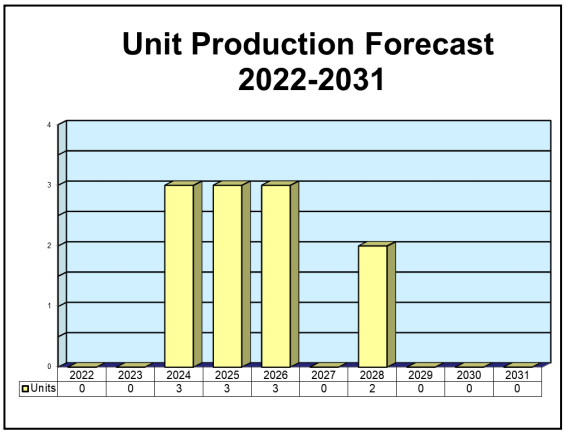
PEQ-1C SOFLAM

Outlook

- Market has been overtaken by newer variants and competing systems
- Mini Special Operations Forces Laser Marker offers enhancements
- L3Harris produces competing system – Scarab Ground Laser Target Designator



Orientation

Description. The PEQ-1(V) Special Operations Forces Laser Marker (SOFLAM) is a laser rangefinder and target designation system that marks targets for laser-guided bombs. The current variant is the PEQ-1C SOFLAM SOFLRD (Special Operations Forces Laser Rangefinder Designator) model.

Sponsor
U.S. Navy
Naval Surface Warfare Center
Crane Division
103 Furlong St
Crane, IN 47522

Status. In production and operational use. The current market is for spares and maintenance.

Application. Laser rangefinder and targeting system used by U.S. Special Forces.

Price Range. Based on procurement budget cost averaging, the per-unit price of the PEQ-1C SOFLAM SOFLRD was estimated at $84,600 in 2009 dollars. When adjusted for inflation, this comes to roughly $104,288 in January 2022 dollars.

Contractors

Prime

Northrop Grumman Mission Systems, Laser Systems	http://www.northropgrumman.com, 2787 S Orange Blossom Trail, Apopka, FL 32703 United States, Tel: + 1 (321) 354-3000, Fax: + 1 (321) 354-3848, Email: laser-systems@ngc.com, Prime

PEQ-1C SOFLAM

Subcontractor

Teledyne FLIR	http://www.flir.com, 27700A SW Pkwy Ave, Wilsonville, OR 97070 United States, Tel: + 1 (503) 498-3547 (Enhanced Targeting Sight)

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; rich.pettibone@forecast1.com

Technical Data

	Metric	**U.S.**
PEQ-1 (Original Model)		
Physical Characteristics		
Weight	5.5 kg	<12.0 lb
Volume	6,557 cubic cm	<400 cubic in
Size	26 cm x 30 cm x 13.1 cm	10.23 in x 11.7 in x 5.14 in
Tilted Eyepiece	45°	
Operation	Manual or remote control	
Battery Power	14-volt DC power source rechargeable NiCad standard	
Vehicle Power	28-volt DC (MIL-STD-1275)	
Laser Type	Nd:YAG	
Wavelength	1.064 µm	
Pulse Energy	80 mJ	
Pulse-to-Pulse Stability	<0.3 mrad	
Boresight Retention	<0.15 mrad	
Modes	Range and Mark	
Operating Temperature	-30°C to + 40°C	
Ranging Features		
Ranging	200 to 9,995 m (±5 m)	
Range Counter Logic	Selectable First/Last	
Range Discrimination	50 m	
Display	4-digit red LED in eyepiece	
Sighting Optics Features		
Sighting Optics	10 power	
Field of View Horizontal	>5°	
Field of View Vertical	>4.7°	
Reticle	0.5 mrad open cross	
Diopter Adjustments	+2 to -6	
Exit Pupil	5-mm diameter (nominal)	
Eye Relief	15 mm	
Marking/Designating		
Marking	2.3 m x 2.3 m target at 5 km	
Pulse Repetition Frequency	Band I/Band II	
Duty Cycle	5-1-5-1-5 (on/off) at 10 pps, then a 30-minute cool-down period	
PRF Coding	Selected by three pushbuttons	
NSN	5860-01-349-2108 PEQ-1 CAGE 80058 SOFLAM laser	

PEQ-1C SOFLAM

	Metric	U.S.
GLTD II		
Physical Characteristics		
Weight	5.6 kg	12.1 lb
Volume	7,145 cubic cm	436 cubic in
Size	28.5 cm x 33.6 cm x 13.1 cm	11.2 in x 13.2 in x 5.2 in
Tilted Eyepiece	45°	
Operation	Manual or remote control	
Battery Power	24-volt DC lithium or rechargeable NiCad standard	
Vehicle Power	28-volt DC (MIL-STD-1275)	
Laser Type	Nd:YAG	
Wavelength	1.064 µm	
Pulse Energy	80 mJ	
Pulse-to-Pulse Stability	15%	
Boresight Retention	<0.3 mrad	
Modes	Range and Mark	
Operating Temperature	-30° C to +40° C	
Ranging Features		
Ranging	200 to 19,995 m (±5 m)	
Range Counter Logic	Selectable First/Last	
Range Discrimination	35 m	38.28 yd
Display	5-digit red LED in eyepiece	
Sighting Optics Features		
Sighting Optics	10 power	
Field of View Horizontal	>5°	
Field of View Vertical	>4.4°	
Reticle	0.2 mrad open cross	
Diopter Adjustments	+2 to -6	
Exit Pupil	5-mm diameter (nominal)	
Eye Relief	15 mm	
Marking/Designating		
Marking	Target in excess of 10 km	
Pulse Repetition Frequency	Band I/Band II	
Duty Cycle	5-1-5-1-5 (on/off) at 10 pps, then a 30-minute cool-down period	
PRF Coding	Selected by three pushbuttons	
PEQ-1C		
Physical Characteristics		
Size	28.5 cm x 33.6 cm x 12.1 cm	11.2 in x 13.2 in x 5.2 in
Weight	5.2 kg	11.3 lb
Volume	7.100 cubic cm	435 cubic in
Operating Temperature	-32°C to +49°C	-30°F to +120°F
NATO	Three mounting rails for night vision devices	
Tripod Interface	1/4-in -20 tapped hole	
Tilted Eyepiece	45°	
Operation Manual and Remote Control		
Battery Power	24 VDC lithium or rechargeable NiCad	
Vehicle Power	24 VDC (MIL-STD-1275)	

PEQ-1C SOFLAM

	Metric	U.S.
Performance		
Laser Type	Nd:YAG	
Wavelength	1.064 µm	
Pulse Energy	80 mJ	
Pulse-to-Pulse Stability	15%	
Beam Divergence	0.3 mrad	
Boresight Retention	0.3 mrad	
Modes	Range and Mark (designate)	
Ranging		
Ranging	200 to 19,995 m (+/- 1 m)	218.72 to 21,866.80 yd
Range Counter Logic	Selectable First/Last	
Range Discrimination	35 m	38.28 yd
Display	5-digit red LED in eyepiece	
Sighting Optics		
Power	10x	
Field of View	Horizontal 5° Vertical 4.4°	
Reticle	0.2 mrad open cross	
Diopter Adjustments	+2 to -6	
Exit Pupil	5-mm diameter (nominal)	0.20 in
Eye Relief	15 mm	0.59 in
Mark (Designate)		
Marking	Target in excess of 10 km	
Pulse Repetition Frequency	Band I/Band II	
User Programmable PRF Codes		
PRF Coding	Selected by three pushbuttons	
I/O and Data Display		
Data Input and Output	RS-422 compatible	
Full Duplex		
DATA OUTPUT		
Range 5 Digit Display		
DATA INPUT		
Azimuth	0 to 6,399 mils or 0 to 359.9°	
Elevation	-400 to +400 mils or -22.5 to +22.5°	

Ground Laser Target Designator II (GLTD II)

Source: Northrop Grumman

PEQ-1B Special Operations Forces Laser Marker

Source: USMC

Variants/Upgrades

PEQ-1. Original model.

PEQ-1B SOFLAM. Upgraded and enhanced version of the original.

PEQ-1C SOFLAM SOFLRD. Updated PEQ-1B model earlier known as the Improved Technology PEQ-1B.

Ground Laser Target Designator (GLTD) II. U.S. Marine Corps version of the PEQ-1B SOFLAM. According to manufacturer Northrop Grumman, an export variant of the GLTD II is also available. The GLTD II provides ground forces with a compact, lightweight, man-portable laser target designator / rangefinder that is ideally suited for precise delivery of laser-guided munitions, such as Paveway bombs and HELLFIRE missiles. Through an RS-422 datalink, the GLTD II can be integrated into a digitized, day/night fire control and surveillance system.

Ground Laser Target Designator (GLTD) III. The GLTD III offers improved laser technology and provides the warfighter with a smaller, lighter, quieter, more reliable, and more efficient laser designator. The GLTD III replaces the flashlamp-pumped laser in the GLTD II with a state-of-the-art, athermal, diode-pumped laser that requires no active cooling system. The result is a silent running, more efficient laser designator with a longer mean time between failures (MTBF). Use of athermal technology eliminates the major drawbacks of most diode-pumped laser systems, specifically warm-up time and standby power consumption. The GLTD III reduces the number of batteries required for operation, allowing operators to carry additional essential items when performing terminal attack control missions.

Mini Special Operations Forces Laser Marker (SOFLAM). A U.S. R&D effort to redesign and retrofit the current laser designator system without having to develop and procure an entirely new system.

Program Review

Background. Development of the PEQ-1 is believed to have started in the early 1990s, with OPEVAL (operational evaluation) completed in October 1995, and deliveries (of 296 units) started in May 1996. By April 1998, the PEQ-1 was deemed to have achieved Full Operational Capability.

In June 2003, the U.S. government issued a requirement for 288 units of an upgraded PEQ-1, which has since been designated the PEQ-1B. This contract went to Litton Systems' Laser Systems, which has since been acquired by Northrop Grumman Laser Systems.

In April 2005, Northrop Grumman was awarded a contract for two prototypes of an Improved Technology PEQ-1B. According to Northrop Grumman, this version is now designated PEQ-1C.

In fall 2006, Litton Systems (a unit of Northrop Grumman) won a procurement contract for up to 300 additional units of the PEQ-1B.

PEQ-1C SOFLAM

In August 2007, Northrop Grumman received a U.S. order for 940 PEQ-1C SOFLAM SOFLRD systems. Production ran through 2012.

Northrop Grumman received a follow-up order in March 2014 to provide spares and support to the U.S., Romania, and Lithuania.

L3Harris Supplies Imaging Equipment to the ROK's Air Force and Marine Corps

L3Harris' Warrior Systems-Advanced Laser Systems Technology (ALST) was awarded a contract in October 2013 to deliver state-of-the-art Ground Laser Target Designators (GLTDs) to the Republic of Korea. L3Harris' Scarab system is a modular laser designator equipped with rangefinding and an IR thermal imager, providing accurate target designation both day and night and in nearly all battlefield conditions. The initial contract value is approximately $30 million.

Under the terms of the contract with the ROK's Defense Acquisition Program Administration (DAPA), L3 would provide Scarab GLTD systems, conduct in-country operator and maintenance training, supply spares, and establish and maintain a full-range, multiyear logistics support capability in the ROK.

As a lightweight, single man-portable system with tripod mounting, Scarab provides an operational capability to identify and designate targets on the ground. This battery-powered system is capable of delivering over 60 minutes of continuous designation from a single battery and incorporates the latest advances in diode-pumped laser generation.

L3Harris announced that the first shipment of its Scarab GLTD systems was successfully delivered to South Korea on January 14, 2015. Media sources reported that Korea was the launch customer for the Scarab GLTD.

The systems were reportedly intended to equip forward air control units of the ROK Air Force and Marine Corps.

Deliveries of the Scarab GLTD were completed by mid-2015.

Malaysian Special Operations 'Paints' Enemy Targets with GLTD II

In January 2016 it was reported that the GLTD II had performed with distinction in Malaysia's 2013 Operation Daulat. The Pasukan Khas Udara TUDM (Royal Malaysian Air Force Special Air Service) used the laser under difficult wartime conditions to designate high-value and time-sensitive targets for precision munitions engagement. "Painting," or illuminating, the enemy targets via GLTD allowed for the quick and precise destruction of enemy forces with minimal collateral damage.

Funding

No specific funding for the PEQ-1C has been identified at this time.

Contracts/Orders & Options

Contractor	Award ($ millions)	Date/Description
Northrop Grumman	98.0	Aug 2007 – A firm-fixed-price, indefinite delivery/indefinite quantity contract, with a five-year ordering period, for a maximum of 940 SOFLAM SOFLRD (PEQ-1C) models, associated data, and provisioning items. Work was performed in Apopka, FL, and completed by Aug 2012. The U.S. Naval Surface Warfare Center, Crane, IN, was the contracting activity. (N00164-07-D-8580)
Northrop Grumman	12.4	Mar 2014 – FFP, IDIQ contract for SOFLAM/GLTD, spares, and repairs. This requirement not only supported the U.S. but also included Foreign Military Sales to Romania (71.4 percent) and Lithuania (28.6 percent) through the support of Building Partnership Capacity programs. Work was completed by Mar 2018. The Naval Surface Warfare Center, Crane, IN, was the contracting activity. (N00164-14-D-JQ16)

Worldwide Distribution/Inventories

Users at this time appear to be **U.S. Army Special Forces** and **Rangers**, **Navy SEALs**, **Marine Force Reconnaissance**, and **Air Force Special Tactics Squadrons**. Unconfirmed international users likely include **Lithuania**, **Malaysia**, **Romania**, and **South Korea**.

Forecast Rationale

The PEQ-1C SOFLAM is a portable laser marker and target designator primarily used by U.S. Special Operations Forces. The unit has several variants: the original PEQ-1, the PEQ-1B, and the current PEQ-1C Special Operations Forces Laser Marker (SOFLAM) Special Operations Forces Laser Rangefinder Designator (SOFLRD). There are also offshoot versions: the Ground Laser Target Designator (GLTD) II (the U.S. Marine Corps version of the PEQ-1B) and the GLTD III. According to Northrop Grumman, the GLTD II has an international (outside the U.S.) variant. Significant numbers of that unit have reportedly been sold.

The PEQ-1C SOFLAM SOFLRD variant proved quite successful; the end of production is now likely being followed by maintenance and support. There is the possibility of a small production run of the export version through the U.S. Foreign Military Sales program to replace systems in the inventories of international users.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION

Designation or Program	High Confidence				Good Confidence			Speculative			
	Thru 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
Northrop Grumman Mission Systems												
PEQ-1 C <> Lithuania <> Armed Services												
	38	0	0	0	0	0	0	2	0	0	0	2
PEQ-1 C <> Romania <> Armed Services												
	76	0	0	0	0	0	0	0	0	0	0	0
PEQ-1 C <> United States <> Armed Services Note: Formerly known as PEQ-1B Improved Technology version. Also known as SOFLAM SOFLRD.												
	955	0	0	3	3	3	0	0	0	0	0	9
Subtotal	1,069	0	0	3	3	3	0	2	0	0	0	11
Total	1,069	0	0	3	3	3	0	2	0	0	0	11