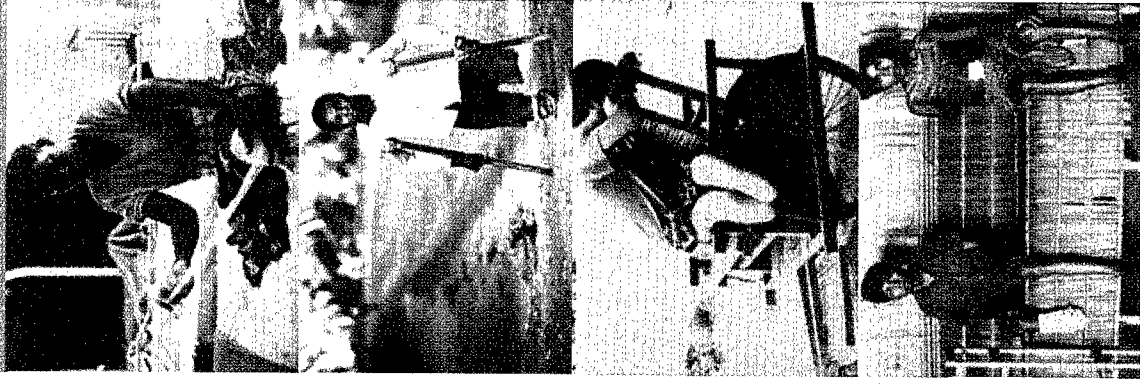


1 9 9 7

HUMANITARIAN DEMINING EQUIPMENT CATALOG



TAMING THE DEMON...

***SOLVING THE GLOBAL PROBLEM
OF UNCLEARED LANDMINES AND
UNEXPLODED ORDNANCE***

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

19970908 013

The technologies displayed in this document were developed and evaluated under the Department of Defense Humanitarian Demining Technology Development Program. The purpose of this catalog is to provide information for organizations involved in the humanitarian demining effort. Demining is an inherently dangerous activity. This handbook provides an overview of the types of products and technologies that are available for demining in order to bring as many options as are possible to the attention of the reader. DoD does not endorse the listed products or companies and makes no warranties or representations concerning use of the listed products. Intended agencies are encouraged to contact listed vendors and contractors directly for equipment availability and current pricing. The Department of Defense points of contact, however, would appreciate any and all feedback on equipment suitability and use.

**Office of the Assistant Secretary of Defense
Special Operations and Low Intensity Conflict
Pentagon Rm 1A674B
Washington, DC 20301-2500**

Table of Contents

Introduction	1
Demining Technologies	
Detection	7
Vehicle Mounted Mine Detector	8
Free-leash K-9 Detection	10
MEDDS K-9 Detection	12
Mini Mine Detector	14
Clearance.....	17
Mini-Flail.....	18
LEXFOAM®	20
Shaped Charges.....	22
Mine Marking and Neutralization Foam	24
Tele-Operated Ordnance Disposal System (TODS)	26
Explosive Demining Device (EDD)	28
Chemical Neutralization	30
Supersonic Air Spade.....	32
Training and Mine Awareness.....	35
Demining Support System (DSS)	36
Mine Awareness Education Comic Book.....	38
Mine Facts CD-ROM.....	40
Training Mine Simulants	42
Mine Recognition Board Set.....	44

Individual Components	47
Extended Length Weedeater	48
Mine Location Marker	50
Blast & Fragment Container	52
Command Communications Video and Light System (CCVLS)	54
 Near Term Future Systems	56
 Conclusion	57

Humanitarian Demining Equipment Catalog

A. Genesis of the Landmine Problem

Since the mid 19th century, landmines have been an important and prolific weapon of war. Although a long-standing and accepted part of warfare between military forces, world events have evolved to an era where innocent civilians are now the primary victims of landmines.

The proliferation of landmines throughout the world is the most significant cause of the high number of civilian casualties. They are a prominent weapon in these regions because they are so effective, yet so inexpensive and easy to make. Landmines are frightening residual weapons of war that retard resettlement and economic renewal. This menace denies access to roadways and other lines of communication, villages and urban areas, agricultural fields and other rural areas long after the declaration of peace. Their numbers and the devastation they exact are staggering. When published in early 1995, the Department of State report *Hidden Killers, the Global Landmine Crisis* estimated that some 85-110 million mines in 62 countries maim and kill approximately 26,000 people a year. The problem is most acute in underdeveloped nations already ravaged by conflict and lacking the resources and the infrastructure needed to deal with their landmine problems. The removal and destruction of all forms of dangerous battlefield debris, particularly land mines and other unexploded ordnance (UXO), are vital pre-requisites for a country to recover from the aftermath of a war.



B. The Landmine Problem is Tough to Solve

The development of new demining technologies is a difficult task because of the tremendous diversity of environmental conditions in which mines are employed and because of the wide variety of landmines. Mines range in size and type from antipersonnel models small enough to fit into the palm of a child's hand to large antitank mines. There are different activation mechanisms such as pressure, electronic and command detonation. Mines use the blast effect from the explosion or flying fragments to injure or kill their victims. Mines can be manufactured from metallic and non-metallic materials. Fuzing, lethality, and emplacement methodologies have evolved significantly since WW II. Full width attack, standoff "side attack" and "top attack" mines are either in development or already in the inventories of several nations. This tremendous diversity makes the demining



mission complex and dangerous. Improvements in technology are critical to the success of any effort to reduce this threat to soldiers conducting peacetime contingency operations and to the civilian population.

The United States and other countries are working to eliminate the landmine problem. The plight of the many nations suffering from severe landmine problems, and the threat to US forces engaged in peace operations, has led to an emphasis by the White House, the Congress and the Department of Defense on the development of new technologies and equipment for mine detection and clearance. The development of these new technologies will improve the efficiency, safety and effectiveness of the demining process. Under the direction of the Assistant Secretary of Defense for Special Operations and Low Intensity Conflict, research and development programs to meet the countermine needs of tactical military forces and of peacetime humanitarian demining operations are now underway at the Night Vision and Electronic Sensors Directorate (NVESD).

C. US Participation in Demining

Military forces, non-governmental organizations and contracted commercial enterprises have all been involved in demining. US military forces participate in the demining effort within limits established by US government policy. American military



forces involved in humanitarian demining will not enter an active minefield and, by law (10 U.S.C. 401(a)(4)), are restricted to performing demining only for protection of U.S. forces. Rather than perform actual demining, the US theater commands establish and support demining and mine awareness programs, and conduct demining training for indigenous personnel. Another important policy requirement is that deminers must destroy all mines where they find them. This is to prevent anyone from removing, stockpiling and re-using them in the future. An added benefit to this restriction is that it enhances deminer safety. These policy requirements have an important bearing on how DoD supports the demining effort and on the technology that it requires.

Special Operations Forces (SOF) components of the theater commands, with Explosive Ordnance Disposal (EOD), civil affairs and psychological operations participation, establish and help maintain demining and mine awareness training programs in host nations. Demining programs will vary from country to country based on the

level of education and industrial capability. These characteristics of the nation involved are important factors to consider when introducing new demining equipment. Establishment of a training program, and the types of equipment needed are also highly dependent on diversity of the mine and overall UXO threat in the host country, and existing geographic and environmental conditions. When considering the need for humanitarian demining around the globe, from desert to temporal to jungle climates, there is a huge challenge to optimize technology to make a meaningful difference in the elimination of landmines.



D. Program Description

Traditionally, countermine and mine requirements have addressed battlefield operations to support the pace of maneuver.

Technology solutions for rapid surveillance, reconnaissance, detection, and neutralization portend significant countermine capability for maneuver forces' needs to achieve requisite tempo, survivability, and battlespace management of countermine and mine operations. Humanitarian demining research and development (R&D), however, focuses on developing, testing, and evaluating the best available technologies that might be applied throughout the full range of demining requirements: locate minefields (or confirm their absence); detect individual mines; clear and destroy a large number of mines rapidly and safely; enhance the safety of deminers; and tools to facilitate mine awareness and deminer training. Humanitarian demining R&D efforts leverage, where applicable, the technology investments made for combat countermine as well as those investigated for remediation of defense sites, EOD, and the clearance of our training and test ranges.

Existing technology and equipment used for demining are slow, dangerous and man-intensive. During the past two years the US Department of Defense has engaged in a substantial effort to increase the efficiency and safety of demining with technology. As part of the international humanitarian demining effort, Congress provided RDT&E funding in FY 1995 and FY 1996 to develop

and demonstrate technologies applicable to humanitarian demining and other Military Operations Other Than War (OOTW). Congress directed DoD to help solve unique humanitarian demining equipment requirements by leveraging new, proven, and promising technologies that are capable of being used for demining and to share those technologies with the international environment.

The diversity of the mine threat pointed to the need for different types of equipment to neutralize landmines. The short timeframe of this program dictated a development effort that maximized the use of existing off-the-shelf technology. The requirement to develop equipment for use by host nation deminers with very different language, cultures and education levels added significantly to the challenge.



The FY1995-1996 Humanitarian Demining Technology Program focused on training initiatives to assist other countries in developing effective mine awareness programs and on the development of improved demining technologies. Areas of interest for technology development were:

- Detection of metallic and non-metallic antitank and antipersonnel mines.
- Low-cost increased efficiency mine clearance and neutralization systems.
- Low-cost protective systems for personnel and clearance vehicles.



- Highly reliable clearance verification techniques and procedures.

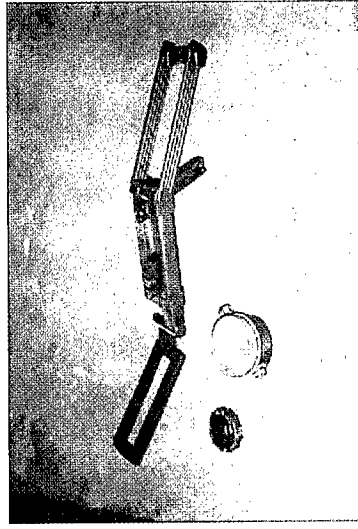
- Mine awareness training materials that educate populations in protecting themselves from landmines.

The goal of this program was to rapidly provide suitable technology to detect all land mines, achieve near perfect removal, neutralization and operator safety, and provide special purpose hand and small power tools optimized for demining. This technology will allow the United States to expand its contributions to assist other countries in developing effective demining programs.

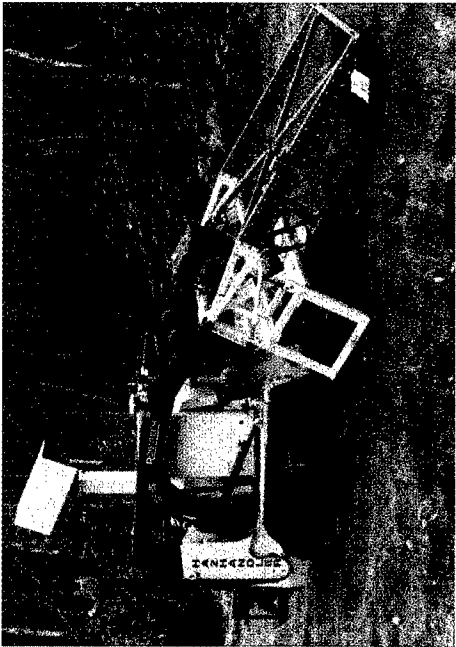
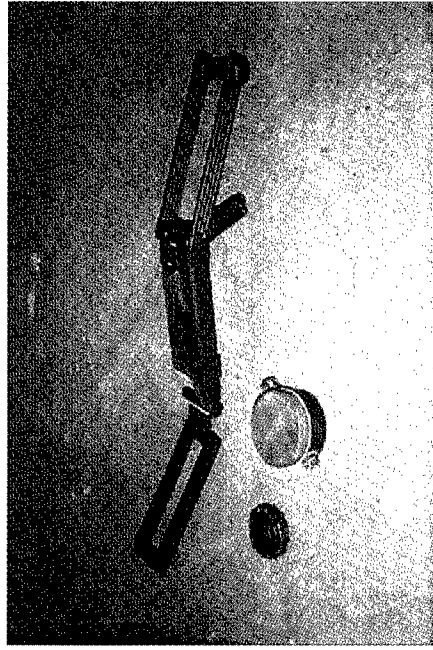
Demining needs and sustainment requirements were identified and prioritized by the regional Commanders in Chief, representatives from the Interagency Working Group (IWG) and Special Operations Forces. The Research and Development subgroup to the IWG provided scope and focus to the developmental activities.

In compliance with congressional direction, the NVESD designed, developed and demonstrated short term, low-risk, practical solutions for mine detection, mine clearance and mine awareness training equipment for use in humanitarian demining

and peacekeeping activities. Several of these prototype items performed well enough to be put into immediate operational use in support of humanitarian demining operations. This catalog describes those items.



Humanitarian Demining Technology Program

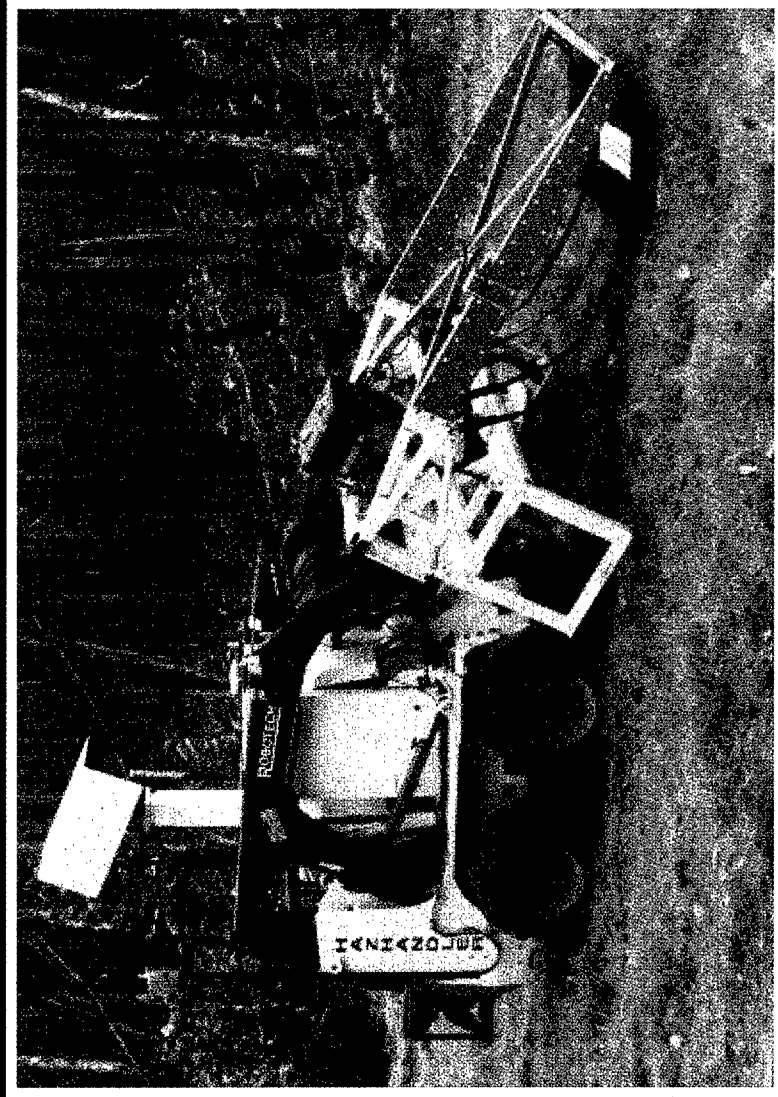


Detection

For detection, the major technical challenge is discriminating landmines from other debris. Sensors, sensor fusion and automatic target recognition on a wide variety of platforms (handheld, vehicle based and airborne) are needed to detect mines both on and off-road.



Vehicle Mounted Mine Detector





Vehicle Mounted Mine Detector



Mission:

Provide remotely controlled capability to detect landmines in on-road and off-road environments.

Description:

The Vehicle Mounted Mine Detector (VMMD) detects on/off-road landmines using a multi-sensor mine detection suite mounted on a commercial remote control platform. This system provides deminers with the ability to detect antipersonnel and antitank mines with minimal metal content using a flexible metal detection array for close-in detection and infrared (IR) and ultraviolet (UV) sensors for standoff detection. The system also provides the capability to record mine locations using a Differential Global Positioning System (DGPS).

Availability:

One concept demonstrator system was built to conduct testing in 1995. The vehicle width metal detection unit is commercially available and costs about \$500,000.

Points of Contact:

Department of Defense

OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: sburke@nvl.army.mil

Contractor

Schiebel Instruments, Inc.
2127 California St., NW
Washington D. C. 20008
(202) 483-8311





Free-leash K-9 Detection





Free-leash K-9 Detection

Mission:

Provide a capability to detect antipersonnel and antitank landmines and tripwire devices in on-road and off-road environments.

Description:

The Free-leash K-9 Detection program demonstrated that dogs can be trained to detect explosive materials emitted from mines buried for extended periods of time. The dogs have demonstrated exceptional performance in locating tripwires in heavily vegetated areas. Under handler control, the free-leash dogs operate in suspected mined areas and alert the handler that they have detected a mine or tripwire by sitting within one meter of the detection. The dog/handler relationship is extremely important in the free-leash program. Handlers must have the ability to sense their dog's abnormal behavior that could possibly indicate that a mine may be present.

Availability:

Two dogs have been deployed to Bosnia-Herzegovina and Africa and have demonstrated excellent performance locating minimum metal content mines.

Points of Contact:

Department of Defense

OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: sburke@nvl.army.mil

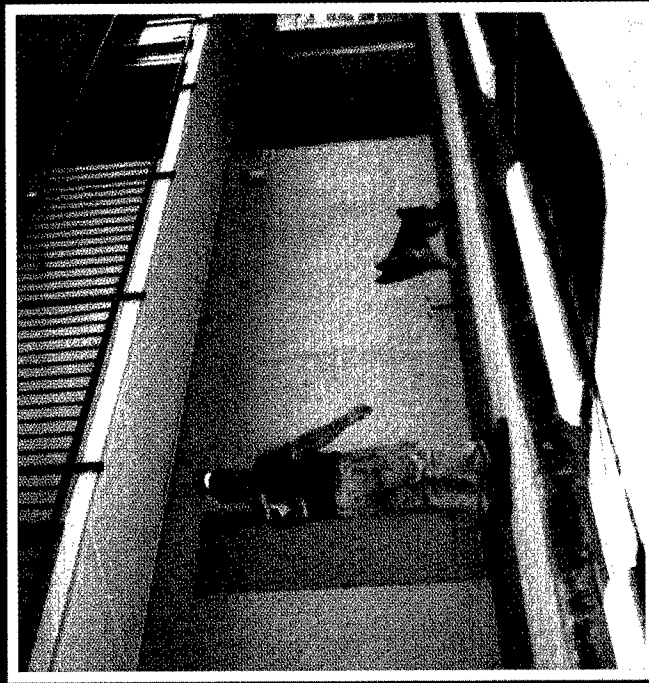
Contractor

RONCO Consulting Corp.
2301 M Street N.W., Suite 400
Washington, D.C. 20037
(Attn: David Lundberg)
(202) 785-2791





MEDDS K-9 Detection





MEDDS K-9 Detection



Mission:

Provide a capability to detect mined and mine-free areas as well as individual mines in on-road and off-road environments.

Description:

The MEDDS K-9 Detection program demonstrated that dogs can be trained to detect the explosive vapors collected from air collection filters placed in mined areas. The MEDDS K-9 detection method uses vacuum filters that collect air samples in a suspected mined area. The vacuum filter (collection box) samples are collected by vehicular platform or man-portable backpack units and transported to the dogs at a remote location. The samples are inspected by the dogs to determine if explosive traces are present in the sample. If explosive traces are detected, then free running detection dogs can be taken to the area for further inspection. This method is especially useful for rapidly discriminating between mined and mine-free areas, particularly roads and highways.

Availability:

The MEDDS K-9 Detection systems can be deployed within 60 to 90 days.

Points of Contact:

Department of Defense
OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

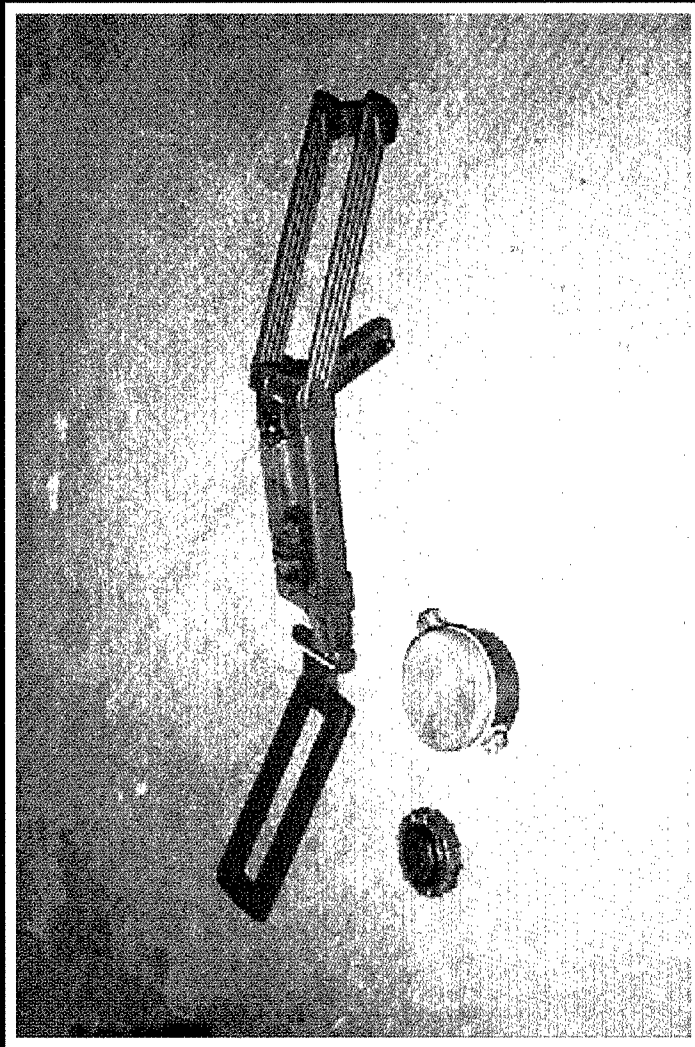
Program Manager
U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: sburke@nv1.army.mil

Contractor
MECHEM Ltd
329B, Mundt Street, Waltloo, Pretoria
PO Box 912454
SILVERTON 0127, South Africa
(012) 803-7290





Mini Mine Detector





Mini Mine Detector



Mission:

Provide deminers with a lightweight pocket sized mine detector that can be carried at all times for use in emergencies and detection in hard to reach areas.

Description:

The Mini Mine Detector is a battery powered, hand held, miniature metal detector. It is designed to operate for 10 hours on four AA batteries, weighs 3.2 pounds, and is based on the electronic module in the AN-19/PSS-12 hand held metal detector. The key feature of the Mini Mine Detector is that it is small and light enough to be transported in a deminer's pocket, therefore available at all times for emergency minefield extraction. The system can also be operated with an external D-Cell battery pack for longer operations.

Availability:

The Mini Mine Detectors are in the first article production runs and will be commercially available for about \$6,000 in the summer of 1997.

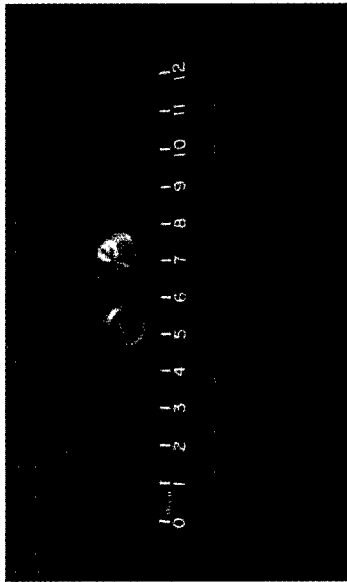
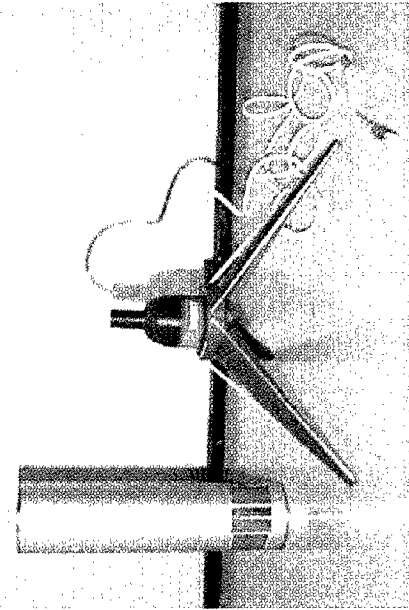
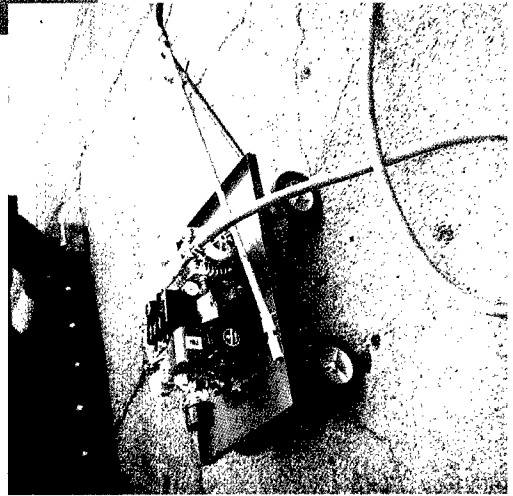
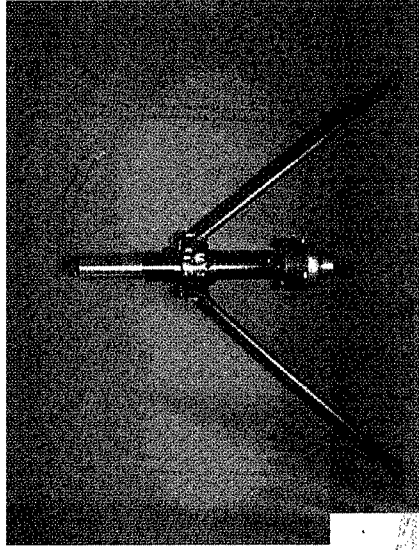
Points of Contact:

Department of Defense
OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager
U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BEL VOIR, VA 22060-5806
email: sburke@nvl.army.mil

Contractor
Schiebel Instruments, Inc.
2127 California St., NW
Washington D. C. 20008
(202) 483-8311





Clearance

Cost effective and efficient clearance techniques are needed to clear landmines in all types of terrain. Manually/tele-operated/semi-autonomous mission platform(s) that provide standoff protection to demining equipment operators are key requirements in achieving this goal.



Mini-Flail





Mini-Flail



Mission:

Provide capability to remotely clear antipersonnel mines from footpaths and off-road areas.

Description:

The Mini-Flail is a remotely controlled utility vehicle that clears antipersonnel mines from unimproved lines of communication and off-road areas that are not accessible to large area mine clearers. The unit includes a commercial line of sight radio control, armor to protect against antipersonnel mine blasts, and a set of rotating chains that are easily replaceable. The system weighs 2,000 pounds and is helicopter transportable. It has a 5 gallon diesel tank and can operate about 40 hours before refueling. The radio control operates up to a half mile line-of-sight and operates on commercial batteries. The Mini-Flail is effective against bounding, tripwire fuzed and simple pressure antipersonnel mines.

Availability:

Several versions of the Mini-Flail currently exist and have been used in Bosnia-Herzegovina. Other units can be built within eight to twelve months for approximately \$150,000 each.

Points of Contact:

Department of Defense
OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

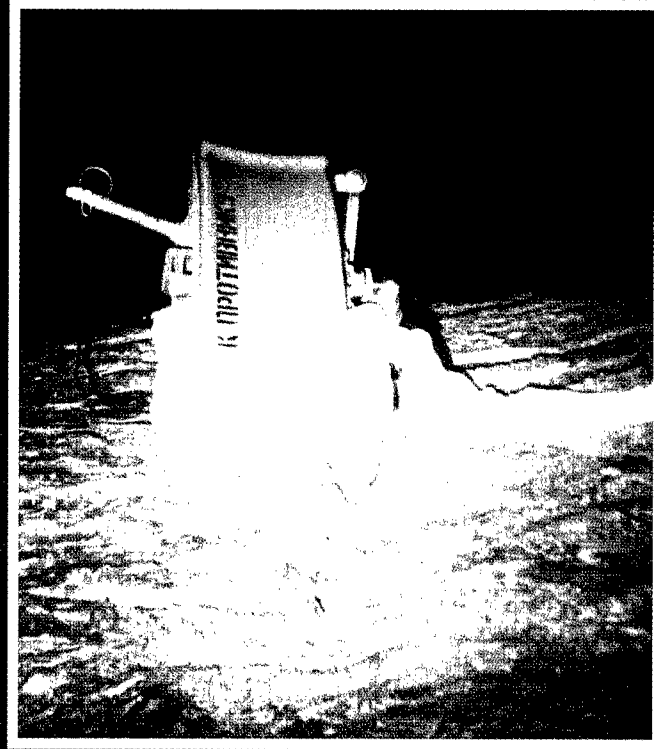
Program Manager
U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: jregnier@nvl.army.mil

Contractor:
Army NVESD/Navy OST/
Lockheed Martin
Baltimore, Maryland 21220





LEXFOAM®





LEXFOAM®

Mission:

Provide a cost effective method for in place neutralization of all types of landmines.

Description:

LEXFOAM® is a nitromethane based explosive foam used as a blasting agent to destroy mines in place. It will neutralize individual mines and some UXO. The LEXFOAM® dispensing system has two configurations: a man-portable backpack unit for use in small or difficult to reach areas; and a truck mounted palletized version for use in large, open areas accessible by commercial truck or equivalent vehicle.

Availability:

4,000 pounds of LEXFOAM® and four delivery systems are currently in use in Bosnia-Herzegovina, and 500 pounds (55 gallons) are enroute to Cambodia. The prototype backpack dispensing unit and prototype backpack filling station cost approximately \$7,000 and \$4,000 respectively. The cost of LEXFOAM® is \$9.75 per pound for small orders and as low as \$6.75 per pound for large orders.

Points of Contact:

Department of Defense

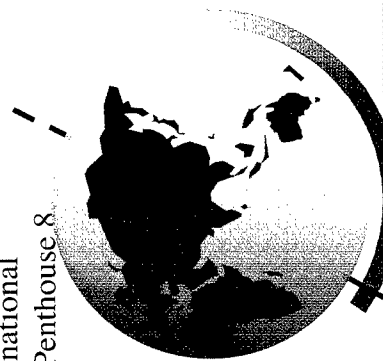
OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: jregnier@nvl.army.mil

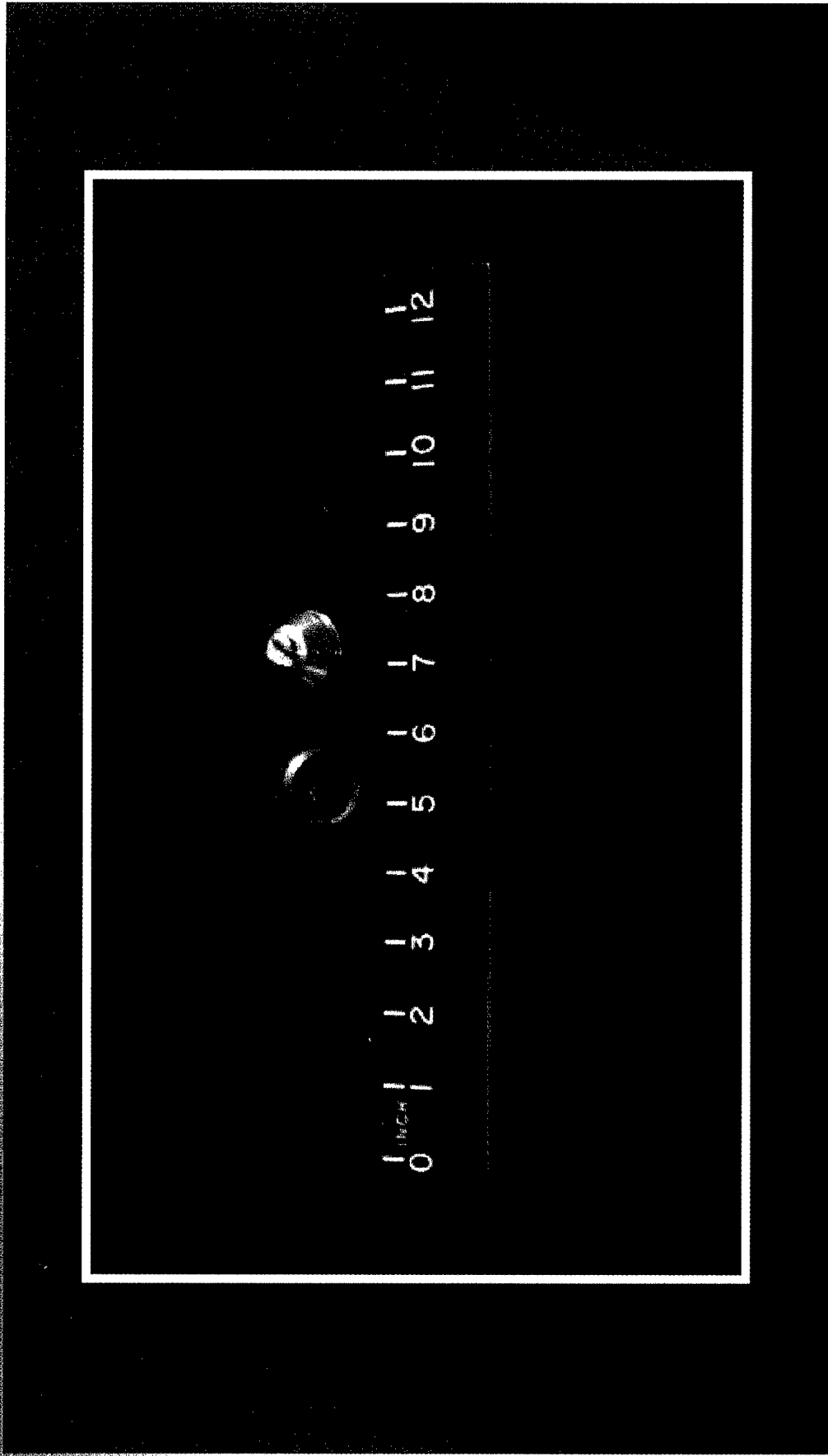
Contractor

Golden West Products International
15233 Ventura Boulevard, Penthouse 8
Sherman Oaks, CA 91403
ATTN: Joseph L. Trocino
(818) 981-6400





Shaped Charges





Shaped Charges



Mission:

Provide a low cost, easy to use capability for in place neutralization of surface and shallow buried antipersonnel and antitank mines.

Description:

Commercially available oil well perforators (shaped charges) that contain sufficient energy and resulting shaped charge jets, have been used to cause high order detonation of landmines. A selection of different size shaped charges permits the use of an optimum charge against a given size mine, reduces fragment dispersion and diminishes the value of these charges as ammunition.

Availability:

Commercial shaped charges are available from various vendors, including the one evaluated. Unit prices range from \$3.00 to \$5.00 depending on the weight of explosives. The cost will be less for larger quantity orders.

Points of Contact:

Department of Defense
OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: soliacac@policy1.policy.osd.mil

Program Manager
U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: jregnier@nvl.army.mil

Contractor
Western Atlas International
P.O. Box 1407
Houston, TX 77251-1407
(713) 972-4000





Mine Marking and Neutralization Foam



Clearance/Neutralization



Mine Marking and Neutralization Foam



Mission:

Provide a method to safely mark and remove landmines while rendering the fuze inoperable if in place neutralization is not possible, or not desirable.

Description:

The Mine Marking and Neutralization Foam is a two part, hand dispensed polyurethane foam that is applied to exposed landmines. The bright color provides a quick and easy method to mark mines and dangerous areas. As the foam hardens, it impregnates the exposed parts of the mine and renders the fuze inoperative. The hardened foam prevents detonation of the mine if a deminer accidentally steps or falls on the marked mine. The foam acts as an adhesive to "glue" rope to the exposed mines so that deminers can then safely remove mines suspected of being booby-trapped. The foam operates over a temperature range of 0°C to 40°C, is environmentally inert, and comes in packs that can treat up to 40 mines.

Availability:

The Mine Marking and Neutralization Foam is currently available and costs approximately \$20 per package. Each package can be used against two or three mines. An improved system will be available in the summer of 1997.

Points of Contact:

Department of Defense

OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: jregnier@nvl.army.mil

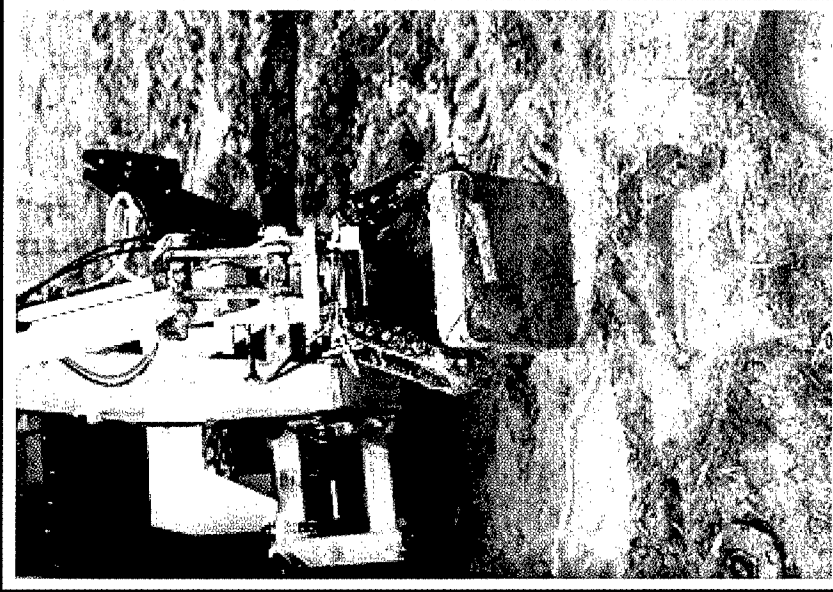
Contractor

Instafoam Products, Inc.
1500 Cedarwood Drive
Joliet, IL 60435-3187
(800) 800-FOAM





Tele-Operated Ordnance Disposal System (TODS)





Tele-Operated Ordnance Disposal System (TODS)



Mission:

Provide a standoff capability to remove landmines in heavy and light vegetation.

Description:

The Tele-Operated Ordnance Disposal System (TODS) is a device that can remotely excavate landmines via a tele-operated commercial backhoe chassis. The system includes a heavy vegetation cutter and a rapidly interchangeable arm with specialized attachments for landmine excavation. Attachments include an air knife for excavation of landmines, a bucket for soil removal, and a gripper arm to manipulate certain targets. Remote control capability combined with a GPS subsystem and on-board cameras enable the system to be guided to previously marked mine locations.

Availability:

The Tele-Operated Ordnance Disposal System is commercially available for about \$350,000 and requires an eight month manufacturing lead time.

Points of Contact:

Department of Defense
OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager
U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: jregnier@nvl.army.mil

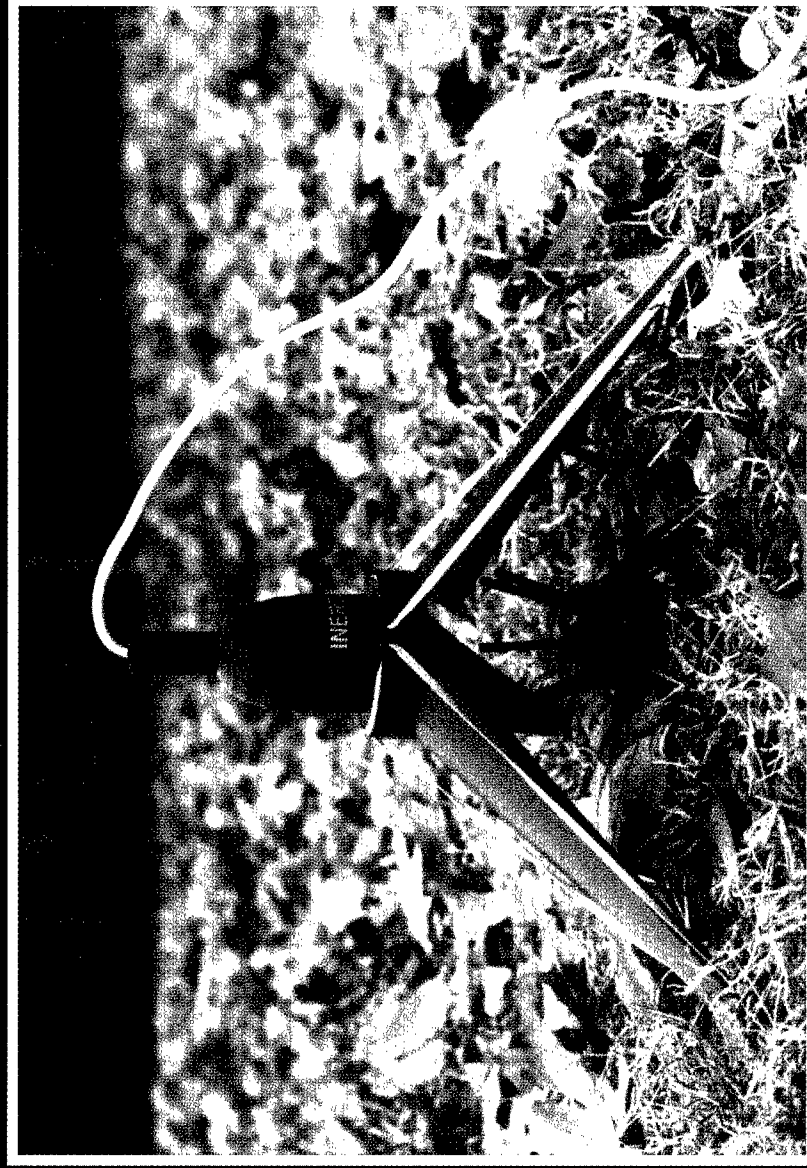
Contractor
OAO Corporation
Suite 209S
9639 Doctor Perry Road
Ijamsville, MD 21754
(301) 874-2205



Clearance/Neutralization



Explosive Demining Device (EDD)





Explosive Demining Device (EDD)



Mission:

Provide an inexpensive, easy-to-use capability for in place destruction of surface and buried mines.

Description:

The Explosive Demining Device is a tripod mounted shaped charge integrated into a simple fixed time delay fuse assembly. This device provides deminers with an ability to clear landmines and some UXO with minimum training. The EDD is packaged in an easily transportable weatherproof cardboard container.

Availability:

One thousand units will cost \$12.00 per unit, and 10,000 units will cost \$7.00 per unit.

Points of Contact:

Department of Defense

OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BEL VOIR, VA 22060-5806
email: jregnier@nvl.army.mil

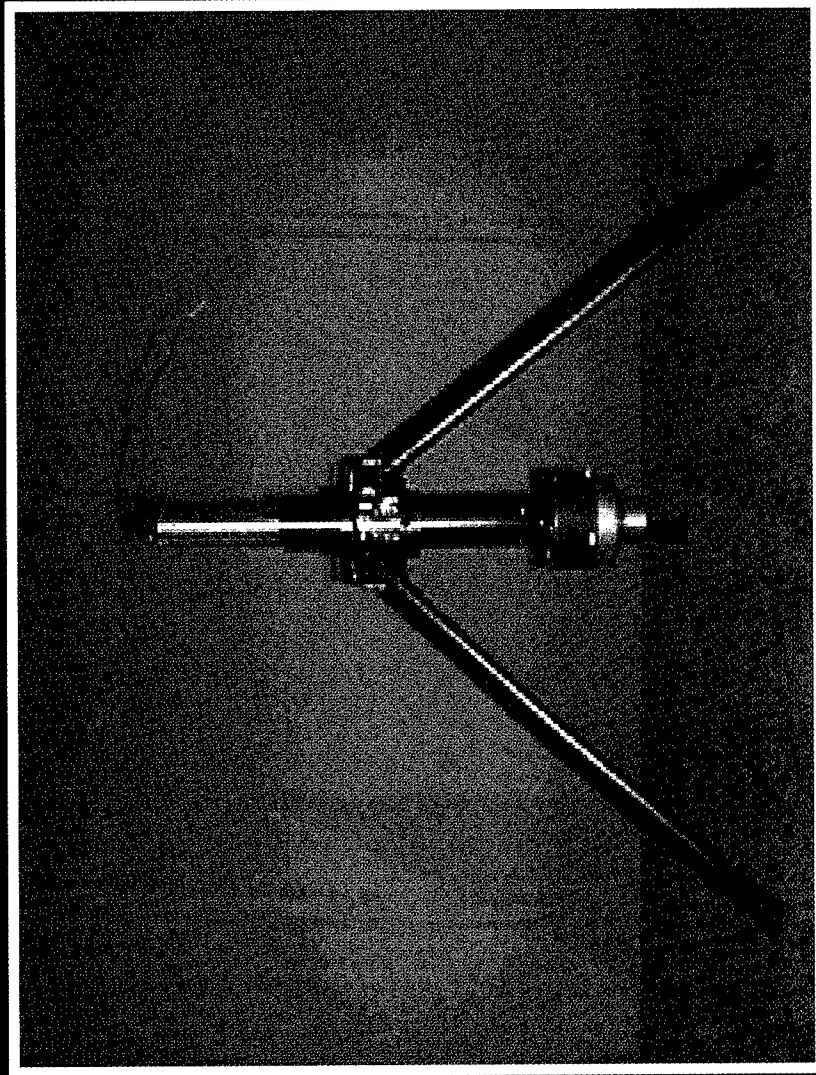
Contractor

TRACOR
6500 Tracor Lane
Austin, TX 78725-2070
(512) 929-2980
ATTN: Les Richard





Chemical Neutralization





Chemical Neutralization

Mission:

Provide a non-explosive in place neutralization capability to eliminate the dispersion of metallic fragments associated with high order detonation of landmines.

Description:

The Chemical Neutralization system consists of a bullet, firing device, and plastic capsule. The bullet and firing device is used to penetrate the mine case and deliver the chemical (diethylenetriamine) into the mine. The chemical initiates the explosive by the highly exothermic autocatalytic reaction without detonating the mine. This system has been successfully evaluated against mines containing TNT and TNT-based explosives, such as Comp B and Pentolite.

Availability:

Three systems currently exist and could be deployed within two months. An additional ten systems could be made available in another six to nine months at a cost of \$480 to \$550. Future systems will integrate the chemical and the bullet into a single unit.

Points of Contact:

Department of Defense
OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicaeq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: jregnier@nvl.army.mil

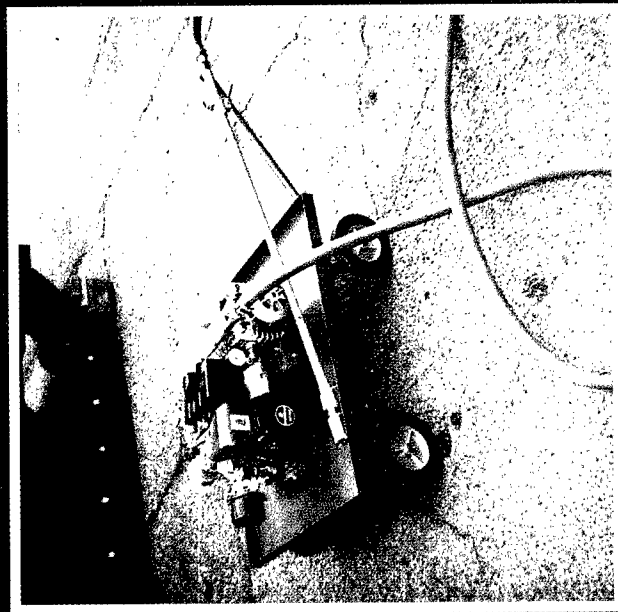
Contractor

IIT Research Institute
10 West 35th Street
Chicago, IL 60616-3799
(312) 567-4293
ATTN: Dr. Allen J. Tulis





Supersonic Air Spade



Clearance/Neutralization



Supersonic Air Spade



Mission:

Provide a stand-off capability to safely and quickly excavate buried landmines.

Description:

The Air Spade uses a commercial air compressor and specially designed air nozzles to create a focused jet of air at supersonic velocity to excavate buried landmines. The Air Spade has excellent capability to remove soil, sand, and clay from around mines, yet exerts a low enough pressure on solid, non-porous objects such that the mines are not activated during excavation. The compressor weighs 500 pounds, is diesel powered, and is connected to the Air Spade via a long pneumatic hose and nozzle.

Availability:

Backpack, hand towed, and truck mounted concept demonstrators were tested in 1996. The backpack and hand towed systems are undergoing further development to increase system power and the truck mounted version is available commercially from the manufacturer with a one or two month lead time at a cost of about \$7,000.

Points of Contact:

Department of Defense

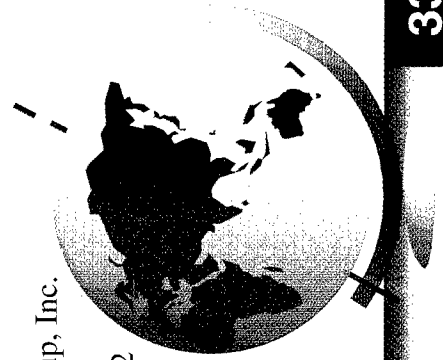
OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BEL VOIR, VA 22060-5806
email: jregnier@nvl.army.mil

Contractor

Concept Engineering Group, Inc.
610 William Pitt Way
Pittsburgh, PA 15238-1332
(412) 826-3191



Training & Mine Awareness

Provide an unprecedented mine awareness and training capability to educate indigenous people, with different languages, cultures, and educational levels, to the hazards posed by landmines and to further instruct them in demining skills. Mine awareness training has proven to be a key element in the reduction of casualties in mine afflicted regions.



Demining Support System (DSS)





Demining Support System (DSS)



Mission:

Provide multi-lingual media capability and mine awareness materials to facilitate the training and the conduct of humanitarian demining operations throughout the world.

Description:

The Demining Support System is a suite of multi-media, audio-visual computer equipment. It provides multi-lingual modules for demining, medical training, access to information databases, demining equipment operation and maintenance, development of mine awareness materials, and templates for mission planning. The system is also modular and rugged to facilitate transportation in the field.

Availability:

Twelve systems have been developed and deployed throughout the world. Additional systems can be acquired within 4 months at a cost of \$60,000 per system.

Points of Contact:

Department of Defense

OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: imartin@nvl.army.mil

Contractor

ESSEX CORPORATION
1430 Springhill Road, Suite 510
McLean, VA 22102
(703) 556-9400





Mine Awareness Education Comic Book





Mine Awareness Education Comic Book



Mission:

Educate the indigenous population, especially the children, on the dangers associated with landmines and indications of mined areas.

Description:

The initial Mine Awareness Education Comic Book is a public-private humanitarian initiative that teaches children in Bosnia-Herzegovina how to avoid landmines which threaten their safety. The Superman® character was chosen after careful and deliberate research to ensure that the concept was culturally acceptable. The concept has proven highly successful, and lends itself to modification and adaptation to other mine-afflicted regions of the world.

Availability:

Quantities and price can be negotiated with individual vendors. The Superman® comic is currently available in limited quantities.

Points of Contact:

Department of Defense

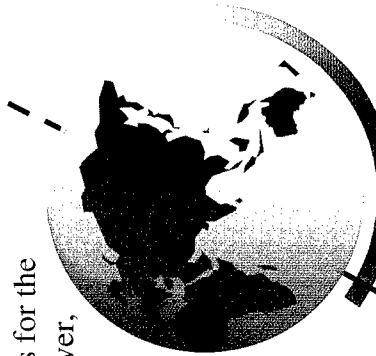
OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BEL VOIR, VA 22060-5806
email: imartin@nvl.army.mil

Contractor

D.C. Comics owns the rights for the Superman® character, however, other vendors can be contacted depending on the desired concept.





Mine Facts CD-ROM



Mine Facts®



Department Of Defense
United States Of America

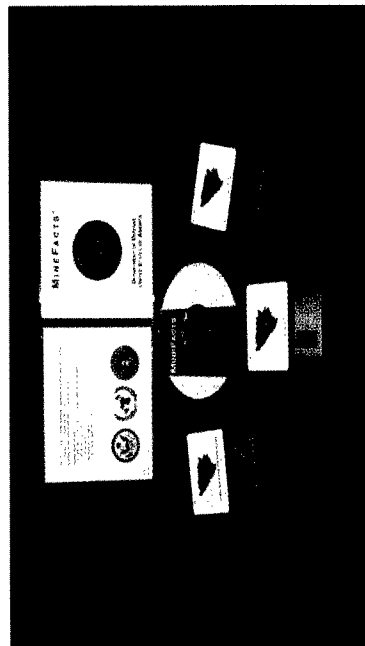
Start

About

Exit

Describe the Mine, Then Click on Find.

Type of Mine: ☒ Antipersonnel ☐ Antitank ☐ All Types	Shape: ☐ Square/Rectangular ☒ Round/Cylindrical ☐ Don't Know	Case Material: ☐ Metal ☐ Wood ☒ Plastic ☐ Don't Know
Manufactured In: Egypt Finland Former Czechoslovakia Former East Germany Former Soviet Union Former West Germany Former Yugoslavia	Longest Side if Square/Rectangular, or Diameter if Round/Cylindrical: ☒ Less Than 6 Inches ☐ 6 Inches Or More ☐ Don't Know	
Find		Back



		Enlarge Play	
Description The PMN antipersonnel mine consists of a bakelite lower body component, a plastic pressure plate, a black rubber pressure plate cover, a spring-loaded firing device, and the explosive components. The rubber cover is secured to the lower case component by a thin metal strap that is tightened with a key to the point that the mine is waterproofed. Opposing openings on the side of the mine allow the user to insert the booster and detonator in one side and the cocked striker mechanism in the other.		Manufacturing Country Iraq Former Soviet Union, China, Afghanistan, Cambodia, China, Egypt, Former East	
Print		Page	
Back		Page	



Mine Facts CD-ROM



Mission:

Provide landmine information to facilitate training, mine awareness and mine identification in support of global demining operations.

Description:

Mine Facts is a compendium of 700 landmines. It allows the user to access mine information by country of origin, type of mine, case material, shape and other physical characteristics. The collection of landmine information was developed jointly with the National Ground Intelligence Center (NGIC) and the Naval Office of Special Technology (OST). It exists on CD-ROM, is a critical module of the Demining Support System, has been deployed to all theater Commanders-in-Chief (CINCs), and is a key component of mine awareness training provided through the Mine Action Centers.

Availability:

A limited number of copies can be obtained at no cost from OASD (SO/LIC) or NVESD. Additional, or large quantities, may be acquired within 5 days at a cost of \$3.00 per copy from the contractor.

Points of Contact:

Department of Defense

OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: imartin@nvl.army.mil

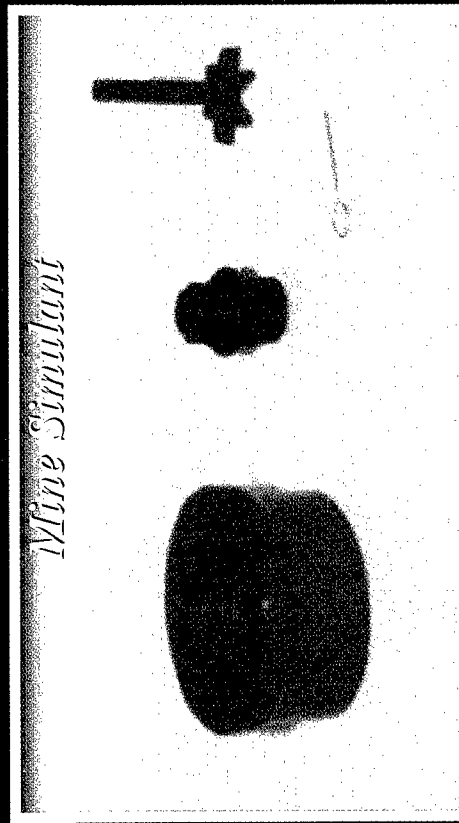
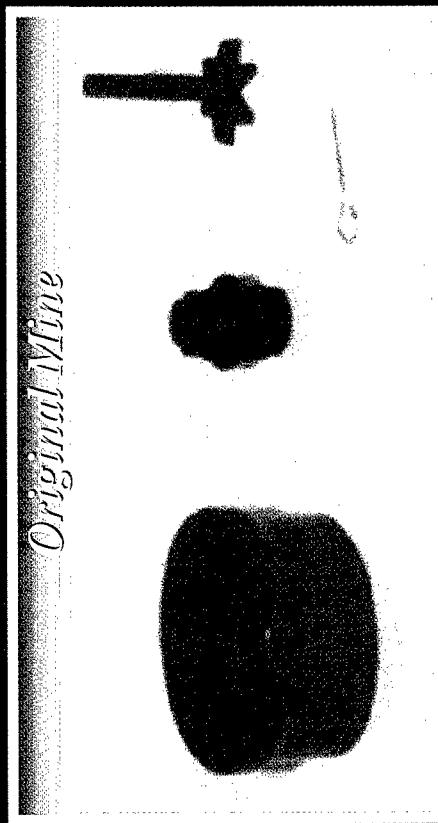
Contractor

ESSEX CORPORATION
1430 Springhill Road, Suite 510
McLean, VA 22102
(703) 556-9400





Training Mine Simulants





Training Mine Simulants



Mission:

Provide mine simulants for mobile training kits and static displays to facilitate training, mine awareness and mine identification.

Description:

Mine simulants are accurate full scale inert replicas, capable of reproducing the mechanical functions, metallic subassemblies and contrasting dielectric constants of real mines. These models can be used for mine awareness training and testing R&D equipment.

Availability:

Mine simulants are available within 16 weeks of request at an approximate cost of \$126.00 per unit. The exact production time and cost of the simulants is highly dependent upon the complexity of the replicas, quantity ordered and the level of detail required.

Points of Contact:

Department of Defense

OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: imartin@nvl.army.mil

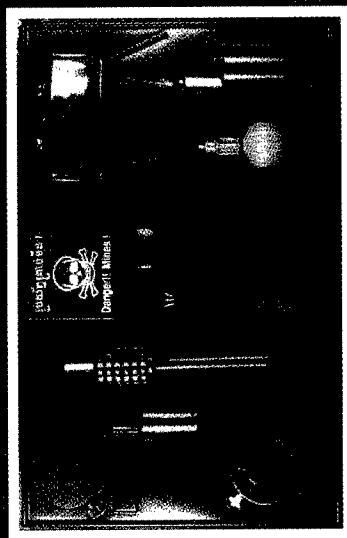
Contractor

CST ENTERPRISES, INC.
116 Maple Hill Lane
Labadie, MO. 63055
(314) 451-0435

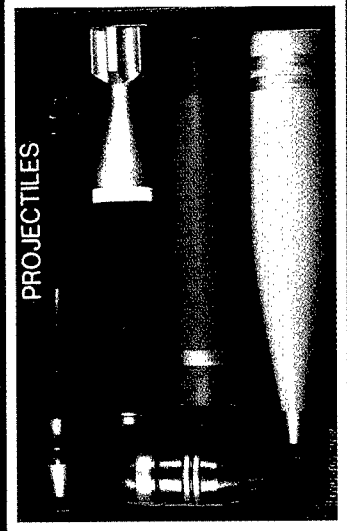




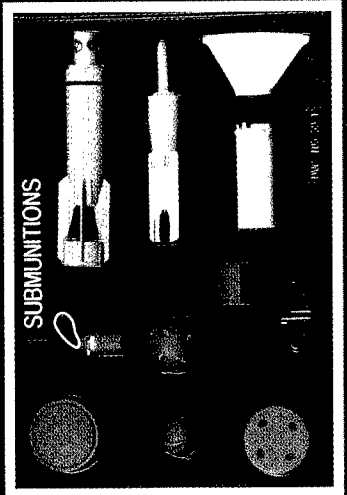
Mine Recognition Board Set



Cambodia Mine Recognition



PROJECTILES



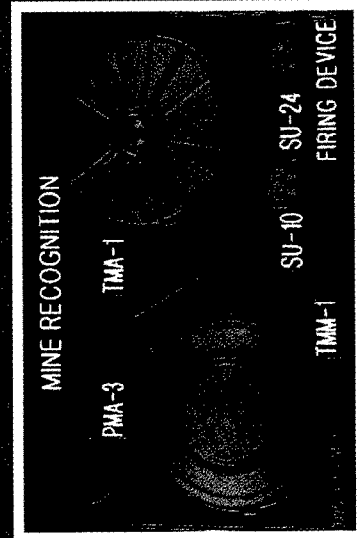
SUBMUNITIONS



UXO Recognition



Bosnia Mine Recognition



MINE RECOGNITION

PMA-3

FLARE

PMA-2

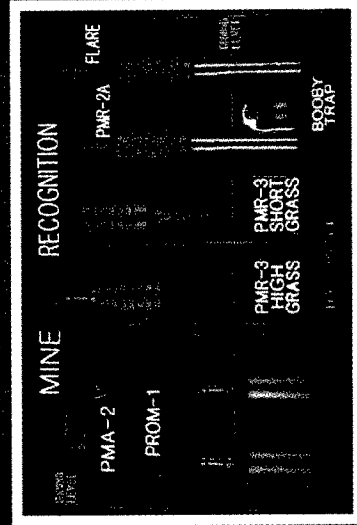
TMA-1

SU-10

SU-24

FIRING DEVICE

TMA-1



MINE RECOGNITION

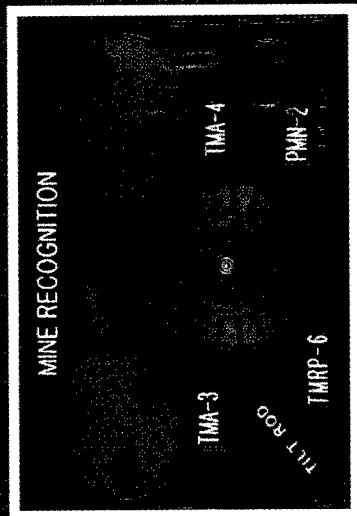
PMA-2

PROM-1

PMR-3
HIGH
GRASS

PMR-3
SHORT
GRASS

BOOBY
TRAP



MINE RECOGNITION

TMA-3

TMA-4

PMN-2

TMRP-6



Mine Recognition Board Set



Mission:

Provide Mine Recognition Board Sets to facilitate training, mine awareness and mine identification in support of global humanitarian demining operations.

Description:

The Mine Recognition Board Sets are accurate vacuum-formed, plastic replicas of mines. The 24" X 36" recognition boards are constructed to depict detailed mine information such as mine dimensions, mine fuzes, and booby trap devices. The boards are painted and detail actual mine color codes.

Availability:

Mine Recognition Board Sets can be made available at an approximate cost of \$150.00 per set.

Points of Contact:

Department of Defense

OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

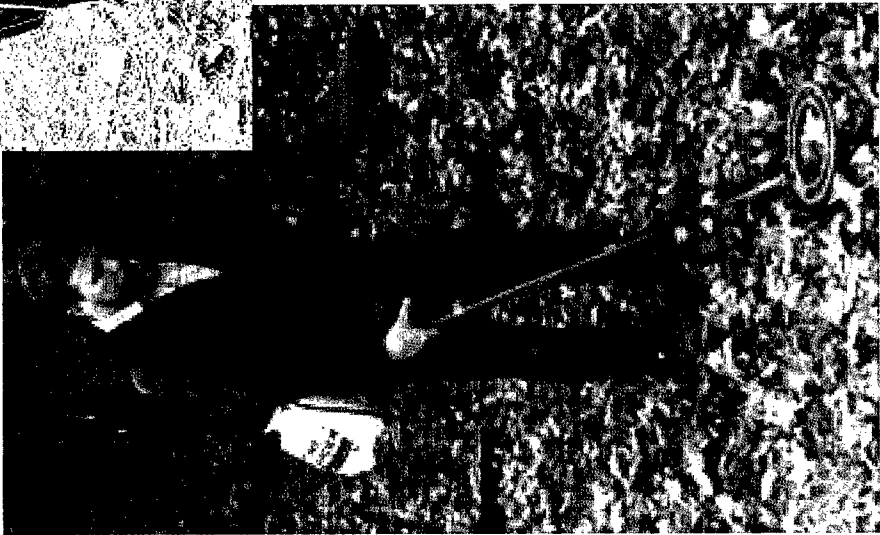
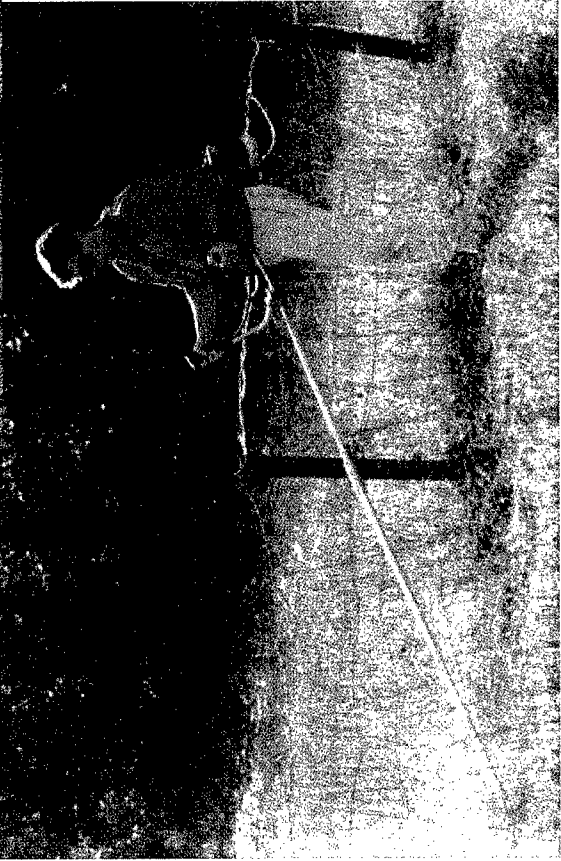
Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BEL VOIR, VA 22060-5806
email: imartin@nvl.army.mil

Contractor

CORPORATE INFORMATION CENTER
U. S. ARMY MISSILE COMMAND
AMSMI-CIC-OD-TD
REDSTONE ARSENAL, AL 35898-7462
(205) 955-6079





Individual Components

Although technology developments promise to vastly increase the safety and efficiency of demining operations, there is no end in sight to the need for some degree of manual demining work. Small, low cost mission aids are needed to assist individuals engaged in manual demining operations.



Extended Length Weedeater





Extended Length Weedeater



Mission:

Provide individual deminers with a stand-off capability to clear vegetation from suspected mined areas and optimize the use of mine detectors and other clearance devices.

Description:

The Extended Length Weedeaters are modified commercial off-the-shelf, hand held and wheeled vegetation cutters. The shaft lengths are increased and blast shields are incorporated to provide the individual deminer with increased stand-off protection against accidental mine detonation.

Availability:

One wheeled and one hand held system currently exist. The overall system is undergoing major upgrades to optimize speed and safety issues.

Points of Contact:

Department of Defense

OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BEL VOIR, VA 22060-5806
email: cchiches@nvl.army.mil

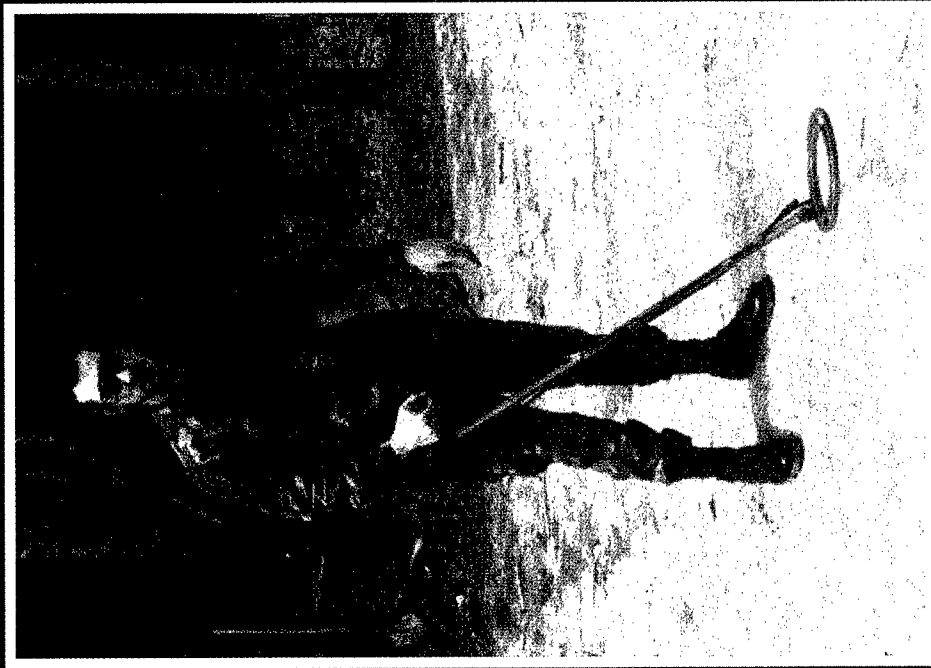
Contractor

Contact CECOM NVESD
for further information.





Mine Location Marker





Mine Location Marker



Mission:

Provide an integrated real-time marking system for hand held mine detectors.

Description:

The Mine Location Marker adds a real time marking device to the AN-19/PSS-12 mine detector to increase operator efficiency by eliminating the need for previous marking devices. The Mine Location Marker is a small, commercial yard sprayer with plastic extensions attached to the shaft of the mine detector and a sprayer tip positioned inside the detector's center ring.

Availability:

The Mine Location Marker is a simple modification to the AN-19/PSS-12 mine detector using commercial off-the-shelf items. Instructions and materials are currently ready for immediate fielding.

Points of Contact:

Department of Defense

OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: cchiches@nvl.army.mil

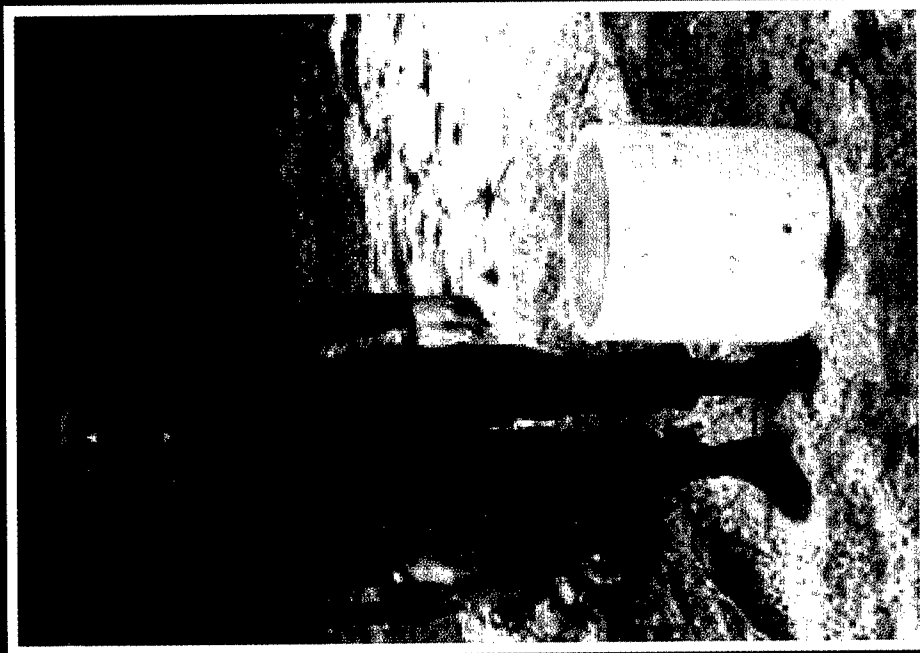
Contractor

Contact CECOM NVESD
for further information.





Blast & Fragment Container





Blast & Fragment Container



Mission:

Provide protection for high value assets and eliminate subsequent minefield cleanup associated with in-situ neutralization operations.

Description:

United States demining policy requires that all landmines be destroyed in place. Because many mines have been employed near critical infrastructure or high value assets, the need for protection against the fragments associated with in-situ neutralization has emerged. Blast and Fragment Containers have been developed to eliminate damage from mine detonations, particularly from the bounding fragmentation mines, and eliminate subsequent minefield cleanup. The containers are 27 inches in diameter and constructed of single length S2 glass dry rolled into a one inch thick cylindrical container weighing 85 pounds.

Availability:

A set of 10 Blast and Fragment Containers could be fabricated and deployed within 30 days for an approximate cost of \$10,000. Developments to improve container durability and reduce the overall weight are planned for FY97.

Points of Contact:

Department of Defense
OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager
U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BEL VOIR, VA 22060-5806
email: cchiches@nvl.army.mil

Contractor
International Engineering Technologies, Inc.
596 Central Drive, Suite 101
Virginia Beach, VA 23454
(757) 486-5251





Command Communications Video and Light System (CCVLS)





Command Communications Video and Light System (CCVLS)



Mission:

Provide a capability for an instructor located outside the minefield to monitor and communicate real-time with an individual performing demining operations.

Description:

The Communications Video & Light System (CCVLS) is a rapidly deployable, self-contained video and audio communications system. It enables a deminer to communicate with personnel located at a command post outside the minefield. The command post instructor can provide the deminer with proper instructions, techniques and safety procedures associated with specific landmines. CCVLS is comprised of a Protec helmet with a helmet mounted camera, a perimeter link camera, high gain directional antennas and three easily transportable cases. Two of the cases contain the perimeter link transmitter and the down range receiver/transmitter. The other case contains the command post that is used to view and record minefield operations and to relay information to the deminer. The CCVLS recordings can be used later to train and critique indigenous personnel on proper demining procedures.

Availability:

Two CCVLS systems currently exist. Other units could be made available in about 60 days at an approximate cost of \$60,000 each.

Points of Contact:

Department of Defense

OASD (SO/LIC) Acquisition
2500 Defense Pentagon
Washington, DC 20301-2500
(703) 693-5222
(703) 693-3039 (fax)
email: solicacq@policy1.policy.osd.mil

Program Manager

U.S. Army CECOM NVESD
ATTN: AMSEL-RD-NV-CD-ES
10221 BURBECK ROAD, SUITE 430
FORT BELVOIR, VA 22060-5806
email: cchiches@nvl.army.mil

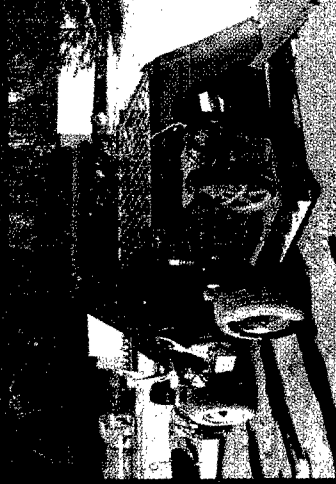
Contractor

International Engineering Technologies, Inc.
596 Central Drive, Suite 101
Virginia Beach, VA 23454
(757) 486-5251



Near Term Future Systems

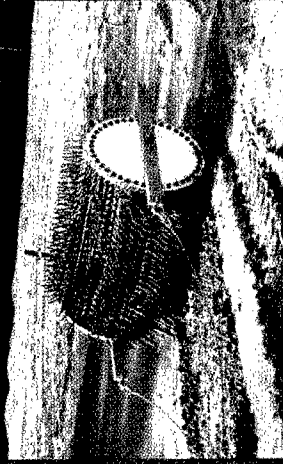
Several other promising technologies under development will be available in the near future. Pictured here are some of these prototype items.



Berm Processing Assembly will remove mines from berms created by mine clearing blades.



Floating Mine Blade will clear mines buried up to 10 inches deep and retain soil's ability to support crops.



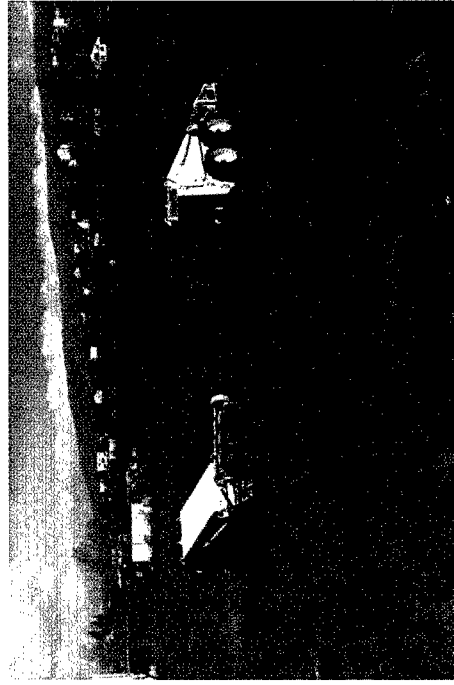
Lightweight roller specialized for clearing AP mines in watery areas such as rice paddies - towable by small truck or animal.



Camcopter's radio controlled, fully autonomous platform will utilize airborne sensors and an inertial navigation system based flight control system to provide an extremely flexible and programmable wide area detection system.

Conclusion

Humanitarian demining has attracted national and international visibility during the past few years. The items displayed in this catalog represent small but significant accomplishments made by the Department of Defense that could make measurable differences in international demining efforts. The world's landmine problem will take many years to resolve. The Department of Defense remains committed to working with international agencies and private relief organizations in the development of equipment to eradicate this problem.





HUMANITARIAN DEMINING

EQUIPMENT CATALOG

