

Appendix D Expedient Demolitions

D-1. Expedient Techniques. These techniques are intended for use only by personnel experienced in demolitions and demolitions safety. Do not use expedient techniques to replace standard demolition methods. Availability of trained soldiers, time, and material are the factors to consider when evaluating the use of expedient techniques.

D-2. Shaped Charges.

a. *Description.* Shaped charges concentrate the energy of the explosion released on a small area, making a tubular or linear fracture in the target. The versatility and simplicity of shaped charges make them effective against many targets, especially those made of concrete or those with armor plating. You can improvise a shaped charge (Figure D-1). Because of the many variables (configuration, explosive density, liner cavity density, and so forth), consistent results are impossible to obtain. Therefore, experiment to determine the optimum standoff distances. Plastic explosive is best suited for this type of charge. However, dynamite and molten TNT can be effective expedients.

b. *Fabrication.* Obtain a container for the shaped charge and remove both ends. Almost any kind of container will work.

Cans, jars, bottles, or drinking glasses will do. Some containers come equipped with built-in cavity liners, such as champagne or cognac bottles with the stems removed. With the ends removed, the container is ready for a cavity liner and explosive. Optimum shaped-charge characteristics are:

(1) **Cavity Liner.** Make a cone-shaped cavity liner for the container from copper, tin, zinc, or glass. Funnels or bottles with a cone in the bottom (champagne or cognac bottles) are excellent. However, if material is not available for a cavity liner, a workable but less effective shaped charge can be made by cutting a coned-shaped cavity in a block of explosive.

(2) **Cavity Angle.** For most high-explosive antitank (HEAT) ammunition, the cavity angle is 42 to 45 degrees. Expedient charges will work with cavity angles between 30 and 60 degrees.

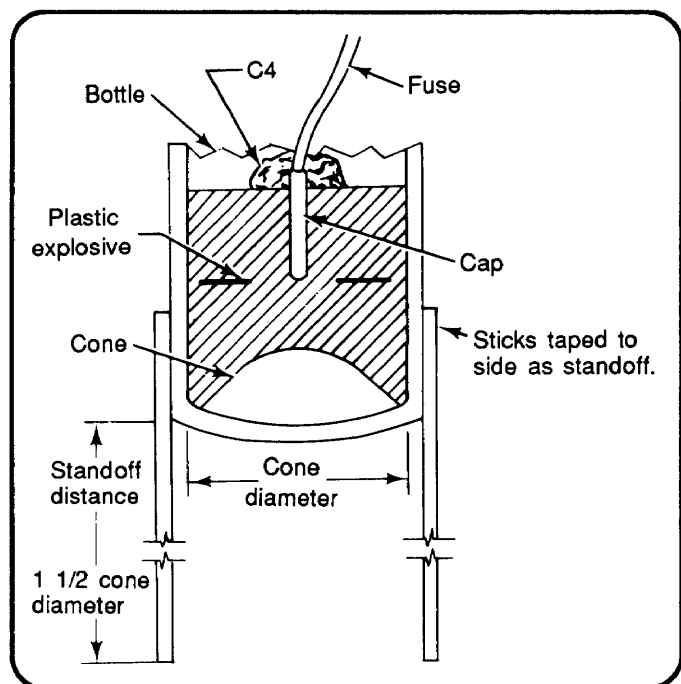


Figure D-1. Improvised shaped charge

(3) **Explosive Height (In Container).** The explosive height is two times the cone height, measured from the base of the cone to the top of the explosive. Press the explosive into the container, being careful not to alter the cavity angle of the cone. Ensure the explosive is tightly packed and is free of any air pockets.

(4) **Standoff Distance.** The normal standoff distance is one and one-half cone diameters. Use standoff sticks to achieve this.

(5) **Detonation Point.** The exact top center of the charge is the detonation point. Cover the blasting cap with a small quantity of C4 if any part of the blasting cap is exposed or extends above the charge.

NOTE: Remove the narrow neck of a bottle or the stem of a glass by wrapping it with a piece of soft, absorbent twine or by soaking the string in gasoline and lighting it. Place two bands of adhesive tape, one on each side of the twine, to hold the twine firmly in place. To heat the glass uniformly, turn the bottle or stem continuously with the neck up. After the twine or plastic has burned, submerge the neck of the bottle in water and tap it against some object to break it off. Tape the sharp edge of the bottle to prevent cutting hands while tamping the explosive in place. A narrow band of plastic explosive placed around the neck and burned gives the same results as using string or twine.

D-3. Platter Charge. This device uses the Miznay-Shardin effect. It turns a metal plate into a powerful, blunt-nosed projectile (Figure D-2). Use a round, steel platter, if available. Square platters also will work. The platter should weigh 2 to 6 pounds.

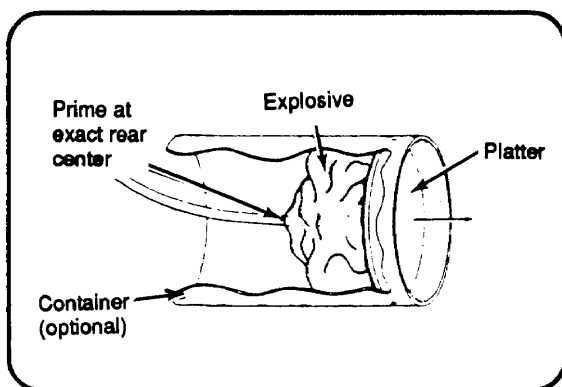


Figure D-2. Platter charge

a. *Charge Size.* Use a quantity of explosive equal to the platter weight.

b. *Fabrication.*

(1) Uniformly pack the explosive behind the platter. A container is not necessary if the explosive will remain firmly against the platter without a container. Tape is an acceptable anchoring material.

(2) Prime the charge at the exact, rear center. Cover the blasting cap with a small quantity of C4 if any part of the blasting cap is exposed.

(3) If available, use a gutted M60 fuze igniter as an expedient aiming device and aim the charge at the direct center of a target. Ensure the explosive is on the side of the platter opposite the target. With practice, you can hit a 55-gallon drum, a relatively small target, at 25 yards about 90 percent of the time with a platter charge.

D-4. Grapeshot Charge. This charge consists of a container (an ammo can or Number- 10 can), projectiles (nails, bolts, glass, small pieces of scrap metal, or rocks), buffer material (soil, leaves, felt, cloth, cardboard, or wood), a charge (plastic explosive like C4), and a blasting cap. Assemble these components as shown in Figure D-3.

a. *Charge Size.* Use a quantity of explosive equal to one quarter the projectile weight.

b. *Fabrication.*

(1) Make a hole in the center of the bottom of the container large enough to accept a blasting cap.

(2) Place the components in the container in the following sequence:

(a) *Explosive.* Place the plastic explosive uniformly in the bottom of the container, remove all voids or air spaces by tamping with a nonsparking instrument.

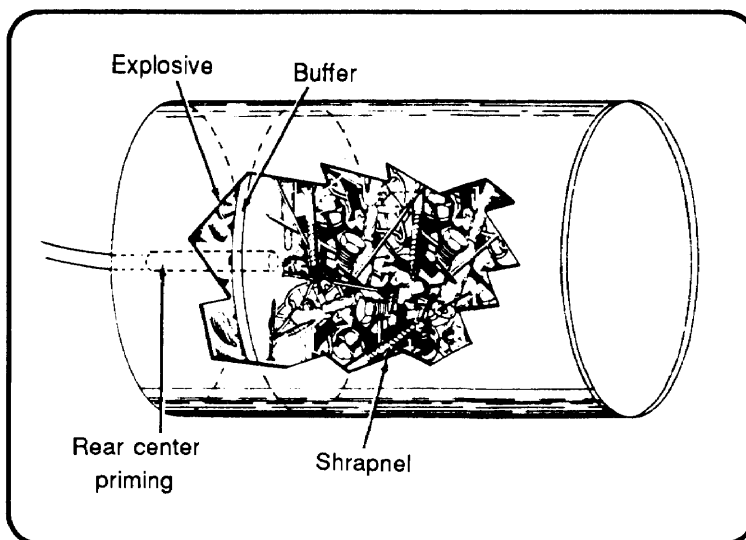


Figure D-3. Grapeshot charge

(b) *Buffer.* Place 2 inches of buffer material directly on top of the explosive.

(c) *Projectiles.* Place the projectiles on top of the buffer material, and place a covering over the projectiles to prevent them from spilling out when handling the charge.

(3) Make a cap well in the plastic-explosive charge through the hole in the bottom of the container and insert the blasting cap of the initiation set. Cover the blasting cap with a small quantity of C4 if any part of the blasting cap is exposed

(4) Aim the charge at the center of the target from approximately 100 feet.

D-5. Dust Initiator. Dust-initiator charges use small quantities of explosives with larger amounts of powdered materials (dust or cover) to destroy thin-walled, wooden buildings or railroad boxcars. These charges work best in an enclosed area with few windows. At detonation, the dust or cover is distributed in the air within the target and ignited by an explosive-incendiary charge. The dust-initiator charge consists of an explosive, mixed with equal parts of incendiary mix, and a cover of finely divided organic material.

a. *Charge Computations.*

(1) *Charge Size.* One pound of explosive-incendiary mixture will effectively detonate up to 40 pounds of cover. To make a 1-pound explosive-incendiary mixture, combine 1/2 pound of crushed TNT or C3 and 1/2 pound of incendiary mix (two parts aluminum powder or magnesium powder and three parts ferric oxide). Do not use C4 because the explosive component in C4 will not combine properly with the incendiary mixture.

(2) *Cover (Dust) Size.* Use 3 to 5 pounds of cover for each 1,000 cubic feet of target (3 pounds for enclosed buildings, 5 pounds for partially enclosed buildings). The cover can consist of coal dust, cocoa, powdered coffee, confectioners sugar, tapioca, wheat flour, corn starch, hard-rubber dust, aluminum powder, magnesium powder, powdered soap, or a volatile fuel such as gasoline.

b. *Fabrication.* Place the TNT or C3 explosive in a canvas bag and crush it into a powder with a wooden mallet. In the same bag that contains the crushed explosive, add an equal amount of incendiary mixture and mix thoroughly. Prime this explosive-incendiary charge with a detonating-cord knot. Place the primed charge in the center of the target and pour or place the cover on top of it, forming a pyramid. When using gasoline as the cover, do not use more than 3 gallons, since greater quantities will not evenly disperse in the air, giving poor results.

c. *Detonation.* The charge can be detonated by attaching initiation sets to the detonating cord.

D-6. Improvised Cratering Charge. This charge consists of a mixture of ammonium nitrate fertilizer (at least 33.33 percent nitrogen) and diesel fuel, motor oil, or gasoline. The ratio of fertilizer and fuel is 25 pounds to 1 quart. The fertilizer must not be damp. You may fabricate almost any size of improvised charge from this mixture. Proceed as follows:

a. Measure the fertilizer and fuel for the size charge you require.

b. Add the fuel to the fertilizer and mix thoroughly.

c. Allow the fuel to soak into the fertilizer for an hour.

d. Place half of the ammonium nitrate charge in the borehole. Then, place two 1-pound primed blocks of explosives in the borehole and add the remainder of the ammonium nitrate charge. Never leave the charge in the borehole for a long period, since the charge will accumulate moisture, reducing its effectiveness.

NOTE: Boreholes should receive 10 pounds of explosives for every foot of depth and must be dual primed.

e. Detonate the charge.

D-7. Improvised Borehole Method (Detonating-Cord Wick). This method (Figure D-4) is used to enlarge boreholes in soil. The best results are obtained in hard soil. Use the following procedure:

a. Tape together several strands of detonating cord 5 to 6 feet long. Generally, one strand enlarges the diameter of the hole by about one inch. Tape or tie the strands together into a wick for optimum results.

b. Make a hole by driving a steel rod approximately 2 inches in diameter into the ground to the depth required. According to the rule of thumb, a hole 10 inches in diameter requires 10 strands of detonating cord.

c. Place the detonating-cord wick into the hole using an inserting rod or some other field expedient. The strands must extend the full length of the hole.

d. Fire the cord either electrically or nonelectrically. An unlimited number of wicks can be fired at one time by connecting them with the detonating cord ring main or line main. If successive charges are placed in the holes, blowout excess gases and inspect the hole for excessive heat.

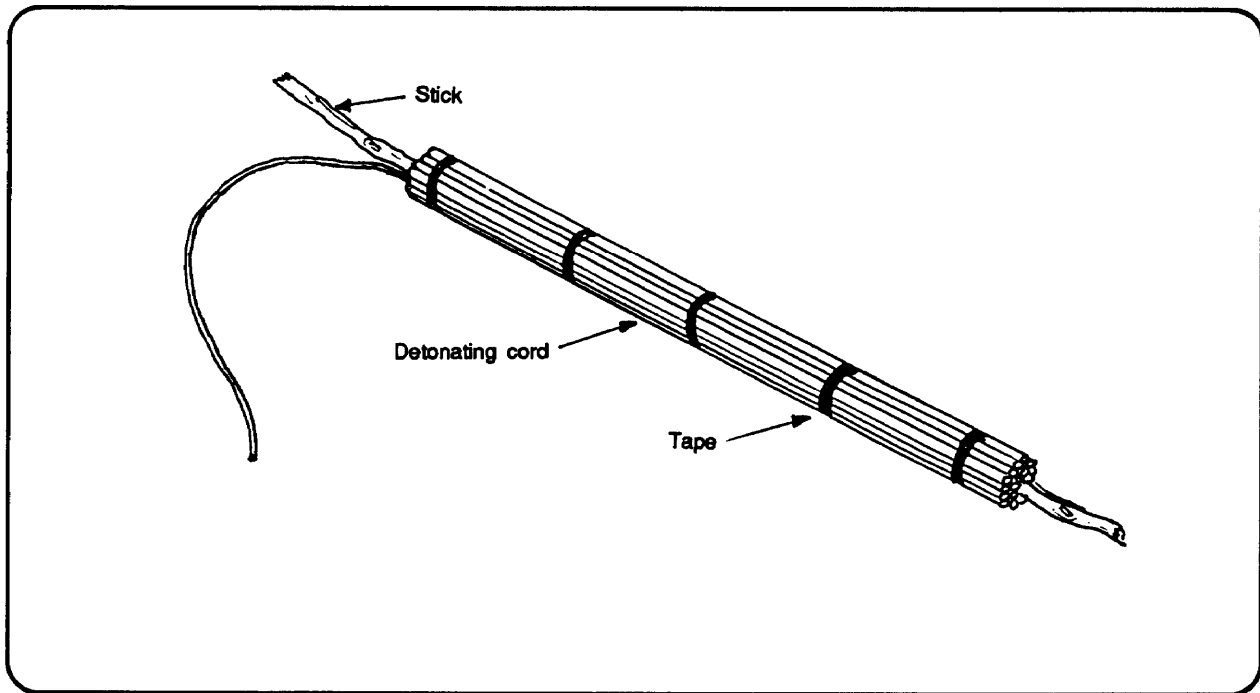


Figure D-4. Detonating-cord wick

D-8. Ammonium-Nitrate Satchel Charge. Although the satchel charge is excellent, it is mostly suitable for cratering. A more manageable charge may be used by mixing ammonium-nitrate fertilizer with melted wax instead of oil. The mixing ratio is 4 pounds of fertilizer to 1 pound of wax. Set the primer in place before the mixture hardens.

a. Preparation.

(1) Melt the wax in a container and stir in the ammonium-nitrate pellets, making sure that the wax is hot while mixing.

(2) Before the mixture hardens, add a 1/2-pound block of explosive primed with detonating cord. Ensure the primed charge is in the center of the mixture and that there is sufficient detonating cord available to attach initiation sets.

(3) Pour the mixture into a container. Add shrapnel material to the mixture if desired or attach the shrapnel on the outside of the container to give a shrapnel effect.

(4) Detonate the charge by attaching initiation sets to the detonating cord coming from the satchel charge.

b. Use. Because the wax and fertilizer may be molded into almost any size or shape, it may be applied to a great many demolition projects with satisfactory results.

D-9. Expedient Flame Fougasse. Use this device in defensive or offensive operations for its incendiary, illuminating, and signaling effects. The charge consists of a 55-gallon drum of thickened fuel, a kicker charge, a trip flare, and detonating cord (Figure D-5, page D-6). A 55-gallon drum containing a fougasse mixture is effective for a controlled-direction burst.

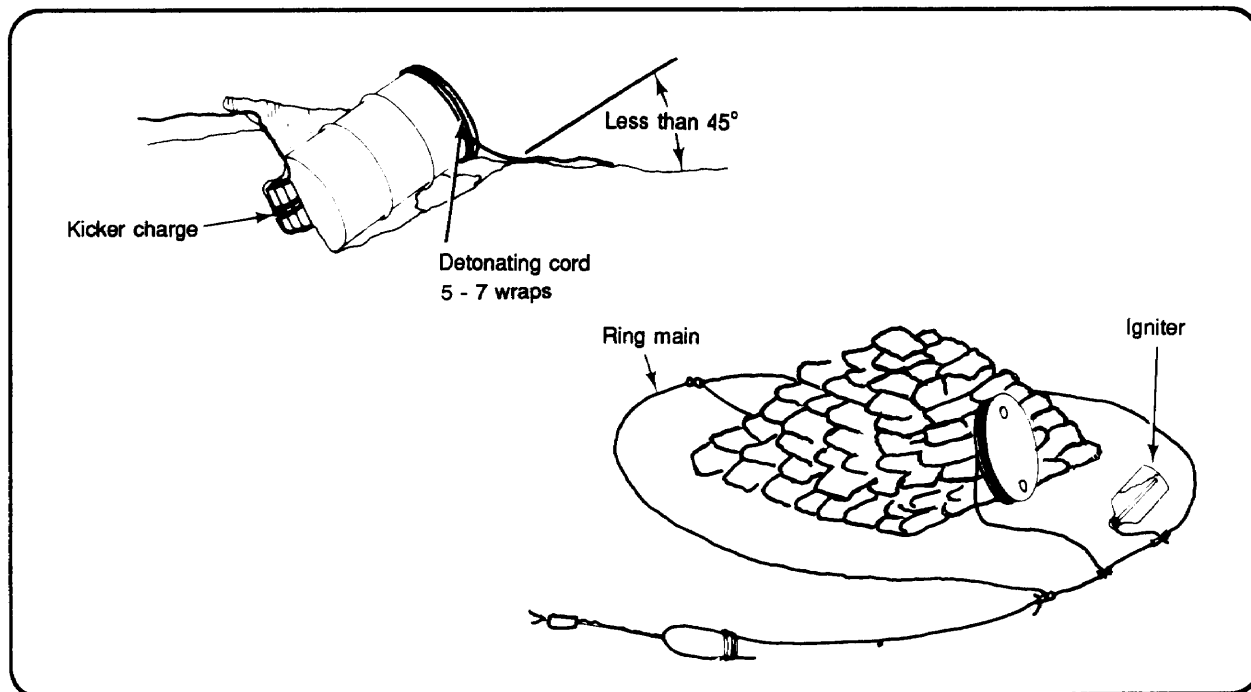


Figure D-5. Expedient flame fougasse

a. Preparation.

(1) Make the fougasse mixture by mixing 3 ounces of M4 thickening compound per gallon of gasoline or JP4 fuel. Depending on the temperature, the mixture may take from 15 minutes to several hours to thicken to the desired viscosity (resembling applesauce or runny gelatin). For a 55-gallon drum, vigorously mix 150 ounces of M4 thickening compound with 50 gallons of gasoline or JP4 fuel.

(2) Dig an angled trench for the 55 gallon drum that will allow the best coverage and dispersion of the flame fougasse. However, do not build the trench steeper than 45 degrees. Make a small cutout area in the back of the trench for the kicker charge (2 pounds of TNT or 2 blocks of C4).

(3) Prime the kicker charge with detonating cord, leaving 6 to 10 feet of detonating cord free to tie into a ring main (6 to 10 feet).

(4) Wrap the top end of the 55 gallon drum with 5 to 7 wraps of detonating cord, leaving 6 to 10 feet of the detonating cord free to tie into a ring main.

(5) Lay the drum in the trench and place the kicker charge in the small cutout. Push the drum against the back of the trench so the kicker charge seats firmly against the bottom of the drum. It may be necessary to tamp soil around the charge to properly center the kicker charge against the bottom of the drum. The running ends of detonating cord for the kicker charge and drum top should extend from the trench. Avoid kinks or sharp bends in the detonating cord.

(6) Lay out a ring main of detonating cord around the 55-gallon drum and tie the detonating cord from the kicker charge and wraps to the ring main.

(7) Cover the entire 55-gallon drum with a minimum of 1 foot of tamped soil, leaving the front of the drum exposed or uncovered.

(8) Using a length of detonating cord, tape one end under the spoon handle of an igniter trip flare (M49). Tape the spoon handle down securely, attach the trip flare to a stake, and position the stake 3 to 4 feet in front of the drum. Attach the free end of the detonating cord secured to the trip flare to the ring main. During combat, a WP grenade (M34) will work in place of the trip flare. If trip flares are not available, do the following:

- Take a 2-liter plastic bottle and fill it half full with raw gasoline or JP4 (unthickened).
- Punch a hole in the cap of the bottle and thread one end of a detonating cord through the hole.
- Tie a single overhand knot in the detonating cord to prevent it from being pulled back out of the cap.
- Place the detonating cord with the single overhand knot inside the bottle and secure the cap onto the bottle.
- Take the opposite end of the detonating cord and attach it to the ring main.

(9) Attach initiation sets to the ring main.

b. *Function.* When initiated, the ring main initiates the detonating cord to the trip flare, the drum top, and the kicker charge. The wraps cut the top of the drum off, the kicker charge propels the thickened fuel outward, and the trip flare ignites the thickened fuel as it travels downrange. The result is a flash of flame that spreads downrange for approximately 100 meters.