

PORTABLE VEHICLE ARRESTING BARRIER (PVAB): M1

A Non-Lethal Area Denial System



Presented By:
Primex Non-Lethal Systems

PRIMEX
TECHNOLOGIES



- A Leading Force in a Changing World
- A Defense and Aerospace Company headquartered in St. Petersburg, FL with:
 - Sales of \$540+M
 - 2600+ Employees
 - 11 Manufacturing Locations in the United States
- Core Businesses:
 - Munitions
 - Propellants
 - Satellite Propulsion Systems
 - Electronics



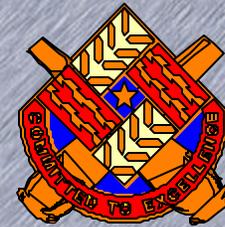
PVAB

A safe and effective vehicle capture system for Traffic Control Points

Developed for & under contract to:
Program Manager for Mines,
Countermine & Demolitions Office



US Army Tank and Automotive
Command (TACOM), Army
Research & Development
Engineering Command (ARDEC),
Picatinny Arsenal, NJ



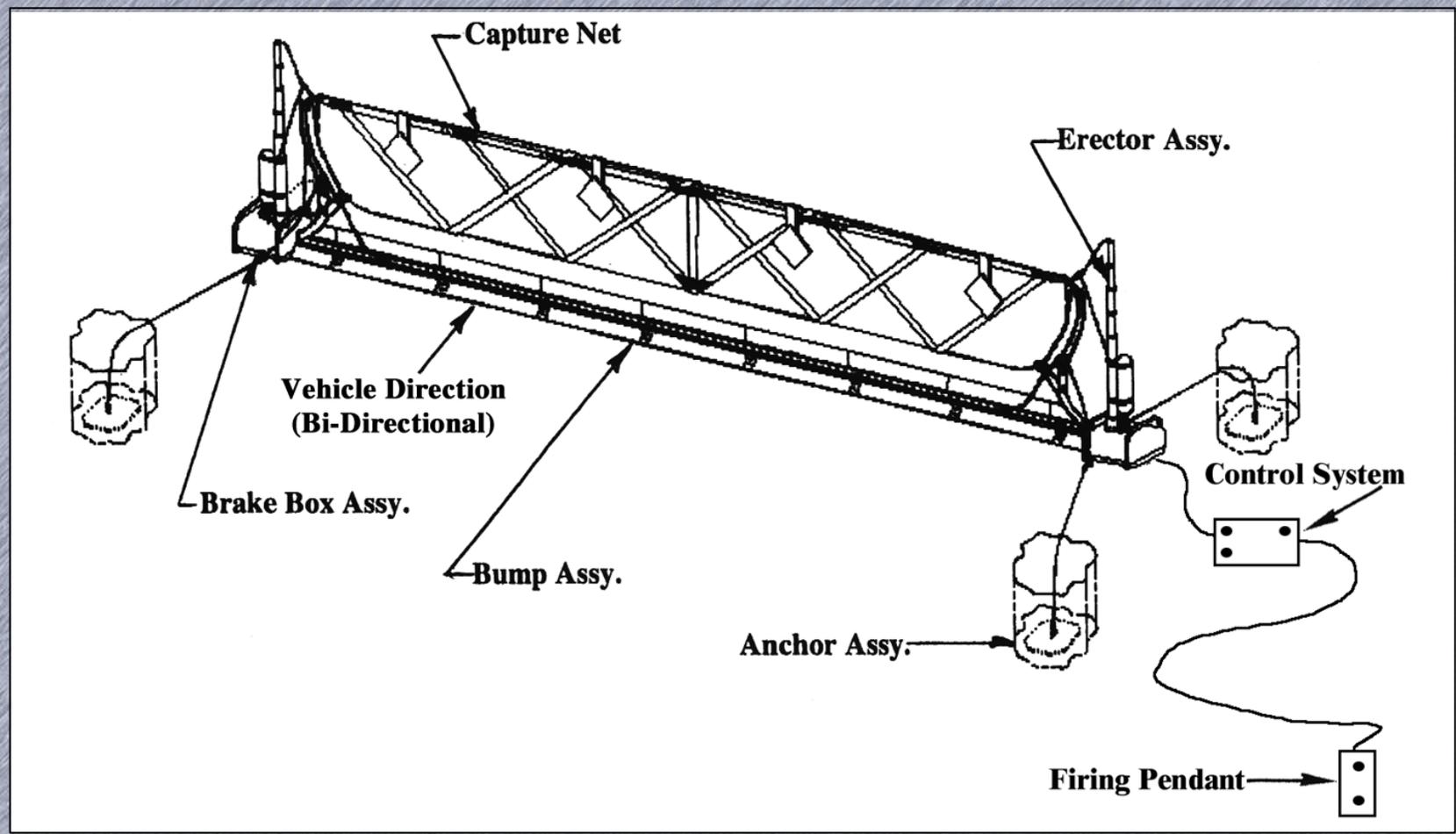
Department of Defense Joint Non-Lethal Weapons Directorate and Joint Non-Lethal
Weapons Program - USMC H.Q., Quantico, VA



PRIMAX
TECHNOLOGIES

PVAB

Illustration of Capture Mode



PVAB EVOLUTION

- Primex submitted White Paper to the government in 1996
- 2 contracts awarded
 - Proof of Principle – May 1996 - Nov 1998
 - Engineering and Manufacturing Development – Dec 1998 - Dec 1999
 - Successful development and Operational Testing Performed
 - Cold (-25°F) reliability testing at Army's Cold Region Test Center, Ft. Greeley, Alaska
 - Hot (+125°F) reliability testing at Yuma Proving Ground, Arizona
- Army Type Classified system in March 2000
- First Year production contract to be awarded in April 2000 consisting of:
 - Product Enhancement Program (PEP)
 - Low rate production of 54 systems

PVAB OPERATING RATIONALE

- PVAB is lightweight, portable, easily emplaced and recoverable
- System can be unpacked/set-up for use with a two man team in less than two hours
- Allows normal traffic flow



System in Standby Mode

PVAB OPERATING RATIONALE

Con't

- Telescoping erectors raise net from the speed bump to a height of 4 feet
- System can be reset to standby mode in less than 20 minutes



System in Capture Mode

PVAB OPERATING RATIONALE

Con't

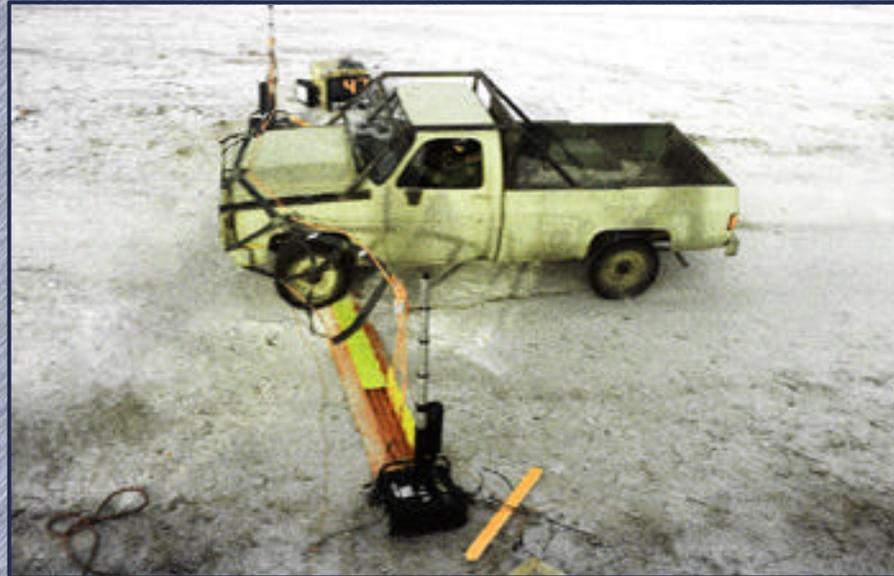
- Upon command, if approaching vehicle fails to stop, checkpoint guard activates the system to capture mode with a remote control pendant from a maximum distance of 300 feet (or 1,000 ft. with WD-1 Como wire)
- Capture net raises to full height in less than 2 seconds



Approaching Hostile Vehicle

PVAB OPERATING RATIONALE

Con't



Vehicle Engaging Capture Net

- PVAB is designed to capture a 7,500 lbs. Vehicle traveling at up to 45 mph
- Successfully captured vehicle weighing 14,000 lbs. traveling at 35 mph

PVAB OPERATING RATIONALE

Con't

Vehicle Being Stopped by the System



- Capture net wraps around vehicle, and capture lines are tightened by vehicle motion
- Brake line payout provides a controlled braking force
- Brake box applies increasing brake force as brake lines are pulled out
- Rear capture line wraps around rear axle to help stop vehicle

PVAB OPERATING RATIONALE

Con't

- Rope ratchets in capture net keep net tight, preventing vehicle from escaping after capture
- Occupants inhibited from opening doors, impeding escape



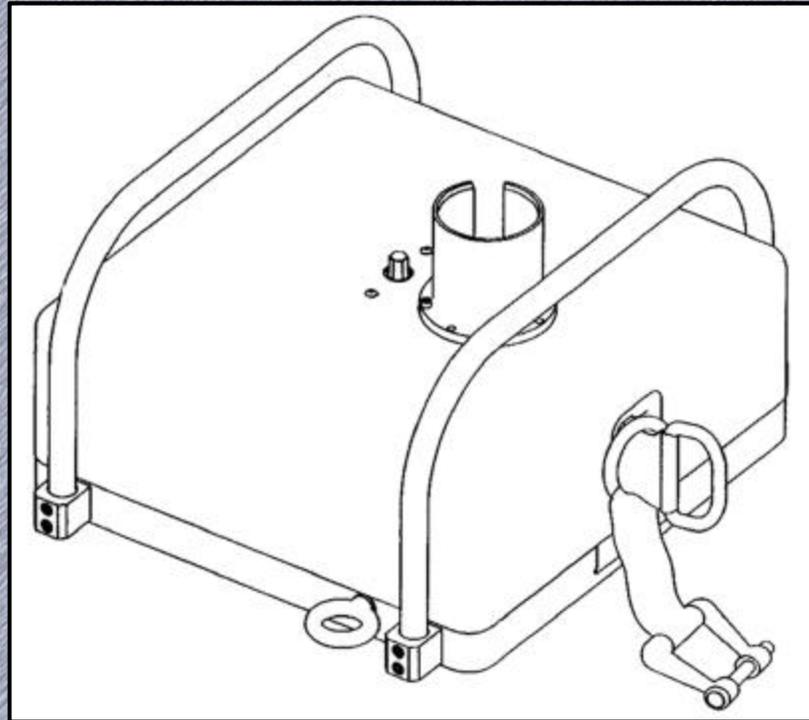
Captured Vehicle

PVAB PERFORMANCE

Description	Goal	Performance
1. Capture Vehicle Weight & Speed	7500 lbs. @ 45 mph	7500 lbs. @ 45 mph 14,000 lbs. @ 35 mph
2. Max Stopping Distance	200ft	152ft. average
3. Max Net Erection	2 seconds	1.3 secs average
4. Max Vehicle Stopping Deceleration	3 G's	.9 G's average
5. System Setup Time	2 hrs. w/3 people	.5-1.5 hrs. w/2 people
6. Reconfigure Time after Capture	30 min. w/2 people	20 minutes w/2 people
7. Lane Width	Single & double	Meets Goal
8. Capture Direction	Bi-directional	Meets Goal

PVAB DESIGN

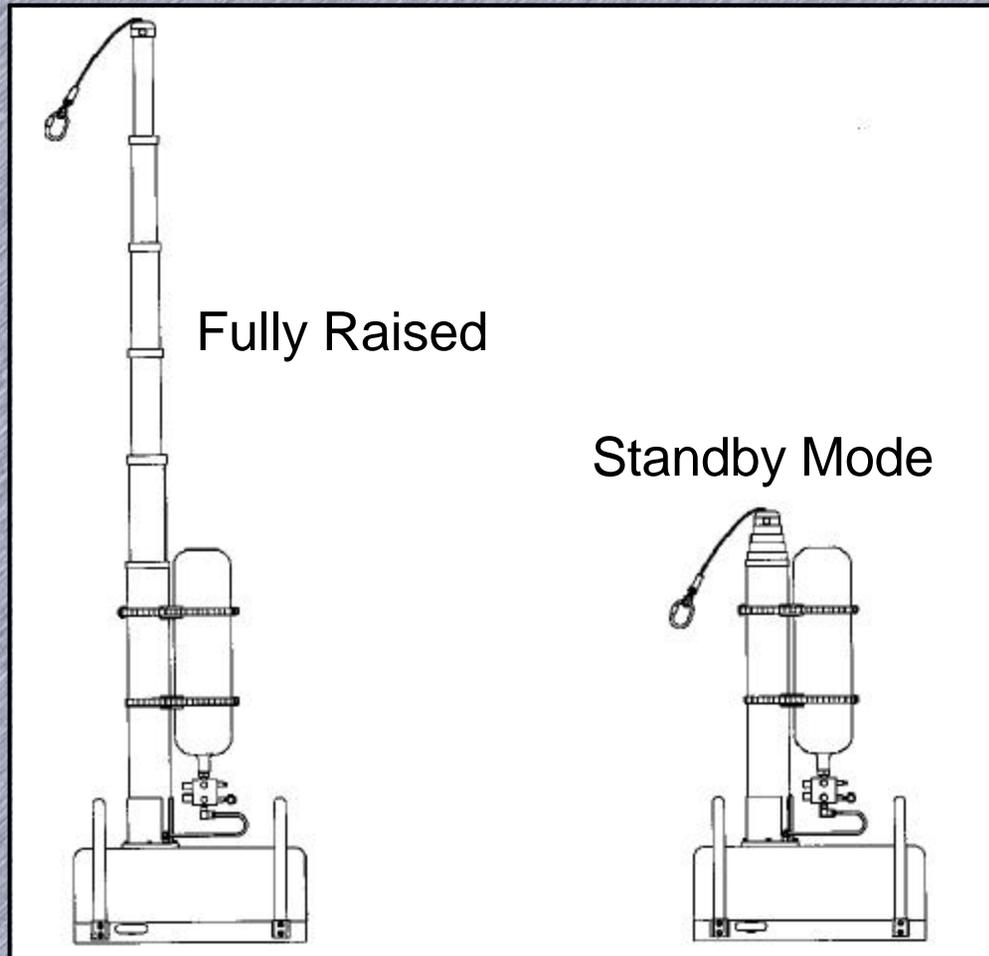
BRAKE BOX ASSEMBLY



- Brake box contains braking mechanism and payout brake line reel
- Braking mechanism is a disc brake similar to a car brake
- Brake line is a woven nylon with a high break strength

PVAB DESIGN

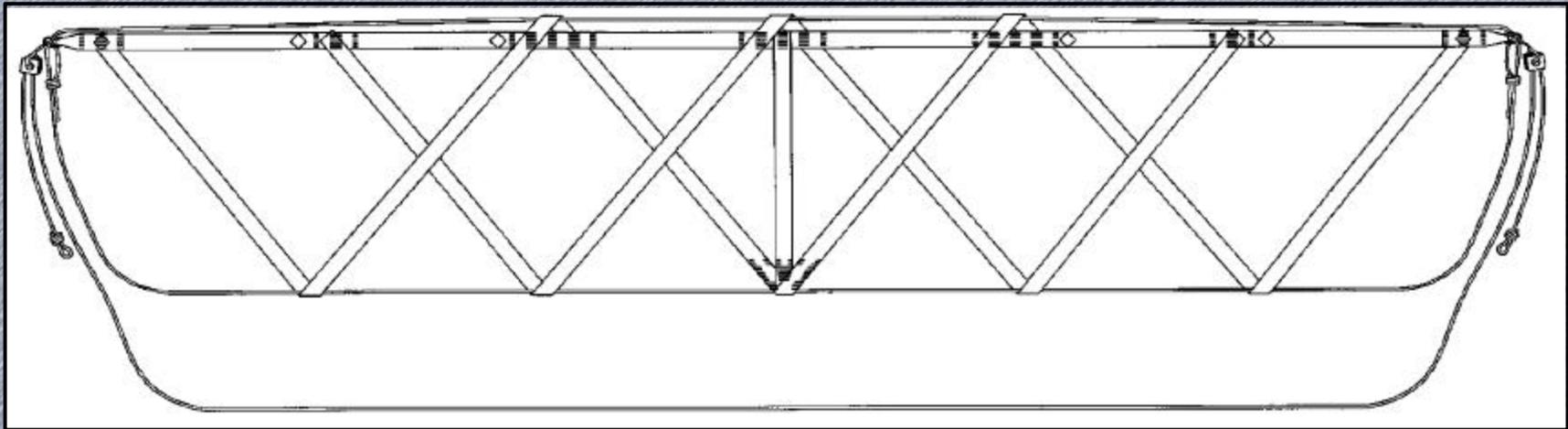
ERECTOR ASSEMBLY



- Erector is raised by air pressure from attached low pressure air bottle
- Air is released from air bottle by actuation of solenoid air valve
- Control cable activates solenoid valve when fire control switch is pushed

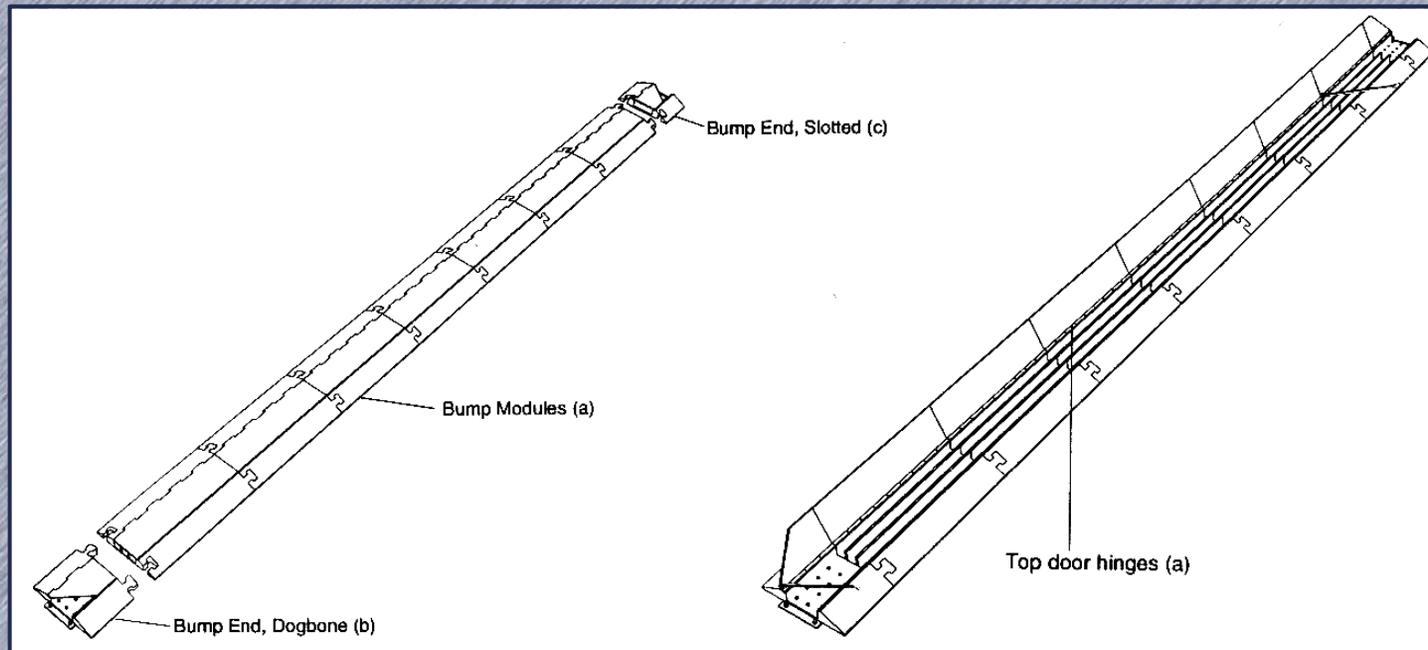
PVAB DESIGN

CAPTURE NET ASSEMBLY



- Capture net made from 3" wide nylon webbing with a 9,000lb. break strength
- Overlapping diagonal design provides generic vehicle fit

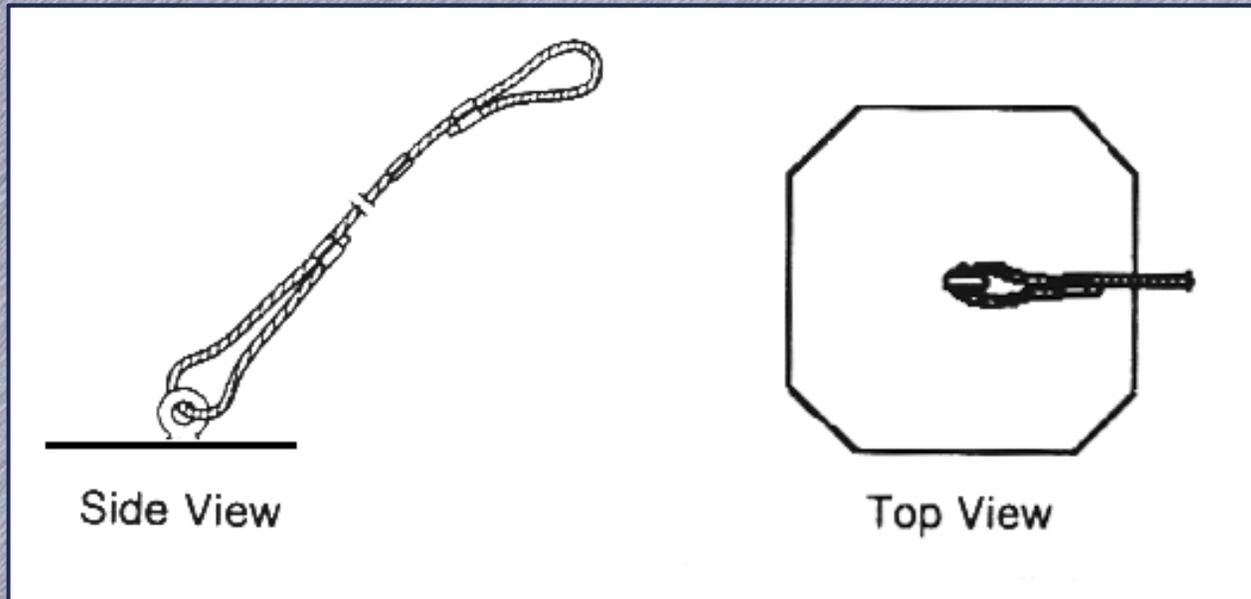
PVAB DESIGN BUMP ASSEMBLY



- Assembled Bump Sections form a speed bump across roadway
- Bump assembly contains and protects the Capture Net and Control Cable
- Does not impede normal traffic flow in standby mode

PVAB DESIGN

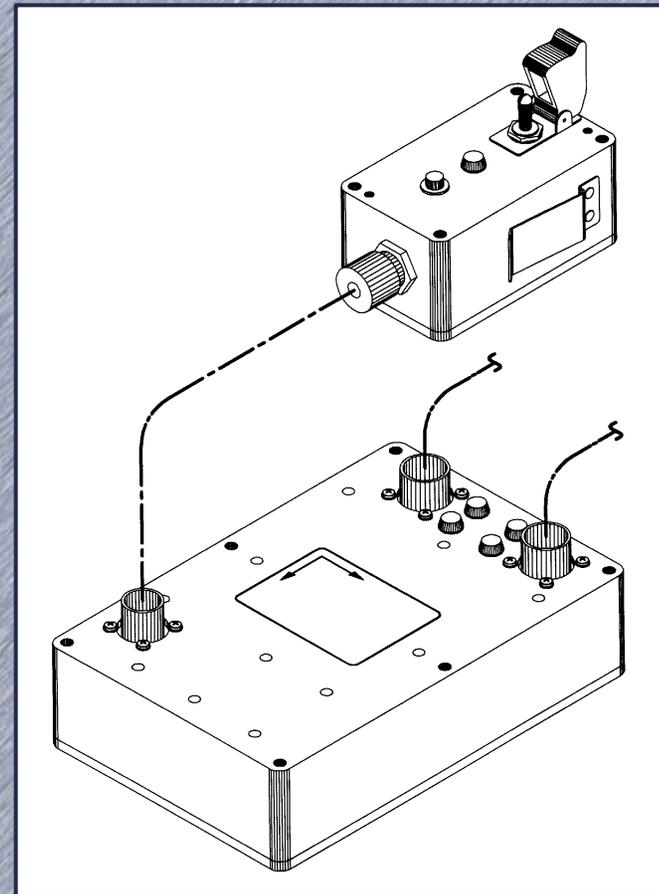
ANCHOR PLATE ASSEMBLY



- System has 4 anchor Plate Assemblies; two on each side of roadway
- Anchor cables attach to Brake Box to keep system in place
- Buried 2 ft. deep
- Anchoring techniques have been developed for all types of terrain

PVAB DESIGN CONTROL SYSTEM

- Control System is powered by Lithium battery pack
- External Power supply connections for 12 volt car battery
- Control Cables are quick disconnect
- Control Box has built-in test circuits to verify the system is ready
- Pendant can test and/or fire system from up to 300 ft. away from PVAB (or 1,000 ft. with WD-1 Como wire)



POTENTIAL MARKETS FOR PVAB

- US Department of Defense
 - “Non-Lethal Capability Sets” for quick deployment
 - Army
 - Marine Corps
 - Air Force
 - Permanent protection for domestic and foreign military installations
- Other US Agencies
 - Immigration and Border Control
 - State Department
 - Department of Energy
- Foreign Military Sales
- US Domestic Market
 - Police Forces
 - Utility Facilities
 - Corporations requiring high security

POTENTIAL ENHANCEMENTS

- Permanent system installations for long term protection
 - Place Bump Assembly flush with road surface to allow for very high traffic flow
 - Secure anchors in concrete to permanently secure system
 - Modify Control System to use 110 volt power and batteries as backup
 - Modify Capture Net Assembly to accommodate semi-trailer captures
- Wireless Control System for fire control pendant
- Modify Braking System to capture very light to very heavy vehicles up to 40,000 lbs. without increasing deceleration forces

CONCLUSION

PVAB offers:

- A highly effective and safe area denial of unauthorized vehicles
- A low cost system that is portable with quick setup and recovery
- Reliably stops & captures 7,500 lb. vehicle @ 45 mph
- Ability to stop & capture a 14,000 lb. vehicle @ 35 mph
- Little or no damage to vehicle and occupants
- A broad range of applications

FOR MORE INFORMATION

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