

Minefields to Minespace

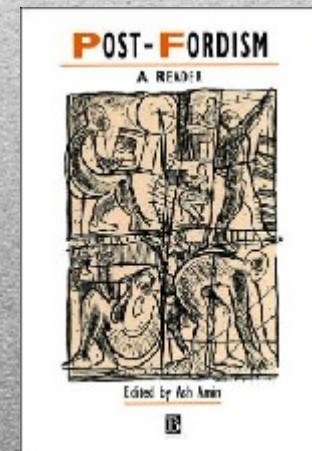
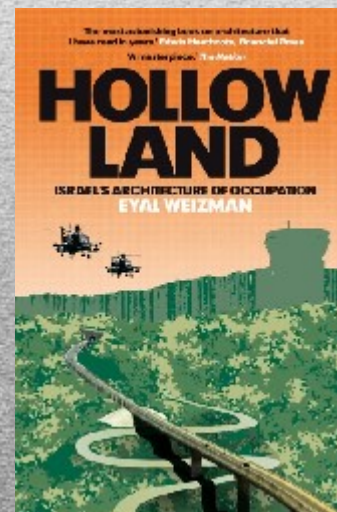
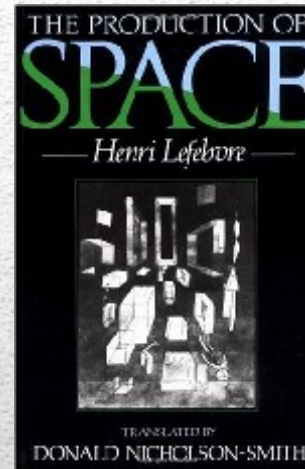
The Changing Architecture of
Autonomous Killing



Battlefield to Battlespace

The Shape of War

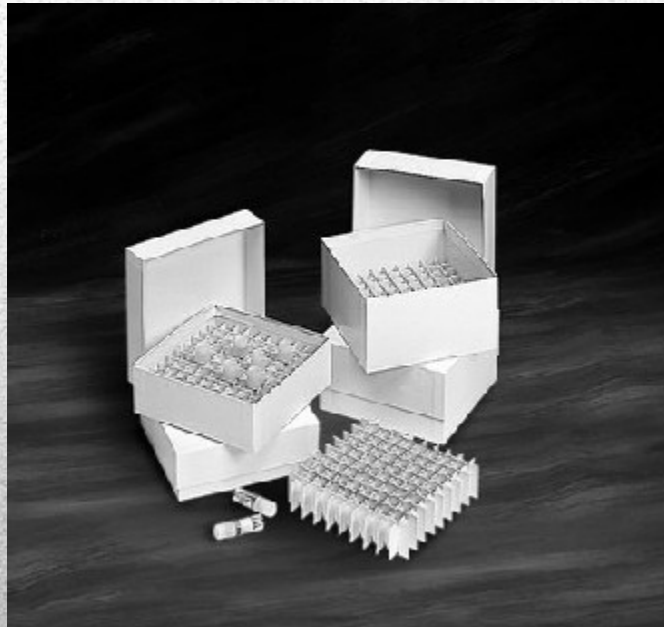
- Post-modernity has shifted the way space is produced by war, from clear divisions between nation-state territories to diffuse and complex 'rhizomes', networks or assemblages



What Shape is a War Zone?

- “We are seeing the **multiplication** of a broad range of partial, often highly specialized or obscure, **assemblages** of bits of territory, authority and rights once firmly ensconced in national and interstate institutional frames. These assemblages **cut across the binary of inside and outside**, ours and theirs, national versus global.”

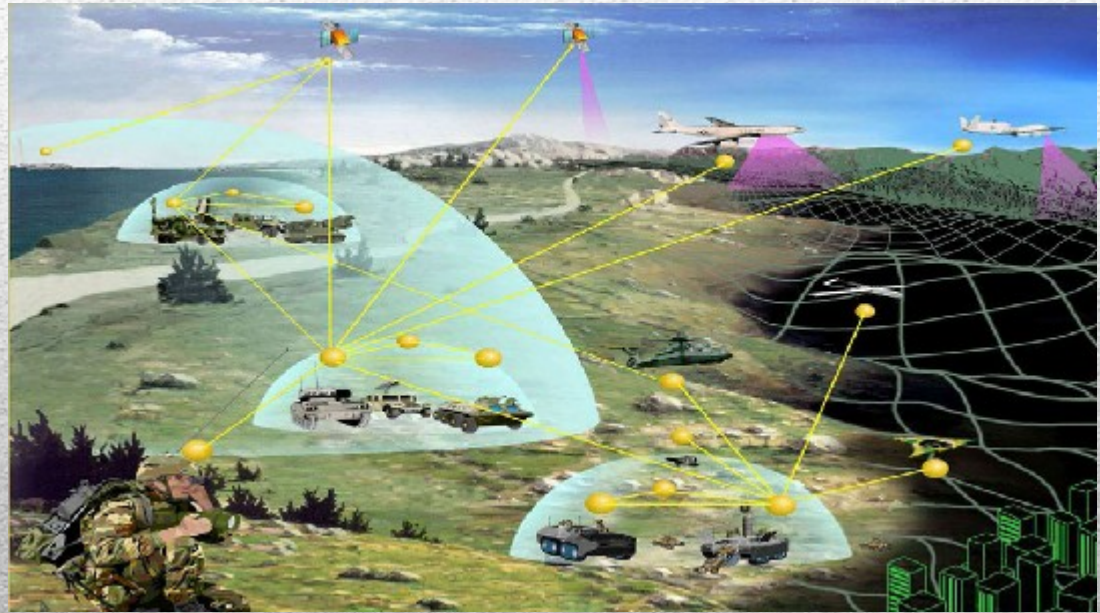
Saskia Sassen



Space as Box to Space as Assemblage



Territorial Sovereignty to Global Network



Battlefield to Battlespace

Landmines



Killer Robotics

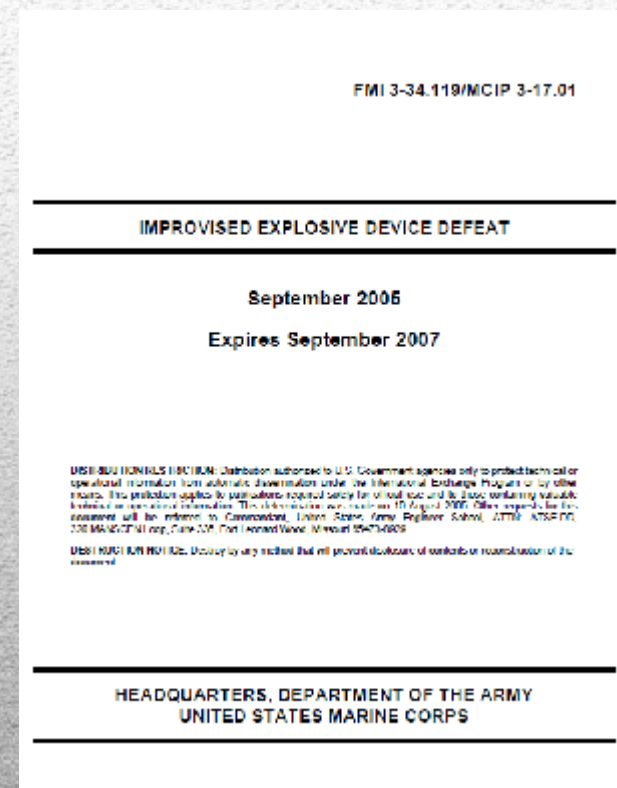
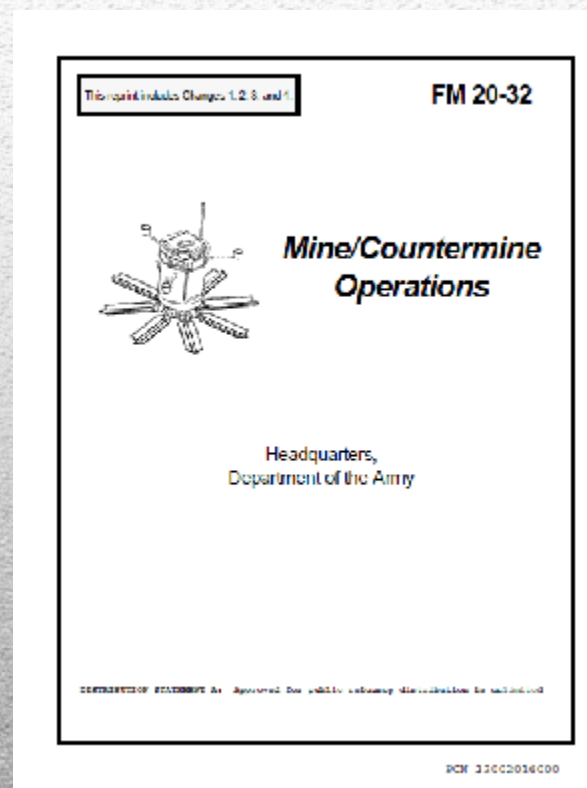
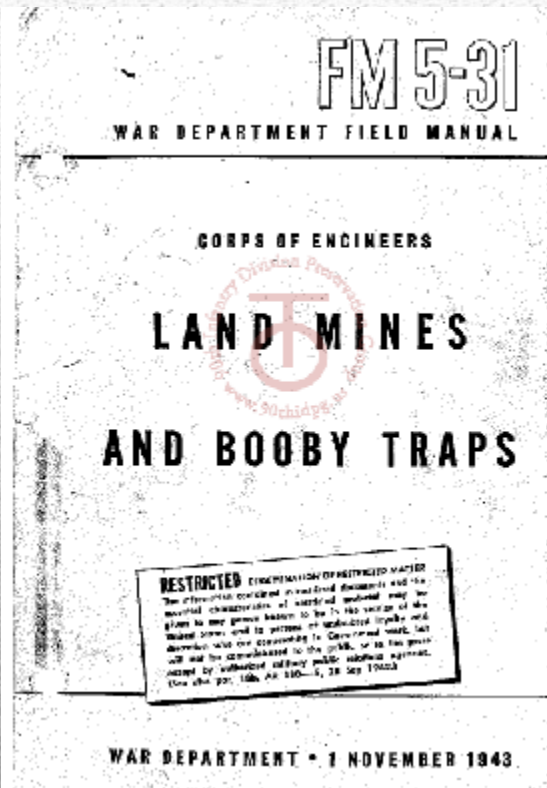


Case Study: Autonomous Killing



The minefield: An archeology

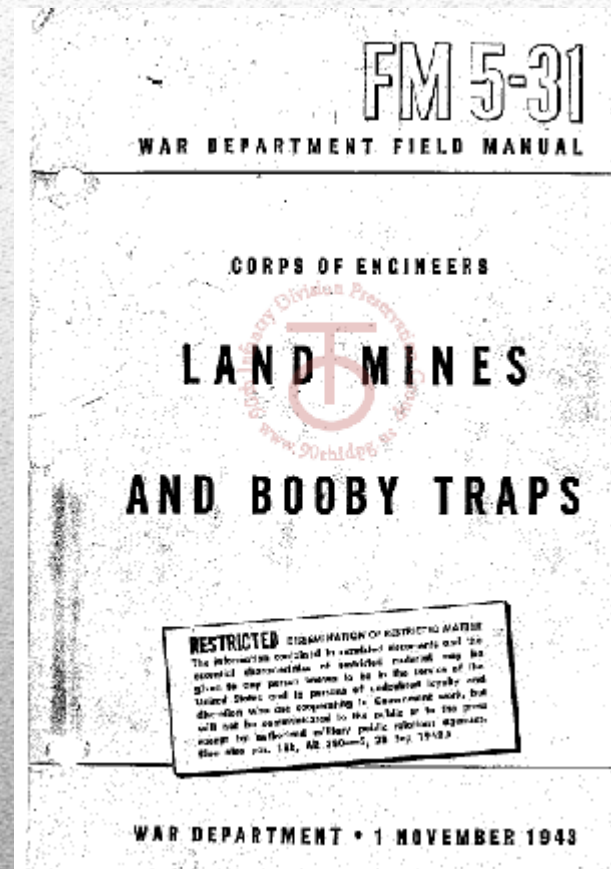
Mines, Booby Traps and IEDs in US Army
Field Manuals



Minefield as Architecture

1943
The Minefield as
Modernist
Architecture

FM5-31



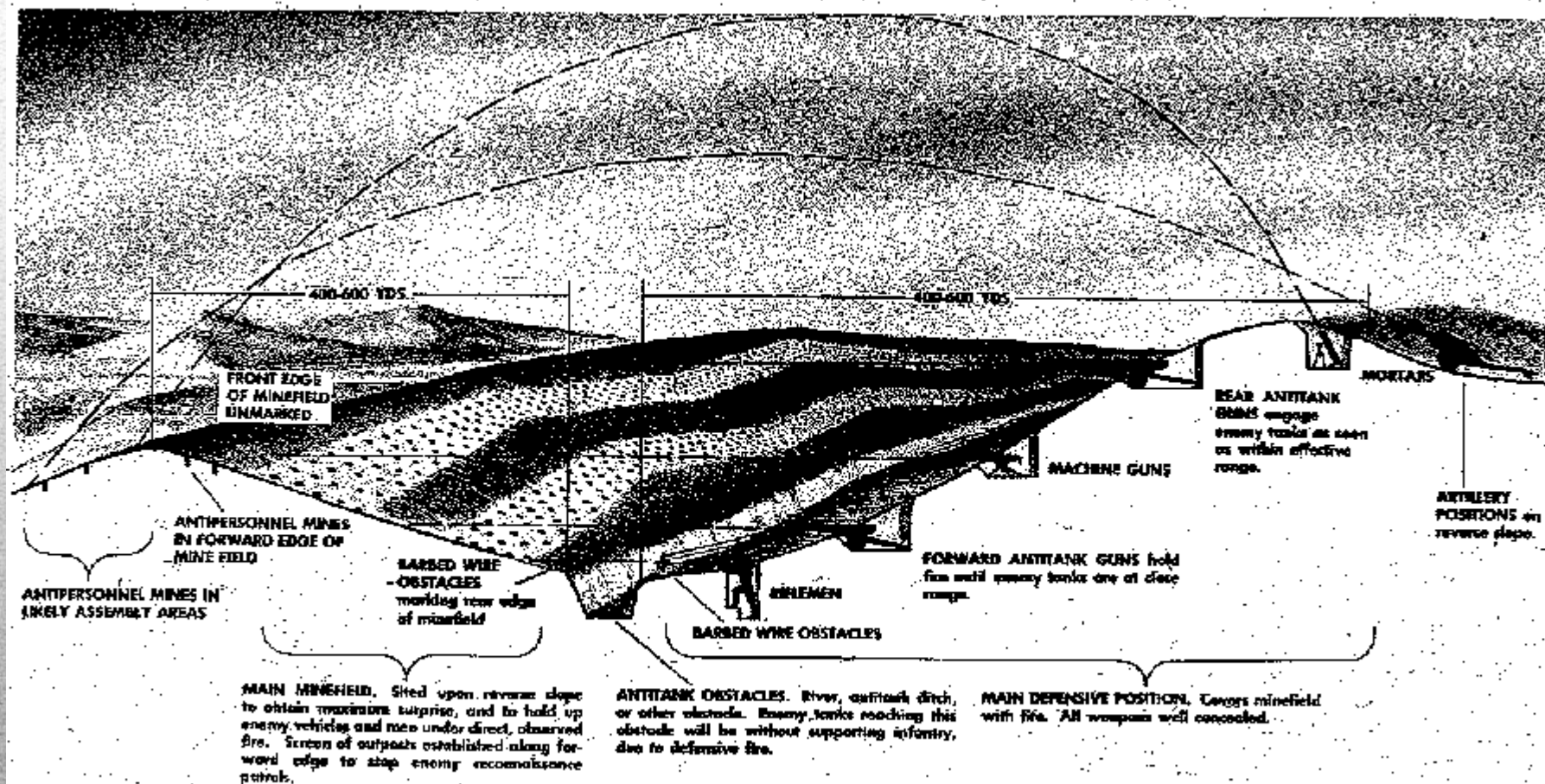
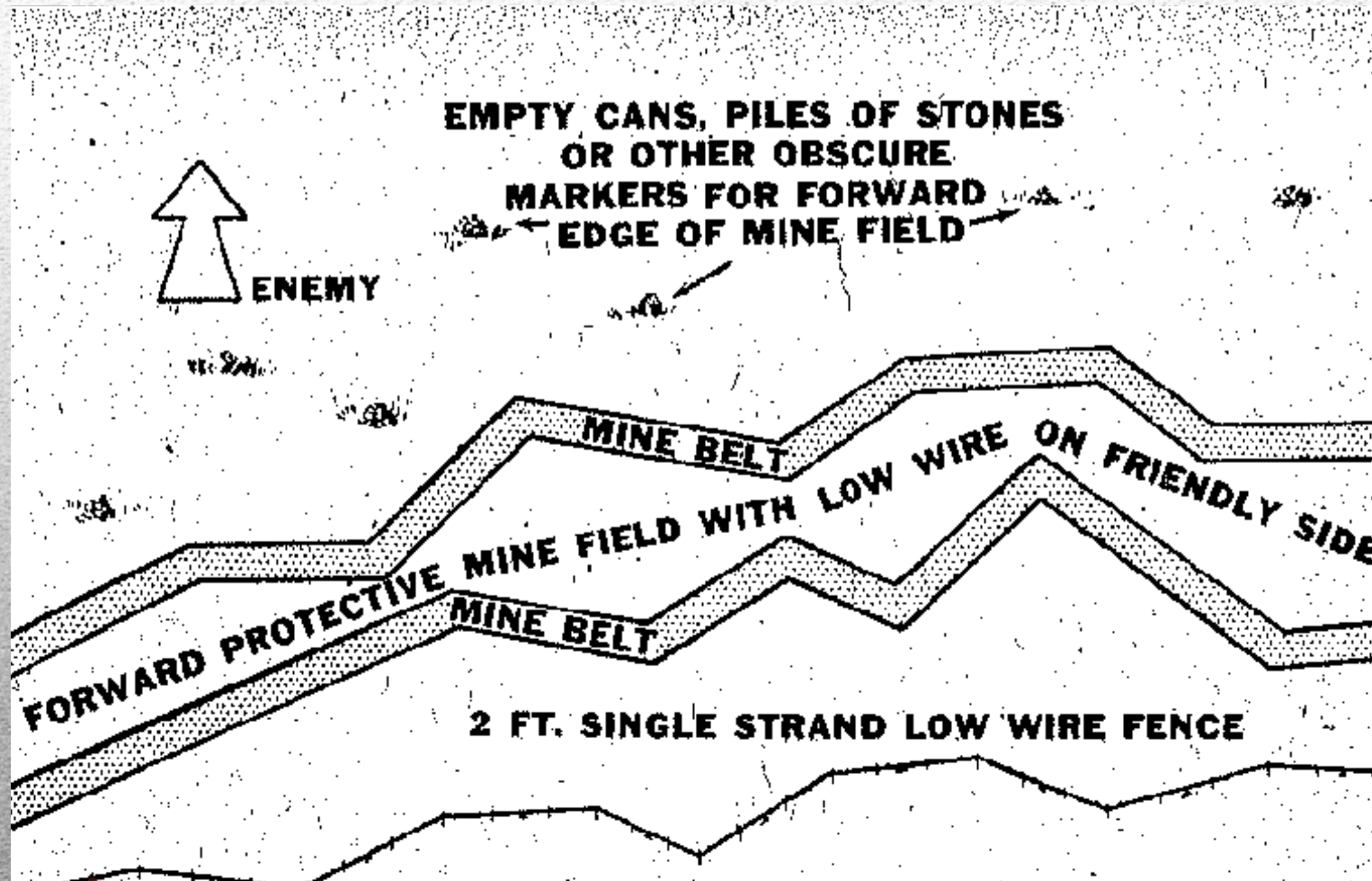
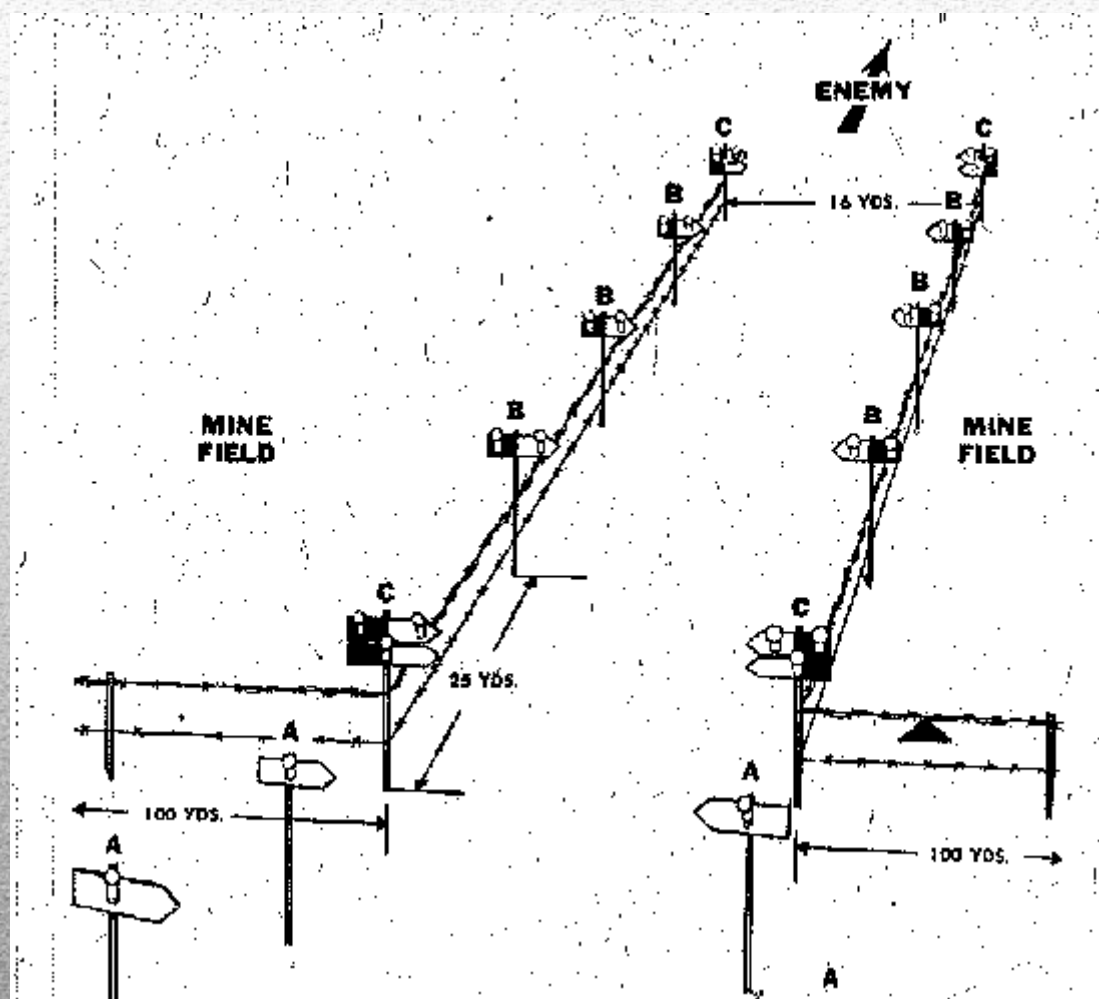


Figure 21.02. Ideal lay-out of antimechanized defensive position (schematic).

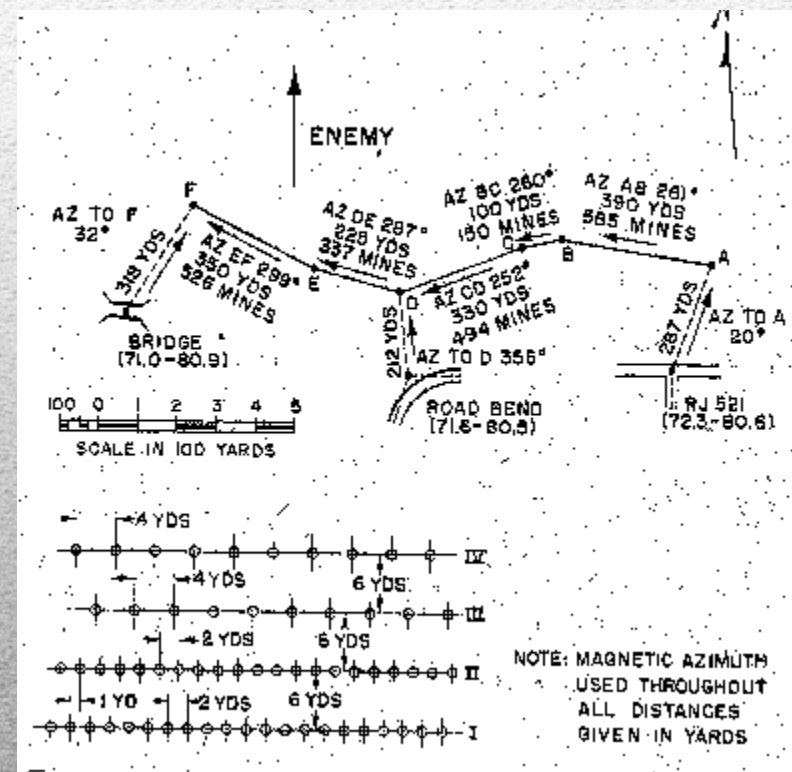
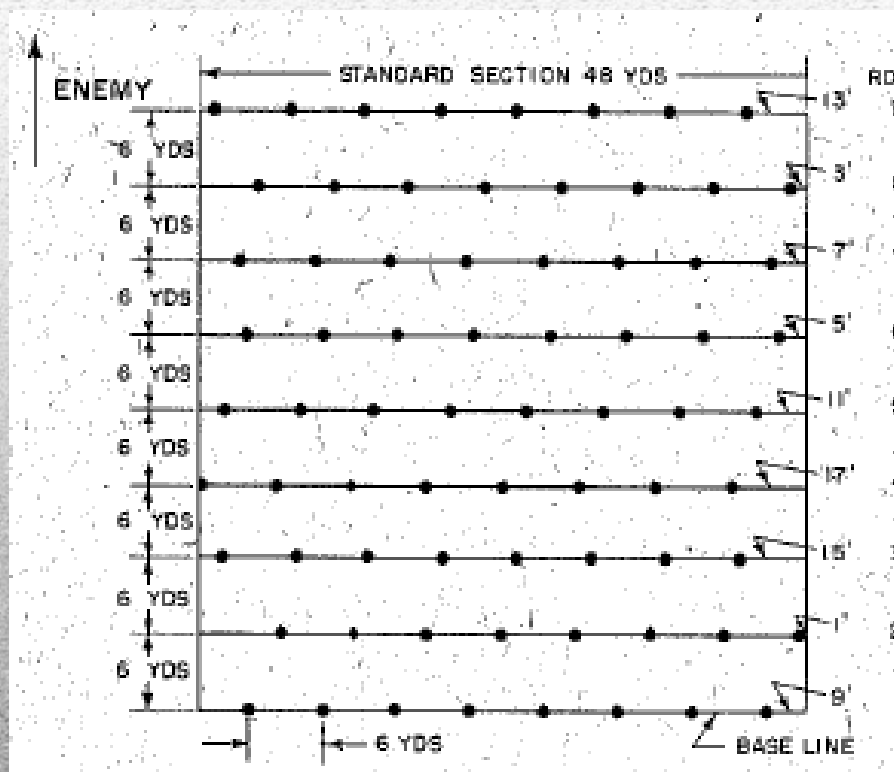
The Modernist Minefield



The Westphalian Minefield



Clausewitz in the Minefield



Descartes in the Minefield

(2) DETAILED MINE-FIELD RECORDS (figs. 31.05c and 32.09)

d. All units laying mine fields normally prepare detailed mine-field records. The unit laying the field prepares the original record and transmits it to the division engineer section at division headquarters, or to the corps engineer section if corps units are involved. When the division engineer receives it he reproduces the original record and sends an operational report of the field to the division G-2 and G-3 sections. In addition, he sends to the corps engineer two copies each of both the operational and detailed records. If the mine fields be laid by troops under corps control the corps engineer receives the original record. He reproduces it and sends an operational report of the field to the corps G-2 and G-3 sections.

32.07. ORGANIZATION FOR LAYING DELIBERATE MINE BELT Each section of a deliberate mine belt normally is laid by a platoon. The organization is as follows:

	Officers	Noncommissioned Officers	Men
Officer in charge	1		
Senior noncommissioned officer		1	
Surveying party		1	6
Placing party		1	6
Burying party		1	12
Antipersonnel party		1	6
Marking party		1	6
Total	1	6	36

32.08. PROCEDURE FOR LAYING DELIBERATE MINE BELT

Personnel	Equipment	Duties
Officer in charge	Map, notebook, lantern, compass, flashlight (night).	Designates location of base line. Priorities number and location of booby-trapped and antipersonnel mines. Designates topographical references and locations of auxiliary markers. Verifies lengths and azimuths of all reference lines. Collects all safety forks and safety pins and has them buried beside right rear corner stake of each section. Establishes mine-field safeguards. Collects and inspects all mine-field records. Turns in records, and reports completion of task to next higher commander.

Weber in the Minefield

U. S. ANTITANK MINE, M1A1

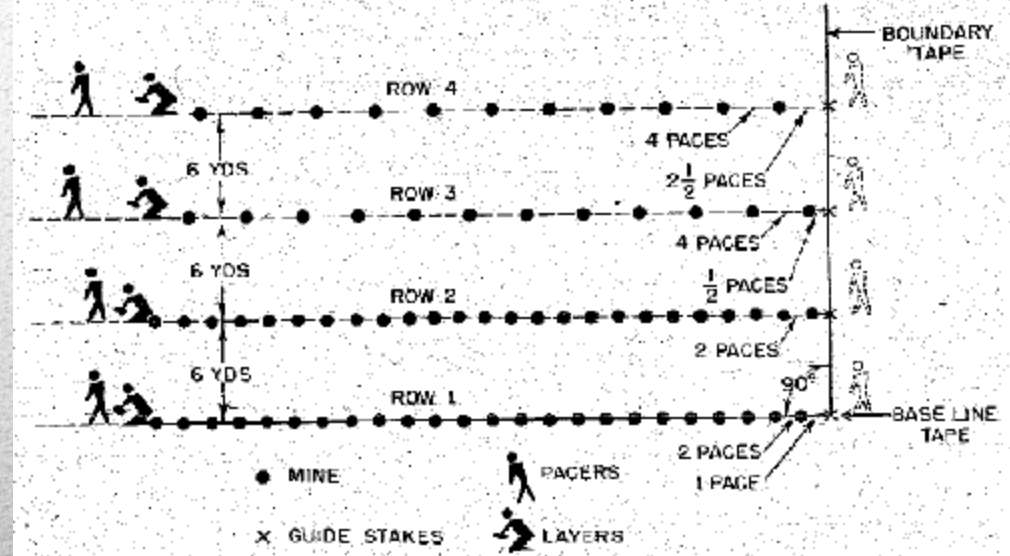
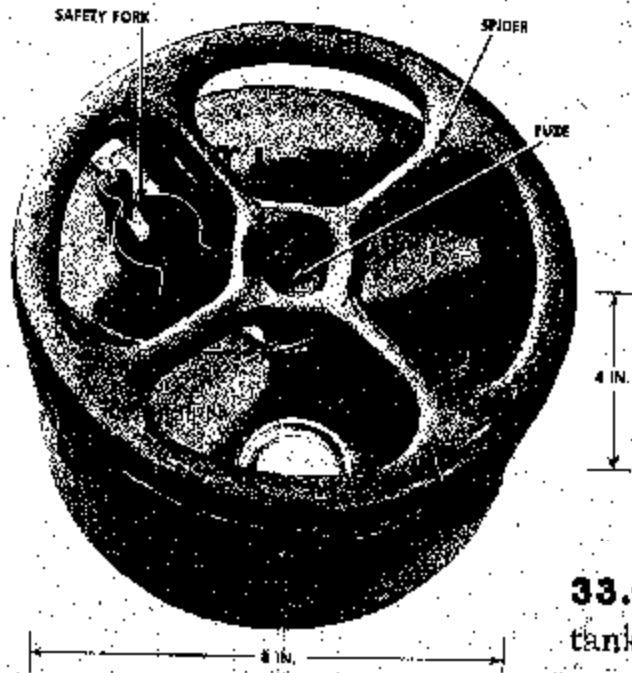


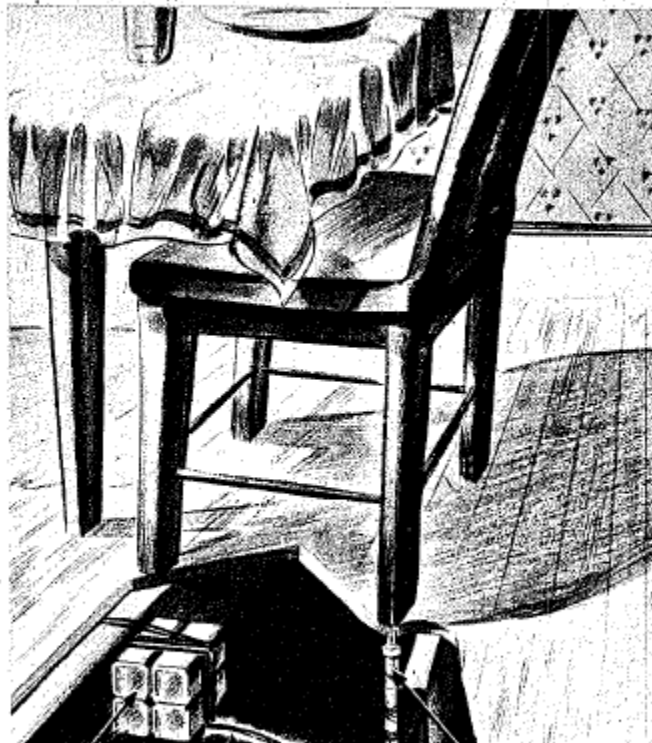
Figure 51-106. Alternate procedure for laying hasty mine belts.

33.01. LOGISTICAL DATA Vehicles-carrying capacities for anti-tank mines (M1A1), exclusive of personnel, are—

- 2½-ton truck—370 boxed or 500 unboxed mines.
- 1½-ton truck—220 boxed or 300 unboxed mines.
- 1-ton trailer—150 boxed or 200 unboxed mines.

Fordism in the Minefield

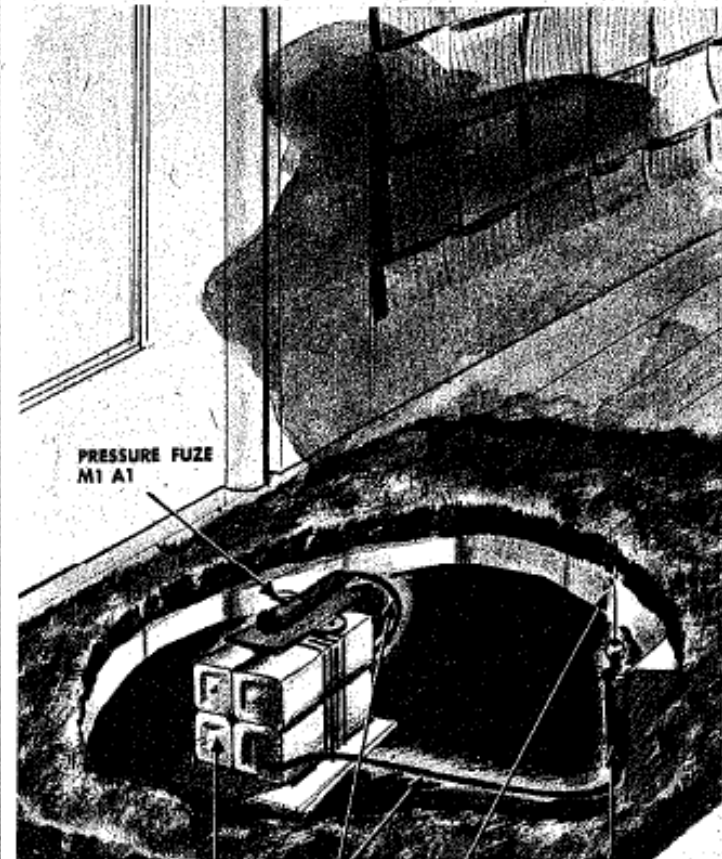
U. S. PULL FUZE UNDER CHAIR



CHARGE PRIMACORD U.S. PULL FUZE M1

Fuze is detonated when chair is moved.

U. S. DOOR-MAT BOOBY TRAP



CHARGE PRIMACORD TRIP WIRE PULL FUZE M1

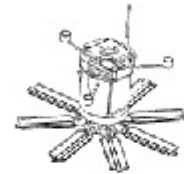
Booby Traps: The 'Other Mines'

2004
Unraveling and
Deconstruction

FM20-32

This update includes Changes 1, 2, 3, and 4

FM 20-32

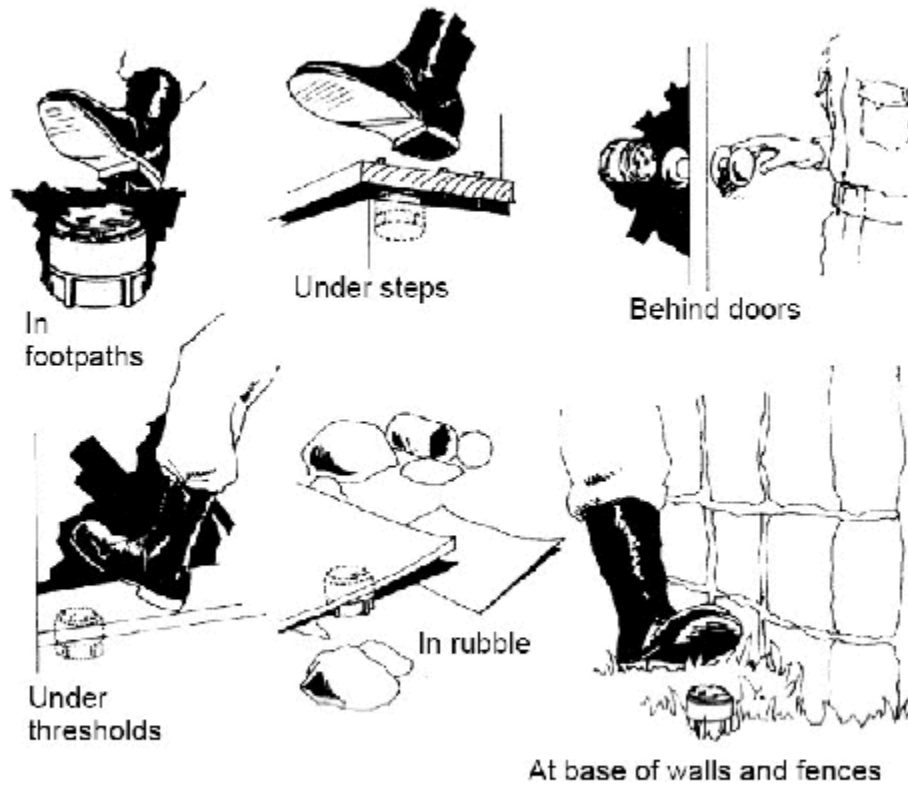


Mine/Countermine Operations

Headquarters,
Department of the Army

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Possible Booby Trap and Mine Locations

Diffusion and Fragmentation

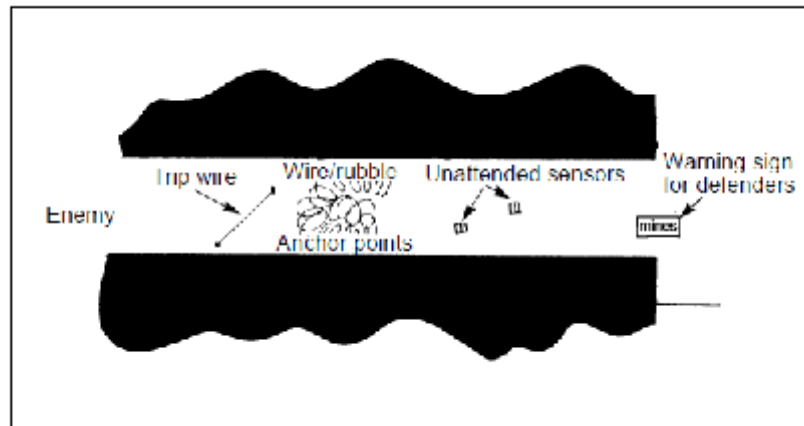


Figure 12-4. Underground passageway

Roof Obstacles

Mines and booby traps supplement wire obstacles to deny operations that require air assault onto rooftops. They also prevent occupation on roofs that afford good observation points and fields of fire. (See Figure 12-7.)

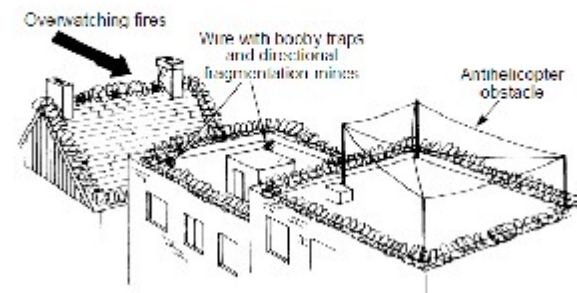


Figure 12-7. Roof obstacles

Diffusion: Verticality

M93 HORNET

The M93 Hornet (Figure 4-8) is an AT/antivehicular off-route munition made of lightweight material (35 pounds) that one person can carry and employ. The Hornet is a nonrecoverable munition that is capable of destroying vehicles by using sound and motion detection methods. It will automatically search, detect, recognize, and engage moving targets by using top attack at a standoff distance up to 100 meters from the munition. It is employed by combat engineers, rangers, and SOF.

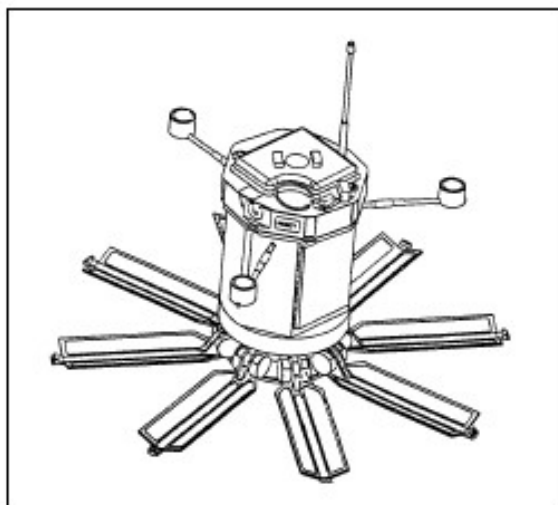


Figure 4-8. M93 Hornet

Air Volcano

The air Volcano system provides a three-dimensional capability that allows units to emplace minefields in deep, close, and rear operations. It provides US forces with the capability to employ minefields rapidly under varied conditions. The air Volcano can be used to emplace tactical minefields; reinforce existing obstacles; close lanes, gaps, and defiles; protect flanks; and deny the enemy use of potential air-defense sites. Volcano minefields are ideal for flank protection of advancing forces and for operating in concert with air and ground cavalry units on flank-guard or screen missions.

COMPONENTS

The air Volcano system (Figure D-1) consists of an M87-series mine canister, an M139 dispenser, and vehicle-specific mounting hardware (UH-60 Blackhawks require a jettison kit).

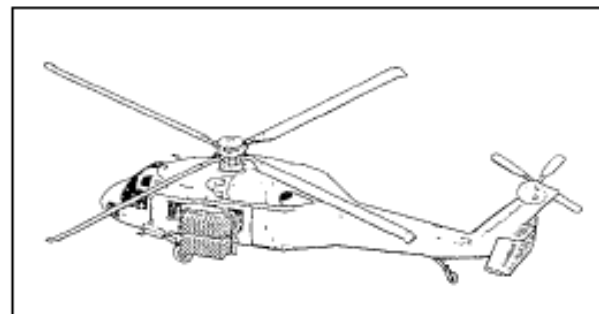


Figure D-1. Air Volcano system

Dynamic Projection

ANTIPERSONNEL MINES

US policy prohibits the use of non-self-destructing AP mines for all US forces except those on the Korean Peninsula. However, US forces can expect to encounter AP mines that are emplaced by other countries in support of MOBA. They are employed to block infantry approaches through or over underground passageways; open spaces; street, roof, and building obstacles; and dead spaces.

DEMINING

Demining is the complete removal of all mines and UXO to safeguard the civilian population within a geopolitical boundary after hostilities cease. It is an extremely manpower- and time-intensive operation and is sometimes contracted. Although not a formal Army mission or function, SOFs may provide special expertise in training demining organizations, acting as advisors, and taking the lead in providing clearance equipment or techniques that can be useful in demining operations. Demining TTP are outlined in TC 31-34.

Stigmatization

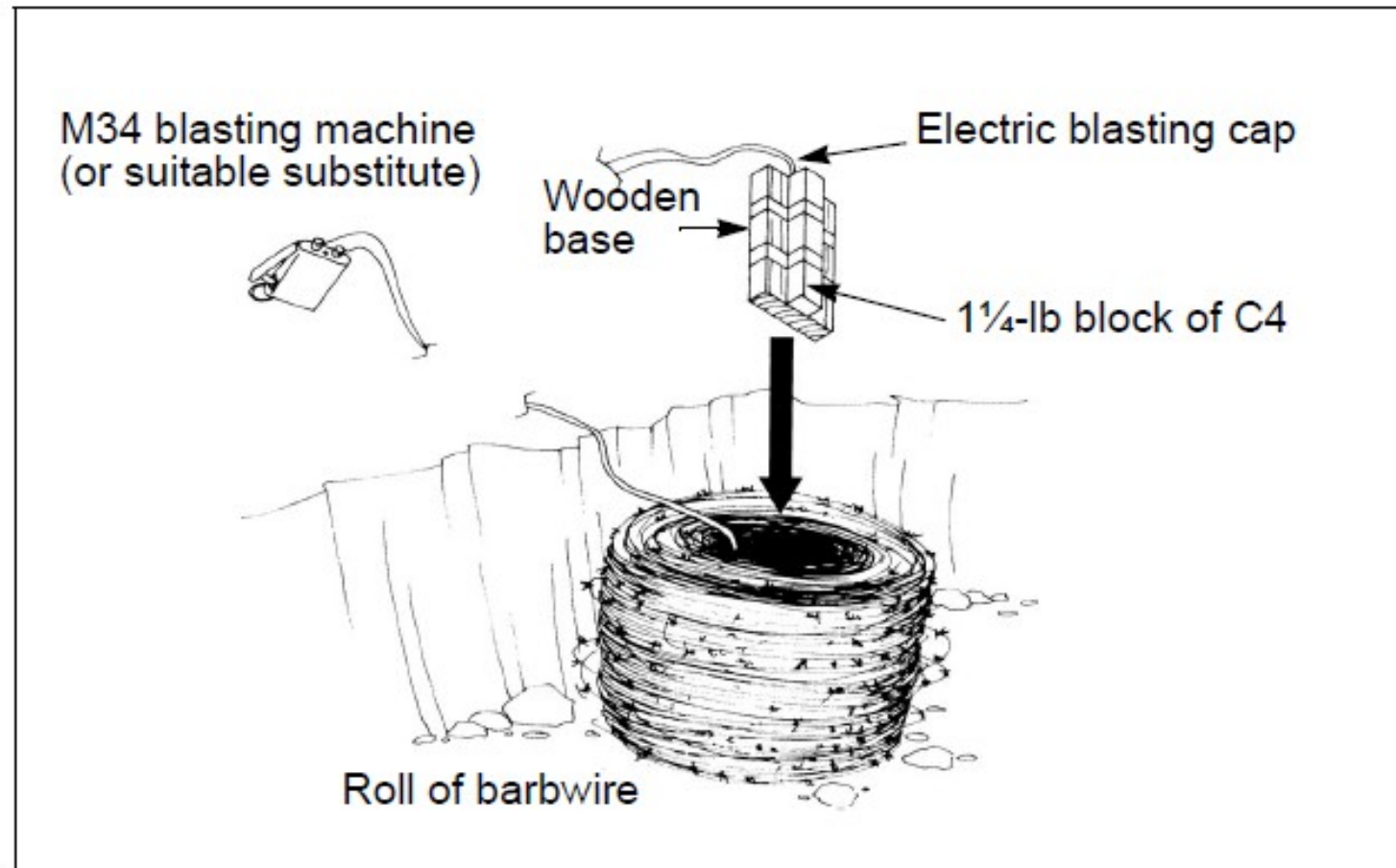


Figure 13-19. Barbwire AP device

Improvisation & Informalization

2005 The IED as a Nonlinear System

FMI3-34.119

FMI 3-34.119/MCIP 3-17.01

IMPROVISED EXPLOSIVE DEVICE DEFEAT

September 2005

Expires September 2007

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HEADQUARTERS, DEPARTMENT OF THE ARMY
UNITED STATES MARINE CORPS

Introduction

"This is not a new war. Our enemies have been waging it for some time, and it will continue for the foreseeable future. As President Bush has stated, 'This is a different kind of war against a different kind of enemy.' It is a war we must win, a war for our very way of life."

General Peter J. Schoomaker,
Chief of Staff of the Army
Arrival Message, 1 August 2003

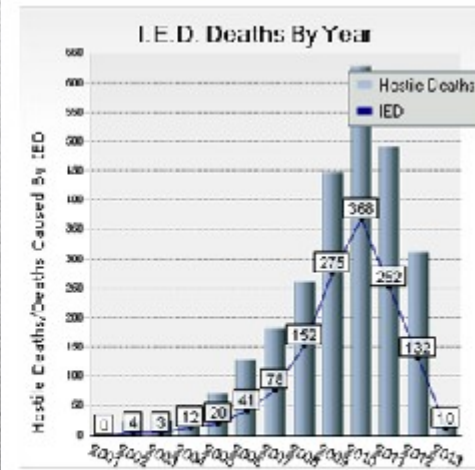
The proliferation of IEDs on the battlefield in both Iraq and Afghanistan has posed the most pervasive threat facing coalition forces in those theaters. The persistent effectiveness of this threat has influenced unit operations, U.S. policy, and public perception. IEDs are a weapon of choice and are likely to remain a major component of the Global War on Terrorism for the foreseeable future.

IED as Existential Threat

IEDs are the
number one
killer of US
troops in Iraq
and
Afghanistan

IED Fatalities

Period	IED	Total	Pct
2001	0	4	0.00
2002	4	25	16.00
2003	8	26	31.54
2004	17	77	44.44
2005	20	73	27.40
2006	41	130	31.54
2007	75	184	42.39
2008	152	263	57.79
2009	275	451	60.98
2010	368	630	58.41
2011	252	492	51.22
2012	132	312	42.31
2013	10	22	45.45



Afghanistan

The IED Threat

2-52. IED operations are basically nonlinear. The enemy, whether a nation-state or nonstate actor, will try to present U.S. or coalition forces with a nonlinear, simultaneous battlespace in which there is no safe “rear area.” The enemy can use IEDs to attack our headquarters (HQ), logistics centers, and supply and evacuation routes. It can also use IEDs to attack our living quarters, dining facilities, and places frequented by our off-duty Soldiers, Marines, and civilians.

Nonlinear Battlespace

Main Charge



Explosive Filler

Initiating System



Casing



Containers

Figure 4-1. Components of an IED

Chapter 3

Improvised Explosive Device Threat

Although virtually any person or type of conventional or paramilitary group may employ an IED, it is a proven and effective weapon for insurgents, terrorists, and other nonstate actors. Such groups may or may not be linked to a political state and are not limited by geographic boundaries. Their motivations are often ideological and do not share the same characteristics or centers of gravity as those found in a typical state versus state conflict. They are typically organized in a nonhierarchical, nonlinear network of cells. The structure resembles that of a communication network, such as the Internet, and its nonlinearity makes it extremely survivable. There are often many communication paths and decentralized C2. Some of these networks are independent and range from the theater down to the village level. Others are linked together to provide coordinated attacks against U.S. and coalition forces and are a part of large international terrorist organizations. The rapid technological advances in communication devices (such as wireless) and the Internet provide low-cost and easily obtainable modes of communication.

The IED as a System

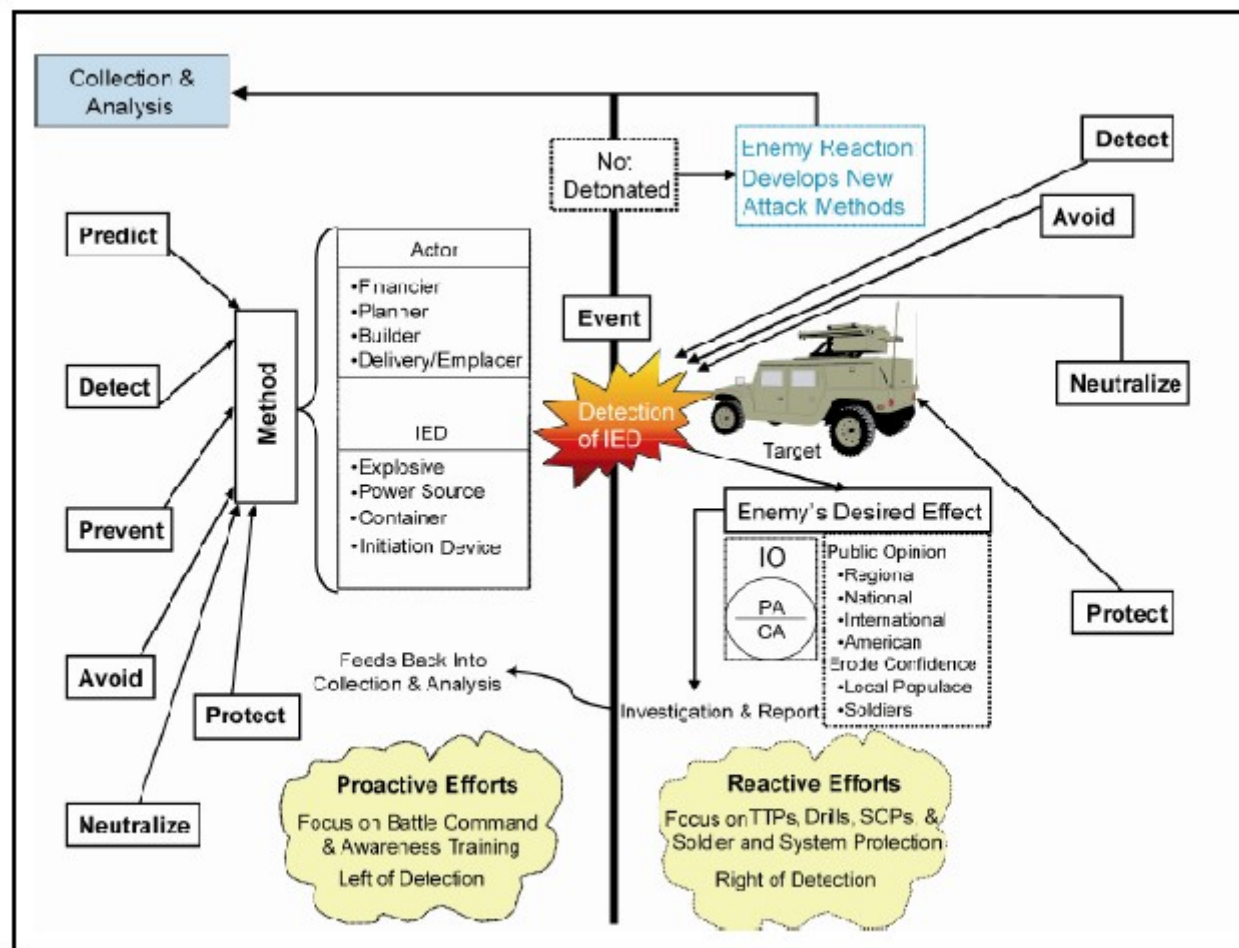


Figure 1-1. IED defeat framework

The IED as Society Made Explosive

ALLOW NO SANCTUARY

2-50. Enemy forces seek to use IEDs to deny U.S. or coalition forces safe haven

- Previous IED sites (past successes).
- Frequently traveled, predictable routes, such as roads leading to FOBs and along common patrol routes.
- Boundary turn around points (pattern).
- Roadway shoulders (usually within 10 feet).
- Medians, by the roadside, or buried under the surface of any type of road, often in potholes and covered with dirt or reheated asphalt.
- Trees, light posts, signs, overpasses, and bridge spans that are elevated.
- Unattended vehicles, trucks, cars, carts, or motorcycles (attached or installed in).
- Guardrails (hidden inside) or under any type of material or packaging.
- Potential incident control points (ICPs).
- Abandoned structures (sometimes partially demolished).
- Cinder blocks (hidden behind) or piles of sand to direct blast into the kill zone.
- Animal carcasses and deceased human bodies.
- Fake bodies or scarecrows in coalition uniforms.
- Buildings.



Figure 4-3. Common areas of IED emplacement

Minespace/Mineopolis

Enemy IED Activity Model

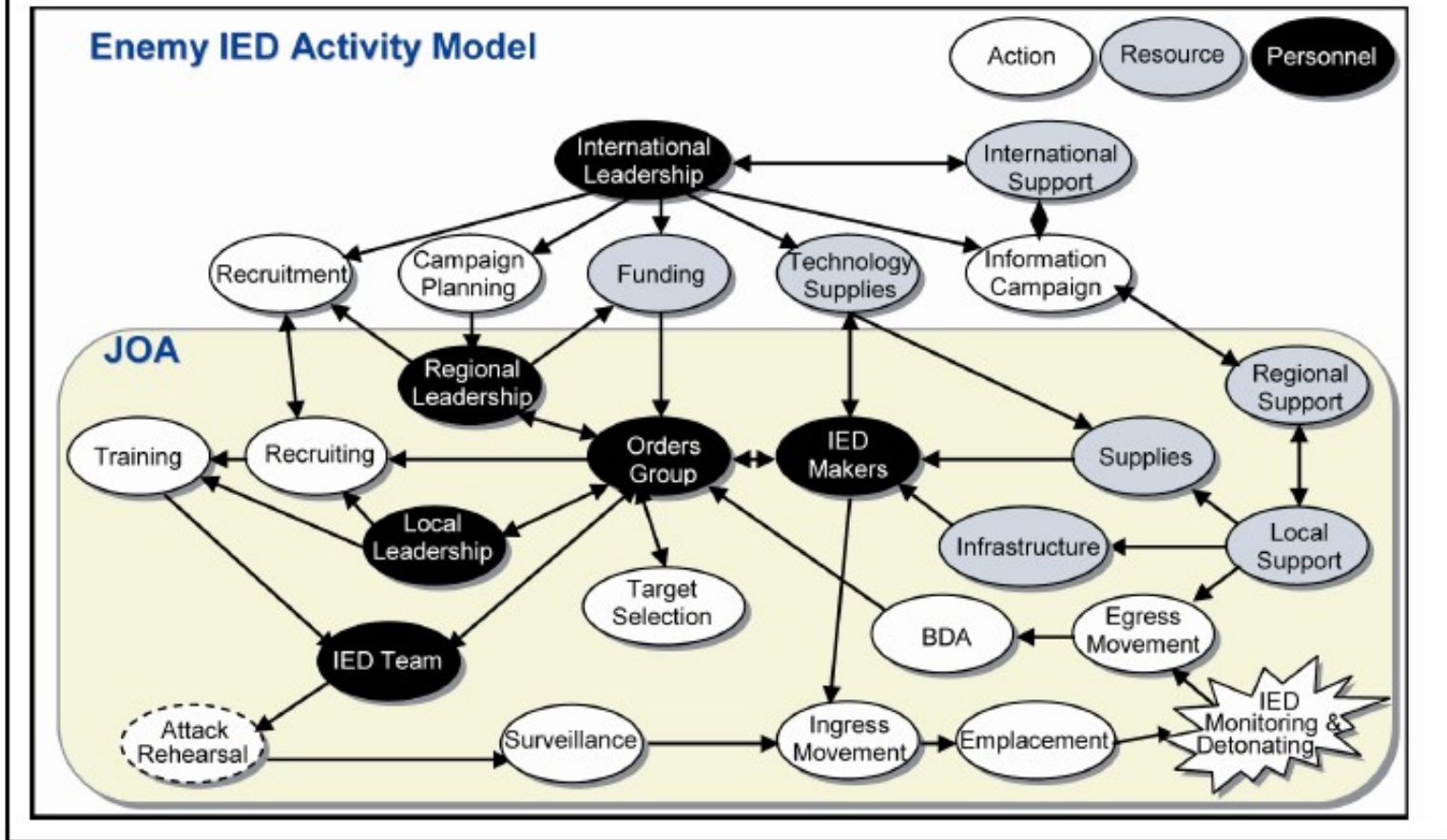


Figure 3-1. Enemy IED system

EOD as Political Intervention

JOINT IMPROVISED EXPLOSIVE DEVICE DEFEAT TASK FORCE

5-26. The JIEDD TF focuses all counter-IED efforts within the DOD, while concurrently engaging other outside sources of potential solutions, to defeat current and future IED threats endangering joint and coalition forces. It is chartered to adopt a holistic approach focused on intelligence, TTP, information operations (IO), and the tenets of assured mobility (mitigation, prediction, detection, prevention, and neutralization). The goal is to identify and neutralize enemy leaders, suppliers, trainers, enablers, and executors responsible for the employment of IEDs against coalition forces. At the same time, the TF is focused on training our own forces in the most current TTP being used by the enemy and the best available U.S. TTP to eliminate the IED threat.



Weaponizing EOD



Global Metamine

Remote Autonomous Killing

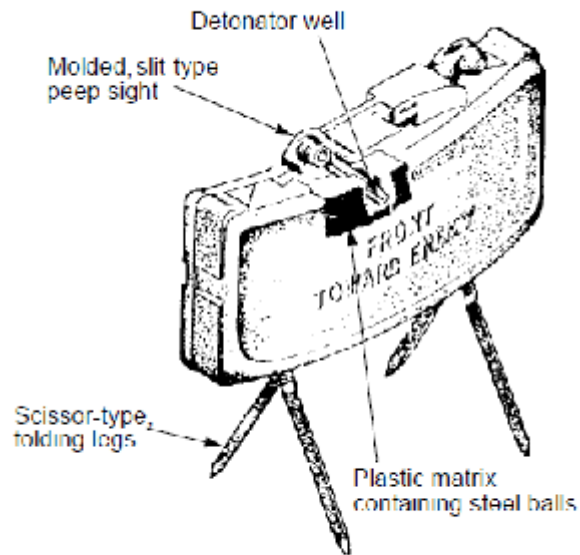
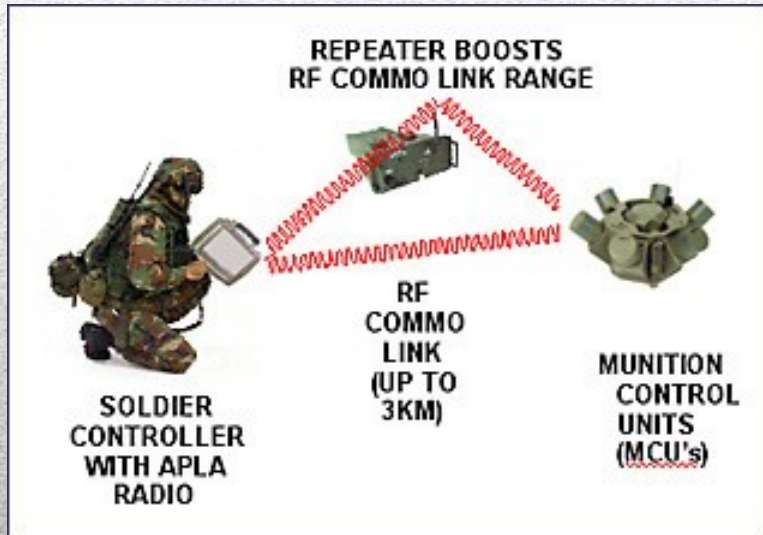


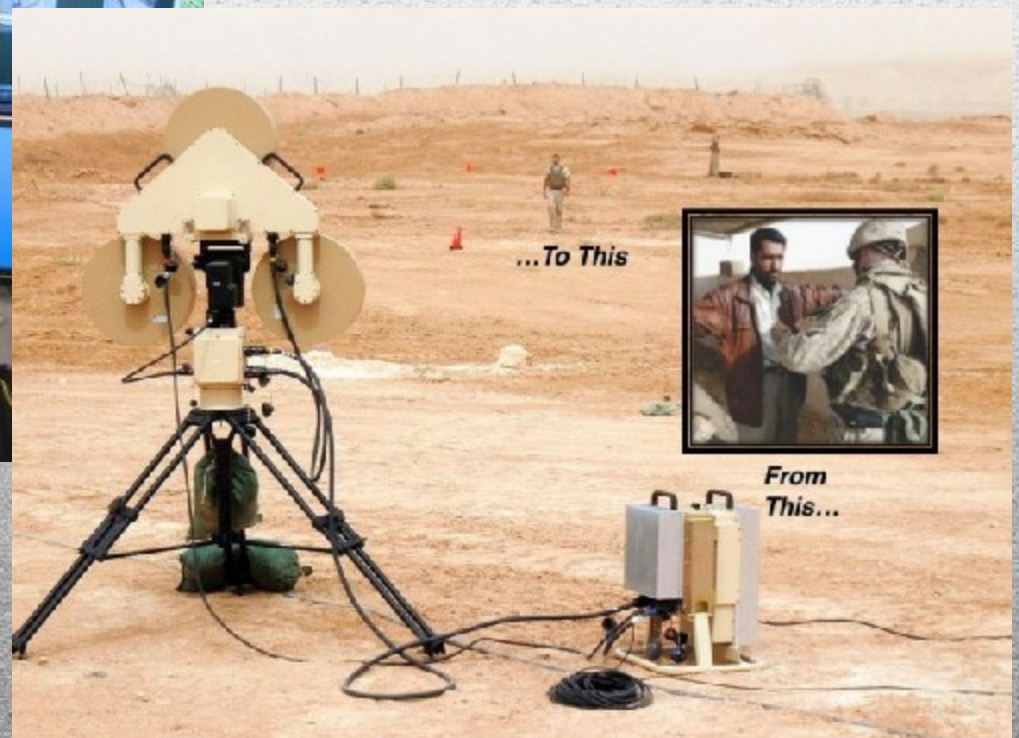
Figure 4-2. M18A1 claymore



The Claymore Goes Mobile



The Spider



Surveillance & Detection



Datamining

Defense Update

International, Online Defense Magazine



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JIEDDO's Information Systems are Targeting IED Support Networks



JIEDDO's Information Systems are Targeting IED Support Networks

The strategy developed by the U.S. DoD Joint Improvised Explosive Device Defeat Organization (JIEDDO) focuses on inter-IED efforts using three lines of operation: Attack the Network, Defeat the Device and Train the Force.

'Attack the Network' is one of the biggest areas where progress has been made. JIEDDO supports units conducting offensive operations through improvements to intelligence collection, information operations, forensic exploitation and surveillance. These initiatives become long-term service programs of record that provide an enduring C-IED capability to the war fighter.



Killer Robotics

HOW STUXNET WORKED



1. infection

Stuxnet enters a system via a USB stick and proceeds to infect all machines running Microsoft Windows. By brandishing a digital certificate that seems to show that it comes from a reliable company, the worm is able to evade automated-detection systems.

2. search

Stuxnet then checks whether a given machine is part of the targeted industrial control system made by Siemens. Such systems are deployed in Iran to run high-speed centrifuges that help to enrich nuclear fuel.

3. update

If the system isn't a target, Stuxnet does nothing; if it is, the worm attempts to access the Internet and download a more recent version of itself.



4. compromise

The worm then compromises the target system's logic controllers, exploiting "zero-day" vulnerabilities—software weaknesses that haven't been identified by security experts.

5. control

In the beginning, Stuxnet spies on the operations of the targeted system. Then it uses the information it has gathered to take control of the centrifuges, making them spin themselves to failure.

6. deceive and destroy

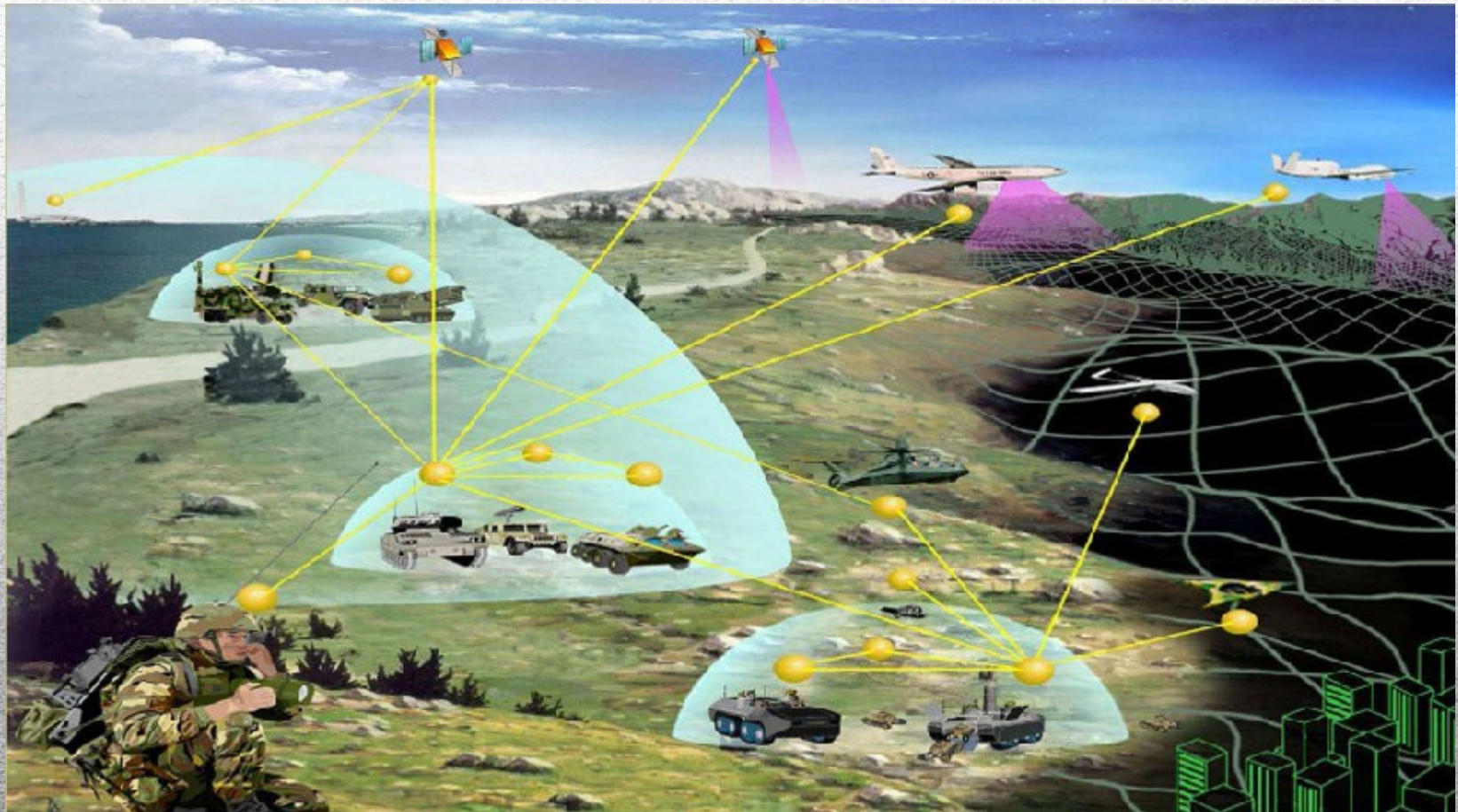
Meanwhile, it provides false feedback to outside controllers, ensuring that they won't know what's going wrong until it's too late to do anything about it.

Stuxnet

SEC. 2. AUTHORIZATION FOR USE OF UNITED STATES ARMED FORCES.

(a) IN GENERAL- That the President is authorized to use all necessary and appropriate force against those nations, organizations, or persons he determines planned, authorized, committed, or aided the terrorist attacks that occurred on September 11, 2001, or harbored such organizations or persons, in order to prevent any future acts of international terrorism against the United States by such nations, organizations or persons.

S.J. Res 23 – 18 Sept 2001



Minespace



Resisting Metamine

Campaign Assemblages



How do you demine Global Metamine?



Figure 1.2. Electrical mine detector.

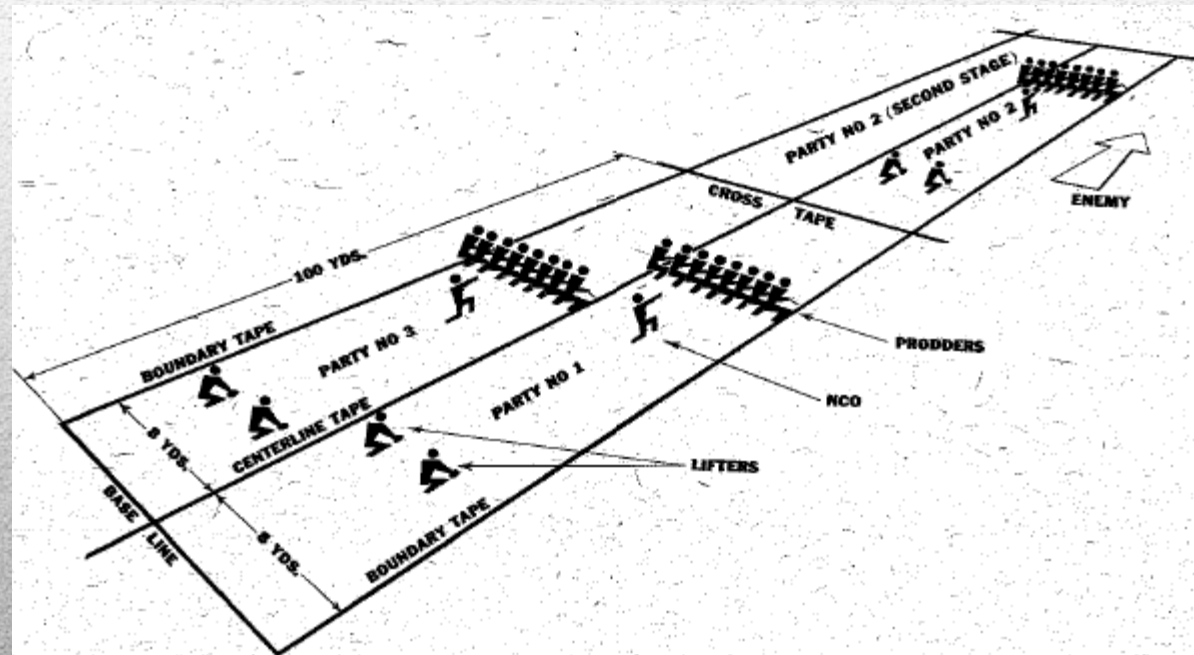


Figure 43.13. Mine-lane breaching parties—prodding method.

Statist Demining



The Mine Action Assemblage



**CAMPAIGN TO STOP
KILLER ROBOTS**

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MEDIA

About Us

The Campaign to Stop Killer Robots is an international coalition of non-governmental organizations (NGOs) launched in April 2013 that works for a ban on fully autonomous weapons (robotic weapons that would be able to choose and fire on targets on their own without any human intervention).

The Steering Committee is the principal leadership and decision-making body for the Campaign to Stop Killer Robots.

Steering Committee

Human Rights Watch

Article 36

Association for the Aid and Relief Japan

International Committee for Robot Arms Control

Mines Action Canada

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BAN KILLER ROBOTS



OUR CALL TO ACTION »

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Campaign Assemblages