



**Homeland
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Science and Technology

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System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective assessments and validations on commercial equipment and systems, and provides those results along with other relevant equipment information to the emergency responder community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

For more information on this and other technologies, contact the SAVER Program Support Office.

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Summary

Pistol-Mounted Lights

(AEL reference number 03OE-04-LTHH)

Pistol-mounted lights attach under the barrels of semiautomatic pistols commonly used by law enforcement officers. Mounting the light in this manner allows an officer to operate their weapon and light with one hand. These lights are used in low light to aid in target identification.

To provide responders with information on currently available pistol-mounted lights, the Space and Naval Warfare Systems Center (SPAWARSYSCEN) Atlantic conducted a comparative assessment of these lights for the System Assessment and Validation for Emergency Responders (SAVER) Program in August 2012. Detailed findings are provided in the *Pistol-Mounted Lights Assessment Report*, which is available by request at <https://www.rkb.us/saver>.

Assessment Methodology

Prior to the assessment, eight law enforcement personnel were chosen from various jurisdictions to participate in a focus group. The focus group identified evaluation criteria and recommended product selection criteria and possible scenarios for assessment.

After identifying evaluation criteria, the focus group assigned each criterion to one of four SAVER categories. The affordability category was discussed, and no criteria were identified for the category. The focus group recommended that affordability be assessed by the reader of the assessment report because jurisdictions have varying budgets available for purchasing equipment and product performance should be assessed separately from cost.

The focus group then assigned a weight for each criterion's level of importance. Once the criteria were weighted, a percentage value was assigned to the SAVER categories to represent the level of each category's importance relative to the other categories.



Based on focus group recommendations and market research, the following products were selected for assessment:

- TLR-1[®]s, Streamlight Inc.;
- M3 LED, L-3 Communications EOTech;
- M3X LED, L-3 Communications EOTech;
- X300[®], SureFire LLC;
- TLR-3[®], Streamlight Inc.;
- WL1-AA (WL1-000-A3), L-3 Communications EOTech;
- X2 LED, L-3 Communications EOTech;
- LAS/TAC 2, Laser Devices Inc.;
- AWL-P Amphibious LED Pistol Light (700-200), FoxFury Lighting Solutions; and
- Night-Ops Xiphos NT, BLACKHAWK! Products Group[®].

Seven responders served as evaluators for this assessment. All evaluators had at least 11 years of experience using pistol-mounted lights. During the assessment, evaluators rated the pistol-mounted lights based on evaluation criteria established by the focus group. The assessment was separated into two phases: the specification assessment and the operational assessment. Evaluators assessed the products based on vendor-provided information during the specification assessment. Hands-on experience using the products in three scenarios—illumination, target identification, and live-fire—served as the basis for the operational assessment. A range safety officer was present throughout the assessment to ensure the safety of evaluators and assessment facilitators.

Assessment Results

According to evaluators, all of the assessed lights provided sufficient illumination to identify the characteristics of a target at close distances (15 yards or less) and in low-light conditions. The lights also provided enough peripheral light to illuminate an average-sized room. Evaluators noted that the lights were compatible with common pistol rail systems, could be operated ambidextrously and with one hand, and did not affect the balance, recoil, or proper function of their pistols. In addition, the lights were easy to clean and withstood barrel heat, pistol recoil, and muzzle blast. Evaluators concluded that the strobe illumination mode is a feature that may complicate the operation of the light and none of them could identify a tactical purpose for this feature.

Table 1 displays the composite assessment scores as well as the category scores for each pistol-mounted light. Higher scores indicate a more favorable rating by evaluators. The advantages and disadvantages of each light, as identified by evaluators, are listed in table 2. To view how each light scored against the evaluation criteria assigned to the SAVER categories, see table 3. For specifications, see table 4.

Responder agencies that may be considering the purchase of pistol-mounted lights should review the detailed findings in the *Pistol-Mounted Lights Assessment Report* and carefully consider each product’s overall capabilities and limitations in relation to their jurisdiction’s operational needs. All reports in this series, as well as reports on other technologies, are available in the SAVER section of the Responder Knowledge Base (RKB) website, <https://www.rkb.us/saver>.

SAVER Category Definitions
Affordability groups criteria related to life-cycle costs of a piece of equipment or system.
Capability groups criteria related to the power, capacity, or features available for a piece of equipment or system to perform or assist the responder in performing one or more relevant tasks.
Deployability groups criteria related to the movement, installation, or implementation of a piece of equipment or system by responders at the site of its intended use.
Maintainability groups criteria related to the maintenance and restoration of a piece of equipment or system to operational condition by responders.
Usability groups criteria related to the quality of the responders’ experience with the operational employment of a piece of equipment or system. This includes the relative ease of use, efficiency, and overall satisfaction of the responders with the equipment or system.

Table 1. Pistol-Mounted Light Assessment Results

Product	Composite Score	Capability (33% Weighting)	Deployability (30% Weighting)	Maintainability (6% Weighting)	Usability (31% Weighting)
TLR-1®s	4.7	4.6	4.9	4.3	4.6
M3 LED	4.6	4.3	4.7	4.7	4.7
M3X LED	4.6	4.7	4.6	4.7	4.5
X300®	4.6	4.5	4.8	4.6	4.5
TLR-3®	4.5	4.4	4.7	4.6	4.4
WL1-AA (WL1-000-A3)	4.4	4.4	4.4	4.6	4.5
X2 LED	4.3	3.9	4.4	4.7	4.4
LAS/TAC 2	4.1	4.2	3.8	3.6	4.3
AWL-P Amphibious LED Pistol Light (700-200)	4.0	4.3	4.0	4.3	3.8
Night-Ops Xiphos NT	3.8	3.6	4.5	3.0	3.6

Table 2. Pistol-Mounted Light Advantages and Disadvantages





Product	Advantages	Disadvantages
 TLR-1®s Composite Score: 4.7	<ul style="list-style-type: none"> Concentrated, bright center beam is well defined and provides ample peripheral lighting Smooth and easy switch movement Durable aluminum housing Mount permits additional tightening with tool or fingers 	<ul style="list-style-type: none"> Easy to inadvertently activate strobe illumination mode Difficult to open battery door
 M3 LED Composite Score: 4.6	<ul style="list-style-type: none"> Concentrated, bright center beam is well defined and provides ample peripheral lighting Smooth and easy switch movement Light attaches securely to pistol 	<ul style="list-style-type: none"> Difficult to remove from pistol Not waterproof
 M3X LED Composite Score: 4.6	<ul style="list-style-type: none"> Concentrated, bright center beam is well defined and provides ample peripheral lighting Wide operating temperature range Smooth and easy switch movement Light attaches securely to pistol 	<ul style="list-style-type: none"> Difficult to remove from pistol Difficult to open battery door
 X300® Composite Score: 4.6	<ul style="list-style-type: none"> Concentrated, bright center beam is well defined and provides ample peripheral lighting Battery cover on bottom of light does not interfere with mounting and removal Durable aluminum housing 	<ul style="list-style-type: none"> Stiff switch

Table 2. Pistol-Mounted Light Advantages and Disadvantages (Continued)







Product	Advantages	Disadvantages
 <p>TLR-3® Composite Score: 4.5</p>	<ul style="list-style-type: none"> • Concentrated, bright center beam is well defined and provides ample peripheral lighting • Powered by a single battery • Adaptable for smaller pistols due to its small size • Durable aluminum housing • Mount permits additional tightening with tool or fingers 	<ul style="list-style-type: none"> • Some of the mounting keys do not fit well • Must change grip on pistol to activate constant-on illumination mode
 <p>WL1-AA (WL1-000-A3) Composite Score: 4.4</p>	<ul style="list-style-type: none"> • Concentrated, bright center beam is well defined and provides ample peripheral lighting • Powered by AA batteries that are commonly available and inexpensive • Switches have independent functions and operate consistently • Adjustable placement of the light on the pistol 	<ul style="list-style-type: none"> • Easy to inadvertently activate strobe illumination mode • Difficult to remove from the pistol without a tool • Location and design of battery door release mechanism (door opens accidentally)
 <p>X2 LED Composite Score: 4.3</p>	<ul style="list-style-type: none"> • Concentrated, bright center beam is well defined and provides ample peripheral lighting • Powered by a single battery • Smooth switch movement 	<ul style="list-style-type: none"> • Not waterproof • Does not work well with most full-size pistols because it does not mount flush against the trigger guard
 <p>LAS/TAC 2 Composite Score: 4.1</p>	<ul style="list-style-type: none"> • Concentrated, bright center beam is well defined and provides ample peripheral lighting • Ambidextrous switch is consistent on both sides of the light • Light is easy to attach and adjust on the pistol 	<ul style="list-style-type: none"> • Stiff switch • Battery compartment opens inadvertently when removing the light from the pistol • Inconsistent information provided by technical support regarding cleaning the lens
 <p>AWL-P Amphibious LED Pistol Light (700-200) Composite Score: 4.0</p>	<ul style="list-style-type: none"> • Good battery runtime • Powered by a single battery • Light is easy to attach and adjust on the pistol • Excellent technical support 	<ul style="list-style-type: none"> • Limited peripheral lighting • Must cycle through strobe illumination mode to get to constant-on illumination mode • Difficult one-handed operation • Flimsy mount locking tabs
 <p>Night-Ops Xiphos NT Composite Score: 3.8</p>	<ul style="list-style-type: none"> • Powered by a single battery • Light is easy to attach and adjust on the pistol • Mount allows for additional tightening with fingers 	<ul style="list-style-type: none"> • Light beam has a dark circle on the outside • When used ambidextrously, the switch requires different levels of pressure to activate the light • Battery compartment spring fell out during assessment • Battery door opens inadvertently when removing the light from the pistol • Right- or left-handed model must be selected at time of purchase • Requires a proprietary holster • Customer service representative could not answer technical questions

Table 3. Pistol-Mounted Light Criteria Ratings¹

KEY										
	TLR-1 [®] s	M3 LED	M3X LED	X300 [®]	TLR-3 [®]	WL1-AA (WL1-000-A3)	X2 LED	LAS/TAC 2	AWL-P Amphibious LED Pistol Light (700-200)	Night-Ops Xiphos NT
Capability										
Beam characteristics	●	●	●	●	●	●	●	●	◐	◐
Durability	●	◐	●	●	●	◐	◐	◐	◐	●
Battery runtime	◐	◐	◐	◐	◐	◐	◐	◐	●	◐
Mode	●	●	●	●	●	●	●	●	●	◐
LED life	●	●	●	◐	●	●	●	●	●	◐
Deployability										
Mounting	●	●	●	●	●	◐	◐	◐	◐	◐
Pistol compatibility	●	●	●	●	●	●	●	●	●	●
Maintainability										
Easy to maintain	◐	●	●	●	●	◐	●	●	●	◐
Warranty	◐	●	●	◐	◐	●	●	◐	◐	◐
Technical support	◐	●	●	◐	◐	●	●	◐	◐	◐
Usability										
Switches	◐	●	●	◐	◐	◐	◐	◐	◐	◐
Weight	●	●	●	●	●	●	●	●	●	●
Size	●	◐	◐	●	●	●	◐	◐	●	◐
User manual	◐	◐	◐	◐	◐	●	◐	●	◐	◐

Note:

¹ Averaged criteria ratings for each assessed product are graphically represented by colored and shaded circles. Highest ratings are represented by full green circles.

Table 4. Pistol-Mounted Light Specifications¹

Specifications	TLR-1®s	M3 LED	M3X LED	X300®	TLR-3®	WL1-AA (W11-000-A3)	X2 LED	LAS/TAC 2	AWL-P Amphibious LED Pistol Light (700-200)	Night-Ops Xiphos NT
MSRP	\$119	\$200	\$200	\$275	\$135	\$250	\$140	\$310	\$186	\$200
Warranty duration ²	Lifetime (2 yr electronics)	Lifetime	Lifetime	Lifetime (2 yr electronics)	Lifetime (2 yr electronics)	Lifetime	Lifetime	1 year (3 yr LEDs)	2 years	Lifetime (1 yr electronics)
Light output ³	160 lm	125 lm	150 lm	170 lm	110 lm	150 lm	80 lm	200 lm	140 lm	90 lm
Dimensions	3.3 x 1.5 x 1.4 in.	3.4 x 1.6 x 1.5 in.	3.4 x 1.6 x 1.6 in.	3.6 x 1.5 x 1.3 in.	2.7 x 1.2 x 1.5 in.	3.6 x 1.4 x 1.3 in.	2.4 x 1.4 x 1.6 in.	3.2 x 1.4 x 1.3 in.	3.1 x 1.3 x 1.6 in.	3.1 x 1.1 x 1.4 in.
Weight ⁴	4.2 oz	3.3 oz	3.9 oz	3.8 oz	2.3 oz	3.4 oz	1.7 oz	3.1 oz	2.4 oz	2.5 oz
Water resistance	Waterproof (1 m)	Water resistant	Waterproof (20 m)	Waterproof (22 m)	Waterproof (1 m)	Waterproof (1 m)	Water resistant	Waterproof (3 m)	Waterproof (18 m)	Waterproof (10 m)
Operating temperature range	-40°F to 120°F	Unknown	-22°F to 149°F	Unknown	-40°F to 120°F	14°F to 122°F	Unknown	-40°F to 131°F	0°F to 300°F	-40°F to 120°F
Storage temperature range	-40°F to 120°F	Unknown	-40°F to 158°F	Unknown	-40°F to 120°F	-22°F to 158°F	Unknown	-40°F to 131°F	Unknown	-20°F to 120°F
Battery type	CR123A (2)	CR123A (2)	CR123A (2)	CR123A (2)	CR2	AA (2)	CR2	CR123A (2)	CR123A	CR123A
Battery runtime	150 min	120 min	120 min	144 min	90 min	90 min (lithium)	60 min	70 min	240 min	120 min
LED life	50,000 hr	50,000 hr	50,000 hr	10,000 hr	50,000 hr	50,000 hr	50,000 hr	50,000 hr	50,000 hr	Unknown

Notes:

¹ Information was provided by manufacturers and has not been independently verified by the SAVER Program.

² Lifetime warranties include LEDs and electronics, unless otherwise specified.

³ Approximate amount of light output.

⁴ Weight with batteries.

F = Fahrenheit

hr = hours

in. = inches

LED = light-emitting diode

lm = lumens

m = meter(s)

min = minutes

MSRP = manufacturer's suggested retail price

oz = ounces

SAVER = System Assessment and Validation for Emergency Responders

yr = year(s)