

Ballistics of Classic Rifle Cartridges

Cartridges introduced prior to 1960. Velocities shown are factory ammo standards.

Cartridge	Year Intro	Bullet				Velocity				Energy ft lb	Keith lb-ft
		g	gr	Dia in	Sec Den	m/s	fps	Bbl in.	Source		
.22 Long Rifle	1887		40	.222	.116		1280	na	W	146	7
.22 WRF	1890		45	.224	.128		1450	na	WS	210	9
.22 WMR	1959		40	.224	.114		1910	na	W	324	11
.22 Hornet	1930		45	.224	.128		2690	24.0	R	723	17
.222 Remington	1950		50	.224	.142		3140	24.0	R	1095	22
.222 Remington Magnum	1958		55	.224	.157		3240	24.0	R	1282	25
.220 Swift	1935		40	.224	.114		4050	24.0	W	1457	23
			50	.224	.142		3870	24.0	W	1663	28
.22 Savage High Power	1912		70	.227	.194		2780	na	WS	1201	28
.243 Winchester	1955		100	.243	.242		2960	24.0	W	1945	42
6mm Remington	1955		100	.243	.242		3100	24.0	R	2134	44
.240 H&H Apex	1923		100	.245	.238		2900	28.0	KY	1867	41
.25-35 Winchester	1895		117	.257	.253		2280	na	WS	1350	38
.250 Savage	1915		87	.257	.188		3030	24.0	W	1773	38
			100	.257	.216		2820	24.0	W	1766	40
.257 Roberts	1934		100	.257	.216		2900	24.0	W	1867	41
			120	.257	.260		2780	24.0	F	2059	48
.257 Weatherby Magnum	1948		115	.257	.249		3150	24.0	F	2533	52
6.5x54 K Mauser (.256 Mauser Short)	1900?	8.2	127	.261	.266	751	2464	23.6	DW	1712	45
		8.2	127	.261	.266	826	2710	23.6	DW	2071	49
6.5x54 Mann-Sch (.256 Mannlicher)	1903	10.3	159	.264	.326	670	2198	17.7	RW	1706	50
			160	.264	.328		2300	28.5	KY	1879	53
6.5x55 Swedish	1894	8.2	127	.264	.260	885	2904	25.6	RW	2378	53
		9.1	140	.264	.287	870	2854	25.6	RW	2532	57
		10.1	156	.264	.320	780	2559	24.0	N	2268	57
6.5x57 Mauser	189?	8.2	127	.264	.260	870	2854	23.6	RW	2297	52
6.5x58 Portuguese	1904?	9.0	139	.264	.285	846	2776	25.6	DW	2378	55
		10.15	157	.264	.322	783	2569	25.6	DW	2301	58
.264 Winchester Magnum	1958		140	.264	.287		3030	24.0	W	2854	61
.270 Winchester	1925		130	.277	.242		3060	24.0	F	2703	57
			140	.277	.261		2950	24.0	F	2705	59
			150	.277	.279		2850	24.0	F	2705	61
.270 Weatherby Magnum	1943		140	.277	.261		3100	24.0	F	2987	62
7x57 Mauser (.276 Mauser)	1892		140	.284	.248		2660	24.0	F	2199	53
		10.0	154	.284	.273	835	2740	23.6	M	2567	60
		10.5	162	.284	.287	800	2625	23.6	RW	2478	61
		11.2	173	.284	.306	770	2526	23.6	RW	2451	62
.275 Rigby	1907		140	.284	.248		2750	28.0	KY	2351	55
			173	.284	.306		2400	28.0	KY	2212	59
7x64 Brenneke	1917	10.0	154	.284	.273	885	2904	25.6	RW	2883	64
		10.3	159	.284	.282	880	2887	25.6	RW	2942	66
		10.5	162	.284	.287	880	2887	25.6	RW	2998	67
		11.2	173	.284	.306	850	2789	25.6	RW	2988	69
.280 Remington	1957		140	.284	.248		3000	24.0	R	2798	60
			150	.284	.266		2890	24.0	R	2782	62
			160	.284	.283		2800	24.0	F	2785	64
		11.0	170	.284	.301	825	2707	24.0	N	2766	66
7mm Weatherby Magnum	1944		160	.284	.283		3100	24.0	F	3414	71
.280 Ross	1906		140	.287	.243		2900	28.0	KY	2614	58
			150	.287	.260		2775	28.0	KY	2565	59
			160	.287	.277		2700	28.0	KY	2590	62
			180	.287	.312		2525	28.0	KY	2548	65
.275 H&H Magnum	1912		160	.287	.277		2675	28.0	KY	2542	61
.280 Jeffery	1915		140	.287	.243		3000	28.0	KY	2798	60

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		g	gr	Dia in	Sec Den	m/s	fps	Bbl in.	Source		
.30-30 Winchester	1895		150	.308	.226		2390	24.0	F	1902	51
			170	.308	.256		2200	24.0	F	1827	53
.300 Savage	1920		150	.308	.226		2630	24.0	R	2304	56
			180	.308	.271		2350	24.0	R	2207	60
.30-40 Krag	1892		180	.308	.271		2430	24.0	R	2360	62
			220	.308	.331		2190	na	WS	2343	69
.308 Winchester	1952		150	.308	.226		2820	24.0	F	2648	60
			165	.308	.248		2700	24.0	F	2671	64
			180	.308	.271		2620	24.0	F	2743	67
			200	.308	.301		2450	24.0	W	2665	70
.30-03 Springfield	1903		220	.308	.331		2200	26.0	KY	2364	69
.30-06 Springfield (7.62x63)	1906		150	.308	.226		2910	24.0	F	2820	62
			165	.308	.248		2800	24.0	F	2872	66
			180	.308	.271		2700	24.0	F	2913	69
			200	.308	.301		2550	24.0	F	2887	73
		13.0	200	.308	.301	800	2625	24.0	N	3060	75
	220	.308	.331		2410	24.0	F	2837	76		
.300 H&H Magnum	1925 1920?		180	.308	.271		2700	28.0	KY	2913	69
			180	.308	.271		2880	24.0	F	3315	74
			220	.308	.331		2350	28.0	KY	2697	74
			220	.308	.331		2580	24.0	W	3251	81
.300 Weatherby Magnum	1944		180	.308	.271		3110	24.0	F	3865	80
.303 British	1888		150	.311	.222		2700	25.0	KY	2428	58
			180	.311	.266		2460	24.0	F	2418	63
			215	.311	.318		2160	na	WS	2227	66
7.65x53 Mauser	1889	11.3	154	.312	.226		2750	29.0	KY	2586	61
			174	.312	.255	760	2493	24.0	N	2401	62
			219	.312	.321		2025	29.0	KY	1994	63
8x51 K Mauser (.315 Mauser Short)	1888?	10.2	157	.318	.222	657	2156	20.1	DW	1620	48
		12.7	196	.318	.277	640	2100	20.1	DW	1919	59
.32 Winchester Special	1902		170	.321	.236		2250	24.0	F	1911	55
8x56 Mann-Sch	1908		200	.323	.274		2200	20.0	KY	2149	63
8x57J	1888	10.0	154	.318	.218	837	2746	26.8	DW	2578	60
		12.7	196	.318	.277	772	2533	26.8	DW	2792	71
		12.8	198	.318	.280	775	2543	26.8	DW	2843	72
		14.7	227	.318	.321	709	2326	26.8	DW	2727	75
8x57JS ("8mm Mauser")	1905	10.0	154	.323	.211	886	2907	26.8	DW	2889	64
		11.7	180	.323	.246	820	2690	23.6	RW	2892	69
		12.0	185	.323	.253	800	2625	26.8	DW	2830	69
		12.1	187	.323	.256	820	2690	23.6	RW	3004	72
		12.7	196	.323	.268	800	2625	23.6	RW	2999	74
		12.8	198	.323	.271	800	2625	23.6	RW	3029	74
		14.26	220	.323	.301	748	2454	23.6	SB	2942	77
8x60 Mauser (.315 Mauser)	1921	10.0	154	.318	.218	906	2972	25.6	DW	3020	65
		12.7	196	.318	.277	788	2585	25.6	DW	2908	72
		12.8	198	.318	.280	787	2582	25.6	DW	2931	73
		14.7	227	.318	.321	729	2392	25.6	DW	2884	78
8x60S Mauser		10.0	154	.323	.211	920	3018	25.6	DW	3114	66
		11.7	180	.323	.246	835	2740	23.6	RW	3000	70
		12.0	185	.323	.253	817	2680	25.6	DW	2950	71
8x64S Brenneke	1912	12.8	198	.323	.271	848	2782	na	BR	3402	79
		14.2	220	.323	.301	780	2559	na	BR	3199	80
8x68S RWS	1939	12.1	187	.323	.256	970	3182	25.6	RW	4204	85
		14.5	224	.323	.307	870	2854	25.6	RW	4051	91

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		g	gr	Dia in	Sec Den	m/s	fps	Bbl in.	Source		
.318 Westley Richards	1909		180	.330	.236		2700	28.0	KY	2913	69
			250	.330	.328		2230	23.6	M	2760	80
			250	.330	.328		2400	28.0	KY	3197	86
.333 Jeffery (rimless)	1911		250	.333	.322		2500	28.0	KY	3469	89
			300	.333	.386		2200	28.0	KY	3224	94
.33 Winchester	1902		200	.338	.250		2200	24.0	W	2149	63
.338 Winchester Magnum	1958		200	.338	.250		2960	24.0	W	3891	85
			225	.338	.281		2800	24.0	F	3917	90
			250	.338	.313		2660	24.0	F	3927	95
			300	.338	.375		2430	24.0	W	3933	104
.348 Winchester	1936		200	.348	.236		2520	24.0	W	2820	72
			250	.348	.295		2320	na	WS	2988	83
9x56 Mann-Sch	1905		245	.354	.279		2100	22.5	KY	2399	74
9x57 Mauser (.354 Mauser)	189?	13.3	205	.356	.231	739	2425	28.3	DW	2677	71
		13.9	215	.356	.242	725	2379	28.3	DW	2702	73
		14.9	230	.356	.259	722	2369	28.3	DW	2866	78
			245	.356	.276		2150	24.0	KY	2514	75
		16.0	247	.356	.278	700	2297	23.6	M	2893	81
		16.0	247	.356	.278	705	2313	28.3	DW	2934	82
18.2	281	.356	.317	613	2011	28.3	DW	2523	81		
.35 Remington	1906		200	.358	.223		2080	24.0	R	1921	59
.35 Winchester	1903		250	.358	.279		2200	24.0	KY	2687	79
.358 Winchester	1955		200	.358	.223		2490	24.0	W	2753	71
			250	.358	.279		2230	24.0	W	2760	80
.35 Whelen	1922		200	.358	.223		2675	24.0	R	3177	76
			225	.358	.251		2600	24.0	F	3377	84
			250	.358	.279		2400	24.0	R	3197	86
			275	.358	.307		2250	24.0	GH	3091	88
.400/.350 Rigby	1899		310	.358	.346		2000	28.0	KY	2753	89
.350 Rigby Magnum	1908		225	.358	.251		2625	24.0	KY	3442	84
.350 G&H Magnum	1925		275	.358	.307		2441	24.0	GH	3638	96
.358 Norma Magnum	1959	16.2	250	.358	.279	840	2756	24.0	N	4216	98
9.3x57 Mauser	190?	15.0	232	.366	.247	720	2362	24.0	N	2874	78
		18.5	285	.366	.304	630	2067	24.0	N	2704	84
9.3x74R	190?	15.0	232	.366	.247	780	2559	24.0	N	3373	85
		18.5	285	.366	.304	720	2362	24.0	N	3530	96
.360 No. 2 Nitro Express	190?		320	.366	.341		2200	28.0	KY	3439	101
9.3x62 Mauser (.366 Mauser)	1905	15.0	232	.366	.247	800	2625	24.0	N	3549	87
		16.2	250	.366	.267	800	2625	24.0	N	3825	94
			285	.366	.304		2250	24.0	KY	3203	92
		18.5	285	.366	.304	715	2346	23.6	M	3483	96
		18.5	285	.366	.304	720	2362	24.0	N	3530	96
		18.5	285	.366	.304	726	2382	28.3	DW	3590	97
		18.5	285	.366	.304	740	2428	24.0	N	3730	99
21.1	325	.366	.347		2300	24.0	N	3817	107		
9.3x64 Brenneke	191?	14.6	225	.366	.240	900	2953	25.6	RW	4356	95
		19.0	293	.366	.312	785	2575	25.6	RW	4313	108
.375 Flanged Nitro Exp 2 1/2"	1899		270	.375	.274		1975	25.0	KY	2338	76
.400/.375 Belted Nitro Exp	1905		270	.375	.274		2175	28.0	KY	2836	84
.375 Rimless Nitro Express	1910		270	.375	.274		2100	25.0	KY	2644	81
9.5x57 Mann-Sch	1910		270	.375	.274		2150	25.0	KY	2771	83
.375 H&H Magnum	1912		235	.375	.239		2800	28.0	KY	4091	94
			270	.375	.274		2690	24.0	F	4338	104
			300	.375	.305		2530	24.0	F	4263	108
		22.7	350	.375	.356		2300	24.0	N	4111	115

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		g	gr	Dia in	Sec Den	m/s	fps	Bbl in.	Source		
.405 Winchester	1904		300	.411	.254		2200	24.0	KY	3224	94
.400 Whelen	1922		300	.411	.254		2375	24.0	GH	3757	102
			350	.411	.296		2200	24.0	GH	3761	110
.450/.400 Nitro Exp 3¼"	1898?		400	.411	.338		2150	26.0	KY	4105	123
.450/.400 NE Jeffery 3"	1902		400	.411	.338		2125	30.0	KY	4010	121
.416 Rigby	1911		410	.416	.338		2300	26.0	KY	4815	135
			410	.416	.338		2370	24.0	F	5113	139
		29.2	450	.416	.371		2150	24.0	N	4618	138
10.75x68 Mauser (.423 Mauser)	192?		347	.423	.277		2175	24.0	KY	3645	108
		22.5	347	.423	.277	670	2198	23.6	DW	3722	109
		22.5	347	.423	.277	705	2313	23.6	M	4122	115
.404 Jeffery (10.75x73)	1909		300	.423	.240		2625	28.0	KY	4590	113
	1905?		400	.423	.319		2125	28.0	KY	4010	121
			400	.423	.319		2160	23.6	M	4144	123
		26.0	400	.423	.319	705	2313	25.6	RW	4751	132
	29.2	450	.423	.359		2150	24.0	N	4618	138	
.45-70 Government	1873		300	.458	.204		1880	24.0	W	2354	81
			405	.458	.276		1330	24.0	R	1591	77
.450 Express 3¼" (Black Powder Express)	1871?		270	.458	.184		1975	28.0	KY	2338	76
			310	.458	.211		1800	28.0	KY	2230	80
			325	.458	.221		1775	28.0	KY	2273	82
			365	.458	.249		1700	28.0	KY	2342	89
.450 Nitro for BPE 3¼"	1892?		365	.458	.249		2100	28.0	KY	3574	110
.450 Nitro Express 3¼"	1898		480	.458	.327		2150	28.0	KY	4926	147
.500/.450 Nitro Express	1899?		480	.458	.327		2175	28.0	KY	5042	149
.450 No. 2 Nitro Express	1903		480	.458	.327		2175	28.0	KY	5042	149
.458 Winchester Magnum	1956		350	.458	.238		2470	24.0	F	4741	124
			400	.458	.272		2250	24.0	F	4496	129
			500	.458	.341		2090	24.0	F	4849	149
		32.4	500	.458	.341	645	2116	24.0	N	4971	151
			510	.458	.347		2040	24.0	W	4712	149
.500/.465 Nitro Express	1907?		480	.468	.313		2150	28.0	KY	4926	147
.470 Nitro Express	1907?		500	.474	.318		2125	31.0	KY	5013	152
		32.4	500	.474	.318		2100	24.0	N	4896	150
			500	.474	.318		2150	24.0	F	5132	154
.475 Nitro Express	1907+?		480	.476	.303		2175	28.0	KY	5042	149
.476 Westley Richards NE	1907+?		520	.476	.328		2100	28.0	KY	5091	156
.475 No. 2 Nitro Express	1907+?		480	.483	.294		2200	28.0	KY	5158	151
.475 No. 2 NE Jeffery	1907+?		500	.488	.300		2120	28.0	KY	4989	151
.500 Nitro Express 3"	189?		570	.510	.313		2150	28.0	KY	5850	175
.577 Nitro Express 3"	189?		650	.585	.271		1950	28.0	KY	5488	181
			750	.585	.313		2050	28.0	KY	6998	220

$$\text{Energy ft lb} = (\text{velocity fps}^2 \times \text{bullet weight gr}) / 450400$$

$$\text{Keith lb-ft (Momentum)} = (\text{bullet weight gr} \times \text{velocity fps}) / 7000$$

BR - Brenneke 2005 or 2007 KY - Kynoch / ICI **1936** catalog RW - RWS 2004 or 2006
 DW - DWM **1935** or **1937** catalog M - Mauser **1930** catalog SB - Sellier & Bellot 2004
 F - Federal 1987, 2000, 2006, or 2009 N - Norma 2004, 2006, or 2008 W - Winchester past or present
 GH - Griffin & Howe **1930** catalog R - Remington past or present WS - Western **1947** catalog

Metric Barrel Lengths: 450 mm = 17.7 in 650 mm = 25.6 in meters x 3.28084 = feet
 510 mm = 20.1 in 680 mm = 26.8 in grams x 15.43237 = grains
 600 mm = 23.6 in 720 mm = 28.3 in