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HAND HELD SEARCHLIGHT  
COMPARISON SUMMARY



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## **1.0 PURPOSE**

The purpose of this report is to provide a comparison of two handheld searchlights; the Maxa Beam from Peak Beam Systems Inc., and the Xenonics NightHunter, and to identify key differences between the products with reference to shipboard suitability.

## **2.0 APPLICABLE DOCUMENTS**

References:

- a. Firm Fixed Price Abbreviated Source Selection Plan (GAMMA)
- b. OPNAV N34 Force Protection Hand-Held Searchlight Performance Requirements
- c. NSWC Crane 4042-TR-090201, Hand Held Searchlight Report

A Request For Proposal (RFP) for force protection hand held searchlights was issued based on the criteria established in References (a) and (b). A Test of the searchlights provided by the two respondents, Peak Beam Systems Inc. and Xenonics, was conducted and results were recorded in Reference (c).

## **3.0 SEARCHLIGHT CRITERIA AND EVALUATION**

The suggested technical evaluation factors of Reference (a) include the following: Beam intensity, Beam spread, Battery duration and configuration, Weight, One-handed operation of controls, Infrared operations, Battery charging system, Ease of use, and Storage system. The detailed criteria that the searchlights must meet with respect to each of these factors, is established in Reference (b). Additional criteria in the areas of Environmental ruggedness, Materials and Workmanship, Documentation, and Maintenance kit, are also defined in this reference. While all of these areas were addressed in the Reference (c) comparison test, the factors of primary importance are those of Reference (a). An explanation of these requirements and their significance relative to shipboard operations is described below along with a brief synopsis of the Reference (c) test results.

Beam intensity – The OPNAV N34 illumination requirement is 1.5 miles using visible light in clear conditions. This is the minimum estimated distance that would provide the ship time to set General Quarters if necessary after a threat has been detected. The higher the intensity, the greater the distance at which a threat can be detected and the more time the ship would have to assess and respond to an incoming threat. The metric associated with this capability is the beam intensity measured at a fixed distance from the searchlight. The intensity requirement is 2000 foot-candles measured at 50 feet from the searchlight. Test results showed the Maxa Beam maximum available intensity to be around 2300 foot-candles, and that of the NightHunter to be about 800 foot-candles.

Beam spread – The ability a searchlight has to concentrate a beam of light maximizes its usage of available candlepower. The requirement is for a variable spot size from 2 feet to 17 feet diameter at a distance of 100 feet from the optic. This ensures greater performance in identifying targets at long distances. NightHunter shows a minimum beam diameter of 4 feet, and Maxa Beam 2 feet.

Battery duration and configuration – To meet the objective of reducing the number of battery changes during watch-standing, a goal of 90 minutes of battery life under normal power was established, 60 minutes is acceptable. A battery that can be changed quickly without tools is also an operational requirement. Both lights met the 60 minute battery life requirement in all configurations. Maxa Beam meets the preferred requirement of 90 minute battery duration for both the battery belt and battery integral to searchlight configurations. NightHunter meets the ‘no tools’ requirement only when used in the battery belt configuration.

Weight – The searchlight is required to be portable. The lighter the hand held portion of the searchlight, the less physical stress is experienced by the user over an extended period of operation. A target weight of 4 pounds for the hand held portion of the searchlight was established. Battery belt options are also desirable in an extended use environment. The weight of the Maxa Beam both with and without integral battery is less than that of NightHunter. Without battery the Maxa Beam weighs 3.3 lbs. vs. 6.1 lbs. for the NightHunter. With batteries the weights are 8.8 and 10.9 lbs. respectively.

One-hand operation of controls – One hand operation is particularly important in shipboard application. The other hand may be holding a radio or weapon, or in the case of patrol craft, used to safely stabilize the user against motion. NightHunter beam width is adjusted by manually turning the lens housing, making one hand control impossible for this function. Beam width and all other Maxa Beam functions are controllable with one hand using a multi-positional ‘conditioning’ switch.

Infrared (IR) operations – With the appropriate filter in place, a searchlight can become an IR illuminator for use with night vision equipment. The Navy has made considerable procurements in the area of night vision upgrades. Using a spotlight with the greatest intensity in the near IR for night operations helps to maximize the utility of this investment. The requirement for IR operations is target visibility at 1000 meters. Quantitative metrics were not established for this test. Photographic evidence from reference (c) however shows the Maxa Beam provides greater IR illumination than the NightHunter.

Battery charging system – The charging system must support continuous nighttime searchlight operation through the recharge and exchange of batteries. It is also required that the unit be capable of bulkhead mounting and is provided with a securing strap. This is in keeping with standard shipboard practices for equipment stowage. Both units provide sufficient batteries and charging equipment to keep them continuously operational. The NightHunter however does not provide a means for bulkhead mounting of the charger.

Ease of use – Basic features that would result in a benefit to users in a shipboard environment through savings of time or effort were examined. Ease of battery change, charger use, access to controls, switching to alternate configuration modes, use of belts and straps, and other related features were considered. Both units are considered sufficiently easy to use in a shipboard environment.

Storage system – System must be capable of stowing all parts and accessories for the searchlight. It must be rugged and portable enough for shipboard applications. Stowage systems for both units are considered acceptable for shipboard use.

#### 4.0 RESULTS SUMMARY

Table A outlines the relative differences in test results discussed in Section 3.0 for the suggested technical evaluation factors of Reference (a). A thorough explanation of test results is included in Reference (c). The Table shows that the NightHunter fails to meet the minimum performance targets established by OPNAV N34 and NCIS in reference (b) in five of the nine test categories listed. Maxa Beam meets or exceeds targets in every category. In seven of the categories, Maxa Beam showed better overall performance as compared to the NightHunter. In the categories of Ease of Use and Stowage System, the units rate the same with no significant deficiencies in either.

<b>Table A</b>		
<b>Category</b>	<b>Fails to meet Performance Targets</b>	<b>Performance Advantage</b>
Beam Intensity	NightHunter	Maxa Beam
Beam Spread	NightHunter	Maxa Beam
Battery Duration & Configuration		Maxa Beam
Weight	NightHunter	Maxa Beam
One Hand Operation of Controls	NightHunter	Maxa Beam
Infrared (IR) Operations		Maxa Beam
Battery Charging System	NightHunter <sup>1</sup>	Maxa Beam
Ease of Use		
Storage System		

<sup>1</sup>NightHunter meets the continuous operation requirement when used with a battery belt but fails to provide charging in a bulkhead mount configuration.

#### 5.0 CONCLUSION

Maximum performance of Force Protection gear is considered of great importance in a security environment shaped by recent terrorist attacks in the US and on Navy assets abroad. Based on the differences in the key performance areas addressed above, the Maxa Beam is considered the best value for shipboard spotlight applications, where performance can be critical to mission success and crew safety. Use of the NightHunter may be appropriate for shore based activities.