USMC Ground Robotics Current and Desired Future Capabilities

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USMC Ground Robotics Current Capabilities

- EOD current capabilities
  - **Man transportable robotics systems**
    - **Designed to allow EOD personnel to interrogate and neutralize IEDs, UXO and other conventional/unconventional munitions remotely**
  - **Deliberate permissive environment capability**
    - **Legacy robotic capability primarily for deliberate operations in garrison and civilian support operations in CONUS/OCONUS**
      - Full spectrum of explosive hazard neutralization
  - **Large explosive/VBIED disruption capability (GWOT only)**
    - **Response to UUNS; not POR. Transport system for VBIED disruption charges**
  - **Small disposable robotic explosives delivery capability**
    - **BOMBOT is also used by maneuver forces for recon and ID**
  - **UUNS materiel solution for MARSOC Man Portable Robotic System currently in process**
    - **NaIL triaged systems under review by UUNS originator**
- Maneuver Force current capabilities
  - **Robotic systems fielded in response to JUONS to provide maneuver forces with reconnaissance and identification capability (X-bot)**
    - **Two systems fielded in response to JUON CC-0111; MARCBOT and PackBot 510 w/FASTAC**
    - **Does not provide reduction or neutralization capability**

USMC Ground Robotics
Future Desired Capabilities

- EOD desired capabilities
  - **Family of like robotic systems (small, medium and large)**
    - **Identical capabilities separated by size**
  - **Each system will be one-for-one capable in comparison with human**
    - **Current robotics technologies cannot match human motor skills in existing platforms**
    - **Integration of existing technologies and platforms to achieve future capability**
    - **Anticipate contract award in 2012 with initial deliveries in 2013.**
- Maneuver Force desired capabilities
  - **Increased capabilities for existing reconnaissance and identification platforms**
  - **Initial efforts underway for the development of engineer specific robotics platforms for the reduction of explosive and non-explosive obstacles, engineer reconnaissance and patrolling missions.**

Back Up Slides

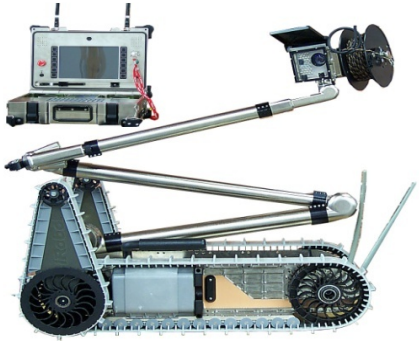
Current Systems

MK 4 Mod 0 Bombot (EOD) TAMCN E0077

The Bombot is a low-cost expendable robot used to by EOD units to carry an explosive charge to countercharge an IED. It is a commercial radio-controlled 4-wheel drive vehicle with a remote dump mechanism and a small inexpensive camera and monitor. The Marine Corps EOD Bombot (kit) consists of 2 transmitters and 6 vehicles.

Size:12”x8”x 22”
Weight:15lbs
Cost: $31,212

MK 1 Mod 0 MTRS Packbot (EOD) TAMCN E0064



The Packbot is a rugged, lightweight robot designed to conduct EOD reconnaissance, and other search and surveillance tasks. It is capable of employing EOD tools used to safely disrupt IEDs, military ordnance, and other hazardous devices.
Weight - 58 lbs (Robot Only)
Size:27”x18”x7.5”
Sensors – 3 Color Cameras
Range: LOS – up to 300M, FO Tether
802.11 Frequency Diversity Video and Control at 2.4 GHz

Cost: $156,060

MK 2 Mod 0 MTRS Talon (EOD) TAMCN E0066

The TALON is an EOD all-terrain, all-weather robot platform with day/night capability. It is controlled through a two-way RF or fiber optic link from an attaché-sized Operator Control Unit (OCU). It uses a two-stage arm that can reach a minimum length of 64 inches and a gripper attachment to manipulate hazardous materials or ordnance.

Size:52”x32”x24”
Weight: 115 lbs
Cost: $155,060

Current Systems

RC-60 (EOD)

The RC-60 is a remote controlled steer skid loader designed for use in interrogating Vehicle Borne Improvised Explosive Devices (VBIED)

Size:75”x77”x60”
Weight: 6200 lbs
Cost: $654,023

MK 3 Mod 1 RONS (EOD) TAMCN E1385

The RONS provides an Explosive Ordnance Disposal (EOD) Team with a remote, standoff capability to perform explosive ordnance disposal tasks in a high-risk and / or contaminated environment. It complements the EOD Technician when performing reconnaissance, access, render-safe, and disposal during extremely hazardous explosive ordnance missions.

Size:36”x42”x29”
Weight: 678 lbs
Cost:$226,637

MARCBOT (non-EOD)

Mission-specific robot used by Engineers for the optical inspection of suspect objects. Provides the ability to identify IEDs with standoff. Allows patrols and convoys to continue mission. Less expensive than other robotic platforms.

- Robot Weight: 32 lbs
- Robot dimensions: 24”x19.5”x13.5”
- Robot Height w/antennas: 48 in.
- OCU Weight: 12.5 lbs
- Camera Height Max: 39 in.
- Operating Range – Up to 300 m (LOS)
- Power Requirements: 3 – 2590 or 390 batteries
- Cost: $19,000

Current Systems

PackBot 510 w/FASTAC (non-EOD) - TAMCN B0048

Figure 2. Packbot 510 with FASTAC Operator Control Unit (OCU), with laptop display, hand-held controller, radio, and short and long-range antennas.

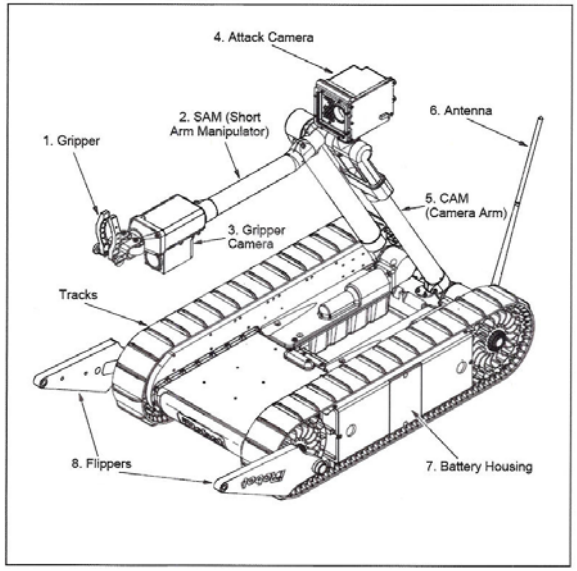


Figure 1. PackBot 510 with FASTAC Remotely Controlled Vehicle (RCV).

CHARACTERISTICS

Weight - 53 lbs (Robot Only)

OCU Weight – 8.4 lbs

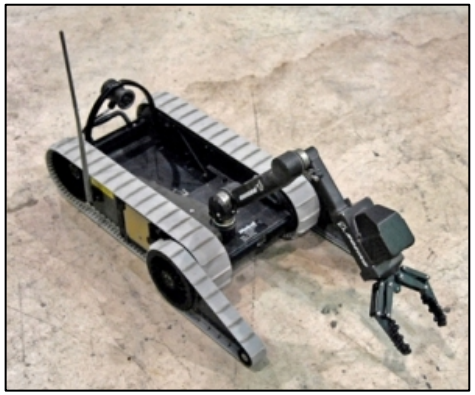
Dimensions – W: 20.3” L: 27” H: 16” (arm stowed)

Range: LOS – up to 1000M

Selected replacement for MARCBOT as maneuver force capability.

MARSOC UUNS for Man Portable

SUGV 310



- Weight 34.4 lbs. (35 lb maximum requirement)
- The battery used was a military standard BB-2557
- 1:04 minutes from large military ruck sack configuration to operational set-up
- 2:19 minutes to stow in large military ruck sack from operational set-up
- Height w/o flexible antenna 10.86 inches
- 3.68 centimeters of ground clearance
- 10 seconds to replace batteries / no tools

Dragon Runner 20

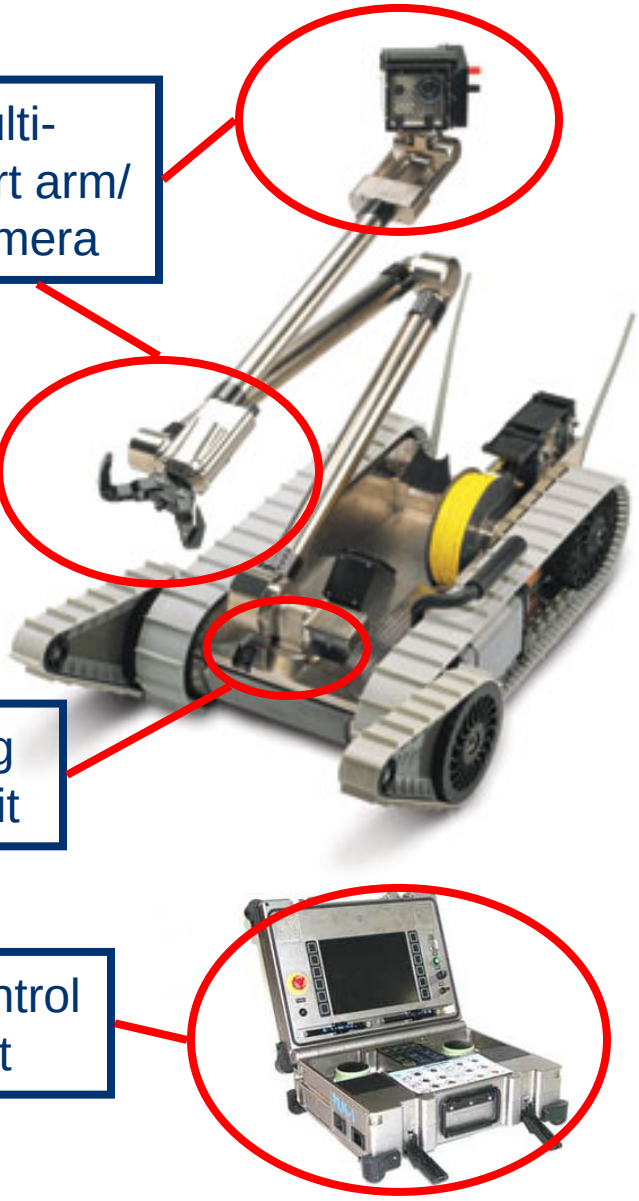
- **Weight 49.5 lbs. (35 lb maximum requirement)**
- **The battery used was a military standard BB-2590 with an unauthorized modification**
- 6:12 minutes from large military ruck sack configuration to operational set-up
- 5:16 minutes to stow in large military ruck sack from operational set-up
- Height w/o flexible antenna 18.02 inches
- 4.55 centimeters of ground clearance
- 1:51 minutes to replace batteries / one screw driver required

EOD PACKBOT

Multi-part arm/ camera

Firing circuit

Control Unit



Maneuver force PACKBOT

Non-EOD robot has two arms for camera and claw vs since three part arm.

Note the lack of integrated firing system as another difference.

The chassis is essentially identical.

Control unit is markedly different.

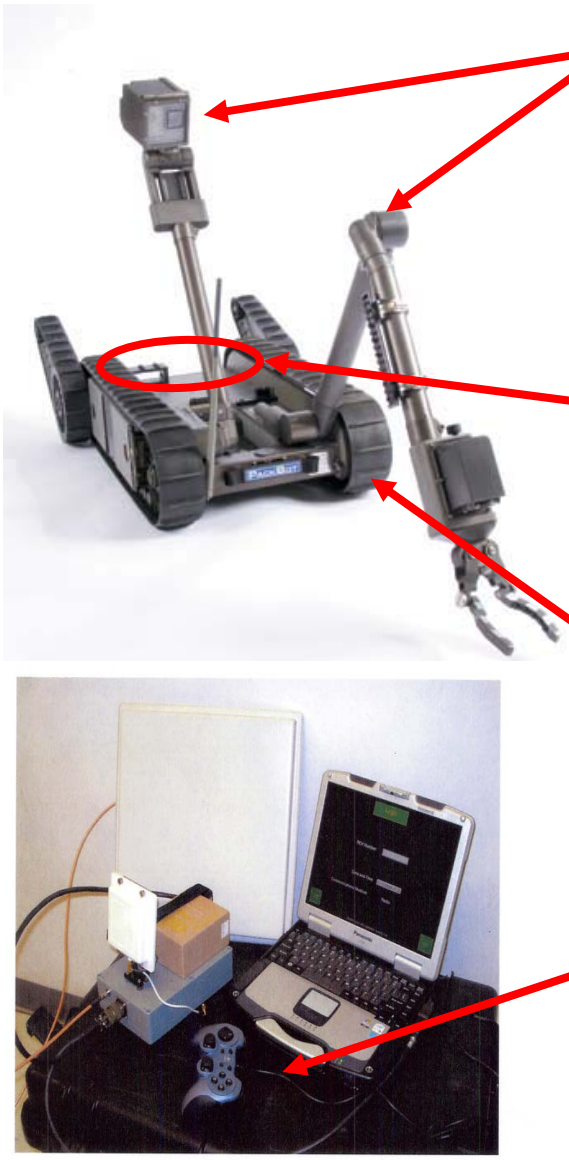


Figure 2. Packbot 510 with FASTAC Operator Control Unit (OCU), with laptop display, hand-held controller, radio, and short and long-range antennas.

PackBot 510 with Engineer Kit

Capability Increase Over

PackBot 510 w/FasTac

PackBot 510 Chassis

PackBot 510 w/EOD Kit

- PackBot 510 w/FasTac is least capable PackBot produced
- PackBot 510 chassis is common to all variants
  - **Power accessories are identical**
  - **Developer accessories are identical**
    - **E.g. payload tub kits, AC power adaptor, etc.**

Engineer Kit Upgrades

- QuickClamp Picatinny Rail Kit
- QuickClamp Fireset w/Accessory Connector
- QuickClamp Fireset w/o Accessory Connector
- QuickClamp Mount w/Accessory Connector
- QuickClamp Accessory Mount
- WB-2 Glass Breaker
- ICx Fido© Explosives Detection Kit
- LWIR Thermal Camera Kit
- Safe Firing System Key or Code Plug Kit
- Universal SmartSpool™ Fiber Optic Spooler
- OCU Fiber Module
- CMD Spool Kit
- Proparms 20mm Recoilless Disrupter w/Mount
- Proparms 12.5mm Recoilless Disrupter w/Mount
- Richmond RE70 M3 Disrupter
- Richmond RE12 12 Disrupter
- Richmond Recoilless Disrupter Mount
- Pan Disrupter w/Mount
- Single Channel Shock Tube Initiator