



US Army Close Terrain Shaping Obstacles





What do US Army Engineers Do?

Mobility

- Obstacle Breaching
- Gap crossing



Counter Mobility

- Close
 - Lethal
 - Non-lethal
- Mid/Deep
- Physical
 - Ditches
 - Fence



Survivability/General Engineering

- Blast mitigation
- Vehicle and Soldier protective positions
- Infrastructure
- Route repair & maintenance
- Airfield damage repair
- Port opening & repair



How do we do this in the future?





Counter Mobility

Close now



Buried or surface laid persistent
 Mines are slow to emplace and
 Policy restricted
 Create obstacle for both Enemy
 and Friendly forces
 Persistent after conflict

Future

Controllable – on/off/on
 Lethal and non-lethal effects
 Fast and autonomously emplaced
 Ottawa compliant
 “Self healing” after attempted breach

Mid/Deep – now

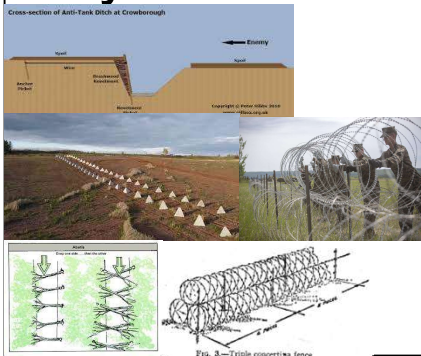


Persistent after conflict
 Difficult to track exact location of
 emplacement

Future

Controllable – on/off/on
 Fast and autonomously emplaced
 Ottawa compliant
 Long range deployment through
 various delivery methods
 Self reporting of status and location
 Low comms band bandwidth

Physical – now



Slow to construct
 Soldiers intensive to construct
 Logistic & Resource intensive

Future

Autonomous
 Rapidly emplaced
 Scalable

Army Modernization Strategy and Impacts



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Supports multiple Army key modernization initiatives:

- CTSO munition fields integrated into the scheme of maneuver and fires improves the effectiveness of long-range precision fires, next generation combat vehicles, and Soldier lethality

Enables key Army modernization initiatives by accomplishing:

- A robust lethal obstacle capability deters threats from seizing land that U.S. forces will defend
- CTSO provides a combat multiplier required to successfully fight and win against a near-peer enemy
- Complex obstacles slow, turn, and canalize enemy formations creating exposed targets and massed vehicle concentrations

Accomplishes the following tasks:

- CTSO will be a DoD Landmine Policy compliant, rapidly emplaced, close directed obstacle
- CTSO munitions will report their status and location via the remote-control station (RCS) to Army Tactical Command and Control (C2) Systems enabling a common operating picture of all munition fields via the unified network Army Tactical Network

Close Terrain Shaping Obstacles (CTSO) Development Strategy



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Interim/ONS

MTA

ACQ: FY19

IOC: FY23

ACQ: FY22

IOC: FY28

ACQ: FY26

IOC: FY31

Top Attack

XM204 Top Attack



Capabilities:

- Affordable, easily trained & employed
- Ground-based, lethal Anti-Vehicle (AV) obstacle w/breach resistance measures
- Detect, Track & Engage Threat Vehicles
- Durable & Versatile: Maneuver Support & Maneuver Missions
- 4 hr, 48 hr, or 15 day Soldier selected self-destruct times

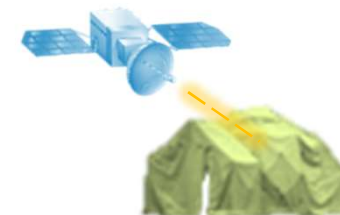
Top Attack



Capabilities:

- + Rapidly Emplaced; Recoverable & Reusable (Close)
- + Improved Lethality and sensing
- + Advanced counter-measure resistance
- + Common Control for networked obstacles
- + ON-OFF-ON Munitions
- + Self Report location of obstacles
- + Self report status, tamper, and/or activation of munition field
- + Remotely modified self-destruct / self-deactivate times
- + Command destruct / deactivate

Full Network Capability



Capabilities:

- + System communications (2-300 km)
- + Automated Cryptography and Command & Control
- + Ground-based, lethal AV complex obstacle (Bottom and Top Attack) with breaching resistance measures
- + All Terrain/Weather Environments and Deliverable at *Close, Mid, and Deep Ranges*
- + Direct Integration to Mission Command. Common Operating Picture.

ACQ: FY19

IOC: FY23

ACQ: FY25

IOC: FY29

Bottom Attack

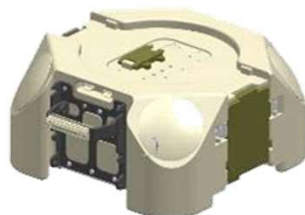
XM343 SAVO



Capabilities:

- Hand emplaced, man portable alternative means to employ Volcano canisters to form an AV obstacle
- Rapid obstacle emplacement and recovery
- SAVO baseplate (new item) will use existing inventory
 - Initiation System(s): M7 Spider, RAMS, Blasting Machine
 - Munition: M87/M87A1 Volcano munitions

Bottom Attack



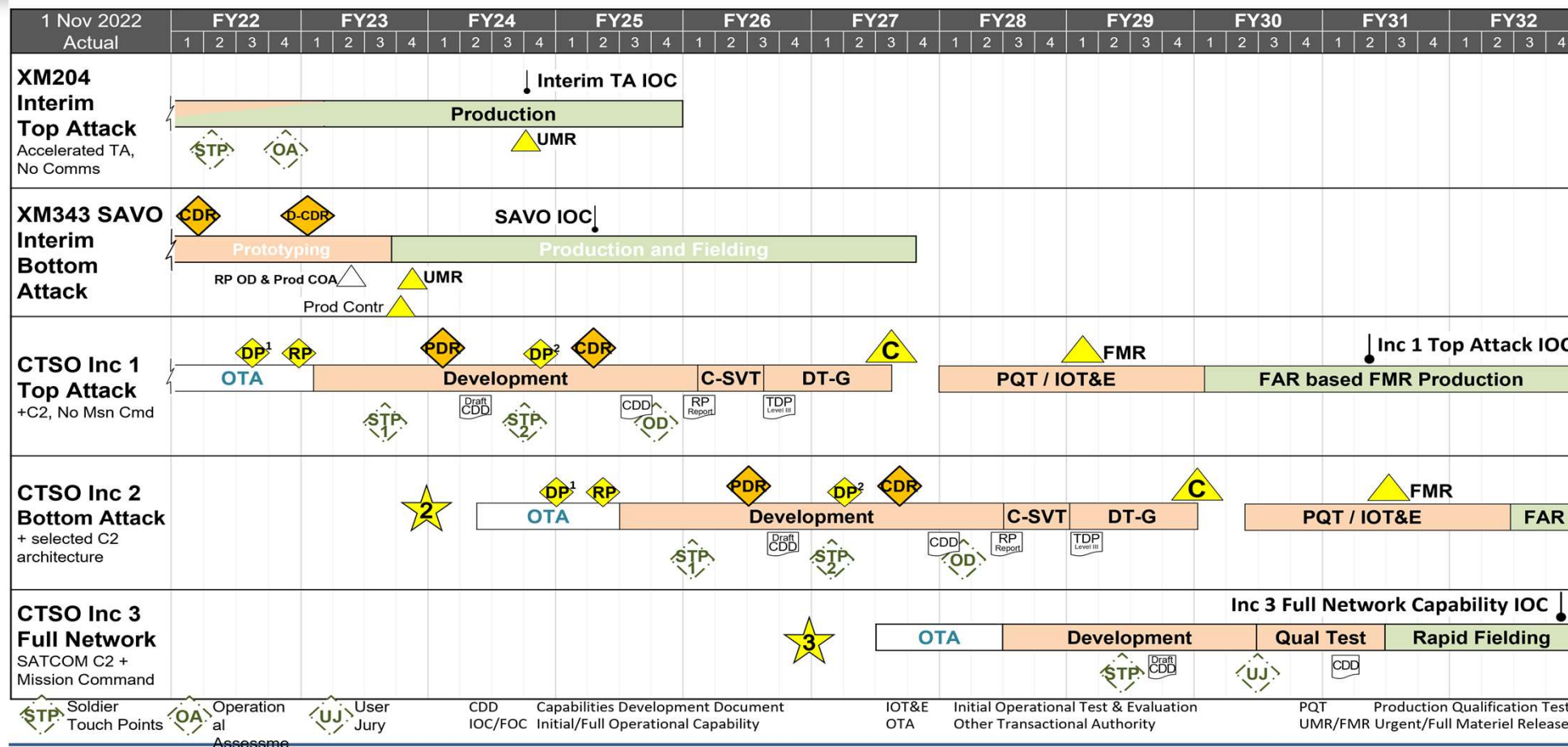
Capabilities:

- Rapidly Emplaced
- ON-OFF-ON Munitions
- Increased Lethality against Main-Battle Tanks (MBTs)
- Self Report location of obstacles
- Self report status, tamper, and/or activation of munition field
- Remotely modified self-destruct / self-deactivate times
- Command destruct / deactivate

Terrain Shaping Obstacle Program Acquisition Strategy



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- CTSO systems will replace the Family of Scatterable Mines (FASCAM) systems which are nearing their end of useful life.
- U.S. Policy Compliant and the modernization of the Army's terrain shaping capabilities
- Key element to maneuver's success in Large Scale Ground Combat Operations (LSGCO)
- Force multiplier, enabling technology to defeat an overwhelming mechanized force
- Deny Enemy Access to Terrain and Freedom of Action

XM204 Top Attack System Overview



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Program Description

- Supports Close Tactical Obstacle Capability Operational Needs Statement (ONS 18-22702)
- U.S. Landmine Policy compliant Interim Top Attack capability to address Army's directed close tactical obstacle capability gap

Performance Capabilities

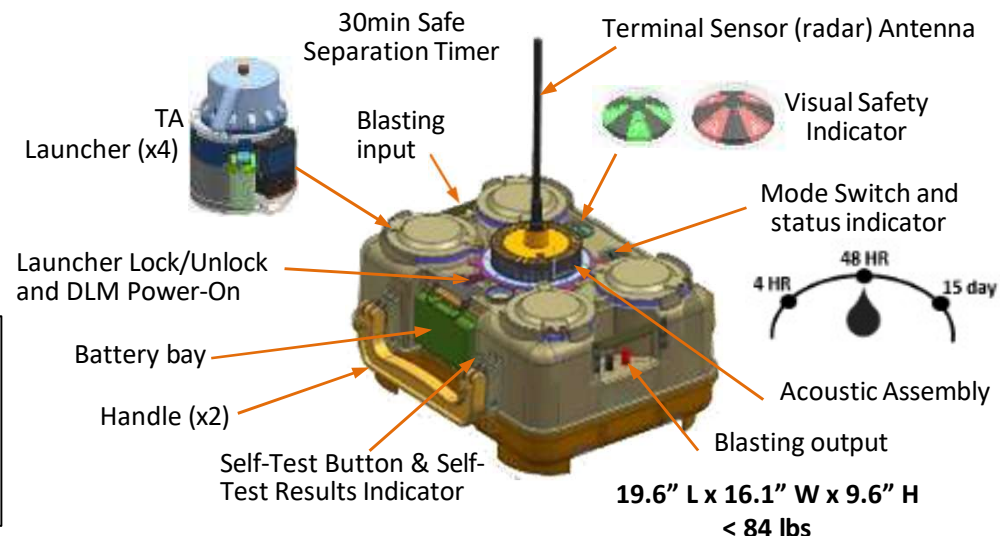
- XM204 autonomously engages vehicles through ground based and submunition sensors resulting in target localization and aimpoint
- Manual initiation
- Stand-off capability with 100m Zone of Authority (ZoA)

- XM204 TA provides a top attack capability to serve as a point obstacle or to create complex area denial obstacles with Standoff Activated Volcano (SAVO, XM343)
- Each DLM is capable of engaging multiple targets at once.

Internal

- Seismic assembly
- Terminal Sensor Subsystem
- Low-Power Management System
- Ordnance Assembly
- Capacitive Discharge units

System Overview



Munition Field Options



Employment Concept



XM343 Standoff Activated Volcano Obstacle (SAVO)

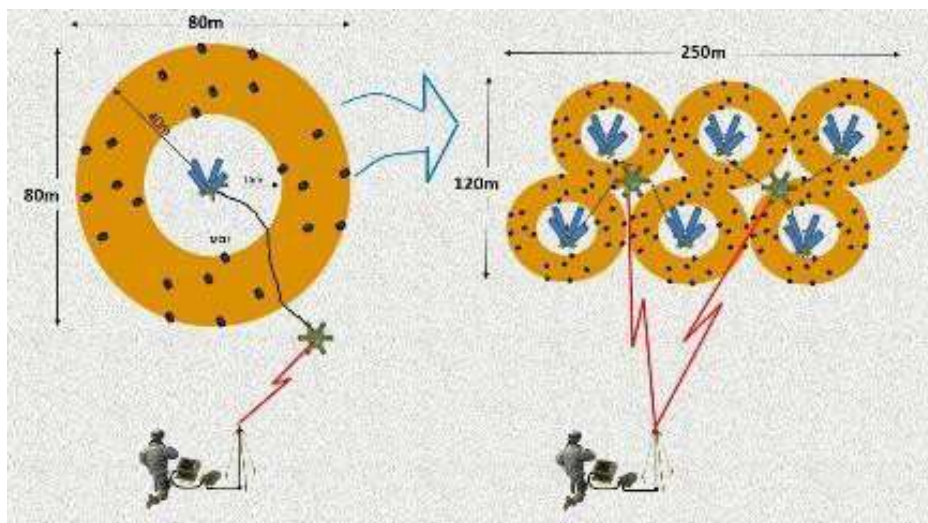


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SAVO is a hand emplaced, man portable alternative means of employing Volcano canisters to form an Anti-Vehicle (AV) obstacle

80m x 80m Building Block with Single SAVO Baseplate

Larger Obstacles formed with multiple SAVO baseplates

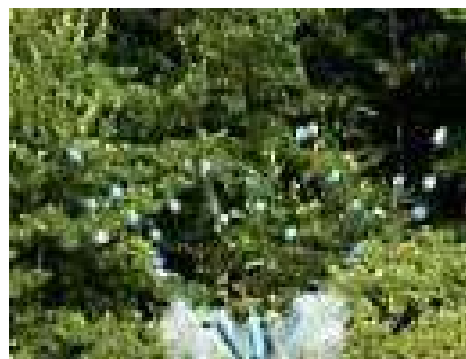


Requirements

- Hand emplaced, one-man portable
- Should not exceed 35 lbs.
- Open and rolling terrain and max 15° slope
- Employed life of up to 6 months
- Safe to recover and reuse up to 6 times



SAVO



M88 Deployment (24 munitions)

Initiation Methods:



MK152 / M156 Remote Activation Munitions System (RAMS)

CD450-4J Blasting Machine