

REMINGTON AND PETERS C.F. RIFLE CARTRIDGES—BALLISTICS AND PRICES

Peters cartridges are identical with Remington loads having the same basic caliber designation, hence the ballistics given will serve for both brands. Peters cartridges not duplicated by Remington are listed in boldface type. Remington cartridges not duplicated by Peters are listed in italic type. — indicates a new cartridge or load. All ballistic figures are computed from line of bore.

CARTRIDGE	BULLET Wt. Gr. Style	VELOCITY—FEET PER SECOND				ENERGY—FOOT POUNDS				MID-RANGE TRAJECTORY			PRICE For 20
		Muzzle	100 yds.	200 yds.	300 yds.	Muzzle	100 yds.	200 yds.	300 yds.	100 yds.	200 yds.	300 yds.	
218 See Hi-Speed*	46 Mush.	2860	2160	1610	1200	835	475	265	145	0.7	3.8	11.5	\$6.90
219 Zipper Hi-Speed*	56 Mush.	3110	2440	1940	1530	1200	740	465	300	0.6	2.9	8.3	3.60
221 Hornet Hi-Speed*	45 Mush.	2690	2030	1510	1150	720	410	230	130	0.8	4.3	13.0	6.70
220 Swift Hi-Speed*	45 S.P.	2690	2030	1510	1150	720	410	230	130	0.8	4.3	13.0	6.70
222 Remington Hi-Speed	48 S.P.	4110	3490	2930	2440	1800	1300	915	635	0.8	1.4	3.8	3.85
222 Remington Hi-Speed	50 S.P.	3200	2650	2170	1750	1140	780	520	340	0.5	2.5	7.0	3.15
222 Remington Magnum Hi-Speed	55 S.P.	3500	2800	2340	1930	1330	955	670	455	0.5	2.3	6.1	3.45
223 Remington	55 S.P.	3265	2905	2550	2210	1300	1035	795	595	0.5	2.1	5.4	3.45
8mm Remington	100 Prd.S.P.C.L.	3190	2920	2660	2420	1220	1090	820	600	0.4	1.8	4.7	4.30
243 Winchester Hi-Speed	80 Prd.S.P.	3500	3080	2720	2410	2280	1690	1370	1300	0.5	2.1	5.1	4.30
244 Winchester Hi-Speed	100 Prd.S.P.C.L.	3070	2790	2540	2320	2090	1730	1430	1190	0.5	2.2	6.4	4.30
244 Remington	75 Prd.S.P.	3500	3070	2660	2290	2040	1570	1180	875	0.4	1.9	4.9	4.30
244 Remington	90 Prd.S.P.	3200	2850	2530	2230	2050	1630	1280	995	0.5	2.1	5.5	4.30
244 Remington	90 Br.P.	3200	2850	2530	2230	2050	1630	1280	995	0.5	2.1	5.5	4.30
25-20 Winchester Hi-Speed*	60 Mush.	2250	1660	1240	940	675	365	205	140	1.2	6.3	21.0	6.25
25-20 Winchester	86 Lead	1460	1180	1030	940	405	245	200	170	2.6	12.5	32.0	5.90
250 Savage Hi-Speed	86 S.P.	1460	1180	1030	940	405	245	200	170	2.6	12.5	32.0	5.90
250 Savage Hi-Speed	87 S.P.	3030	2660	2330	2060	1770	1370	1050	820	0.6	2.5	6.4	4.00
250 Savage Hi-Speed	100 Prd.S.P.C.L.	2820	2500	2210	1940	1760	1390	1080	835	0.6	2.8	7.1	4.00
250 Winchester	100	2820	2500	2210	1940	1760	1390	1080	835	0.6	2.8	7.1	4.00
25-38 Winchester	117 I.B.S.P.	2320	1950	1670	1460	1370	985	730	555	1.0	4.6	12.0	3.70
25-35 Winchester Express	117 S.P.C.L.	2300	1910	1600	1460	1370	985	730	555	1.0	4.6	12.0	3.70
257 Roberts Hi-Speed	100 Prd.S.P.C.L.	2900	2580	2280	2000	1870	1400	1080	865	0.6	2.7	6.7	4.45
257 Roberts Express	117 S.P.C.L.	2650	2280	1950	1690	1820	1350	1040	740	0.7	3.4	8.8	4.45
254 Winchester Magnum	100 Prd.S.P.C.L.	3700	3260	2880	2550	3040	2340	1840	1400	0.7	2.6	6.6	4.45
254 Winchester Magnum	140 Prd.S.P.C.L.	3900	3440	3060	2730	3180	2490	1910	1400	0.5	2.1	5.2	3.85
270 Winchester Hi-Speed	140 Prd.S.P.C.L.	3400	3070	2690	2340	2090	1600	1220	0.4	1.8	4.8	4.78	
270 Winchester Hi-Speed	130 I.B.S.P.	3140	2880	2580	2320	2040	1570	1180	875	0.4	1.9	4.9	4.30
270 Winchester Hi-Speed	130 Br.P.	3140	2880	2580	2320	2040	1570	1180	875	0.4	1.9	4.9	4.30
270 Winchester Hi-Speed	130 S.P.C.L.	2800	2440	2140	1870	1610	1240	915	635	0.5	2.1	5.3	4.78
280 Remington	100 Br.P.	3570	3140	2770	2420	2050	1630	1280	995	0.5	2.1	5.5	4.30
280 Remington	125 Prd.S.P.C.L.	3190	2880	2590	2320	2050	1630	1280	995	0.5	2.1	5.5	4.30
280 Remington	130 Prd.S.P.C.L.	2890	2640	2440	2210	2780	2340	1980	1630	0.6	2.1	5.3	4.75
280 Remington	145 S.P.C.L.	2890	2640	2440	2210	2780	2340	1980	1630	0.6	2.1	5.3	4.75
7mm Remington Magnum	150 Prd.S.P.C.L.	2890	2510	2220	1970	2910	2310	1810	1420	0.6	2.8	7.2	4.75
7mm Remington Magnum	175 S.P.C.L.	2890	2510	2220	1970	2910	2310	1810	1420	0.6	2.8	7.2	4.75
30 Carbine*	110 S.P.	1980	1540	1230	960	700	400	230	130	1.5	7.5	24.5	5.85
30-30 Winchester Express	150 S.P.C.L.	2410	1960	1620	1360	1190	880	660	465	1.4	8.5	24.5	7.50
30-30 Winchester Express	140 M.C.	2220	1870	1600	1370	1240	915	665	465	1.0	5.0	13.0	3.75
30-30 Winchester Express	170 M.C.L.	2220	1890	1630	1410	1800	1350	1000	750	1.2	4.6	12.5	3.75
30-30 Winchester Express	170 S.P.C.L.	2220	1890	1630	1410	1800	1350	1000	750	1.2	4.6	12.5	3.75
30 Remington Express	170	2220	1890	1630	1410	1800	1350	1000	750	1.2	4.6	12.5	3.75
30 Remington High Velocity	170 I.B.S.P.	2220	1890	1630	1410	1800	1350	1000	750	1.2	4.6	12.5	3.75
30-40 Krag Hi-Speed	180 S.P.C.L.	2470	2120	1830	1510	1260	980	730	510	1.2	4.6	12.5	3.75
30-40 Krag Hi-Speed	180 Prd.S.P.C.L.	2470	2120	1830	1510	1260	980	730	510	1.2	4.6	12.5	3.75
30-40 Krag High Velocity	220 I.B.S.P.	2200	1930	1700	1510	2360	1820	1410	1110	1.0	4.6	12.0	4.75
30-40 Krag High Velocity	220 S.P.C.L.	2200	1930	1700	1510	2360	1820	1410	1110	1.0	4.6	12.0	4.75
30-06 Springfield Hi-Speed	110 Br.P.	3420	2940	2490	2090	2360	2110	1810	1070	0.4	2.1	5.6	4.75
30-06 Springfield Hi-Speed	150 Prd.S.P.C.L.	2970	2710	2470	2240	2930	2440	2030	1670	0.3	2.4	6.0	4.75
30-06 Springfield Hi-Speed	125 Prd.S.P.	3200	2810	2400	2130	2930	2370	1920	1510	0.6	2.4	6.1	4.75
30-06 Springfield Hi-Speed	180 S.P.C.L.	2700	2330	2010	1740	2540	2190	1710	1340	0.5	2.2	5.6	4.75
30-06 Springfield Hi-Speed	180 Prd.S.P.C.L.	2700	2470	2250	2040	2910	2440	2020	1660	0.7	2.9	7.0	4.75
30-06 Springfield Hi-Speed	180 Br.P.	2700	2480	2280	2080	2910	2460	2080	1730	0.7	2.9	6.9	4.75
30-06 Springfield Palma Match	180 M.C.T.H.	2900	2520	2350	2190	2910	2540	2200	1900	0.6	2.8	6.7	4.75
300 H. & H. Magnum Hi-Speed	180 Prd.S.P.C.L.	2410	2120	1870	1670	2830	2190	1710	1360	0.8	3.9	9.8	4.75
300 H. & H. Magnum Match	180 M.C.T.H.	2920	2740	2550	2380	3400	2850	2380	1970	0.6	2.4	5.9	4.00
300 H. & H. Magnum Express	270 S.P.C.L.	2620	2320	2050	1830	3350	3000	2600	2260	0.6	2.4	5.7	4.45
300 Winchester Magnum*	190 Prd.S.P.C.L.	3400	3050	2730	2430	3850	3100	2050	1630	0.7	3.2	8.2	6.00
300 Winchester Magnum*	180 Prd.S.P.C.L.	3070	2850	2640	2440	3770	3250	2790	2380	0.5	1.9	4.8	6.00
300 Savage Hi-Speed	150 S.P.C.L.	2670	2270	1930	1660	2370	1710	1240	915	0.7	3.1	5.1	4.60
300 Savage Hi-Speed	150 Prd.S.P.C.L.	2670	2410	2170	1950	2370	1930	1370	1170	0.7	3.0	7.5	4.60
300 Savage Express	180 S.P.C.L.	2370	2040	1760	1520	2240	1660	1240	920	0.9	4.1	10.5	4.60
300 Savage Express	180 Prd.S.P.C.L.	2370	2160	1960	1770	2240	1860	1530	1250	0.9	3.7	9.2	4.60
303 British	180 S.P.C.L.	2540	2300	2090	1900	2580	2120	1750	1440	0.7	3.3	8.2	4.95
303 Savage High Velocity	215 S.P.	2180	1900	1660	1460	2270	1720	1310	1020	1.1	5.4	14.0	4.95
303 Savage Express	180 S.P.C.L.	2140	1810	1550	1340	1830	1310	960	715	1.1	5.4	14.0	4.95
308 Win. Hi-Speed	110 Prd.S.P.	3340	2810	2400	2090	2730	2200	1780	1400	0.6	2.6	6.5	4.75
308 Win. Hi-Speed	150 Prd.S.P.C.L.	2860	2570	2300	2050	2730	2200	1780	1400	0.6	2.6	6.5	4.75
308 Winchester	180 Prd.S.P.C.L.	2610	2390	2170	1970	2720	2280	1870	1540	0.8	4.9	13.0	3.85
32 Remington Express	180 S.P.C.L.	2610	2390	2170	1970	2720	2280	1870	1540	0.8	4.9	13.0	3.85
32 Winchester Special Express	170 S.P.C.L.	2220	1890	1610	1400	1860	1350	975	740	1.0	4.8	12.5	3.85
32-20 Winchester Hi-Speed**	80 Mush.	2100	1430	1090	950	780	450	250	145	1.5	8.5	24.5	7.15
32-20 Winchester*	100 Lead	1290	1060	940	840	780	365	210	160	1.5	8.5	24.5	7.15
32-40 Winchester*	100 S.P.	1290	1060	940	840	780	365	210	160	1.5	8.5	24.5	7.15
348 Winchester Hi-Speed	165 S.P.	1440	1250	1100	1030	760	570	445	390	2.4	11.0	30.0	5.85
348 Winchester High Velocity	150 S.P.	2890	2360	1860	1420	2780	1850	1150	670	0.6	3.2	9.0	5.85
348 Winchester Express	200 S.P.C.L.	2530	2140	1820	1570	2840	2030	1470	1090	0.8	3.8	10.0	5.85
35 Remington Hi-Speed	150 Prd.S.P.C.L.	2400	1960	1620	1370	2840	2030	1470	1090	0.8	3.8	10.0	5.85
35 Remington Express	200 M.C.L.	2210	1830	1540	1310	2170	1490	1050	760	1.1	5.2	14.0	4.75
351 Winchester Self-Loading*	180 S.P.	1850	1560	1310	1140	1370	975	685	520	1.5	7.8	21.5	4.75
375 H. & H. Magnum	270 M.C.	1850	1560	1310	1140	1370	975						

4/7/69

Dear Dick,

Every time it begins to look like I'm going to get caught up on some things there are new developments to prevent it. This time it is John Nichols' suit. He asked for suggestions and I'm writing an analysis of the government's response. Got up at three to get a good start, got perhaps 2500 words done before taking Lil to work, and the mail that required immediate attention (which didn't all get done) took me until 3 p.m., when I decided I still had to get some outdoors exercise in and did for an hour and a half. And so the day goes...

Your note on prints is correct. Until I get to the writing I cannot be certain of the source. I believe it is Blair and the transcript. However, whatever turns out to be what seems to be fact, the presence of prints is less significant than their absence, for planting them is consistent with being a decoy whereas their absence is consistent only with his total absence.

Had today not been a kind of holiday there I'd have had the sighted rifle back, with the ammo, etc. I borrowed their Guns Digest book and copied the enclosed, also another one on ammo but seemingly reloaded. I was looking for and didn't get what you sent. Thanks. Got the data on the M-S but not the M-C cartridge. What you say in explanation is what the gunsmith told me, only you are more lucid, more complete. I still, however, adhere to my initial belief that the smaller bullet is the better choice for assassination for the reasons you confirm and because there is less likelihood of tracing the remnant(s). For more scientific reasons this seems to be your belief.

As I told you, the evidence is they cannot tie the slug to the rifle. I have no reason to believe they can be certain of the calibre, but I do not recall that part clearly.

In due time I'll be asking for a representation of the evidence. I have already been denied the evidence itself.

When I can get to it, I'll try and confirm your theories on the local range, with the instructor doing the experimenting. If and when I can, I'll let you know.

That part of AGENT OSWALD dealing with the frameup is really shaping up.

Hastily,

2 April 69

Harold:

Attached ~~is~~^{are} specific ballistic data on the ~~xxx~~ .243 Win. and the 30/06. Both cartridges can accomplish about the same thing, but they do it in a somewhat different way from one another.

What is important is the weight of the bullets that they fire, and the velocity at which they fire them. Understand that many variables come into play in determining the effect that each type and weight of bullet will have, but ~~in general~~ in general the heavier bullets of the 30/06 (soft-nose loads) tend to expand (into mushroom shape) more gradually than the ~~xxxxx~~^{lighter} lighter bullets of the 243 (assuming that both the heavy and light bullets are moving at about the same rate of speed when they strike their target).

Perhaps it would be best to illustrate. There is a goat a hundred yards away. I have rifles in 30/06 and .243 Win, and ~~various~~ cartridges of various bullet weights for each.

~~I~~ I shoot the goat with my 30/06, using fairly heavy bullets of, say, 150 grains. The bullets that do not strike bone are likely to pass right through before they have completed the mushrooming expansion. On a bigger and tougher animal (a black bear, say) my bullet probably would have expanded fully, perhaps coming to rest in the bear's body just inside the hide on the other side of the entrance wound. Skin is elastic and very tough, and bullets that do not pass through often end up there.

Now, if my 150 gr. 30 cal. bullet struck a bone in the goat, depending on how hard was the bone and how the bullet struck it, I would expect that if the bullet fragmented, it broke only into three or four ~~px~~ fairly large pieces, with perhaps a few tiny fragments. That I mean is that the fragmentation is not explosive.

Now I shoot a goat with a light 30 cal bullet-- say 110 grains. This bullet moves very fast, and is bad, bad medicine for small animals like goats, for the expansion of this bullet is much more violent, and the shock wave inside the body is devastating. This bullet will expand very fast inside the goat, and (I hope) will come to rest on the inside of his hide opposite the entrance.

If that light 30 cal strikes bone, it will butrst into more pieces than the heavy bullet.

The heavy loading of my ^(100grains) ~~243~~ 243 is likely to have the same effect as the light loading of my 30/06. Actually, the 30 cal. and 243 cal. bullets are about the same weight, but the bullets are "light" or "heavy" with respect to the other loadings in the respective calibers.

* ^{this, I believe, is about 80 grains (I have not yet checked ballistic tables.)}
The light bullet fired in the 243 is going to mash up that goat pretty badly; ~~this~~ this small bullet is moving at tremendous speed; ~~xxxxxx~~ that combination--light weight, and high speed-- does something quite different from the previous bullets mentioned. This type of combination is the favorite of varmint hunters who like to shoot woodchucks, foxes, crows, prairie dogs, and the like-- little animals. You don't want the bullet to mushroom when it strikes ~~the~~ these little creatures, for mushrooming takes too long-- the mushrooming would just be getting started when the bullet is passing out ~~the~~ the other side; it's no better than shooting the little thing with a non-expanding bullet. What you want for varmint shooting is a bullet that explodes on impact, a bullet that does most of its damage on the surface of what it strikes. The high-speed .22 cal center-fire cartridges are best for this business,

.225 Winchester



Historical Notes The .225 Winchester was officially announced in June, 1964. However, as is usually the case, production rifles and ammunition were not available until some months later. A standard sporter and heavier varmint version of the new Model 70 bolt action were the initial arms chambered for the round. Winchester has indicated the new .225 will replace the older .220 Swift. The cartridge is described as of "semi-rimmed construction," actually looking more like a rimmed type with normal extraction lip. Rim diameter is .095 inch larger than the .222 Remington, or about the same as most .30-06 class cartridges (.473"). Maximum average operating pressure is given as 52,000 psi so it is strictly in the high velocity-high intensity class. Barrels have a 1-14 twist.

General Comments The .220 Swift, introduced by Winchester in 1936, has never achieved great popularity. Although possessed of really top flight long range performance and the highest velocity of any commercial cartridge, it also had its faults. For a .22, the Swift has a very sharp, loud report. Both rifles and ammo were expensive and .220 Swift barrels aren't noted for long life. Consequently the .222 Remington regular and magnum pretty well cornered the high velocity .22 centerfire market. The .225 is Winchester's effort to win some of this back.

In power the .225 Winchester is in the same identical class as the belted .224 Weatherby. Factory adver-

tised velocity with the 55-gr. bullet is 3650 fps in both cases. There is not much to choose from performance-wise, but Winchester Model 70 rifles are substantially cheaper and mechanically just as good as the fancier Weatherby. In the final analysis that is largely what will determine the average person's choice. As to accuracy, that will be a matter of individual rifle plus what can be done by custom tuning. Both cartridges have shown excellent accuracy.

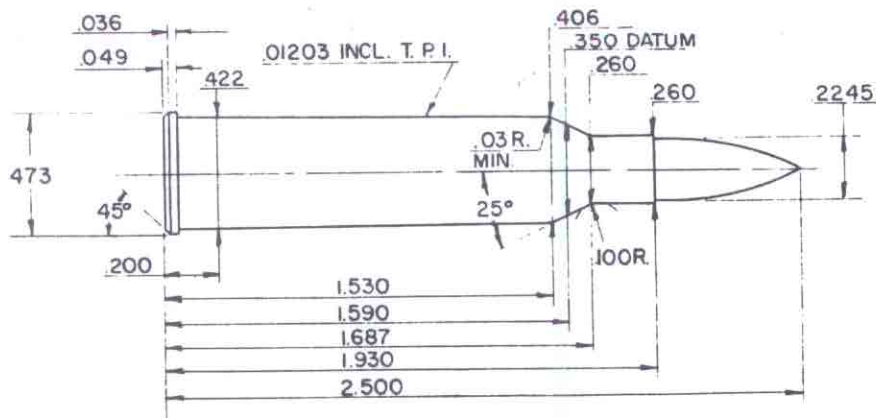
Winchester has indicated that they will eventually load a 60-gr. bullet at a muzzle velocity of 3500 fps and possibly also a 50-gr. at 3800 fps. If so, this will provide a wide choice of bullets to cover any possible varmint shooting situation.

The .225 Winchester has an edge over the .222 Rem. Mag. for long range shooting because it starts its bullet out at 300 to 350 fps higher velocity. To some individuals this will be a matter of importance. In actual practice it might not add up to any great advantage because the ability to connect at extreme ranges depends on other things besides flat trajectory. Killing power will be enhanced also, but even the regular .222 Rem. has all the power needed for varmint size animals. None of this is meant to disparage what is truly an excellent long range varmint cartridge. On the other hand, a few hundred feet per second increase in muzzle velocity does not necessarily render all similar cartridges obsolete. Primarily a varmint cartridge, the .225 Win. might be suitable for small deer if loaded with proper bullets.

Reloading Data and Factory Ballistics

Bullet (grs.)	Powder/grs.	MV	ME
50	3031 32.3	3675	1500
50	4895 36.2	3565	1411
55	4320 35.0	3700	1672
55	FL (muzzle)	3650	1630
55	FL (100 yds.)	3140	1200
55	FL (200 yds.)	2680	875
55	FL (300 yds.)	2270	630
55	FL (400 yds.)	1900	440
55	FL (500 yds.)	1560	295

100 yd. MRT = 0.4"
200 " " 1.8"
300 " " 4.8"
400 " " 10.0"
500 " " 19.0"



.243 Winchester

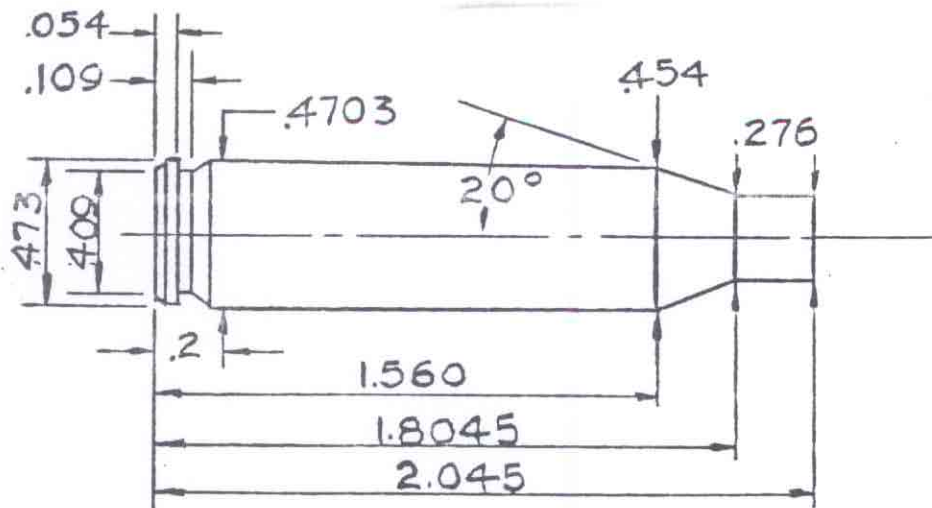


Historical Notes Introduced by Winchester in 1955 for their Model 70 bolt action and Model 88 lever action rifles. The .243 was quickly adopted by Savage for their Model 99 lever and Model 110 bolt action rifles. All of the British and European manufacturers began chambering bolt action rifles for this round, including BSA, FN, Sako, Husqvarna, Mannlicher-Schoenauer and others. In fact, even Remington, who developed their own 6mm, had to recognize the popularity of the .243 and start chambering some of their rifles for it. The .243 (6mm) Winchester is nothing more than the .308 Winchester case necked down. Original development and publicity was due largely to the efforts of gun writer Warren Page, who along with other wild-catters worked out a similar version before Winchester. The .243 is chambered today (1963) in more Winchester rifles than any other cartridge — the 88 lever action, 100 semi-auto, 70 Featherweight, 70 Standard, 70 Varmint and, formerly, in the 70 Bull Gun.

General Comments The .243 Winchester represents a successful effort to develop a varmint-to-deer class rifle that could hold its own with the various high velocity .22's for extremely long range use on small targets and still be adequate for the larger animals. The .243 does this job so well that it has taken a lot of play away from the .222 Rem. and all the rest of the .22 cartridges. It eliminates the need for owning two different rifles for anything from small game and pests right up to and including deer, antelope or black bear. The 80-gr. bullet is intended primarily for varmint and medium game and the 100-gr. bullet for deer size animals. The .257 Roberts and the 250-3000 Savage are supposed to cover the same range and certainly do. However, the .25-caliber bullets don't have quite the sectional density for long range varmint shooting until bullet weight gets up around 120 grs. and then the velocity falls off badly. All in all, the 6mm does a better job in covering the intended range of game and shooting conditions.

Reloading Data and Factory Ballistics

Bullet (grs.)	Powder/grs.	MV	ME	
80	4831 48	3265	1890	Varmint, med. game
80	4350 43	3300	1930	
80	H-380 39	3205	1820	
100	4831 44	3100	2130	Deer, antelope, etc.
100	3031 35	3045	2060	
100	4350 42	3060	2078	Dup. fact. ball.
80	FL	3500	2180	200 yd. MRT = 1.8"
100	FL	3070	2090	" " 2.2"



.30-06 Springfield



Historical Notes United States military cartridge adopted in 1906 for the Model 1903 Springfield service rifle, which was based on the Mauser bolt action system. The .30-06 is actually a slightly modified version of the original 1903 cartridge, which was loaded with a 220-gr. round-nosed bullet at a muzzle velocity of 2300 fps. Because of cartridge developments in Europe it was considered advisable to change to a 150-gr. bullet at an increased velocity of 2700 fps, and at the same time the case neck was shortened by .07-inch. This improved round was designated the "Ball Cartridge, caliber .30., Model of 1906," but in practice the nomenclature was shortened to .30-06. The .30-06 version can be chambered and fired in any rifle made for the original 1903 round, but the reverse is not always true because of the difference in case length. For many years both the 1903 and 1906 loadings and case configuration were loaded by sporting ammunition manufacturers. Shooting the '06 in the '03 chamber reportedly gave poor accuracy. Old catalogs list both rounds, and occasionally the 1903 version is called the .30-45 because the original loading used 45 grains of smokeless powder.

Again because of military developments in Europe, the army switched to a 172-gr. bullet with a 9" boat-tail in 1926, the new round being designated the "Ball, caliber .30, M1." Muzzle velocity, originally the same as the 150-gr. load on 2700 fps, was later reduced to 2640 because of difficulty in maintaining pressure specifications at the higher velocity. In 1940 the 150-gr. flat-base bullet was re-adopted as the "Cartridge, Ball, caliber .30, M2" and this was the load used in World War II. It is my understanding that the return to the lighter bullet came about, at least in part, because of difficulties in adapting the then new Garand semi-auto rifle to handle the 172-gr. loading. The heavier boat-tail bullet was superior for machine gun use through its greater maximum range (nearly 6000 yards for the original 2700 fps load), compared to about 3500 yards for the 150-gr. loading.

The rimless .30-03 and the later .30-06 replaced the older rimmed .30-40 Krag as the official U.S. military round. The .30-06 has, in its turn, been superseded by the 7.62mm M59, also known as the 7.62mm NATO or, in its commercial version, as the .308 Winchester. As a sporting cartridge the .30-06 is one of the most popular and widely used big game numbers ever developed. In Europe it is known as the 7.62X63mm. Every manufacturer of standard length bolt action sporting rifles in the western world includes the .30-06 as one of the available calibers.

The Winchester Model 1895 lever action appears to have been the first sporting rifle chambered for the then new .30-03. The cartridge was added to the line of available calibers in 1904-1905, the modified 1906 round in 1908. The Remington bolt action Model 30, introduced in 1921, and the Winchester bolt action Model 54 brought out in 1925 both offered the .30-06, among other calibers. The Savage bolt action Model 40 and 45 Super-Sporter rifles were also so chambered when introduced in 1928. At present, in addition to

the many bolt action rifles, the Remington Model 760 slide action and 742 semi-auto as well as the Browning High-Power semi-auto include the .30-06 as standard calibers. The Ruger Number One single shot rifle is also offered in .30-06. A number of British and European side by side or over-under double rifles can be ordered in this caliber and so can some European rifle-shotgun combination guns.

General Comments The .30-06 is undoubtedly the most flexible, useful, all-round big game cartridge available to the American hunter. For many years it has been the standard by which all other big game cartridges have been measured. To say that a cartridge is in the .30-06 class means it is suitable for any game in North America. The secret of success when using this cartridge is to be sure and select the right bullet for the game and hunting conditions at hand. The lighter bullets of around 100 to 130 grains, should be used only for varmint hunting. While these bullets can be driven at impressive velocities, starting out at over 3000 fps, they are made to expand rapidly on small animals and will not penetrate properly on large game. For deer, antelope, goat, sheep, black or brown bear, under most hunting conditions, the 150- or 165-gr. bullet is proper. For heavier game, such as elk, moose or the big brown bear, the 180-, 200- or 220-gr. bullet is the best choice. These are also considered best for woods or brush hunting, regardless of the quarry. Many experienced hunters consider the 180-gr. bullet as the most satisfactory all-round loading for the .30-06 because it can be used effectively on anything from deer sized animals on up to the heaviest varieties under almost any hunting conditions. When handloaded with the 250-gr. bullet, the .30-06 practically duplicates the performance of the British .318 Rimless-Nitro, popular in many parts of Africa for shooting plains game. As a matter of fact, the .30-06 will give a good account on all but the heaviest or most dangerous African or Asiatic species under average hunting conditions. The 220-gr. bullet is generally recommended for African game although the 180-gr also has a good reputation there. With the proper bullet, this cartridge can be adapted to any game or hunting situation in North or South America, whether in the mountains, plains, woods or jungle. Few other cartridges can claim equal versatility.

One of the joys and advantages of owning a .30-06 is the availability (at least heretofore) of low-cost surplus military ammunition. This comes in a confusing variety of types and manufacture, and the question often arises as to the meaning of the color coding used on the bullet tips or which lots have corrosive or non-corrosive primers. To save space and facilitate identification, these data are presented in tabular form for U.S. .30-06 military ammunition only. Other countries, such as Mexico, also adopted the .30-06 as their official military round, but information covering all the foreign varieties is outside the scope of this book.

Table Showing Change from Corrosive to Non-Corrosive Primers for Various Lots and Manufacture of 30-06 Military Ammunition

Source	Headstamp	Year and Lot #
Dominion*	DAQ	Ball, all n-c
Frankford	FA	Ball (6/51) #4149
		AP (10/51) #887
Lake City	LC	Ball (6/51) #13700
		AP (4/51) #13158
Remington	RA	Ball (11/51) #33853
St. Louis	SL	Ball (5/52) #9420
		AP (7/52) #9467
Twin Cities	TW	Ball (12/50) #19362
		AP (2/52) #19776
Verdun*	VC	Ball, all n-c
Western Cartridge Co.	WCC	Ball (6/51) #6428
Winchester Repeating Arms	WRA	Ball (8/51) #23201
		AP (6/51) #22007

*Canadian; all others, U.S.

Note: Practically all U.S. Military ammunition loaded after 1952 has non-corrosive primers. The principal exception is Frankford Arsenal Match ammunition marked "FA 53, 54 or 56" which has the old style corrosive priming. This can be identified by the date and the green, red or purple waterproofing compound around the primer. Military primers marked "FA 26," or "FA 70" are of the chlorate type and corrosive composition.

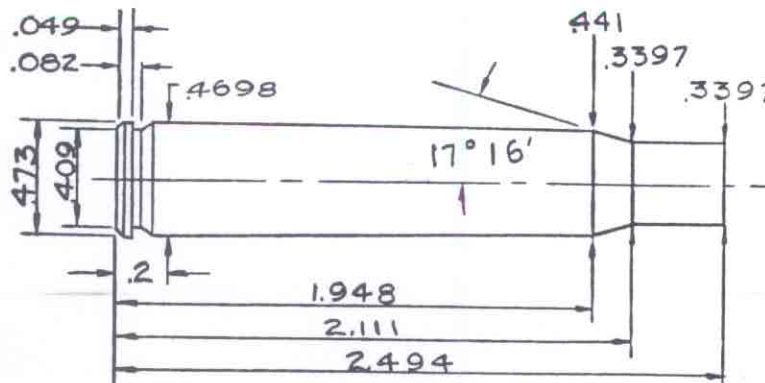
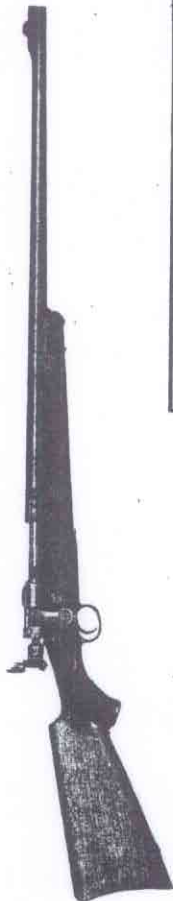
Principal Caliber .30-06 Military Weapons

U.S. 1903 Springfield series, 1917 Enfield and M1 Garand rifles; 1918 series Browning automatic rifle (BAR); 1917 and 1919 series and M37 machine guns. Late Gatting guns.
 Belgian FN M49 rifle and Model D automatic rifle.
 Lewis machine guns.
 Mexican M1954 rifle and RM-2 Mendoza light machine gun.
 Danish Madsen 1958 rifle (bought by Colombia).
 FN (Belgian) rifles made for various South American governments, based on the Mauser '98 pattern bolt action.

Col. Whelen's longtime favorite game rifle was this Fred Adolph-stocked .30-06 Springfield. See Addenda pages for other U.S. military weapons of World War II chambered for this cartridge.

Reloading Data and Factory Ballistics

Bullet (grs.)	Powder/grs.	MV	ME	
93	4198 50	3450	2460	Varmint load
110	4064 56	3300	2660	" "
110	H-380 58	3220	2562	" "
130	3031 53	3210	2998	Medium game
130	H-380 56	3100	2776	" "
150	4350 60	2990	2980	Dup. fact. ball.
150	HV-2 48	2938	2868	Deer, elk, etc.
165	4320 52	2880	3050	" "
180	4320 50	2700	2910	Dup. fact. ball.
180	4831 61	2710	2940	Elk, moose, bear
200	4320 47	2500	2872	Heavy game
220	HV-2 43	2410	2843	Woods, brush load
250	4831 54	2450	3480	Max.—heavy game
110	FL	3370	2770	200 yd. MRT = 2.2"
**130	FL	3281	3108	" " 1.5"
150	FL	2970	2930	" " 2.5"
180	FL	2700	2910	" " 3.1"
220	FL	2410	2830	" " 3.9"
250	4831 54	2450	3325	



6mm Lee Navy See chapter 2.

6.5x54 Mannlicher-Schoenauer



Historical Notes This original Greek military cartridge, designed in 1900, was used in the 1903 Mannlicher bolt action rifle. It is also a popular sporting number in Europe and the U.S. All major American munitions companies loaded the 6.5mm Mannlicher until about 1940. The Austrian-made Mannlicher-Schoenauer sporting rifle imported by Stoeger Arms Co. is about the only rifle available in this caliber at the present time. Sporting ammunition is loaded in England and Europe and Norma imports Boxer primed, reloadable brass and a good variety of sporting loads. European ammo uses the Berdan primer, usually the 5.5mm or .217" size.

General Comments The 6.5mm M-S has always had a certain following in the United States, even though American-made rifles do not chamber it as a standard

caliber. It is a very fine cartridge for North American hunting, with far better killing power than the .30-30 or anything in that class. In fact, every species of big game on earth has been taken with this cartridge. A great many elephants were killed by ivory hunters using the little 6.5mm and solid bullets. It did not make enough noise to bother the herd and gave deep penetration for well-placed brain shots. In the hands of an experienced hunter, it will do for any North American big game. However, by today's standards, it is considered as primarily a deer, sheep, antelope or black bear cartridge. In power it is often compared to the .257 Roberts and there is some validity for this. On the other hand, the 6.5mm M-S is loaded with bullets of around 160 grs. in weight compared to the 120-gr. top weight of the .257. It is the long heavy bullet that makes it a good killer on the tougher varieties of game.

Reloading Data and Factory Ballistics

Bullet (grs.)	Powder/grs.	MV	ME	
139-140	3031 35	2610	2120	Antelope, deer
139-140	HV-2 36	2470	1900	
156	4350 38	2510	2182	
156	3031 34	2460	2100	Dup. fact. load
160	4064 38	2450	2140	Heavy game
159 (military)	FL	2223	1740	200 yd. MRT = 3.6"
77 (Norma)	FL	3120	1660	" " 1.9"
139 "	FL	2580	2040	" " 2.5"
156 "	FL	2461	2100	" " 3.0"

6.5x54R Mannlicher (Dutch & Romanian)



Historical Notes The earlier, rimmed version of the 6.5x54 Greek cartridge, designed by Mannlicher, and used in the bolt action Netherlands Models 1892 and 1895 and the Romanian Models 1892 and 1893. The cartridge was dropped by both countries after WW II.

General Comments This cartridge delivers ballistics practically identical to the regular 6.5x54 Mannlicher-Schoenauer, known for many years in the United States and at one time loaded by most cartridge companies. The rimmed version is used in a few single shot and

combination European sporting rifles. Commercial hunting ammunition in this caliber is loaded in both England and Europe.

This cartridge was introduced into the United States after WW II when quantities of the Netherlands and Romanian military rifles and carbines were sold in the surplus stores. Only imported sporting ammunition is available, but many dealers furnish hunting loads based on the military round with the bullet replaced. Rifles in this caliber are suitable for deer, antelope, black bear and the like.

Reloading Data and Factory Ballistics

Bullet (grs.)	Powder/grs.	MV	ME	
120	HV-2 31	2440	1590	
120	4064 35	2650	1875	
140	3031 35	2550	2360	
156	3031 34	2445	2095	Dup. military ball.
156	4350 38	2510	2192	
160	3031 34	2250	1810	
156 & 159 (mil.)	FL	2433	2085	200 yd. MRT = 3.2"
160 (sporting)	FL	2350	1960	" " 3.5"