



Scientific Crossbow Test

by Jon Teater

Mission Archery continues to impress the archery community with its latest crossbow design: the MXB-Sniper Lite. Mission, a Mathews company, has demonstrated innovation since it entered the crossbow market a few years back. Although Mission is well-known for its vertical bow line and the value offered in it, the Sniper Lite may demonstrate equal to greater value for the consumer in a horizontal package. The Sniper Lite is expected to be a top selling model for Mission. It is designed to be different from its predecessor models, particularly when it comes to weight and several other facets that will be discussed throughout this article.

The latest offering from Mission is created around the ideal of tactical lightness. The product's name is meant to reiterate its objective. Both the aesthetics and performance key on the word "Sniper." The expectation for consumers is precise shooting and Mission believes this product will deliver. Regarding the Sniper Lite's look, the two tone stealth concealment intertwines black and grey color tones. Additionally, the skeleton barrel, stock and frontal configuration boost the tactical appeal. The tactical look is enhanced by the lightweight design and denoted by the term "Lite." Other facets, such as weight distribution and balance point, contribute immensely to the Sniper Lite's appeal.

The Sniper Lite crossbow MSRP is \$599 (crossbow only). The product is offered in four packages, which are entitled the "XB Basic," "XB Hunter," "XB Pro" and "XB Red Dot." As would be expected, the configurations of each package vary. Each offers well designed options and the MSRPs range from \$199 to \$499 for the packages. The product tested in this article utilized the XB Pro Package. The XB Pro package consists of a Hawke XB-1 with a 1.5-5 × 32 SR etched reticle in a variable speed, two color illuminated scope and match grade rings; three Mission crossbow arrows (half-moon metal nock, 22 inches long) and a Mission MX-3 quiver (in a Lost AT or black finish).

Introduction

The Sniper Lite may be viewed by some as an improved version of the popular Dagger. Both products have similar dimensions and weight per the previous *ArrowTrade* Dagger report, excluding power stroke and overall length. Nonetheless, the products are quite different. The Sniper Lite utilizes the SyncCam. This cam does not have the perimeter weight or the aggressive radius of the WX-cam.



It promotes an ultra-smooth draw. The SyncCam is a linked system that provides centering throughout as the arrow is released. In addition, the Smart Guide Cable Slide reduces torque. The guide rides in a slanted or angular track, providing relief on the cable and cam system as the crossbow is drawn and peak weight builds. These features, combined with a less aggressive draw curve, promote durability and accuracy.

The Sniper Lite utilizes an RS Tread. The RS Tread is integrated into the aluminum riser. This design feature is unique and places the foot-hold location behind the riser. The technology reduces the overall crossbow length, as there is no need for a traditional stirrup. Just in front of the RS Tread are the limb pockets. The pocket system is unique in that it employs an ALRS (Adjustable Limb Retention System). The system allows limb tension adjustments, which is unusual for crossbows. The extra-long limb bolts permit users to do their own maintenance without the need for a crossbow press.

The BIAS (Bridged Integrated Accuracy Support) Rail is designed to promote accuracy. The system includes a beveled rail and low friction surface; such features are positive for shooting, as they have minimal adverse impact on the propulsion cycle. The Sniper Lite's barrel runs from the aluminum riser to the rear of the crossbow. Its design is distinctive yet functional and promotes a ridged, robust crossbow platform.

The PCC (Positive Cocking Control) Anchor is an orange

Mission MXB-Sniper Lite

Contact Info

Mission Archery

www.missionarchery.com

MSRP:

\$599 (Crossbow ONLY)

Finish:

Black Tactical

String Material:

Zebra® Hybrid

Cams:

SyncCam™

Riser:

Aluminum

Stock:

Composite

Performance at a Glance:

Arrow	Speed	K.E.	Momentum
425 Grains	299.5	84.7	18.1
475 Grains	284.6	85.5	19.3
525 Grains	271.9	86.2	20.3

colored device that is positioned under the rail at the rear of the crossbow. The grooved mounting device acts as an anchor point that is used in combination with the rope cocking aid to draw the crossbow. This feature is unlike that of most other crossbow models, which position the cocking rope behind the trigger housing. The PCC Anchor instead creates a downward angle for the cocking rope, limiting the ability of the cocking aid to become unhooked. The PCC Anchor also acts as a connection component for the RSD (Removable Silent Draw) System. The RSD is one of the most advanced components released on the market for drawing a crossbow yet it is designed to be simple to use. The RSD is exclusive to Mission and is constructed to aid those who want an effortless and noiseless system while drawing a crossbow in the field or at the range.

The crossbow dimensions/weights measured out of the box are shown in the chart above.

Next, the crossbow went through a thorough inspection. The review focused on the string/cables, eccentrics, limb and limb pockets, rail, stock, butt plate, trigger housing, trigger and trigger guard. After a thorough review of the Sniper Lite, I found several small blemishes in the finish. I noted a minor nick on the scope rail and riser. I would rate this product as above average in the workmanship section.

Thereafter, I put the product through a 75 to 100 shot cycling to verify functionality. Some minor testing was

Dimensions

Model	Axle-to-Axle (inches)	Axle-to-Axle (full draw) (inches)	Power Stroke (inches)	Overall Length (inches)	Mass Weight (including scope)	Mass Weight (without scope)
Mission MXB-Sniper Lite	17.94	13.69	14.25	33.25	7.59 lbs	6.5 lbs

performed but the focus was to detect any issues or concerns with the product before starting the actual performance testing. The Sniper Lite performed well in this segment. No major differences were noted from the start to the finish. I thoroughly checked the strings and cables and noted no differences from the initial quality review. Rail lubricant is a must for this crossbow. The user manual recommends use of Mission Rail Lube at intervals of 15 to 20 shots.

The crossbow was next evaluated on the five criteria outlined below:

Dynamic Efficiency: The dynamic efficiency portion of the test utilized a Revere Load-Cell controlled by a winch device; the load-cell connected to the crossbow with a cocking aid. The crossbow was mounted in a shooting platform that controlled any movement that might have been experienced as draw-force curves were taken. The stored energy obtained from the draw-force curve was used in conjunction with the speed measurements to calculate dynamic efficiency.

Speed per Inch of Power Stroke: Speed measurements were taken with three projectiles. A Pact Chronograph XP and a Competition Electronics Pro-Chrono IR were set in tandem to record results. The average speed measurement was divided by the power stroke to determine the speed per inch of power stroke.

Noise Output: Sound measurements were recorded with three projectiles. The measurements were averaged and the sound meter was set to take measurements with the



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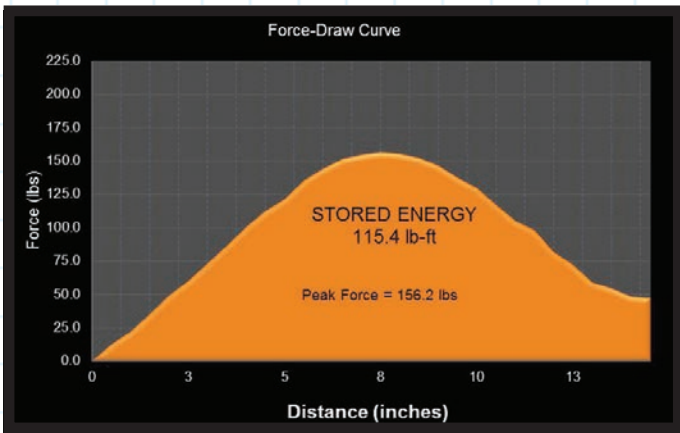
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Performance Information

Peak Force	156.2	lbs
Stored Energy	115.4	lb-ft
Dynamic Efficiency	425 grains	73.4 percent
Dynamic Efficiency	475 grains	74.0 percent
Dynamic Efficiency	525 grains	74.7 percent



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Trigger Force: The Trigger Force measurements were recorded in pounds and averaged. An Imada Digital Force Gauge was used to determine the peak trigger force.

Precision Measurements: This test provided an indication of how close groups were shot together when shot by hand from a bench rest or another supportive device. Group size was calculated using extreme spread.

Testing

The Sniper Lite performed flawlessly in the laboratory testing. The results were near what was expected per the advertised measurement. The sound results were likely the lowest that have been recorded since 2009 and the felt vibration was minimal. In fact, I do not remember a crossbow with less vibration. While keeping this in mind, consider that the Sniper Lite is not a speed bow. It is likely one of the slowest crossbows I have tested but it still averages 20 feet per second (fps) per inch of power stroke. Lower energy output does not always result in lower noise and vibration but in this design, it does. The Mission limb pockets are likely one of the features that isolate the limbs, where vibration predominately originates. Other features are integrated in a way that possibly increases the vibration transmission loss in the crossbow, which is a good thing. The Sniper Lite design limits any loose parts or components that are susceptible to reacting negatively to resonating vibration.

The Sniper Lite's efficiency numbers were where I had expected they would be based on the draw curve and energy

Sound Measurements

Weight (grains)	425	475	525
Parameter	Peak A -Weighted Noise		
1	83.6	82.3	82.3
2	83.5	82.7	82.3
3	84.1	82.4	82.8
4	83.7	83.0	82.5
5	84.0	82.8	82.3
6	84.2	83.0	82.4
7	84.0	83.0	82.5
8	83.9	83.4	82.3
9	83.6	83.0	82.6
10	83.6	82.9	82.7
Average	83.8	82.9	82.5
Total Avg Max (dBA)	83.0		

output. The stored energy displayed a hill-like shape that presented a steady rise, subtle plateau and steady decline. Such characteristics demonstrate a "smooth" draw, as it is considered in the vertical bow world. The recorded efficiency numbers were just under 75 percent. The output numbers were near 300 fps. Note that the minimal arrow weight utilized was 375 grains. Therefore, the use of a lower arrow weight may push the crossbow speed up 10 to 20 fps.



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The trigger pull measured just over 2.5 pounds. Some may consider that lighter than normal. The range of most manufacturers is 3 to 6 pounds. The profile of the Sniper trigger is unique. The trigger stacked irregularly, as the weight load was not linear but constant. If the shooter let off the trigger prior to reaching the break point, the trigger would not reposition itself, meaning it would not return to its static position as most do. This last aspect is distinctive. As the trigger reaches the break point, slight let-off is achieved and a defined break point occurs. The break point is definite and distinct and should be acceptable for many as long as they do not jerk the trigger. The trigger was acceptable from a user standpoint and I experienced no malfunctions.

The precision results were acceptable. The arrows utilized were made by Victory Archery, incorporated aluminum half moon nocks and required a 1.35 inch fletching clearance. The lighter of the two arrows seemed to fly more consistently and the scores demonstrated groups around 2 inches. Groups at or below 2 inches seem to be an acceptable standard for my testing, considering my shooting prowess. This crossbow produced results around that standard.

Speed Information

shot	Weight (grains)	Chrono 1	Chrono 2	shot	Weight (grains)	Chrono 1	Chrono 2	shot	Weight (grains)	Chrono 1	Chrono 2
1	425	299.8	298	1	475	284.8	283	1	525	272.1	270
2		299.1	297	2		284.2	282	2		271.6	270
3		299.6	298	3		284.9	283	3		272.0	270
4		299.7	298	4		284.6	283	4		271.9	270
5		299.2	297	5		284.5	283	5		271.8	270
avg (fps)		299.5	298	avg (fps)		284.6	283	avg (fps)		271.9	270

Performance Information

Peak Force		156.2	lbs
Stored Energy		115.4	lb-ft
Dynamic Efficiency	425 grains	73.4	percent
Dynamic Efficiency	475 grains	74.0	percent
Dynamic Efficiency	525 grains	74.7	percent

In The Field

In the woods, I set up targets at 30 to 40 yards from a ground blind that was set up for turkey hunting. The Sniper Lite's precision shooting results from the performance testing are likely representative of what most average shooters will experience. In the field, the results were the same and in a few instances, maybe better, which I suspect was due to my



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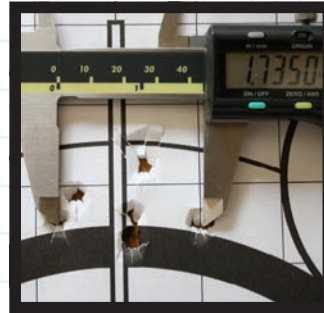
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Projectile Precision

	Model/ Brand	Arrow Weight	Distance (yards)	Spread 1 (inches)	Spread 2 (inches)	Average (inches)
Shooting by Hand	Mission	417.7	40	1.735	1.779	1.757
Shooting By Hand	Mission	419.1	40	2.567	2.569	2.568

heightened familiarity with the product. I did not have an RSD System with me while in the blind but I certainly recommend one. When you are shooting in tight spaces or out of a treestand, it is a vital feature and a worthy investment.

While shooting at the target, I tend to displace my attention away from the point of aim for several moments and focus on the crossbow features. The Sniper Lite's soft touch forearm and handle provide ample comfort and increase crossbow control. The center of mass is just in front of the trigger; the positioning is ideal for most shooters. The balance point will change slightly with the addition of the quiver, bracketing and arrows. The additional weight is not significant and did not affect my shooting. The two other items that played into the field test were the trigger and scope. The trigger is acceptable and I think most will enjoy its low weight and distinctive release point. The Hawke XB-1, a 1.5-5 × 32 SR etched reticle scope, absolutely stood out. The package includes clear instructions for operation and maintenance. This scope is very clear and with numerous mounting options, the shooter can really customize the fit to his or her preferences. Additionally, the scope can be precisely calibrated for



Trigger Analysis

	Trigger Pull (lbs)
1	2.76
2	2.66
3	2.71
4	2.58
5	2.59
6	2.68
7	2.75
8	2.91
9	2.55
10	2.56
11	2.78
12	2.79
13	2.81
14	2.71
15	2.62
Trigger Pull	2.69

various speeds based on the speed selector mechanism. The illuminated reticle from Hawke is a great option for those who hunt in shade, in a blind or at dawn or dusk. The etched reticle is designed for easy target acquisition and the ability to quickly and simply acquire targets is essential in the field.

I mentioned the RSD System as a great accessory. For some, due to their physical limitations, it is a necessity but others may be just as satisfied with the standard rope cocking aid. The Sniper Lite's draw-force curve replicated what I consider an ultra-smooth draw. Because I did not use the RSD in the field, I had to draw the crossbow with the standard rope cocking aid. In my field testing scenario, I was in tight corridors and had to repeat the drawing sequence many times; this created a requirement for a product that was simple and easy to draw. I did not struggle and I suspect most will not either; I am pleased to see Mission focusing on characteristics that are more of a concern in the vertical bow market. Another simple-to-use feature is the RS Tread. The RS Tread fosters compact crossbow design and the tread scheme allows for ample contact. Trying to reload a crossbow in a treestand or a blind can be difficult because of space constraints. This feature minimizes those concerns and supports drawing of the crossbow while sitting down.

The last feature I wish to discuss is weight. The Sniper Lite is advertised to have a bare crossbow weight under 6 pounds. The measurements taken in this test were slightly higher but the crossbow is certainly lighter than most competitors' products. Mission, like Mathews, is focused on easy-to-use features and facets that benefit archers in the field. A lightweight product can make a difference and will ultimately make or break a shooter's success. The Sniper Lite demonstrates some major advancements that users will enjoy and weight may be its top selling attribute.

Hot Features

This article has listed numerous technologies that are innovative and prove the Mission design team understands what consumers prefer. Mission is not introducing all these technologies just to be different. The Sniper Lite is designed with purpose and its unique look and feel are meant to strike a chord with newbies and experienced crossbow users. Here

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are the “hot” features that I suspect users will enjoy: the easy to handle draw-force curve, RS Tread, Hawke scope, product weight and minimal sound and vibration output.

The Sniper Lite scored as exceptional, above average and average in many categories. The performance in some areas was superb and in other segments, it was normal. The product did well in the sound and vibration criteria and the overall crossbow is designed robustly. One feature that could be improved upon is the rear part of the stock. Increasing stock comfort while maintaining the same level of or perhaps increasing adjustability should increase the likability. The trigger displayed no opposing pressure during the pulling sequence prior to reaching the break point. Those who do a lot of shooting may prefer a trigger that provides resistance toward the static position while it depresses, especially in a scenario in which the shooter has to pause or cease firing.

Overview

Mission’s MXB-Sniper Lite demonstrates great functionality in a compact package. Key technologies exist across the entire platform. Mission presents several options for those looking to customize the Sniper Lite. The various options provide adequate flexibility to build a crossbow package with price and user preferences in mind. Those who are interested in shooting the Sniper Lite will likely key in on the weight, draw-force curve and sound and vibration output. Comparatively few crossbows will compete in those areas.

As always, please try and test fire this crossbow; relying on objective results alone does not tell the full story of how a

product feels and shoots.

A special thanks goes to Caldwell Shooting Supplies and BIGShot Targets.

Caldwell Shooting Supplies provides high definition targets and a sturdy shooting table that is unyielding during testing. Caldwell is a solid company in the outdoor industry, producing top-of-the-line shooting supplies.

BIGShot Targets provides Iron Man Targets, utilized in the laboratory testing as well in the precision shooting test. The targets are able to withstand shots at close and long distances, including shots in tight groups centered on a single point. I have been impressed and pleased with the quality of products produced by this target supplier.



ArrowTrade Scorecard

Evaluation Criteria	Score
Adjustability	Green
Craftsmanship	Green
Design Integrity	Green
Features	Green
Performance	Light Green
Sound	Blue
Trigger	Light Green
Vibration	Blue

Note: The ratings are based on the following color codes:

Blue = exceptional,
Green = above average,
Light Green = average,
Yellow = marginal,
Red = unacceptable



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