IHS™ Jane’s®
Land Warfare Platforms
Logistics, Support & Unmanned

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Description

The M9 Armored Combat Earthmover (ACE) is intended to operate in forward areas and, due to its high road speed, can be located close to where it is needed, rather than at the back, as in the case with vehicles (such as the Caterpillar D7 medium crawler) which the M9 was intended to replace.

The M9 ACE is a general purpose engineer vehicle and can carry out tasks in three critical areas: mobility, counter-mobility and survivability.

Mobility tasks include: filing craters and ditches; assisting fighting vehicles (reinching or towing); removing roadblocks, trees, rubble and other battlefield obstacles; preparing access/escape for firing sites and river crossings; preparing and maintaining combat routes; and preparing and maintaining access/escape for vehicles.

Counter-mobility tasks include: the construction of anti-armour obstacles; demolishing fords and bridge bypasses; participating in the digging of tank ditches; destroying landing zones; and anti-armour participations in the preparation of strong points and haulage obstacles.

Survivability tasks include: the digging of hull defilade positions for armour; construction of defensive positions for command-and-control operations; construction of earth berms for protection; hauling material for protective shelters; clearing fields of fire; and digging slots for vehicle-mounted TOWs and other battlefield weapons.

The M9 is air-portable in C-130, C-141B and C-5A transport aircraft. It is unarmed but has a smoke grenade launcher. Other equipment includes a standard NBC system (ventilated facepiece), a radio and the operator can utilize standard night vision goggles.

It has an amphibious capability after minimal preparation and armour protection is provided for the engine, power train and the operator.

The hull of the M9 is made of welded aluminium armour. At the front of the vehicle is the 6.7 m³ capacity scraper bowl (ballast compartment), hydraulically operated apron and positive load ejector.

The driver is seated towards the middle of the vehicle on the left side and is provided with a cupola providing 360° vision. A lighter hatch cover (weight 81.65 kg) than those fitted to early vehicles has been introduced; the hatch incorporates vision blocks in place of the earlier periscope vision devices.

The Cummins V903C diesel engine is positioned to the right of the driver’s compartment. The Clark Model 13.5 HR 3610-2 transmission is below the engine and the skid unit is to the rear, coupled to the final drives. On-vehicle equipment includes a 15.2 litre/65 gallon and a Canco P30 planetary winch with a line pull of 15,900 kg, using a 19 mm diameter wire rope 60 m long.

The dozer blade is mounted on the apron and dozing and scraping are accomplished by raising and lowering the entire front of the vehicle by means of the hydropneumatic suspension.

This consists of eight sets of 711 mm diameter steel road wheels with the drive sprocket at the rear. The hydropneumatic suspension allows the M9 to be tilted to apply the dozing effort to one corner of the blade. The capability of the vehicle for operations such as dozing can be nearly doubled by self-loading the bowl with approximately 8,000 kg of earth, which is used as ballast.

Late production vehicles incorporate six new system improvements, including an all-alloy dozer blade furnished by the US Government. The US Army Anniston Army Depot has overhauled M9 ACE vehicles as well as incorporating a number of improvements as part of a Product Improvement Package (PIP).

Turkish M9 ACE

The Turkish company of FNSS Savunma Sistemleri has been awarded a contract by the TFLC for the supply of 12 AVE plus one hull for ballistic tests. This is very similar to the US Army’s BAE Systems US Combat Systems M9 Armored Combat Earthmover (ACE).

The Turkish AVE will have a crew of two rather than having a crew of one and will have more up to date sub systems as some of the original ones are no longer manufactured.
General Dynamics Land Systems launched the last of 43 vehicles in late 2003 to complete the Wolverine Heavy Assault Bridge (HAB) based on parts and technical manuals.

Warfare Platforms: Support & Unmanned

The upgraded AVLB based on a M60 chassis replaced the M48/M60 AVLBs. It is expected that the M48/M60 AVLB would be replaced by the M1A1 based Joint Assault Bridge. The US Marine Corps deployed five JAB combat systems in 2007. The Joint Assault Bridge is provided in a separate entry in IHS Jane’s Land Warfare Platforms: Support & Unmanned.

The bridge takes three minutes to launch and can be recovered from either the front or rear. The width is 3.64 m, 3.81 m overall and 2.92 m with the bridge removed. The bridge weighs 13,380 kg and is made primarily of aluminum. It is carried folded and launched over the front of the vehicle hydraulically as follows: the bridge is driven up to the obstacle and halted, the bridge is raised hydraulically into the vertical, unfolded and lowered into place and the launcher detached. The complete launch can be accomplished from under cover.

The bridge takes three minutes to launch and can be recovered from either end. Recovery time is between 10 and 60 minutes depending on ground conditions. The bridge has an overall length of 19.202 m and can span up to 18.288 m. Overall bridge width is 3.96 m, 3.81 m usable roadway, with trackway 1.486 m wide. Its maximum capacity is 54,431 kg.

Status

US Army/Marine Corps Joint Assault Bridge (JAB)

With the conversion work carried out by the US Army Anniston Depot which has considerable experience in the overhaul and upgrade of armoured fighting vehicles, including the M1A1 MBT.

Contractor

Global Combat Systems was awarded a contract worth USD9 million to integrate six of the JAB launchers on US Marine Corps M1A1 Abrams MBT chassis. These guidelines were not used in the formulation of this document, as we have not seen them used to date. The M48 and M48A1 were all powered by a 12-cylinder petrol engine which developed between 810 and 825 hp at 2,800 rpm, while the M48A3 was powered by a row 13 Propulsion Systems (originally Textron Continental Motors) 12-cylinder diesel (AVDS-1790-2D engine) which developed 750 hp at 2,400 rpm, giving the vehicle an increased operational range.

Northrop Grumman Inc of Hopkins, Minnesota, has provided complete AVLB system support including training, technical assistance, special tool packages, spare parts and technical manuals.

In US Army service the M48/M60 AVLBs replaced the M48/M60 MBTs. The M48/M60 MBTs were all powered by a 12-cylinder petrol engine (AVDS-1790–2A) engine which developed 750 hp at 2,400 rpm, giving the vehicle an increased operational range.

Mack Model RM6866RS (6 × 6) truck

Development

The Mack Model RM6866RS (6 × 6) truck was produced in Australia by Mack Trucks Australia Pty Limited as the Truck, Cargo, Heavy, MC3. It is a version of the basic US Mack 'R' series. Three prototypes were produced (in Australia) in 1978. After evaluation, an order was placed in 1981 for 906 units. These were all delivered by the end of 1986. In 1986, a further 19 units were built and delivered, bringing the total to 925.

During 1990 a contract to upgrade 541 of these trucks was awarded to Mack Trucks Australia Pty Limited. The contract, worth AUD 8.77 million, involved the replacement of mechanical suspension units with an SA441W air suspension system and was scheduled to take two years. In 1994 an extension to the contract was issued to cover the remainder of the Australian Army's Mack fleet, together with modifications on Cargo/Cargo with Winch variants to fit container twist locks. Between 1994 and April 1996, 288 cargo variants were fitted with eight container twist locks to enable the transport of a 20 ft ISO container or one, two or three 6 ft containers. This work was carried out around Australia in Mack branches and dealers. Also in 1994, four dump truck variants were converted to Truck, Tanker, Fuel variants under the Bushranger project. This work was carried out in Brisbane. Between 1999 and 2000, 186 Cargo, Army Tractor/Medium Gun and Cargo, Crane variants had the Abbey CTM 3000 hydraulic crane removed and replaced with Hub 390-3 cranes.

The Heavy Recovery Vehicle MC3 is a Mack Model RM6866RS (6 × 6) truck chassis that has undergone major modifications. The HRV entered operational service with the Australian Army in April 2005 and replaced the earlier Truck, wrecker, heavy, MC3.

Under Phase 2a of the Australian Department of Defence’s Defence Materiel Organisation (DMO) multiphase project, Project Land 121; Project Overlander a project to reduce the in-cab noise of the Mack Model RM6866RS was undertaken. By mid-2008 all the required noise reduction kits (cabin insulation and air-conditioning kits) had been delivered and approximately 400 vehicles had been modified before a minor design defect in the air-conditioning halted progress. Work towards correcting the defect was scheduled, with installation of the remaining kits to follow.

Also under Phase 2a of Land 121 a contract to modify the Mack gun tractor fleet with twist locks was signed in December 2006. The modification programme commenced in May 2007 and was scheduled for completion by the end of 2008.

Phase 2a of Land 121 addressed capability shortfalls within the current field vehicle and trailer fleet that are a result of significant occupational health and safety issues. Phase 2a was an "umbrella project" for six separate sub-projects.

By mid-2011 it was stated that 863 of the original 906 Mack RM6866RS trucks delivered remained in service. The 19 examples delivered during 1988 were in the process of being converted into Truck, Tanker Fuel - Aviation.

The Mack Model RM6866RS fleet will be replaced under Project Land 121. It was announced in December 2005 that Land 121 tenders involving medium/heavy vehicles and modules (known as the MHC segment) had been released to a shortlist of nine companies, these being the then ADILimited, the then DaimlerChrysler Australia-Pacific, General Dynamics Land Systems-Australia, MAN Nutzfahrzeuge, Mack Trucks Australia, Scania Australia, the then Stewart & Stevenson, the then Terex Corporation.

By early 2006 three Requests For Tender (RFT) worth up to AUD 600 million and covering Phase 3a of Land 121 had been issued. These initial Land 121 Phase 3a RFTs involved superseding the ADF’s high-readiness fleet of 1,400 medium, heavy and light vehicles, 1,500 trailers and 1,200 specialist modules. Land 121 Phase 3b, the replacement of the remaining bulk of the fleet, was to follow on from Phase 3a.

With the second pass approval of Land 121, Phases 3a and 3b ceased to exist as independent phases. Phase 3a became Phase 3, Phase 3b became Phase 5, and Land 121 Phase 4 emerged. With the second pass approval of Land 121 the total quantity required under the new standalone Phase 3 requirement increased to 2,080 vehicles, 1,506 of these armoured. The total value of Land 121 Phase 3 reached around AUD 3.3 billion. Late-2007, BAE Systems (medium/heavy), the now Mercedes-Benz Australia Pacific Pty Ltd (light), and Haulmark Trailers Australia (trailers) were announced as preferred tenderers for Phase 3 of Land 121, the quoted value of

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Korea (South)

ROBHAZ-DT3

Type
Small tracked, chemical, biological, radiological and nuclear (CBRN) detection UGV.

Development
The ROBHAZ-DT3 has been designed by the Korea Institute of Science and Technology to carry out civilian and military missions in operational environments that are characterised by rather uneven terrain and other hazards, such as mines, explosives and chemical warfare agents. The robot was developed under the National Dual-Use Technology Development Project worth approximately USD0.5 million which commenced in 1999 and was completed in 2004.

Although the ROBHAZ-DT3 was specifically destined to be deployed with the South Korean armed forces in Iraq for detection and patrolling missions, the commercialisation of the robot was undertaken by the Yujin Robotic and the first ROBHAZ-DT3 was exported to the Japan disaster rescue organisation and later to Australia for research purposes.

Description
The ROBHAZ-DT3 employs a passive double-track mechanism which provides adaptability and increases mobility in rough terrains. Each of the tracks is supported through an individual single motor, while a shock absorber is placed between the front and rear track components.

The platform is comprised of three parts, the front and rear body with their respective tracks, and a travel limit mechanism. Thus, configurations can be implemented on the platform which can affect the stability of the vehicle in uneven or rough terrains.

For obstacle detection, eight ultrasonic sensors are mounted on the vehicle which are sustained by the water-proof, dust and shock resistant capabilities of the ROBHAZ.

The platform adheres to a plug-and-play principle which is supported by a two speed mode transmission system.

The integrated control system consists of a Linux central processing unit (CPU) motherboard, two controllers and two BLDC controllers which enhance the responsive control towards the equal distribution of the calculation load of the platform.

The communication between the operator and the robot is facilitated through the wireless local area network (LAN).

Specifications

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<td>Manipulator arm:</td>
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<td>Max lift capacity:</td>
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<td>(extended)</td>
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<td>CBRN sensor package:</td>
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<tr>
<td>Gases detected:</td>
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</table>

Status
In service with the South Korean armed forces as well in Japan and Spain. Also exported to Australia.

Contractor
Korea Institute of Science and Technology, Seoul
Yujin Robotic Company.

Scobot 100

Type
Small tracked reconnaissance UGV.

Description
The Scobot 100 is a quiet (>60 db) UGV fitted with four independently controlled tracks.