

ARCHIVED REPORT

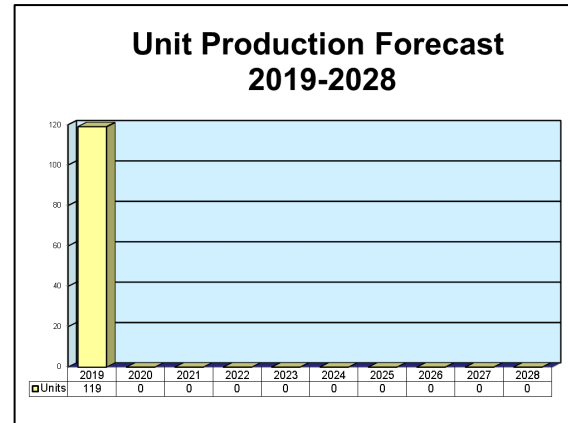
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B-300/Mk 150 SMAW

Outlook

- August 2008: U.S. Marine Corps awards Nammo Talley an SDD/LRIP contract for SMAW II launchers and FFE rounds
- According to U.S. DoD budget request documentation, production of SMAW II launchers was complete in FY18
- Production forecast reflects our estimates for new B-300 launchers only; forecast does *not* include procurement of ammunition



Orientation

Description. Man-portable anti-armor and bunker-busting weapons.

Sponsor. The Israel Ministry of Defense sponsored the development, and the Israel Defense Forces the procurement, of the B-300.

The U.S. Marine Corps sponsors the development and U.S. procurement of the Mk 150 SMAW and SMAW II.

Status. Development through serial production.

Total Produced. Through 2018, we estimate that the contractors produced 7,811 B-300 launchers and 4,494 Mk 150 SMAW launchers.

Application. Lightweight, man-portable, shoulder-fired anti-armor and bunker-busting weapons systems.

Price Range. In 2019 U.S. dollars, the complete B-300 (reusable launcher and one round) carries a unit price of \$9,321 for IDF procurement.

The 83mm Mk 3 Mod 0 HE Dual Purpose (HEDP) rocket carries a unit price of \$1,886 for U.S. Marine Corps procurement.

The 83mm HE Anti-Armor (HEAA) Practice rocket for the SMAW carries a unit price of \$4,077.01 for U.S. Marine Corps procurement.

The SMAW II launcher carried an FY18 unit price of \$47,751.88.

B-300/Mk 150 SMAW**Contractors****Prime**

Israel Military Industries Ltd, (IMI)	http://www.imi-israel.com, PO Box 1044, Bialik St 64, Ramat Hasharon, Israel, Tel: + 972 3 548 5222, Fax: + 972 3 548 6125, Email: imimrktg@imi-israel.com, Prime
Nammo Talley Defense Inc	http://www.nammo.com, 4051 N Higley Rd, PO Box 34299, Mesa, AZ 85277-4299 United States, Tel: + 1 (480) 898-2200, Fax: + 1 (480) 898-2358, Email: marketing@nammotalley.com, Prime

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**B-300**

Dimensions. The following data reflect the latest production-standard B-300 launcher.

	<u>SI Units</u>	<u>U.S. Units</u>
Projectile length	72.5 cm	28.54 in
Total length (loaded)	1.35 m	4.42 ft
Projectile diameter	82 mm	3.23 in
Total diameter	8.8 cm	3.46 in
Projectile weight	3.5 kg	6.82 lb
Total weight (loaded)	8.0 kg	17.82 lb
Finspan	28.7 cm	11.29 in
Cone standoff	5.2 cal	5.2 cal

Performance. The armor perforation data reflect IMI's published literature, depicting the latest Mk 2 High Explosive Anti-Tank (HEAT) round striking armor angled at 65°, at optimal range.

	<u>SI Units</u>	<u>U.S. Units</u>
Speed	295 mps	967.84 fps
Altitude	Line of sight	Line of sight
Range	250 m	273.41 yd
Armor perforation	55 cm	21.65 in



Mk 150 SMAW

Source: U.S. Marine Corps

Mk 150 SMAW (Shoulder-Launched Multipurpose Assault Weapon)

B-300/Mk 150 SMAW

Dimensions. The following data reflect the production-standard SMAW launcher carrying the Mk 118 Mod 0 DM warhead.

	<u>SI Units</u>	<u>U.S. Units</u>
Projectile length	72.3 cm	28.46 in
Total length (loaded)	1.375 m	54.13 in
Projectile diameter	83 mm	3.27 in
Total diameter	8.9 cm	3.51 in
Projectile weight	3.3 kg	7.26 lb
Total weight (loaded)	13.4 kg	29.48 lb
Finspan	28.7 cm	11.29 in

Performance. We develop the following armor perforation data by applying a modification of our standardized formula for HEAT warheads to the SMAW's DP warhead. The SMAW warhead is not optimized for armor perforation.

	<u>SI Units</u>	<u>U.S. Units</u>
Speed	295 mps	967.84 fps
Altitude	Line of sight	Line of sight
Range	250 m	273.41 yd
Armor perforation	12 cm	4.72 in

Propulsion. Both systems use the B-300 solid-fuel rocket propulsion unit, consisting of a number of M7 (U.S. designation) double-base propellant sticks bonded to a pin plate.

Launcher Mode. The B-300 and SMAW warheads launch from a reusable glass-fiber/epoxy tube with an attached sighting unit and firing mechanism.

Control & Guidance. Eight ring-mounted, spring-out metal fins deploy upon exiting the launch tube to provide aerodynamic stabilization for the warhead in flight.

Warhead.

B-300. Four basic 82mm warhead types are available for the B-300 launcher:

- *Mk 1.* High Explosive (HE) warhead, which is not optimized for maximum armor perforation. IMI modified the Mk 1 HE warhead for general-purpose use and slightly enhanced it for armor perforation by integrating a HEAT dart.
- *Mk 2.* HE warhead, featuring a much higher degree of armor perforation.
- *HEAT Follow Through.* HEAT warhead with a secondary charge that enters the target through a hole made by the HEAT charge. Essentially a tandem warhead.

- *Training Round.* Features an impact market component.

In addition to the training round, a subcaliber device (which employs a standard 9x19mm Parabellum pistol cartridge) is also available.

SMAW. Talley offers five basic 83mm warhead types for the SMAW:

- *Follow-Through Grenade (FTG).* Features a shaped-charge front warhead with a full-caliber follow-through grenade for use against brick and concrete walls.
- *Common Practice Round (CPR).* Inert training round with full-caliber rocket. Duplicates weight, center of gravity, and flight characteristics of live rounds.
- *HE Dual Purpose (HEDP).* Features target-sensing fuze for optimum detonation.
- *HE Anti-Armor (HEAA).* Penetrates heavy armor from oblique angles.
- *Novel Explosive (NE).* Dual-purpose, dual-safe, self-discriminating warhead, optimized for urban environments.

B-300/Mk 150 SMAW

Variants/Upgrades

Variants. To date, IMI has not offered any variants of the basic B-300 launcher. In the U.S., three variants of the Mk 150 Shoulder-Launched Multipurpose Assault Weapon (SMAW) concept have emerged, as follows:

Designation

Lightweight SMAW

Description

CMS Defense Systems Inc (Titusville, FL) was reportedly developing a lightweight version of the SMAW launcher as a private venture. However, as this firm (a former subcontractor for the SMAW program) no longer has any contractual or marketing rights for the SMAW, we do not expect this program to pursue any further activity.

SMAW-D

In 1985, the U.S. DoD initiated development of a disposable SMAW variant, the SMAW-D. This version, weighing 6.3 kilograms (13.86 lb), fires the same rocket munitions as the original SMAW model.

M141 Bunker
Defeat Munition

In 1991, Talley Defense Systems joined (then) McDonnell Douglas Astronautics in the further integration of the various SMAW warheads with the launcher Talley developed for the Multipurpose Individual Munition program. The contractors intend to develop an "Interim MIPM," or Bunker Defeat Munition.

Modernization and Retrofit Overview. Between October 1999 and February 2001, the Naval Surface Weapons Center (Crane, Indiana) reportedly replaced a glass-fiber launch tube on an undisclosed number of SMAW launchers. Any other modernization and retrofit for the SMAW will be limited to the development of new munitions.



SMAW 83mm Ammunition Types

Source: Nammo Talley

Program Review

Background. In the late 1970s, Israel Military Industries Ltd began developing the B-300 in response to an Israel Ministry of Defense requirement for an indigenous anti-armor assault weapon optimized for infantry use. Production of the B-300 commenced in 1980. IMI completed the serial production run for the Israel Defense Forces in 2004. The combat-proven

B-300 is still available for follow-on IDF orders and export.

Description. The B-300 weapon system consists of two basic components:

- The projectile, which comes packaged in a glass-fiber/epoxy tube used as a launch tube.

B-300/Mk 150 SMAW

- The reusable launcher, which features a retractable shoulder rest, folding bipod, pistol grip, rear battle sight, telescope mount, and the firing mechanism / grip assembly.

While the B-300 mounts a simple battlesight for emergency use, the operator usually employs a stadia-type sighting telescope, which is interchangeable with a PVS-2 night vision device.

Sequence of Operation

The operator carries the launcher and two or three rounds in disposable launch tubes. To ready the B-300 for operation, the operator inserts a round into the rear of the launch tube. Electrical contact between the launcher and the round in its tube is automatic. After acquiring the target, the operator fires the weapon. The rocket motor burns out before exiting the launcher at a velocity of 295 meters per second (967.84 fps). After firing, the operator disconnects the launch tube from the launcher and discards the expended launch tube. Loading, sighting, and firing the B-300 takes less than 20 seconds.

Pressure from the motor firing initiates the warhead arming process; a mechanical timer completes the process after the warhead travels 15 meters (49.2 ft) downrange of the launcher. The warhead self-destructs upon impact. At a 250-meter (273.4-yd) range, hit probability is 90 percent.

Enter the Mk 150 SMAW

In the late 1970s, the U.S. Marine Corps began the study of a multipurpose shoulder-fired weapon system: the Mk 150 Shoulder-Launched Multipurpose Assault Weapon. Originally, the SMAW program, a program similar to the now-defunct Viper, explored a number of domestic and international systems. In May 1982, the U.S. Marine Corps selected the B-300; McDonnell Douglas (the U.S. licensee for the B-300) secured an \$11 million full-scale engineering development and production contract.

Serial production began in 1983, with deliveries starting in February 1984. By the time deliveries under the initial contract were completed in 1987, the U.S. licensee had delivered 1,828 Mk 153 launchers to the U.S. Marine Corps, plus an additional 120 launchers for use by the U.S. Army's XVIII Airborne Corps (Fort Bragg, North Carolina). Development and production of ammunition continue.

Changing Hands

In 1994, Talley Defense Systems (Mesa, Arizona) acquired the development/production license for and control of the entire SMAW program. In April 2007, Nammo AS (Raufoss, Norway) acquired Talley Defense Systems. The U.S. contractor continues to operate as Nammo Talley, a component of the Nammo Group.

SMAW II and FFE

In August 2008, the U.S. Marine Corps Systems Command awarded Nammo Talley Inc a \$51,764,684 cost-plus-fixed-fee with fixed-price incentive contract for System Development and Demonstration and low-rate initial production of SMAW II launchers and Fire From Enclosure assault rounds. The SDD phase specified 18 SMAW II launchers and 165 FFE assault rounds; the LRIP phase specified 130 SMAW II launchers and 750 FFE assault rounds. The SDD phase was completed by February 2012.

B-300 & SMAW Not the Same

While exhibiting an external configuration like the B-300, the American-redesigned launcher differs significantly from the Israeli system. The SMAW launcher features a 9x19mm spotting rifle similar to that of the LAW 80. Indeed, the Royal Small Arms Factory at Enfield (Middlesex, U.K.) developed the SMAW spotting rifle. The spotting rifle offers the advantage of greatly simplified target acquisition and enhanced probability of hit. The SMAW launcher is reusable for at least 100 shots.

The original Mk 1 projectile, while using the B-300 propulsion unit, features an American-designed multipurpose warhead, reflecting the originally specified assault application of the weapon. The warhead has proven highly effective against reinforced concrete, sandbag, and timber bunkers; brick and block walls; and lightly armored vehicles.

In 1998, the U.S. Marine Corps reportedly began planning to first upgrade and then replace its 1,828 Mk 153 SMAW weapons in order to provide the SMAW with a credible anti-armor capability. During Operation Desert Storm (1991), troops employed the SMAW primarily as a "bunker buster."

B-300/Mk 150 SMAW

Better at Bunker Busting

The Israeli B-300 and the SMAW are, at best, effective bunker busters, with only a moderate anti-armor capability. The warhead technology currently employed by these weapons is effective only against non-explosive reactive armor.

The B-300 and SMAW are not primarily anti-armor weapons. They are actually multipurpose assault weapons, a class of weapon gaining significant interest on the international market. While we do not expect the B-300 and SMAW to garner any major new export sales, the basic weapon design will likely become the technological basis for new designs.

Related News

Elbit Systems Reports First Quarter 2019 Results – Elbit Systems reported revenues of \$1,021.7 million in the first quarter of 2019, as compared to \$818.5 million in the first quarter of 2018. Net income for the quarter was \$50.8 million, compared to \$49.9 million in the same period a year ago.

Elbit's backlog of orders as of March 31, 2019, totaled \$9.7 billion. as compared to \$8.0 billion as of March 31, 2018. Approximately 59 percent of the current backlog is attributable to orders from outside Israel. Approximately 61 percent of the current backlog is scheduled to be addressed during 2019 and 2020.

Key Recent Events:

On March 27, 2019, the company announced that it had been awarded an approximately \$125 million contract from the Israeli Ministry of Defense to supply fully automatic self-propelled howitzer gun systems to the Israel Defense Forces. The contract, which also includes the supply of training simulators, will be performed over a 12-year period.

On April 5, 2019, the company announced that its U.S. subsidiary, Elbit Systems of America LLC, had signed a definitive agreement with Harris Corporation for the acquisition of Harris' Night Vision business for a purchase price of \$350 million. The transaction is conditioned on completion of Harris' proposed merger with L3 Technologies Inc, as well as customary closing conditions, including receipt of regulatory approvals.

On April 11, 2019, Elbit announced that it had been awarded an approximately \$30 million contract to supply STYLET, a precise guided mortar munition, to a country in Asia-Pacific. Contract work will be performed over a two-year period.

On May 26, 2019, the company announced that it had been awarded a \$127 million contract to supply vehicular tactical radio systems to the army of a country in South Asia. The contract will be performed over a three-year period. (FI, 5/19)

Elbit Systems Continues Growth through Acquisition with IMI Systems Buy – Elbit Systems has completed the acquisition of IMI Systems Ltd for a purchase price of approximately \$495 million (NIS1.8 billion), with an additional payment of approximately \$27 million (NIS100 million) contingent upon IMI meeting agreed-upon performance goals.

This was the second major acquisition for the year, the first being Universal Avionics Systems in the USA.

Elbit's acquisition strategy is two-pronged, based on the following factors. First, while ongoing defense industry consolidation has decreased the number of competitors, it has naturally increased the relative size of those competitors and, more importantly, the resources they can bring to bear. Second, there is a growing trend of many governments requiring that part of any work contracted outside the country be done by local companies in their country.

In Israel, the firm has successfully assimilated many of its local competitors, such as Elop, Elisra Electronic Systems, and Tadiran. In addition, Elbit has acquired numerous other medium-size aerospace and defense companies, such as Cyclone Aviation, Innovative Concepts, Shiron Satellite, Kinetics, and BVR Systems, to name a few. The company also added artillery developer Soltam Systems, armored fighting vehicles firm Saymar, and defense electronics manufacturer ITL Optronics to the fold. Elbit pushed into cybersecurity with the acquisition of the Cyber and Intelligence division of NICE Systems. This division was subsequently folded into a new subsidiary, Cyberbit, which will lead Elbit's push into the growing cybersecurity market.

B-300/Mk 150 SMAW

Continuing this trend, Elbit pursued its biggest deal to date, the purchase of IMI Systems. The deal will create a broad-based defense conglomerate with a product range that includes Elbit's avionic systems, drones, and cybersecurity offerings coupled with IMI's portfolio of missiles, precision-guided munitions, and armor systems. The deal should give Elbit sufficient economies of scale to match its global rivals.

In terms of expanding its geographic footprint, Elbit has been successful in making inroads into the U.S. – its "second home market" – with some \$800 million in sales. Again, following the strategy of growth via mass, the Elbit Systems of America unit acquired M7 Aerospace, a provider of MRO services and logistics support for both civil and military aircraft fleets. In addition, Elbit Systems of America bought out its partner General Dynamics and assumed control of UAV provider UAS Dynamics – a key market for the firm.

In early 2018, the company returned to its avionics roots in the U.S. with the purchase of Universal Avionics Systems. This synergistic purchase not only expands the company's position as an avionics systems integrator but furthers its penetration into new markets, especially in the USA. Universal Avionics will become the key sales point for all of Elbit's commercial avionics systems in the hemisphere. Further, the company also gains access to its new subsidiary's existing distribution and support network – an MRO area that is quite lucrative.

Beyond Israel and the U.S., Elbit establishes footholds via teaming or acquisition in select regions. Once these have taken root, Elbit then leverages its position as a local company for both political and economic considerations. For example, the company has opened joint ventures in Poland and India for various defense competitions. (FI, 11/18)

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Funding

The following table reflects U.S. Department of Defense FY20 budget request documentation (March 2019) for U.S. Marine Corps procurement under the SMAW program. All amounts are in millions of U.S. dollars.

U.S. FUNDING						
	<u>FY16</u> <u>QTY</u>	<u>FY16</u> <u>AMT</u>	<u>FY17</u> <u>QTY</u>	<u>FY17</u> <u>AMT</u>	<u>FY18</u> <u>QTY</u>	<u>FY18</u> <u>AMT</u>
Procurement						
<u>U.S. Marine Corps</u>						
Rocket, 83mm HE	-	-	-	-	-	-
Rocket, 83mm HEAA Practice	-	-	3,003	12.9	10,604	37.6
FOAAWS/SMAW II Launcher	-	-	474	22.9	399	19.0
Total	-	-	-	35.8	-	56.6
	<u>FY19</u> <u>QTY</u>	<u>FY19</u> <u>AMT</u>	<u>FY20</u> <u>QTY</u>	<u>FY20</u> <u>AMT</u>	<u>FY21</u> <u>QTY</u>	<u>FY21</u> <u>AMT</u>
Procurement						
<u>U.S. Marine Corps</u>						
Rocket, 83mm HE	-	-	-	-	-	-
Rocket, 83mm HEAA Practice	4,600	18.1	2,075	8.5	-	-
FOAAWS/SMAW II Launcher	-	-	-	-	-	-
Total	-	18.1	-	8.5	-	-
	<u>FY22</u> <u>QTY</u>	<u>FY22</u> <u>AMT</u>	<u>FY23</u> <u>QTY</u>	<u>FY23</u> <u>AMT</u>	<u>FY24</u> <u>QTY</u>	<u>FY24</u> <u>AMT</u>
Procurement						
<u>U.S. Marine Corps</u>						
Rocket, 83mm HE	-	-	-	-	-	-
Rocket, 83mm HEAA Practice	-	-	-	-	-	-
FOAAWS/SMAW II Launcher	-	-	-	-	-	-
Total	-	-	-	-	-	-

B-300/Mk 150 SMAW**Contracts/Orders & Options**

No Israeli contract information for the B-300 is available.

The U.S. Marine Corps continues to procure 83mm rockets for the SMAW under a Mar 2003 Naval Surface Warfare Center contract with Talley Defense Systems. The original contract (N00178-00C-1016), worth \$8,867,704, was for the procurement of 6,091 Mk 3 Mod 0 rockets. The contract has since effectively evolved into an open-ended agreement.

On Sep 10, 2015, the Army Contracting Command awarded Nammo Talley a \$97,200,000 firm-fixed-price contract for production and delivery of SMAW HEDP practice and novel explosive rounds with respective inert cut-aways.

Timetable

The following reflects the B-300 and SMAW only, and does not account for any variants (such as the SMAW-D).

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1974	B-300 development begun
	1978	U.S. DoD initiates SMAW program; McDonnell Douglas wins competition
	1980	B-300 production starts in Israel
Late	1980	Operational tests of SMAW completed
May	1982	McDonnell Douglas wins SMAW development/production contract
Nov	1983	Serial production of SMAW begun
Feb	1984	First SMAW production deliveries
Nov	1984	SMAW achieves Initial Operational Capability with U.S. Marine Corps
	1986	U.S. Army begins limited SMAW procurement
Early	1994	Talley Defense Systems acquires Mk 150 SMAW program
Dec	2006	U.S. Marine Corps orders 3,000 SMAW-NE rockets
Apr	2007	Nammo AS (Raufoss, Norway) acquires Talley Defense Systems
Aug	2008	MARCORSYSCOM awards Nammo Talley SDD/LRIP contract for SMAW II
	2019	B-300 development and production continue; development and low-rate production of SMAW munitions continue

Worldwide Distribution/Inventories

Export Potential. While the B-300 has been available on the international market for years, Israel Military Industries has yet to announce any export sales. However, third-party sources suggest that IMI may have secured at least two export sales. Mexico reportedly purchased a small quantity of B-300 launchers and the associated ammunition from Israel. In addition, reports indicate that El Salvador purchased 200 B-300 launchers and an unspecified amount of ammunition.

Countries. El Salvador (200 B-300), Israel (B-300), Mexico (B-300), and the United States (Mk 150 SMAW, SMAW II).

B-300/Mk 150 SMAW

Forecast Rationale

Israel Military Industries Ltd expected B-300 production to resume for procurement by the Israel Defense Forces in 2015. However, the Forecast International Weapons Group has not yet seen any indications of renewed IDF procurement.

U.S. Department of Defense FY20 budget request documentation (March 2019) indicates that the U.S. Marine Corps is transitioning from SMAW II launchers to procurement of the reusable 84mm M3A1 Multipurpose Anti-Armor Weapon System (MAAWS)

under the auspices of the Family of Anti-Armor Weapon Systems (FOAAWS) program.

Although combat operations in Afghanistan and Iraq may have stirred international demand for multipurpose "bunker-buster" weapons, the B-300 and SMAW programs have not benefitted from such demand.

While we do not expect the B-300 and SMAW to garner significant new export sales, the basic weapon design will likely become the technological basis for new designs.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	Thru 2018	High Confidence				Good Confidence			Speculative			Total
		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	
Israel Military Industries Ltd												
B-300 <-> Israel												
	7,742	119	0	0	0	0	0	0	0	0	0	119
Total	7,742	119	0	0	0	0	0	0	0	0	0	119