



The  
**Rifle**  
Magazine

November-December 1972  
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Special Hunting Issue

# The **Rifle** Magazine

"Only accurate rifles are interesting"  
- Col. Townsend Whelen

Volume 4, Number 6  
November-December 1972

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## Cover

The rock chuck hunter on the cover of this issue is armed with a Remington Model 700 .22-250 Varminter equipped with a 20X Redfield 3200 scope on a Bridge Mount Co. extension base. Color transparency by Richard Aldis with a 4x5 Graphic View Camera.

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# MUZZLE FLASHES

by NEAL KNOX

**M**AKING BULLETS is interesting, but it can get to be a chore. After you've made your first thousand or so, the glow that comes with ejecting a beautifully formed, near-perfect projectile becomes a great deal less luminous. At least, that's the way it was with me. So I've done everything I could think of to speed up the process and/or make it easier, including picking the brains of long-time bullet-makers for their "secrets."

The first step in bullet-making (as outlined in the last column) is core-cutting, and an easy place to save some time. Our core-cutter, which Dave had had for some time, wasn't marked, so we don't know the maker — which is just as well. It would cut cores, but slowly. The principal flaws were a lack of a shearing arm stop and the

fact that the wire had to be poked through a hole in the shear, instead of being cut by the edge of the shear. In addition, poor mating of the cutting surfaces caused the core to be cut with a wire edge which caused it to stick in the shear hole.

So the core-cutter was overhauled — it would have been as easy to build one from scratch. The hinge pin (a plain threaded bolt) was replaced with a bolt with a shank which had been ground to closely fit new holes. The mating surfaces were ground flat and the hole in the shear milled out to form a notch. An L-shaped bar was silver-soldered to stop its movement as soon as the core was cut; and a hardened cap screw, with the end ground square and polished to reduce drag which tended to bend the cores, was installed.

When a core is cut, the shear stop causes the side of the shear to block any further movement of the wire until the notch is again brought into alignment with the hole through the body. This allows the operator to hold constant pressure on the wire, which makes it possible to cut cores at a rate of better than one per second — if you're in a hurry.

Most custom die makers make some type of automatic ejection system, and I can't imagine making any quantity of bullets without one. Ours, made for the Simonson dies, consists of a plate held to the top of the replacement press ram by the punch holder; this plate is connected by two continuous thread shafts to another plate above the die. Withdrawing the punch from the die brings the top plate against the ejection punch, smoothly ejecting the bullet or core. When we purchased Rorschach dies, the same ejector frame was used (though Rorschach makes one) simply by making a new lower plate to fit his ram replacement. This system works well, but it is possible to tighten the nuts holding the top plate so it is not square, which can throw side loads on the ejection punch, creating unnecessary wear.

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To further speed things up, some die makers have offered devices to catch the ejected core or bullet, but those I've seen have been rather complicated. We simply used an 18-inch tube (a cardboard mailing tube will do, but a Plexiglas powder hopper from a shotshell press is better). The tube was notched to fit around the punch, and part of the top cut off to clear the die and press. Though the ejected core or bullet will drop on the punch, the drop is only about an inch, and doesn't leave any detectable marks.

The tube goes up and down with the ram, and as the bullet is ejected, it



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rolls down the tube into a box which caps the end. This catcher box, which has a pad in the base, rests on blocks which incline the tube enough to insure that the bullets will roll and slide into the box, but not so fast that they might be damaged by banging against each other. With the tube in place, time can be cut by a third, for instead of having to keep one hand waiting to catch the ejected bullet, that hand can be reaching for another core or bullet while the other hand is working the press.

One big time waster is setting up the dies; and it must be done every time unless you have a die body for each die. If you do, the die can be set one time, the locking ring set to hold the die body snug (but not so tight that the body can't be removed without releasing the ring), and the die body screwed into place the next time you use it with assurance that the next batch of bullets is going to be just like the last. Of course, we check the first few bullets to be sure, and we keep the bullets in lots just in case there is some slight difference.

If you are to achieve maximum production, the press handle must be moving almost continuously, with little or no pause to put another piece on the punch. That's difficult to do for long periods. The solution was to C-clamp a piece of plywood to the bench, giving an extension on which to rest the elbow (on a pad). Position the pad so the arm, without the elbow moving, can swing in a smooth arc from the punch to a place on the bench where you can keep the stock of cores. Not only does this eliminate some fumbling, it keeps the arm and shoulder muscles from becoming so tired.

One thing that I've never figured out how to do quickly is dropping the cores into the jackets. I made a loading block from Plexiglas, which holds 100 jackets upright so cores can be dropped in and inspected to be sure all have the convex end down, but this operation takes about twice as long as running the cored jackets through the press. Simonson told me at New Orleans that he plans to begin making core swaging punches that are concave, rather than flat, which will give a core rounded on each end, and which will help cut time a great deal — no longer will it be necessary to look at each core to get the round end into the jacket.


I find it helps to drop all the cores into jackets as a separate operation,

stacking the cored jackets in low flat boxes. While running them through the press I set the container on an angle so they can be removed one at a time. With all pointed the same direction, instead of lying helter-skelter on a towel, there's less fumbling while positioning them over the punch. For a time, I tried pressing each core into place with a cut-off screwdriver, which holds them in the jacket as it is inverted, making handling easier; but this operation also takes time, and I found I got through the total job quicker if I

kept the core in place with the middle finger tip over the mouth of the jacket as it was inverted over the punch.

With these shortcuts, the total time spent making bullets has been cut in half, but it still takes the better part of an hour per hundred, if I include all the time spent checking bullets, lighting my pipe, filling up my coffee cup and generally messing around. But streamlining the operations hasn't affected bullet quality one bit — at least, not that I can detect.

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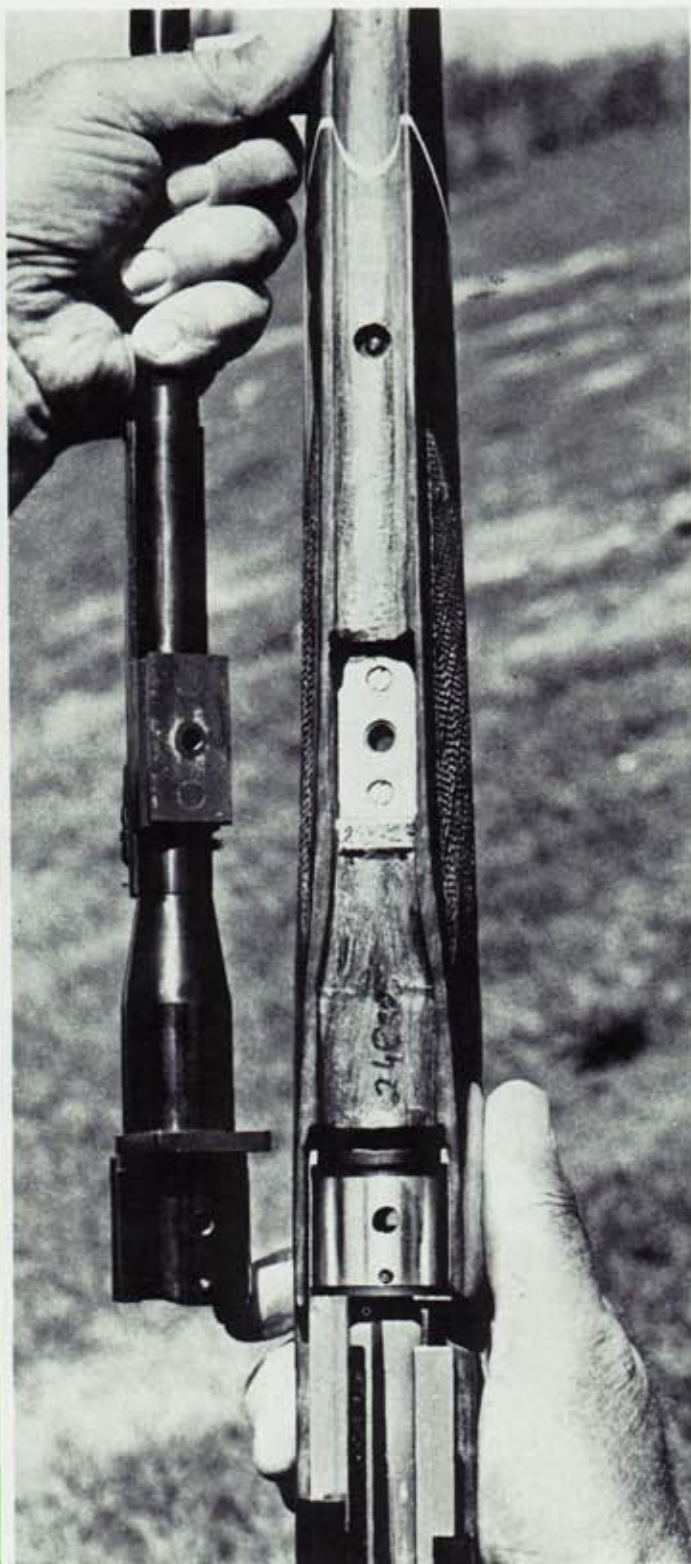
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**a PERFORMANCE report:**

# Mauser's 660 System

By DON ZUTZ



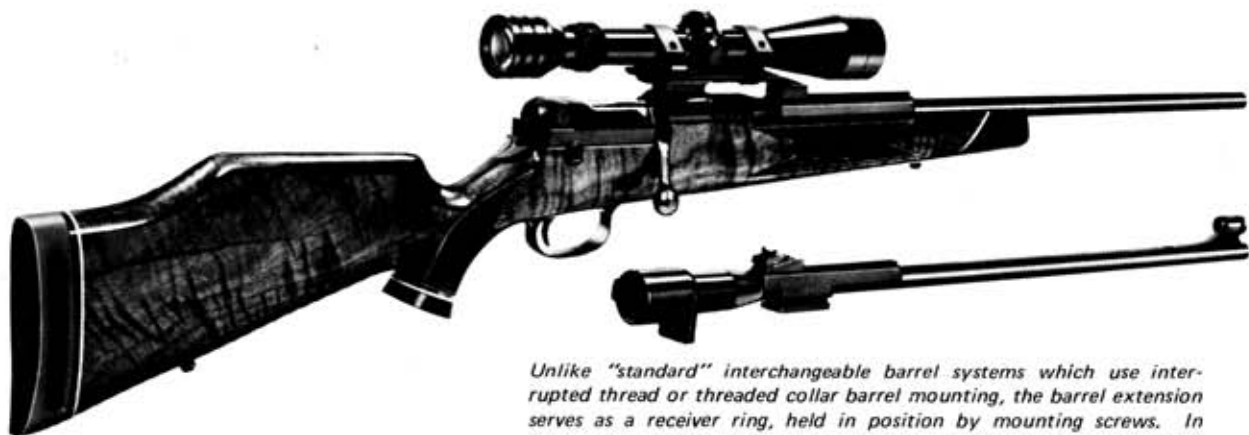
**M**AUSER-BAUER'S Model 660 turnbolt sporter is a new concept in rifle versatility and design, matching an interesting shortaction innovation with interchangeable barrels of various calibers.

Although that description, packed into one sentence, could leave readers scratching their respective noggins as to details, I'm certain it will cause no such wonderment; for the sophisticated rifle buff who reads this magazine has certainly been introduced to the 660 Mauser long ago via pictures in sundry magazines. The Mauser-Bauer Corporation of Fraser, Michigan, which imports and distributes the Model 660, has undertaken an extensive advertising campaign for this item, and various drug store magazines have run introductory reviews of it. Moreover, the *American Rifleman* magazine of March 1971 gave the Model 660 Mauser a 3-page spread, wherein the physical features were discussed and/or described in detail. Thus, well-read riflemen are certainly not at a loss for background information regarding the 660's design and appearance.

Since another basic review would be like eating Wheaties without milk or cream, I'll spare my reader such dry and repetitious prose. Instead, this article will emphasize performance, both insofar as accuracy and handling are concerned. Indeed, this writer, for one, agrees with the reader who complains about plunking down coin for gun reviews based upon nothing more than a mere eyeballing of some arm fresh out of the box. Shooting is the name of the game, and this must be done with the rifle, not the typewriter.

To begin, let's explore the narrative and results of my accuracy testing: Theoretically, any takedown rifle or one of interchangeable barrel design is suspected of being inherently less precise than solid frame models. In general, said inaccuracies stem

*Heart of the unique Mauser 660 interchangeable barrel system are the metal bedding bases below the barrel lug and "receiver ring." Mounting screws hold the barrel in position against the contact points, and the bolt lugs lock directly into the barrel extension. Accuracy is surprisingly good.*



Unlike "standard" interchangeable barrel systems which use interrupted thread or threaded collar barrel mounting, the barrel extension serves as a receiver ring, held in position by mounting screws. In essence, it amounts to a two-piece receiver. The .308 barrel on the test gun was fitted with iron sights, while the .243 tube was clean, fitted with a Mauser scope mount.

from erratic vibrations caused by the lack of rigidity at the takedown point, varying pressures and tensions, and the seeming impossibility of precisely bedding several barrels to one stock. The question in my mind was: could the 660 Mauser system, with its new approach to bedding and securing the interchangeable barrels, overcome the aged rule of thumb?

Essentially, the 660 Mauser does not employ the screw-in method of barrel switching, such as that used on the older takedown Model 99 Savage, the new and expensive "Crusader" concept covered by Larry Sterett in No. 21 Rifle, and the multi-barreled "Old Faithful" discussed by Bob Milek in Rifle No. 9. Rather than utilize a threaded front receiver ring as the principle lock-up point, the 660 system's innovative designers obviously thought in terms of greater rigidity and bedding uniformity. The result is a barrel assembly/receiver concoction of unconventional features, the most important of which are the fact that the barrel extension is, in effect, serving the purpose of a front receiver ring, while the tube/extension assembly rests upon dual fixation points in the barrel channel and is secured there by two allen screws forward of the trigger guard. Thus, the barrel of a 660 lifts on and off instead of being torqued into a front ring, and the above-mentioned allen screws, jutting up through the stock, draw the barrel snugly down and hold it securely positioned with uniform pressures.

One fixation point is a metallic, concave bearing surface set betwixt the magazine's front wall and the recoil lug's mortise. This concave "nest" hosts the chamber portion of the barrel. The forward fixation point finds a flat barrel lug dropping atop an

equally flat brass plate epoxied into the barrel channel just ahead of the tube's tapering forcing cone area. According to Mauser-Bauer literature, great pains are taken in the alignment of these bearing surfaces, since shooting accuracy is almost entirely dependent upon manufacturing precision at those points. And, apparently, the the company feels its production techniques accomplish this alignment requirement, because it does not hesitate to suggest 1 MOA grouping capabilities — which is certainly more than other manufacturers of multiple-barrel rifles (and most fixed-barrel rifles) will do!

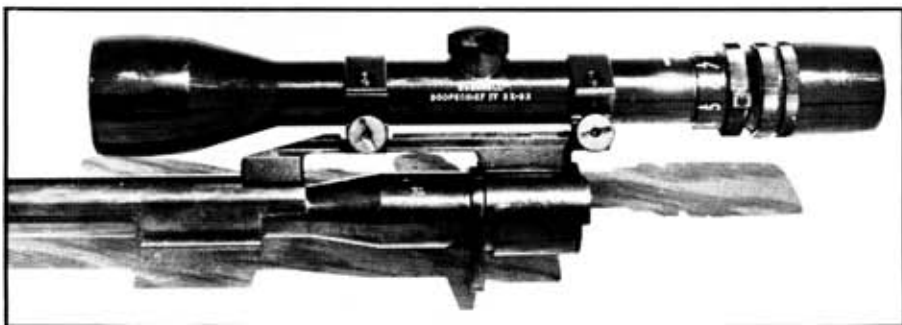
No attempt is made to bed the 18 1/8 inches of barrel forward of the flat fixation lug. However, it must be noted that this free-floated segment does not look like a piece of culvert in an open ditch, as nothing thicker than a sheet of target paper can slip between the barrel and stock.

The Mauser 660 placed at my disposal had a .308 barrel installed and an additional .243 tube. The .308 barrel

wore open field sights; the .243 was plain and hosted a Mauser No. SM6600B scope mount. Additional mounts possible for the 660 are available from Bausch & Lomb, Conetrol, and J. B. Holden.

The .308 assembly slipped on and off the fixation points with no contact on either side of the stock. But the .243 rig did touch somewhat on the right side as it was worked into place atop the bearing surfaces, and one could feel slight wood-to-metal tension as the .243 barrel was drawn down by the allen screws. This slight contact, though, had no noticeable effect upon accuracy, as the .243 tube was a 1-inch performer with at least 3 loadings, and groups always exhibited a symmetrical pattern with no fliers when those accuracy recipes were shot.

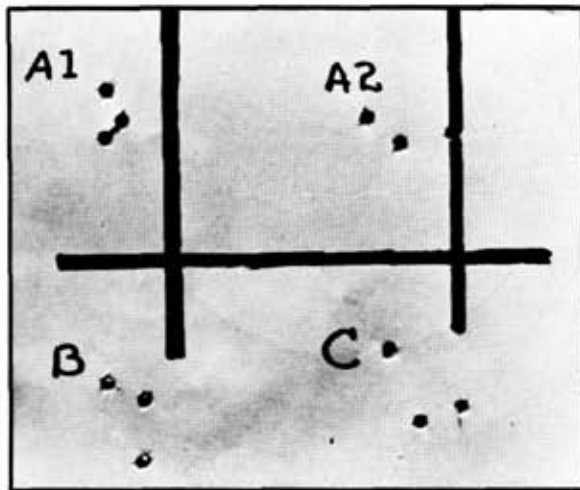
When the .243 assembly did not slip easily into place, another question popped into my mind: how would the lugs bear in these interchangeable barrels? Using layout blue and shimmed empties to supply a back pressure, my local gunsmith came up with the an-



Note that the dismantled .243 barrel wears a completely independent scope and mount, allowing barrels to be interchanged without the necessity of radical sight changes, although Zutz found that there was some variation in point of impact after the barrels had been changed. This barrel wears a 3X-9X Bushnell Scope Chief IV in Mauser-Bauer mounts. Mounts are also available from Bausch & Lomb, Conetrol and J.B. Holden.



The 660 showed the classic tendency to place light bullets higher than heavy weights, as shown at the target at left, shot with the same centered hold on the bull. The 150-grain Silvertips hit about 2 3/8 inches higher than the 180-grain R-P Corelokts. The groups in the right photo were fired at 100 yards with the .308 barrel, and showed



the 660's ability to return to near zero after barrel removal and replacement. Groups A1 and A2 were shot with the barrel "settled in" by several preceding groups. The barrel was removed and replaced before firing both Group B and Group C. The aiming points for Groups A1 and A2 are above the top of the photo.

swer. The right lug was bearing firmly in both the .308 and .243 assemblies, but the left lug did not bear at all in the .243 and touched only lightly at a point about .020-inch out from the bolt body in the .308. Luckily these lugs on the 660 are massive - I would guess designed so to meet such ill-fitting exigencies. (Incidentally, it isn't too unusual to find non-bearing lugs on standard factory rifles.)

Now to the actual shooting: Being no fan of the .308 WCF, I have never obtained dies or collected brass for this mediocre medicine; consequently, I settled on commercial ammo for accuracy work with the .30-caliber tube. I switched the scope mount to the .308 barrel, which also wore open sights, and began punching groups at 100 yards with four different factory loadings.

The results were pleasantly surprising. Through the 9X setting of a Bushnell variable, I watched 150-grain W-W Silvertips and R-P 180-grain Corelokts run 3-shot groups of 1 1/8 to 1 1/4 inches, on average. Some salvos slipped under an inch; others opened slightly to 1 5/8 inches. But everything shot with 150 and 180-grain projectiles landed itself well inside 2 inches, which is very acceptable big game accuracy. Although R-P 180-grainers ran

a shade tighter, on average, than 150-grain W-W products, I eventually used W-W 150-grain Silvertip ammunition as my control load because I found a local dealer desirous of parting with it at wholesale prices.

I then fired three-shot groups with 150-grain Silvertips to determine what the overall performance would be, and a well-held, well-squeezed series of five groups, each cluster begun with a cold barrel, produced a 1.40-inch average. This result, coupled with experimental firings, was sufficient evidence to establish a working control load for the .308.

I then switched the 3X-9X Bushnell to the .243 barrel, and this time greater efforts were made to obtain maximum accuracy. For it seems to me that,

in an interchangeable barrel situation, anyone switching to the smallbore .243 would expect at least 1 MOA happenings. Moreover, there were other experiments to be run, and I used the .243 accuracy load as a control load for those tests.

For my first session I took a random batch of handloads, the contents of which are reported in an accompanying Accuracy Data Table (Initial Firing). I expected some difficulty in developing something that would average under



The Allen screws holding the barrel assembly allowed tightening with greater uniformity than would have been possible with screwdrivers, due to the leverage offered by the wrench.

## Accuracy Trial Data

(INITIAL FIRING)

Rifle: Mauser 660  
Range: 100 yards  
Conditions: Bench Rest; calm, sunny bright  
Groups: 3-shot

### .243 Barrel

| Load                   | Group Size |
|------------------------|------------|
| 35.0/N-203/100 Hornady | 2"         |
| 36.5/RL-21/100 Hornady | 3 1/8"     |
| 36.0/4064/100 Hornady  | 11/16"     |
| 46.0/4831/100 Hornady  | 19/32"     |
| 45.0/4350/90 Remington | 1 1/8"     |
| 38.0/4064/70 Hornady   | 1 3/8"     |
| 45.0/4064/85 Sierra    | 1 1/4"     |
| 47.0/4831/85 Sierra    | 1 3/8"     |

### .308 Barrel

|   |        |
|---|--------|
| Winchester 150-grain (Silvertip)          | 1 1/4" |
| Remington 180-grain (Core-Lokt)           | 1 1/8" |
| Federal 180-grain (Hi-Shok)               | 2"     |
| Winchester 110-grain (Pointed Soft Point) | 3 1/8" |

1 inch, but again the 660 surprised me. Of the eight handloaded recipes used during that initial workout, three punched into less than an inch! One load, 45.0/4350/90 Remington, gave a 3/8-inch performance, but it turned out to be a freak and settled down to 1 to 1 1/8-inch averages during successive outings.

However, a pair of other loads with 100-grain Hornady Spire Points consistently shot into less than an inch for 3-shot groups. These were 46.0/4831 and 36.0/4064. I eventually selected 46.0/4831/100 Hornady as my .243 accuracy load because I had a goodly supply of 4831 on hand; and, on a calm afternoon, I sent a quintet of 3-shot strings downrange to establish a working idea of average group size. Shooting slowly and allowing for complete barrel cooling between clusters, I wound up with an average of 29/32-inch, thereby proving that switching from the 660's big game calibers to a lesser bore would indeed deliver varminting accuracy. I have had some solid frame rifles that couldn't match that average.

With the calm prevailing, a trio of 3-shot groups was fired over the 200-yard range. Measured center-to-center, these checked out at 1 5/16, 2 3/16, and 1 3/4, giving a 1 3/4-inch average.



The square-back receiver houses a crossbolt-type safety which Zutz says "takes some getting used to." Note the far-forward bolt handle position, to which Zutz adapted more quickly than he had expected.

With the exception of one bullet in the second group, which opened that cluster to 2 3/16, all bullet holes were easily inside a crow's body at 200 yards.

With control loads established, it was now possible to work out other aspects of interest to serious rifle buffs, namely, (A) what can we learn about barrel vibration characteristics, and (B) what affect does barrel removal and replacement have upon accuracy and point of impact factors?

A series of handloads assembled with various bullet weights were sent through the .243 tube in 3-shot strings, and

it became obvious that this barrel was shooting in the classical manner, which is to say it placed light bullets higher than heavy slugs. The difference, though, was not great; 70-grain Hornady S/P's at about 3,300 fps hit only 1 1/2-inches above 100-grain S/P's leaving with a muzzle velocity slightly below 3,000 fps.

The scope assembly was then shifted back to the .308 tube for a similar check. It followed suit, only the distance between group centers was much more pronounced than it was with the .243. Remington and Federal 180-grain stuff hit at about the same center

## Successive Group Data

| .243 Barrels                        |           |             |            |        |
|-------------------------------------|-----------|-------------|------------|--------|
| Load                                | Distance  | Group No.   | Group Size |        |
| 46.0/4831/100 Hornady               | 100 yards | 1           | 19/32"     |        |
|                                     |           | 2           | 1 1/16"    |        |
|                                     |           | 3           | 13/16"     |        |
|                                     |           | 4           | 1 1/4"     |        |
|                                     |           | 5           | 3/4"       |        |
|                                     |           | Average     | 29/32"     |        |
| 46.0/4831/100 Hornady               | 200 yards | 1           | 1 5/16"    |        |
|                                     |           | 2           | 2 3/16"    |        |
|                                     |           | 3           | 1 3/4"     |        |
|                                     |           |             | Average    | 1 3/4" |
|                                     |           | .308 Barrel |            |        |
| Winchester 150 grain<br>(Silvertip) | 100 yards | 1           | 1 1/4"     |        |
|                                     |           | 2           | 1 5/8"     |        |
|                                     |           | 3           | 1 5/8"     |        |
|                                     |           | 4           | 1 1/2"     |        |
|                                     |           | 5           | 1"         |        |
|                                     |           | Average     | 1.40"      |        |
| Winchester 150 grain<br>(Silvertip) | 200 yards | 1           | 3"         |        |
|                                     |           | 2           | 2 1/2"     |        |
|                                     |           | 3           | 3"         |        |
|                                     |           |             | Average    | 2.83"  |

## Group Sizes with Control Loads

| .308 Barrel |               |              |  |
|-------------|---------------|--------------|--|
| Test Series | Initial Group | Second Group | Point of Impact from Aiming Point (Group Center) |
| .308A       | 1 5/8"        | 1 1/8"       | 2 3/8"   |
| .308B       | 1 1/2"        | 1 3/8"       | 3"   |
| .308C       | 1 3/4"        | 1 1/4"       | 3 1/8"   |
| .308D       | 1 13/16"      | 1 1/2"       | 3"   |
| .243 Barrel |               |              |  |
| .243A       | 15/16"        | 3/4"         | 1"   |
| .243B       | 1 1/8"        | 1"           | 1"   |
| .243C       | 1 1/4"        | 1 1/8"       | 1 1/4"   |
| .243D       | 1 1/8"        | 15/16"       | 1 1/2"   |
| .243E       | 1 3/16"       | 13/16"       | 1 3/8"   |

Note: The above data, as described in the text, was gathered by a test session in which the respective barrel assembly was removed and replaced for each test series. The data shows that the initial group for a freshly replaced barrel is invariably larger than a follow up group, and that the point of impact can fluctuate whenever a barrel is removed and returned.

of impact, but 150-grain W-W ammo struck with group centers 2½ inches higher than the holes made by heavier slugs. The few remaining 110-grainers flew even higher, printing a full 3-3½ inches above group centers established by 180-grainers.

In general, these varying points of impact for differing bullet weights are hardly out of the ordinary. The .30 caliber rifles have never been famous for shooting all projectile weights to the same point anyway, and the 1½-inch discrepancy found for .243 fodder is minimal. Moreover, most load-to-load variations were in a purely vertical plane with little noticeable horizontal dispersion.

The next experiment was shot to determine whether there was a performance discrepancy between a freshly installed barrel and one that had been "settled in" by several fired rounds. This, it would seem, is of primary importance to the man using an interchangeable-barrel rifle; for the glory of such a piece is its versatility due to immediate caliber changes, and this would indeed be blemished if ac-

curacy broke down and points of impact shifted every time a barrel were removed and replaced.

Still using 150-grain W-W stuff, I fired two 3-shot groups with a barrel that had been settled by the above-mentioned tests to find the point of impact variations among bullet weights. Marked as groups A1 and A2, these clusters ran 15/16 and 1 5/8 inches respectively, and the group centers were equidistant from the aiming point, hitting 3 inches low and slightly left.

The .308 barrel was then removed and placed in the shade for 15 minutes. It was then returned, and group B was punched immediately without any settling in shots being fired. Group B measured 1 5/8, and its mid-point was 3¼ inches low and left.

Again the .308 barrel was removed, cooled, and screwed back into place for group C. This effort was only 2½ inches below the aiming point, although it retained the left-of-center characteristic. The 1 3/4-inch spread of group C was somewhat larger than average for W-W 150-grainers. However, from these trials it seemed as though the first shots through a 660's freshly installed barrel would deliver big game accuracy, especially if chances did not exceed 300 yards.

To check on that conclusion a second target of identical design was put up and the entire test was repeated — with one added step: instead of merely firing one group each time the barrel was removed and replaced, a follow-up group was unleashed to learn whether there would be a substantial reduction in group size after three bullets had been sent down a barrel assembly only recently returned to the fixation points.

Results for the initial 3-shot groups from each freshly reseated barrel assembly were no different from those of the first trials. Groups ran 1½ to 1 ¼ inches, while group centers con-

tinued to fluctuate by 1 to 1 3/8 inches.

But the follow-up groups, made after barrel cooling, did turn up some interesting facts. As my Successive Group Data shows, the second 3-shot group from each barrel invariably showed a reduction in group size. In other words, based upon my results, the shooter can expect a group expansion of anywhere from 25-50 percent for the first two or three shots whenever he removes and returns a barrel assembly on the 660 system. Thereafter, however, groups shrink rapidly, with the second salvo capable of turning in 1 MOA work.

Once the barrel assembly is seated, the point of impact remains virtually the same with each load. The only thing that must be worried about in this regard is where the point of impact will be once the tube is removed and replaced, as this shifts enough to cause problems for the precision-minded varmint. Thus, it seems advisable to check out the 660 every time a barrel is changed, because shooting on paper will give the hunter a chance to locate the new point of impact and adjust his sights accordingly, and "settle in" the barrel assembly so optimum accuracy will be available for field work.

As a final exercise, a batch of .243 control loads was brewed and consumed over the same course. The results and conclusions proved to be nearly identical, although the .243 tube did, of course, produce smaller overall groups because its control load shot tighter to begin with. Otherwise, the .243 showed a definitely smaller group for the second effort than it did with the initial three shots after reassembly, and the point of impact did dance around.

Thus, after a couple weeks of heavy shooting, it became apparent to me that the 660 Mauser could shoot! However, it would be folly for anyone to believe that he could switch barrels at will and pick up his accuracy and point of impact as they had been prior to barrel removal and return. A few settling shots are needed to drain the best from each newly mounted tube. The initial salvo through each pipe runs wider than average, while reassembly of the 660 tends to produce a new point of impact.

In all fairness, I must say that control loads did not open initial groups enough to spoil big game usage. Nor

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was the point of impact change enough to cause misses on deer-sized targets at ranges of, say 100-150 yards. But those point of impact variations might have some bearing on longer range considerations, and they would definitely be a factor in success on small varmints at all distances. So despite the convenience and versatility symbolized by an interchangeable barrel rifle, I would warn against haphazard switching. The smart fellow will toss a few at paper to learn what is going on every time he puts on another barrel assembly.

Insofar as field performance is concerned, the 660 snapped through its functioning trials flawlessly. Several times I cleared the reloading bench of .243 fodder, filled the rifle's magazine, and sent those rounds downrange as rapidly as I could work the bolt and line up on a 6-inch bull. Perhaps 50 cartridges were unleashed in this manner as I got in some rapid-fire offhand practice, and there was nary a feeding or ejection bobble.

At first I thought the forward-positioned bolt handle would be doubly troublesome: first, a man would have to reach forward of the trigger to grab it; secondly, it could prove an obstruction to gripping the 660 at its balance point for one-hand carrying. However, both fears proved unwarranted. Recoil served to bring the bolt handle rearward enough to simplify quick contact with the knob. I merely found that, in working the 660's action during rapid-fire sequences, the shooter is wise to open his hand and extend his fingers when going from trigger to bolt knob, because this increases the speed with which one finds the bolt. (This suggestion of extending one's fingers when going from trigger to bolt knob is made because, with rifles having the bolt directly above or behind the trigger guard, many hunters make the transition with a cupped hand.)

I also found that the 660's bolt handle was no real obstruction to achieving balance for the one-hand carry, although the hunter may have to press the heel of his hand backward

into the handle. In general, the Mauser 660's bolt position is comparable to the butter-knife protrusion of the old Mannlicher-Schoennauer.

The 660, complete with .243 barrel and Bushnell 3X-9X, was fitted with a Williams carrying strap and used on a number of summer varmint jaunts. Observations made under these actual field conditions may be of interest to both Mauser-Bauer and prospective purchasers. For example, stock length was judged too long for speedy handling. The sample item has a 13 15/16 length of pull, which is bothersome even in light clothes. Slip on the bulkier garb one wears for big game hunting in November, and fast, easy gun mounting becomes impossible for anyone save Wilt Chamberlain. The length of pull makes it somewhat awkward at the bench, too, requiring neck stretching and/or a rearward mounted scope. Your reporter thinks a 13 1/2-inch pull is about maximum for any hunting rifle, and if the 660 Mauser were going on a serious big game hunt he would have the full-sized recoil pad removed and replaced by a slim rifle pad to help reduce this excessive distance.

The pistol grip's geometry is also subject to criticism. For although it does permit a rather straight-line trigger pull, the distance from trigger to grip is short. The man with a large hand will fill this area and, perhaps, find it uncomfortable. When I wear gloves, the grip/trigger area is packed, and I am by no means a big-fisted fellow.

Each man will have to decide for himself whether he likes the 660's safety, which is a cross bolt version that works through the bolt sleeve.

Working this safety is not unlike the left-to-right movement made when releasing the wing or lever-type safety found on older or military Mauser actions.

The 660 Mauser system shows excellent workmanship throughout. The stock, which is of the Weatherby/California persuasion, has a glossy lacquer finish which resisted scratches quite successfully while being lugged afield. The trigger is adjustable and breaks cleaner than those found on any form of commercial Mauser. Lock time is short, due mainly to a firing pin travel of only 7mm as compared to 12 to 14mm on most other actions. A gas venting system is also incorporated. Checkering is deep and provides a sure grip, although diamonds are not finished to a perfect point. Except for the fact that both lugs do not bear evenly, minimum tolerances seem to be held to insure proper barrel bedding.

In conclusion, then, the 660 Mauser has more accuracy potential than any other interchangeable-barrel rifle of hunting design. As a final inquiry, I took it back to the range, attached a sling, and fired several groups while applying maximum sling pressure from various directions. This had no noticeable effect on group size or point of impact. With the length of pull reduced, I'd trust this gun on any hunt.

Additional information and prices are available through the Mauser-Bauer Corporation, 34575 Commerce, Fraser, Michigan 48026.

*Don Zutz*

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