

Appendix I

Appendix I

Improvised Explosive Devices, Suicide Bombers, and Unexploded Ordnance

Improvised explosive devices (IEDs), car bombs, unexploded ordnance (UXO), and suicide bombers pose deadly and pervasive threats to Soldiers and civilians in operational areas all over the world. Infantrymen at all levels must know how to identify, avoid, and react to these hazards properly. Newly assigned leaders and Soldiers should read everything they can find on current local threats. They should also become familiar with unit SOP policies and other relevant information contained in locally produced Soldier handbooks and leader guidebooks.

This appendix introduces discussions of improvised explosive devices (IEDs), homicide bombers, and unexploded ordnance (UXO). It incorporates tactical-level countermeasures learned from recent combat operations.

SECTION I — IMPROVISED EXPLOSIVE DEVICES

I-1. IEDs are nonstandard explosive devices used to target U.S. Soldiers, civilians, NGOs, and government agencies. IEDs range from crude homemade explosives to extremely intricate remote-controlled devices. The devices are used to instill fear in U.S. Soldiers, coalition forces, and the local civilian population. Their employment is intended to diminish U.S. national resolve with mounting casualties. The sophistication and range of IEDs continue to increase as technology continues to improve and as terrorists gain experience.

TYPES

I-2. Some of the many types of IEDs follow.

TIMED EXPLOSIVE DEVICES

I-3. These can be detonated by remote control such as by the ring of a cell phone, by other electronic means, or by the combination of wire and either a power source or timed fuze ([Figure I-1](#)).

IMPACT DETONATED DEVICES

I-4. These detonate after being dropped, thrown, or impacted in some manner.

VEHICLE BOMBS

I-5. These may include explosive-laden vehicles detonated with electronic command wire or wireless remote control, or with timed devices. They might be employed with or without drivers.

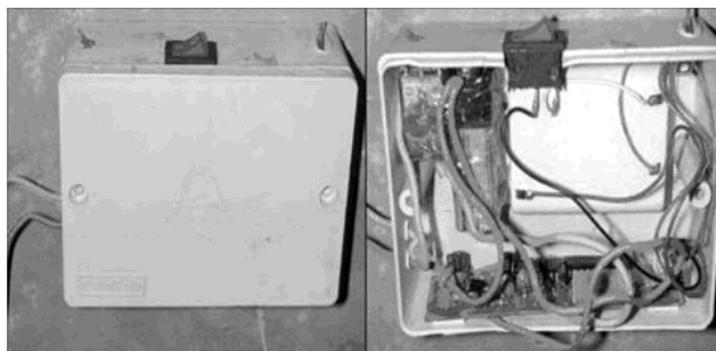


Figure I-1. Example of IED detonation device with explosive.

CHARACTERISTICS

- I-6. Key identification features and indicators of suspected IEDs include—
- Exposed wire, cord, or fuze protruding from an object that usually has no such attachment.
 - An unusual smell, sound, or substance emanating from an object.
 - An item that is oddly light or heavy for its size.
 - An object that seems out of place in its surrounding.

- An object or area locals are obviously avoiding.
- An threatening looking object covered with written threats or whose possessor uses verbal threats.
- An object that is thrown at personnel, facilities, or both.

INGREDIENTS

I-7. Anything that can explode will be used to make IEDs. Examples include:

- Artillery rounds containing high explosives or white phosphorous.
- Any type of mine (antitank or antipersonnel).
- Plastic explosives such as C4 or newer.
- A powerful powdered explosive.
- Ammonium nitrate (fertilizer) combined with diesel fuel in a container. (The truck bomb that destroyed the Oklahoma City Federal Building used ammonium nitrate and diesel fuel.)

CAMOUFLAGE

I-8. An IED can vary from the size of a ballpoint pen to the size of a water heater. They are often contained in innocent-looking objects to camouflage their true purpose. The type of container used is limited only by the imagination of the terrorist. However, containers usually have a heavy metal casing to increase fragmentation. [Figure I-2](#) shows some of the types of camouflage that have been used to hide IEDs in Iraq. Some of the more commonly used containers include:

- Lead, metal, and PVC pipes with end caps (most common type).
- Fire extinguishers.
- Propane tanks.
- Mail packaging.
- Wood and metal boxes.
- Papier-mâché or molded foam or plastic "rocks," (containers that look like rocks, usually employed along desert roads and trails).
- Military ordnance, or rather modified military ordnance, which uses an improvised fuzing and firing system.

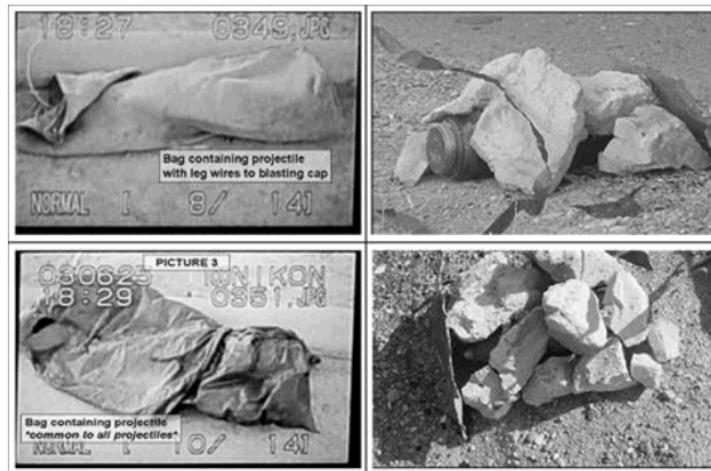


Figure I-2. Camouflaged UXO.

VEHICLE-BORNE DEVICES (CAR BOMBS)

I-9. Car bombs obviously use a vehicle to contain the device. The size of the device varies by the type of vehicle used. They can be packed into varying sizes of sedans, vans, or a large cargo trucks ([Figure I-3](#)). Larger vehicles can carry more explosives, so they cause more damage than smaller vehicles. Device functions, like package types, vary.

I-10. Signs of a possible car bomb include:

- A vehicle riding low, especially in the rear, especially if the vehicle seems empty. Explosive charges can also be concealed in the panels of the vehicle to distribute the weight of the explosives better.
- Suspiciously large boxes, satchels, bags, or any other type of container in plain view on, under, or near the front seat in the driver's area of the vehicle.
- Wire or rope-like material coming from the front of the vehicle that leads to the rear passenger or trunk area.
- A timer or switch in the front of a vehicle. The main charge is usually out of sight, and often in the rear of the vehicle.

- Unusual or very strong fuel-like odors.
- An absent or suspicious-behaving driver.

ATF	Vehicle Description	Maximum Explosives Capacity	Lethal Air Blast Range	Minimum Evacuation Distance	Falling Glass Hazard
	Compact Sedan	500 pounds 227 Kilos (In Trunk)	100 Feet 30 Meters	1,500 Feet 457 Meters	1,250 Feet 381 Meters
	Full Size Sedan	1,000 Pounds 455 Kilos (In Trunk)	125 Feet 38 Meters	1,750 Feet 534 Meters	1,750 Feet 534 Meters
	Passenger Van or Cargo Van	4,000 Pounds 1,818 Kilos	200 Feet 61 Meters	2,750 Feet 838 Meters	2,750 Feet 838 Meters
	Small Box Van (14 Ft. box)	10,000 Pounds 4,545 Kilos	300 Feet 91 Meters	3,750 Feet 1,143 Meters	3,750 Feet 1,143 Meters
	Box Van or Water/Fuel Truck	30,000 Pounds 13,636	450 Feet 137 Meters	6,500 feet 1,982 Meters	6,500 Feet 1,982 Meters
	Semi-Trailer	60,000 Pounds 27,273 Kilos	600 feet 183 Meters	7,000 Feet 2,134 Meters	7,000 Feet 2,134 Meters

Figure I-3. Vehicle IED capacities and danger zones.

EMPLOYMENT

I-11. IEDs have been used against the U.S. military throughout its history. Operation Enduring Freedom (Afghanistan) and Iraqi Freedom (OIF) have seen the use of IED attacks on a significant scale targeting U.S., coalition, and Iraqi Security forces, and civilian concentrations. Some threat TTPs might include:

- An IED dropped into a vehicle from a bridge overpass. An enemy observer spots a vehicle and signals a partner on the overpass when to drop the IED. Uncovered soft-top vehicles are the main targets. These IEDs are triggered either by timers or by impact (Figure I-4).
- An IED used in the top-attack mode and attached to the bottom of a bridge or overpass. This IED is command-detonated as a vehicle passes under it. This method gets around the side and undercarriage armor used on U.S. vehicles.
- An IED used with an ambush. Small arms, RPGs, and other direct-fire weapons supplement the IED, which initiates the ambush (Figures I-5, I-6, and I-7). Terrorists sometimes use deception measures such as dummy IEDs to stop or slow vehicles in the real kill zone.
- The driver of a suicide or homicide vehicle such as a taxicab feigns a breakdown and detonates the vehicle when Soldiers approach to help. The vehicle with IEDs might also run a checkpoint and blow up next to it.
- Suicide bombers sometimes approach U.S. forces or other targets and then self-detonate. Children might approach coalition forces wearing explosive vests.

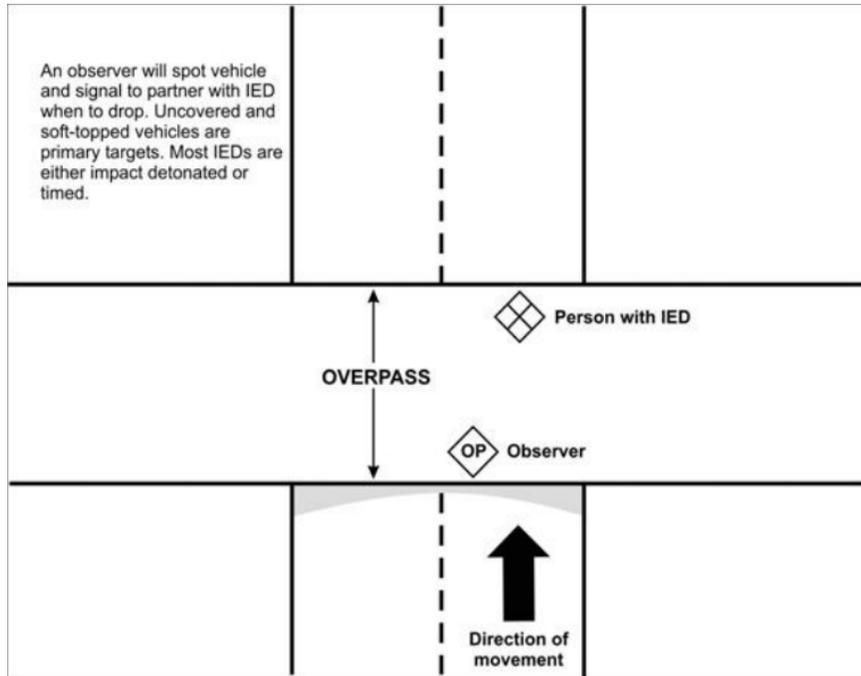


Figure I-4. Example of IED dropped into vehicles.

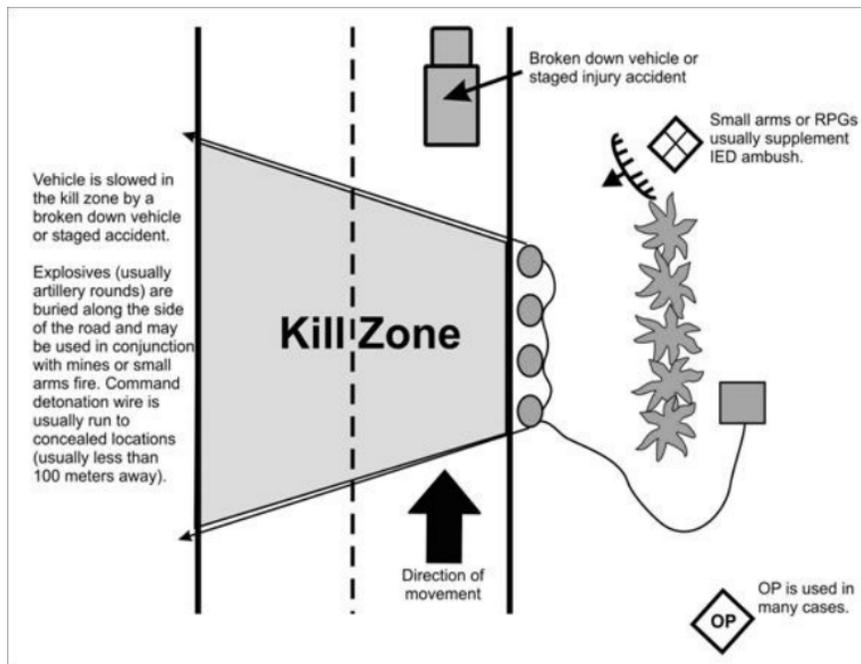


Figure I-5. Typical IED combination ambush.

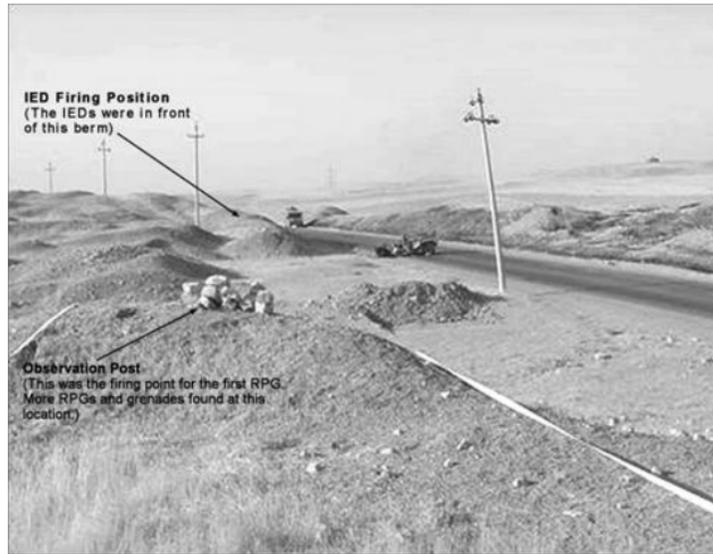


Figure I-6. IED combination ambush in Iraq.

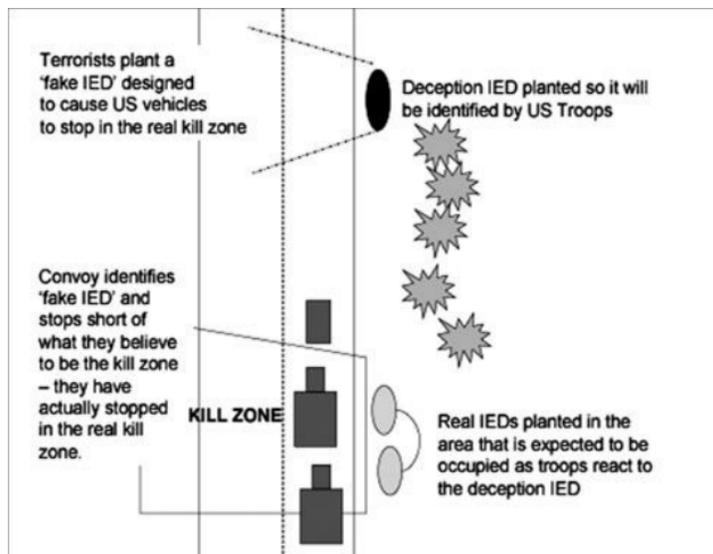


Figure I-7. Deception or fake IED used to stop convoy in kill zone.

COUNTERMEASURES

I-12. The enemy continues to adapt as friendly countermeasures evolve. Following are some measures used to counter an IED threat.

AVIATION SUPPORT

I-13. Operate with army aviation support when possible. Terrorists employing command-detonated IEDs generally rely on a quick escape after detonating an IED or executing an ambush. Recent trends have shown that OH-58D support deters attacks because terrorists are unable to break contact easily.

ALL-ROUND SECURITY

I-14. Remain alert. Maintain all-round security at all times. Scan rooftops and bridge overpasses for enemy activity.

CONVOY SECURITY

I-15. When possible, travel in large convoys. Vary road speed to disrupt the timing of command-detonated devices. However, terrorists often target convoys (or specific vehicles within convoys) with poor security postures. All occupants of convoy vehicles should have and keep their weapons pointed in an alert and defensive posture. Maintain a strong rear security element or a follow-on "shadow" trail security element. This force can more quickly be brought to bear on an enemy attacking the rear of a convoy. Use armed vehicles to speed ahead of a convoy to overwatch overpasses as the convoy passes. The lead vehicle in a convoy should have binoculars to scan the route ahead. All convoys should have extra tow bars or towing straps to recover broken-down vehicles quickly.

ADAPTATION

I-16. Be aware of evolving enemy tactics/procedures and be prepared to design countermeasures ([Figure I-8](#)). To the maximum possible extent, avoid becoming predictable. Vary routes, formations, speeds, and techniques.

TURNS

I-17. Avoid moving toward or stopping for an item in the roadway. Give wide clearance to items in the road. Turn to the outside of corners because terrorists often plant IEDs on the inside of turns to close the distance to the target. Turning to the outside also allows a longer field of view past the turn.

AUDIBLE SIGNALS

I-18. At night be aware of audible signals that can be used to communicate the approach of a convoy such as flares, gunfire, lights going off, or horns honking.

ENEMY OBSERVERS

I-19. Be alert for people who seem overly interested in your convoy, especially those using cell phones while watching your convoy.

UNUSUAL SILENCE

I-20. Be aware of unusually quiet areas. Often, local civilians have been warned of an enemy attack on coalition forces.

USE OF HEADLIGHTS

I-21. Do not use service drive headlights during the day. Having lights on during daylight makes the military vehicles stand out and easier to identify at a greater distance.

VEHICLE PROTECTION

I-22. Harden all vehicles.

OTHER TRAVELING PRECAUTIONS

I-23. Do not stop for broken down civilian vehicles, vehicle accidents, or wounded civilians along a convoy route.

CIVILIAN VEHICLE THREATS

I-24. Be alert to civilian vehicles cutting in and out or ramming vehicles in a convoy as if attempting to disrupt, impede, or isolate the convoy. Current ROE might permit you to fire warning shots or to engage threatening vehicles.

FIVES C's TECHNIQUE

I-25. Using the five C's (confirm, clear, call, cordon, control) technique helps to simplify both awareness and reaction to a suspected IED.

CONFIRM

I-26. The first step when encountering a suspected IED is to confirm that it is an IED. If Soldiers suspect an IED while performing 5- and 25-meter searches of their positions, they should act as if it could detonate at any moment, even if it turns out to be a false alarm. Using as few people as possible, troops should begin looking for telltale signs such as wires, protruding ordnance, or fleeing personnel.

CLEAR

I-27. If an IED is confirmed, the next step is to clear the area. The safe distance is determined by several factors: the tactical situation, avoidance of predictability, and movement several hundred meters away. Everyone within the danger zone should be evacuated. If more room is needed such as when the IED is vehicle-borne, Soldiers should clear a wider area and continuously direct people away. Only explosive ordnance disposal (EOD) personnel or their counterparts may approach the IED. While clearing, avoid following a pattern and look out for other IEDs. If you find any more, reposition to safety and notify a ranking member on the scene.

CALL

I-28. While the area around the IED is being cleared, a nine-line IED/UXO report should be called in. The report is much like the nine-line MEDEVAC report. It includes the necessary information for the unit's TOC to assess the situation and prepare an appropriate response.

CORDON

I-29. After the area has been cleared and the IED has been called in, Soldiers should establish fighting positions around the area to prevent vehicle and foot traffic from approaching the IED. They assure the area is safe by checking for secondary IEDs. They use all available cover. The entire perimeter of the effected area should be secured and dominated by all available personnel. Available obstacles should be used to block vehicle approach routes. Scan near and far for enemy observers who might try to detonate the IED. Insurgents often try to hide where they can watch their target area and detonate at the best moment. To deter attacks, randomly check the people leaving the area.

CONTROL

I-30. Since the distance of all personnel from the IED directly affects their safety, Soldiers should control the site to prevent people from straying too close until the IED is cleared. No one may leave the area until the EOD gives the "all clear." While controlling the site, assure all Soldiers know the contingency plans in case they come under attack by any means, including direct-fire small arms or RPGs, or indirect fires.

SECTION II — SUICIDE BOMBERS

I-31. These are different from all other terrorist threats, and require specific guidance on actions, particularly the interpretation of the ROE.

DEFINITION

I-32. A suicide attack is so called because it is an attack that means certain death for the attacker. The terrorist knows that success depends on his willingness to die. He conducts this kind of attack by detonating a worn, carried, or driven portable explosive charge. In essence, the attacker is himself a precision weapon. Suicide bombers aim to cause the maximum number of casualties, or to assassinate a particular target. Stopping an ongoing suicide attack is difficult. Even if security forces stop him before he reaches his intended target, he can still activate the charge and kill or injure those around him at the time. An additional benefit is the simplicity of such an attack. Neither escape nor extraction is an issue. Nor is intelligence, for no one will be left to interrogate. The only way to prepare for a suicide attack is to train Soldiers to react immediately with competence and confidence. Soldiers should also train to avoid overreacting with unnecessary or inappropriate lethal force. The following are potential high-value targets for suicide bombers.

- High-signature forces such as uniformed military and security elements; military vehicles; civilian vehicles used for military purposes; military bases; checkpoints; patrols; liaison personnel; or supportive host nation personnel.
- Members and facilities of the international community such as ambassadors and other diplomats; embassy, U.N., and NGO buildings; and diplomatic vehicles and staffs.
- National and provincial leaders and government officials.
- Civilians in public places such as markets, shops, and cafes. Although civilians in these locations are seldom primary targets, some groups do attack them.

DELIVERY METHODS

I-33. The two main methods of employing devices are by person or by vehicle.

- A person-borne suicide bomb usually has a high-explosive and fragmentary effect and uses a command-detonated firing system such as a switch or button the wearer activates by hand. A vest, belt, or other specially modified clothing can conceal explosives with fragmentation ([Figure 1-8](#)).
- A vehicle-borne suicide bomb uses the same methods and characteristics of other package or vehicle bombs, and is usually command detonated.



Figure I-8. Suicide bomber vest.

INDICATORS

I-34. Suicide bombers can be either gender and any age. For example, recent Palestinian bombers were female teenagers. You might be looking at a suicide bomber if you see someone who—

- Tries to blend in with the (target) environment.
- Wears ordinary, nondistinctive clothing, military or religious garb, or an oversized, bulky, or unseasonably heavy coat or jacket.
- Demonstrates fanatical religious beliefs by behaviors such as praying fervently, possibly loudly, in public.
- Has a shaved head (Muslim males); wears their hair short and their face clean shaven; or wears fragrance, which is unusual for an Arab man.
- Behaves nervously, that is, sweats, or glances about anxiously.
- Has religious verses from the Quran written or drawn onto their body, hands, or arms.
- (Islamic males) dresses as and pretends to be a woman.
- Carries a bag tightly, clutched close to the body, and in some cases squeezes or strokes it.

SPECIAL CONSIDERATIONS

I-35. Consider the following when dealing with potential suicide bombers:

- Most will try to detonate the device if they believe they have been discovered.
- Suicide bombers are of any nationality, not necessarily of direct Middle Eastern descent. They may simply sympathize with the terrorist group's cause(s).
- If you determine that a suspect is a suicide bomber, then you will probably have to use deadly force. Prepare for and expect a detonation. Shoot from a protected position from as far away as possible.
- Many suicide bombers use pressure-release-type detonation devices that they hold in their hands. They apply the pressure before they begin their final approach to the target. The explosive payload will detonate as soon as the bomber relaxes his grip, so it will go off even if you kill him.
- Some bombers also have a command-detonated system attached to their bomb, and a second person observes and tracks him to the target. This also allows the terrorists to control and detonate the bomb, even if the bomber dies or his trigger is destroyed or disabled.
- The suicide bomber may also use a timed detonation system, and again this works whether or not you kill him before he reaches his target.

COMPLICATIONS

I-36. Dealing with a suicide bomber is one of the toughest situations a Soldier can face. In just a few seconds he must identify the bomber, assess the situation, consider how to comply with the ROE, and act decisively. There is seldom time to think beyond that or to wait for orders. The only possible way to stop the bomber short of his target is to immediately incapacitate him with lethal force. Challenging him would probably cause him to trigger his device at once. The suicide bomber is trained and prepared to carry out his mission. Some experts believe that a suicide bomber considers himself already dead when setting out on an attack. The Soldier and leader must continually be aware that—

- A pressure release switch can detonate the device as soon as the bomber is shot.
- A device could be operated by remote control or timer even after the bomber is incapacitated.

- Another person observe and command–detonate the bomb.
- A second suicide bomber might be operating as a backup or to attack the crowd and assistance forces that normally gather after a detonation.

SECTION III — UNEXPLODED ORDNANCE

I-37. Unexploded ordnance (UXO) are made up of both enemy and friendly force ordnance that have failed to detonate. UXO sometimes pose no immediate threat, but they can cause injuries, loss of life, and damage to equipment if appropriate actions are not taken. UXO can be found on the battlefield, in urban areas, caves, and almost anywhere in an AO. UXO can be a result of a recent battle or war, or left over from past conflicts. During Operation Enduring Freedom (OEF), U.S. Soldiers, coalition forces, and the local population were in danger of encountering an estimated 10,000,000 pieces of UXO and mines left over from 23 years of war in Afghanistan. Soldiers in Bosnia and Soldiers fighting in Operation Iraqi Freedom have been exposed to an estimated 8 million antipersonnel mines and 2 million antitank mines, as well as UXO. Soldiers can expect to encounter UXO in any future conflict.

RECOGNITION

I-38. Soldiers' knowledge of UXO is essential to help prevent the risk of injury. Soldiers are generally familiar with the appearance of ammunition and munitions used in their own weapons. They seldom recognize what the actual projectile looks like once it has been fired, especially if it is discolored or deformed by impact. Also, Soldiers might not be able to easily recognize UXO from USAF–delivered weapons or from non–U.S. weapons. In general, leaders should caution their Soldiers against disturbing any unknown object on the battlefield.

I-1.

I-39. FM 3-100.38 provides detailed illustrations and identifying characteristics of the four categories of UXO, including projected, thrown, placed, and dropped.

PROJECTED ORDNANCE

I-40. Projected ordnance includes:

- Projectiles such as HE, chemical, illumination, and submunitions.
- Mortar rounds such as HE, chemical, WP, and illumination.
- Rockets such as self–propelled projectiles, no standard shape.
- Guided missiles such as missiles with guidance systems.
- Rifle grenades similar to mortars but fired from rifles.

THROWN ORDNANCE

I-41. Thrown ordnance including fragmentation, smoke, illumination, chemical, and incendiary hand grenades.

PLACED ORDNANCE

I-42. Placed ordnance includes:

- AP mines, generally small, of various shapes and sizes, and made of plastic, metal, or wood. They might have trip wires attached.
- AT mines, large, of various shapes and sizes, and made of plastic, metal, or wood. They might have antihandling devices.

DROPPED ORDNANCE

I-43. Dropped ordnance includes:

- Bombs, small to very large, with metal casings, tail fins, lugs, and fuzes. They may contain HE, chemicals, or other hazardous materials.
- Dispensers that look similar to bombs but may have holes or ports in them. Do not approach as sub–munitions might be scattered around.
- Very sensitive submunitions such as small bombs, grenades, or mines.

DANGER

DO NOT TRY TO TOUCH OR MOVE UXO. ORDNANCE FAILS FOR MANY REASONS, BUT ONCE FIRED OR THROWN, THE FUZING SYSTEM WILL LIKELY ACTIVATE. THIS MAKES THE ORDNANCE TOO UNSTABLE TO HANDLE. IF A ROUND FAILS TO FUNCTION INITIALLY, ANY SUBSEQUENT STIMULUS OR MOVEMENT MIGHT SET IT OFF.

IMMEDIATE ACTION

I-44. Many areas, especially previous battlefields, might be littered with a wide variety of sensitive and deadly UXO. Soldiers need to follow

these precautions on discovering a suspected UXO:

- Do not move toward the UXO. Some types of ordnance have magnetic or motion-sensitive fuzing.
- Never approach or pick up UXO even if identification is impossible from a distance. Observe the UXO with binoculars if available.
- Send a UXO report to higher HQ (Figure I-9). Use radios at least 100 meters away from the ordnance. Some UXO fuzes might be set off by radio transmissions.
- Mark the area with mine tape or other obvious material at a distance from the UXO to warn others of the danger. Proper markings will also help EOD personnel find the hazard in response to the UXO report.
- Evacuate the area while carefully scanning for other hazards.
- Take protective measures to reduce the hazard to personnel and equipment. Notify local people in the area.

BOOBY TRAPS

I-45. Booby traps are typically hidden or disguised explosive devices rigged on common items to go off unexpectedly (Figure I-9). They may also be employed as antihandling devices on UXO, emplaced mines, or as improvised explosive devices (IED). Identify, mark, and report using the nine-line UXO incident report (Figure I-10). Field-expedient booby traps have also been employed with some success during most conflicts.

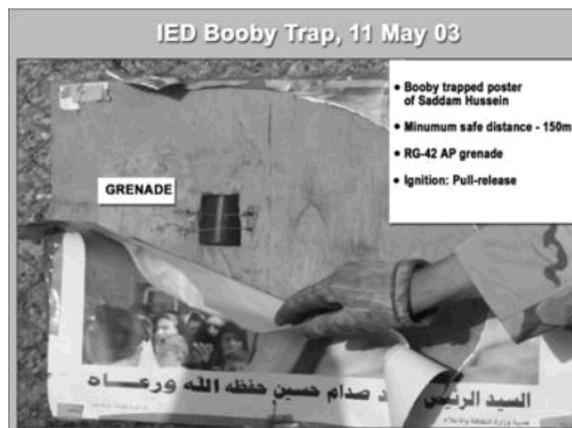


Figure I-9. Example booby trap.

1. **DTG:** Date and time UXO was discovered.
2. **Reporting Unit or Activity, and UXO Location:** Grid coordinates.
3. **Contact Method:** How EOD team can contact the reporting unit.
4. **Discovering Unit POC:** MSE, DSN phone number and unit frequency, or call sign.
5. **Type of UXO:** Dropped, projected, thrown, or placed, and number of items discovered.
6. **Hazards Caused by UXO:** Report the nature of perceived threats such as a possible chemical threat or a limitation of travel over key routes.
7. **Resources Threatened:** Report any equipment, facilities, or other assets threatened by the UXO.
8. **Impact on Mission:** Your current situation and how the UXO affects your status.
9. **Protective Measures:** Describe what you have done to protect personnel and equipment such as marking the area and informing local civilians.

Figure I-10. Nine-line UXO incident report.

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