

IMPROVING UPON A MODERN CLASSIC?

There are cat people and dog people. Some pet lovers may embrace both with universal acceptance, but for most it's an either or proposition. So too it seems that semi-auto shooters and double-gun shooters favor one or the other, but rarely both. The choice of a gun is an intensely personal one, which is why so many shooters customize their guns with all manner of adjustments, appendages and modifications – to which a cursory glance at the gun rack at any sporting shoot will attest.

Like so many, I started with an autoloader. But as soon as I could afford it, I purchased a new double gun. As I became more serious about sporting, I gravitated to a succession of Italian over-and-unders and have not purchased a repeater since.

But just as an autoloader enthusiast must admit some advantages to a double gun, I began considering experimenting

with a gas gun for a number of reasons, principal of which was reduced recoil. A friend of mine showed up at the range one day with a couple of cases of loads he had won at a charity shoot. They were free for the taking, but neither he nor I could tolerate the pain of shooting them, until he pulled out of his trunk a Beretta 391 Xtrema, which happily devoured the brutal loads without a whimper.

After such a display, the seed was planted and I was ready to purchase an autoloader for the first time in three decades to serve as a back-up target gun and occasional waterfowler. Of the big three autoloader makers, Beretta, Benelli, and Browning, the choice was simple. For one thing the Beretta fits – right off the rack. For another, I needed look no further than to the well-worn 686 in my gun safe with hundreds of days afield and thousands of rounds

STEVEN CLAY GROH COMPARES THE PERFORMANCE OF THE BERETTA OPTIMA-BORE® BARREL PROFILE TO THE UBIQUITOUS BERETTA MOBILCHOKE® BORES IN THE AL391 URIKA, SUGGESTING A COMMON SENSE STRATEGY FOR IMPROVED PERFORMANCE, CONVENIENCE, AND AESTHETICS FOR AN OFF-THE-RACK AUTOLOADER— WITHOUT BREAKING THE BANK.



THE BERETTA MOBILCHOKE (2.0"), BRILEY SPECTRUM (2.75") AND BERETTA OPTIMACHOKE (3.5") CHOKE TUBE COMPARISON.

fired through it without a single malfunction – just one of several flawlessly reliable 680 series guns I have owned.

TO MODIFY OR NOT

The question was whether to buy a current model, featuring Optima-Bore® barrels with over-bored tubes of .733, lengthened forcing cones and longer Optimachoke® chokes, or to modify one of the time tested guns with standard Mobilchoke® bores measuring .723, like an entire generation of Beretta 300 series autoloaders and 680 series over-and-

unders – including my trusted duck gun.

The venerable firm, Briley, has long offered modifications to Beretta autoloaders. In fact, they offer a Beretta 391 Performance Package, which includes back-boring, lengthened forcing cones, porting and extended chokes, essentially replicating the changes offered in the latest Optima-Bore® guns. How would the two compare? Beretta claims that the Optima-Bore® design “reduces felt recoil and improved shot distribution.” Lest I stand accused of trashing what is a fine product, it should be noted that one would have to look far and wide to find a bigger fan of Beretta shotguns. That said, color me skeptical.

UNBIASED ASSISTANCE

Acknowledging my own shortcomings in scientific matters, I enlisted the assistance of Mike Renfro of Renfro Consulting, Inc. as an unbiased, independent consultant, who holds a MS in Applied Experimental Design, to assist in testing and interpreting the pattern performance of the two barrel profiles and the three choke tube options.

The science of ballistics is an arcane field, the seminal work of which, *The Mysteries of Shotgun Patterns*, was published half a century ago by George Oberfell and Charles Thompson. More recently, research has been conducted by D.J. Compton of the ballistics laboratory at the University College London under titles as titillating as *A Stochastic Model of the Dynamics of an Ensemble of Spheres*. As tempting as it may be to delve into the physics of Gaussian spherical distributions and their attendant anomalies, consider it sufficient to say that shotgun patterns exhibit bell-shaped distributions with relatively higher pellet densities toward the center and lower numbers toward a pattern’s edge. This should come as no surprise.

But what is surprising is just how little we actually know about shotgun patterns. The myriad combinations of barrels, chokes, and cartridges can produce dramatically different results with seemingly minor variables. We did not set out to publish a scientific treatise; we wanted to conduct a simple test to provide a reliable, but not exhaustive, conclusion.

TEST CONDITIONS

To control the environmental conditions, we bench tested Beretta Mobilchoke®, Briley Spectrum® and Beretta Optimachoke® improved cylinder choke tubes in the same Beretta 391 Urika at Rocky Mountain Shooters Supply’s 25-yard indoor range in Fort Collins, Colorado. Our

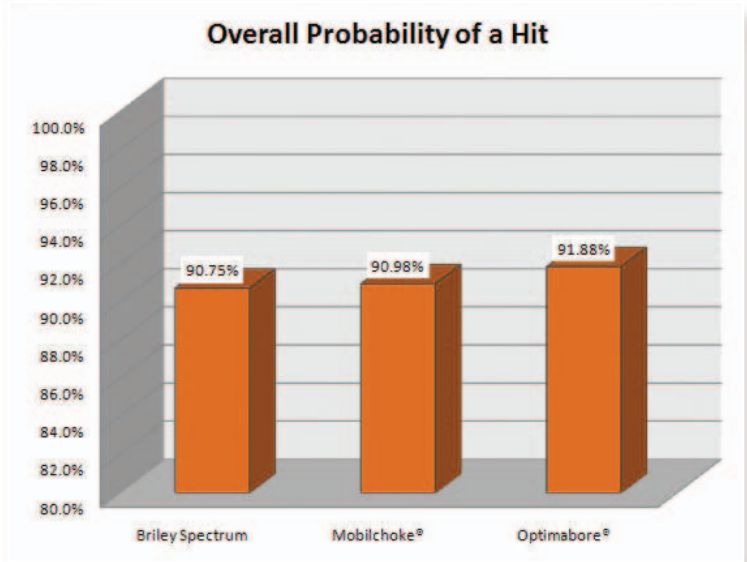
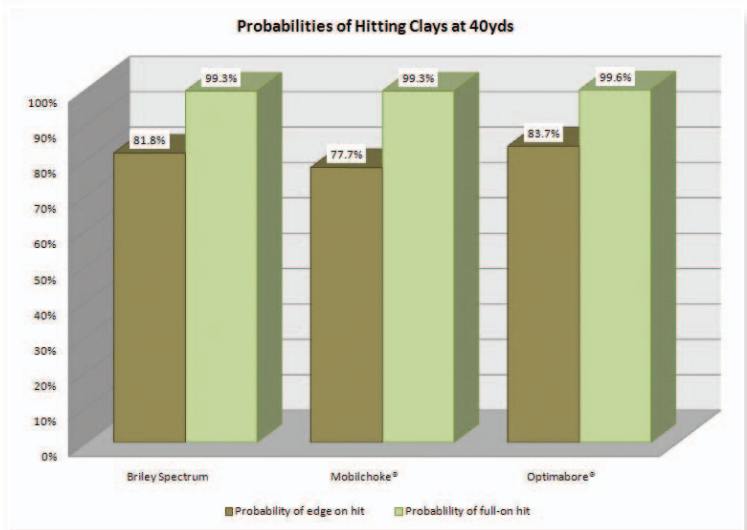
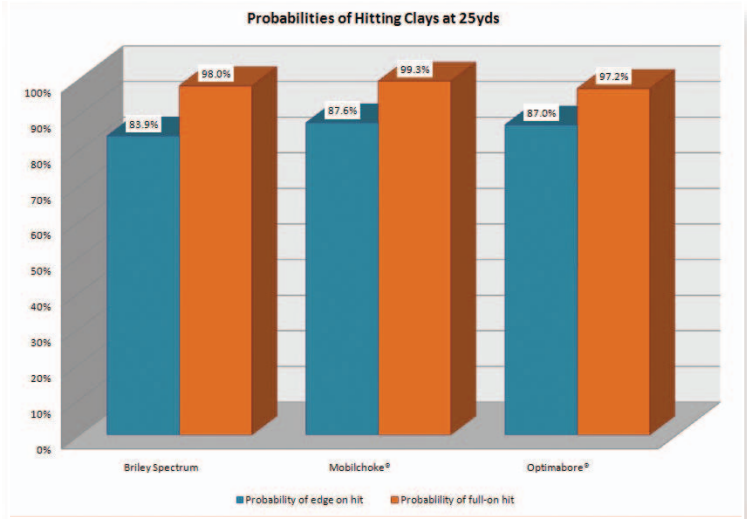
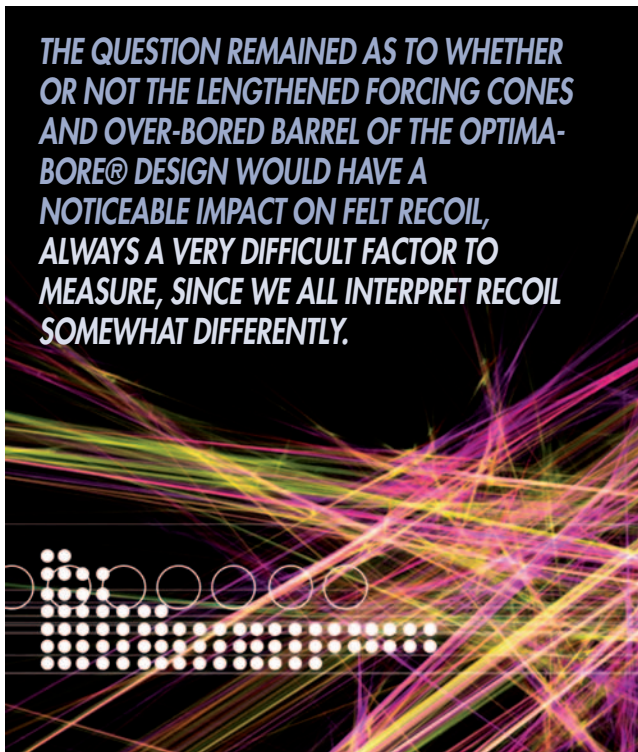
test load was a 28 gram Baschieri & Pellagri sporting clays cartridge in 7 1/2 shot. From a bench rest, one shooter fired three sets of five targets for each choke.

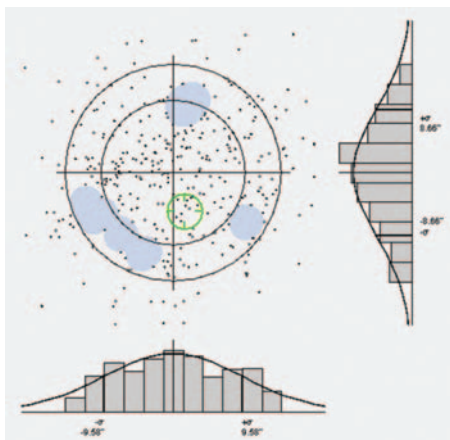
We then processed the results of our testing with Dr. A.C. Jones's Shotgun-Insight pattern analysis software, which performed statistical analysis at our 25-yard test distance, as well as allows us to simulate other distances based upon the pattern recorded. We have reported the results of testing at both 25 yards and 40 yards. Shotgun-Insight develops the statistical probability of a strike of either an edge-on or a full-face standard 110mm target. The results of the center weighted sum, where a shooter would hit the center third of the pattern one third of the time, the middle third of the pattern a third of the time, and so on, demonstrate a very small statistical difference between the three chokes.

At 25 yards, the probability of a full-on hit ranged from 97.2% to 99.3%, and the likelihood of an edge-on hit varied somewhat more from 83.9% to 87.6%. While at a simulated range of 40 yards, the probability of a full-face strike ranged from 99.3% to 99.6%, an extraordinarily small variance, and the chance of an edge-on hit ranged from 77.7% to 83.7%.

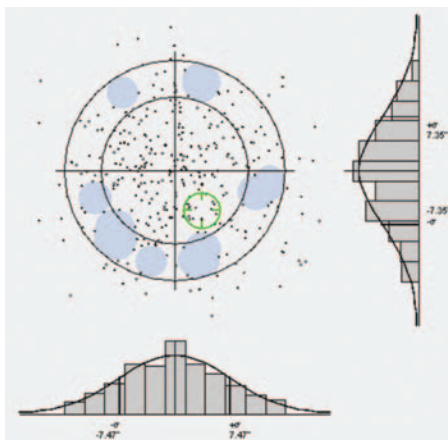
When we estimated overall performance, assuming an even distribution between edge-on and full-face birds, as well as 25 yard and 40 yard shots, the difference is even less statistically significant with the of overall probability of a hit ranging from 90.75% to 91.88%.

But the statistical difference may not translate to a practical difference, since it generally takes more than a single pellet to break a target, especially an edge-on presentation. In the final analysis, the difference is at most one bird per hundred, which of course could be the margin of victory, but I remain unconvinced that there is a practical discrepancy in performance at all.

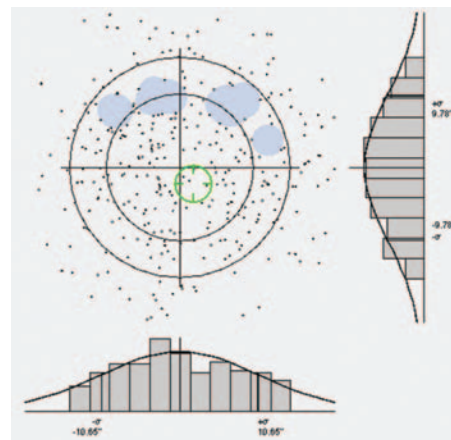




MOBILCHOKE 40 YARD PATTERN.



BERETTA OPTIMA CHOKE PATTERN AT 40 YARDS.



BRILEY SPECTRUM CHOKES AT 40 YARDS.

The question remained as to whether or not the lengthened forcing cones and over-bored barrel of the Optima-Bore® design would have a noticeable impact on felt recoil, always a very difficult factor to measure, since we all interpret recoil somewhat differently. Although I am relatively recoil sensitive, and I habitually shoot light loads, I could not distinguish between the .723 Mobilchoke® barrel and the .733 Optima-Bore®. The Beretta 391 attenuates recoil so successfully that I found it hard to differentiate.

Faced with the potential modifications – back-boring, lengthened forcing cones, porting, and extended chokes – we were now armed with some data. The combination of back-boring and lengthened forcing cones did not

affect either pattern performance or recoil, at least not to a significant enough extent to warrant reaming out the very durable chrome lining of the factory barrels. Likewise, I dismissed the option of porting the Mobilchoke® barrel, since I have a strong aversion to the excess noise and additional cleaning associated with ported barrels.

UPGRADES

But a few upgrades made perfect sense. My gun came with the standard flush Mobilchoke® tubes, which require both a wrench to remove and a pair of glasses to read. For only \$49.95 each, I could purchase as many brightly color-coded and prominently labeled Briley Spectrum® chokes as I wished.

And being precision machined to Briley's legendary standards, these extended chokes could be changed by hand with ease! And an additional benefit of the 391 is that its single bore necessitates half the choke inventory.

I also opted to improve upon the ease with which I could work

the action by adding two simple and relatively inexpensive options: an oversize tactical bolt operating handle and a Briley Beretta EZ bolt release lever kit. With these convenience items, the action opens with ease and closes with authority. It isn't the satisfying clunk of closing a double gun, but



AN AFTER MARKET TACTICAL BOLT AND BZ RELEASE LEVER MAKE FOR EASE OF OPERATION.



THE MERCURY-FILLED REPLACEMENT FORE-END IS AVAILABLE IN VARIOUS WEIGHTS TO CUSTOMIZE FEEL.

Cost of Upgrades

	Units	Cost	Total
Briley Spectrum Chokes	3	\$ 49.95	\$149.85
Briley Beretta EZ bolt release lever kit	1	\$ 60.00	\$ 60.00
Briley Bolt Operating Handle	1	\$ 25.95	\$ 25.95
Hi Vis MagniComp Sight	1	\$ 41.15	\$ 41.15
Mag Cap Weight 6 oz.	1	\$ 60.00	\$ 60.00
Total			\$336.95



it is a noticeable improvement.

As long as I was tricking out this classic autoloader with the latest performance features, it seemed only natural to add the latest in optical technology with Hi Vis Shooting Systems MagniComp sight.

But the greatest single modification to the gun was the addition of a 6 ounce mercury-filled fore-end cap to replace the factory 3 ounce cap. The addition of just three ounces not only transformed the feel of the gun to one much more akin to the solid sensation of shooting an over/under, but moreover the change in weight and balance (and possibly the mercury) did make a noticeable difference in felt recoil.

For a relatively small sum I had improved the feel and function of the Beretta 391 Urika.

The only other upgrade to consider was stock work. A custom stock from Montana Long Guns could be in the offing. But another less expensive option would be to order a ready-made stock from Cole Gunsmithing. Rich Cole's inventory of 391 wood sets range from the *very nice* at around \$500 to *truly spectacular* for around \$1,200.

It will never be mistaken for a Perazzi or a Krieghoff, but my off-the-rack Beretta 391 shoots as well and feels as good as an autoloader can in the hands of a confirmed double gun afficianado. If my previous experience with other Berettas is any guide, I can expect to be well served on the range or in the field for many years to come. Although I am about as likely to run out and adopt a kitten as I am to switch to shooting an autoloader when it really matters, change can sometimes be a good thing. ■