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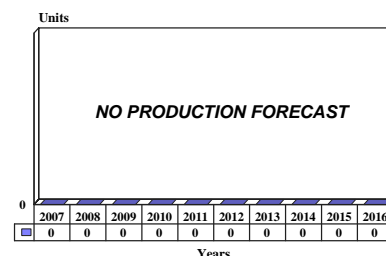
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M992 - Archived 10/2008

Outlook

- Production line for new M992 FAASV remains dormant
- Funding for U.S. Army M992A2 FAASV PIP (to upgrade entire fleet) ended in FY06
- Production forecast reflects current lack of prospects for new M992 FAASV export sales, though contractor holds out hope for at least some modest sales to M109 users

10 Year Unit Production Forecast
2007 - 2016



Orientation

Description. A tracked artillery support and logistics vehicle.

Sponsor. The prime contractor initially pursued the M992 as a private venture. The U.S. Department of Defense, through the U.S. Army, sponsored U.S. Army procurement of the M992 and the ongoing FAASV PIP upgrade program.

Licensees. None

Status. Development through low-rate production.

Total Produced. Through 2006, the prime contractor produced 1,253 M992 vehicles, including 119 Fire Direction Center variants.

Application. An armored artillery logistics vehicle optimized to support self-propelled artillery systems during offensive and defensive operations.

The U.S. Army refers to this class of vehicle as a Field Artillery Ammunition Support Vehicle (FAASV).

Price Range. In 1999 U.S. dollars, the basic M992 FAASV carried a unit price of \$1,088,888. The price reportedly remains essentially unchanged.

Contractors

Prime

**BAE Systems Land & Armaments,
Ground Systems Division**

<http://www.na.baesystems.com>, 1100 Bairs Rd, PO Box 15512, York, PA 17405-1512 United States, Tel: + 1 (717) 225-8000, Fax: + 1 (717) 225-8003, Prime

Subcontractor

**Allison Transmission Division,
General Motors Corp**

<http://www.allisontransmission.com>, PO Box 894, Indianapolis, IN 46206 United States, Tel: + 1 (317) 242-5000 (XTG-411-2A & Final Drive Gearbox)

Detroit Diesel Corp

<http://www.detroitdiesel.com>, 13400 W Outer Dr, Detroit, MI 48239-4001 United States,

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	Tel: + 1 (313) 592-5000, Fax: + 1 (313) 592-5158, Email: defense@detroitdiesel.com (8V-71T Diesel Engine)
Goodyear Tire & Rubber Co	http://www.goodyear.com, 1144 E Market St, Akron, OH 44316 United States, Tel: + 1 (330) 796-2121, Fax: + 1 (330) 796-2222 (T-154 Track Assembly)
Greene Metal Products Inc	http://www.greenemetal.com, 24500 Capital Blvd, Clinton Township, MI 48036 United States, Tel: + 1 (586) 465-6800, Fax: + 1 (586) 465-0136, Email: greenemet@greenemetal.com (MACS & Artillery Projectile Stowage Kits)
Marvin Land Systems	http://www.marvingroup.com, 260 W Beach Ave, Inglewood, CA 90302 United States, Tel: + 1 (310) 674-5030, Fax: + 1 (310) 673-9472, Email: sales@marvinland.com (M992 Auxiliary Power Units)
NOTE(S): BAE Systems Land & Armaments, formerly United Defense LP, acts as the sole-source contractor for the basic M992 FAASV chassis and non-automotive components.	

Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Technical Data

Crew. Three: commander, driver, and assistant. The vehicle can carry up to six additional soldiers.

Dimensions. The following data reflect the baseline M992; the M992A1 and A2 are essentially the same.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	6.67 m	20.03 ft
Width	3.15 m	10.33 ft
Height	3.24 m	10.62 ft
Combat weight	26.11 tonnes	28.78 tons
Fuel capacity	511 liters	135.90 gal

Performance. The range and speed data reflect use on a paved road.

	<u>SI Units</u>	<u>U.S. Units</u>
Maximum speed	56 kmph	34.77 mph
Maximum range	354 km	219.83 statute mi
Step	55 cm	1.80 ft
Trench	1.83 m	6 ft
Slope	40%	40%
Gradient	60%	60%
Fording	1.07 m	3.51 ft

Engine. Detroit Diesel Corporation 8V-71T eight-cylinder, supercharged, liquid-cooled diesel engine. This powerplant generates 302.13 kilowatts (405 hp), with a power-to-weight ratio of 11.55 kilowatts per tonne (14.04 hp/ton). The 24-volt electrical system features a shielded 100-ampere (180-ampere in the A2) alternator and four 6TN 12-volt batteries.

Gearbox. Allison XTG-411-2A powershift gearbox, with one reverse and four forward gear ratios.

Armament. One pintle-mounted 12.7x99mm (.50-cal) M2HB machine gun at the commander's cupola.

Variants/Upgrades

Variants. The prime contractor has developed the following variants from the basic M992:

<u>Designation</u>	<u>Description</u>
M992	Basic tracked Field Artillery Ammunition Support Vehicle (FAASV).

Designation

M1050
Fire Direction
Center (FDC)

Description

Basic FAASV, configured to handle 203mm ammunition. None procured. Features auxiliary power unit, graphic display, TACFIRE display terminal, battery computer system, and PRC-68 radio. U.S. Army did not procure this variant; it is currently in service with Egypt (72), Greece (41), and the People's Republic of China (6).

M992A1
M992A2

Features improved T-154 track assembly, electrical system, and ammunition handling. M109A6 Paladin-compatible variant of M992A1. Now U.S. Army standard.

Modernization and Retrofit Overview. In FY06, the U.S. Army completed the upgrade of its M992 and M992A1 inventory to the M992A2 standard. The upgrade occurred under the FAASV Product Improvement Program (FAASV PIP). As the M992 shares the basic M109 chassis, the FAASV PIP integrates the following major elements of the M109A6 Paladin program:

- Detroit Diesel 8V-71T LHR engine
- Improved XTG 411-4 transmission
- Reliability and maintainability (RAM) upgrades to the suspension, electrical, cooling, hydraulic, and fuel systems

The FAASV PIP also integrates the following additional elements:

- Auxiliary power unit (APU)

- Modular Artillery Charge System (MACS) stowage and handling equipment
- Improved crew compartment Halon fire detection/suppression system
- Defense Advanced Global Positioning System Receiver (DAGR)
- Battery Guard System

The FAASV PIP enhances M992 interoperability with the M109A6 Paladin 155mm self-propelled howitzer. The program ultimately provided the U.S. Army with 789 converted M992A2 vehicles, supplementing the 138 new-production M992A2 vehicles in service. For more information on the M109A6 Paladin, see the "M109 155mm Self-Propelled Howitzer" report in Tab A (Self-Propelled Tube Artillery Systems) of the *Ordnance & Munitions Forecast*.

Program Review

Background. In the 1970s, Bowen-McLaughlin-York (the manufacturer of the M107, M109, and M110 self-propelled howitzers) developed a vehicle based on the M109 chassis to meet U.S. Army requirements for an ammunition resupply vehicle to replace the M548 in field artillery units.

- M1050, supporting the 203mm M110 self-propelled howitzer

Meeting Specifications

The new vehicle had to meet the following specifications:

- Sufficient ammunition capacity to support artillery fire missions for extended periods
- Low initial costs
- Commonality of components with existing self-propelled artillery systems
- Operability with minimal crew training
- Crew protection from small arms fire and ballistic projectiles

BMY initially developed two versions of the Field Artillery Ammunition Support Vehicle (FAASV):

- M992, supporting the 155mm M109 self-propelled howitzer

M992

The U.S. Army awarded the first production contract for the M992 on May 25, 1983, with an initial procurement objective of 1,464 M992 vehicles. The U.S. Army ultimately procured 927 M992 series vehicles. Of these, 138 are new-production M992A2s; the U.S. Army later retrofit the remaining 789 M992s and M992A1s to the M992A2 configuration (see *Modernization and Retrofit Overview*, above).

The U.S. Army did not procure any M1050 FAASV or Fire Direction Center variants.

Corporate Evolution

After a name change to BMV Combat Systems, the prime contractor merged with FMC Corporation in 1974 to become United Defense Limited Partnership (UDLP). On June 24, 2005, BAE Systems completed its acquisition of UDLP. The U.S. contractor, which now operates as BAE Systems Land & Armaments, maintains the original BMV production facility in York, Pennsylvania.

Description. The M992 exhibits 60 percent parts commonality with the M109, greatly reducing the unit price and operating costs of the vehicle. The M992 chassis is 52 centimeters (20.47 in) longer than the M109; a fully enclosed fixed superstructure replaces the M109 turret.

Purpose-Built M109 Variant

Inside this armor-plated superstructure are an automatic stacker and storage rack options for the following types and amounts of ammunition:

<u>Caliber</u>	<u>Projectiles</u>	<u>Charges</u>	<u>Fuzes</u>
155mm	109	109	136
175mm	86	87	104
203mm	71	78	104

As the M992 is actually a variant of the M109, it shares the basic M109 interior layout. In the aluminum hull, the driver sits to the left-front; the engine and gearbox mount to the right-front. The driver's station features a single-piece hatch cover and three M45 periscopes. The commander's cupola at the center of the superstructure roof provides access to the pintle-mounted M2HB machine gun.

The rear of the vehicle opens up to provide access to the storage area and an extendable conveyer mechanism. A hydraulically operated crane at the front of the vehicle facilitates loading of the ammunition storage racks through a large hatch on top of the vehicle superstructure.

A heavy-duty electrical system is standard, as are fire detection/suppression systems in the crew and engine compartments. The nuclear, biological, and chemical (NBC) protective suite is similar to that of the M109. The 5083 aluminum armor is 3.2 centimeters (1.25 in) thick all around.

Protected Resupply

For ammunition resupply operations, the loaded M992 backs up to the rear hatch of the M109 or other self-propelled artillery system. By raising the large armor-plated rear hatch – which extends over the rear of the M109 – the crew can transfer ammunition under ballistic protection from overhead fire. An electric conveyer extends from the M992 into the receiving vehicle; ammunition transfer occurs at a rate of up to eight rounds per minute.

The M992 can also service almost any towed artillery system available today. The vehicle can tow the piece with the artillery crew and ammunition riding in the vehicle.

Significant News

CAESAR and Stryker MGS Gaining Share of the Self-Propelled Artillery Market – The international market for self-propelled artillery remains a highly competitive and dynamic environment. In its annual analysis “The Market for Self-Propelled Artillery Systems,” the Forecast International Weapons Group projects that the market will produce over 4,500 self-propelled artillery systems, worth more than \$13.51 billion, through 2016.

Most armies tend to rely on tried-and-true older designs, such as the classic BAE Systems Land & Armaments (formerly United Defense LP) M109 series. Newer designs tend to borrow liberally from this benchmark design. If reflecting on the basic design concept of the M109 style of self-propelled howitzer, the Samsung Techwin K9 Thunder program continues to stand out as the clear market leader. Forecast International expects the K9 Thunder (along with its licensed TUSpH Storm program in Turkey) to account for 19.17 percent of all self-propelled howitzer production worldwide, worth a commanding 28.24 percent of the market, through 2016.

Competing with the classic M109 design is the emerging class of wheeled designs, optimized for the rapidly deployable medium force option. Designs such as the General Dynamics Land Systems Stryker Mobile Gun System (MGS) and the Nexter (formerly Giat Industries) CAESAR offer the advantages of lighter weight and enhanced

M992

mobility, as well as lower production and maintenance costs. Over the past six years, the outlook for the combined market share of wheeled designs has grown steadily. The wheeled systems are now expected to account for 8.36 percent of all new production, worth 9.05 percent of the market, through 2016.

Normally, the Forecast International Weapons Group does not factor modernization and retrofit programs into market analyses, limiting its forecast calculations to new-production systems only. However, the Paladin is a unique case. Strictly speaking, the M109 is no longer a factor in this market in terms of new production. Yet, the U.S. Army's ongoing M109A6 Paladin rebuild program is so complete that the end system is virtually a new-production item. For the purposes of this analysis, the ongoing M109A6 Paladin rebuild effort is treated as equivalent to a new production program. Forecast International is projecting that the M109A6 Paladin rebuild program will account for 6.62 percent of all new production, worth 1.12 percent of the market, through 2016.

Despite the uncertainties of the post-Cold War world, new threat scenarios, and transformational military doctrines, conventional tube artillery continues to offer an unmatched capability to reliably deliver accurate and effective fire under all conditions – when and where the infantryman needs it. (FI, 5/07)

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Funding

The following table reflects U.S. Army FY08/FY09 budget request documentation (February 2007) regarding the M992 FAASV program.

U.S. FUNDING						
	FY05 <u>QTY</u>	FY05 <u>AMT</u>	FY06 <u>QTY</u>	FY06 <u>AMT</u>	FY07 <u>QTY</u>	FY07 <u>AMT</u>
U.S. Army						
M992A2 FAASV PIP	-	6.8	-	6.3	-	-
	FY08 <u>QTY</u>	FY08 <u>AMT</u>	FY09 <u>QTY</u>	FY09 <u>AMT</u>	FY10 <u>QTY</u>	FY10 <u>AMT</u>
U.S. Army						
M992A2 FAASV PIP	-	-	-	-	-	-
	FY11 <u>QTY</u>	FY11 <u>AMT</u>	FY12 <u>QTY</u>	FY12 <u>AMT</u>	FY13 <u>QTY</u>	FY13 <u>AMT</u>
U.S. Army						
M992A2 FAASV PIP	-	-	-	-	-	-

All amounts are in \$ millions.

Contracts / Orders & Options

Since January 1, 2004, the U.S. Army Tank-Automotive and Armaments Command has awarded the following procurement contract related to the M992 FAASV program. All amounts are in U.S. dollars.

<u>Date</u>	<u>Contract</u>	<u>Contractor</u>	<u>Amount</u>	<u>Description</u>
2004/09/09	W15QKN-04D-1017	Greene Metal Products Inc	\$9.80 million	M109A6 Paladin MACS kits, M992 FAASV MACS kits, and Paladin projectile stowage kits
2005/09/12	W56HZV-05D-0379	Marvin Land Systems Inc	\$5.62 million	M992 FAASV family of vehicles auxiliary power units

M992

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Late	1978	BMV fabricates first prototypes of M992 and M1050
	1979-1982	U.S. Army operational testing
	1983	Initial U.S. Army contract award for M992
Jul	1984	First production deliveries to Egypt
	1994	Production falls dormant
Oct	2002	Renewed production and conversions
	2007	Production dormant, available for new orders

Worldwide Distribution/Inventories

Export Potential. In addition to the United States, all other users of the M109 series of self-propelled howitzers are candidates for M992 procurement. The 155mm M109 self-propelled howitzer is currently in service with at least 30 nations besides the United States, providing a large potential customer base for used (and possibly some new-production) M992 vehicles. For a listing of M109 users, see the "M109 155mm Self-Propelled Howitzer" report in Tab A (Self-Propelled Tube Artillery Systems) of the *Ordnance & Munitions Forecast*.

Countries. **Egypt** (51 M992; 72 FDC); **Greece** (41 FDC); **Kuwait** (64 M992A2); **Republic of China (Taiwan)** (6 M992; 6 FDC); **Saudi Arabia** (111 M992); **Spain** (6 M992); **Thailand** (40 M992); **United States** (925 M992 series). At least one additional sale has gone unreported.

Forecast Rationale

The M992 production line remains dormant, but is available for new orders. The contractor, BAE Systems Land & Armaments, maintains hope for at least some export sales during the near term of the forecast period. However, a specialized vehicle such as the M992 is virtually a luxury item to all but the more well-equipped armies. Most second-line armies consider a good all-terrain truck to be at least as satisfactory as the M992 for supporting self-propelled artillery in the field.

FAASV PIP

For the U.S. Army, the center of gravity for the M992 program was the FAASV Product Improvement Program (FAASV PIP), which ended in FY06. The program upgraded all existing M992 and M992A1 vehicles to the M992A2 configuration. U.S. Army FY08/FY09 budget request documentation (February 2007) indicates that funding for the FAASV PIP ended in FY06.

Out of Production?

Our 10-year production outlook reflects the lack of any serious prospects for export sales. Without new orders, the production line will likely remain dormant.

The U.S. Army apparently has no plans for any new M992A2 FAASV procurement, as the FAASV PIP standardized the entire U.S. Army inventory of 925 surviving vehicles to the M992A2 configuration. As the FAASV PIP involved only the modernization of existing vehicles, it remains transparent to our historical production figures below.

Soldiering On

Like its M109A6 Paladin stable-mate, the M992A2 FAASV is hardly the newest design available. Nevertheless, this team of vehicles has a proven combat record with the U.S. Army. As long as the M109A6 Paladin and M992A2 FAASV continue to meet U.S. Army operational requirements, they will likely stay in service.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

High Confidence
Level

Good Confidence
Level

Speculative

Total

M992

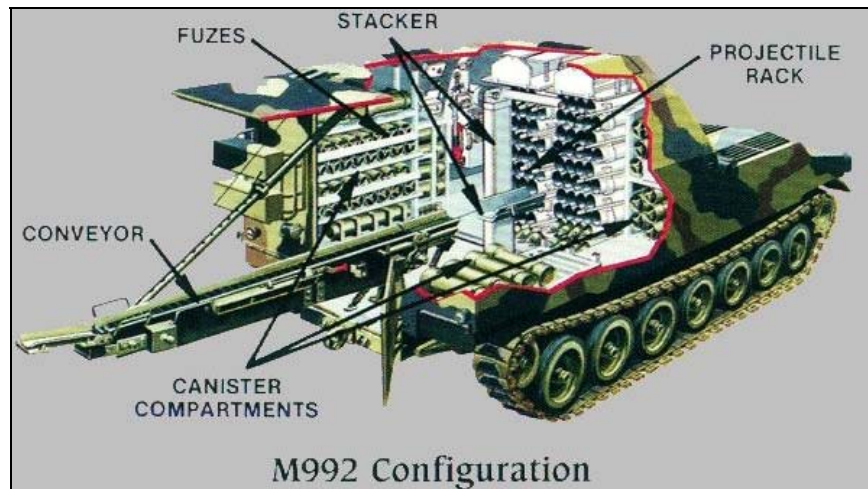
Vehicle	(Engine)	thru 06	07	08	09	10	11	12	13	14	15	16	07-16
BAE SYSTEMS LAND & ARMAMENTS													
M992 (a)	8V-71T	1253	0	0	0	0	0	0	0	0	0	0	0
Total Production		1253	0	0	0	0	0	0	0	0	0	0	0

(a) Historical production includes the FDC vehicle and all exports.



M992 FAASV (Front View)

Source: BAE Systems Land & Armaments



M992 Configuration

M992 FAASV (Cutaway Rear View)

Source: BAE Systems Land & Armaments