/U

TRUCK NO. 13

Truck, cargo, 2½-ton, 6x6, long wheelbase, with trailer, cargo, 1½-ton, 2-wheel

Personnel:

Same as for Truck No. 12.

Equipment:

Same as for Truck No. 12, except as follows:

Delete—

1 Gun, machine, 7.62-mm, lightweight, general purpose
1 Mount, tripod, machinegun, 7.62-mm
50 Pot, smoke, HC, M5

Add—

50 Pot, smoke, floating, AN–M7

TRUCK NO. 14

Same as Truck No. 13

Personnel:

Same as for Truck No. 13.

(Truck No. 14—Continued)

Equipment:

Same as for Truck No. 13, except as follows:

Delete—

50 Pot, smoke, floating, AN–M7

Add—

1 Chain assembly, single-leg, 5/8 inch x 16 feet

TRUCK NO. 15

Same as Truck No. 13

Personnel:

Same as for Truck No. 13, except as follows:

Delete—

1 Light truck driver

Add—

1 Senior light truck driver

Equipment:

Same as for Truck No. 13, except as follows:

Delete—

1 Can, gasoline, 5-gallon capacity

1 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel

50 Pot, smoke, floating, AN–M7

Add—

1 Gun, submachine, cal. .45

TRUCK NO. 16

Same as Truck No. 13

Personnel:

Same as for Truck No. 13.

(Truck No. 16—Continued)

Equipment:

Same as for Truck No. 13, except as follows:

Delete—

1 Can, gasoline, 5-gallon capacity

50 Pot, smoke, floating, AN–M7

TRUCK NO. 17

Same as Truck No. 13

Personnel:

Same as for Truck No. 13.

Equipment:

Same as for Truck No. 13, except as follows:

Delete—

1 Can, gasoline, 5-gallon capacity

50 Pot, smoke, floating, AN–M7

Add—

1 Chain assembly, single-leg, 5/8 inch x 16 feet

TRUCK NO. 18

Same as Truck No. 13

Personnel:

Same as for Truck No. 13.

Equipment:

Same as for Truck No. 13, except as follows:

Delete—

1 Can, gasoline, 5-gallon capacity

TRUCK NO. 19

Same as Truck No. 15

Personnel:

Same as for Truck No. 15.

(Truck No. 19—Continued)

Equipment:

Same as for Truck No. 15.

TRUCK NO. 20

Same as Truck No. 13

Personnel:

Same as for Truck No. 13.

Equipment:

Same as for Truck No. 13, except as follows:

Delete—

50 Pot, smoke, floating, AN–M7

TRUCK NO. 21

Truck, cargo, 2½-ton, 6x6, long wheelbase, with winch, with trailer, cargo, 1½-ton, 2-wheel

Personnel:

Same as for Truck No. 17.

Equipment:

Same as for Truck No. 17, except as follows:

Add—

1 Gun, machine, cal. .50, Browning, heavy barrel, flexible

1 Mount, tripod, machinegun, cal. .50

TRUCK NO. 22

Truck, cargo, 2½-ton, 6x6, long wheelbase, with winch, with trailer, tank, water, 1½-ton, 2-wheel

Personnel:

1 Light truck driver

1 Supply handler

(Truck No. 22—Continued)

Equipment:

2 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Mattock, pick, with handle, 5-pound
1 Shovel, hand, round point, D-handle, No. 2, open back
2 Bayonet-knife, with scabbard, carbine
2 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
2 Can, gasoline, 5-gallon capacity
1 Goggles, M–1944
1 Heater, water, immersion, gas-operated
1 Lantern, gasoline, leaded fuel
1 Paulin, duck, OD, 40x20 feet
6 Pump, barrel, rotary, kerosene or gas, with 6-foot hose and nozzle
1 Tube, flexible nozzle
16 Oil, fog, SGF, in 55-gallon drums
12 Can, water, 5-gallon
1 Flashlight, MX–991/U

TRUCKS NO. 23 and 36

Truck, utility, ¼-ton, 4x4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Platoon leader
1 Platoon sergeant
1 Radio-telephone operator

Equipment:

1 Detector kit, chemical agent
3 Mask, protective, field

(Trucks No. 23 and 36—Continued)

1 Ax, single bit, 4-pound, 36 inches long
1 Machete, rigid handle, 18 inches long, with sheath
1 Scale, plotting, flat, rectangular, graduation yards meters, 1 to 20000 map ratio, 10 inches long
1 Shovel, hand, round point, D-handle, No. 2, open back
1 Tape, measuring, steel, 3/8-inch wide, graduated in eighths, inches, and feet, 50 feet long
3 Bayonet-knife, with scabbard, carbine
1 Binocular, 6x30, military, reticle
1 Galvanometer, blasting, with case and strap
1 Gun, machine, 7.62-mm, lightweight, general purpose
1 Launcher, rocket, 3.5 inch
1 Machine, blasting, 100-cap capacity
3 Rifle, 7.62-mm, selective automatic, semiautomatic, light barrel
1 Can, gasoline, 5-gallon capacity
1 Carrier, wire cutter
1 Cutter, wire
2 File, paper, clipboard, 9 inches wide, 15½ inches long
1 Goggles, M–1944
2 Lantern, gasoline, leaded fuel
1 Tube, flexible nozzle
1 Anemometer, ML–497( )/PM
1 Axle RL–27

(Trucks No. 23 and 36—Continued)

1 Handset-headset, H–144/U
1 Radiacmeter, IM–93/UD
1 Radiacmeter, IM–108( )/PD
1 Radio set, AN/VRC–9, mounted in truck
1 Reel, equipment, CE–11
1 Spool, DR–8
1 Telephone set, TA–312/PT
1 Tool, equipment, TE–33
1 Wire pike, MC–123
2 Flashlight, MX–991/U
1 Watch, wrist, grade II

TRUCKS NO. 24, 30, 37, 43

Truck, utility, ½-ton, 4x4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Section leader
1 Smoke generator operator
1 Smoke generator operator's helper

Equipment:

2 Generator, smoke, mechanical
3 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Machete, rigid handle, 18 inches long, with sheath
1 Shovel, hand, round point, D-handle, No. 2, open back
3 Rifle, 7.62-mm, selective automatic, semiautomatic, light barrel
1 Can, gasoline, 5-gallon capacity
2 Can, water, 5-gallon

(Trucks No. 24, 30, 37, 43—Continued)

1 Goggles, M–1944
3 Tube, flexible nozzle
2 Flashlight, MX–991/U

TRUCKS NO. 25, 26, 28, 31, 32, 34, 38, 39, 41, 44, 45, and 47

Truck, utility, ¼-ton, 4x4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Squad leader
1 Smoke generator operator
1 Smoke generator operator's helper

Equipment:

2 Generator, smoke, mechanical
3 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Shovel, hand, round point, D-handle, No. 2, open back
3 Bayonet-knife, with scabbard, carbine
1 Gun, submachine, cal. .45
2 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
1 Can, gasoline, 5-gallon capacity
2 Can, water, 5-gallon
1 Goggles, M–1944
3 Tube, flexible nozzle
1 Telephone set, TA–312/PT
1 Machete, rigid handle, 18 inches long, with sheath
2 Flashlight, MX–991/U

TRUCKS NO. 27, 29, 40, 42

Truck, utility, ¼-ton, 4x4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Smoke generator operator
1 Smoke generator operator's helper
1 Radio-telephone operator

Equipment:

2 Generator, smoke, mechanical
3 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Shovel, hand, round point, D-handle, No. 2, open back
3 Bayonet-knife, with scabbard, carbine
3 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
1 Can, gasoline, 5-gallon capacity
2 Can, water, 5-gallon
1 Goggles, M–1944
3 Tube, flexible nozzle
1 Flashlight, MX–991/U
1 Radio set, AN/VRC–9

TRUCKS NO. 33 and 46

Truck, utility, ¼-ton, 4x4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Smoke generator operator
1 Smoke generator operator's helper

(Trucks No. 33 and 46—Continued)

Equipment:

2 Generator, smoke, mechanical
2 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Shovel, hand, round point, D-handle, No. 2, open back
2 Bayonet-knife, with scabbard, carbine
2 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
1 Can, gasoline, 5-gallon capacity
2 Can, water, 5-gallon
1 Goggles, M–1944
3 Tube, flexible nozzle
1 Flashlight, MX–991/U

TRUCKS NO. 35 and 48

Truck, utility, ¼-ton, 4x4, with trailer, amphibious, cargo, ¼-ton, 2-wheel

Personnel:

1 Platoon executive officer
1 Smoke generator operator
1 Smoke generator operator's helper

Equipment:

2 Generator, smoke, mechanical
3 Mask, protective, field
1 Ax, single bit, 4-pound, 36 inches long
1 Shovel, hand, round point, D-handle, No. 2, open back
3 Bayonet-knife, with scabbard, carbine

(Trucks No. 35 and 48—Continued)

3 Rifle, 7.62-mm, selective automatic, semi-automatic, light barrel
1 Can, gasoline, 5-gallon capacity
2 Can, water, 5-gallon
1 Goggles, M–1944
3 Tube, flexible nozzle
1 File, paper, clipboard, 9 inches wide, 15½ inches long

APPENDIX VIII

REORGANIZATION OF THE CHEMICAL SMOKE GENERATOR COMPANY INTO A PROVISIONAL FLAME FUEL MIXING UNIT

1. General

This appendix is a guide for the reorganization of the chemical smoke generator company into a provisional flame fuel mixing unit to perform its secondary mission, when required. It is not expected that the entire company will normally be employed to mix flame fuel. It is anticipated that a part of the company will be employed to mix flame fuel while the remainder will be employed to generate smoke.

2. Organization

In general, company, platoon, and section headquarters continue to function in accordance with the TOE organization. Each smoke generator squad is reorganized into a flame fuel mixing team, as required. The total capability is 12 teams.

3. Control

The supported unit operationally controls the flame fuel mixing unit designated to support it. The company and battalion headquarters furnish administrative support. In the event that the

company has a split mission—to generate smoke and to mix flame fuel—the operational support and administrative support continue as above.

4. Training

It will be necessary to train flame fuel mixing teams to learn the characteristics, use, and proper mixing techniques of thickened fuel. Army Subject Schedule 3–9 furnishes guidance for this training.

5. Equipment

The following items of equipment, one per team, will be required:

M1A1 7 CFM power-driven reciprocating compressor
M10A1 flamethrower fuel filling kit
M1 drum tripod hoisting unit
M5 incendiary oil mixing and transferring unit or M4A1 flamethrower service unit
M2A1 portable flamethrower service kit

6. Employment

The entire company may be employed as a provisional flame fuel mixing unit or any of its platoons or sections may be so employed. However, a single squad should not normally be employed as a flame fuel mixing team separated from its supporting headquarters.

APPENDIX IX
TROOP LEADING

1. General

Proper troop leading procedures insure that the smoke unit commander makes maximum use of that period of time between notification of the smoke mission and the start of smoke operations. The smoke unit commander utilizes this period of time to plan and issue instructions to his subordinate unit commanders. However, he makes certain that the maximum time is made available to subordinate leaders for their own reconnaissance, planning, and issuance of orders. The smoke unit commander may use his subordinate leaders, when applicable, to assist him in reconnaissance and planning. The troop leading steps outlined below may be used as a guide by the smoke unit commander to prepare his unit for a smoke mission. Speed of action is essential.

2. Planning (Step 1)

The smoke unit commander plans the use of available time. He begins his estimate, based on the information received from the supported unit commander. He makes a careful analysis of the weather and terrain—the primary factors affecting smoke screens. Initial information pertaining to the weather and terrain is obtained

from the intelligence section of the supported unit. The meteorological data and the local conditions of terrain and vegetation indicate to some extent where the smoke-producing equipment can be located and the quantity and type of equipment that may be required.

a. Weather. Information on the weather should cover predicted weather and prevailing conditions of wind speed and direction. This information must be obtained quickly to enable the unit commander to deploy his unit in the proper locations and to cover the vital area rapidly and effectively.

b. Terrain. In his terrain analysis, the commander considers the operational areas; the surrounding terrain, including road nets, high ground, cover and concealment; and the smoke line. The terrain analysis enables the commander to use the terrain to the best advantage for smoke operation.

c. Estimate of Situation. The smoke unit commander analyzes the possible courses of action to determine the best method by which to accomplish his mission. He makes his initial estimate of the situation just after receiving the supported unit's operation plan and continues the estimate through the completion of his operational smoke plan.

3. Arrangements (Step 2)

Final decisions concerning the activities listed below usually are made during the smoke unit commander's reconnaissance. The commander

makes *arrangements* to expedite the following activities:

a. Movement of Unit. The smoke unit commander determines as early as practicable the time required for the movement of his unit to arrive at the operational area at the appointed time. If time permits, the unit commander may return from his reconnaissance and personally lead his unit from the assembly area to the operational area for deployment. Frequently, the responsibility for initial deployment of the platoons is assigned to the fuel supply officer, who must be informed of the location of the operational area, the route to be used, the desired time of arrival, and the order of march for elements of the unit.

b. Reconnaissance. The smoke unit commander plans his reconnaissance so as to cover his operational area as completely as time permits. If time is limited or if the operational area assigned to the unit is extremely large, the unit commander may assign reconnaissance responsibilities to his staff. Subordinate commanders may accompany the smoke unit commander on reconnaissance. If the situation permits, Army aircraft may be used for air reconnaissance; the unit commander makes arrangements with the staff chemical officer for the airlift.

c. Issuance of Order. The smoke unit commander arranges to issue his operation orders as soon as possible after receipt of the supported unit orders. He should issue his orders early so that the subordinate leaders will have sufficient

time for their own reconnaissance, planning, and issuance of orders.

d. Coordination. Following receipt of the supported unit's orders, the smoke unit commander arranges to contact commanders of all units listed in the orders who are affected by smoke operations. He arranges for final coordination with the following commanders after his reconnaissance:

(1) Supported unit commander to obtain latest enemy information and, if necessary, additional support.

(2) Adjacent commanders to exchange plans for defense.

4. Reconaissance (Step 3)

After determining the requirements for reconnaissance, the smoke unit commander conducts his own personal reconnaissance. He formulates a plan for employment of his unit in accordance with the information he gains during his reconnaissance. He must reconnoiter, or require to be reconnoitered, the vital area to insure smoke coverage regardless of wind direction. This reconnaissance may be made by air or ground transportation but should be in sufficient detail to assist the commander in the development of a sound, workable smoke plan. In many instances he may be required to reconnoiter an area for secondary (dummy) smoke screens.

5. Complete Plan (Step 4)

After completing his reconnaissance, the smoke

unit commander receives recommendations from subordinate unit commanders. Based upon these recommendations and his own reconnaissance, the commander completes his estimate of the situation and revises, as necessary, his preliminary plans.

6. Issuance of Orders (Step 5)

The operation order for the mission is issued at the time and place designated by the smoke unit commander.

7. Supervision (Step 6)

The smoke unit commander, personally and through his staff, constantly supervises his subordinate units. He makes certain that their final preparations for the mission will implement his unit operation plan. This supervision is pursued vigorously throughout the mission.

The following image(s) may be of poor quality due to the poor quality of the **original**.

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By Order of *Wilber M. Brucker*, Secretary of the Army:

MAXWELL D. TAYLOR,
General, United States Army,
Chief of Staff.

Official:

D. V. LEE
Major