ping tube cardboard to hold the rocket upright.

f. Bangalore Torpedo. A bangalore torpedo is designed to breach wire barriers and minefields. In an emergency, they may be improvised.

(1) Breaching barbed wire. Tamp explosive into a piece of steel pipe long enough to span the wire obstacle. Prime the torpedo at one end. Position the torpedo under the wire on the ground. The explosion causes the fragments from the pipe to cut the wire, thus creating a path through the barrier. This torpedo should also detonate mines underneath it and may be fired electrically or non-electrically.

(2) Breaching mine fields. If no pipe is available, a torpedo may be constructed by taping explosives end to end on a length of wood such as a small tree. The effectiveness of this torpedo can be increased by placing another piece of wood or log on top of the explosive. The length of the torpedo must equal the length of the desired path in the mine field. To insure positive detonation, imbed detonating cord in the explosive for the entire length of the torpedo. Prime the torpedo at one end. This torpedo will not consistently cut wire barriers but should detonate all mines underneath it.

b. Chemical Mixtures. This section discusses chemical mixtures used to fabricate incendiaries of various kinds. Some of the desirable characteristics of incendiaries are—

(1) Easy to ignite.
(2) Difficult to extinguish.
(3) Burn with an intense heat.
(4) Leave little or no evidence.

c. Chemical Formulas. The names of certain chemicals and compounds do not always translate exactly into a foreign language. To eliminate this difficulty, table II, chemicals used internationally, shows alphabetical and numerical abbreviations for each chemical. The name of the chemical can be determined by personnel having a knowledge of chemistry using these abbreviations and reference materials such as encyclopedias and dictionaries.

d. Precautions. The following precautions should be observed when making improvised incendiaries:
(1) Use a mixing container made of non-sparking material such as ceramic bowl, cardboard, or newspaper.
(2) Use a wooden stick, plastic, or rubber spatula to stir chemicals.
(3) Do not heat gasoline or any petroleum product over an open flame.
(4) Do not place a top on the container when heating gasoline or wax.
(5) The vapors and dusts of many chemicals are toxic; therefore, they should be prepared in the open, or, if indoors, good ventilation should be provided.
(6) Test all finished products before using against a target.
(7) Store them in a dry place.

139. First-Fire Mixtures

a. Sugar-Potassium Chlorate Incendiary. A fast-burning, easy-to-ignite incendiary may be made by mixing 3 parts potassium chlorate or sodium chlorate with 1 part common household sugar. This mixture may be ignited by applying heat, spark, or sulphuric acid. It may be used as a primer (first-fire mixture) to ignite other mixtures.

b. Sugar-Potassium Permanganate Incendiary. Mix 1 part sugar with 9 parts potassium permanganate. It may be ignited by glycerine, time fuse, or spark.

c. Potassium Nitrate-Sulphur Incendiary. Mix 7 parts potassium nitrate (saltpeter) with 1 part sulphur and 2 parts flour, starch, coal dust, or sawdust. This may be ignited by flame or time fuse. Either sodium nitrate or ammonium nitrate may be substituted for potassium nitrate.

d. Potassium Permanganate-Aluminum Incendiary. Mix 2 parts potassium permanganate with 1 part aluminum. This mixture should be ignited with a time fuse.

e. Powder-Aluminum Incendiary. A very hot incendiary may be made by mixing 1 part black powder with 1 part aluminum. Either black powder or smokeless powder may be used. Smokeless powder may be obtained by pulling the bullets out of cartridges and pouring the powder from them.

140. Main-Fire Mixtures

The following mixtures of the same quantity will burn longer than the mixture discussed above. Main-burning mixtures are usually primed by one of the incendiaries discussed above.

a. Gelatin Gas. Use 4 parts nondetergent soap to 6 parts gasoline, kerosene, or other petroleum products. Heat the liquid in a double boiler or over a flameless heat source until it begins to boil. Then remove the liquid from the heat and introduce the soap in small chips or powder. Stir this mixture until it becomes a thick putty-like mass. This incendiary may be ignited with any flame.
b. Wax and Sawdust. Mix 5 parts wax and 5 parts sawdust. Any flame may be used to light this mixture.

141. Improvisation

a. Improvised Thermite Grenade (fig. 73). If issued thermite grenades are not available, one may be improvised in the following manner:

1. Pour about one-half centimeter of magnesium into a ceramic or clay container. This container must have a hole in the bottom covered with paper.
2. Add a mixture of 3 parts ferric oxide and 2 parts aluminum powder over the magnesium.
3. Add a priming mixture such as 1 part sugar and 3 parts potassium chlorate.
4. The priming mixture is ignited by using flame or sulphuric acid. When this grenade is lighted, the hot molten iron and aluminum pours out of the hole in the bottom of the container, burning through the target or welding parts together. A substitute for the ferric oxide and aluminum mixture is 1 part thermite with 4 parts magnesium.

b. Brick Incendiary. An incendiary may be made to look like a building brick. Use 1 part water, 1 part plaster of paris, and 1 part powdered aluminum. The amount of each material must be calculated by weight. Mix the plaster

Figure 73. Improvised thermite grenade.
nesium, or thermite. This incendiary may be made the color of brown or red brick by adding brick dust or iron oxide (Fe²⁺), depending upon the color desired. A cardboard or wooden form may be used to obtain the proper configuration.

142. Incendiary Mixtures and Igniters and Delays

a. General. This paragraph contains examples of easily constructed igniters and incendiary mixtures. A low-order explosion may be obtained by placing some of these mixtures in containers and detonating.

b. Cigarette Delay (fig. 74). Inclose the lighted cigarette in the matchbook or box and surround it with inflammable material such as rags, waste, or shredded paper. American cigarettes burn at the rate of 2.54 centimeters per 7 or 8 minutes in the air.

c. Candle Delay. Surround the candle with inflammable material, such as rags, wastes, or shredded paper.

d. String fuse. If time fuse is not available, it may be improvised as follows:

1. Wash a shoelace or string in hot soapy water to remove the oil and dirt and rinse it in fresh water.

2. Dissolve 1 part potassium nitrate or potassium chlorate and 1 part granulated sugar in 2 parts hot water.

3. Soak the string in the hot solution for at least 5 minutes.
(4) Remove the string from the solution and twist or braid three strands together and permit it to dry.

(5) Check burning rate by measuring the time it takes for a known length to burn.

e. Acid Delay. Acid delays may be constructed in various ways depending upon the material available. The pipe incendiary (fig. 75) delay is one example and is constructed as follows:

(1) Place a tight-fitting copper disk midway in a pipe.

(2) Fill one end of the pipe with a mixture of 3 parts potassium chlorate and 1 part sugar, then cork.

(3) Fill the other end with sulphuric acid and cork. When the pipe is placed with the acid higher than the sugar chlorate mixture, it slowly dissolves the copper disk, ultimately reaching the sugar chlorate mixture. This mixture produces a hot flame. The thickness of the copper disk, strength of the acid, and the temperature determine the length of delay.

(4) Gelatin capsules, rubber containers, or bottles with rubber membranes are other examples of materials that may be used with acids to achieve delays.

f. Water Can Delay (fig. 76). This device is improvised as follows:

(1) Materials needed.

(a) A bucket-type container.

(b) A float (wood or cork).

(c) Small diameter floatmast.

(d) Battery.

(e) Electric blasting cap.

(f) Electric wire.

(2) Directions. Make a small hole in the container. Attach the mast to the float. Place a copper wire through the diam-

Figure 74. Cigarette delay.
Figure 75. Incendiary delay in pipe.

eter of the upper part of the container with the insulation removed at the center. Prime the charge with an electric cap attaching one lead wire to the stripped end of the wire in the upper portion of the container, and the other lead wire to one of the terminals on the battery. Fill the container with water. Connect a wire from the other battery terminal to the top of the mast.

(3) Functioning. As the water drips from the container the float sinks in the can. When the top of the mast contacts the naked cross wire, the electric circuit is completed thus detonating the cap. Delay depends on the quantity of water and size of the escape hole. Some protection should be used to prevent falling trash, leaves, and other materials from stopping up the hole.

g. Watch Delay (fig. 77). This device is improvised as follows:

(1) Materials needed—
(a) Watch with celluloid crystal.
(b) Small screw (preferably brass or copper).
(c) Battery.
(d) Electric blasting cap.
(e) Electric wire.

(2) Directions. Drill a small hole one-half centimeter from the center of the crystal and insert a screw. Tighten the screw so that either the hour or minute hand of the watch will make contact but the screw does not touch the face of
Figure 76. Water can delay (electric).

NOTE:
CAREFULLY REMOVE ANY FINISH FROM PORTION OF WATCH HAND TO TOUCH SCREW THRU CRYSTAL TO INSURE GOOD CONTACT. SHORT PIECES OF CAP LEAD WIRE MAY BE USED TO MAKE ILLUSTRATED CONNECTIONS.

Figure 77. Watch delay device (electric).
the watch. If a delay of more than 1 hour is desired, remove the minute hand. Wind the watch and set the hand for the desired delay. Connect one wire to the stem of the watch and a terminal of the battery and the other wire to the screw in the crystal of the watch.

(3) Functioning. When the hand of the watch comes in contact with the screw, the electric circuit is completed thus detonating the electrical cap.

143. Train Derailment

A number of factors influence train derailment. Security measures, such as patrols and trackwalkers, may be expected wherever there is resistance activity. Mountainous terrain offers steep grades, sharp curves, bridges, culverts, and tunnels which are ideal locations for derailment. In other areas a long level section of track may be the only vulnerable point, and it is suitable if the train moves through the area at high speed. Derailment on double-track lines should be accomplished on curves so that a single train will obstruct both tracks. Three derailment techniques are described in this section.

a. Technique, 3–5–2 (fig. 78). This method uses three charges, weighing 1.25 kilograms each, placed and tamped under every fifth crosstie.

(1) The charges are linked together with detonating cord. A firing device with detonator is taped to detonating cord leads on both ends of the chain. The charges may be detonated from either end by an electrical firing circuit or by a pressure device actuated by the weight of the train wheels. The detonating cord should be extended on each end of the charges for a distance of at least 10 meters. The firing device should be placed at the end of the detonating cord nearest the approaching train. This is to insure that the charges blow in front of the train and not under it. The charges are placed under their respective ties and firmly tamped into position. The explosion will remove the rails at least 1 meter beyond the outside charges, disrupting at least 6 meters of rail. Additionally, the ties are broken and a crater is formed. The depth of the crater depends on the type of ballast material in the railbed. Since the charges are not placed in contact with the rail, the rail is lifted upon detonation. The pressure breaks the rail just beyond the outside charges.

(2) The disadvantages of this technique are the time required and noise associated with the placement of the charges. Once the charges are emplaced, they may be left in position for extended periods.

b. Technique, 10–2–1 (fig. 79). This method uses a total of ten 0.5 kilogram charges, each
charge placed against the rail over every second crosstie.

(1) The charges are linked together with detonating cord. The charges are wedged or lashed to the web of the rail directly over the crossties. Detonating cord priming leads must extend from both ends of the chain. A pressure firing device may be used.

(2) The advantages of this technique are speed and silence in emplacement. The disadvantage is that the charges are visible to trackwalkers.

144. Foreign Explosives

Foreign explosives and equipment should be used when available. Except for minor differences, foreign material is similar to American.

a. Principal Explosives. Many countries make TNT, dynamite, and plastic explosives similar to American explosives. Table III shows standard explosives. It does not indicate the packaged size or form of the different explosives.

b. Characteristics of Foreign Explosives. A particular explosive produced by one nation is usually similar in characteristics to the same explosive produced in another nation. Minor differences in purity, density, ingredients, etc., may influence the performance of an explosive slightly; but the important characteristics particularly those of sensitivity and stability, are generally the same.
(1) **TNT.** TNT is probably the most common explosive. It may be formed in different shapes, but its characteristics are similar to TNT manufactured in the United States since, chemically, they are the same (trinitrotoluene).

(2) **Plastic explosives.** Plastic explosives are manufactured by many countries and used for frontline demolition work. Their characteristics and performance are similar to those manufactured in the United States.

(3) **Picric acid.** TNP (Trinitrophenol) is slightly more powerful than TNT with a velocity of about 7,000 meters per second. It is a lemon-yellow, crystalline substance which may be identified by its tendency to dye water or material it may contact. It combines readily with some metals to form picrate (explosive) salts which are extremely sensitive to shock, friction, and heat. For this reason careful attention must be paid to packaging (usually paper or zinc is used) and storage. Otherwise, TNP has the same general characteristics as TNT.

(4) **Guncotton.** The power of guncotton, which is a cellulose of high nitration, is directly influenced by moisture. Dry guncotton generally detonates at a velocity of 7,300 meters per second; when wet,
the velocity of detonation is about 5,600 meters per second. Dry guncotton is extremely sensitive to shock and should be used only for booster pellets and blasting caps.

(5) Nitroglycerin explosives. Standard, ammonia, and gelatin (Gelignite) dynamos are common in foreign countries. Granular or free-running dynamite is conventional for borehole loading and replaces black powder in some areas of the world. It usually is less sensitive than other dynamos because of the increase of ammonium nitrate or other compounds necessary to make it pour. Nobel's 808 is similar to blasting gelatin, being of a higher density though somewhat less sensitive. It has a hard, rubber-like texture which tends to soften as the temperature is increased. Its color normally varies between green and brown.

145. Foreign Accessories

a. Primers. Many foreign explosives are as insensitive to shock as TNT. Since most foreign blasting caps are only equivalent to the standard, commercial, American, numbers 6 and 8 caps, the insensitive foreign explosives cannot be detonated consistently by using the American caps. A small amount of a more sensitive explosive must be used as the link between the charge and the cap:
this is called a booster or primer. Foreign demolition charges of the cast kind require the use of a booster and are manufactured with a booster recess.

b. Blasting Caps. Foreign blasting caps are often identical to the American number 6 or 8 caps. They may be of dry guncotton or some other compound pressed into a cardboard, metal, or paper shell. Some of the Russian caps are made of cardboard and paper and may be of slightly different lengths and diameter.

c. Burning Fuse. It is important to recognize instantaneous fuse manufactured by some countries for booby trapping and incendiary purposes. They burn at fast speeds; some burn as fast as 61 meters per second. When ignited it may appear to explode. To minimize accidents, all fuse should be tested before being used with explosives. Activate unidentified fuze with a firing device from a safe distance or with a known time fuse with a 45° splice.

146. Handling Foreign Explosives

a. General. The characteristics of an unknown explosive must never be taken for granted, and should be subjected to the expedient test methods outlined below.

b. Procedure for Handling Unknown Explosives. Unknown explosives should be tested as follows:

(1) Examine the packaged unit (case, block, cartridge) for exuded liquids. If there is reason to believe that an oozing explosive is dynamite (i.e., contains considerable nitroglycerin) it should be destroyed.

(2) Subject 0.5 kilogram of the explosive to rifle fire. If it fails to detonate after five or more hits, it may be considered insensitive to shock and friction. Dynamite containing nitroglycerin should detonate on the strike of a bullet.

(3) Place approximately 28 grams of the explosive on paper or some other combustible material and ignite it. This permits the tester to withdraw to a safe distance before the flame reaches the explosive. Take note of the following burning characteristics: color of flame, rate of burning, whether or not the explosive melts, amount and color of smoke, etc. These may be similar to the burning qualities of known explosives and an indication of the content of the unknown explosive compound.

(4) Attempt to detonate a unit of the unknown explosive with a blasting cap. If this fails, increase the number of blasting caps by one for each successive attempt until detonation occurs.

Section II. COUNTERINSURGENCY

147. Counterinsurgency Operations

In support of counterinsurgency operations,
the detachment commander and the combat engineer specialist will place primary importance on those actions designed to win the willing and active cooperation, assistance, and support of the people. In remote areas, where Special Forces detachments will normally operate, there may be a lack of sophisticated structures of any kind. The construction of buildings may well be the assigned mission of the detachment, as opposed to combat operations. Extensive area studies conducted before commitment will reveal additional information on which to prepare plans and details of operations. In preparing for commitment, the engineer specialist will conduct extensive training and development in the field of expedient engineering that may include—

1. Road expedients.
2. Expedient crossings and bridges.
3. Landclearing for farming.
5. Construction of simple sanitation projects.
6. Use of tools and materials for simple engineering.
7. Training and advising indigenous construction and combat engineering units in general construction tasks and in the preparation of defensive fortifications for security of the local villages.

**148. Expedient Engineering**

Programs undertaken by Special Forces detachments supporting counterinsurgency operations are called civic action or environmental improvement programs. Special Forces detachments conducting military civic actions find that they are the contact, or go-between, for the local administration and the national government. In undertaking these programs and in assisting the local administration to satisfy the aspirations of the people, the Special Forces advisor helps create the image of a responsive and capable government. When this is accomplished, the opening for subversion diminishes.

**149. Civic Actions**

a. In assessing the capabilities of the units and minority groups advised, the Special Forces commander will propose military civic action projects in accordance with the overall counterinsurgency plan and within the capability of the indigenous units. The Special Forces detachment commander must insure that the objectives of proposed environmental improvement programs will—

1. Contribute to the betterment of the lives of the local populace.
2. Gain the support, loyalty, and respect of the people for the government and contribute, in some measure, to national development.

b. The Special Forces detachment undertaking civic action programs must evaluate each program from the standpoint of resources required to complete each task. Harvesting and road im-
provements, for example, may be undertaken by paramilitary units possessing little more than a labor pool and manpower. The detachment commander and his engineer specialist encourage their counterparts and local population to use local material and equipment as much as possible before requesting assistance from other U.S. support facilities. Where it is required, indigenous engineer troops may be used in tasks requiring a certain degree of skill; but, maximum use of trained personnel should be made from local units. Those tasks requiring pure labor should be relegated to the local villages on a self-help basis. These actions will provide the Special Forces detachment with immediate work on the project and still afford a degree of training to local engineer units to increase their skill levels.

c. In all environmental improvement programs undertaken, Special Forces personnel must insure that the local, indigenous soldier understands that his actions are accomplishing the following objectives:

1) The soldier is learning his responsibility toward his community.
2) On interchange of skills between soldier and civilian, there is an exchange of ideas and understanding that enhances national unity.
3) A soldier learns skills which will be useful in his home village.
4) Soldiers possessing special skills have the opportunity to increase these skills and prepare for future employment with local governments as well as with a higher administration.

d. For techniques in the performance of military civic action programs and functions see pages 12 through 19, FM 31–73.

150. Construction Programs

Special Forces detachment personnel may find it necessary to employ the technical skills and capabilities of engineer units of the host country forces for projects supporting environmental improvement programs; however, the Special Forces detachment must adhere to fundamentals and avoid the more advanced techniques and procedures, particularly those that are not compatible with limitations of terrain, road nets, size of host forces, and mobility. Special Forces personnel will try to improvise when standard equipment is not available. The assessment and evaluation of units' and local villagers' capability and availability will dictate those projects to be undertaken. They may include—

a. General Construction Tasks. This may include rough carpentry; construction of drainage facilities with logs and stakes; construction of adobe buildings; rigging, and lashing techniques; and construction of small, water supply reservoirs.

b. Military Engineer Tasks. Here the emphasis will be on field fortifications and protection from
direct weapons fire, rather than blasts from heavy artillery and large explosives. Considerations should be given to trench-type fortifications around fixed installations. Additionally, the Special Forces may assist in the preparation and use of—

(1) Obstacles. Preferably anti-personnel obstacles as opposed to vehicular; installations of minefields and barbed-wire; construction of nuisance items such as heavy brush and impaling devices; construction of watch towers; and using natural obstacles to impede vehicular movement.

(2) Boobytraps. Improvised traps for warning devices (FM 5–31); using selected items of clothing and equipment that would naturally appeal to an enemy; and anti-personnel mines employed in normal defensive positions.

(3) Demolitions used to improve mobility of tracked vehicles by reducing steep banks, destruction of tunnels, and underground hiding places.

c. Specific Construction Projects.

(1) Construction of bridges and ferries from natural materials.

(2) Routes of communications which may include construction and improvement of roads, ditching, drainage, and temporary construction of air landing facilities.

(3) Land clearing for agriculture projects. For detailed information on construction programs that may be employed, see FM 31–73.

151. Resources Control

Through extensive training and constant development of destructive techniques, the Special Forces detachment personnel learn the various materials and their many uses in making destructive devices. Through extensive studies of their operational areas, they determine the availability of these materials to the local populations as well as the insurgent force. The Special Forces detachment commander is able to advise his counterparts on resources control measures to deny the insurgent access to such materials. The detachment commander must exploit all available means to help the local law enforcement agencies prevent essential resources from falling into the hands of the insurgent. The police and paramilitary forces in operational areas must be properly oriented and indoctrinated for this task.

a. In establishing requirements for resources control, priorities must be assigned to specific items to be denied the insurgent. Restrictions on certain items may be injurious to the attitude of the population, such as the control of fertilizer in a primarily agrarian area. Two methods may be employed in controlling materials—

(1) Price regulation.

(2) Rationing.

b. Additional controls must be employed for materials that can be used as expediens in manu-
facturing improvised explosives. Adequate control of these items will depend upon properly trained, security personnel positioned at the production and distribution facilities for these sensitive items.

(1) **Physical security.** Physical security could include check points for searching personnel and vehicular traffic entering and leaving installations; detection devices for certain items that react to electronic devices; clothing change points requiring personnel to shower and change clothes on entering or leaving installations.

(2) **Personnel security.** Personal security is more difficult; however, Special Forces personnel, working in close conjunction with local police and security elements, may instigate a personnel security investigation to insure that personnel selected for work are reasonably clear of implications with known insurgent members. Additional procedures may be—

(a) Planting of informers.

(b) Offers of rewards for information.

(c) Planting of erroneous information concerning activities.

(d) Surveillance of after-duty-hour activities.

(e) Curfews.

The use of resources control measures is sensitive and must be carried out with utmost discretion. Infringement upon the rights of the local population, through violence or needless oppression, will lose the population to the insurgent. Local law enforcement agencies should be closely supervised at all times during the operation.

### Section III. METRIC CALCULATIONS

#### 152. General

The following metric formulas may be used for demolition projects when working with personnel familiar with the metric system. Use of metric formulas and construction and placement of charges are the same as for U.S. Corps of Engineer formulas and charges. Since the formula results give kilograms of TNT, the relative effectiveness of other explosives must be considered. For demolition formulas see FM 5–25, or Demolition Card (GTA 5–10–9).

a. **Structural Steel.**

Formula: \[ Kg = \frac{A}{38} \]

Kg = Kilograms of TNT required.

A = Cross-sectional area in square centimeters.

b. **Timber.**

(1) **External charge.**

Formula: \[ Kg = \frac{D^2}{550} \]

Kg = Kilograms of TNT required.

D = Diameter of target in centimeters.
(2) Internal charge.

Formula: \[ Kg = \frac{D^3}{3,500} \]

\( Kg \) = Kilograms of TNT required.

\( D \) = Diameter of target in centimeters.

c. Breaching.

Formula: \[ Kg = 16 R^2 KC \]

\( Kg \) = Kilograms of TNT required.

\( R \) = Breaching radius in meters.

\( K \) = The material factor based on
strength and hardness of material to be demolished (table IV).

\( C \) = The tamping factor based on type and extent of tamping to be used (fig. 82).

Add 10 percent to a calculated charge of less than 22.5 kilograms.

(1) Breaching radius. The breaching radius (\( R \)) is the distance in meters which an explosive charge must penetrate and within which all material is displaced or destroyed. For example, if it is de-

<table>
<thead>
<tr>
<th>Material</th>
<th>( R )</th>
<th>( K )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary earth</td>
<td>All values</td>
<td>0.05</td>
</tr>
<tr>
<td>Poor masonry, shale and hardpan</td>
<td>All values</td>
<td>0.23</td>
</tr>
<tr>
<td>Good masonry, ordinary concrete,</td>
<td>Less than 1 meter</td>
<td>0.35</td>
</tr>
<tr>
<td>rock.</td>
<td>1 to less than 1.5</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>1.5 to less than 2</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>2 meters</td>
<td>0.23</td>
</tr>
<tr>
<td>Thick concrete, first-class</td>
<td>Less than 1 meter</td>
<td>0.45</td>
</tr>
<tr>
<td>masonry.</td>
<td>1 to less than 1.5</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>1.5 to less than 2</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>2 meters</td>
<td>0.28</td>
</tr>
<tr>
<td>Reinforced concrete</td>
<td>Less than 1 meter</td>
<td>0.70</td>
</tr>
<tr>
<td>(will not cut reinforcing steel)</td>
<td>1 to less than 1.5</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>1.5 to less than 2</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>2 meters</td>
<td>0.43</td>
</tr>
</tbody>
</table>

sired to break a 2-meter concrete wall by placing a charge on one side, then the value of \( R \), in the formula \( Kg = 16 R^3 KC \), is 2.

![Figure 82. Value of C (tamping factor).](image-url)
(2) **Material factor** (table IV). The values of material \((K)\) for various types of construction are given in the following tables:

(3) **Tamping factor.** The value of the tamping factor depends on the location and the tamping of the charge. No charge is fully tamped unless it is covered to a depth equal to the breaching radius.

(4) **Number of charges.** For calculations to determine the number of charges, see FM 5–25.

Section IV. ATOMIC DEMOLITION MUNITION

153. **General**

ADM is employed in conformance with tactical requirements of the assigned mission to reduce the tactical mobility of the enemy and to deny the use of key facilities such as bridges, industrial facilities, and power plants; however casualties among civilian personnel, destruction of man-made and natural terrain features, and the creation of areas of high intensity, residual radiation may cause adverse political effects as well as create obstacles to friendly movement. Destruction and contamination is held to a minimum consistent with military necessity.

154. **Procedures**

a. For command and staff procedures in ADM employment to include troop and installation safety requirements, see FM 5–26.

b. See FM 31–21A, Special Forces Operations for information on personnel to employ ADM, target selection and coordination, target analysis, preparation for ADM mission, logistical procedures, employment, and support of conventional forces employment of ADM.

c. Firing option, emplacement consideration, and nuclear effect data are contained in FM 5–26A Employment of ADM (U).

d. Operational techniques—see TM 9–1100–205–12.

e. For a suggested SOP for employment of ADM, see appendix IX.
CHAPTER 12
MEDICAL ASPECTS OF SPECIAL FORCES OPERATIONS

Section I. GENERAL

155. General Medical Requirements

In efforts to gain the support of local populations, medical care has proven to be a most effective instrument. The offer of medical assistance may be used effectively to achieve entry into hostile areas and to assist in gaining the support of those indigenous populations with indifferent (or undecided) loyalties; however, a basic distinction exists between unconventional warfare and counterinsurgency operations with respect to the goals one hopes to achieve in this manner. The goal of medical operations in the unconventional warfare situation is to secure the support of local populations for U.S. forces operating within the GWOA. In counterinsurgency operations, the goal is to attract the loyalties of the villager to the central government. It is well to point out that in certain areas of the world the local population may not be receptive to the Western medical practices and concepts. Before a medical program can be initiated in such an area, it will be necessary to persuade the populace to accept the program.

156. Organization for Medical Support

a. The organization of medical elements in unconventional warfare or counterinsurgency operations is tailored to fit the particular situation. The basic medical organization is organic to the Special Forces group; however, it may be augmented by personnel from medical augmentation detachments, depending upon the skills required. In any case, this basic medical organization will be expanded, as appropriate, through use of trained, indigenous, medical personnel and through implementation of medical training programs for indigenous civilian, military, and paramilitary personnel.

b. Skills organic to the Special Forces medical organization provide for the following capabilities:

(1) The provision of organizational medical care, medical supply, and dental service to the group, or elements thereof, and to indigenous military and civilian personnel in consonance with command policy.

(2) The planning, supervision, and conduct of programs for the instruction of U.S. forces and indigenous military and civilian personnel in—

(a) The care of casualties from disease and injury.

(b) Personal, organizational, and community measures for the preservation of health.
The selection and preservation of foods.

(d) The care and handling of pack animals and on field expedients in rigging packs and litters for animal transport.

(3) The provision of preventive medicine functions, medical technical intelligence, and veterinary activities to include—

(a) Epidemiologic investigation of conditions affecting the health of U.S. forces, indigenous military and civilian personnel, and animals.

(b) Field surveys and inspection of significant environmental factors affecting the transmission of disease.

(c) The planning and application of measures to control diseases and disease reservoirs in U.S. forces and indigenous military and civilian personnel.

157. Preventive Medicine Techniques

Preventive medicine techniques applicable to Special Forces operations may be divided into four phases—

a. Procedures in garrison and during field training, before deployment in unconventional warfare or counterinsurgency operations.

b. Procedures in unconventional warfare operations.

c. Procedures in counterinsurgency operations.

d. Procedures for collecting medical intelligence from areas of unconventional warfare or counterinsurgency operations.

158. Preventive Medicine Procedures Prior to Deployment

a. During periods of garrison duty and field training, preventive medicine activities in Special Forces units are directed toward maintaining the highest standards of personal hygiene and cleanliness in troop areas and facilities, unit and individual training in preventive medicine techniques, and the preparation of area medical studies. Technical advice and supervision are provided in connection with—

(1) Food and its preparation.
(2) Water supply.
(3) Troop housing.
(4) Bathing and latrine facilities.
(5) Waste and garbage disposal.
(6) Insect and rodent control.
(7) Sanitation in campsites.

b. Periodic reports are prepared to keep the command informed of the status of the health of command of the conditions which may adversely affect health. Corrective action is recommended for unsatisfactory conditions.

During the period immediately preceding deployment, preventive medicine activities are directed primarily toward—

(1) Briefings on the general medical situa-
tion in areas of planned deployment, to include information on the endemic diseases and on individual and small-unit measures which may be implemented for their prevention.

(2) Immunizations, to provide a high degree of immunity to certain common disease conditions.

(3) Predeployment medical examinations, to identify and eliminate those personnel with medical conditions for which treatment in remote situations would be difficult or impossible.

Section II. MEDICAL REQUIREMENTS FOR GWOA

159. General

a. Medical requirements within the GWOA will differ in two respects from those posed by conventional operations.

(1) Battle casualties are normally lower in guerrilla units than in conventional units.

(2) The incidence of disease is often higher in guerrilla forces than in conventional units of similar size.

b. The medical organization in support of guerrilla forces will ordinarily feature both organized medical groups and auxiliary medical facilities. The former are usually located in guerrilla base areas and staffed by guerrilla medical detachments. Auxiliary facilities are in locations in which individual patients (or a small number of patients) may be held in a convalescent status, or may be sustained until a time when it is safe to evacuate them to more advanced treatment facilities in "safe" areas.

160. Evacuation and Hospitalization in the GWOA

a. Evacuation.

(1) Since evacuation within and from the GWOA is normally difficult, unit commanders must rely on their own resources and on support from auxiliaries and the underground in planning the evacuation of casualties. Great reliance must be placed on self-aid. Maximum use must be made of specially trained, enlisted, medical personnel who may give treatment which obviates the requirement for evacuation. Local pack animals and other civilian ground and water transportation should be used to the maximum possible extent, as well as litter bearers recruited from among indigenous personnel. Every effort is made to evacuate wounded personnel from the scene of action. The condition of the wounded and the tactical situation may preclude the transportation of casualties along with the unit to the guerrilla base. In this event, the wounded may be hidden in safe sites or
well-concealed locations. The auxiliary, who can care for the wounded until their return to active duty is possible, is notified. All planned operations should include an SOP for emergency treatment and evacuation. When tactically possible, use should be made of scheduled and on-call air evacuation from the area.

(2) The removal of dead from the scene of action is most important for security reasons. Identification of the dead by the enemy may jeopardize their families and their units. The bodies of those killed in action are removed and cached until recovery is possible. Bodies are then disposed of by means consistent with the customs and religions of the local population.

(3) As the overall tactical situation begins to favor the sponsor, evacuation of sick and wounded to friendly areas may become feasible. This lightens the burden upon the meager facilities available to the area command and provides a higher standard of medical care for the patient.

b. Hospitalization. The care and treatment of sick and wounded will generally be accomplished by guerrilla medical personnel within the area, until evacuation of selected personnel can be accomplished to friendly areas outside the GWOA through the auxiliary and the underground. Small, isolated, and well-hidden treatment and holding facilities may be established. When necessary, the auxiliary and the underground may assist in the infiltration of medical personnel and equipment to accomplish life-saving procedures. In some instances, the auxiliary may arrange hospitalization in widely-scattered, private homes where periodic visits can be made by medical personnel. As the GWOA expands, the services of professional medical personnel and the facilities available in villages and towns within the GWOA may become available during certain hours, if not for complete and continued hospitalization.

161. The Build-Up Phase of Unconventional Warfare Operations

a. During the build-up phase of unconventional warfare operations, an initial assessment is conducted to determine the state of sanitation and health within the GWOA. Such an assessment will include consideration of the diseases endemic to, as well as potential epidemic diseases within, the area of operations.

b. The guerrilla force will be comprised of both foreign and indigenous personnel; therefore, differences in immunity to the endemic diseases will exist between these two groups. Certain preventive measures may be applicable to one group and not to the other. This factor must be considered in the implementation of immunizations and use of chemoprophylactic agents, for instance, the use of chloroquine-primaquine in the prevention of malaria. (While it may be neces-
sary to administer routine prophylaxis to those recently introduced to the area, it may not be desirable to treat indigenous guerrilla forces with chemoprophylactic drugs, since such treatment may alter naturally-acquired immunity to this infection.) Further, the indigenous members of the force may exhibit diseases uncommon to U.S. forces, such as serious nutritional deficiencies and cases of active tuberculosis.

c. It is during the build-up phase that the guerrilla force is thoroughly indoctrinated in preventive medicine procedures which must be strictly adhered to during active operations. This indoctrination will be directed toward basic sanitation, personal hygiene, and individual protective measures. Specific attention will be given to the use of chemoprophylactic agents, immunizations, food and water sanitation, individual methods for protection against bites from arthropods, and the sanitary disposal of human wastes. Recommendations are made to individual commanders with respect to the measures to be enforced in all localities of the GWOA. The scope of the preventive medicine effort must be adequate to encompass the probable expansion of the guerrilla force.

d. The preventive medicine section organic to the Special Forces group will conduct a principal preventive medicine area study and assessment to be used as a guide to planning and implementing preventive medicine techniques appropriate to all phases of unconventional warfare operations. This area study and assessment will consider the preventive medicine requirements for the indigenous civilian population (i.e., the dependents of the guerrillas), as well as the guerrilla force itself and should include the material suggested in appendix V.

162. The Employment Phase of Unconventional Warfare Operations

During the period of employment of the guerrilla force in active operations against the enemy, preventive medicine activities must be directed toward the prevention of disease among individual members of small, highly mobile, operational units which will be deployed throughout the GWOA. Preventive medicine techniques will be determined by local and immediate requirements. Preparations must be made to meet unexpected problems such as widespread epidemics. Preventive medicine programs will be limited, due to the nature of guerrilla operations, to individual and small-unit measures for the prevention of disease; however, the programs must include the civilian populations of the villages from which guerrilla forces originate and from which support may be expected. The support of civilian population may be enhanced by offers of medical assistance. Members of the families of guerrilla forces must be actively encouraged to adopt the same standards of personal hygiene and sanitation as those enforced among the guerrilla forces.

The Demobilization Phase of Unconventional Warfare Operations

The demobilization phase occurs when junc-
ture between friendly, conventional forces and the area command is completed, and the ability of the guerrilla forces to support the military operations gradually diminishes. This phase is characterized by social disorganization created by relocation and resettlement of large numbers of displaced persons, refugees, and evacuees. Disorganization of civil government, the disruption of public utilities, and mass migrations all contribute to the potential for widespread epidemics.

b. The role of the preventive section organic to the Special Forces group now changes from one of support for the guerrilla unit and the families of the guerrillas, to one of assisting civil government and military civil affairs units to implement public health measures within the areas of guerrilla operations. The principles set forth in the paragraphs on counterinsurgency operations are, in general, applicable to this phase.

164. Medical Supply in the GWOA

a. In all probability, medical supplies in the GWOA will be available in limited quantity. Preplanning to provide the minimum essential medical supplies and equipment for current, planned, and contingency operations is mandatory. During the area assessment, and as the development of the guerrilla medical organization progresses, medical supplies are requested from the SFOB by the operational detachments based upon their operational requirements. Excess medical stock will be maintained at the SFOB to expedite prompt resupply or delivery of medical items to operational detachments with the greatest requirements. Medical supplies may include dental equipment, blankets, drugs, bandages, and ambulatory aids. As the medical facility expands there may be a requirement for special items of surgical equipment. Medical items are ordered through use of the Catalog Supply System (app VII).

b. There should be minimum dependence on the local economy for the provision of medical supplies and equipment, because such items will certainly be scarce and in great demand by the local population. On the other hand, captured medical supplies are of value in augmenting guerrilla stocks. Such materials should be returned to the SFOB as expeditiously as possible for redistribution according to overall operational requirements.

c. It may be necessary to cache excess medical supplies in order to maintain mobility and any access to the enemy. Precautions must be taken to prevent spoilage.

d. Medical supplies are strictly controlled by area command, since such articles are potential black market items.

Section III. MEDICAL REQUIREMENTS FOR COUNTERINSURGENCY OPERATIONS

General

Requirements in counterinsurgency operations from those in the GWOA, in that medical
activities are conducted openly, using existing medical organization and facilities. The medical organization should provide for training and operational assistance to indigenous military and paramilitary forces of the host country, with particular emphasis on the development of civic action programs. Civilian personnel, selected from the community, are trained, in cooperation with existing civilian health agencies and U.S. AID missions, to improve health and sanitary conditions in local villages (so-called village health workers). These personnel are trained in basic first aid and health and sanitation, either at centrally located medical training facilities or in the village. These indigenous personnel will carry out self-help programs in sanitation within the village under the supervision, and with the advice, of medical technical personnel organic to the Special Forces group or special action force.

166. Preventive Medicine in Counterinsurgency Operations

a. In contrast to unconventional warfare operations, in which primary emphasis is on those measures which will improve and maintain the health of the guerrilla unit, the effort in counterinsurgency operations is directed toward improvements in health and sanitation among indigenous civilian populations. The general steps to be taken in implementing such programs are—

(1) Establish liaison with existing health authorities.

(2) Accomplish an initial area assessment.

(3) Attempt to secure the support of the village leaders.

(4) Implement a training program for village health workers.

(5) Implement health and sanitation measures based on priorities and the desires of the villagers.

b. The success of counterinsurgency operations at a village level requires tangible evidence that the central government is responsible for efforts to improve the lot of the villager. Early liaison with appropriate local representatives of existing health agencies is, therefore essential in order to achieve support, approval, and participation in plans for health programs to be implemented in the village.

c. The success of health programs will depend largely upon one's ability to motivate the villager to undertake changes in habits which have been practiced for generations. To accomplish this, it is necessary to have a knowledge of the social structure of the village (Who are the official and unofficial community leaders?) and the local beliefs, customs, taboos, and mores. (In many primitive societies the occurrence of disease is associated with visitations by evil spirits.) The collection of information of this nature is part of the process of area assessment. Once some insight has been acquired into these matters, it is usually possible to lay out an intelligent plan...
by which to attack basic health problems in the village.

d. Efforts are then directed toward motivating and training local villagers to accomplish these objectives. Local support is usually best achieved through the village leaders (the village council or similar governing body), to include the unofficial leaders (opinion formers) who, although not acting in an official capacity, nevertheless exert great influence within the community.

e. Training programs in basic health subjects must be initiated for individuals who can successfully use their knowledge to help the people help themselves toward better health. It is usually wise to permit the village council to select those who will undertake such training. The prestige associated by the villagers with this activity will usually result in the selection of individuals who are already in a position of influence within the community, thereby giving additional emphasis to the program. The subjects recommended for such training programs are—

1. Germs and parasites as causes of disease.
2. Food and water sanitation.
3. Personal hygiene.
4. Village sanitation, latrine, and bath facilities.
5. Pre- and post-natal care.
7. Arthropod and rodent-borne disease control.

f. Although initial emphasis is placed on enlist-

ing the support of selected leaders and training village health workers, it is also necessary to obtain active participation by the villagers in order to accomplish the goals of improving and maintaining village health. Some suggested projects for general village participation might include one or more of the following:

1. General village improvement teams.
2. Waste disposal inspection teams.
3. Food and water inspection teams.
4. Rodent and vector control teams.

g. Priorities for programs are based upon the initial area assessment as well as upon the desires ("felt needs") of the community. In initiating programs, give consideration to these basic rules—

1. Know the community and its leaders.
2. Do not unnecessarily interfere with the people's customs.
3. Get the people to help themselves.
4. Keep programs simple and practical.
5. Build and maintain momentum.
7. Make it fun and convenient.

Section IV. VETERINARY MEDICAL TECHNIQUES

General

Veterinary medical techniques applicable to special Forces and special action force opera-

354
355
a. Procedures in garrison and during field training, before deployment in unconventional warfare or counterinsurgency operations.

b. Procedures in unconventional warfare operations.

c. Procedures in counterinsurgency operations.

d. Procedures for the collection of veterinary medical intelligence from areas of unconventional or counterinsurgency operations.

168. Veterinary Procedures Prior to Deployment

a. During periods of garrison duty and field training, veterinary activities are directed toward the preparation of area medical studies and individual and unit training on the subjects of—

(1) Wholesomeness and sanitation of subsistence.

(2) Care and management of pack animals.

(3) Food inspection procedures.

(4) Zoonotic diseases.

(5) Techniques for using animals for pack and transportation.

(6) Survival techniques.

b. Immediately before deployment, veterinary activities are directed toward—

(1) Briefings on the veterinary medical situation in areas of planned deployment, to include endemic and potential epidemic zoonoses, and on individual and unit measures which may be implemented for their prevention.

(2) Briefings on diseases of animals in areas of planned deployment that may directly or indirectly influence the outcome of unit deployment.

169. The Build-Up Phase of Unconventional Warfare Operations

a. During the build-up phase of unconventional operations, veterinary activities will include area studies which are designed to determine the veterinary requirements for support of combined (U.S. and indigenous) guerrilla forces within the GWOA. Area of emphasis should include—

(1) Food and rations and the nutritional requirements of indigenous guerrilla personnel.

(2) Animal diseases transmissible to man.

(3) Availability of animals for transportation and evacuation.

(4) Programs based upon this information will usually be implemented as expansion of the guerrilla force occurs and will include—

(1) The establishment of suitable facilities in which to receive, store, and issue rations.

(2) The establishment of standards of acceptability for partisan-supplied foods.

(3) Stockpiling U.S.-supplied rations and the
supervision of preparation of operational rations. (Composition of rations will be based upon the previous assessment of nutritional requirements of guerrilla personnel.)

(4) The establishment of preventive medicine procedures for the control of animal and zoonotic diseases.

(5) The procurement of pack animals.

(6) Training for guerrilla personnel in—
   (a) Survival techniques to be used by individuals and small, operational units.
   (b) The selection and preparation of indigenous foods.
   (c) The care and handling of pack animals.

c. Recommendations will be made to appropriate guerrilla commanders with respect to veterinary preventive measures which must be initiated and enforced to control endemic and potentially epidemic diseases of animals, and the zoonotic diseases.

170. The Employment Phase of Unconventional Warfare Operations

a. During this phase, veterinary activities will consist of continued evaluation of veterinary data and the formulation of plans to improve environmental sanitation, the provision of food supplies, and the control of animal diseases and zoonotic conditions within the GWOA.

b. Emphasis will be on providing assistance and technical information to deployed operational detachments.

171. The Demobilization Phase of Unconventional Warfare Operations

a. During the demobilization phase, veterinary activities are redirected toward providing an adequate food supply for large numbers of displaced persons, refugees, and evacuees. Secondary efforts are directed toward the control of animal diseases of public health significance.

b. The major veterinary programs, formulated at theater level, will be directed at redevelopment of food production and processing and will be implemented under the operational control of the civil government and the civil affairs units having jurisdiction within the country.

Section V. COLLECTION OF INTELLIGENCE AND INFORMATION

172. General

a. Intelligence collecting is an inherent capability of medical personnel. The activities of medical personnel in treating members of the local population and administering to the sick and wounded insurgent provide innumerable opportunities to collect intelligence; for example, information on the effects of environmental improvement program; the efforts of propaganda
on the populace; and information on weapons, equipment, medical supply, and morale. This function is over-and-above that of collecting technical medical intelligence. The deployment of small units to such areas provides a unique opportunity to delineate the military disease problems of the area by using deployed personnel as “sentinels.”

b. An appropriate battery of screening examinations can usually be devised for a given area which is administered before deployment to obtain baseline data. The same examinations accomplished on the return from a mission serve the dual functions of detecting those individuals who have acquired disease during the mission which requires treatment, and delineation of the major disease problems of an area by systematically tabulating the results of examinations and mapping the results according to the probable area of acquisition of disease. This effort requires the support of the advanced, medical laboratory facilities in rear areas.

c. Epidemiologic surveillance, conducted in this manner, serves two functions—

(1) It provides the basis for recommending preventive measures to be taken by units to be deployed in these areas in the future.

(2) It brings to attention those disease problems of major military importance which require further investigation within operational areas by teams of trained personnel in order to devise techniques (immunizations, chemoprophylactic drugs) for their prevention.

173. Veterinary Procedures in Counterinsurgency Operations

The principles and considerations for implementation of veterinary programs in conjunction with counterinsurgency operations are similar to those outlined in paragraph 166.

a. A major effort in veterinary counterinsurgency operations is directed toward improving animal health in the host country. In rural areas, self-help programs will be directed toward increasing agricultural and livestock production in order to improve and increase food supplies. Such programs should be realistic and not overlook the development of protein food sources; for example, the raising of small animals and fowl and the cultivation of fish.

b. Programs to establish high sanitary standards and provisions for quality control in food processing, storage, and handling can eventually provide opportunities for competition in world markets.

174. Development of Veterinary Information

a. The collection and evaluation of veterinary medical information is an essential and integral part of the principal preventive medicine area assessment (see app V). The following informa-
tion is of interest to the staff veterinarian of the Special Forces group in the accomplishment of such an assessment:

1. Animal diseases endemic to the area.
2. Animal diseases transmissible to man.
3. Agricultural production.
4. Methods of food procurement, processing, and preservation.
5. Nutritional status of the indigenous personnel.
6. Food resources of animal origin.

Such information will be of value in planning during the build-up phase of unconventional warfare operations.

b. Veterinary medical information is usually meager and frequently outdated in many of the more remote areas of the world. In-country surveys conducted by veterinary personnel are the best source of veterinary information.

APPENDIX I
REFERENCES

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APPENDIX II
FIELD EXPEDIENT PRINTING METHODS

1. Instructions for Making and Using the Silk Screen

a. Tools for the Job. There are six items of equipment which are necessary for printing in the field. The use of these six tools will make it possible to have printed matter available for use at any time and anywhere. The field expedient printer can carry these items along whenever he expects to do printing in the field; however, it is important to remember that a good workable substitute can be found for all of these items in the forests, swamps, and deserts of the world. The field expedient printer can often do his job through the use of substitute items. The six essential tools for printing in the field are—

1. A silk screen.
2. A stencil.
3. Ink.
4. A stylus.
5. Paper.
6. A squeegee, or ink roller.

(a) The silk screen (fig. 83) consists of a frame over which is stretched a piece of cloth. This frame is attached to a base to provide a flat working space.
The cover is not necessary for printing but simply makes the silk screen easy to carry from one place to another.

![Diagram of silk screen and frame]

*Figure 83. Silk screen with carrying case.*

(b) The stencil is a device which allows the ink to pass through the screen and onto the paper where it is needed and blocks out the ink where it is not needed.

(c) The ink used in silk screen printing should be thick and have an oil base; many kinds of ink can be used for printing in the field.

(d) A stylus is a device used to etch the stencil. A pointed piece of wood or metal can be used for this purpose.

(e) Paper or a good substitute is an essential item for printing in the field.

Many good substitutes for paper have been found, but it is best to have a good supply of paper whenever possible. Often paper which has been used can be reused by the printer for a new mission.

(f) The squeegee, or ink roller, is a tool used to spread the ink evenly and to force the ink through the stencil and onto the paper.

b. Making a Silk Screen. The field expedient printer can construct a silk screen printing press by following the instructions below. Remember that the silk screen and all of the other items mentioned can be made by using materials found in the field. A good serviceable silk screen can be made by using wooden pegs instead of nails, a rock instead of a hammer, a knife instead of a saw, and bamboo instead of pieces of wood for the frame. Three tools used for making a silk screen are—

1. A hammer or heavy object for driving tacks and small nails.
2. A knife for cutting the cloth and canvas hinge.
3. A saw or hatchet for cutting the wood.

Materials for constructing the frame (fig. 84)

1. 4-pieces of wood 3.18 cm. x 1.91 cm. x 38.74 cm.
2. 4-pieces of wood 3.18 cm. x 1.91 cm. x 53.34 cm.
(3) 16-2.54 cm. nails.
(4) 2-8.18 cm. nails.

Nails must be very thin so that they will not split the wood. It is best to use “soft” wood in making the frame.

Figure 84. Dimensions for construction of silk screen frame.

When you have made the frame, you are ready to attach the cloth. Many kinds of material can be used to make the screen. Silk cloth is a material which gives the best results; is strong and can be cleaned and used many times. Parachute nylon or a cotton handkerchief will also serve in an emergency and even an undershirt can be used; however, remember that only finely woven cloth will allow a fine line to be printed.

c. Directions for Attaching the Cloth to the Frame (fig. 85).

(1) Cut the piece of cloth so that it is several inches larger than the dimensions of the frame.
(2) Soak the cloth in water so that it will shrink tightly over the frame when it dries.
(3) Place the cloth over the wooden frame and place one tack in each corner as shown in A, fig. 85. Either small .64 cm. tacks or staples can be used. You will need about 90 tacks or staples to attach the cloth securely.
(4) Next, place a row of tacks along one side of the frame as shown in B, fig. 85. Ten evenly spaced tacks or staples will be enough.
(5) Place a row of tacks along the opposite edge of the frame as shown in C, fig. 85. The cloth must be pulled very tightly before driving each of these 10 tacks.
(6) Continue to drive the tacks around the outside of the frame.
(7) Add a second row of tacks around the inside as shown in D, fig. 85. This will give added strength to the screen.

Materials for Constructing the Base and (fig. 86).

(1) 4-pieces of wood 2.54 cm. x 2.54 cm. x 48.18 cm.
(2) 4-pieces of wood 2.54 cm. x 2.54 cm. x 71.12 cm.
Figure 85. Tacking cloth to underside of frame.

(3) 2-pieces of cardboard or plywood 48.26 cm. x 71.12 cm.

(4) 1-piece of canvas or very heavy cloth 6.08 cm. x 71.12 cm.

(5) 8-3.18 cm. nails.

(6) 140-.64 cm. tacks.

e. Directions for Making the Base and Cover.

(1) The four pieces of wood (2 pieces, 43.18 cm. and 2 pieces, 71.12 cm.) are nailed together as shown in figure 86. Two nails are used at each corner.

(2) The piece of cardboard or plywood is then placed over the wood frame and tacked around the edge with tacks. Space the tacks evenly one inch apart.

f. The Hinge Nails. You are now ready to hinge the silk screen to the base. Place the frame in the

Figure 86. Dimensions for construction of base and cover.

box with the cloth side down. The silk screen is now flat against the cardboard or plywood. The end of the silk screen frame should be 3.81 cm. from the end of the base. This will permit the frame to be raised. The two 3.18 cm. nails are driven through the side of the base from the outside and into the end of the silk screen frame. Figure 83 shows where these hinge nails are placed. These two nails form a hinge which allows the screen to be raised and lowered. The final step in making your silk screen is the hinging of the base to the cover. This is done by using the 5.08 x 66.04 cm. piece of canvas as a hinge. This piece of cloth is tacked along one side of the base cover. You now have a carrying case for the screen, making the screen portable.

g. The Ink to be Used. Many different kinds of
ink can be used for printing with the silk screen. Ink with an oil base, such as mimeograph ink, is best. Paint with an oil base is the best substitute, or printer's ink can also be used for field expedient printing. Ink that is used for silk screen printing should be thick; oil base paints are almost the right thickness. A little practice with the silk screen will teach the printer what to look for in a good printing ink. The field expedient printer can practice by using many kinds of ink and paints. In an emergency, berries or any stain producing material can be crushed and an ink substitute produced.

h. How to Use the Stencil and Silk Screen.

(1) The first step is to make sure that you have all six of your tools. They should be clean and in good working order, and you should have enough paper to finish the job.

(2) Place the words, pictures, or symbols on the stencil. If you are using the standard printing stencil, scratch the words onto the stencil with the pointed stylus. If you are using the cut out stencil, remove the parts of the stencil where you want the ink to pass through. Use a knife or sharp object for this purpose.

(3) Lift the silk screen frame up from the base as in figure 83. Place the stencil at the bottom of the screen. Tacks, tape, or glue can be used to hold the stencil in place.

(4) Place a piece of paper on the base under the stencil. This piece of paper will protect the base from ink while you are preparing to print.

(5) Lower the silk screen onto the base. Place enough ink on the silk to cover the screen. Use the squeegee to spread the ink evenly and to force the ink through the opening in the stencil. The squeegee must have a straight edge; another tool which will do the same job is a roller. A roller made of hard rubber is best for spreading the ink on the silk screen. A stiff brush is another tool which can be used for this job.

(6) You are now ready to print. Place the piece of paper to be printed on the base and lower the silk screen on top of the paper. Slide the squeegee firmly over the silk, forcing the ink through the stencil; lift the screen, remove the paper, and allow the paper to dry. If the printing is not dark enough, add more ink to the screen.

(7) When the printing job is finished, remove the stencil and clean the screen and all of the other tools. Also, be sure that the squeegee is very clean.

Instructions for Making and Using the Rocker-Type mimeograph Machine

General Instructions. Cover any smooth,
curved surface with a heavy (thick) porous fabric. Saturate fabric with mimeograph ink. Cover ink pad with desired stencil and apply to appropriate paper with a rocker-type movement of the apparatus.

b. Specific Instructions. A frame or base for this aid can be created, on the spot, by using many ordinary items. A wooden block, tin can, glass bottle, can be used as a frame. The machine can be made with crude tools; or, in some cases, the article may be used as it is. A frame may be made from a wooden block, using a chopping axe and a penknife. The surface can be rubbed smooth against a concrete wall or a smooth stone. The block can also be hollowed out to carry ink, styli, and stencil paper for supply purposes. Size can be increased by fastening a piece of sheet metal to the block.

(1) A coat or blanket can yield thick, porous fabric; or felt or burlap can be used. A cover also may be made of many layers of thin fabric. Wrap the fabric around the smooth, curved surface of the printing frame to make an ink pad. The pad can be held in position with tape, string, thumb tacks, or glue.

(2) Saturate the pad with mimeograph ink. This “ink” can be a composite of almost any grease and carbon scraped from a fireplace or grating. Color can be achieved by mixing pigments of color to the grease instead of carbon. Mimeograph ink, commercial grade, is a universal item and is available in any civilized country. Shoe polish, thinned with kerosene or other solvent, is generally available and usable.

(3) Stencils can be made from thin, tough tissue or thin air mail paper by applying a coat of wax (paraffin) to one side. This wax can be rubbed on, then gently warmed to insure uniformity of thickness and penetration of the paper. Only partial penetration is desirable; not saturation.

(4) For a stylus, you may use a ballpoint pen, a slender stick of hard wood, or even a heavy piece of wire with the ends rounded and smoothed enough to etch the wax without tearing the paper. The stylus is used to inscribe the desired message or to sketch on the wax coating of the paper. The paper is then applied to the ink pad with the wax next to the ink. Some of the ink will penetrate through the lines made by the stylus, thus “printing” the blank paper. The undisturbed wax prevents ink’s penetrating the paper in unwanted places.

(6) If no mimeograph paper is available, substitute paper chosen for printing should be of quality similar to newspaper; but, almost any paper will suffice.
3. Instructions for Making and Using a Gelatin Printing Device

a. General Instructions. This reproduction method is more commonly known as the hectograph technique, a commercial technique used worldwide. All necessary materials are commercially known by the name “Hectograph” and are available in several variations, from gelatin plates to prepared plates which are fiberbacked wrap-around models for machine use (Ditto). The Ditto machines are similar in appearance to mimeograph machines. Emergency or field conditions will probably dictate the use of the simple gelatin plate described below.

b. Specific Instructions. Gelatin, the base for this technique, can be purchased as a Hectograph product, made from gelatin powder produced by food concerns (such as Knox), or made by boiling the bones and skin of animals. (Pulverizing the bone will speed the boiling down process.) Enough gelatin powder should be added to make a semi-solid plate. The warm, liquid gelatin is poured into a shallow, wide container or on a tabletop where it is allowed to cool and set. When properly prepared, it becomes a glass-smooth plate which feels like sponge rubber to the touch. This will be soft enough to absorb the ink but firm enough not to bleed the ink on the master copy. The addition of a little animal glue will toughen the plate and a little glycerine will keep it from drying out too quickly. The effects of these additions are in direct proportion to the quantity

(1) The master copy is made on a good grade of smooth, tough, hard finish paper. The material to be reproduced is typed or written using Hectograph or Ditto carbon paper, ribbon, ink, or pencil: all are commercially available. In an emergency, trial and error testing will unveil numerous ink pencils (indelible), writing inks, and stamp pad inks that will reproduce. When the ink has been applied to the master copy, do not blot. If pencil is used, be sure that the copy is strong and uniform.

(2) When the gelatin plate is set and ready for work, sponge the plate thoroughly with cold water and allow it to set for an additional minute or two. Using a sponge, remove all excess moisture and apply the master copy, face down, on the gelatin plate. Carefully smooth the copy to ensure complete and uniform contact with prepared plate. Do not remove for at least 2 minutes. Lift one corner of the master for a gripping point and carefully lift the master copy from the gelatin plate. The gelatin plate now bears a negative copy of the desired material and is ready to reproduce the copy.

(3) Begin reproduction immediately after

360 AOG 6242C 381
the master copy has been removed from the gelatin plate. Reproduction is accomplished by placing a blank sheet of smooth surface paper on the gelatin plate and smoothing it into total contact by using the hand (or a rubber roller if available), then lifting the sheet from the gelatin surface. This is done as rapidly as possible to obtain as many copies as possible from one inking of the plate. One good inking of the plate may produce from 100 to 200 copies by this method, while a commercial Ditto machine may produce as many as 700 copies. In order to speed this process, one small corner of the sheet of reproduction paper is left free for gripping. This can be accomplished by permanently affixing a small piece of paper to the place on the gelatin plate where a corner of the reproduction paper would fall. This piece of paper acts as a guide and a buffer to keep that one corner of the reproduction paper from sticking. When removing the reproduction paper, lift the sheet by the loose corner; do not attempt to roll it away. The rolling action will cause the reproduction paper to curl as it dries.

(4) After completing the reproduction job, sponge the gelatin plate thoroughly with cold water and allow it to set for 48 hours or until the ink has been assimilated by the gelatin. The plate is now ready to be used on a new and different job. The only way to shorten this time span is to dissolve the gelatin plate in hot water; boil off the superfluous water until the liquid is thickened to the desired consistency, and pour a new gelatin plate. Of course, two or more gelatin plates may be prepared to increase production capabilities.
APPENDIX III
AIR AND AMPHIBIOUS MESSAGES

1. Sample Drop Zone Report

<table>
<thead>
<tr>
<th>Item</th>
<th>Sample entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code name</td>
<td>DZ HAIRY</td>
</tr>
<tr>
<td>Location</td>
<td>THREE TWO TANGO PAPA TANGO SIX FOUR ONE TWO FOUR THREE</td>
</tr>
<tr>
<td>Open quadrants</td>
<td>OPEN ONE THREE ZERO DEG TO TWO TWO ZERO DEG AND THREE THREE ZERO DEG TO ZERO ONE TWO DEG</td>
</tr>
<tr>
<td>Recommended track</td>
<td>TRACK THREE SIX ZERO DEG</td>
</tr>
<tr>
<td>Obstacles</td>
<td>RADIO TOWER ZERO EIGHT SIX DEG SIX KM</td>
</tr>
</tbody>
</table>

* All items will be reported. When applicable NONE will be reported in order to preserve sequence.

2. Sample Area Drop Zone Report

<table>
<thead>
<tr>
<th>Item</th>
<th>Sample entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code name</td>
<td>DZ JOLLY AREA</td>
</tr>
<tr>
<td>Location</td>
<td>PT ALFA THREE TWO TANGO PAPA TANGO SIX ONE TWO THREE FOUR FIVE PT BRAVO THREE TWO TANGO PAPA TANGO SIX ONE TWO FOUR NINE TWO</td>
</tr>
<tr>
<td>Open quadrants</td>
<td>NONE (NOTE: Not applicable to area DZ's, but will be reported to preserve report sequence)</td>
</tr>
<tr>
<td>Track</td>
<td>TRACK THREE SIX ZERO DEG</td>
</tr>
<tr>
<td>Obstacles</td>
<td>PT ALFA TOWER ONE EIGHT ZERO DEG ONE ZERO KM</td>
</tr>
</tbody>
</table>

Sample Landing Zone Report

<table>
<thead>
<tr>
<th>Item</th>
<th>Sample entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>LZ NOBLE</td>
</tr>
<tr>
<td>Location</td>
<td>THREE TWO TANGO PAPA TANGO SIX ONE SIX TWO FOUR ZERO</td>
</tr>
<tr>
<td>Axis</td>
<td>AXIS ONE TWO ZERO DEG</td>
</tr>
<tr>
<td>Direction</td>
<td>FIRM SOD ONE FIVE ZERO FT BY THREE SIX ZERO FT</td>
</tr>
<tr>
<td>Open quadrants</td>
<td>OPEN ZERO FIVE ZERO DEG TO ONE NINE ZERO DEG AND TWO FIVE ZERO DEG TO THREE ONE ZERO DEG</td>
</tr>
<tr>
<td>Recommended track</td>
<td>TRACK ONE TWO ZERO DEG</td>
</tr>
<tr>
<td>Obstacles</td>
<td>TOWER ZERO ONE ZERO DEG FOUR KM</td>
</tr>
<tr>
<td>Landing point</td>
<td>OLBURG ZERO FIVE ZERO DEG NINE KM</td>
</tr>
</tbody>
</table>

The Request for Airdrop or Airlanded Mission

<table>
<thead>
<tr>
<th>Item</th>
<th>Sample entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>DZ HAIRY PRI</td>
</tr>
<tr>
<td>Reason</td>
<td>Requesting a mission to be flown to a drop or landing zone that has been reported to SFOR previously, it is necessary to give this mission request should contain all items shown to the examples above.</td>
</tr>
<tr>
<td>Target group</td>
<td>ZERO FIVE TWO TWO ZERO ZER0 ZULU FEB</td>
</tr>
<tr>
<td>Target</td>
<td>ONE ZERO INDIA ALFA</td>
</tr>
<tr>
<td>Target</td>
<td>DZ HANDY ALT</td>
</tr>
</tbody>
</table>
| Alternate zone        | Alternate drop or landing zone normally will be designated as mission is requested. If the alternate DZ/LZ has been
reported to SFOB previously, only the code name need be given. If the
DZ/LZ has not been reported previously, the mission request should
contain complete information as shown in the preceding examples. Pri-
mary and alternate will always be identified as such by use of the
abbreviations PRI and ALT as shown above. A date/time for the
alternate will not be submitted by the requesting detachment, but will
be determined by the SFOB in coordination with the air support unit,
and the requesting detachment will be advised in the mission confirma-
tion message.

5. Sample Airdrop Confirmation Message

<table>
<thead>
<tr>
<th>Item</th>
<th>Sample entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Name</td>
<td>DZ HAIRY PRI</td>
</tr>
<tr>
<td>Actual track</td>
<td>TRACK THREE SIX ZERO DEG</td>
</tr>
<tr>
<td>Actual date/time</td>
<td>ZERO FIVE TWO TWO ZERO ZERO ZULU FEB</td>
</tr>
<tr>
<td>Number containers</td>
<td>ONE TWO PERS THREE BUNDLES</td>
</tr>
<tr>
<td>Drop altitude</td>
<td>EIGHT ZERO ZERO</td>
</tr>
<tr>
<td>Alternate DZ</td>
<td>DZ HANDY ALT</td>
</tr>
<tr>
<td>Alternate date/time</td>
<td>ZERO FIVE TWO TWO FOUR ZERO ZULU FEB</td>
</tr>
</tbody>
</table>

6. Sample Airland Confirmation Message

<table>
<thead>
<tr>
<th>Item</th>
<th>Sample entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code name</td>
<td>LZ NOBLE PRI</td>
</tr>
<tr>
<td>Actual track</td>
<td>TRACK ONE TWO ZERO DEG</td>
</tr>
<tr>
<td>Actual date/time</td>
<td>ONE NINE ONE THREE ZERO ZULU APR</td>
</tr>
<tr>
<td>Alternate</td>
<td>LZ NANCY ALT</td>
</tr>
<tr>
<td>Alternate date/time</td>
<td>ONE NINE ONE THREE ZERO ZULU APR</td>
</tr>
</tbody>
</table>

7. Sample Beach Landing Site Report, with Mission Request

<table>
<thead>
<tr>
<th>Item</th>
<th>Sample entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code name</td>
<td>BL WATER PRI</td>
</tr>
<tr>
<td>Location</td>
<td>THREE TWO TANGO PAPA TANGO ONE ONE SIX TWO THREE FOUR</td>
</tr>
</tbody>
</table>

Sample entry

<table>
<thead>
<tr>
<th>Description</th>
<th>FIRM SAND THREE ZERO ZERO M LONG BY FIVE ZERO M WIDE NO OBSTRUCTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date/time</td>
<td>ZERO EIGHT ZERO FOUR ZERO ZERO ZULU JUN</td>
</tr>
<tr>
<td>Request</td>
<td>TWO FOXTROT LIMA NINE FOXTROT MIKE EIGHT ALFA JULIETT</td>
</tr>
<tr>
<td>Alternate</td>
<td>BL WINDY ALT</td>
</tr>
</tbody>
</table>

Sample Beach Landing Mission Confirmation Message

<table>
<thead>
<tr>
<th>Item</th>
<th>Sample entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code name</td>
<td>BL WATER PRI</td>
</tr>
<tr>
<td>Actual date/time</td>
<td>ZERO EIGHT ZERO FOUR ZERO ZERO ZULU JUN</td>
</tr>
<tr>
<td>Date</td>
<td>BL WINDY ALT</td>
</tr>
<tr>
<td>Date/time</td>
<td>ZERO EIGHT ZERO EIGHT THREE ZERO ZULU JUN</td>
</tr>
</tbody>
</table>

Sample message for any of the purposes stated above may be constructed by simply
taking the information given in the “Sample” column, without breaks or paragraph
nings. An example, using the samples given paragraphs 1 and 4, is shown—

HAIRY PRI THREE TWO TANGO PAPA G0 SIX FOUR ONE TWO FOUR THREE N ONE THREE ZERO DEG TO TWO TWO 0 DEG AND THREE THREE ZERO DEG 0 ONE TWO DEG TRACK THREE SIX 0 DEG RADIO TOWER ZERO EIGHT SIX SIX KM WHITE LAKE ONE SEVEN DEG SEVEN KM ZERO FIVE TWO TWO
APPENDIX IV
FIELD EXERCISE

Section 1. INTRODUCTION

1. General

a. This appendix outlines a field exercise for both headquarters and operational elements of a Special Forces group which have attained the advanced unit level of training. The exercise is a joint maneuver and incorporates other service support of unconventional warfare activities to include participation by the Joint Unconventional Warfare Task Force (JUWTF) in overseas theaters. The exercise may be modified to meet local requirements; however, to retain maximum realism, the basic structure should not be altered.

b. The exercise consists of two phases—a preparatory phase, involving Special Forces participants, of 30 to 45 days; and the exercise proper of 30-days’ duration.

2. Purpose and Scope

a. The exercise is a training vehicle designed to—

(1) Train the headquarters and operational elements of the Special Forces group.
(2) Provide for joint training between the Special Forces group and support elements from other services.

(3) Exercise communications systems over extended distances.

(4) Test, in overseas theaters, certain aspects of unconventional warfare plans such as—
   (a) The logistical support plans.
   (b) Activation of the SFOB.
   (c) Command relationships between the Special Forces group, the JUWTF, and other unified command elements.

b. In addition to the unconventional warfare objectives of the exercise, conventional troop participants benefit as follows:
   (1) Aggressor force. Training in counter-guerrilla operations with stress on small-unit actions. Most aggressor activity involves small units on semi-independent missions transported and supplied largely by aircraft.
   (2) Guerrilla troops. The troops participating as the guerrilla rank and file are trained by the Special Forces operational detachments. Training stresses small-unit operations conducted at night in enemy rear areas. Demolitions, air resupply procedures, raids, and ambushes receive heavy emphasis. The exercise is an excellent training vehicle for small-unit leaders.

   c. The exercise is a joint field maneuver commencing with the establishment of the SFOB; continuing with initiation of operations; and ending with demobilization of the area command.

Conduct of the Exercise

a. The exercise may be conducted in a single cycle or extended over two or more cycles. Each cycle is a complete exercise (30 days) for all participants.

   (1) Single cycle exercise. This exercise requires commitment of the entire Special Forces group. The single cycle method has the advantage of involving for a relatively short period of time the Special Forces group and large numbers of other participants. The major disadvantages of the single cycle method is that all detachments of the group are not able to participate in an operational role. The same number of detachments is required for guerrilla cadre duties as for operational units. Additional personnel in excess of the headquarters and headquarters company are needed to staff the exercise control group.

   (2) Two or more cycles. This method has several advantages. Since all detachments usually have not achieved the same level of training, the less qualified
detachments participate in later cycles when they reach the necessary level of readiness. All detachments are employed in the operational role. Those detachments completing cycle one as operational detachments may be used during cycle two in their same area as the guerrilla cadre detachment. The major disadvantage is the large number of supporting elements required over a relatively long period of time.

b. The exercise should be conducted annually by detachments that have reached advanced unit training. The exercise is designed to be the high point of the Special Forces group training year.

c. Realism throughout the exercise is stressed. The commander responsible for its preparation prescribes restrictions to meet safety requirements. Within these limits, the director insures that realistic procedures are incorporated.

d. Maximum latitude of action is allowed all participants in the conduct of the exercise within necessary maneuver restrictions.

4. Participants

a. Friendly Forces.

(1) Special Forces group.

(a) Headquarters and headquarters company establishes the SFOB. Signal company provides base radio communication within the SFOB and with

b. SF operational detachment, and other central communications as required.

c. Special Forces companies.

1. Provide operational detachments.

2. Provide detachments to cadre the guerrilla force on the basis of one guerrilla cadre detachment per operational sector. The guerrilla cadre detachment should contain all of its regularly assigned personnel with

(c) ...
the possible exception of communications personnel.

(2) United States Air Force provides air support units as required.

(3) United States Navy provides naval support as required.

(4) JUWTF provides operational control (control headquarters) for designated theater unconventional warfare forces. If the exercise originates from the continental United States (CONUS), the JUWTF may be played by a Special Forces group operational detachment C.

(5) Theater Army Communications Zone (CommZ) furnishes administrative and logistical support. If the exercise originates from CONUS, this support is provided by the appropriate continental army commander.

(6) Theater or CONUS intelligence agencies provide intelligence support.

(7) Theater Army, or in CONUS, the continental army area furnishes troops for the guerrilla force. A minimum of 50 non-Special Forces guerrillas are provided for each Special Forces guerrilla cadre detachment.

(8) Personnel to participate as evaders in evasion and escape, should be aircrew members and furnished from Air Force, naval air, or Army aviation units.

b. Aggressor Forces. The size of the aggressor force depends upon the size of the exercise area and the strength of the deployed unconventional warfare force in the areas. As a general rule, the aggressor to friendly force ratio should be no less than 3 to 1 in favor of aggressor. An exercise area containing 400 to 500 guerrillas and Special Forces troops requires an aggressor force equal to 2 or more infantry battalions. The aggressor force should contain the following additional elements:

(1) Elements of one airmobile battalion as required.

(2) One troop of an armored cavalry squadron.

(3) Military intelligence elements—
   (a) OB specialists.
   (b) Interrogators.
   (c) Intelligence corps (INTC) personnel.

(4) Army aviation elements other than the airmobile battalion.

(5) Communications security or communications intelligence elements.

(6) Normal administrative and logistical support elements for a brigade.

(7) Elements of a psychological operations company (loudspeaker and leaflet).

(8) Appropriate aerial surveillance and target acquisition elements with supporting military intelligence imagery interpreters.
5. Exercise Area

a. Location. The exercise area should contain—

(1) Terrain of varying ruggedness to facilitate development of a guerrilla force.

(2) Suitable "live" targets (railroads, highways, and telecommunications systems) to be used for actual and simulated attack.

b. Size. The area must be large enough to permit logical subdivision into sufficient operational areas or sectors for the number of detachments to be deployed. A sector of roughly 700 square miles is adequate for a single detachment in an exercise of 30-days duration. Size is further influenced by the nature of the terrain.

c. Organization. The exercise area is subdivided into guerrilla warfare operational areas (GWOA) and sectors. As a general rule, one operational detachment may organize each sector. Detachments B and C are either superimposed upon an A detachment or employed in separate areas.

d. Relationship of Guerrilla Warfare Operational Areas (fig. 81). Operational areas and sectors are ideally located in a circular formation around the field control headquarters and adjacent to each other. Although this arrangement is not always an operational ideal, it facilitates administrative control by the exercise director and allows the employment of more operational detachments. It also tends to increase the effectiveness of the aggressor force.

6. Planning and Preparatory Phase

a. Planning. Planning the FTX requires 6 to 9 months, depending upon the command structure in the theater, the number and types of participants, and their relative geographic locations. The headquarters directing the exercise appoints planning personnel (the exercise director and necessary staff assistance) far enough in advance of the exercise to insure adequate preparatory planning and coordination by all participants.

b. Special Forces Group.

(1) Preparation. Special Forces troops should be given 30 to 45 days for preparation. This preparatory phase is designed to:

(a) Permit operational detachments to reach a high peak of unit proficiency before the exercise.

(b) Teach special techniques to be employed or tested during the exercise.

(c) Train the operational detachments in conjunction with the supporting air or naval units.

(d) Train guerrilla cadre detachments.

(e) Allow the guerrilla cadre detachments to reconnoiter and prepare their operational areas.
(f) Conduct a CPX for headquarters elements.

(g) Train the exercise control personnel.

(2) Facilities. If the SFOB is not physically established, the headquarters elements of the Special Forces group and theater support troops erect the necessary facilities during the preparatory phase.

(3) Programming. One week is programmed between the end of the preparatory training and the commencement of the exercise. This period allows for maintenance of equipment and final preparation.

(4) Operational detachments.

(a) The operational detachments undergo an intensive period of training to prepare for the exercise. This training is conducted as a series of short (4 to 5 days) field exercises which incorporate the following:

1. Air or amphibious operations in conjunction with supporting air or naval units.
2. Reconnaissance and selection of guerrilla bases and other related areas (evasion and escape contact areas, mission support sites, and caches).
3. Tactical operations.
5. Organization and employment of area command forces.
6. Training of guerrilla forces.
7. Field craft and cross-country movement.
8. Evasion and escape identification techniques.

(b) In addition, operational detachments engage in certain preparatory training not conducted in the field, such as:

---

Figure 88. The exercise area.
1. Area studies of the entire exercise area.
2. Demolitions simulation procedures.
4. Administrative briefings.
5. Foreign weapons.

(5) Guerrilla cadre detachments.

(a) Guerrilla cadre detachments are Special Forces operational detachments that provide the guerrilla force with its leadership and also serve as a part of the exercise control system. The success of the exercise as a training vehicle rests to a great extent upon the efforts of the guerrilla cadre detachment. These detachments are selected because of their experience and advanced state of training. Where possible, the guerrilla cadre detachment has already participated as an operational detachment in a similar exercise.

(b) The guerrilla cadre detachments undergo short formal training (3 to 5 days) conducted by the control group. This training includes—
1. Administrative briefings.
2. Area studies of assigned operational area. For this area study the guerrilla cadre detachment prepares a terrain analysis of their area.
3. Requirements to be presented to operational detachments. These are the requirements to be injected into the exercises on a predetermined time schedule.
4. Role of the guerrilla cadre detachment in the exercise control system.

(c) The majority of time in the preparatory phase is utilized by the guerrilla cadre detachments for a physical reconnaissance of the operational areas. This reconnaissance should take at least 3 weeks. It permits the detachments to become thoroughly familiar with their areas. The cadres establish contacts with civilians in the area and organize the nucleus of auxiliary units. They attempt to elicit support from the civilians for the friendly forces. They locate possible guerrilla bases, mission support sites, evasion and escape contact areas, caches, and other installations. They become familiar with the important targets in the area. They study the terrain and suitable routes for movement. The results of this reconnaissance are reported to the exercise director. This report includes as a minimum—
1. An infiltration DZ and alternate DZ.
2. Suitable landing zones for aircraft, or water landing sites.
3. Recommended routes for ambush problems.