



**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 response 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

Binocular Laser Rangefinders

(AEL reference number 03OE-02-LASR)

Laser rangefinders may be used by law enforcement personnel to acquire accurate measurements of an accident scene for police reports or accident reconstruction. They may also be used when conducting site surveys for the installation of security cameras or intrusion detection systems outside prisons or other secure buildings. In addition, laser rangefinders are frequently used by marksmen and snipers to measure the distance to targets.

In order to provide responders with information on currently available binocular laser rangefinders, the Space and Naval Warfare Systems Center (SPAWARSYSCEN) Atlantic conducted a comparative assessment of binocular laser rangefinders for the System Assessment and Validation for Emergency Responders (SAVER) Program in May 2011. Detailed findings are provided in the *Binocular Laser Rangefinders Assessment Report*, which is available by request at <https://www.rkb.us/saver>.

Assessment Methodology

Prior to the assessment, eight responders were chosen from various jurisdictions to participate in a focus group. Participants possessed strong law enforcement backgrounds. The 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 laser rangefinders were selected for assessment:

- Victory RF 8x45 T*, Carl Zeiss Optical Inc.;
- Victory RF 8x56 T*, Carl Zeiss Optical Inc.;
- Victory RF 10x45 T*, Carl Zeiss Optical Inc.;
- Victory RF 10x56 T*, Carl Zeiss Optical Inc.;
- GEOVID 8x42 HD, Leica Camera Inc.;
- GEOVID 8x56 HD, Leica Camera Inc.;
- GEOVID 10x42 HD, Leica Camera Inc.;
- GEOVID 15x56 HD, Leica Camera Inc.;
- Fusion™ 1600 ARC 10x42, Bushnell Corporation; and
- 10x50 Military LRF, Steiner.

Five responders served as evaluators for this assessment. All evaluators had at least 16 years of law enforcement experience.

During the assessment, evaluators rated the laser rangefinders 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 in three ranging activities served as the basis for the operational assessment.

Assessment Results

All 10 products scored favorably overall and had laser ranges and accuracy suitable for most operations. The small range of scores between products indicates only slight differences in the overall performance of the assessed laser rangefinders. Table 1 displays the composite assessment scores as well as the category scores for each laser rangefinder. Higher scores indicate a higher rating by evaluators. The advantages and disadvantages of each laser rangefinder, as identified by evaluators, are listed in table 2. To view how each laser rangefinder scored against the evaluation criteria assigned to the SAVER categories, see table 3. For product specifications, see table 4.

Responder agencies that may be considering the purchase of binocular laser rangefinders should review the detailed findings in the *Binocular Laser Rangefinders 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 at <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. Binocular Laser Rangefinder Assessment Results

Product	Composite Score	Capability (35% Weighting)	Deployability (25% Weighting)	Maintainability (10% Weighting)	Usability (30% Weighting)
Victory RF 8x45 T*	4.4	4.8	4.1	3.4	4.6
Victory RF 8x56 T*	4.4	4.8	3.9	3.4	4.6
Victory RF 10x45 T*	4.4	4.8	4.1	3.4	4.6
Victory RF 10x56 T*	4.4	4.9	3.9	3.4	4.6

Table 1. Binocular Laser Rangefinder Assessment Results (Continued)

Product	Composite Score	Capability (35% Weighting)	Deployability (25% Weighting)	Maintainability (10% Weighting)	Usability (30% Weighting)
GEOVID 8x42 HD	4.2	4.4	4.0	3.4	4.4
GEOVID 8x56 HD	4.2	4.4	3.9	3.4	4.3
GEOVID 10x42 HD	4.2	4.5	4.0	3.4	4.3
GEOVID 15x56 HD	4.1	4.4	3.8	3.4	4.3
Fusion™ 1600 ARC 10x42	3.8	3.8	3.8	4.5	3.7
10x50 Military LRF	3.6	3.4	3.8	4.5	3.5

Table 2. Binocular Laser Rangefinder Advantages and Disadvantages











Product	Advantages	Disadvantages
 <p>Victory RF 8x45 T* Composite Score: 4.4</p>	<ul style="list-style-type: none"> • Easy to manually focus • One-button activation • Reticle is a large, red circle • Battery runtime • Fast distance reporting • Excellent image quality 	<ul style="list-style-type: none"> • Battery replacement requires a coin • Difficult battery access • Spring-loaded battery door is not attached
 <p>Victory RF 8x56 T* Composite Score: 4.4</p>		
 <p>Victory RF 10x45 T* Composite Score: 4.4</p>		
 <p>Victory RF 10x56 T* Composite Score: 4.4</p>		
 <p>GEOVID 8x42 HD Composite Score: 4.2</p>	<ul style="list-style-type: none"> • High-quality image • Easy to manually focus • One-button activation 	<ul style="list-style-type: none"> • No user-selectable units of measure • Have to press button twice to get a reading • Reticle too small • Battery replacement requires a coin • Difficult battery access • Spring-loaded battery door is not attached
 <p>GEOVID 8x56 HD Composite Score: 4.2</p>		
 <p>GEOVID 10x42 HD Composite Score: 4.2</p>		
 <p>GEOVID 15x56 HD Composite Score: 4.1</p>		
 <p>Fusion™ 1600 ARC 10x42 Composite Score: 3.8</p>	<ul style="list-style-type: none"> • Lightweight • Features an inclinometer • Battery access • Battery type 	<ul style="list-style-type: none"> • Not covert • Small buttons • Reticle is too dim in bright sunlight • Blue-tinted lenses reduce image brightness
 <p>10x50 Military LRF Composite Score: 3.6</p>	<ul style="list-style-type: none"> • Battery type • Battery access 	<ul style="list-style-type: none"> • Difficult to operate • Location of lens caps interferes with image/laser • Difficult to manually focus • Heavy • Uncomfortable, unpadded neck strap • No case included with purchase

Table 3. Binocular Laser Rangefinders Criteria Ratings¹

KEY															
	Least Favorable	➔		Most Favorable	Victory RF 8x45 T*	Victory RF 8x56 T*	Victory RF 10x45 T*	Victory RF 10x56 T*	GEOVID 8x42 HD	GEOVID 8x56 HD	GEOVID 10x42 HD	GEOVID 15x56 HD	Fusion™ 1600 ARC 10x42	10x50 Military LRF	
Capability															
Accuracy															
Laser range															
Image quality															
Relative brightness															
Deployability															
Durability															
Physical characteristics															
Anti-fog															
Tripod adapter															
Battery runtime															
Covertiness															
Protective cases															
Maintainability															
Battery access															
Battery type															
Usability															
Ease of operation															
LCD/LED visibility															
Adjustable focus															
Field of view															
Ergonomics															
Reticle characteristics															
Selectable units of measure															

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. Binocular Laser Rangefinders Specifications¹

Specification	Victory RF 8x45 T*	Victory RF 8x56 T*	Victory RF 10x45 T*	Victory RF 10x56 T*	GEOVID 8x42 HD	GEOVID 8x56 HD	GEOVID 10x42 HD	GEOVID 15x56 HD	Fusion™ 1600 Arc 10x42	10x50 Military LRF
MSRP	\$2,900	\$3,300	\$3,000	\$3,400	\$2,349	\$2,849	\$2,399	\$2,999	\$1,436	\$2,860
Purchase price ²	\$2,500	\$2,800	\$2,550	\$2,900	\$1,975	\$2,399	\$2,019	\$2,525	\$675	\$2,400
Warranty	5 years	5 years	5 years	5 years	5 years	5 years	5 years	5 years	2 years	2 years
Weight	35 ounces	41 ounces	35 ounces	41 ounces	34 ounces	39 ounces	34 ounces	46 ounces	31 ounces	46 ounces
Field of view	375 feet at 1,000 yards	345 feet at 1,000 yards	330 feet at 1,000 yards	330 feet at 1,000 yards	37 feet at 100 yards	36 feet at 100 yards	33 feet at 100 yards	23 feet at 100 yards	305 feet at 1,000 yards	318 feet at 1,000 yards
Relative brightness index	31.4	49.0	20.3	31.4	27.6	49.0	17.6	14.0	17.6	25.0
Anti-reflection lens coating	Fully multicoated				Fully multicoated				Fully multicoated	Multicoated
Anti-fog lens coating (hydrophobic lenses)	LotuTec				AquaDura				RainGuard® HD	None
Selectable units of measure	Meters and yards				Meters or yards ³				Meters and yards	Meters and yards
Storage temperature	-40° to 158° Fahrenheit (F)				Not available				-4° to 158°F	-40° to 176°F
Operating temperature	14° to 122°F				-13° to 131°F				14° to 122°F	-4° to 140°F
Housing material	Magnesium with rubber armor				Aluminum with stainless steel hinge pin				ABS plastic with rubber armor	Makrolon® polycarbonate with rubber
Battery type (3-volt lithium)	CR2				CR2				CR123A	CR123A
Battery runtime	10,000 measurements				2,000 measurements				1,400 measurements	5,000 measurements

Notes:

- ¹ Information was provided by manufacturers and has not been independently verified by the SAVER Program.
- ² The actual price paid for the products purchased for the assessment.
- ³ Not user selectable. Must be specified at time of purchase.