

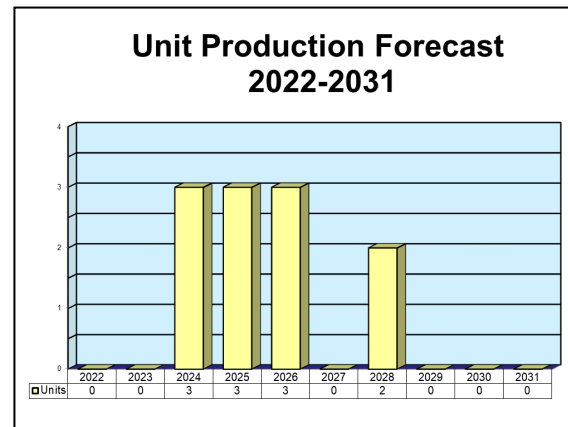
ARCHIVED REPORT

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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

| | |
|---|---|
| <p>Northrop Grumman Mission Systems, Laser Systems</p> | <p>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</p> |
|---|---|

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) |
|----------------------|--|

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

| | <u>Metric</u> | <u>U.S.</u> |
|---------------------------------|--|------------------------------|
| 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

| | <u>Metric</u> | <u>U.S.</u> |
|---------------------------------|---|----------------------------|
| 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 μ m | |
| 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 (\pm 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) | |
| Performance | | |
| Laser Type | Nd:YAG | |
| Wavelength | 1.064 μ m | |
| Pulse Energy | 80 mJ | |
| Pulse-to-Pulse Stability | 15% | |
| Beam Divergence | 0.3 mrad | |
| Boresight Retention | 0.3 mrad | |
| Modes | Range and Mark (designate) | |

PEQ-1C SOFLAM

| | <u>Metric</u> | <u>U.S.</u> |
|------------------------------|---|------------------------|
| 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 | | |
| Full Duplex | RS-422 compatible | |
| 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-1C SOFLAM

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

| <u>Contractor</u> | <u>Award (\$ millions)</u> | <u>Date/Description</u> |
|-------------------|----------------------------|---|
| 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) |

PEQ-1C SOFLAM

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 | | | Total |
| | Thru 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | |
| 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 | | | | | | | | | | | | |
| <small>Note: Formerly known as PEQ-1B Improved Technology version. Also known as SOFLAM SOFLRD.</small> | | | | | | | | | | | | |
| | 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 |