

ArrowTrade Bow Report

Have you ever gone to a crowded gym to do some strength training with free weights? If so then undoubtedly you have seen the guy who screams in his buddy's face to "push it", "don't give up", "drive, drive, drive", etc. No matter how that scene may appear to someone on the outside the guy doing the yelling is actually acting in the best interest of his buddy because he knows that only through pushing past his comfort zone will his buddy reach his goal. This is the scenario that came to mind when I was thinking about the Mathews company and its founder Matt McPherson; only in this case the guy yelling and the guy doing the heavy lifting were one in the same – Matt. Matt pushes himself and his company to reach beyond what is accepted as the norm or what is considered "good enough". If you lay out the innovations brought to market by Mathews since their inception you will see a steady, unrelenting process of continuous improvement.

The new Mathews Z7 embodies my point above. It not only takes the mechanics of shooting to a new level it also has a new look and feel to go along with it. You will find some "oldies but goodies" on the Z7 including past parallel SE4 Composite limbs, Harmonic Dampeners, SphereLock Pivoting Limb Cup with Limb Turret, limb mounted string dampeners, Quick Change Axle and Zebra strings/cables. Features new for 2010 include a SlimFit Inline grip, Monkey Tails string silencers, Reverse Assist Roller Guard and Grid Lock riser.

Isometric Infrastructure:

The first thing that will catch your eye when you see the Mathews Z7 is the all-new Grid Lock Riser design. A series of isometric cutouts aligned to a grid replace the typical random cutouts found on most rigs. While I'm sure looks had something to do with why it was created this way my guess is that there is much more to it. After all, we are talking about Matt McPherson's company here. The grid pattern builds strength through interlocking bridges that connect the riser's outer edges. Increased muscle, however, does not equal increased bulk in this case, as the Z7 tips the

scales with an overall mass weight of only 3.97 pounds.

Pushing the envelope and thinking beyond the norm is what put Mathews on the map many years ago and it is what drives the company still today. Joining the Grid Lock Riser on Mathews' "new" list is the Reverse Assist Roller Guard. Mounted to the riser just above, and opposite, the shelf area the new roller guard gets part of its name from the position of the cables on the rollers. Rather than placing the cables in the typical position under the rollers (further away from the shooter) Mathews REVERSES their position, placing them over the rollers and closer to the archer where they are held in position by the system's tension. In a typical system the cables move toward the shooter during the draw cycle. With the cables wrapped under the rollers it makes sense that they would get tighter and tighter on the stationary guard the closer to full draw you got. With this new configuration the cables on the Z7 actually get looser resulting in less tension and torque, which translates into a smoother draw. Cables are trapped between the rollers and a post mounted at the rear of the system to provide safety through full capture containment. The Reverse Assist Roller Guard's main structural arm is machined out of aluminum and contains cutouts that compliment the overall look of the riser and bow.

One of the most important components on any bow is the interface between the shooter and the rig - the grip. In past years Mathews has been known for their narrow throat grips with an inflated heel. While they got the job done functionally



SlimFit Inline grip

About The Author

Jon E. Silks has a degree in Quality Engineering and much of his career has centered around the testing and evaluation of products. Now 41, he's been bowhunting since age 12. Silks started writing for magazines and websites 10 years ago and since then has done more than 500 product reviews. Manufacturers who appreciate his thoroughness and frankness have often asked him to conduct third-party testing of their prototypes. Silk's work has appeared on the web on Bowhunting.net and Bowsite.com and has been published in *Petersen's Bowhunting*, *Bowhunter*, *Arrow Adventure* and *Whitetail Fanatic*, along with *ArrowTrade*. Jon and Jennifer Silks have six children and live in Pennsylvania. Silks can be reached at jon@silksoutdoors.com.





Mathews Z7



there were some folks that criticized the large heel, complaining that it was not comfortable. The Z7 sports an all-new SlimFit Inline grip, which is narrow from top to bottom. A single red strip of wood that is laminated into the one-piece walnut grip defines the centerline of the bow. This marker allows for a quick and easy initial setup of the arrow rest's windage position. The words "Mathews Solocam" and "Z7" are laser engraved into the grip.

Other riser features include a metal stabilizer-mounting insert, Dead End String Stop, Harmonic Stabilizer and Harmonic Dampener. The webbing that surrounds the Harmonic Stabilizer and Dampeners is red to go along with the other red accents found on the Z7. Available riser finishes include Lost Camo or Matte Black.

Talking Points – Riser

(Notable bow features/characteristics to bring up during the selling process)

- Point out the new Reverse Assist Roller Guard and explain how its mechanical function makes sense and helps to produce a system with less tension and torque and why that translates into a more accurate shot and smooth draw.
- You now have a grip on a Mathews that will sell itself. Get the Z7 into your customer's hands. The new narrow profile will undoubtedly fit a wide array of archers and you now have a response to those that say they never really liked the Mathews grip.
- Point out all of the technology and features found on the riser – there is no shortage of talking points here.

Minimal Material/Maximum Impact:

Once you reach each end of the riser you will see that Mathews has made it their business to produce performance with a minimal amount of material. We will start with the SphereLock Pivoting Limb Cup and Limb Turret. There are three basic components that make up the overall pocket system. These include the flared ends of the riser, the SphereLock Pivoting Limb Cup System and the Mathews' Limb Turret. Working together they accomplish comparable limb control to that of a full size pocket.

Located at the forward riser flare are the limb bolt and SphereLock Pivoting Limb Cup System. This small cup is not much larger than the head of the limb bolt and captures about 8/10 of the limb's thickness. The rear facing



Detail of the limb cup system

Test Equipment	
Last Chance Archery Power Press	Oehler M35 Chronograph with indoor lighting system
Spot-Hogg Hooter Shooter portable shooting machine	Easton Professional Chronograph with an infrared lighting system
Modified Apple Bow Drawing Machine	Easton Digital Bow Scale
Calibrated Mitutoyo Dial Calipers – 8”	Calibrated steel rule – 36”
Calibrated Chatillon DFIS 200 Digital Force Gauge	Victory Archery Arrows
NAP QuikTune 3000 Arrow Rest	Tru Ball Chappy Boss Mechanical Release
American Whitetail Large Bag Target	

riser flare is home to the precisely machined aluminum Limb Turret. This unit cradles the limb and essentially spreads the limb load over a greater area. A lack of material in these components works into a reduced mass weight.

When Mathews initially introduced the Slim Limb technology they relied on extensive cycle testing data to ease the fears of those not too sure about these kid-bow looking limbs. I have to admit that when I first pulled a bow outfitted with these limbs my face was grimaced and eyes were half shut! Now, years later they have all the cycle testing data they need provided by the thousands of archers who have been shooting the design. These limbs may look undersized to an industry dominated by wider versions but they have proven themselves to be among the most reliable in the business. Limbs measure 14 inches in length and are constructed of a proprietary composite material.

Talking Points – Limbs and Limb Pockets

- The limb pockets and limbs are a minimalist's dream! They do the same or better job than other designs with a significant reduction in material – the return to the customer is a lighter bow that can be trusted.
- A pivoting limb pocket creates a more consistent and precise limb-to-riser interface

A new style of roller style cable guard has the rollers inside the cables, so as the bow is drawn and the eccentrics move down and in the tension on them relaxes.



Smooth Sailing

Mathews invested deeply into the design of their Z7 Solocam with a laser-like focus on creating an ultra smooth draw coupled with good speed. Both cam and idler wheel are outfitted with sealed ball bearings for less friction and increased efficiency. Draw lengths are cam specific meaning that a new cam is needed for each draw length option. Cams are available from 25 to 30 inches including half sizes

Bow Specifications			
Manufacturer:	Mathews		
Model:	Z7		
Website:	www.mathewsync.com		
<i>Draw Weights</i>	40, 50, 60, 65 and 70 lb peak	<i>Finish</i>	Lost Camo or Black
<i>Draw Lengths</i>	25-30" including half sizes	<i>Grip</i>	SlimFit Inline
<i>Axle-to-axle length</i>	30"	<i>Riser</i>	Grid Lock Riser
<i>Brace Height</i>	7"	<i>Limb Pockets</i>	Limb Turret/SphereLock Cup
<i>Mass Weight</i>	3.97 lbs	<i>Limbs</i>	SE4 Composite Slim Limb
<i>Let-off</i>	0.80	<i>Cable Guard</i>	Reverse Assist Roller
<i>Advertised IBO</i>	Up to 332 fps	<i>Warranty</i>	Limited Lifetime
<i>Eccentrics</i>	Z7 Solocam	<i>MSRP</i>	\$899.00
<i>Strings/Cables</i>	Zebra Barracuda		

Test Parameters

- Bow weight: 70 pounds +/- 0.1 pounds
- Draw Length will be set to 30" (+ 0.25" -0.00")
- Properly spined arrows will be selected according to the formula set out in the I.B.O. rules for minimum grains per pound (350 grains)
- All arrow velocity ratings must be measured using a shooting machine with mechanical release
- A minimum of five shots must be chronographed using an arrow as defined above. The five shots will then be averaged to obtain the final result. All velocity values for a given arrow must fall within a range of 2 ft/sec
- A chronograph with a minimum of two gates set no more than 48" apart will be used. The initial gate will be set at 36" from the front of the bow's handle.

Test Method

- Just to make sure the bow is at least in the right ballpark the draw weight and draw length are roughly verified with Easton's Hand Held Bow Weight Scale and a simple draw length arrow correlated to a mark on the shelf adjacent to the deepest part of the grip. This saves me a lot of time if the bow is not close to the right draw length or draw weight.
- Brace height is tested using calibrated dial calipers
- Install New Archery Products Quik Tune 3000 Arrow Rest
- Set nock point
- Verify draw weight using a calibrated digital force gauge backed up with the Easton Bow Force Mapper (BFM) System handheld unit
- Verify draw length using the Silks Outdoors Bow Analysis Program, which is a combination of a custom software package, modified Apple Bow Drawing Machine, Chatillon digital force gauge, calibrated 36" steel rule and trammel point
- Mark cams at full draw
- Paper tune by hand
- Set bow on Spot Hogg's Hooter Shooter portable shooting machine – draw to cam marks and fire through two chronographs – Oehler and Easton. Both chronographs are equipped with indoor lighting kits.
- Speed is recorded from the average of 5 shots.

(25.5 – 29.5 inches). Mathews makes the job of changing out cams easier with their Quick Change Axle (QCA) feature. Rather than the typical e-clip design the QCA uses a simple plastic fixture to capture one end of the axle while the opposite end is fitted with a pull-knob. IBO speeds are advertised to reach 332 feet per second with an 80 percent system letoff.

Talking Points – Eccentrics

- Speeds reaching 330 fps were almost unthinkable not all that long ago – Mathews is now doing it with a single cam that demonstrates excellent shooting characteristics including a super smooth draw.

Objective Test Categories

Kinetic Energy: 84.14 foot-pounds

This is the energy that actually goes into propelling the arrow. Basically, it is the energy that is left over from the stored energy after all of the bow system friction is accounted for.

Stored Energy: 102.23 foot-pounds

When a bow is drawn energy is supplied to the limbs. The amount of energy that the limbs can hold is the stored energy

Efficiency Rating: 82.3 percent

This is the amount of stored energy (in %) that can be successfully transferred into propelling the arrow upon release. The bow design, including limbs, limb pockets, cam systems, and axle types play into the bow's efficiency.

SE/PF Ratio: 1.46

This is the ratio of stored energy to peak force. In other words, what returns are you getting for the power you supply?

There are no metal spring clips to keep track of with the Z7, as eccentrics are fitted with another Mathews innovation. The Quick Change Axle feature operates with finger pressure and has a two-stage release so the axle is contained even in a bump should free the main lock.



Velocity Test Results

	350 Grain Arrow	425 Grain Arrow	540 Grain Arrow
Shot # 1	328.6	300.4	268.5
Shot # 2	328.3	300.6	268.4
Shot # 3	328.7	300.5	268.9
Shot # 4	329	300.6	268.2
Shot # 5	328.8	300.7	268.3
5 Shot Total	1643.4	1502.8	1342.3
Average Velocity	328.68	300.56	268.46



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Testing

A single brass nock and QuikTune 300 Arrow Rest were attached to the bow – nothing more. With the exception of these two items every bow is tested just as it would be shipped to the dealer or customer. If it has string silencers or other components pre-installed it is tested with them installed. While the 'official' velocity rating for our calculations will be taken with an arrow as defined below, we will also use two other test arrows as reference points. This will be done to bring a bracketed picture of the bow's speed performance to the reader. Test arrows include a lightweight 350-grain arrow, a mid-weight 425-grain arrow and a relatively heavy 540-grain arrow. Before recording speeds with these arrows the bow was first paper tuned with each one. Most every bowhunter/archer will be able to extrapolate their approximate arrow speed in relation to similar set-up parameters and results presented from the three test arrows.

The speed result from the 350-grain arrow is entered into the Silks

Outdoors Bow Analysis Program, which then automatically calculates Kinetic Energy, Stored Energy, and Efficiency.

Potential customers will generally make their bow purchase choice based on several factors including the cost, speed, shot noise, shock/vibration level, grip and the draw cycle.

In our testing for Arrow Trade

Magazine we try to give you a feel for how a bow performs in the "subjective" areas mentioned above. You can then focus on the bow's notable subjective points when interacting with your customer. The term "subjective" can basically be translated into "opinion". Here is my opinion of this bow's performance in the following subjective categories:

Subjective Test Results

Shot Noise:

With a minimal report at the shot the Z7 will no doubt prove to be one of the quieter bows on the market for 2010.

Grip Comfort and Function:

A definite win on the Z7, as Mathews has retained the effectiveness needed for accurate shooting while narrowing the grip for added comfort.

Draw Cycle "Feel":

Exceptionally smooth for any bow - made all the more impressive by the speeds generated. Check out the smooth transitions to and from peak on the draw cycle curve.

Shock and Vibration Levels:

The shot produces a small "bump" in the Z7's handle, however, it is short lived. A quality stabilizer deadened it even quicker.

TestID:	10 Mathews Z7	Draw Length:	30.25"	Speed:	329
Tested By:	JS	Brace Height:	7.0"	Power Stroke:	1.79 ft
Min Load:	15.6 lbs	Max Load:	70 lbs.	Kinetic Energy:	84.14 ft-lbs
Min Pos:	30.25"	Max Pos:	20"	Stored Energy:	102.23 ft-lbs
				Dynamic Eff.:	82.30%
				Brace Height:	△
				Peak Draw Weight:	△
				Full Draw Condition:	△
Distance	Load R1				
8.75	0.00				
9	2.00				
10	14.60				
11	26.40				
12	38.80				
13	50.80				
14	60.00				
15	65.80				
16	68.80				
17	69.60				
18	69.40				
19	69.40				
20	70.00				
21	70.00				
22	70.00				
23	69.40				
24	69.40				
25	69.60				
26	68.40				
27	65.80				
28	56.60				
29	44.20				
30	24.80				
30.25	15.60				



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