

# Myth Meets Fact

## World War II Sniper Rifles—how good were they?

**Mike “Duke” Venturino & Dave Emary**

**Photos: Yvonne Venturino**

**A** couple of very popular World War II movies would have viewers think that a sniper could put a bullet right through his enemy's rifle scope. Such was shown in both *Enemy At The Gates* and *Saving Private Ryan* made in the 1990s. Not! It's Hollywood nonsense.

If such ever did happen, it was an accident. WWII sniper scopes were weak in power. In the European Theater of Operations (ETO) they

ranged from a mere 1.5X with the German's Zf41 to 4X, with that same nation's ZF4. Coupled with coarse crosshairs and/or post reticles, such

allow at best a decent aim point on a human body at modest to moderate ranges. Perhaps the most limiting factor in WWII sniper marksmanship was the issue ammunition was just not of high enough quality in many cases.

Last summer, I traveled to Nebraska for some special shooting with my friend Dave Emary, ballistician at Hornady. We are both into WWII history, and, between the two of us, we rounded up a variety of sniper rifles to test fire. Some were all-originals, some were facsimiles and some combinations thereof. For instance, my German K98k with Zf41 1.5X scope is an as-issued German rifle, even shown in the book *Backbone Of The Wehrmacht Volume II*. However, its original scope was too dim to use, so I've fitted it with a modern replica from Numrich Arms.

In Nebraska, Dave has access to a private rifle range all the way to 1,000 yards. We had suitable rifles and a nice place to shoot. The trick was to find proper ammunition. From prior experience with modern ammo, we knew the rifles collectively were capable of good accuracy. What about wartime production ammunition? With some difficulty we searched out some modest amounts of proper military ammunition dating either from the 1939-1945 period, or in the case of the '06s, we used some from the Korean War.

Has such old ammo deteriorated? That's where Dave being a ballistician was beneficial. He test fired our vintage military loads for pressure and velocity in the lab. The results can be seen in his charts. The .303-British stuff gave some problems in the form of hangfires. Therefore we pulled powder and bullets from the .303s and reloaded it in Winchester brass primed with Federal 210s. Nothing really changed in the rifle's performance, so we attribute its relatively mediocre showing to the quality of the bullets. For comparison, in a couple of '06



**For the British test, Duke provided an original No. 4, Mk I (T) sniper rifle with original a 3.5X No. 32 scope in .303 British.**



**Duke's rebuilt US M1903 .30-06 is fitted with a 3X Leatherwood scope (top) and the original German K98k 8mm Mauser is fitted with Numrich reproduction 1.5X Zf41 scope.**



**Duke's US sniper rifles include an original US M1903A4 with original 2.5X Weaver 330 scope (top) and a new reproduction by the Gibbs Rifle Company of the M1903A4 with reproduction 2.5X scope.**



**The original US Model 1903A4 shot poorly at 300 yards with original M2 ball issue ammunition dated 1953, with a 3-shot group of 17.5".**



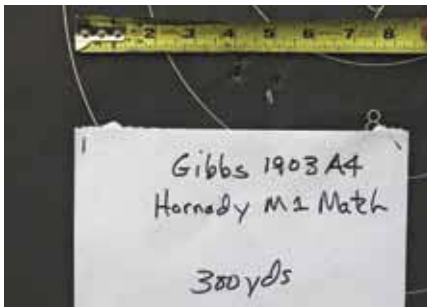
**Even with mildly defective original .303 British military issue ammunition, the No.4, Mk I (T) sniper rifle performed fairly well out to 300 yards.**



**The original German K98k 8mm with much clearer optics of the Numrich reproduction 1.5X Zf41 scope delivered good accuracy at 200 yards.**



**Dave Emery's original Soviet Model 91/30 7.62x54mm sniper rifle with original Soviet PU 3.5X scope was the star performer of their project.**



**Original US Military ammo shot poorly overall. To ascertain the true accuracy potential of some of the .30-06 rifles they were fired with new Hornady match ammunition. This group was fired at 300 yards with the Gibbs reproduction US Model 1903A4.**



**Using the Soviet Model 91/30 with 3.5X PU scope, Dave Emery made four consecutive hits on this 44" steel plate at 1,000 yards with friend Truman Burch spotting for him.**

caliber rifles we fired some Hornady match ammo.

Being true-blue Americans, Dave and I both thought the Springfield '06s would be the top dogs in this little exercise. We felt German rifles would be next. Then the crudely made and finished .303 British and 7.62x54mm Russian rifles would vie for last place.

Again, *not!* Indeed the Brit No.

4(T) .303 did end up in last place. Reliable hits on a man-size target could not happen past 300 yards. That could possibly be the fault of the hangfires. The big disappointment was with our Springfields. With *some of the ammunition* tried, they would not reliably stay on a man-size target past 300 yards. Only once—with my '03 Springfield fitted with a 3X

Leatherwood scope—did we get precision suitable to 500 yards. The German K98k rifles did relatively well. Mine, with its tiny 1.5X Zf41 scope, shot a 6" group at 300 yards. I tried it at 400 yards, but because of aiming problems the result was a huge 20" group.

The top shooting rifle/ammo combination was that crude Mosin/Nagant Model 91/30 with 3.5X PU telescope. At the distance of 600 yards, it still delivered a 7" group. Then, just moments before I had to start driving back to Montana, Dave teamed up with his friend and our host Truman Burch to shoot at a 44" steel plate at 1,000 yards. Both of those gents are Camp Perry match shooters, so Truman called wind as

#### TEST RIFLES

MODEL	CALIBER	SCOPE	POWER
UK No. 4 (T)	.303 British	No. 32	3.5X
USA M1903 Springfield (dated 3-42)	.30-06	Leatherwood	3X
USA Remington M1903A4 (dated 4-43)	.30-06	Weaver 330C	2.5X
Gibbs M1903A4 (repro)	.30-06	Repro 330C	2.5X
German K98k AC42	8x57mm	Numrich Zf41	1.5X
German K98, BCD 45, (Krieger barrel)	8x57mm	Numrich ZF4	4X
USSR Mosin/Nagant Model 91/30 (Ishvisk 1944)	7.62x54Rmm	PU	3.5X



## AMMUNITION

CALIBER (TYPE OR DATED)	BULLET (WEIGHT, GRAINS, STYLE)	TYPE (FPS)	VELOCITY PRESSURE (PSI)
.303 British 1943 Mk VII	175 FMJ flatbase	2,498	50,100
.30-06 Denver 1943	150 M2 FMJ	(No pressure testing, limited quantity)	
.30-06 Lake City 1944	162 M2 FMJ-AP	2,800	61,600
.30-06 Lake City 1953	150 M2 FMJ	2,740	50,300
8x57mm German 1940 & 1945 (steel case)	198 FMJBT	2,494	50,000
7.62x54Rmm Russian, 1945	147 FMJBT	2,832	41,400*
7.62x54Rmm Bulgarian 1953	147 FMJBT	(No pressure testing done)	

Notes: \*Pressure measured in Copper Units of Pressure (CUP)

Dave shot. To my utter amazement, once Dave put a bullet on steel, he kept them there for three more tries. Those four shots were in 16"—with a 1944-dated rifle, original optics and 1945-dated ammunition.

So there's one bit of WWII sniper lore that seems perfectly true. That is that the Soviet Union was the only combatant nation of the ETO to enter hostilities with a fully developed sniper program.—*Duke Venturino*

### The Test—Dave Emery

I have always been keenly interested in WWII firearms, particularly sniper rifles and their employment. My father served in the 101st Airborne 506th regiment in WWII from Holland until the end of the war. It came as a surprise to me

about 10-years ago, when he told me he trained in England with a scoped Springfield and jumped into combat in Holland with it as the first scout for I Company.

Several years ago, I finally got my father to relate some of his experiences with sniping in WWII. From his description of the rifle and scope it was a 1903A4 with either the Weaver 330C or M73 scope. He said there was never any special ammunition, just whatever they had—ball or armor piercing (AP). He had zeros to 500 yards, but most of his practice was 300 yards and closer. He said all the guys training with the scoped Springfields felt if they could ever fire three shots at 100 yards and cover them with a quarter, they would have reached the Mecca

of shooting. He then stated no one ever did it. I asked how he used the rifle in combat and at what distances he engaged targets. He stated most of his shooting was at 150 yards or less and he never would have considered taking a shot beyond 200 yards against somebody who would shoot back.

In order to try and establish what was reasonably expected of WWII European Theater of Operations sniper rifles, we wanted to be as authentic as possible, including the ammunition. We encountered all kinds of information, such as snipers preferred AP ammo because it was more accurate, or Denver arsenal ammunition was more accurate and coveted by snipers, or British snipers preferred Winchester manufactured

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ammunition, etc. We found some of the information seemed to have credence in our small test sample and some was likely false.

The details of the ammunition we test fired are in the table. Most of it was fired in SAAMI specification test barrels and found to be within specs for the ammunition. It should be noted the .30-06 AP was loaded to significantly higher pressures than the M2 ball. Although the AP ammunition tested over the SAAMI spec of 60,000 psi maximum average pressure; the original military specification called for a maximum operating pressure for AP of approximately 64,000 psi. (From this I would not recommend a regular diet of AP ammunition through a prized collector-grade M1 Garand.) Except for the comments made by Mike in his section of this article concerning the hangfires with .303 British, we encountered no functioning problems with any of the ammunition.

Regarding the actual shooting test, all groups fired were 3-shot groups unless otherwise noted. This is a very limited test. We didn't necessarily set out to do a definitive test, but more to establish a baseline for what could be expected from the various weapons and ammunition combinations. Our criteria was, when we could no longer hold on a human-size silhouette we had essentially reached the end of the effective range of the rifle and ammunition for sniping purposes. Most of the .30-06 rifles were tested with current match ammunition to show their true accuracy potential.

Summing up, several things are obvious when looking at the results. First, wind drift certainly made some groups larger. Several showed the windage component of the group



**The original military issue ammunition from either World War II or the Korean War Duke and Dave Emary used for this informal test included (from left to right) US .30-06, USSR 7.62x54Rmm, British .303 and German 8x57mm Mauser.**



**This elevated bench allowed shooting all the way to 1,000 yards.**

was much larger than the elevation component. We tried to avoid shooting in gusts but time constraints did not allow for serious wind doping. In addition, most of the scopes are not capable of doing serious dialing for windage adjustments.

### Limitations

American and British snipers were very limited by the ammunition available to them. It is unlikely either did much serious work beyond 400 yards unless an exceptional lot of ammunition was encountered. My father's words of not considering shots beyond 200 yards were probably pretty close to the mark.

The German snipers appear to have had access to more accurate and uniform performing ammunition than American or British snipers. The Zf41 mounted K98k was limited by the 1.5X optic. Out to 300 yards it proved very useable and deadly accurate, but beyond that its post completely covered a human size silhouette. The ZF4 4X-mounted K98 provided very good accuracy to 400 yards and would certainly have been effective on a man-size target to between 500 and 600 yards. It would appear as though the German sniper had a significant effective range advantage on his American or British counterpart. Likely German wartime ammunition also varied but the two samples we had represented early and late war production. It tested very uniformly for us in both accuracy and point of impact.



**This is a view of the range used for this test, looking over the top of Duke's German K98k with Zf41 1.5X scope.**



**Duke with Dave Emary at the shooting bench. The rifle, which proved to be the best of the bunch as far as accuracy at longer range with original ammunition, is an original Soviet Model 91/30 with PU 3.5X scope.**



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## SHOOTING TEST

AMMUNITION	RIFLE
RANGE (YARDS)	GROUP SIZE (INCHES)
<b>.303 British MK VII</b>	<b>No. 4 (T)</b>
200	5.75
300	8
400	16
<b>.30-06 LC 1953 Ball M2</b>	<b>M1903, Leatherwood 3X</b>
200	7
300	10
400	5.75*
500	5*
*Different box of ammunition than 200 and 300 yards	
<b>.30-06 Hornady M1 Garand Match</b>	<b>M1903, Leatherwood 3X</b>
300	2.5
<b>.30-06 LC 1953 Ball M2</b>	<b>Remington M1903A4</b>
200	5.25
300	17.5
<b>.30-06 LC 1953 Ball M2</b>	<b>Gibbs M1903A4</b>
200	5
300	9.5
400	8
500	16
Notes: 200 and 300 yards were the same box of ammunition, 400 and 500 were each different boxes of ammunition	
<b>Denver 1943 Ball M2</b>	<b>Gibbs M1903A4</b>
200	2.75
300	7
400	11
<b>Hornady M1 Garand Match</b>	<b>Gibbs M1903A4</b>
300	1.25
<b>8x57mm 1945-dated Ball</b>	<b>K98k Zf 41 1.5X</b>
200	6.25
300	6
400	20
Note: At 400 yards it was nearly impossible to see the human size target, aiming was very difficult.	
<b>8x57mm 1940-dated Ball</b>	<b>K98 ZF4 4X</b>
200	2.25
300	5
400	8
500	12
<b>7.62x54Rmm Russian, 1945</b>	<b>Mosin/Nagant 91/30 PU 3.5X</b>
200	4
300	4.75
400	5.25
500	10
600	7
1,000	16 (4 shots)

Notes on Test Conditions: Lexington, Neb.: Elevation 2,350'. Temp: 70 to 83 degrees F. Winds: Full value cross wind 15 to 25 mph at 200 and 300 yards; 6 to 12 mph at 400 yards; 3 to 8 mph at 500 to 1,000 yards. (Out to 500 yards no effort was made to make wind calls. We tried to shoot in the nominal condition and not to shoot in big gusts or let offs.)

The results we obtained with the Russian 91/30 PU 3.5X and our 1945 sample of ammunition were stunning to us. We did not expect such good performance from what looks to be a rather crude rifle and scope. The trigger takes considerable getting used to, as it is more like a cannon lanyard than a trigger. That aside, with some familiarization, this system is capable of serious long-range sniping. Even today with good ammunition it would be a formidable sniper rifle. A Soviet sniper certainly would have enjoyed considerable success to 600 yards and would probably have been deadly to ranges on the order of 800 yards with some regularity.—Dave Emary **GUNS**

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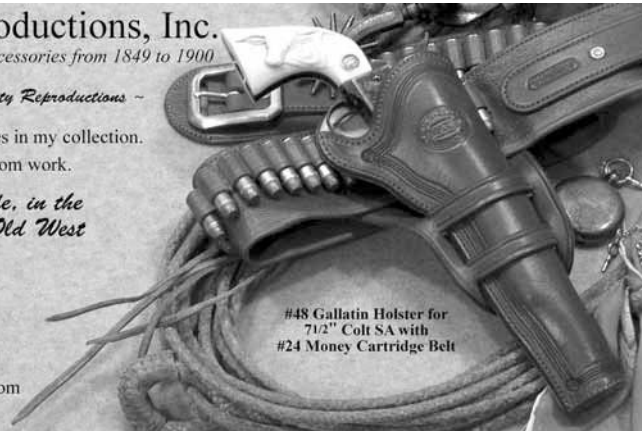
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