



# LSA QUARTERLY



The Louisiana Shooting Association

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On the cover: Ms. Taylor Boudreaux and Ms. Hannah Mahute show off their F-Open rifles after an outstanding performance in the 2012 Louisiana State Mid-Range Prone F-class Championship.

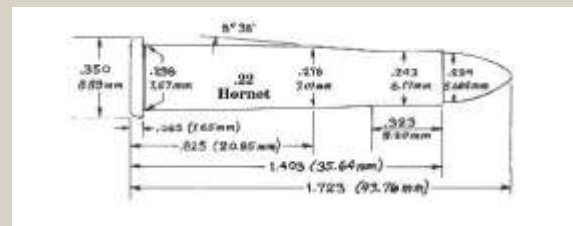
## Tons of Fun in a Little Package: Shooting the .22 K-Hornet

By

Jay D. Hunt, Ph.D.

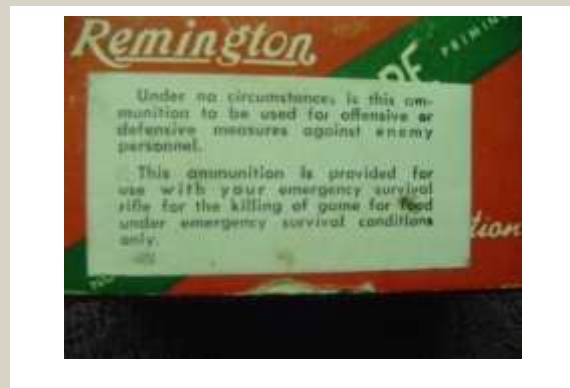
A few years ago, LSA President Dan Zelenka and I were enjoying a beautiful Autumn day shooting our hunting pistols at the Honey Island Shooting Range near Slidell. As I recall, I was shooting a Ruger Redhawk in .44 Remington Magnum, and Dan was shooting a T/C Contender in 6.5 JDJ. We were getting ready for the upcoming deer season. After all the heavy work was done, Dan pulled out a Contender in .22 Hornet. Now, to be honest, I had never really even considered owning a firearm in .22 Hornet. To my way of thinking, it was completely useless. After all, I have a .22 Long Rifle for squirrel and other small game, and a .223 Remington for predators; why in the world would I ever need, or for that matter, want a .22 Hornet? After Dan showed me the diminutive, archaic looking round, I KNEW I was right. I think I said something to the effect of, "Why do you own that piece of @\$%?"

To his credit, Dan did not respond in kind, but smiled and asked me if I would like to shoot it. Well, yes, of course I did. After one shot, I was hooked! I immediately apologized to Dan (not really), and a nearly three year search for a T/C Contender barrel in .22 Hornet began.



The ancestry of the .22 Hornet is somewhat murky. In his classic encyclopedic work, *Cartridges of the World* (Barnes, 2012), Frank Barnes attributes the .22 Hornet to experiments done in the 1920s using the black-powder .22 WCF (Winchester Center Fire) at the Springfield Armory. Certainly, the long taper, shallow shoulder, and rimmed case were standard for cartridges that made the transition from the black powder period to the smokeless powder era. Col.

Townsend Whelen and Capt. G.L. Wotkyns are given credit as the designers of the cartridge. Winchester began to produce .22 Hornet ammunition as a wildcat cartridge in 1930, even though no commercial firearms were available at that time. In 1932, Winchester announced the Model 54 bolt action rifle in .22 Hornet, but the rifles did not actually make it to market until 1933 (Donnelly, 1987). The Savage Model 23-D bolt action rifle was available in .22 Hornet as early as August 1932. During World War II, the M4 Survival rifle was produced in .22 Hornet for use by US Air Crews. Military survival issue .22 Hornet ammunition

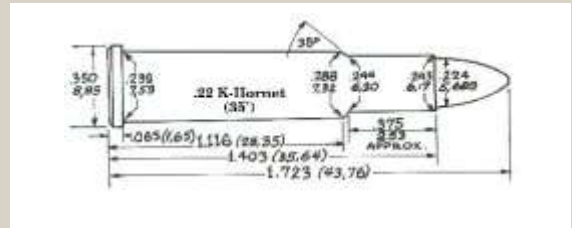


was loaded with soft-point expanding jacketed bullets, which did not comply with the Hague Convention; however, the ammunition was labeled, "Under no circumstances is the ammunition to be used for offensive or defensive measures against enemy personnel. This ammunition is provided for use with your emergency survival Rifle for the Killing of Game for food under emergency survival conditions only."

The .22 Hornet truly is the forerunner high velocity small caliber varmint and small game cartridge to which all subsequent cartridges were compared. The black powder era was dominated by large calibers, heavy projectiles, and lumbering velocities. The standard military .45-70 Government round fired a 405 Gr. lead round nose projectile at about 1200 FPS. In 1892, the

US military switched from rounds that fired black powder to those stoked with smokeless powder when it adopted the .30 US Army (.30-40 Krag) round, which was America's first "small bore" military cartridge. But, cartridge designers quickly realized that the increased velocities possible with smokeless powder would allow one to use a truly small bore projectile at much higher velocities. The results were a cartridge with much better ballistics and subsequent flatter trajectory.

Early cartridge experimenters, like P.O. Ackley, "improved" standard cartridges by increasing the angle of the shoulder, thereby increasing powder capacity of the improved cartridge. The most popular improved version of the .22 Hornet is the .22 K-Hornet.



Originated by Lysle Kilbourn in 1940, it is based on the fire-formed and blown out .22 Hornet case with a straight body, sharp shoulder, and short neck (Barnes, 2012). The advantage of the .22 K-Hornet is increased case capacity, allowing higher velocities than one can achieve with the .22 Hornet; however, one can fire .22 Hornet ammunition out of a firearm chambered in .22 K-Hornet with no ill effects on accuracy.

My search for a T/C Contender barrel in .22 Hornet was arduous. Over the past three years, I identified several barrels using on-line gun auction sites, but the barrels always sold for more than I was willing to pay. However, earlier this year a 10-inch octagon barrel in .22 K-Hornet came up for auction on GunBroker.com. The barrel had the rear sight removed and replaced with a very sturdy picatinny rail. When the bidding was done, the barrel was mine at a very reasonable price. Frankly, I would have rather have had it chambered in .22 Hornet, but after winning the barrel and learning more about the .22 K-Hornet, I'm definitely not disappointed.

Cartridge	Bullet	Powder	Min. Load	Velocity	Max. Load	Velocity	Barrel
.22 Hornet	35 Gr. Hornady V-Max	AAC-1680	12.1	2516	13.5	2516	Rifle
.22 K-Hornet			14.4	2979	16.0	3177	Rifle
.22 K-Hornet			14.4	2645	16.0	2854	Contender

The Hornet and K-Hornet really shine with small projectiles up to about 50 Gr. The added

capacity of the little K-Hornet beats the standard Hornet. For comparison, the maximum load for the .22 Hornet with Accurate 1680 powder is 13.5 Gr., resulting in 2516 FPS from a 20-inch barrel; however, the maximum charge of 1680 in the .22 K-Hornet is 16.0 Gr.,

Comparison of .22 Caliber Cartridges in Pistol Barrels

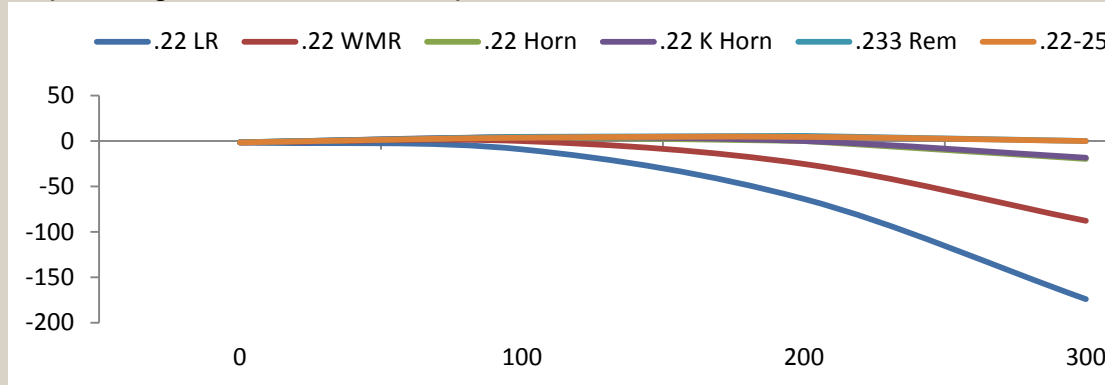
Cartridge	Bullet Weight (Gr)	Muzzle Velocity (FPS)	Velocity 100 yds (FPS)	Velocity 200 yds (FPS)	Velocity 300 yds (FPS)	Energy 300 yds (ft-lbs)
.22 LR SV*	40	950†	861	790	731	47
.22 WMR	40	1480	1139	963	858	65
.22 Hornet	40	2180	1828	1518	1266	142
.22 K-Hornet	40	2250	1891	1573	1308	152
.223 Remington	55	2970	2616	2289	1986	482
.22-250 Remington	55	3250	2872	2526	2205	594

\*Abbreviations: LR, Long Rifle; SV, Standard Velocity; WMR, Winchester Magnum Rimfire.

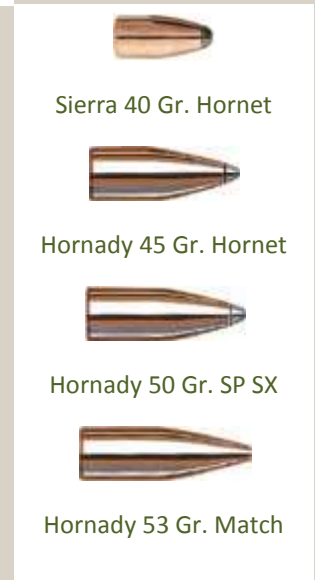
†Barrel length is 6" for .22 LR and .22 WMR, 10" for .22 Hornet and .22 K Hornet, and 14" for .223 Remington and .22-250 Remington

resulting in 3177 FPS from a 20-inch barrel, and 2854 FPS from a 14-inch barrel.

As a comparison to more modern, and perhaps more popular varmint loads, the .22 Hornet and K-Hornet were compared to the .22-caliber cartridges from .22 Long Rifle up to the blazing fast .22-250. Clearly, the .22 Hornet and .22 K-Hornet are not effective long range varmint cartridges; however, when kept to within 150 yards, the two are more than capable of quickly and humanely dispatching varmints and small predators.



Given the craziness going on in Washington, DC at the moment with the prospect of the Federal Government overstepping its bounds and limiting our Right to Keep and Bear Arms, it has gotten to be extremely difficult to find any .224 caliber projectile that might feed through an AR-15, which, unfortunately, also includes the light-for-caliber .22 Hornet/K-Hornet bullets. However, I was able to lay my hands on boxes of Hornady 45 Gr. Hornet bullets (Item No. 2230) and 40 Gr. Sierra Hornet bullets (Item No. 1200). I also had some archaic boxes of bullets I had bought back in the early 1980s in my loading supplies: a box of Winchester 48 Gr. PSP (discontinued by Winchester), Hornady 50 Gr. SX (Item 2240), and Hornady 53 Gr. Match (replaced by Hornady 53 Gr. HP, item No. 2250).



Because .22 K-Hornet brass is not produced, the first step in loading .22 K-Hornet is to fire-form .22 Hornet brass in the .22 K-Hornet chamber. Although Winchester and Remington produce .22 Hornet brass, all distributors were out of the brass and there does not appear to be any hopes of getting US-made brass anytime soon. So, I purchased a 100-count bag of Prvi Partizan brass. On first inspection, the Prvi Partizan (PPV) brass seemed to be well made, but, read on. I began the process by loading 50 of the .22 Hornet cases with stout charges of Hodgdon H-110 under three types of bullets, and fired away. Accuracy, although not great at 100 yards, was acceptable, and probably was more related to my inattention at the bench than the true potential of the barrel or load.

**Fire Forming of .22 Hornet Cases in .22 K-Hornet Chamber**

Bullet	Case	Load	COAL	Velocity	Accuracy*
Win 48 Gr. PSP		9.9 Gr. H-110	1.890	2091 ± 39	2.31
Horn 50 Gr. SX		9.9 Gr. H-110	1.870	2072 ± 64	2.24
Horn 53 Gr. Match		9.2 Gr. H-110	1.899	1966 ± 53	2.15

\*Groups fired at 100 Yards

Primers used in all loads were Winchester Small Rifle

One of the tricks to fire forming brass is to either use brand new, never fired brass to make your new cases, or to anneal the case shoulder, neck, and mouth before fire forming. In both cases, the reason for this is to avoid hard, and therefore, brittle cases.



Repeatedly firing and reloading cases causes them to become "work hardened." This is easy to duplicate, and you have no doubt done this yourself by repeatedly bending a piece of metal back and forth until you are able to break it in half. Typically, if one uses new brass, there will be very little loss of cases due to cracked shoulders or necks. However, when I fire formed the brand new PPV brass, I lost 30% of the cases to cracked necks. I was perplexed, but did not understand the reason for this until later.

Once the brass had been fired, I began the process of reloading the new

.22 K-Hornet cases. This is where I ran into trouble with the PPV brass. For years I've used ground corn cob media to clean my cases, but a couple of years ago I purchased a sonic cleaner and have begun to use Hornady One Shot® Sonic Clean™ solution. I placed the brass PPV .22 K-Hornet brass in the solution, and then ran it through several cycles in the sonic cleaner. I've done this many hundreds of times, and even have accidentally left cases in the solution overnight (and for one unfortunate case, a week). The cases always come out bright, shiny and BRASS colored. But, when I pulled the PPV cases out of the solution, they were copper colored. In fact, the PPV cases are not brass at all, but are instead brass-washed copper cases. Ah, the reason for the cracked necks was revealed. The high copper content of the

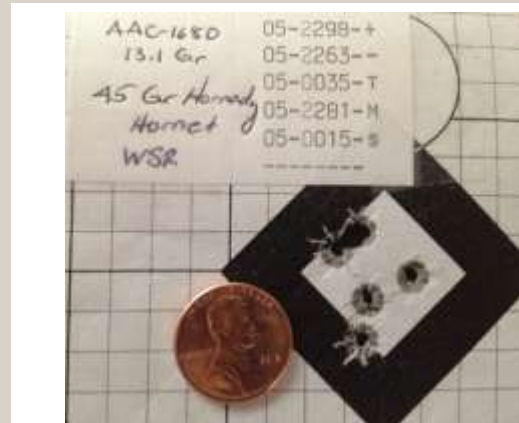
**Accuracy Tests of .22 K-Hornet Loads**

Bullet	Case	Load	COAL	Velocity	Accuracy
Horn 45 Gr. Hornet	.22 K-Hornet	12.5 Gr. AAC-1680	1.850	2197 ± 51	1.51*
		13.1 Gr. AAC-1680	1.850	2281 ± 15	0.62*
		13.8 Gr. AAC-1680	1.850	2413 ± 20	0.96*
Sierra 40 Gr. Hornet		13.6 Gr. AAC-1680	1.800	2320 ± 14	2.53†
		14.3 Gr. AAC-1680	1.800	2400 ± 38	3.40†
Sierra 40 Gr. Hornet		10.1 Gr. 2400	1.721	2434 ± 62	3.90†

\*Groups fired at 50 Yards

†Groups fired at 100 Yards

Primers used in all loads were Winchester Small Rifle



Groups at 50 yards have been outstanding. This load of 13.1 Gr. of AAC-1680 behind a 45 Gr. Hornady Hornet bullet had an extreme spread of 2298 and 2263 FPS, with an average of 2281 ± 15 FPS.

cases made them susceptible to cracking. So much for using PPV cases. (I purchased a box of Winchester .22 Hornet loaded ammunition to make new Winchester .22 K-Hornet, but life has prevented me from getting to the range to fire them).

With only 35 or so .22 K-Hornet cases in hand, and with short time

between obtaining the barrel and the writing of this article, I've only had limited shooting experience. I can say, the little pistol is a HOOT to shoot! There is no recoil, and accuracy at 50 yards has been outstanding, with 5-shot groups consistently less than 1 inch. I'm still struggling to get good groups at 100 yards, but I think that the problem is mine alone, and not the pistol's. I'm looking forward to working up good shooting loads at 100 yards!

**.22 K- Hornet Reloading Data**

Wt.	Bullet	Manf.	Powder	Min	Max	Min Vel	Max Vel	Remarks	Source
33	Speer Hornet HP	Alliant	2400	9.5	10.6	2312	2570		Lyman Handbook 49th Ed.
33	Speer Hornet HP	Accurate	AAC-1680	14.4	16.0	2521	2701	Compressed	Lyman Handbook 49th Ed.
33	Speer Hornet HP	Hodgdon	H-110	11.5	12.8	2697	2885		Lyman Handbook 49th Ed.
33	Speer Hornet HP	IMR	IMR-4227	12.0	13.5	2450	2508	Compressed	Lyman Handbook 49th Ed.
33	Speer Hornet HP	Hodgdon	Lil'Gun	10.0	11.3	2429	2666		Lyman Handbook 49th Ed.
33	Speer Hornet HP	Vihtavuori	VV-N110	10.8	12.0	2566	2646	12.0 Gr. Accurate Load	Lyman Handbook 49th Ed.
35	Hornady V-Max	Alliant	2400	9.0	10.1	2296	2487		Lyman Handbook 49th Ed.
35	Hornady V-Max	Accurate	AAC-1680	14.4	16.0	2645	2854	Compressed	Lyman Handbook 49th Ed.
35	Hornady V-Max	Hodgdon	H-110	11.5	12.8	2779	3009		Hodgdon On-Line
35	Hornady V-Max	Hodgdon	H-110	11.0	12.2	2378	2786		Lyman Handbook 49th Ed.
35	Hornady V-Max	Hodgdon	H-4227	11.0	12.3	2747	2924		Hodgdon On-Line
35	Hornady V-Max	IMR	IMR-4227	11.4	12.7	2310	2472	Compressed	Lyman Handbook 49th Ed.
35	Hornady V-Max	Hodgdon	Lil'Gun	12.5	13.5	2858	2935		Hodgdon On-Line
35	Hornady V-Max	Hodgdon	Lil'Gun	10.0	11.2	2459	2703	11.2 Gr. Accurate Load	Lyman Handbook 49th Ed.
35	Hornady V-Max	Vihtavuori	VV-N110	10.0	11.2	2466	2546	Compressed	Lyman Handbook 49th Ed.
40	Nosler Ballistic Tip	Hodgdon	H-110	11.5	12.9	2636	2940		Hodgdon On-Line
40	Nosler Ballistic Tip	Hodgdon	H-4227	11.0	12.2	2644	2822	Compressed	Hodgdon On-Line
40	Nosler Ballistic Tip	Hodgdon	Lil'Gun	12.5	13.5	2695	2817		Hodgdon On-Line
40	Speer Spire SP	Alliant	2400	9.0	10.0	2202	2423		Lyman Handbook 49th Ed.
40	Speer Spire SP	Accurate	AAC-1680	12.8	14.3	2408	2543		Lyman Handbook 49th Ed.
40	Speer Spire SP	Hodgdon	H-110	10.4	11.6	2198	2545		Lyman Handbook 49th Ed.
40	Speer Spire SP	IMR	IMR-4227	10.8	12.0	2128	2320	Compressed	Lyman Handbook 49th Ed.
40	Speer Spire SP	Hodgdon	Lil'Gun	9.3	10.4	2155	2383		Lyman Handbook 49th Ed.
40	Speer Spire SP	Vihtavuori	VV-N110	9.0	10.2	2222	2373	10.2 Gr. Accurate Load	Lyman Handbook 49th Ed.
45	Barnes TSX FB	Hodgdon	H-110	10.5	11.2	2524	2640		Hodgdon On-Line
45	Barnes TSX FB	Hodgdon	H-4227	10.5	11.3	2502	2619		Hodgdon On-Line
45	Barnes TSX FB	Hodgdon	Lil'Gun	12.0	13.0	2672	2859		Hodgdon On-Line
45	Speer Spitzer SP	Hodgdon	H-110	11.5	12.4	2658	2761		Hodgdon On-Line
45	Speer Spitzer SP	Hodgdon	H-4227	10.7	11.7	2520	2669		Hodgdon On-Line
45	Speer Spitzer SP	Hodgdon	Lil'Gun	12.0	13.2	2568	2744		Hodgdon On-Line
50	Sierra BlitzKing	Hodgdon	H-110	10.4	11.1	2416	2552		Hodgdon On-Line
50	Sierra BlitzKing	Hodgdon	H-4198	11.5	12.5	2201	2386	Compressed	Hodgdon On-Line
50	Sierra BlitzKing	Hodgdon	H-4227	10.0	11.0	2375	2520		Hodgdon On-Line
50	Sierra BlitzKing	Hodgdon	Lil'Gun	12.0	13.0	2542	2751		Hodgdon On-Line
50	Speer Spire SP	Alliant	2400	8.2	9.2	1915	2164		Lyman Handbook 49th Ed.
50	Speer Spire SP	Accurate	AAC-1680	11.2	12.5	2144	2220		Lyman Handbook 49th Ed.
50	Speer Spire SP	Hodgdon	H-110	9.0	10.2	2024	2217		Lyman Handbook 49th Ed.
50	Speer Spire SP	IMR	IMR-4227	9.5	10.6	1921	2002		Lyman Handbook 49th Ed.
50	Speer Spire SP	Hodgdon	Lil'Gun	8.0	9.1	1809	2113	8.0 Gr Accurate Load	Lyman Handbook 49th Ed.
50	Speer Spire SP	Vihtavuori	VV-N110	8.3	9.3	1992	2132		Lyman Handbook 49th Ed.
53	Barnes TSX FB	Hodgdon	H-110	9.5	10.2	2247	2340		Hodgdon On-Line
53	Barnes TSX FB	Hodgdon	H-4198	11.5	12.5	2153	2335	Compressed	Hodgdon On-Line
53	Barnes TSX FB	Hodgdon	H-4227	9.5	10.5	2240	2357		Hodgdon On-Line
53	Barnes TSX FB	Hodgdon	Lil'Gun	11.5	12.3	2446	2571		Hodgdon On-Line

**The 2013 Annual Meeting and Election of the Board of Directors of the Louisiana Shooting Association was held on Sunday, February 17, 2013.**

**US Congressman Bill Cassidy, State Senator Neil Riser and State Representative Jeff Thompson addressed the LSA and provided a review of federal and state firearms issues. The Defend Louisiana program was rolled out, reviewed, and endorsed by the LSA. For additional information regarding the Defend Louisiana initiative you can visit the website at [www.defendla.org](http://www.defendla.org).**



**U.S. Congressman Bill Cassidy discusses upcoming firearm legislation and issues with the LSA.**

**Louisiana State Senator Neil Riser receives the third annual Legislative Excellence Award for his support of Louisiana's second amendment rights.**



**Louisiana State Representative Jeff Thompson explains the "Defend Louisiana" initiative.**





LSA President, Dan Zelenka, signs his pledge to Defend Louisiana.

**Congratulations to those who were re-elected to the LSA Board of Directors. Also, congratulations to our newest member, Chris Vinson, who was elected as first alternate to the BoDs. Everyone's terms are shown below.**

### **Officers**

- President Daniel E. Zelenka, II (term expires 2016)**
- Vice-President Kendall Comeaux (term expires 2014)**
- Secretary Paul Prokop (term expires 2015)**
- Treasurer Jay D. Hunt, III (term expires 2015)**
- Member-at-Large Joseph (Jay) Meynier (term expires 2016)**

### **Directors**

- Mark Altazin (term expires 2016)**
- Paul Angrisano (term expires 2016)**
- Donald Hackford (term expires 2014)**
- James D. (Danny) Hudson, III (term expires 2014)**
- Jeremy Jouette (term expires 2014)**

**Ronald (Buck) Kliebert (term expires 2015)**  
**John Laws (term expires 2016)**  
**Rick Stewart (term expires 2015)**  
**Michael Strikmiller (term expires 2014)**  
**Ted Torres (term expires 2015)**

**Alternate Directors**

**Chris Vinson (term expires 2014)**  
**Gerald E. (Jerry) Liuzza (term expires 2014)**

**A view from the range**  
**The 5 Ps**

**By Michael G. Strikmiller**

Many years ago Father O'Hara celebrated the children's Mass on Sunday morning and always seemed to mention the 5 Ps in his talk with the children. It was a good life lesson and can be applied to everyday life especially when it comes to the shooting sports. So let's see what the 5 Ps are and how they can work for you.

The 5 Ps are: Proper Preparation Prevents Poor Performance. Seems so very simple yet how many of us have forgotten one of them resulting in a bad day? I'll give you one of my 5P failures and see how it hurt me.

Last year I drove to Camp Perry with two fellow shooters. A 1000 mile all night drive to take part in 6 days of shooting with the first match taking place on a Monday morning. As usual I put all my gear together the night before making sure magazines were loaded, all equipment was ready, rifle was clean, and all necessary accessories in good shape and available on my cart. Our usual practice is to get up at 0430, get food for the day ready, pack up the truck and drive to the range.

We arrived at the range early (usually by about 1-1/2 hours) in order to get a good parking spot. We sat around the truck BS-ing up until the time when we had an hour before first shot down range to unload our gear from the truck so that we could make the 1000 yard walk to the assembly area for roll call. We all had our carts out of the truck loaded up and ready for the trek to the assembly area when I realized something was missing. My shooting stool was not in the truck! No it couldn't be!

Under most circumstances my shooting stool makes no difference as it is attached to my cart. A shooting cart has everything you need and is large enough that you can't miss it. But for Camp Perry I use a 3 wheeled cart and have a separate shooting stool that I bring to the line. The

night before in order to fulfill my 5 Ps I put my extra ammunition and loaded magazines for my AR as well as my hearing protection, glasses and spare parts kit into the forgotten stool! No stool, no ammunition, no magazines, no Presidents 100 match. The worst of it is that if I had checked the truck when we got to the range as was our custom I would have had plenty of time to drive back and get my stool with all my shooting gear. But instead of following through I sat around shooting the breeze and missed out on a day's shoot.

So where was my stool? I apparently took it off of the cart and leaned it against the wall of the condo so that I could load my lunch kit under the main compartment of the cart. The stool hangs off of the back of the cart and was in the way of stowing my chow. Lunch but no shoot! Poor Preparation Produced Poor Performance.

That was my last 5 Ps misadventure. But working as a range officer at the range at Honey Island I can't tell you how many times I have witnessed someone arrive at the firing line only to realize they forgot their magazines, bolt (yes, bolt!) eye and hearing protection and many other items. How about showing up with the wrong ammunition or no ammunition at all? It is difficult to sight in a rifle with open sights at 100 yards without a spotting scope or pair of binoculars. And if you have everything but that spotting scope and think someone at the range will have one for you to use you may very well be disappointed. With today's prices for ammunition who wants to shoot 10-15 rounds only to realize that you are way off target. Why? Because you can't see the hits without a spotting scope.

We all have had our little embarrassments by forgetting something – ever leave your wallet at home? Ever went to a restaurant and realized you have no money to pay?

So the lesson here is to make a plan, (a checklist is ideal) write it down if you must, methodically check everything off of it and don't leave the house until you've checked it again. Getting out in a duck blind with no mosquito repellent might work on a very cold day but how much fun is it when the weather is moderate in the swamps of south Louisiana or maybe share a tree stand with gnats that have fangs about 2" long? Talk about a miserable day!

Here's another one for you: a fellow I know fell out of his boat down around the mouth of the Mississippi River during a long weekend duck hunt when the temperature was in the low 30s. He said he almost froze to death. I asked him why he didn't build a fire and change his clothes. He said his matches were in his pants pocket, now wet, his extra set of clothes were in the boat that turned over and his shooting partner was in another area and they were not to meet up at camp until that evening. So he learned a number of valuable lessons: he wasn't prepared for getting wet while on the water; he should have had extra clothes and matches at the camp, and standing up in a pirogue is not a good idea. I didn't mention that his shotgun and ammo also took a dip.

My mental list of the 5 Ps gets checked and double checked every time I do something whether it is a project around the house or getting ready to go to a match. I even have appropriate spares with me so that I can bail someone else out when their 5 Ps were not followed. Extra gear is better than not enough.

So Proper Preparation Prevents Poor Performance is a good life lesson we should all learn and practice!

## Restoring an Old Classic Rimfire Rifle

By  
Jay D. Hunt, Ph.D.

When it comes to collector's value, restoring an old firearm is almost always a mistake. But, what if that old rifle has a value to its owner that is more than its collector's value? I recently faced this exact dilemma when I offered to help my wife's friend get rid of some old guns that previously were owned by her husband. When she showed up at my house, she had a pile of junk the likes of which I had never seen before. There was an H&R .22 rim fire Model 929 "Side Kick" pistol that had obviously been used to fire black powder rounds, and that had just as obviously never, ever been cleaned. There was a Winchester Model 47 .22 short, long, and long rifle that lacked a bolt and that was covered in a deep coat of rust. When I asked her if she had the bolt, she replied, "what's a bolt?" Oh, my.

But, amongst the detritus of years of neglected firearms, one little jewel sprang forward. Buried in the pile was a Marlin Model 20 Pump Action .22 rimfire rifle that looked like it might just be salvageable. There was quite a bit of rust on the outside surfaces, and closer inspection showed deep pitting on the outside of the barrel. However, a quick glance down the barrel revealed that it was dirty, but seemed to lack any rust. After retiring to my gun room, I wiped the rust off the external surfaces and gave the barrel a very thorough cleaning. To my delight, the barrel was bright with good rifling. Ironically, the wax and oil from many hundreds of .22 rimfire rounds, which had never been removed by cleaning the barrel, probably saved the barrel from rusting.

The Marlin Model 20 Pump Action rifle is a wonderful little gun, but I had no real knowledge of the history of this model. The best source of information that I have found is *Marlin Firearms: A History of the Guns and the Company That Made Them* by Lt. Col. William S. Brophy (Stackpole Books, Mechanicsburg, PA, 1989). The Model 20 was manufactured by Marlin from 1907-1911, followed by the Model 20A/20S from 1911-1922. The Model 20S was identical to the Model 20 with the exception of a shorter length locking bolt, the shape of the rear end of the firing pin, and the extractor. The Model 20A incorporated all of the features of the Models 20 and 20S, but had a different shape and spring action of the firing pin. The model 20A also was available with a full-length tube magazine. The cost of a Model 20 when new was \$11.50.

As a result of a fire at the Marlin plant that destroyed all of their early records, it is impossible to determine the exact date of manufacture of a particular rifle, although the serial numbers for the Model 20 ranged from 29 - 29,134. The serial number of the Model 20 is stamped on the left side of the tang under the wood stock; the stock must be removed to read the serial number. This particular rifle has the serial number 4,218. Given that the Marlin Firearms Corporation (the original company that preceded the Marlin Firearms Company, which has manufactured firearms from 1924 to the present) manufactured some 29,105 Model 20 rifles



On top is an ad from 1907, the original year for the Model 20. Below is a 1910 ad.



during the four year period 1907-1911, a serial number in the 4,200 range almost certainly indicates that this rifle was manufactured in 1907. In fact, in the correct light one can clearly see that someone scratched "P.F. Coe 1907" into the left side of the receiver.



A Model 20A with a full length magazine is shown in the top picture, along with a Model 20 with a half length magazine.



The serial number is located on the left side of the upper tang. The stock must be removed to read the serial number (clearly, the Model 20 was made before the BATFE was formed). Note that the

The 1907 Marlin Firearms Corporation catalog described the Model 20 as follows:

The Model 20 is a take-down .22 caliber repeater with the popular trombone action, using in the same rifle without any alteration or adjustment the short, long and long-rifle cartridges, black and smokeless, as used in the Models 1892 and 1897.

The Barrel is 22 ½ inches long, octagon, made from the best quality special gun-barrel steel, thoroughly welded and planished in the bar, free from seams and hard spots, carefully straightened, and is bored, rifled, chambered and finished on the Ballard system and guaranteed to shoot at least equal to anything of the same caliber, length and weight up to 200 yards.

The arm is fitted regularly with ivory bead front sight and a new and improved adjustable rear sight, with a flat top that does not obstruct the view for quick shooting, and with a vertical white line to assist the eye in getting the range quickly.

The frame is drilled and tapped on top, and the tang is also drilled and tapped, so that the Marlin receiver sight or a tang peep sight may be used if desired.

The rifle has a tubular magazine, as used in our Models 1892, 1897, and No. 18, and handles at one loading 15 short, 12 long or 11 long-rifle cartridges. The feeding of the cartridges from magazine to chamber is controlled by the pressure of the handle slide on the cartridge cutoff. The cartridges may be loaded into the magazine all of



one kind or mixed indiscriminately, and the gun will handle them perfectly.

In design, the action is extremely simple. The working parts engage directly with one another without links or other complications; there is no loss of power; the gun is extremely quick and easy of operation and without a single weak feature.

The frame is made of the best quality special gun-frame steel thoroughly welded, free from seams or hard spots, and has blue finish.

The small working parts of the action are made from best quality crucible steel, contact points hardened to prevent wear.

Flat springs in action made of best quality Jessop's spring steel imported from England.

Magazine spring, best quality music spring wire.

Buttstock and forearm black walnut, air seasoned for not less than two years, in our sheds, and afterward slowly kiln-dried before working, so that the wood will not warp or shrink after the gun is made up. The wood is especially well finished, as is every part of the rifle. There is not a piece of cheap material in it, and the workmanship is in every way of the highest quality.

The Model 20 action is operated on the trombone principle; has solid top, side ejector and regular closed-in Marlin frame. This makes for greater comfort and convenience and better service. The solid top does not catch rain or snow; keeps a wall of metal between your head and the cartridge; prevents powder and gases from blowing bank into your face. The side ejector throws the shell away from you, not into your face and eyes; you do not get the habit of closing your eyes at each discharge; and as the ejected shell never crosses the line of sight, you do not lose your bead on the game or target, and can make repeat shots instantly.

The Take-Down principle, similar to Marlin Model 897, provides for wear, both laterally and vertically, so that the take-down joint can never become loose or shaky, not matter how long it may be used or how much it may be worn.

Every action part is accessible for inspection and cleaning without tools, and the barrel may be cleaned by inserting the wiping rod at the breech and drawing it entirely through the barrel, using a wiping rag twice as large as in any barrel where it is necessary to clean from the muzzle, doubling up the rag in the chamber. This is important to all shooters of .22 caliber ammunition, and especially to the gallery men who appreciate the saving in time and labor, the better results secured and the longer life of the barrel.

To take down the rifle with the action closed, cock the hammer and unscrew the thumbscrew, move the buttstock portion to the right and the barrel portion to the left. The parts are all locked in place with the gun is taken down so that they cannot drop out accidentally, but all of the parts may be removed in an instant, without tools.

To remove the action parts: With the gun taken down press forward the firing pin to release the locking bolt; raise the rear end of the locking bolt and draw back the forearm as far as it will go; draw forward the magazine tube as in loading- this allows a side play to the

forearm; disconnect the forearm and handle slide from the locking bolt and draw them forward. The breech bolt and parts contained in same can then be taken out sideways and the carrier lifted out, giving access to everything. If desired, the locking bolt and firing pin may be removed from the breech bolt.

To re-assemble the action replace the carrier on its stud; replace the firing pin and locking bolt in the breech bolt; lay the breech bolt and contained parts in the frame at its rearmost position and then slide the breech bolt forward about half way, being sure that the firing pin on top of the rear end of the bolt engages in the groove on the under side of the top of the frame. With the breech bolt half open connect the handle slide with its stud on the locking bolt. Close the magazine. Then close and lock the action, pushing forward the forearm with the left hand, pressing breech bolt and handle slide against the frame with the thumb of the right hand to guide breech bolt and insure that the slide will ride on the cartridge cutoff.

To put together the two portions of the frame, have the action closed and the hammer cocked; bring them together so that the tapered dowel pin in the front end of the right side enters its tapered recess and beveled tenons at the rear engage properly; then screw down the thumbscrew until tight.

Although the rifle looked like it had not been cared for, it did shoot extremely well using Remington Standard Velocity Long Rifle ammunition. Given that I had absolutely no interest in the collector's value of this fine little rifle, I decided to restore it as my "after-hunting-season-is-over" project for 2013. The project would be divided into three parts: (1) the wood would be restored by removing the old finish, removing dents and scratches, and then restoring the finish with a 21<sup>st</sup> century polyurethane coating; (2)

the metal would be bead blasted to remove the 105 year old bluing, the deep pitting would be removed by careful and judicious sanding, and then a new blued finish would be applied; and (3) any worn, broken, or missing parts would be fixed or replaced as necessary.

A careful review of the "before" pictures demonstrates that this 105 year old "beauty" saw honest use, but it functioned nicely. If the previous owner had applied oil to the outside surfaces, the rifle would be a nice collector today. The project began by separating the rifle into its two sections by simply loosening the thumbscrew and "breaking" the rifle into a front portion and rear portion. The right side of the receiver contains the buttstock, tang sight, hammer, mainspring, trigger, and trigger spring. It is a model of simplicity, and has a very nice, crisp trigger 105 years after it came off the assembly line.

Features of the Model 20	
<b>Caliber:</b>	.22 short, long, long rifle
<b>Barrel:</b>	Octagon, 22 ½"
<b>Receiver:</b>	Blued, Takedown
<b>Stock:</b>	Straight with blued steel buttplate
<b>Length:</b>	38 ¼" (25 ½" when taken down)
<b>Weight:</b>	3 lbs., 14 ozs.
<b>Front Sight:</b>	Ivory bead and rotating hooded post



BEFORE RESTORATION The pitting on the right side of the receiver can be observed in panels A and B. "P.F. Coe 1907" has been scratched into the left side of the receiver (panel D). Note the dents and scratches in the stock in panels C and F. The barrel mounted sight is missing its slider (panel E).

The first step in refinishing the wood furniture was to remove the old finish. This was accomplished using Formby's Furniture Refinisher. Using a 3M green scrubbing pad, the refinisher was liberally applied to the forearm and buttstock, and scrubbed until all of the old finish was removed. Two beautiful pieces of old Black Walnut was revealed, along with a lot of dents in the buttstock. To remove the dents, the grain of the wood was raised by steaming the buttstock for about 20 minutes using a vegetable double boiler and an old cotton towel. Following the steam bath, the wood was sanded with the grain of the wood using fine (220 grit) sand paper.

The original finish had a reddish tint to it, so I first applied a coat of Minwax Red Oak (No. 215) wood finish, which is a penetrating oil-based wood stain. The stain was allowed to dry overnight, and then three coats of Minwax Wipe-On Poly satin polyurethane finish was hand rubbed over the finish to seal the finish and the wood. Although a gloss finish would have, without doubt, made the rifle look better, I plan on putting this little rascal back into the field, and a satin finish would be more difficult for those squirrels to see.

The next step in the project was to remove the old bluing and rust, remove as many of the pits and scratches as possible, and refinish the metal. To accomplish this, the rifle was fully disassembled. A note of caution here: one should ALWAYS use a high quality gunsmith's screwdriver kit when working with a firearms, but this was doubly true with this project, as many of the screws are simply not available anymore. If I had marred the slots of the screws, I would have had to make new screws, which is a project in itself!

All of the finish was removed by bead blasting the external surfaces of the metal. Light rust was removed during this process; however, heavier pitting and scratches were not removed by bead blasting. To remove the heavier pitting, a fine 220 grit sand paper was used. In some instances, an orbital sander was used to speed the process, followed by hand sanding, and then final metal preparation with #0 steel wool.

To be certain, the highest quality finish would have been obtained by polishing the metal followed by hot bluing. I have, however, gotten extremely good results on past projects using Brownell's Oxpho-Blue liquid cold bluing process. Originally developed for the occasional bluer who is not equipped to completely polish a gun prior to bluing, Oxpho-Blue gives high quality results for the hobby gunsmith. With Oxpho-Blue all one needs do, in most cases, is dampen a piece of cotton flannel and give the area a good rubbing. In the hands of a careful craftsman, not only is the Oxpho-Blue finish beautiful, but it is also more durable and weather resistant than any other known chemical finish. Before applying the Oxpho-Blue, all oil was removed from the metal using isopropyl alcohol (you may get this from any auto parts store in large quantities without the



The rear half of the rifle was completely disassembled to remove the old finish.



The top tang before bluing showing "Marlin No. 20." the tang rear sight must be removed to see the model number. On the right, the deep blue is shown after application of Oxpho-Blue.

Pharmacy price). After the alcohol had evaporated, Oxpho-Blue was applied using a flannel cloth. The bluing process is immediate, and to the novice, may appear to be uneven. It is not! One should continue to rub the flannel across the metal for several minutes, and then remove the excess with a clean, dry cloth. The final step to reveal the deep black-blue luster is to use #0 steel wool to burnish the metal. A second application can be made if desired or needed. Always remember to burnish the metal with steel wool to bring out the beautiful black-blue luster.



Once the rifle was restored and reassembled, the real fun began: shooting. Given that the rifle is 105 years old, I decided to only use standard velocity .22 Long Rifle ammunition to ensure that no damage would occur to the bolt or firing pin. Many years ago, I bought a case of Remington "white box" standard velocity ammunition from the Civilian Marksmanship Program (CMP). I've found over the years that this ammunition is plenty accurate for hunting, and there is absolutely no need for high velocity ammunition for killing squirrels and other small game. I also decided that since the rifle will chamber and fire .22 Short ammunition, I'd try this as well. I already owned a box of Remington High Velocity .22 Short ammunition, so I simply used it more out of curiosity than anything else.



The author inspects the tang rear sight following bluing.

When I originally obtained the rifle, the barrel sight lacked it's slider, so only the tang rear sight was available. Although the tang rear sight proved to be highly accurate, it is difficult to see a squirrel through that sight in low light conditions. In fact, I had to pass on several squirrels during the season simply because I could not see them! So, during the restoration process I ordered a "Super Semi-Buckhorn Rear Sight w/ Elevator" from Numirch Gun Parts Corporation (Catalog Number 403190G, Cost \$8.70). This rear sight is not correct for the Model 20, but will fit Marlin Models 20, 20A, 20S, 29, 37, 47, and 80. Again, the project was meant to return this little jewel to the field, and not necessarily to increase its collector's value. My thought was to use the barrel mounted rear sight for low light conditions and to zero this sight to 25 yards. I would then sight the tang mounted sight to 50 yards. But, when I got out to the range, I quickly realized that this plan would not work. The buckhorn rear sight made it impossible to see the front sight through the tang mounted rear sight, and my 50 year old eyes made the buckhorn sight much more difficult to use



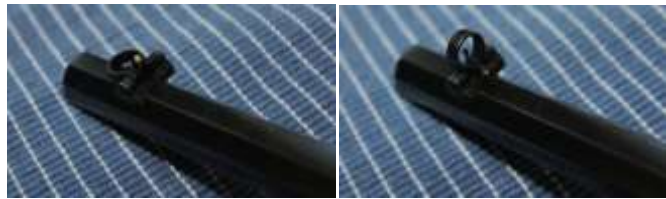
The rear portion of the receiver is shown following bluing with Oxpho-Blue. Note that the deep pitting seen in the "BEFORE" pictures is lacking. The simplicity of the trigger is shown in the right picture. Even though the trigger mechanism is simple, the trigger pull is exceptionally smooth, light, and crisp.

than the tang mounted rear sight. So, the buckhorn sight was removed from the rifle and not used. Those squirrels that come out just before dawn or close to dusk are going to be safe.

It should be noted that the Model 20 has a very interesting and ingenious front sight. There is a hooded sight with a blued steel post with integral bead that can be flipped down to reveal an

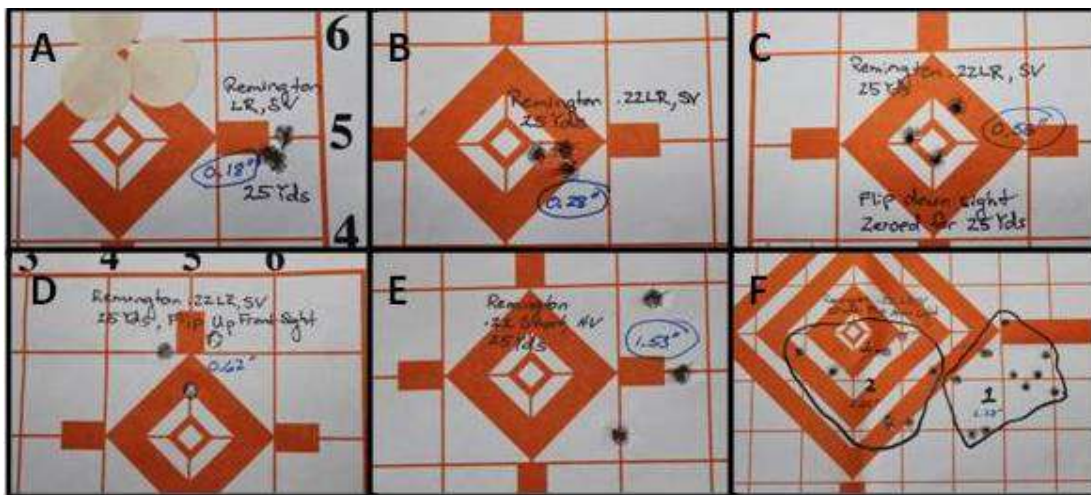


ivory beaded front sight (yes, it's real ivory). I find that the ivory bead is much easier to see in dim light, so I used this sight to zero the rifle. After zeroing the rifle with the ivory bead, I also fired the rifle with the steel flight up sight just to see how it differed from the ivory bead.



The front sight on the Model 20 features a flip design.

Shooting this little rifle is just plain FUN, and it is really accurate! At 25 yards using Remington .22 Long Rifle standard velocity ammunition and the ivory bead front sight, I fired three 3-shot groups: 0.18", 0.28", and 0.56" for an average of only 0.34". Using the flip up steel post front sight, the average accuracy was 0.86" and the groups were higher than with the ivory bead front sight. Not surprisingly, accuracy was not as good using the Remington .22 Short high velocity ammunition, which resulted in an average group size of 1.95". I must admit that I was surprised when I fire the rifle at 50 yards, as the groups were only about 1 inch lower than the groups fired at 25 yards. Although accuracy was not as good (average group size was 2.47"), this is not really surprising for iron sights.



The first group out of the rifle (panel A) measured 0.18" and was to the right of the bull's eye. The front sight was drifted to the right in its dovetail, and the group in panel B was fired, which measured 0.28". A little more drift to the right resulted in the final 0.56" group seen in panel C. Using the flip up sight steel post results in a centered group that is higher than with the ivory bead front sight (panel D). The use of Remington .22 Short high velocity ammunition results in poor accuracy, as observed in Panel E. The average for this ammunition was 1.95" at 25 yards. Finally, as seen in Panel F, the rifle was fired at 50 yards before and after the front sight was drifted to the right (group 1 corresponds to the same sight position as panel B, and group 2 to the same sight position as panel C). The average group size was 2.47".

To say I am pleased with how this project came out is a vast understatement. This sort of project is very easy for anyone with a modicum of mechanical ability, and would be a breeze for anyone who has done any amount of gunsmith work in the past. The only thing needed is a good set of screw drivers, some punches and a small hammer, and a whole lot of patience.



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I'd like to invite all LSA members to share any article they have written that pertains to the shooting sports or activities. With the growth of the organization over the years we have seen many experts over a wide range of disciplines and backgrounds join the association. We would like to welcome those of you to share your wealth of knowledge. If you have an article that you'd like to submit, please email it to [thetedeo25@yahoo.com](mailto:thetedeo25@yahoo.com) with "Article for LSA" as the topic.

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