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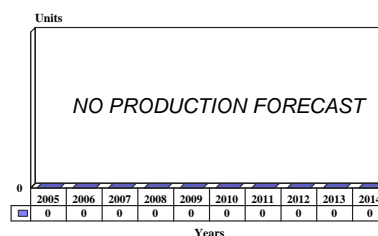
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## Night Targeting System (NTS) - Archived 11/2005

### Outlook

- Production for one of the NTS system's primary platforms, the USMC AH-1 helicopter, has ended
- Most likely future production for spares and replacement only

10 Year Unit Production Forecast  
2005 - 2014



### Orientation

**Description.** An integrated airborne (helicopter) laser designator and forward-looking infrared (FLIR) targeting system.

#### Sponsor

Israeli Ministry of Defense

7 "A" Street

67659 Hakirya

Tel Aviv, Israel

Tel: +972 3 20 51 44

(Israeli AF program sponsor and contracting agency)

#### U.S. Navy

Naval Air Systems Command (NAVAIR)

Jefferson Plaza Bldg 1

Washington, DC 20361

USA

(USMC program sponsor and contracting agency)

**Status.** In production and service.

**Total Produced.** An estimated 374 units were built through 2003.

**Application.** Israeli AH-1S, U.S. Marine Corps and Taiwanese AH-1W, and other variants of the AH-1 Cobra helicopter family.

**Price Range.** A recent contract suggests a unit price of about \$725,000.

### Contractors

Kollsman Inc, <http://www.kollsman.com>, 220 Daniel Webster Highway, Merrimack, NH 03054 United States,

Tel: + 1 (603) 889-2500, Fax: + 1 (603) 889-7966, Second Prime

Israel Aircraft Industries Ltd (IAI), <http://www.iai.co.il>, Ben-Gurion Int'l Airport, 70100 Israel, Tel: + 972 3 935 3111,

Fax: + 972 3 935 8278, Email: [corpmkg@iai.co.il](mailto:corpmkg@iai.co.il), Prime

## Technical Data

|                                 | <u>Metric</u>   | <u>U.S.</u> |
|---------------------------------|---|-------------|
| <b>Weight</b>                   |   |             |
| Total weight of basic M65       | 114 kg  | 251.37 lb   |
| Total weight added to basic M65 | 45 kg   | 99.23 lb    |
| <b>Characteristics</b>          |   |             |
| Day channel - 2 FOV             | 29 deg (wide)<br>4.6 deg (narrow)   |             |
| FLIR channel - 3 FOV            | Wide - 24.5 deg x 18.4 deg<br>Medium - 7.2 deg x 5.4 deg<br>Narrow - 2.0 deg x 1.5 deg<br>Zoom - 2:1 (electronic) |             |
| Field of regard                 |   |             |
| Azimuth                         | Left 110 deg; right 90 deg  |             |
| Elevation                       | Up 32 deg; down 67 deg  |             |
| Power requirements              |   |             |
| DC power                        | 250 W, avg (total original DC power: 672 VA)  |             |
| AC power                        | 38 W, avg (total original AC power: 260 VA)   |             |
| DC power with laser designator  | 570 W   |             |

**Design Features.** The Night Targeting System (NTS) is a joint Israeli Air Force and United States Marine Corps (USMC) program to provide AH-1 Cobra attack helicopters with an advanced targeting capability to acquire, track, and attack ground targets in day/night and in adverse weather conditions. The USMC AH-1W Super Cobra version of the NTS has been called the CLNAS (Cobra Laser Night Attack System); the Israeli Air Force AH-1S version has alternately been referred to as the ASQ-211. However, the NTS designation is more commonly used by both.

The NTS was designed as a modification to either the Hughes M65 airborne TOW (tube launched, optically tracked, wire guided) system or the M65L LAAT (laser augmented airborne TOW) system. It retains the M65/M65L's direct view optics (DVO), which is a monocular system with a flip-over binocular eyepiece/headrest, but adds forward-looking infrared (FLIR) and day TV viewing capabilities. The DVO is controlled by the gunner's left-handgrip control stick and is modified with additional switches for the FLIR, laser designator, and TV camera.

Developed by Israel's Rafael Armament Development Authority, the FLIR has three fields of view. The first is wide for scanning, the second is medium for target recognition and identification, and the third is narrow for targeting. It also has an electronic zoom feature. The FLIR thermal imager is derived from lightweight sensor components developed for unmanned air vehicle applications, and is based on a 120-element detector array that operates in the 8- to 11-micron range. The detector array is mounted onto the right side of the M65/M65L nose optics turret. The FLIR offers 30x

magnification and features a self-contained cooling system.

The laser rangefinder/designator, developed by EL-OP Electro Optics Industries Ltd of Israel, gives the AH-1W an autonomous capability to designate targets for its own laser-guided weapons or those of another aircraft or ground-mount units. Additional features of the NTS include a built-in test capability, automatic in-flight boresight calibration, and an integrated heading display.

**Operational Characteristics.** The mission of the USMC AH-1W and the Israeli Air Force AH-1S is to provide close-in fire support and fire-support coordination for aerial and ground operations. The NTS provides enhanced target identification capabilities at increased range at night or in low-visibility conditions, improving aircraft operational effectiveness and survivability.

While the AH-1S and AH-1W already had an autonomous capability to launch and track TOW missiles, these aircraft originally lacked the laser designator to launch and guide HELLFIRE missiles. NTS incorporates targeting for the Cobra's existing armament systems – 20mm turret, 2.75-inch rockets, 5-inch Zuni rockets, TOW, and Sidewinder/Sidearm missiles. It was also intended to integrate both the improved TOW II and the HELLFIRE Optimized Missile System (HOMS), which improve the electronic counter-countermeasures (ECCM) capability of the aircraft.

To allow the crew to acquire and track targets while maintaining situational awareness, the NTS's automatic tracking offset mode enables the gunner to move the

cursor away from the identified target while retaining the ability to track it. This prevents the target from being alerted that it has been painted. As a laser-guided missile is launched at the target, the cursor is placed

back on the target at the last moment, leaving little or no time for evasive maneuvers. The predictor mode aids in tracking the target accurately even if evading or under cover.

## Variants/Upgrades

Israeli versus U.S. Variants. Because of their lower engine power (compared with the twin-engine AH-1W Super Cobras used by the USMC), the single-engine Israeli AH-1S Cobras do not have the spare weight capacity to carry the full NTS system. Thus, the Israeli Cobras do not include the laser designator.

NTS-A. An improved Night Targeting System was in development for the USMC to eliminate the cumber-

some head-down optical relay tube (ORT) and instead present daylight targeting, as well as FLIR images, on a 5 inch x 5 inch head-up display. IAI Tamam Division has mentioned a follow-on program called the NTS-A, which may be a similar or identical effort. It removes the ORT to provide more space in the cockpit.

NTS-A has reportedly been installed on Italian Army Agusta A129 attack helicopter for evaluation purposes.

## Program Review

The United States and Israeli governments negotiated a Memorandum of Understanding (MoU) dated August 4, 1987, which stipulated that Israel would pay one-third of all common core costs for the Night Targeting System and the U.S. would pay two-thirds. All unique costs, such as aircraft modifications, would be borne 100 percent by the respective governments. Israel's one-third share of the research, development, testing and evaluation, and procurement was estimated at \$62 million.

The NTS called for a common core requirement, and also included configurations and interfaces unique to the needs of the AH-1 aircraft of both the USMC and the Israeli Air Force. For their AH-1W NTS, the USMC required a night FLIR sensor with multiple fields of view for navigation, and for detection, recognition, and identification. A day sensor was also needed with performance equal to or better than the existing Hughes M65L LAAT system. Other requirements included an automatic target tracking capability with offset and predictor modes, a laser rangefinder/designator with autonomous fire capability for HELLFIRE missiles, onboard boresighting, and video record/display.

Of the four services, the USMC had the least night vision equipment in service during the 1991 Gulf War, especially among its helicopter units. In order to launch laser-guided munitions during the war, USMC Cobras were dependent upon external sources for laser designation of ground targets – either a few UH-1Ns equipped with excess DSQ-49 Nite Eagle FLIRs/laser designators, U.S. Army OH-58D AHIPS helicopters, or ground-based designators. This lack of operational

capability may have led to the request by the former USMC Commandant General A. M. Grey to the Secretary of the Navy that the NTS development phase be accelerated.

The first phase covered limited testing to verify the initial effectiveness, safety, and deployability of the NTS. This phase was successfully completed in May 1991, and the U.S. Navy exercised its first production option for Lot I in July 1991. This early testing allowed the contractors to correct deficiencies, and modify software and incorporate the appropriate changes for the production phase. The USMC and the Naval Air Test Center completed its Developmental Test IIA (DT IIA) and Operational Testing II (OT IIA) in November 1991.

A Lot II production contract for 18 NTSs for the USMC was awarded in August 1992. Both Lot I and Lot II contracts were subsequently completed. Tamam built the units for Lot I and the bulk of the orders for Lot II, while assisting Kollsman in producing the remainder of the production lot.

The NTS was first used in operation in August 1993 when the Israelis used NTS-equipped Cobras for operations in Southern Lebanon. The Israelis were pleased with its effectiveness of their NTSs. Testing showed that the systems exceeded specifications – yet another factor in the favorable impression of the NTS in the user community.

Kollsman was originally supposed to deliver the first system 29 months from the onset of development. However, at the request of the USMC, the company was able to cut the time to 14 months and delivered the first

system in November 1993. In September 1994, the first export orders appeared in the form of a US\$64.1 million contract to Kollsman for 65 systems (53 to Turkey and 12 to Taiwan) for retrofit into AH-1W helicopters. Work was completed in July 1996. Two more contracts were awarded for exports to Taiwan, one for 18 systems (November 1996) and the other for 26 (November 1997).

Israeli Aircraft Industries (IAI) Ltd and Augusta un'Azienda Finmeccanica appeared close to a deal in June 1999 to provide helicopters for Turkey's advanced attack (ATAK) helicopter program. Several months later it was announced that the lucrative order had been offered instead to Bell for its AH-1Z helicopter. With Turkey's requirement for 146 choppers, this would have had a positive impact on the production future of the

NTS system. Unfortunately, in spring of 2001 this order became another victim of Turkey's failing economy, and was postponed indefinitely.

In July 2001, the U.S. Navy awarded Kollsman a \$7.8 million contract for the modification and repair of various NTS support systems for the USMC AH-1Ws.

Kollsman was awarded another U.S. Navy contract in August 2003 for \$31.4 million for NTS upgrades and associated items. This work is scheduled to be completed in 2008.

With the end of procurement for the USMC, AH-1W-related order, activity involving the NTS for this application after 2003 was expected to switch primarily to modifications and upgrades.

## Funding

No funding specifically for the Night Targeting System has been identified in current procurement documents.

## Recent Contracts

| <u>Contractor</u> | <u>Award<br/>(\$ millions)</u> | <u>Date/Description</u>   |
|-------------------|--------------------------------|---|
| Kollsman          | 7.8                            | Jul 2001 – Firm-fixed, indefinite-delivery/indefinite-quantity contract for modification/repair of various NTS weapon repairable assemblies in support of AH-W Marine Corps helicopters. Contract contains options which, if exercised, would bring the total cumulative value to \$44,302,356. Work is expected to be completed in July 2006. The Naval Inventory Control Point, Philadelphia, Pennsylvania, is the contracting agency. (N00383-01-D-012G) |
| Kollsman          | 31.4                           | Aug 2003 – Firm-fixed-price, indefinite-delivery/indefinite-quantity contract for NTS upgrades and associated items. Work will be performed in Merrimack, New Hampshire, and is expected to be completed by August 2008. The Naval Surface Warfare Center, Crane Division, Crane Ind., is the contracting agency. (N00164-03-D-8543).   |

## Timetable

| <u>Month</u> | <u>Year</u> | <u>Major Development</u>                                     |
|--------------|-------------|--|
| Aug          | 1987        | Israel and U.S. DoD sign memorandum to jointly develop NTS   |
| FY           | 1987        | IAI selects Kollsman as U.S. second source                   |
| Sep          | 1988        | IAI awarded full-scale development contract                  |
| Late         | 1990        | Flight tests conducted by Israeli Air Force and USMC         |
| Jul          | 1991        | IAI awarded pilot production contract for 35 NTS             |
| Aug          | 1992        | U.S. Navy exercises Option 2 for 18 NTS for USMC             |
| Dec          | 1992        | First NTS delivered to Israeli Air Force                     |
| FY           | 1993        | NTS TECHEVAL and OPEVAL testing completed                    |
| Nov          | 1993        | Kollsman delivers NTS for U.S. Marines' AH-1W Super Cobra    |
| FY           | 1994        | NTS Milestone III approval obtained for full-rate production |

| <u>Month</u> | <u>Year</u> | <u>Major Development</u>                      |
|--------------|-------------|---|
| Nov          | 1996        | Additional contract for 18 systems for Taiwan |
| Nov          | 1997        | Additional contract for 26 systems for Taiwan |
| Jul          | 2001        | Contract to Kollsman for NTS modifications    |
| Dec          | 2001        | Production for Taiwan complete                |

## Worldwide Distribution

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At present, the system is in service with the **Turkish Army**, the **Israeli Air Force**, the **Taiwanese Army** and the **United States Marine Corps**.

## Forecast Rationale

New production of the Night Targeting System (NTS) has been completed for one of its primary platforms, the United States Marine Corps (USMC) AH-1W Super Cobra attack helicopter. While work related to the system will continue through the next several years and it will remain in operation in numerous applications, the long term production prospects for NTS have been greatly diminished.

The system, a joint U.S./Israeli venture, has been widely distributed in its two home countries and has been picked up as an export by at least two other countries. For this reason there may always be some chance for at

least minimal production for other countries. Still, there have apparently been no new orders for NTS since the late 1990s.

Production for new NTS installations for the USMC ended in 2003; however, modification and upgrade work related to the system will continue through 2015, according to U.S. defense budget documents. NTS-related upgrade work entails at least two primary areas of focus: cockpit and canopy reconfigurations; and the inclusion of night vision goggle helmet-mounted displays and improved crew restraint systems.

## Ten-Year Outlook

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Possible production for replacement and spares.

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