ULTRA MODERN FIRE ARMS

A Resource for

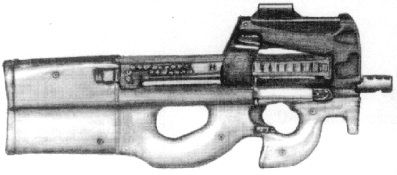
MILLENNIUM'S END

and all other Contemporary Roleplaying Games

by
Charles Ryan

CHAMELEON ECLECTIC

ULTRAMODERN FIREARMS



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A Resource for *Millennium's End* and All Other Contemporary Roleplaying Games

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ULTRAMODERN
FIREARMS

FOREWORD

I am not an expert on guns, and that's exactly why I wrote this book. Over the years, a number of gun books for gamers have come along, and most have found a place on my shelf and a good bit of use in my games. But in every case there have been a number of problems. Most suffer from limited coverage, often devoting a lot of space to interesting but obscure prototypes at the expense of much more common and useful weapons. All thus far have been poorly organized, requiring a lot of page turning to find a given entry. Many are burdened with overwhelming volumes of numbers, meaningless to all but the most accomplished gun enthusiast. And all are under-illustrated, or very poorly illustrated. Even those books that stick to photographs (and I am not just referring to game books—this is true even of "mainstream" weapons encyclopedias) are filled with dark, blurry images, often photographs of photographs of photographs. I found that a weapon I couldn't visualize rarely if ever showed up in my games.

These are a few of the issues I wanted to address when I started work on *Ultramodern Firearms*. As the book progressed, however, I began to see other ways I could make it more useful to the typical gamer. For instance, as I researched the various weapons, a noticed a number of features—some common, others found only on a rare few weapons—that gamers would probably like to know about. But in a conventionally-organized book, the only way to get an overview of these features, and to make an informed comparison between the weapons, is to read and remember every entry. I know I don't want to read the descriptions of seventy different weapons just to outfit a character with the ideal sidearm. Hence the Features Index, a fairly comprehensive listing of the features found on every weapon covered herein. Hopefully the Features Index will make each of these weapons more accessible to all gamers, not just those with an intense interest in firearms.

Finally, I toyed with the idea of writing a multi-system book for a very long time, but eventually decided against it. This is a *Millennium's End* supplement, so I would be remiss if it didn't include complete stats for the *Millennium's End* system. But my real intention was to create a book that would be the ultimate resource on real-world firearms for *any* game. Players can find game stats for many of these weapons in the rulebooks and supplements of their favorite games. They can probably make up those that can't be found elsewhere. My desire here is not to be the highest authority on firearms stats in every game system, but rather to provide the most definitive real-world data in a gaming context. This is the book to turn to when you want to know what all those weapons, covered peripherally in your favorite game, are all about. You can take it from there.

Charles Ryan

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INTRODUCTION

Firearms play a major part in modern-setting roleplaying games, just as they do in the books and movies that are often the games' basis or inspiration. And yet in most games, individual firearms are given a cursory description at best. Even in more comprehensive supplements, the larger issues of how weapons are used in the real world, of what separates the different types of firearms, and of why a given person or organization should choose one gun over another are never covered. Little attention is payed to correcting the many misconceptions that repeatedly crop up in fiction, movies, and of course games.

Ultramodern Firearms is a reference book on guns written for players and referees of roleplaying games. It covers over three-hundred real-world firearms in use in the 1990s, with detailed information useful for any game in which these weapons appear. This book is something of an encyclopedia of the firearms used by modern military, counterterrorist, police, special operations, and even criminal and terrorist organizations. But more than that, it sets out to help players and referees understand these weapons—how they are used, for what applications, and why one may be better than another for a given purpose. With the exception of the *Millennium's End* statistics at the end of the book, *Ultramodern Firearms* is totally game-independent. It does not focus on game stats—it is designed to supplement, not supersede, the coverage your games give to these weapons. But when you find a gun listed in your favorite game with little or no description, this is the place to turn.

Using This Book

Ultramodern Firearms is divided up in to eight chapters, covering six major classes of smallarms, plus ammunition and sighting devices. There is also and appendix containing a glossary, a table listing the weapons used by many professional organizations, and complete weapons statistics for the *Millennium's End* game system. Just after this introduction is a Features Index, a handy overview of the features and capabilities of the weapons covered in this book.

You will probably find yourself using *Ultramodern Firearms* in two ways: to learn more about weapons already in use in your campaign, and to figure out which new weapons with which to equip your characters and NPCs.

When looking for the right weapon, two features in this book are especially useful: the Features Index (starting on page 10), and the Weapons in Use table (page 162). The Features Index lists by class every weapon covered in *Ultramodern Firearms*. At the top of each page is a list of several of the most important, common, or useful features found in that class. The entries indicate which weapons have which features, so comparisons between individual weapons are quick and easy, and you can shop for the weapon you need based on the features most important to you. The Weapons in Use table, in the appendix, lists around fifty military, police, and counterterrorist organizations and the weapons they use. This table is a good starting point for outfitting characters or NPCs that belong to these or similar organizations, or that use their weapons for similar purposes.

These two features will help you find the right weapon for your character or NPCs, and that brings us to the second function of this book. Like several other gun books for games that have come out over the past ten years, *Ultramodern Firearms* contains scores of listings describing specific weapons and their variants. Ultramodern Firearms optimizes these listings for the needs of the gamer. The information covered here is short on history, design, and technical details, and long on features useful to the character, aspects of the weapons that might be important during play, and reputations for accuracy and reliability. But don't limit yourself to just the individual listings. Each chapter has its own introductory passage, which talks a little bit about the class of weapon in general, how it is used, and the advantages and disadvantages you can expect from the weapons discussed.

Esoteric terminology and needless technical information have little bearing on game play, and have generally been left out of *Ultramodern Firearms*. But with the great variety of weapons available and the vast scope of their potential applications, its impossible to make an informed selection without a little bit of functional, if not technical, understanding of guns. A car buyer doesn't need to know the specific engineering differences between standard and anti-lock brakes, but ought to at least know that they are different, and how they perform differently, before deciding whether or not to shell out an extra few hundred dollars. This analogy holds true for firearms—when deciding between two or three pistols, for example, it's a good idea to understand the functional difference between single- and double-action. So the chapter introductions do cover some aspects of the mechanical operation of weapons, where such information is useful for players wanting to make informed decisions. Hopefully, you will find them clear, useful, and interesting.

Some Basic Concepts and Misconceptions

Despite the importance of firearms in modern roleplaying, there is a lot of ignorance and even misconception among gamers on how guns work and what they do. This is especially true in regards to exotic weapons, which probably find as much or more use in games than they do in real life. The importance of a clear, accurate understanding of firearms varies from game to game. In any modern game that has any claims to realism, however, it is critical that players have some understanding of these their most common tools.

Pistols and submachineguns differ from longarms not just in size and shape, but also in power, range, and accuracy. Popular media do not generally appreciate this difference, nor do many games. While even the lightest pistol rounds are lethal, pistols and submachineguns (which fire pistol rounds) in general do not compare to the power of longarms. Rifles and machineguns are not just lethal at longer ranges, but also have the ability to shoot through cover that would stop pistol rounds. There are several reasons for this difference in power. Pistols are designed for portability and even concealability, and they need small ammunition that fits this bill. Pistols are relatively inaccurate, so they don't need ammo with enormous range. Powerful rounds have a lot of energy, and will create deafening muzzle blasts and enormous recoils when fired out of light, short-barreled weapons. In fact, all of these factors hold true within the realm of pistols, as well. There are very few large-caliber pocket-pistols, because they are too inaccurate and uncomfortable to use.

One misconception that appears over and over again in popular media concerns the use of the word "automatic." An automatic weapon, of any class, is a weapon that fires multiple rounds from a single pull of the trigger. When the term "auto" is used to describe a pistol—as in ".45-caliber auto"—it is not short for automatic (except in the rare case of machine-pistols), but for autoloader. Autoloaders are semi-automatic weapons, meaning they fire one shot for every pull of the trigger, mechanically discarding the spent shell casing and chambering a new round. While the term "assault rifle" implies an automatic weapon, most of those found in retail gun stores are semi-automatic only, with no automatic fire capability. Only those sold to the military, law-enforcement agencies, or specially-licensed individuals have automatic fire, a fact generally glossed over in fiction and the media. The assault weapons appearing in *Ultramodern Firearms* are the military versions, with auto-fire capability.

More misconceptions surround the use of silenced weapons than any other type of firearm. Guns make noise in three ways. First and foremost is the muzzle blast, the noise made by the hypersonic gasses leaving the muzzle of the weapon as it is fired. Secondly, any bullet travelling faster than the speed of sound—as most do—creates an audible noise itself, a small sonic boom. Lastly, there is the mechanical noise of the weapon's action.

In order to operate "silently," a firearm must deal with all three of these sources of noise. All silenced weapons include some sort of suppressor—a device that traps the propellant gasses as they leave the weapon's muzzle and slows them to below the speed of sound. Suppressors may be built into silenced weapons, or be designed to fit onto the end of non-silenced guns. Because a suppressor must be designed to handle the power and volume of the gases from a specific round, a suppressor designed for one caliber will not work well (if at all) for another, and the size of a suppressor is proportional to the power of the round it suppresses.

Suppressors have no effect on the noise made by a supersonic bullet. Some pistol rounds have natural velocities below the speed of sound, however, and others can be cold-loaded (given a reduced propellant charge) to lower their speeds. Additionally, many purpose-built silenced weapons let some of the propellant gases leak out before the bullet leaves the barrel, so the bullet never gets past the speed of

sound. The supersonic crack of a full-powered round fired from a suppressed weapon is not silent, but the overall noise is substantially less than that of an unsuppressed weapon.

The last noise source is the mechanical operation of the weapon itself. While not as loud as the muzzle blast, bolt movement of a semi-automatic weapon makes a significant amount of noise. Most purpose-built silenced weapons have some sort of catch that locks the bolt closed. This gives the weapon a little more recoil, and requires the user to cycle the bolt by hand. But it eliminates all but the sound of the hammer striking the firing pin. Weapons that do not have a bolt-catch cannot eliminate mechanical noise.

Features Index

Pistols

	Caliber	Action	Silenced	Double-action	Internal Safety	Ambidextrous	Combat grip	Concealable	Easy to use	Large magazine	Very accurate	Very reliable	Common	Price	Page
Astra A-60	sm	A		✓		✓		✓		✓				460	24
Astra A-80, A-90 , A-100	md	A		✓	✓	✓	✓			✓				540	24
Beretta 81BB, 81	sm	A		✓	✓	✓	✓	✓		✓			✓	450	25
Beretta 82BB	sm	A		✓	✓	✓	✓	✓						425	25
Beretta 84F, 84, 84BB	sm	A		✓	✓	✓	✓	✓		✓			✓	530	25
Beretta 85F, 85BB	sm	A		✓	✓	✓	✓	✓						500	25
Beretta 92 F-M	md	A		✓	✓		✓	✓				✓		625	26
Beretta 92FS, et al	md	A		✓	✓		✓			✓		✓	✚	625	25
Beretta 92FS Comp., 92F Comp.	md	A		✓	✓		✓	✓		✓		✓		625	26
Beretta 950	sm	A						✚						200	26
Bernardelli P-018	md	A		✓			✓			✓		✓		750	27
Browning High-power Mk 3S	md	A			✓					✓		✓	✓	470	27
Calico M950	md	A			✓	✓				✚	✓			650	28
Colt 2000	md	A		✓	✓	✓	✓		✓	✓				580	31
Colt Agent	md	R		✓				✓				✓	✓	300	29
Colt Delta Elite	md	A		✓			✓					✓		705	29
Colt Double Eagle	md	A		✓			✓					✓		700	30
Colt M1911A1	md	A											✚	500	30
Colt Python	lg	R		✓							✓	✓	✓	780	31
CZ 75, CZ 85	md	A		✓	✓					✓		✓		700	28
FN BDA 9	md	A		✓	✓	✓	✓			✓				540	32
FN BDA 9C	md	A		✓	✓	✓	✓	✓						600	32
FN High-power Mk 3 et al	md	A			✓	✓				✓		✓	✚	520	32
Glock 17	md	A		✓	✓	✓	✓		✓	✓	✓	✚	✚	580	33
Glock 19	md	A		✓	✓	✓	✓		✓	✓		✚	✓	580	33
Glock 20	md	A		✓	✓	✓	✓		✓	✓	✓	✚		640	34
Glock 21	md	A		✓	✓	✓	✓		✓	✓	✓	✚		640	34
Glock 22	md	A		✓	✓	✓	✓		✓	✓	✓	✚		580	33
Glock 23	md	A		✓	✓	✓	✓		✓	✓		✚		580	33
HK P7K3	sm	A		✓	✓	✓	✓		✓					1000	34
HK P7M8	md	A		✓	✓	✓	✓		✓					1000	34
HK P7M10	md	A		✓	✓	✓	✓		✓					1160	34
HK P7M13	md	A		✓	✓	✓	✓		✓	✓				1220	34
HK P9S, P9	md	A		✓			✓							800	35
HK VP70	md	A		✓	✓	✓	✓			✚				750	35
IMI Baby Eagle	md	A		✓			✓			✓	✓			600	36
Baby Eagle caliber conversion kit														240	36
IMI Desert Eagle	lg	A		✓		✓	✓				✚			1000	36
LaFrance Colt .45 Silenced	md	A	✚									✓		950	37
LaFrance Nova	md	A		✓				✚			✓			440	37
LEI Mark 2	sm	A	✚								✓			900	37
Llama M-82	md	A		✓			✓			✓				975	38

Features Index

Pistols (cont.)

	Caliber	Action	Silenced	Double-action	Internal Safety	Ambidextrous	Combat grip	Concealable	Easy to use	Large magazine	Very accurate	Very reliable	Common	Price	Page
Llama M-87	md	A		✓			✓			✓	✓			1450	38
MAB PA15	md	A		✓						✓				550	39
Manhurin MR73	lg	R		✓					✓			✓	✓	400	39
RSA Makarov PM	md	A		✓									✓	390	41
RSA P6	md	A	+	✓										840	42
RSA PSM	sm	A		✓			✓							460	41
RSA Tokarev TT-30	md	A												300	42
Ruger P85 Mk II	md	A		✓		✓	✓			✓				450	40
Ruger Security-Six, Service-Six	lg	R		✓	✓									300	40
Ruger Speed-Six	md	R		✓	✓			✓						200	40
S&W 10 M&P	md	R		✓					✓			✓	+	350	48
S&W 19	lg	R		✓								✓	✓	380	48
S&W 29	lg	R		✓							✓	✓		500	48
S&W 1006, 1066	md	A		✓	✓	✓	✓						✓	750	45
S&W 1076	md	A		✓	✓		✓							750	45
S&W 3913, 3914	md	A		✓	✓	✓	✓	✓						580	46
S&W 4006	md	A		✓	✓	✓	✓							700	46
S&W 4506, 4516, 4566	md	A		✓	✓	✓	✓							740	46
S&W 5903, 5904, 5906	md	A		✓	✓	✓	✓			✓				660	47
S&W 6904, 6906	md	A		✓	✓	✓	✓	✓						600	47
S&W Mk 22 Mod 0 Hush Puppy	md	A	+	✓										1200	47
SIG-Sauer P220	md	A		✓	✓		✓					✓	✓	780	42
SIG-Sauer P225	md	A		✓	✓		✓					✓		780	43
SIG-Sauer P226	md	A		✓	✓		✓			✓		✓		830	43
SIG-Sauer P228	md	A		✓	✓			✓		✓		✓		830	43
SIG-Sauer P230	sm	A		✓	✓			✓				✓		520	44
SITES M9, M40 Resolver	md	A		✓	✓	✓		✓	+					525	45
SITES M380 Resolver	sm	A		✓	✓	✓		✓	+					500	44
Star 30M, 30 PK	md	A		✓		✓	✓			✓	✓			620	49
Star Firestar	md	A			✓	✓	✓	✓			✓	✓		460	49
Steyr GB	md	A		✓						✓	✓	✓		850	50
Steyr SPP	md	A		✓	✓	✓				✓	✓	✓		950	50
Tanfoglio Baby	md	A		✓			✓	✓			✓			420	51
Tanfoglio GT41	lg	A		✓			✓							520	51
Tanfoglio TA90	md	A		✓			✓			✓				500	51
Walther P5	md	A		✓	✓									1230	52
Walther P5 Compact	md	A		✓	✓			✓						1650	52
Walther P-88	md	A		✓	✓	✓	✓			✓				1550	53
Walther P-88 Compact	md	A		✓	✓	✓	✓	✓		✓				1100	53
Walther PP	sm	A		✓	✓			✓				✓	+	900	51
Walther PPK	sm	A		✓	✓			✓				✓	✓	600	51

Features Index

Submachineguns

	Silenced	Rifle caliber	Compact	One-handed use	Folding stock	3-round burst	Int./grip safety	Ambidextrous	Large magazine	Very accurate	Very reliable	Common	Price	Page
ARES Folding			✙		✓								1150	59
Armscor BXP			✓		✓								1260	59
Beretta 12, 12S					✓			✓		✓		✓	1400	60
Beretta 93-R			✙	✓	✓	✓							1360	60
Bushman IDW			✙	✓			✓		✓				1800	61
Calico M960A					✓			✓	✓	✓	✙		900	61
Colt 9mm					✓				✓			✓	800	62
CNI Type 64	✙				✓				✓				900	63
CZ Model 61, 63, 68 Skorpion			✙	✓	✓								1200	62
FAMAE					✓	✓							1440	63
FN P90		✓						✓	✓		✓		950	64
Glock 18			✙	✓			✓			✓			1900	64
HK MP5A5 et al					✓	✓			✓	✓		✙	750	65
HK MP5KA5 et al			✓	✓		✓				✓		✓	2400	65
HK MP5 PDW	✓		✓		✓	✓		✓		✓			3200	66
HK MP5SD6 et al	✙				✓	✓			✓	✓		✓	3800	66
HK MP 53		✓			✓	✓			✓				2900	67
HK MP2000	✙		✓		✓	✓		✓		✓			4200	67
IMI Micro-Uzi			✙	✓	✓		✓			✓			800	68
IMI Mini-Uzi			✓	✓	✓		✓			✓		✓	1160	68
IMI Uzi					✓		✓		✓	✓		✙	1280	68
Intratec TEC-9			✓	✓									400	69
JATI Matic			✓				✓						1440	70
KAC Colt 9mm Suppressed	✙				✓				✓				1400	70
MAC Ingram M10			✙		✓					✓			500	71
MAC Ingram M11			✙		✓					✓			550	71
RSA AKSU-74		✓			✓					✓			1100	72
SITES M-4 Spectre			✓		✓		✓	✓			✓		1780	72
Star Z-84					✓		✓	✓	✓	✓			1400	73
Sterling L2A3 et al					✓				✓	✙		✙	940	73
Sterling L34A1	✙				✓				✓	✙		✓	1260	74
Steyr AUG 9mm Para								✓	✙				1550	74
Steyr MPi 81, MPi 69	✓				✓		✓	✓	✓				1400	74
MPi silencer kit													450	74
Steyr TMP			✙	✓				✓		✓			1250	75
Walther MPK			✓		✓								1240	75
Walther MPL					✓				✓				1320	75
Weaver PKS-9 Ultralight					✓								1000	76

Features Index

Assault Rifles

	Caliber	Compact	Folding stock	Lightweight	3-round burst	Ambidextrous	Optical sight	Very accurate	Very reliable	Common	Price	Page
Beretta AR70	5.56			✓				✓			900	84
Beretta SC70	5.56		✓	✓				✓			950	84
Beretta SC 70 Short	5.56	✓	✓	✓				✓			950	84
Beretta 70/90	5.56				✓			✓	✓		940	84
Beretta SC 70/90	5.56		✓		✓			✓			950	84
Beretta SCS 70/90	5.56	✓	✓		✓			✓			900	84
CETME C	7.62										800	85
CETME L	5.56			✓						✓	1000	85
CETME LC	5.56	✓	✓	✓							1050	85
CIS SR 88	5.56				✓						650	85
Colt M4 Carbine	5.56	✓	✓	✓							780	86
Colt M16A1	5.56			✓						+	700	86
Colt M16A2	5.56			✓	✓					✓	940	86
Colt M16 Commando	5.56	✓	✓	✓							800	87
FN FAL, L1A1	7.62						✓	✓		+	1250	87
FN FNC	5.56		✓							✓	1450	87
GIAT FA-MAS	5.56	✓		✓	✓	✓				✓	1400	88
GIAT FA-MAS Commando	5.56	✓		✓	✓	✓					1400	88
HK G3A3	7.62							✓		+	1120	88
HK G3A4	7.62		✓					✓			1300	88
HK G3K	7.62	✓	✓					✓			1350	88
HK G11	4.7	✓			✓	✓	✓	✓	✓		4400	89
HK G33E	5.56				✓				✓	✓	1000	89
HK G33K	5.56	✓	✓		✓				✓		1280	89
HK G41E	5.56		✓		✓				✓		1100	90
HK G41K	5.56	✓	✓		✓				✓		1300	90
IMI Galil ARM	5.56									✓	1125	90
IMI Galil SAR	5.56	✓	✓								1200	90
RSA AKM, AK-47	7.62R								✓	+	500	91
RSA AKMS, AKS-47	7.62R	✓	✓						✓	+	500	91
RSA AK-74	5.45R								+	✓	750	92
RSA AKS-74	5.45R	✓	✓						+	✓	750	92
RSAF L85A1	5.56	✓					✓	✓		✓	1650	91
SIG SG 540	5.56			✓	✓						1050	92
SIG SG 550	5.56		✓		✓			✓			1200	92
SIG SG 551	5.56	✓	✓		✓						1350	92
Steyr AUG	5.56	✓			✓	✓	✓	✓		✓	1450	93
Steyr AUG Carbine	5.56	✓		✓	✓	✓	✓				1450	93

Features Index

Rifles

	Caliber	Action	Silenced	Folding stock	Adjustable fittings	Bipod	Scope or mount	Muzzle brake	Very accurate	Very reliable	Common	Price	Page
AI Covert	md	bolt	+	✓		✓	✓			✓		3100	98
AI PM, L96A1	md	bolt				✓	✓	✓		✓		2400	98
Barrett Model 82A1	lg	semi				✓	✓	✓		✓	✓	2800	99
Barrett Model 82A2	lg	semi					✓	✓		✓		3100	99
Barrett Model 90	lg	bolt				✓	✓	✓		✓	✓	1400	99
Beretta Sniper	md	bolt			✓	✓	✓	✓				1350	100
GIAT FR-F1	md	bolt			✓	✓	✓					1300	100
GIAT FR-F2	md	bolt			✓	✓	✓					1700	100
Grendel SRT	md	bolt		✓		✓	✓	✓				1900	101
HK G3 SG/1	md	semi					✓			✓	✓	1600	101
HK MSG 90	md	semi			✓		✓			✓		2100	101
HK PSG 1	md	semi			✓		✓					2500	102
IMI Galil Sniper	md	semi		✓	✓	✓	✓					1200	102
LEI DeLisle Mark 3	sm	bolt	+			✓	✓					1000	102
LEI DeLisle Mark 4	md	bolt	+			✓	✓					2400	103
Parker-Hale Model 85	md	bolt	✓		✓	✓	✓				✓	1950	103
Model 85 silencer												600	102
Remington M24	md	bolt			✓	✓	✓					2200	103
Remington Model 700	md	bolt							✓	+		500	104
RSA Druganov SVD	md	semi					✓					1600	104
Ruger Mini-14	md	semi							✓	+		490	104
SIG SSG 550	md	semi			✓		✓					1900	105
Springfield M21	md	semi					✓		✓	✓		1400	105
Steyr AMR	lg	semi				✓	✓	✓				5000	106
Steyr SSG 69, SSG-P	md	bolt			✓		✓				✓	2000	106
Steyr SSG-P Silenced	md	bolt	+		✓		✓					2600	106
Technika Destroyer	lg	semi				✓	✓	✓				2000	107
Technika Top Gun	lg	bolt				✓	✓	✓	✓			1200	107
Walther WA 2000	md	semi				✓	✓	✓				3200	107

Features Index

Shotguns

	Action	Autofire	All ammo sizes	All ammo types	Removable mag.	Folding stock	Very reliable	Common	Price	Page
Benelli 121 M1	semi			✓			✓		600	112
Benelli M1 Super 90	semi		✓	✓			✓	✓	750	112
Beretta 1201 FP3	semi			✓					700	112
Beretta M3P	semi			✓	✓	✓			700	113
Beretta RS202-M2 et al	pump		✓	✓					450	113
Bernardelli B4	semi			✓	✓	✓			850	113
Bernardelli B4/B	pump			✓	✓	✓			650	113
Ceiner Ultimate	pump			✓			✓		550	114
Daewoo USAS-12	semi	✓		✓	✓				750	114
Franchi SPAS-12	semi			✓		✓	✓	✓	650	115
Franchi SPAS-15, SPAS-15MIL	semi			✓	✓	✓			800	115
HK 512	semi								650	115
Mossberg 500 ATP8, ATP6	pump			✓		✓	✓	+	500	116
Mossberg 500 ATP8C, ATP6C	pump			✓			✓	✓	480	116
Pancor Jackhammer	semi	✓		✓	✓				1200	116
Remington 870 P et al	pump			✓		✓	✓	+	360	117
Winchester 1300 Defender	pump			✓				✓	260	117
Winchester 1300 Marine	pump			✓				✓	440	117

Machineguns

	Type	Belt feed	Box feed	Bipod	Changeable barrel	Selective fire	Very reliable	Common	Price	Page
CETME Ameli	lt	✓		✓	+				2400	122
CIS .50 CIS	hvy	✓			✓				4000	122
CIS Ultimax 100	lt		✓	✓	✓				1150	122
Colt M16A2 LMG	lt		✓	✓					1100	123
FN MAG	med	✓		✓	✓		✓	+	2000	123
FN Minimi, Minimi Para	lt	✓	✓	✓	✓			✓	3100	123
FN M2HB/QCB	hvy	✓			✓		+	+	5500	124
HK 21E	med	✓		✓	✓	+			2600	124
HK 23E	lt	✓		✓	✓	+			2700	125
IMI Negev, Negev Short	lt	✓	✓	✓		✓			1450	125
Rheinmetall MG42/59, MG3	med	✓		✓	+			✓	3000	126
RSA Degtyarev DShKM	hvy	✓					✓	✓	3000	127
RSA PKM	lt	✓		✓	✓			✓	1000	127
RSA NSV	hvy	✓			✓			✓	3800	127
RSAF L86A1	lt		✓	✓		✓			2400	126
Saco M60E1	med	✓		✓	✓		✓	✓	2950	128
Steyr AUG HBAR	lt		✓	✓		✓			1600	128

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Sighting Devices

Electro-optical Sights

	Magnification	High sensitivity	High-light cutoff	Auto light level	Day/night use	Wide field of view	Common battery	Long battery life	Very rugged	Light weight	Common	Price	Page
Armscor MNV	low						✓		✓	✓		1800	143
ITT F 4961	varies	✚		✓	✚	✚	✓			✚		3650	146
ITT F 4965	none	✓					✓					3000	146
OE NVS-700	med						✓	✚	✓		✓	1500	149
Pilkington Kite	med	✓					✓	✓		✓	✓	2450	150
Pilkington Maxi-Kite	high	✓					✓	✓		✓		2600	150
Simrad KN-250	none	✓	✓			✓	✓	✓		✚		2000	151
Varo-Electron AN/PVS 4	med		✓	✓		✓	✓		✓		✓	2000	152
Varo-Electron Aquila Mini 2500	med	✓					✓		✓	✓		2600	153
Varo-Electron Aquila Mini 3000	med	✚					✓		✓	✓		2900	153

Lasers and Illuminators

	Laser	Illuminator	Visible light	Infrared light	Long range	Common battery	Long battery life	Very rugged	Light weight	Common	Price	Page
Aimpoint Laserdot	✓		✓				✓	✓	✓	✓	250	142
Arsoc Ariel	✓			✓					✓		175	143
Arsoc Dart	✓	✓	✓						✓		200	143
IT Aim 1D	✓	✓		✓		✓	✚	✓		✓	200	145
IT Aim 1D LR	✓			✓	✚	✓	✚	✓			250	145
Laser Products Sure-Fire 1	✓	✓	✓	✓			✓			✓	300	147
Laser Products Sure-Fire 2	✓	✓	✓				✓				375	147
Sopolem PS 2		✓		✓			✚				150	151

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Sighting Devices (cont)

Night-vision Goggles

	High sensitivity	IR illumination	High-light cutoff	Wide field of view	Magnification	Common battery	Long battery life	Very rugged	Light weight	Common	Price	Page
ITT AN PVS-7B	+				✓		✓	✓			3100	145
ITT F 4939M	+	✓	✓		✓	✓					3250	146
ITT F 4939	✓	✓	✓		✓	✓					2900	146
Litton M973	+	✓		✓		✓		✓	✓	✓	3400	148
Litton M972	✓	✓		✓		✓		✓	✓	✓	2800	148
Litton M983	+	✓		+	✓	✓		✓	+		2000	148
Litton M982	✓	✓		+	✓	✓		✓	+		1650	148
OE NV38	+	✓		✓		✓			✓		2850	149
Pilkington Nova	✓	✓		✓			+		+	✓	2600	150
Sopolem TN2-1		✓		✓					+		1900	152

Optical Sights

	Magnification	Wide field of view	Very rugged	Light weight	Common	Price	Page
Aimpoint 2-Power	low	+		+		300	142
Aimpoint 3000	none	+		+		250	142
Elbit Falcon	none	+				600	144
Hensoldt FERO Z-24	med		✓	✓	✓	800	144
Hensoldt ZF 10x42	high		✓			1000	144
Leitz Elcan	med	✓	✓			750	147
USI SUSAT L9A1	med	+	✓		✓	900	152

PISTOLS

CHAPTER ONE

PISTOLS

Although second to the assault rifle as an infantry weapon, the pistol is an important class of military firearm, especially for special operations and anti-terrorism applications. In law enforcement (and in the hands of criminals), pistols are hands down the most common firearms around. The staggering variety of designs and models available is, then, no surprise, as the handgun is a very versatile concept. Pistols are maneuverable and easy to use in tight spaces. They're relatively light and easily carried. The largest are easier to conceal than any other class of weapon, while the smallest can be hidden under even light clothes. The primary weapons of most police and many special operations personnel, pistols are also carried by military officers and others, such as machinegunners, who need a general-purpose alternative to their primary weapon.

Pistols can be easily divided into two classes: revolvers and autoloaders. Each has its own advantages and disadvantages, although autoloaders have been the preferred weapon for military use since the turn of the century, and are rapidly gaining popularity among police forces as well. Revolvers are easy to operate and almost totally reliable, a result of their simple mechanics and the fact that dud rounds will not interfere with their operation. In contrast, the much more complex autoloaders malfunction more frequently, and jam any time a dud round or misfeed occurs. On the other hand, autoloaders can be fitted with large magazines, which are easily reloaded. Revolvers typically hold just six rounds (some models hold only five), and are relatively slow to reload. Furthermore, the necessary diameter of the cylinder makes revolvers bulky, limiting their utility as concealed or backup weapons.

Pistols go way back, in fact right back to the beginning of firearm development (Beretta, a family-owned company, traces its business back to the fifteenth century, and claims to be not just the oldest gunmaker around, but in fact the oldest documented company in existence). Like all early firearms, pistols until the nineteenth century were muzzle-loading single-shot weapons. The first revolvers appeared in the mid-1800s, with autoloaders following towards the end of the century. Although the technology has continued to develop since, many early designs are still around. The popular Browning High-Power was introduced in 1935, and the Colt M1911, which was the U.S. Army's service pistol until just a few years ago, entered production in 1911, and its design dates back to the 1890s. Autoloaders have

from their earliest days been popular as military weapons, although police forces have tended to stick with revolvers, especially in the U.S. Recently, though, police interest has turned towards autoloaders and this, combined with new requirements for military handguns, has spurred something of an explosion in autoloader design. A spate of new weapons has been designed around the 9mm Parabellum round, which has become a military standard. In fact, the U.S. Army's search in the early 1980s for a new service pistol resulted in several very good designs even among the losers of the competition. Several new combat rounds have also been developed in the past few years, further increasing the available options.

Most people understand how revolvers operate: five or six cartridges are contained in a cylinder, so that one round (or at least one slot) is aligned with the barrel. When the trigger is pulled, the cylinder rotates to align the next round with the barrel, and the hammer falls to fire the cartridge from within the cylinder, which acts as the chamber. The spent shell casing remains in the cylinder, until removed when the weapon is reloaded.

Autoloaders are a bit more complex, and there are two common types of operation. Each uses some of the recoil energy from the firing of the round to recock the weapon and load another cartridge. "Blowback" operation is the simplest. The blast of the firing round simply blows open the breach, knocking the slide back to eject the empty shell casing and recock the hammer. A return spring then forces the slide forward again, and a new round is scooped out of the magazine and pushed into the chamber as the breech closes. The opening of the breech must be delayed until the bullet is clear of the weapon, or the propellant gasses will blast out of the breech and into the firer's face. Generally, the only thing that provides this delay is the weight of the slide and the tension of the return spring, so unless some other step is added to slow down the process, blowback operation is only suitable for relatively low-powered rounds.

Weapons firing heavier rounds are generally "recoil" operated. In recoil operation, the back-blast of the fired round forces back the slide and the barrel, which are locked together. When they have both travelled back a short distance, a mechanism is tripped that unlocks them. The barrel stops, but inertia keeps the slide going. It ejects the shell and recocks the hammer as it moves back, then, pushed forward by the return spring, it strips a new round from the magazine, closes with the barrel, and locks both back into their original position. The fact that the barrel and slide move together for a fraction of a second provides the delay necessary to ensure that the bullet is out of the barrel before the breech opens.

A few pistols are gas-operated, siphoning off a small amount of gas from the burning round to operate the breech mechanism. Because only the most powerful rounds merit the extra complexity of gas-operated designs, few gas-operated models exist. Gas operation is explained in the introduction to the Assault Rifles section.

The terms "single-" and "double-action" apply to both revolvers and autoloaders, and describe whether or not a pistol must be cocked manually before it can be fired. Double-action revolvers have trigger mechanisms that pull back the hammer as the trigger is squeezed, releasing it to fire the round at the end of the trigger sweep. Single-action revolvers require that the hammer be cocked before the trigger

is pulled—if not already cocked, the trigger will not function. Autoloaders work the same way, except that the weapon's mechanism automatically cocks the hammer after each round fired, so the trigger mechanism only affects the first round. This usually leads to a slight difference in trigger tension between the first round fired and all subsequent rounds.

As mentioned above, revolvers are very easy to use. Typically, a revolver is loaded by swinging the cylinder out to the side, removing any empty shell casings, then inserting new rounds. This can be a tedious process, especially when done under fire. Speed-loaders were developed to hasten the process—a speed-loader clips together six rounds, in position so that all six are inserted into the cylinder at once. Like autoloader magazines, several loaded speed-loaders can be kept on hand, to quickly replenish ammunition in the weapon. Once loaded, double-action revolvers are very simple to operate. The manual safety is usually a small lever, positioned convenient to a right-hander's thumb. With the safety off, the user need only point and squeeze the trigger. Should a dud round or empty chamber be encountered, a second pull of the trigger will move on to the next round. When done, the safety is once again employed, and the weapon is safe. Many people like to make sure that the chamber in the firing position is unloaded, in case the hammer should be jolted by a shock or fall. Since the cylinder rotates to the next round as the trigger moves back, this doesn't prevent the weapon from firing on the next trigger pull, but it does reduce the number of rounds available before reloading.

Autoloaders are quicker and easier to reload, but much more complex to operate. Rounds are pre-loaded into box magazines. The user inserts a magazine into the bottom of the grip, then pulls back and releases the slide to chamber a round (it's possible to then remove the magazine and load an additional round, but that leaves one in the chamber, which isn't always safe if the weapon isn't going to be fired right away). At this point, the pistol is cocked and ready to fire—just point and shoot. To be carried safely, the cocked hammer must be lowered gently, either by hand or with a de-cocking lever, and the safety must be employed. In such a state, the safety has to be removed again before the weapon will fire, but a double-action pistol will recock the hammer as the trigger is pulled. If a dud round or misfeed occurs, the user must manually operate the slide to eject the malfunctioning round and chamber another. The slide locks to the rear once the magazine is emptied, at least on most autoloaders. That makes it obvious to the user that the weapon is empty, and takes a step out of the reloading process. The new magazine is inserted with the slide still open. Then the user simply thumbs the slide lock to close the breech and chamber a round, and is ready again to fire.

It's obvious, then, why autoloaders are so complex in operation. Most have three levers—a manual safety, a decocking lever, and a slide stop—as well a magazine release, and many have all three duplicated on either side. Some autoloaders have done away with the manual safety, relying instead on an automatic internal safety that disengages the firing pin from the rest of the mechanism except when the trigger is being pulled. A few models do without a de-cocking lever as well. Nevertheless, autoloaders have much more potential for confusion than revolvers, especially with novice users.

Thousands of pistol models are available on the commercial market, although this text is restricted to a few dozen entries suitable for combat applications. The differences between combat and civilian pistols lie less in overall design than in features—in fact, many military and law-enforcement pistols are nothing more than commercial models with a few superficial changes, and vice-versa. Combat pistols generally feature good sights that are quick to use and easy to see under low-light conditions, rubber or checkered handgrips, and recurved trigger-guards that give purchase for a firm, sturdy grip with a second hand. A low profile is desirable, with sights and controls designed not to snag on a holster when drawn. Most combat autoloaders and virtually all revolvers are double-action, and many feature internal safeties that prevent firing unless the trigger is completely pulled, even if the weapon is dropped with the manual safety off.

ASTRA

Astra-Unceta y Cía SA, Spain

Model A-60

Caliber:	.380in Auto, .32in ACP
Length:	17cm
Weight:	0.8kg
Magazine:	13 (.380), 12 (.32)

The Astra A-60 is a small, lightweight pistol chambered for either the .380in Auto or .32in ACP round. It has a simple double-action mechanism and operates by blowback. There are safety levers on either side, and the decocking lever can be moved from one side to the other when the weapon is stripped, so it presents no penalty to left-handed firers.

Model A-80

***also* A-90, A-100**

Caliber:	9mm Para, .45in ACP
Length:	18cm
Weight:	1.1kg
Magazine:	15 (9 P), 8 (.45)

The Astra A-80, A-90, and A-100 pistols are virtually identical to one another, the difference lying only in a few features. All are double-action weapons, recoil-operated, and all were designed with safe use in mind. The A-80 features a decocking lever, manual safety, loaded chamber indicator, and an internal safety that keeps the firing pin out of the hammer's path until the trigger is almost completely pulled. The A-90 is identical, differing only in some mechanical improvements to the trigger mechanism. The A-100 has no manual safety, relying entirely on the decocking lever and internal safety. As with the A-60, above, the A-80 and A-90 have ambidextrous manual safeties, and all three have movable decocking levers.

The A-80 was introduced in 1980, with the others following over the next decade. All have had good police and military sales.

BERETTA

Armi Beretta SpA, Italy

Model 81BB

***also* 81, 82BB**

Caliber:	.32in ACP
Length:	17cm
Weight:	0.9kg, 0.7 (82)
Magazine:	12, 9 (82)

In 1976, Beretta introduced three new models, numbered 81, 84, and 92, and chambered for the .32in ACP, .380in Auto, and 9mm Parabellum rounds, respectively. All three of the weapons were modern, double-action pistols featuring Beretta's trademark open slide. The model 81 is a blowback-operated pistol, with ambidextrous manual safety and magazine release button. The 81BB added an internal safety. The 82BB features a narrower grip, giving it a smaller magazine capacity, but making it easier and more comfortable to conceal. All of the models are coated in Beretta's "Bruniton," a Teflon derivative that protects and lubricates the parts. The original Model 81 is no longer in production, but the two variant models are, and all three are in use with police forces worldwide, especially in Europe.

The 81-series pistols look very much like the 84F pictured below.

Model 84F

***also* 84, 84BB, 85BB, 85F**

Caliber:	.380in Auto
Length:	17cm
Weight:	0.8kg, 0.7 (85)
Magazine:	13, 8 (85)

The Model 84 was introduced in 1976, along with the 81 and 92 models. It is a double-action autoloader chambered for the .380in Auto round. The basic model is essentially the same in terms of features as the basic Model 81 (above), and, like the 81, was superseded by a BB model with an internal safety. An even later version, the 84F, added a decocking feature to the manual safety. The 85BB and 85F are slimmed-down versions of the 84BB and 84F. All are coated with "Bruniton," a Teflon-based protective bluing. The basic 84 model is no longer made, but all four variants are, and are used by law-enforcement organizations around the world. All have had very strong commercial sales as well.

Model 92FS

***also* 92, 92S, 92SB, 92F**

Caliber:	9mm Parabellum
Length:	22cm
Weight:	1.3kg
Magazine:	15

The Beretta 92 was the third of three models introduced in 1976, and it evolved through several variants to become the most popular. The 92 is a double-action weapon firing the popular 9mm Parabellum cartridge. Although it looks similar, if larger, than the 81 and 84 models, it's actually somewhat different in design, featuring a short recoil action rather than simple blowback.

In the United States, 92-series pistols are used by more law enforcement agencies than any other autoloader. Two early versions, the Model 92 and 92S, were adopted by the Italian and other militaries, but have since been discontinued. In 1980, Beretta submitted the 92SB to the U.S. army, which was looking for a service pistol to replace

the aging M1911A1. Beretta beat out several competitors and won the contract, but some further modifications were required, resulting in the 92F. The first variant, the 92S, differed from the original in the placement and design of the safety. The 92SB was the next evolution, incorporating an ambidextrous safety and moving the magazine release to a more ergonomic position. The 92F version, accepted by the army, changed the shape of the grip and trigger-guard to more easily accommodate two-handed firing. An even later version, the 92FS, added a slide over-travel stop. Several other variants have been developed, with minor mechanical differences. All (except a stainless-steel version of the 92F) are coated with "Bruniton," a Teflon-based protective coating, and all except the 92 and 92S are in production.

The 92-series pistols have done very well in commercial sales, in addition to heavy military and police orders. They are frequently seen in movies and TV shows, as well.

Model 92FS Compact

***also* 92F Compact, 92F-M**

Caliber:	9mm Parabellum
Length:	20cm
Weight:	1.0kg
Magazine:	13, 8 (92F-M)

The 92F Compact and 92FS Compact are essentially the same as their full-sized namesakes, above. Their dimensions are reduced slightly in overall length, and in the length of the grip, which in turn reduces magazine capacity. On the 92F-M, the grip is also thinner, narrowing the weapon for purposes of concealability and further reducing magazine size.

Model 950

Caliber:	.25in ACP
Length:	11cm
Weight:	0.3kg
Magazine:	8

The Beretta Model 950 is a blowback-operated autoloader firing the .25in ACP cartridge. It is very small, by far the smallest and lightest weapon covered in this book. It features a tip-up barrel, that allows the user to pop it open to inspect the chamber, or load a single round. The pistol is available with the Beretta "Bruniton" coating or a nickel finish.

BERNARDELLI

Bernardelli SpA, Italy

P-018

This pistol was specifically designed with military and police applications in mind. It is a recoil-operated double-action weapon of rugged design, with a recurved grip and trigger-guard for two-handed use and a reputation for low recoil, good balance, and accuracy.

Caliber:	9mm Parabellum
Length:	21cm
Weight:	1.1kg
Magazine:	16

BROWNING

Browning SA, Belgium

High-Power Mark 3S

The Browning High-Power Mark 3S is a version of the FN Herstal High-Power Mark 3 designed specifically for police use (Browning is a subsidiary of FN Herstal, which makes only military weapons). Both weapons were introduced in 1989, and are single-action (requiring the hammer to be cocked before the first shot can be fired) and recoil operated. The Mark 3S is essentially the same as the Mark 3 (covered below), although most of the parts are not interchangeable. The only functional difference between the two weapons is an internal safety in the 3S not available in the Mark 3. The High-Power series is very popular worldwide, and the 3S has seen good sales to European police forces in particular.

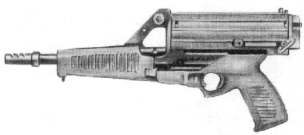
Caliber:	9mm Parabellum
Length:	20cm
Weight:	1.0kg
Magazine:	13

CALICO

Calico, USA

Model 950

Caliber:	9mm Parabellum
Length:	36cm
Weight:	1.5kg
Magazine:	50 (100 available)



The Calico 950 is a unique pistol in almost every regard. The weapon operates with a two-part, roller-locking bolt similar to that of the CETME and Heckler & Koch rifles (see the introduction to the Assault Rifles section for an explanation of the mechanical operation). The magazine is cylindrical, and sits above the weapon. The pistol is made of lightweight, modern materials, including cast aluminum and glass-fibre reinforced polymers.

All of these unique features are used to advantage in the design. The magazine, for example, holds fifty rounds (a much longer 100-round magazine is also available) in a helical pattern. Its position above the weapon actually aids in balance and reduces muzzle climb. In fact, despite its appearance, the 950 is quite easy to handle. Its functions are totally ambidextrous, and the ejection of shell-casings through the bottom of the weapon make the use of a brass-catcher practical. Despite these advantages, however, the 950 has not seen widespread adoption, probably due to its bulk.

CESKÁ ZBROJOKA

Ceská Zbrojoka, Czechoslovakia

CZ 75

***also* CZ 85**

Caliber:	9mm Parabellum
Length:	20cm
Weight:	1.1kg
Magazine:	15

The CZ 75 was introduced in 1975, and since then has gained a reputation as one of the finest combat handguns available. Obviously intended for export rather than home use (the 9mm Parabellum round is not used in Czechoslovakia), the 75 and 85 models are double-action, recoil-operated pistols. They feature internal as well as manual safeties, and are safe with a round in the chamber.

The CZ 75 has the safety, slide catch, and magazine release on the left side, making it inconvenient for left-handers to use. The CZ 85 made these devices ambidextrous, improved the internal mechanism slightly, and added ribbing to the top of the slide, to reduce glare. Both weapons have done well on the export market, but have not been picked up in numbers by any major police or military organization.

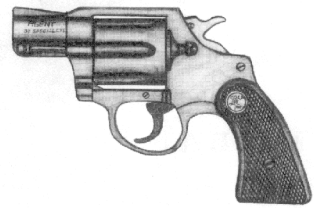
COLT

Colt Industries, USA

Agent

First produced in the 1960s, the Colt Agent is one of the smallest revolvers firing the .38in Special round. It is a double-action pistol with small, rounded features for easy draw and concealability. It can be a little uncomfortable to shoot, especially for large-handed firers, but it is reliable and rugged.

Caliber:	.38in Special
Length:	17cm
Weight:	0.5kg
Magazine:	6



Delta Elite

The Delta Elite is a single-action 10mm autoloader based closely on the design of the M1911, below. Combining a tried and true design with a successful new round, it has essentially the same frame and features as its predecessor, including a grip safety and left side manual safety and slide lock. It adds rubber combat grips. Because of its similarity to the M1911 in design and feel, firers used to the older weapon will be comfortable shooting the Delta Elite.

Caliber:	10mm
Length:	22cm
Weight:	1.2kg
Magazine:	7

Double Eagle

Caliber:	9mm Parabellum, 10 mm, .45in ACP
Length:	22cm
Weight:	1.3kg
Magazine:	9, 8 (10mm, .45in ACP)

Like the Delta Elite, the Double Eagle is based on the successful M1911, and has similar dimensions and features. The Double Eagle is a more heavily modified design, however, featuring double-action, combat grips, and a recurved trigger-guard. It retains the grip safety, and like its predecessors is not an ambidextrous weapon. It is available chambered for the 9mm Parabellum, 10mm, or .45in ACP rounds.

M1911A1

Caliber:	.45in ACP
Length:	22cm
Weight:	1.3kg
Magazine:	8

The M1911A1 has a history going back into the last century, when its design was begun by John Browning (namesake of the Browning High-Power and the .50-caliber machinegun) in 1896. It was submitted to the U.S. army in 1908, and entered service in 1911. A few modifications were made after the experience of the First World War, and the final version, the M1911A1, was the result. Since then, the weapon has gone on to become perhaps the most widespread pistol on earth. While a military version is no longer produced, commercial versions are, and the weapon remains in service with scores of military and police forces around the world.

The M1911A1 was the first autoloader to use a drop-cam operation, a form of recoil operation that has since been used in hundreds of designs. It is a single-action weapon, and features a left-side manual safety lever and a grip safety that prevents firing unless the grip is squeezed.

Python

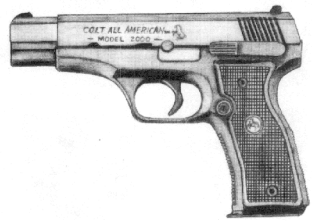
Introduced in 1955, the double-action Colt Python was the first weapon to bring revolver design out of the last century. A large, heavy weapon, the Python is chambered for the .357in Magnum round, although it will also fire the .38in Special round without modifications. Although expensive, the Python is a sturdy, comfortable, and accurate weapon.

Caliber:	.357in Magnum, .38in Special
Length:	29cm
Weight:	1.3kg
Magazine:	6

2000

The Colt 2000 is a new design. A double-action, recoil-operated pistol, it features an ambidextrous magazine catch and an internal safety that negates the need for a manual safety. Although the slide is made of steel, the receiver is polymer, keeping weight down.

Caliber:	9mm Parabellum
Length:	21cm
Weight:	1.0kg
Magazine:	15



FN Herstal

FN Herstal SA, Belgium

BDA 9

Caliber:	9mm Parabellum
Length:	20cm
Weight:	1.1kg
Magazine:	14

The BDA 9 is a recent variant of the High-Power, covered below. Like the High-Power, it is a recoil-operated weapon firing the 9mm Parabellum and using the cam-dropped barrel mechanism first developed by John Browning for the M1911A1. Unlike the High-Power, it is also a double-action pistol, featuring an internal safety, an ambidextrous decocking lever in place of a manual safety, and a recurved trigger-guard for a two-handed grip. The magazine catch is not ambidextrous, but can be moved from one side of the pistol to the other. Because the internal safety prevents firing unless the trigger is almost fully pulled, the BDA 9 may be carried safely with a round chambered.

BDA 9C

Caliber:	9mm Parabellum
Length:	17cm
Weight:	0.9kg
Magazine:	7 (14 available)

The BDA 9C is a compact version of the BDA 9 above, shortened in length and in the grip. Its features and design are essentially the same as the BDA 9, although the grip has been shortened considerably. This reduces the capacity of the magazine to seven rounds (although the pistol will accept the BDA 9's fourteen-round magazine), and makes the weapon somewhat uncomfortable to fire.

High-Power Mark 3

***also* HP-35, Mark 1, Mark 2**

Caliber:	9mm Parabellum
Length:	20cm
Weight:	0.9kg
Magazine:	13

The original Browning High-Power was the last design of John Browning, an influential engineer who's accomplishments include the M1911A1 and many of the basic design concepts used in most auto-loaders today. The High-Power Mark 3 is the latest incarnation of the original, and is only slightly evolved from the earlier versions. The High-Power series has been extremely popular since its introduction before World War Two, and is currently in use in over fifty countries.

FN believes that the High-Power's popularity vindicates its single-action design, and have retained it throughout all its versions. The HP-35 is the most modern production version of the original, and the Mark 1 had few changes. The Mark 2 made the safety lever ambidextrous, and changed the shape of the grips. The Mark 3 is the current version, and differs only by a further enlargement of the safety lever and some minor changes to the sights.

GLOCK

Glock GesmbH, Austria

Model 17

***also* model 22**

Caliber:	9mm P, .40in S&W (22)
Length:	19cm
Weight:	1.0kg, 0.9 (22)
Magazine:	17 (19 avail.), 15 (22)

Introduced in the early 1980s, the 9mm Glock 17 offered a number of innovations. Although the basic recoil-operated cam-dropped breech is essentially the same as found in the M1911A1, Browning High-Power, and many other weapons, the Glock makes extensive use of plastics, dispenses with external hammers, safeties, and slide locks, and has fewer than half the parts of most autoloaders. The result is an extremely rugged and reliable weapon, and the use of a safety switch on the trigger and two internal safeties make it quite safe as well. Furthermore, the Glock's light recoil and ergonomic grip make it a comfortable weapon to fire, and it enjoys a reputation for accuracy. The trigger resistance is adjustable, and the fact that it has no external devices makes the Glock 17 totally ambidextrous. The standard magazine holds seventeen rounds, but a slightly elongated "plus two" magazine is available that holds nineteen.

Contrary to some media representations, the use of plastics in the Glock weapons does not make them invisible to X-ray machines and metal detectors. The barrel and other metal parts are more than sufficient to be detected by even low-sensitivity devices.

The Glock 17 was adopted by the Austrian army in 1983, and has since been picked up by the militaries of over forty additional countries. In the U.S. alone, more than 2,000 police and government agencies issue the Glock. The Glock 22 fires the .40in S&W round, but is the same outside of magazine capacity and some minor dimensional differences. No "plus two" magazine is available for the Glock 22.

Model 19

***also* model 23**

Caliber:	9mm P, .40in S&W (23)
Length:	17cm
Weight:	0.8kg
Magazine:	15 (17 avail.), 13 (23)

The Glock 19 is a compact version of the model 17, just above, and has the same features and safeties. Although the magazine capacity is slightly reduced, a "plus two" magazine is available. The 23 is the same as the 19, but chambered for the .40in S&W round, and has no "plus two" magazine option. Although slightly different in proportions, the Model 19 looks like the Model 17, pictured above,

Model 20

***also* model 21**

Caliber:	10mm, .45in ACP (21)
Length:	19cm
Weight:	1.1kg
Magazine:	15, 13 (21)

The Glock 20 functions the same as the model 17 above, but is a slightly larger weapon built for the more powerful 10mm round. The model 21 is identical to the 20, but is chambered for the .45in ACP cartridge. Neither has a "plus two" magazine available, but even without them both have the largest magazines available in their calibers.

Heckler & Koch

Heckler & Koch GmbH, Germany

P7M13

***also* P7K3, P7M8, P7M10**

Caliber:	9mm Parabellum, .380in Auto/.22LRin (K3), .40in S&W (M10)
Length:	18cm, 17 (K3)
Weight:	1.3kg, 1.0 (M8, M10), 0.8 (K3)
Magazine:	13, 10 (M10), 8 (K3, M8)

The Heckler & Koch P7 series was created specifically with police use in mind. The design concept called for a weapon that was as safe as possible when carried, but which could be brought to action with a minimum of obstructions. The result is a pistol with a number of unique features.

The P7M13 is a blowback operated 9mm pistol that through a unique design uses expanding gas from the cartridge to delay the breech opening and reduce the felt recoil. It is a double-action weapon of sorts—a cocking lever along the front of the grip cocks the striker. When the user grasps the weapon, the hammer is automatically cocked by the grip lever. Should the firer drop or let go of the weapon, removing pressure from the lever, the weapon decocks and is safe. As a result, no other safety or decocking device is fitted, and the weapon is totally ambidextrous. Additionally, the wide grip allows for a near-vertical magazine, making the P7 very reliable when feeding.

The M8 version is essentially the same as the M13, but has a smaller magazine capacity. The P7M10 is also the same, but comes chambered for the .40in S&W round, and has a 10-round magazine. The P7K3 is slightly smaller, and comes with a conversion kit that allows it to fire either the .380in Auto or .22in LR round. Both 9mm versions have had decent sales among police forces in Europe, the U.S. and elsewhere, including the German police and special forces, while the others have had moderate commercial sales.

P9S

***also* P9**

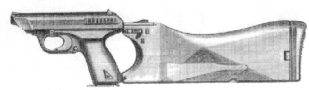
Caliber:	9mm Para, .45in ACP
Length:	19cm
Weight:	1.0kg
Magazine:	9, 7 (.45in ACP)

Introduced in 1972, the P9S is a double-action autoloader that uses a roller-locking breech similar to that in the G3 rifle and MP5 submachinegun. The magazine capacity is relatively small, and the placement of the magazine catch on the bottom of the grip requires two hands to remove the magazine. Additionally, the safety and decocking levers are placed only on the left side, making use inconvenient for left-handers. Despite these issues, however, the P9S has had wide police, military, and commercial sales.

The P9 is the same, but operates as a single-action. Both are available in 9mm Parabellum and .45in ACP.

VP70

Caliber:	9mm Parabellum
Length:	20cm
Weight:	1.0kg
Magazine:	18



Another unique design from Heckler & Koch, the VP70 is a large double-action pistol that converts to a submachinegun firing three-round bursts. The weapon is blowback-operated, and has no external safety. Attaching a special shoulder stock allows the three-round burst option—without the stock, the pistol operates like a standard autoloader.

Although the VP70 was picked up by a handful of countries in Africa and Asia, H&K discontinued the weapon in the mid 1980s.

IMI

Israel Military Industries Ltd., Israel

Baby Eagle

***also* Jericho**

Caliber:	9mm Para, .40in S&W, .41in AE
Length:	21cm
Weight:	1.3kg
Magazine:	16, 10 (.40in S&W), 11 (.41in AE)

The IMI Baby Eagle, also known as the Jericho, is a large, rugged double-action pistol. Despite its similar appearance to the Desert Eagle, below, the Baby Eagle is rather different in design, being recoil- rather than gas-operated. It is sold in 9mm Parabellum and .40in S&W calibers, although a special kit, comprised of a different barrel, return spring, and magazine, converts the 9mm version to fire the .41in AE round. The conversion can be easily carried out by the user. In all three calibers, the weapon is comfortable and accurate when fired.

The Baby Eagle and Desert Eagle are both produced under license in the U.S. by Magnum Research.

Desert Eagle

Caliber:	.357in Magnum, .44in Mag, .50in AE
Length:	26cm
Weight:	1.9kg, 1.6 (alloy)
Magazine:	10, 9 (.44in), 8 (.50in)

The Desert Eagle is a unique gas-operated weapon, the most powerful autoloader made. It is large and heavy, but well-balanced, and in fact its gas-powered mechanism absorbs recoils, making it easier to fire than revolvers in the same calibers. Nevertheless, the Desert Eagle's size requires a user with large, strong hands.

The Desert Eagle's design dates back to the 1950s, although it passed through the hands of several manufacturers before entering production with IMI in the '80s. It is a double-action weapon that operates with a rotating bolt similar to those of most assault rifles. It features an ambidextrous safety mounted on the slide. The Desert Eagle is very accurate, especially when chambered for the .50in Action Express round.

La France

La France Specialties, USA

Colt .45 silenced

Built from a heavily-modified Colt M1911A1, the Colt .45 Silenced has an integral suppressor that is attached to the slide rather than the barrel. This gives the slide enough weight for the weapon to operate on blowback instead of recoil, and the result is an extremely reliable, accurate weapon that operates very quietly while firing standard .45in ACP cartridges.

Caliber:	.45in ACP
Length:	48cm
Weight:	2.0kg
Magazine:	7

Nova

The Nova is one of the smallest autoloaders firing the 9mm round. It is a recoil-operated double-action pistol. A special finish is standard, which makes the pistol virtually rustproof. The Nova has a reputation for excellent accuracy for its size.

Caliber:	9mm Parabellum
Length:	16cm
Weight:	0.7kg
Magazine:	6

LEI

Law Enforcement International Ltd., UK

Mark 2

The LEI Mark 2 is a fully silenced weapon made from a heavily-modified Ruger Mark 2. The low-maintenance suppressor is integral to the slide. The weapon is single-action, and operates by blowback.

The Mark 2 fires .22in Long Rifle rounds, a cartridge generally thought not powerful enough for anything but sport or target shooting. A silenced weapon firing .22in LR is not unreasonable, however, for

Caliber:	.22in LR
Length:	35cm
Weight:	1.2kg
Magazine:	10

two reasons. First, it is assumed that most shots fired covertly will be well-placed, and the .22in round is plenty lethal when well-aimed. Second, because of the low velocity of the .22in LR round, it never needs to be cold-loaded, and it loses very little of its energy when silenced. Higher-velocity rounds, on the other hand, lose a great deal of their power when reduced to subsonic speeds by cold-loading or a suppressor. As a result, .22in LR rounds fired silently are comparable in power to other suppressed pistol rounds.

LLAMA

Llama Gabilondo y Cía SA, Spain

M-82

Caliber:	9mm Parabellum
Length:	21cm
Weight:	1.3kg, 1.0 (alloy)
Magazine:	15

Introduced in 1988, the Llama M-82 is a fairly typical 9mm autoloader. It operates by recoil, and has a double-action firing mechanism. The safety is slide-mounted, and appears on the left side only, making it inconvenient for left-handed users. The standard model is made entirely of steel, but an alloy-frame version is available that is significantly lighter. The M-82 is in service with the Spanish army. It looks very much like the M-87, below, although a little shorter.

M-87

Caliber:	9mm Parabellum
Length:	25cm
Weight:	1.4kg
Magazine:	15

The Llama M-87 is an enlarged, deluxe version of the M-82, above. It features a lengthened barrel, and an extension to the slide that adds a muzzle brake and counterweight for accuracy and comfort. The frame has a special corrosion-resistant nickel treatment, the magazine catch is enlarged for ergonomic reasons, and the trigger pull is adjustable.

MAB

Manufacture d'Armes Automatiques, France

PA15

The PA15 is a 9mm autoloader in service with the French army. It operates by blowback, with an unusual delay device that causes the barrel to rotate as the slide goes back. The safety, slide lock, and magazine catch are all mounted on the left side, making the weapon inconvenient for left-handed users. MAB went out of business in the mid-1980s, so the PA15 is no longer produced.

Caliber:	9mm Parabellum
Length:	20cm
Weight:	1.2kg
Magazine:	15

MANHURIN

Manufacture des Machines du Haut-Rhin, France

MR-73

The Manhurin MR-73 is a high-quality revolver designed especially for military and police applications. The design incorporates a number of safety and ease-of-use features, including a streamlined design to prevent hang-ups when pulled from a holster, and a roller-mounted trigger spring for smooth and even trigger pull. A cylinder change will allow the weapon to fire .38in Special cartridges. The MR-73 is in use with GIGN, the French counter-terrorist unit, and with many local police units in France and other European countries.

Caliber:	.357in Magnum, .38in Special (avail.)
Length:	20cm
Weight:	1.0kg
Magazine:	6

RUGER

Sturm, Ruger, & Co. Inc., USA

P-85 Mark II

Caliber:	9mm Parabellum
Length:	20cm
Weight:	1.1kg
Magazine:	15

The 9mm P-85 Mark II was introduced in 1987, and is the first Ruger autoloader designed specifically for military applications. It is a double-action, recoil-operated weapon, with an ambidextrous safety and magazine catch. The trigger guard is recurved for a two-handed grip, and is large enough to allow use while wearing gloves. The weapon is normally finished in black, but is available with a stainless steel finish. There is also a variant that replaces the manual safety with a decocking lever.

Security-Six

***also* Speed-Six, Service-Six**

Caliber:	.357in Magnum, .38in Sp. (Service-Six)
Length:	24cm
Weight:	1.0kg
Magazine:	6

Introduced in 1972, the Security-Six is a double-action revolver designed specifically for police applications. It is a solid design, featuring an internal safety and easy disassembly for maintenance. The Speed-Six is identical, but has a rounded grip for easier concealment and draw. The Service-Six is also largely identical, but fires the .38in Special round. All are available with a blued surface or in stainless steel.

Russian State Arsenals

State arsenals of Russia and the former U.S.S.R.

Makarov PM

Introduced in the 1950s, the Makarov is the standard service pistol for the nations that were once part of the Soviet bloc. A double-action, blowback-operated pistol, the Makarov is a direct copy of the Walther PP, differing only in caliber, some minor functional aspects, and a modified shape. It fires the Soviet 9x18mm round, which is not compatible with either the 9mm Parabellum or the European 9x18mm Police round. The Makarov has a reputation for being awkward to shoot, and the placement of the safety lever on the left makes the weapon inconvenient for use by left-handed firers.

Caliber:	9x18mm Russian
Length:	16cm
Weight:	0.7kg
Magazine:	8

PSM

The PSM is another Soviet knock-off of the Walther PP, and is issued to the police, internal security, and military police forces throughout the ex-Soviet bloc. It was introduced in the early 1980s, and is a double-action blowback weapon with a narrow design for concealability. The PSM fires an unusual 5.45mm round with a bottle-necked shell, that suffers from a lack of power.

Caliber:	5.45mm PSM
Length:	16cm
Weight:	0.5kg
Magazine:	8

P6

Caliber:	9x18mm Russian
Length:	20cm
Weight:	1.2kg
Magazine:	8

The P6 is a suppressed weapon based on the Makarov PM (above). It has a two-part silencer, half of which is integral to the slide, with the other half being removable. It can be fired without the second half, but is not very efficient. With the removable part attached, however, the weapon is nearly silent. The P6 fires the same 9x18mm round used in the Makarov, and the barrel and slide are vented inside the integral suppressor, to reduce the bullet speed to subsonic. A latch on the side locks the slide, eliminating any mechanical noise, but requiring the slide to be worked manually each time the weapon is fired.

Tokarev TT-33

Caliber:	7.62x26 Russian
Length:	19cm
Weight:	0.9kg
Magazine:	8

The TT-33 was initially introduced in 1930, but significant changes to the design were made in 1933, giving the weapon its name. The TT-33 is a basic recoil-operated single-action design. It offered no innovations at its introduction, but instead focussed on simplicity of manufacture. The pistol has no safety, but the hammer can be moved to a half-cocked position, locking the slide and trigger. Although obsolescent, the TT-33 is still manufactured and used in many ex-Soviet client states.

SIG

SIG Swiss Industrial Company, Switzerland

SIG-Sauer P220

***also* Pistole 75**

Caliber:	9mm Parabellum
Length:	20cm
Weight:	0.9kg
Magazine:	9

SIG is a Swiss firearms manufacturer with a very good reputation. But laws governing the export of weapons from Switzerland have forced SIG to partner up with a German company, J.P. Sauer & Sohn, to produce weapons for international commercial sale. The handguns covered here are all a result of that partnership, designed in Switzerland but manufactured in Germany.

The P220 is a modern 9mm autoloader, recoil-operated and double-action. The decocker acts as a safety, and there is another internal safety, so no manual safety lever is fitted. Like many European pistols, the magazine catch is located on the butt of the grip, but

the de-cocking lever appears only on the left side, so the weapon is not totally ambidextrous. It also has a fairly small magazine for a modern 9mm. Nevertheless, it has a solid reputation, and is used by the Swiss army (which refers to it as the Pistole 75), the Japanese defense force, and a number of police organizations and special forces worldwide.

SIG-Sauer P225

also P6

Caliber:	9mm Parabellum
Length:	18cm
Weight:	0.8kg
Magazine:	8

Similar in design, operation, and appearance to the P220 above, the P225 is a smaller, lighter weapon. It is a double-action, recoil-operated pistol, and aside from its dimensions, magazine capacity, and an improved internal safety, is essentially the same as the P220. It is in service with several German police forces (which refer to it as the P6), as well as various special forces and the U.S. Secret Service. The P225 looks essentially like the P220, above.

SIG-Sauer P226

Caliber:	9mm Parabellum
Length:	20cm
Weight:	0.9kg
Magazine:	15 (20 available)

The P226 was developed from the P220 and 225 as a contender for the new U.S. service pistol trials in 1980. Beretta won the trials with the Model 92, but the P226 performed very well, and was only dropped during final evaluation because of price. It has few changes from the earlier models, except for an increase in magazine capacity and the placement of the magazine release, which was moved up behind the trigger guard. It can be switched from one side to the other, but the decocker remains on the left side only, so the weapon is still not ambidextrous. The P226 looks more or less like the P220 pictured above.

SIG-Sauer P228

Caliber:	9mm Parabellum
Length:	18cm
Weight:	1.0kg
Magazine:	13

Introduced in 1988, the P228 was designed as a small weapon with a full-sized pistol's magazine capacity. The design was successful, and the resulting weapon is not just easily concealable, but also easily handled by users with small hands. Like the earlier 220-series weapons, it is a recoil-operated double-action pistol with a good internal safety, a decocker on the left side, and no manual safety lever. Like the P226, the magazine catch is on the side of the grip, and is moveable from one side to the other. A special feature of this pistol is its resistance to dust and dirt, a result of the very close design of its components.

SIG-Sauer P230

Caliber:	.380in Auto, .32in ACP
Length:	17cm
Weight:	0.5kg
Magazine:	7, 8 (.32in ACP)

The P230 is a departure from the family of weapons described above. A double-action blowback-operated weapon firing a lighter round, the P230 was designed specifically for police work. It has no external safety lever, but, like other SIG designs, has a non-ambidextrous decocking lever. The P230 is available chambered for .380in Auto or .32in ACP round, and both calibers are available in black or a slightly heavier stainless steel.

SITES

SITES SpA, Italy

M380 Resolver

Caliber:	.380in Auto
Length:	15cm
Weight:	0.6kg
Magazine:	8

This sleek pistol was designed with the philosophy that a concealed weapon that is uncomfortable, heavy, or complicated will inevitably give itself away, get left behind, or prove too much for an inexperienced user in a moment of stress. SITES set to work to create a pistol that could be comfortably carried all day, every day, and that required a minimum of functional knowledge on the part of the user. The result is the M380, a blowback-operated double-action pistol with a simple mechanical design, a smooth, narrow exterior (it's only 17mm wide), and no external devices except an unobtrusive magazine catch. With a double-action trigger and no external safety, the firer need only point and pull the trigger, so it can be used reliably by individuals with little experience.

M9 Resolver

also M40

Caliber:	9mm Parabellum, .40in S&W (M40)
Length:	17cm
Weight:	0.8kg
Magazine:	9

The M9 is a spinoff of the M380 concept, although the use of the more powerful 9mm round required a substantially different design. The weapon is recoil operated, retaining the double-action trigger and internal-only safety of the M380. Other than that, and a slightly larger frame, the weapon is functionally and philosophically the same as its predecessor.

A version chambered for the .40in S&W round is also made, and referred to as the M40. Aside from the difference in caliber, it is the same as the M9. Although a little larger, both weapons look essentially like the M380, pictured above.

SMITH AND WESSON

Smith and Wesson, Inc., USA

1006

***also* 1066, 1076**

Caliber:	10mm
Length:	22cm, 20 (1066,1076)
Weight:	1.3kg
Magazine:	9

In the late '80s, Smith and Wesson introduced an entire generation of totally new autoloaders in 9mm, 10mm, .40in S&W, and .45in ACP calibers. The new models are represented by a series of four-digit numbers, the first two of which denote the design and caliber, while the third and fourth indicate types of features and materials, respectively. All of these new weapons are double-action and recoil-operated, and all employ two internal safeties and an ambidextrous manual safety mounted on the slide (except the 1076). Additionally, all are designed with combat-pistol features, such as wrap-around rubber grips, and checkered trigger-guards for improved two-handed use (although only some of the models have the recurved trigger-guard shape that even further improves two-handed grip). The weapons are obviously intended for police as well as commercial sales, and a great deal of input from police departments around the U.S. was solicited during design.

The 1000-series weapons fire the 10mm round. All three variants have stainless steel slides and frames. The 1066 and 1076 have shorter barrels than the basic 1006. The 1076 is the standard FBI service pistol, and has the slide-mounted safety replaced with a thumb-operated decocking lever.

3913

***also* 3914**

Caliber:	9mm Parabellum
Length:	17cm
Weight:	0.8kg
Magazine:	8

The 3900-series fires the 9mm Parabellum round, and is a slim, compact version of the 5900 pistols, covered opposite. The 3900s differ from the 6900s (which are also compact 9mm pistols) in that they give up magazine capacity for a narrower design, making the pistols easier to conceal. Both the 3913 and 3914 have the features mentioned above. The 3913 has an alloy frame and stainless-steel slide, while the 3914's slide is made of blued carbon steel.

4006

Caliber:	.40in S&W
Length:	19cm
Weight:	1.3kg
Magazine:	11

The 4006 was the first pistol made to fire the .40in S&W round. Both slide and frame are constructed of stainless steel, and it is generally the same in design as the 5900-series weapons below.

4506

***also* 4516, 4566**

Caliber:	.45in ACP
Length:	22cm, 18 (4516), 20 (4566)
Weight:	1.3kg, 1.1kg (4516)
Magazine:	8, 7 (4516)

Designed to combine the features of Smith and Wesson's new generation with the tried and true characteristics of a powerful, well-known round, the 4500-series weapons fire the .45in ACP cartridge. The pistols are generally the same in appearance and design as the 1000-series weapons above. All are made with stainless steel slides and frames, and have recurved trigger guards for a positive two-handed grip. The 4566 has a slightly shorter barrel than the 4506, while the 4516 is more compact overall.

5903

***also* 5904, 5906**

Caliber:	9mm Parabellum
Length:	19cm
Weight:	1.0kg, 0.9 (5904), 1.2 (5906)
Magazine:	14

The 5900-series weapons are the largest of the three new series firing the 9mm round. They are functionally identical to the 1000-series weapons above, although they have the added feature of a recurved trigger-guard for improved two-handed grip. The 5903 has an alloy frame and stainless-steel slide, while the 5904 has an alloy frame and carbon steel slide, and is blued. Both slide and frame of the 5906 are made of stainless-steel.

6904

***also* 6906**

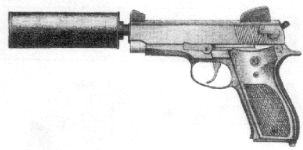
Caliber:	9mm Parabellum
Length:	18cm
Weight:	0.9kg
Magazine:	12

The 6900-series fires the 9mm cartridge, and is a compact version of the 5900, just above. The 6904 is blued, with an alloy frame and carbon steel slide, while on the 6906 both components are made of stainless steel. Although smaller, the 6900-series pistols look more or less the same as the 5900-model pictured above.

Mark 22 Model 0 Hush Puppy

Caliber:	9mm Parabellum
Length:	22cm (32 w/ suppressor)
Weight:	0.9kg (1.2 w/ supp.)
Magazine:	8

The Mark 22 Model 0 is a silenced weapon introduced during the Vietnam War. It was developed from the Smith and Wesson Model 39 (not the same as the 3900-series weapons covered above). A recoil-operated, double-action autoloader, it fires the 9mm Parabellum round. The safety is located on the left side of the slide, at the rear, and there is a slide lock which prevents the mechanism from operating when fired (thus eliminating mechanical noise, but forcing the user to operate the slide manually between shots). The barrel is slightly longer than that of the original Model 39, and the sights have been elevated to clear the bulky silencer. The weapon comes with a series of plugs that allow it to be carried underwater, although the plugs must be removed before the weapon can be fired. The silencer itself is removable, and cannot be used indefinitely. The interior baffles begin to disintegrate after about thirty rounds of subsonic ammunition, or just six standard rounds, are fired through it. After that it loses efficiency, and the plastic baffles must be replaced. The Mark 22 Model 0 is in use with the U.S. Navy Seals, but is no longer made.



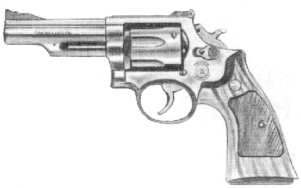
Model 10 M&P

Caliber:	.38in Special
Length:	24cm
Weight:	1.0kg
Magazine:	6

The Model 10 is the most common revolver in the United States, and probably in the world. It is a simple design, with a double-action operation and a swing-out cylinder. It is a very common police weapon in the United States.

Model 19

Caliber:	.357in Magnum
Length:	24cm
Weight:	1.2kg
Magazine:	6



The Model 19 is loosely based on the Model 10 design, although it is a larger weapon. Introduced in 1956, it fires the more powerful .357in Magnum round, has a swing-out cylinder, and operates by double-action. It is probably the most popular revolver in the caliber, and has enjoyed broad commercial and police sales throughout the U.S. and worldwide.

Model 29

Caliber:	.44in Magnum
Length:	30cm
Weight:	1.5kg
Magazine:	6

The Model 29 is a large revolver firing the .44in Magnum round, and is without a doubt one of the most powerful handguns around. It is a double-action weapon with a swing-out cylinder. The power of the round requires a very sturdy weapon, and the Model 29 can be difficult to control, due to the sheer size and weight of the pistol as well as the noise and impact of firing. When properly controlled, however, it is quite accurate.

STAR

Star Bonifacio Echeverria SA, Spain

Firestar

A single-action, recoil-operated weapon, the Firestar is one of the smallest pistols firing the 9mm Parabellum round. It features an internal safety as well as an ambidextrous manual safety, and a recurved trigger-guard for a two-handed grip. Its construction makes it an accurate and reliable little weapon.

Caliber:	9mm Parabellum
Length:	16cm
Weight:	0.9kg
Magazine:	7

Model 30M

***also* 30PK**

The Star Model 30 was introduced in 1988, and is based on the company's earlier designs. It is a full-sized double-action autoloader, recoil-operated. The weapon's ambidextrous manual safety is unusual in that it allows the trigger to be pulled, even with the safety applied (most manual safeties lock the trigger). While the weapon remains safe (it will not fire), the effect of this feature may be a split-second of confusion when every split-second counts. Nevertheless, the Model 30 has an excellent reputation for accuracy, and is in service with Spanish and Peruvian police and military units.

The Model 30M is made entirely of steel, while the 30PK, which is slightly smaller, has a lighter alloy frame.

Caliber:	9mm Parabellum
Length:	21cm, 19 (PK)
Weight:	1.3kg, 1.0 (PK)
Magazine:	15

STEYR

Steyr-Mannlicher GesmbH, Austria

GB

Caliber:	9mm Parabellum
Length:	22cm
Weight:	1.2kg
Magazine:	18

The Steyr GB is a large double-action blowback-operated weapon designed in the early 1980s for the Austrian army, which declined to accept it in favor of the Glock. It has an unusual mechanism similar to that of the H&K VP70 (above), that uses gas from the fired cartridge to delay the opening of the breech. The GB has a decocking lever mounted on the slide that also acts as a safety, and there is no other manual safety fitted. Although the very large magazine makes the weapon bulky and not well-suited for small-handed users, the GB is comfortable when fired, and enjoys a reputation for reliability and accuracy. It is in service with many police forces in Austria and the United States, but is no longer in production.

SPP

Caliber:	9mm Parabellum
Length:	27cm
Weight:	1.6kg
Magazine:	15 (20, 25 available)

Introduced in 1989, the Steyr SPP (Special Purpose Pistol) is a pistol variant of the TMP, covered under submachineguns later in this text. It is a recoil-operated double-action weapon with synthetic receiver and frame.

TANFOGLIO

Fabrica d'Armi Fratelli Tanfoglio SpA, Italy

Baby

The Tanfoglio Baby is a compact version of the TA90, below. It has the same general mechanics and layout. It is an easily concealed weapon, and is very accurate for its size. Although shorter in length and grip, the Baby looks pretty much the same as the TA-90.

Caliber:	9mm Parabellum
Length:	18cm
Weight:	1.0kg
Magazine:	12

TA90

***also* GT41**

The TA90 is a double-action recoil-operated autoloader firing the 9mm Parabellum. It features a non-ambidextrous manual safety that affects several aspects of the weapon's internal mechanism (acting, in effect, like four different safeties operated by a single lever), rubber grips, and a recurved trigger guard for a good two-handed grip. The GT41 is a variant firing the .41in Action Express round. It has some minor styling changes, a repositioned safety, and a reduced magazine capacity.

Caliber:	9mm Parabellum, .41in AE (GT41)
Length:	20cm
Weight:	1.2kg
Magazine:	15, 11 (GT41)

WALTHER

Carl Walther Waffenfabrik, Germany

Model PP

***also* PPK**

The Walther PP and its compact sister, the PPK, date back to about 1930. The PP is a blowback-operated double-action weapon, and was in fact one of the world's first double-action autoloaders. A simple and reliable weapon, it features an internal safety and a manual safety on the left side. The PPK functions identically, and is merely a down-sized version of the PP.

Both models have been produced in four calibers, although only the .32in ACP and the .380in Auto variants are still in production. The PP design spawned many copies, and knock-offs or versions produced

Caliber:	.22in LR, .25in ACP, .32in ACP, .380in Auto
Length:	17cm, 16 (PPK)
Weight:	0.7kg, 0.6 (PPK)
Magazine:	8, 7 (PPK)

under license are made in many countries. Despite the PP's age, it is still in widespread service with military, police, and government agencies in Germany and all over Europe, and it continues to enjoy good commercial sales. The PPK, of course, was James Bond's trademark weapon.

Model P5

Caliber:	9mm Parabellum
Length:	18cm
Weight:	0.9kg
Magazine:	8

Introduced in 1979, the Walther P5 is a recoil-operated, double-action design that evolved from the company's earlier models. It features, however, an innovative safety system that has no less than four internal safeties, all actuated by the decocking lever on the left side. This makes the weapon very safe to carry, even with a round chambered, and no other external safety is fitted. Unfortunately, the decocker is not ambidextrous, and the magazine catch is on the butt of the weapon, requiring both hands to unload it. The P5 is carried by police in the Netherlands, and by some German police forces. It has also been picked up by the Portuguese and Nigerian armies, and some military forces in South America.

Model P5 Compact

Caliber:	9mm Parabellum
Length:	17cm
Weight:	0.9kg
Magazine:	8

As the name suggests, this weapon is a compact version of the P5, just above. It features the same system of safeties as the P5, and with the exception of the magazine catch, which has been moved to the side of the grip, it is functionally the same. It was designed for concealment, and not to catch on the user's clothing when drawn, and is a very comfortable weapon for users with small hands.

Model P-88

The P-88 was introduced in 1988, and is another double-action, recoil-operated 9mm autoloader. Its simple controls are fully ambidextrous, with a combined decocker/side release lever mounted on the receiver and the magazine catch on the grip. The safety is internal, and no manual safety is fitted. The trigger guard is checkered to give a good two-handed grip, but not recurved. It has been evaluated by several military organizations, including the British army.

Caliber:	9mm Parabellum
Length:	19cm
Weight:	1.1kg
Magazine:	15

Model P-88 Compact

This pistol is a compact version of the P-88 above. It has the same simple features as its full-sized namesake, and operates identically. With a fourteen-round magazine, the P-88 Compact has exceptional ammunition capacity for a compact pistol.

Caliber:	9mm Parabellum
Length:	18cm
Weight:	1.0kg
Magazine:	14

SUB MACHINE GUNS

CHAPTER TWO

SUBMACHINEGUNS

Submachinegun design has a long and spotty history, driven by the perceived need, or lack of need, for an automatic weapon firing a pistol cartridge. Having roots in the last century, the submachinegun did not see its true design or operational potential met until the Second World War. Since then, submachinegun development has tapered off substantially, although interest was dramatically rekindled in the '70s with a need for an ideal counterterrorism weapon. Today, submachinegun designs are many and varied, and developments since World War Two have led to some truly sophisticated weapons.

Although the idea of an automatic weapon firing pistol-type ammunition goes back to the 1890s, the first real submachinegun did not appear until early in the First World War. The Italian Villar Perosa (or VP, as it came to be known) consisted of two lightweight automatic weapons joined together, and was originally an aircraft weapon. It was quickly modified for use on vehicles and by infantry. The Germans, who had been producing several automatic versions of their pistols, captured a great many VPs, and, in 1918, issued their own design, the Bergmann MP181. The MP181 had many limitations, however, as it could only be fired on automatic and actually weighed more than a rifle.

In the U.S., John T. Thompson introduced the first in a series of submachineguns in 1917. It was a dismal failure, but led to an evolution of models that culminated in the early '20s in the Tommy gun. Used notoriously by gangsters and police in the prohibition years, the Tommy gun was not adopted by the military until around 1940, when it was designated the M1 Thompson.

Between the wars little need was seen for automatic pistol-calibre weapons, and few new designs were introduced. But German experiences in the Spanish Civil War led them to a revitalized interest in the weapons, and the Germans developed the MP38 just prior to World War Two. This weapon introduced several new design concepts, most notably the folding stock, and ushered in a whole new generation of weapons. These were characterized by their light weight and simple, easy to manufacture components. The most prolific member of this generation was the British Sten, without a doubt the most inexpensive submachinegun ever produced.

Although interest in submachineguns tapered off once again after the war, advances in design did not end altogether. An Israeli named Uziel Gal came up with the next big innovation: the wrap-around (or telescoping) bolt found in the Uzi and many subsequent

designs (the Uzi, obviously, is named after Gal, as is the Galil assault rifle). In telescoping-bolt weapons, the barrel and chamber protrude into the receiver. The bolt is large and hollow, and actually fits over the end of the chamber when closed. This design has a number of advantages. The bolt can be large and heavy without being too long, thus keeping down the rate of fire without requiring a lengthening of the weapon. The pistol grip and magazine well can be combined, making the magazine more secure and easier to load. Finally, with the weight of the bolt forward relative to the barrel, but still over the firing hand, the weapon tends not to climb when fired, and is therefor more controllable and accurate.

Since the Uzi's development in the late '40s a plethora of new weapons have appeared on the scene, especially since the advent of international terrorism in the 1970s. Many are based on the designs of the Second World War, while others incorporate the telescoping bolt principle. A few introduced their own innovations. One example is the Heckler & Koch MP5 family, which uses a scaled-down version of the roller-locked system found in the company's assault rifles (see the introduction to the Assault Rifle section for a description of the mechanism). Another is the Czech vz62 Skorpion, which employs a unique angled buffer within the pistol grip. Both of these weapons were introduced in the '60s, and despite the recent explosion in models available, there have been few truly new ideas since. Until just recently, virtually every submachinegun made has been chambered for the 9mm Parabellum round.

In the late 1980s the proliferation of submachineguns and manic miniaturization of assault rifles collided, resulting in some interesting hybrids. In some cases, such as the Colt 9mm (just an M-16 re-tooled to fire the 9mm Parabellum cartridge), the result is a sub-compact assault rifle firing a pistol round. Others, such as the Russian AKSU and the Heckler & Koch MP53, end up with a submachinegun firing a rifle cartridge. While the Colt has been well-received, it remains to be seen if the higher-powered cousins will find an application.

Despite their apparent similarity to assault rifles and machineguns, submachineguns operate more like pistols than any other class of weapon. Most are blowback-operated, meaning that the bolt is simply blown open by the blast of the fired round. Although this operating method is only appropriate for pistols firing low-powered rounds, it works for submachineguns because they have heavier bolts and stronger return springs, which provide sufficient delay in the opening of the breech. Most submachineguns fire from what is called the "open-bolt" position. That means that they begin and end their firing cycle with the bolt locked rearward, leaving the chamber open. When the trigger is pulled, the bolt is released, and moves forward under pressure from the return spring. It scrapes a round from the top of the magazine and pushes it into the chamber as it closes the breech. The round fires, and the blast blows the bolt back. It locks back in the rearward position, after recocking the trigger, and the weapon is ready to fire again. Of course, on automatic fire, the bolt doesn't lock, but just moves forward again to repeat the cycle, so long as the trigger is depressed. Open-bolt firing prevents chamber overheating, which can be a real problem with the high rates of fire that most submachineguns

have. Unfortunately, the fact that the bolt moves prior to firing means that open-bolt designs are inherently less accurate than similar closed-bolt weapons, especially if the design is not well-balanced.

If submachineguns resemble pistols in the way they work, they resemble assault rifles in how they are operated. Most are fed by box magazines, which are inserted either into the pistol-grip, or just forward. The user then pulls a charging handle, to lock the bolt to the rear. A single lever generally controls the safety and fire selection. Most submachineguns allow only single shot or automatic fire, although a few newer designs also offer three-round-burst settings.

Submachineguns are notorious for inaccuracy, especially in the hands of the inexperienced. The truth is, many submachineguns are quite accurate in single-shot mode. Their recoil and high rates of fire tend to disperse shots fired on automatic, however, and often only the first two or three rounds in a burst have any chance of hitting their intended target. The use of two hands, even on small submachineguns, adds greatly to stability, so well-trained users fire even small submachineguns with two hands, in short, controlled bursts.

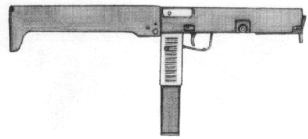
ARES

ARES, Inc., USA

Folding SMG

The ARES Folding submachinegun is a unique weapon designed for compactness, concealment, and portability. It is blowback-operated and fairly conventional internally. What makes it unusual is that the entire weapon, including the magazine, folds into a box-shape not much bigger than a large hand radio. The folded weapon has no protrusions—in fact, the ARES Folding has no sights. It can be unfolded and ready to fire almost instantly. The ARES has just finished its development cycle, and only prototypes exist currently. It is available for custom production, however, and such a unique weapon is likely to find a wider market soon.

Caliber:	9mm Parabellum
Length:	50cm, 26 (folded)
Weight:	2.9kg
Magazine:	32 (20, 25 available)



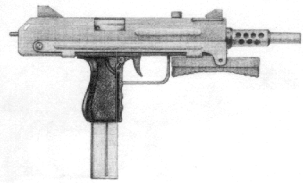
ARMSCOR

Armscor, South Africa

BXP

Introduced in the early 1980s, the Armscor BXP is a compact, conventionally designed blowback submachinegun with a telescoping bolt. It fires from the open bolt, and has a high rate of fire, but is well-balanced and relatively easy to control, even with one hand. The cocking handle is on the top, and the grip-mounted safety is ambidextrous. The two-stage trigger controls fire selection. When pulled partially, the weapon fires single shots, but when pulled fully it fires on full automatic. The BXP is coated with a permanent dry lubricant that protects its parts against wear and corrosion.

Caliber:	9mm Parabellum
Length:	61cm, 39 (folded)
Weight:	2.8kg
Magazine:	32 (22 available)



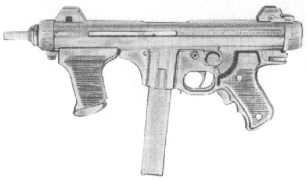
BERETTA

Armi Beretta SpA, Italy

Model 12

***also* 12S**

Caliber:	9mm Parabellum
Length:	66cm, 42 (folded)
Weight:	3.5kg
Magazine:	32 (20,40 available)



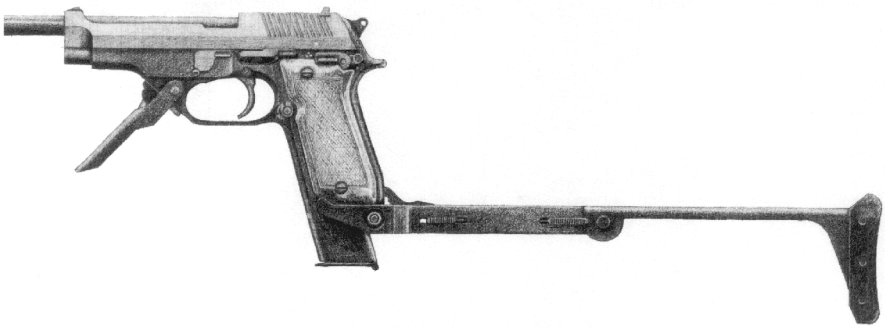
The Beretta Model 12 was introduced in the late 1950s, and was almost immediately adopted by the Italian army. The weapon was one of the earliest production submachineguns to use a telescoping bolt. A reliable design, it has become very popular, with strong military sales in Africa and South America. It features a grip safety, a push-through fire selector switch, and additional manual safety above the grip.

The 12S is a later version, with a few minor changes. The Model 12's fire selection and safety buttons have been replaced with a single, non-ambidextrous switch. The sights are improved, and a corrosion-resistant coating applied.

Model 93R

Caliber:	9mm Parabellum
Length:	24cm (55 w/ stock)
Weight:	1.3kg
Magazine:	20 (15 available)

The 93R is a large pistol with a three-round burst facility. It is very close in design to the Beretta 92-series pistols. In order to improve controllability (a notorious problem with machine-pistols), the barrel has a muzzle brake and there is a fold-down handle forward of the trigger guard. The fire selector/manual safety is located on the left side of the weapon. A folding stock is provided, which can be attached and removed quickly. A twenty-round magazine, which sticks out of the bottom of the grip, comes with the weapon, although it will also accept the fifteen round Beretta 92 magazines. The 93R, like all firearms, can be field-stripped by the user, but its fire selector mechanism requires occasional cleaning beyond the ability of the layman.

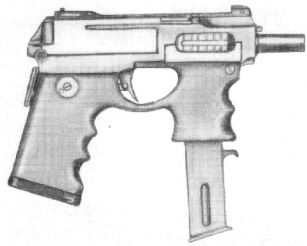


BUSHMAN

Bushman Ltd., UK

IDW

Caliber:	9mm Parbellum, 10mm, .41in AE
Length:	28cm
Weight:	3.3kg
Magazine:	32 (20, 28 available)



The Bushman IDW (Individual Defense Weapon) is a new and unique submachinegun. It has a variable rate of fire that is factory-set at a mechanically optimal 450 rounds per minute, but which can be altered by the user to any rate up to 1400 rounds per minute. The Bushman is blowback-operated, firing from the open bolt, but the bolt is so light that it has little effect on accuracy. In fact, the Bushman is a very accurate submachinegun, even when fired with one hand. Altering the fire regulator to a higher rate has little negative effect on this accuracy.

The Bushman is a compact weapon, made entirely of machined alloy and stainless-steel. It has a left-side thumb lever that actuates the manual safety and selects between single or automatic fire (even on automatic fire, the user can opt for a single shot by only partially pulling the trigger). The cocking handle is on the rear of the weapon, and there is a grip safety through which the user can tell whether or not the weapon is cocked. There is an additional internal safety.

CALICO

Calico, USA

Model 960A

Caliber:	9mm Parabellum
Length:	78cm, 53 (folded)
Weight:	3.0kg
Magazine:	50 (100 avail)

The Calico 960A is a unique new design closely related to the model 950 pistol discussed earlier in this book. Like the 950, the 960A uses a roller-locked blowback action similar to the HK MP5, and fires from the closed-bolt position. It is made of modern, lightweight materials, and has the pistol grip located behind, rather than below, the action. This, combined with the top-mounted magazine, gives the weapon excellent balance and control properties.

The Calico weapons all feed from unique cylindrical magazines that hold the rounds in a helix pattern within. An optional speedloader makes loading a quick and easy task, and the magazine spring can be relaxed, so that loaded magazines may be stored indefinitely without damage to the spring. The fire selector/safety switch appears on both sides, and since rounds are ejected from the bottom, the 960A is truly ambidextrous. The rate of fire is factory set at about 650 rounds per

minute, but the weapon can be ordered with a rate of fire up to 2000 rounds per minute. The rear sight is integral to the magazine, but does not change the weapon's zero even when magazines are changed.

A wide variety of accessories are available for the Calico weapon line, including an optical sight mount, a flashlight mount, a laser sight, and a brass catcher.

CESKÁ ZBROJOKA

Ceská Zbrojoka, Czechoslovakia

Model 61 Skorpion

***also* Models 63, 68**

Caliber:	.32in ACP, .380in Auto (63), 9mm Parabellum (68)
Length:	51cm, 27 (folded)
Weight:	2.4kg
Magazine:	10 (20 available)

The Skorpion, introduced in 1963, was designed to give military vehicle crews an automatic weapon that wouldn't get in their way. The result is one of the smallest submachineguns ever adopted into military service, but its lack of power makes it marginally useful as a combat weapon. The Skorpion is blowback-operated, using a unique buffer to maintain a manageable rate of fire.

The Skorpion has a manual safety/fire selector switch on the left side, above the pistol grip. The ejection port is on the top of the weapon, and spent cases can hit an unprepared firer in the face. It can be easily fired with one hand.

The variant models, 63 and 68, fire the .380in Auto and 9mm Parabellum rounds, respectively. They are very uncommon, despite the weakness of the .32in Auto round fired by the original model. Nevertheless, the Skorpion is common in former eastern-bloc countries, and has been sold to a number of African nations as well.

COLT

Colt Industries, USA

Colt 9mm

Caliber:	9mm Parabellum
Length:	73cm, 65 (folded)
Weight:	2.8kg
Magazine:	20 (32 available)

Introduced in 1987, the Colt 9mm is a cut-down version of the M16 assault rifle. It is blowback-operated and fires from the closed-bolt position, which, together with its long barrel, makes it an exceptionally accurate submachinegun.

The 9mm's assault-rifle roots are obvious, especially when one sees the 9mm magazine sticking out of the 5.56mm magazine well. But the design makes the best of its background. Although relatively bulky, the 9mm is lighter than many much smaller submachineguns. Its telescoping stock, which houses part of the firing mechanism, is very sturdy, and the weapon is reliable and durable overall. The fire selector is on the left side, above the grip, and the cocking handle is on

top, at the base of the carrying handle. These features, and the weapon's operation, are the same as the M16A1's, so anyone accustomed to the assault rifle can easily use the submachinegun with no learning curve. The Colt 9mm is in service with the U.S. DEA and other government agencies.

CNI

China North Industries Corp. and Chinese State Arsenals, China

Type 64

This blowback-operated weapon is very simple in design and construction, but one of few submachineguns with an integral silencer (and perhaps the first to be designed that way from the very beginning). It fires standard ammunition, reducing the bullet's velocity by bleeding away the burning gasses through small holes in the side of the barrel. It is not a very sturdy or ergonomic weapon, but has nevertheless seen moderately good sales.

Caliber:	7.62x26mm Russian
Length:	84cm, 64 (folded)
Weight:	3.7kg
Magazine:	30

FAMAE

FAMAE Fabricaciones Militares, Chile

FAMAE

A simple blowback weapon, the FAMAE has many superficial characteristics of an assault rifle. It is, however, a totally new design, purpose-built from the beginning as a 9mm submachinegun. It has a sturdy stock that folds to the right, and a vented plastic handguard over the barrel forward of the receiver. The cocking handle is located on the right side, while the safety/fire selector is on the left above the pistol grip. The FAMAE offers a three-round burst option in addition to single-shot and automatic fire.

This FAMAE submachinegun is not the same as a much older weapon of the same name, produced by the same company.

Caliber:	9mm Parabellum
Length:	65cm, 41 (folded)
Weight:	3.5kg
Magazine:	30

FN Herstal

FN Herstal SA, Belgium

P90

Caliber:	5.7x28mm
Length:	40cm
Weight:	3.7kg
Magazine:	50

In the late 1980s, FN Herstal unveiled its work on a new type of weapon firing a new round. The P90 was designed as a military weapon for non-infantry soldiers (like vehicle drivers and artillerymen) for whom a full-sized assault rifle is too burdensome, but who cannot afford to go without firepower. It fires a new 5.7mm round which has characteristics much closer to an assault rifle's than a pistol's. While the weapon's closed-bolt blowback operation is not revolutionary, much else about the design is.

The P90 is a bullpup weapon with the magazine placed along the top. The large plastic magazine is translucent, so the operator can tell at a glance how much ammo is available. The weapon is fully ambidextrous, with a cocking handle on either side, and the fire selector/safety mounted on the front of the pistol grip. Brass is ejected through the bottom of the weapon, and even the sling can be attached to one side or the other. An optical sight (no magnification) is fitted, but if it becomes damaged it can be removed, revealing back-up iron sights. A great deal of plastic is used in the construction, saving on weight.

Glock

Glock GesmbH, Austria

Model 18

Caliber:	9mm Parabellum
Length:	22cm
Weight:	0.8kg
Magazine:	17 (19, 33 available)

The Glock 18 is a modified version of the Glock 17, designed to give law-enforcement and special operations personnel selective fire options in a relatively concealable weapon. It is functionally the same as the 17 (covered in the Pistols section), with the addition of a single-shot/autofire selection switch on the rear of the slide. To prevent unauthorized conversions, however, many of the Glock 18's parts were deliberately designed to not be compatible with those of the model 17. The Glock 18 looks almost identical to the model 17, pictured on page 33.

Machine pistols are notoriously difficult to control and use with accuracy, and the Glock is no exception.

Heckler & Koch

Heckler & Koch GmbH, Germany

The HK MP5-series submachineguns are without a doubt one of the most popular types in the world. They are in use with a great many police, counter-terrorism, and special operations groups around the world, including the British SAS. They are durable, reliable, and very accurate weapons.

Introduced in the late 1960s, the MP5 was developed from the roller-locked mechanism of the G3 rifle. In fact, some of its parts, like the pistol grip which houses the trigger mechanism, are interchangeable with the rifle and several other HK weapons. The MP5 is blowback-operated and fires from the closed-bolt position. Its safety/fire selection lever is above the grip on the left, and brass is ejected on the right. It is fitted with fully-adjustable iron sights, but easily mounts scopes or laser sights.

There are five versions of the weapon that fire the 9mm Parabellum round: the MP5A1, with no stock; the A2, with a fixed stock; the A3, with a collapsible stock; and the A4 and A5, which are identical to the A2 and A3 respectively, but feature a three-round burst option and have slightly reshaped grips. The A1 through A3 versions are no longer made, but because the receiver endcap, which is attached to the stock, is interchangeable between versions, it is still possible to obtain a weapon with no stock at all, like the A1. Originally, the MP5 series had straight magazines, but a slightly improved curved magazine was developed in the late '70s. All 9mm versions of the MP5, including the MP5K (below) and MP5SD (next page) series below, use both magazines.

Recently, two additional weapons were added to the line: the MP5/10 and MP5/40. These two weapons are largely identical to the MP5A5, but are chambered for the 10mm and .40in S&W rounds, respectively. They use straight thirty-round magazines made of translucent plastic, which can be snapped together side-by-side for easy access. They are also available with a number of fire-selection options, including two-round and three-round bursts as well as full automatic fire.

MP5A5

***also* A1-A4, MP5/10, /40**

Caliber:	9mm Parabellum, 10mm (MP5/10), .40 S&W (MP5/40)
Length:	68cm, 49 (folded)
Weight:	2.9kg
Magazine:	30 (15 available)

MP5KA5

***also* MP5K, KA1, KA4**

Caliber:	9mm Parabellum
Length:	34cm
Weight:	2.5kg
Magazine:	30 (15 available)

Introduced in 1976, the MP5K series was specifically developed for counterterrorism and police work where a concealable yet powerful weapon is required. It is an extra-short version of the MP5, operating in essentially the same manner. It has no stock and cannot be fitted with any of the interchangeable stocks of the MP5 and MP5SD weapons. It does, however, have a plastic foregrip which greatly adds to its stability. Four versions have been made: the base-model MP5K;

the KA1, which has very small fixed sights for greater concealability and an easy draw from a holster; and the KA4 and KA5, which are the same as the MP5K and KA1 respectively, but add a three-round burst option. There was no KA2 or KA3. The two earliest models are no longer made.

MP5PDW

Caliber:	9mm Parabellum
Length:	70 cm, 36 (folded), 78(w/ supp.), 44 (fold.)
Weight:	2.8kg, 3.4 (w/ supp.)
Magazine:	30 (15 available)

The MP5PDW (Personal Defense Weapon) is a new addition to the MP5 family, and is based largely on the MP5K, above. It was designed specifically for military special operations and as a backup weapon for aircrews. It differs from the MP5K only in the addition of a folding stock, an ambidextrous safety/fire selection lever, and a removable suppressor. Because the extreme shortness of the weapon would not permit the use of HK's standard metal collapsing stock, the PDW is fitted with a plastic stock that folds to the right side, and which has a much sturdier feel than the one fitted to the other HK submachineguns. The sound suppressor is compact, although heavy, and meets a requirement put out by the U.S. Navy SEALS for a suppressor that could be used immediately after being submerged underwater. It can be used indefinitely without maintenance, but must be used with subsonic ammunition for truly quiet operation.

MP5SD6

***also* SD1-SD5**

Caliber:	9mm Parabellum
Length:	78cm, 61 (folded)
Weight:	3.7kg, 3.2 (SD1, SD4)
Magazine:	30 (15 available)

The MP5SD series weapons are versions of the MP5 with integral suppressors. They operate in the exact same manner as the MP5. A number of small holes in the barrel bleed away cartridge gases, reducing the velocity of the bullet to below the speed of sound by the time it leaves the barrel. This allows the weapon to fire standard ammunition, while making the MP5 the quietest off-the-shelf suppressed submachinegun made. The suppressor requires no maintenance, and lasts indefinitely.

Six versions of the weapon have been produced. The SD1, 2, and 3 have no stock, a fixed stock, and a retractable stock, respectively. The SD4, 5, and 6 have slightly different pistol grips, and feature a three-round burst option. They have the same stock arrangements as the SD1, 2, and 3.

MP53

Caliber:	5.56mm
Length:	76cm, 56 (folded)
Weight:	3.3kg
Magazine:	25

The HK MP53 is a submachinegun firing the 5.56mm rifle round, and is essentially a cut-down version of the G33 assault rifle. It uses a roller-locked mechanism, and operates exactly the same as the MP5, opposite. The selector lever is on the left side, and offers single-shot or automatic fire. Optionally, the weapon can be ordered with an ambidextrous selector lever that also allows a three-round burst. Early versions of this weapon had a horrendous muzzle flash, but it has since been fitted with an improved flash suppressor. The MP53 is in service with several special operations and police forces worldwide.

MP2000

Caliber:	9mm Parabellum
Length:	57cm, 39 (folded)
	84 (w/supp.), 66 (fold.)
Weight:	3.2kg, 4.0 (w/ supp.)
Magazine:	30

Outwardly similar to the MP5-series weapons, the MP2000 is a new design intended to capitalize on HK's experience with submachineguns, putting all the features of the MP5 family in a single package. The MP2000 is a recoil-operated weapon firing from the closed-bolt position. It features a collapsible stock, a forward handgrip, and a removable suppressor. The fire selection lever is ambidextrous, and the weapon can be made to fire full auto or three-round bursts, in addition to single shots. The MP2000 uses lightweight plastic magazines which are not compatible with those of the MP5 family. A sight mount which easily accepts most scopes or electro-optical sights is standard.

A truly unique feature of the MP2000 is its silencing system. Like the MP5SD weapons, the 2000 silences standard ammunition by bleeding away some of the propellant gases through holes in the barrel, thus preventing the bullet from reaching supersonic speed. The bleed holes on the MP2000 can be closed, however, allowing it to fire standard rounds at normal velocity when silenced operation isn't required. The weapon also has a switch for locking the bolt closed. This alleviates almost all mechanical noise but requires the user to work the bolt by hand before each shot.

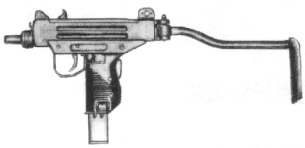
The MP2000 was designed with input from a number of special-operations and law-enforcement organizations. It has recently completed its development phase, and will likely see service with many of these organizations soon.

IMI

Israel Military Industries, Ltd., Israel

Micro-Uzi

Caliber:	9mm Para, .45in ACP
Length:	46cm, 25 (folded)
Weight:	2.2kg
Magazine:	20, 16 (.45in ACP)



This is the smallest and lightest member of the Uzi family (see the Uzi, just below). The Micro-Uzi is about as small as the original design could be made and still function safely. In fact, the bolt has a tungsten core to increase its weight and keep the rate of fire somewhat manageable. The Micro-Uzi has all of the same features as its parent. Its collapsible stock folds to the left.

Mini-Uzi

Caliber:	9mm Para, .45in ACP
Length:	60cm, 36 (folded)
Weight:	3.0kg
Magazine:	20 (25, 32 available), 16 (.45in ACP)

The Mini-Uzi is another miniaturized version of the Uzi, slightly larger than the Micro-Uzi, above. It has all the same features as the parent weapon, and functions in basically the same way, although the model was modified in 1987 to fire from the closed-bolt position, abandoning the unusual "advanced primer ignition" system mentioned below. The folding stock is hinged, swinging to the right side of the weapon. As can be expected from a smaller, lighter weapon, the Mini-Uzi has a higher rate of fire than its namesake.

Uzi

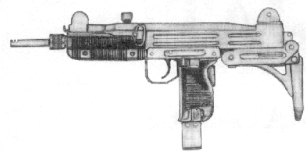
Caliber:	9mm Para, .45in ACP
Length:	65cm, 47 (folded)
Weight:	3.7kg
Magazine:	20 (25, 32 available), 16 (.45in ACP)

Designed in the 1950s, the Uzi is the single most popular submachinegun in the world. It is renowned for its compactness, accuracy, and most of all, durability. A blowback-operated weapon that fires from the open bolt, the Uzi is well-balanced and can be fired with one hand. It is in service with Israel, Germany, and the militaries of over twenty-five other countries.

The Uzi was not the first submachinegun to employ a telescopic bolt, but it was the first to bring the concept to a widespread market. The shortness of the telescoped bolt contributes to the compactness of the weapon, and allows the Uzi to have an unusually long barrel for

such a short weapon. Additionally, it keeps the weight forward, and the vibrations of the bolt directly over the firer's hand, adding to stability. A truly unique feature of the Uzi's operation is the "advanced primer ignition" system: the round is fired before the bolt is fully closed. This slows the bolt's movement, reducing the rate of fire while allowing for a smaller, lighter bolt.

The Uzi's cocking handle is on top of the weapon. The manual safety/fire selector is on the left side, at the top of the grip, and rounds are ejected on the opposite side. There is also a grip safety. While early models were fitted with wooden stocks, some of which were removable, most Uzis have collapsible metal stocks that fold under the rear of the body.



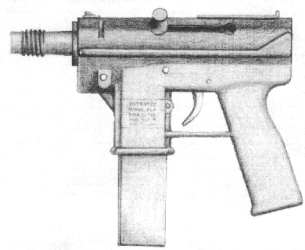
INTRATEC

Intratec, USA

TEC-9

The TEC-9 is a very simple blowback operated submachinegun firing the 9mm Parabellum round. It is made of inexpensive metal parts, with a plastic receiver. Although available as a submachinegun, the TEC-9 is also made as a pistol. In criminal hands the pistol version can easily be modified for automatic fire, so many of the TEC-9 "submachineguns" on the street are really converted pistols. The only functional difference between an actual TEC-9 submachinegun and a modified pistol is in fire selection—the submachinegun permits semi-automatic and automatic fire, whereas the modified pistol can fire on automatic only.

Caliber:	9mm Parabellum
Length:	28cm
Weight:	1.7kg
Magazine:	20 (32 available)



JATI

JATI, Finland

JATI-Matic

Caliber:	9mm Parabellum
Length:	38cm
Weight:	2.1kg
Magazine:	20 (40 available)

The JATI MATIC is an unusual weapon that puts some new twists on a few old design concepts. The JATI is a blowback-operated submachinegun with a telescoping bolt design. What makes it unusual is that the bolt travels on an inclined path. This counteracts the natural tendency of submachineguns to rise as they are fired. It also allows for the grip to be placed behind, rather than below, the barrel, further aiding stability. The JATI has a fold-down front grip, which doubles as a charging handle and locks the bolt into a safe position when folded. Fire selection is controlled by a two-stage trigger.

KAC

Knight's Armament Company, USA

9mm Suppressed

Caliber:	9mm Parabellum
Length:	78cm, 70 (folded)
Weight:	3.8kg
Magazine:	20 (32 available)

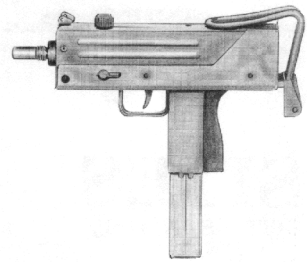
This weapon is basically an after-market conversion of the Colt 9mm submachinegun, covered earlier in this section. It operates in exactly the same manner, the only difference being the addition of an integral suppression system. The barrel is drilled with a number of small holes, to bleed gas away from the round and slow it to subsonic speed. This allows the weapon to operate very quietly while firing standard 9mm Parabellum ammunition. The suppressor is virtually maintenance-free and lasts indefinitely.

MAC

Military Armament Corp. S.W.D., USA

Ingram M10

Caliber:	9mm Para, .45in ACP
Length:	55cm, 27 (folded)
Weight:	3.2kg, 3.5 (.45in ACP)
Magazine:	32



Introduced in 1970, the Ingram M10 is an extremely compact weapon which, despite its very inexpensive manufacturing, is also reliable and tough. Its a blowback-operated weapon, with a telescoping bolt. Although somewhat hard to control if not fired in short, disciplined bursts, it is well-balanced weapon, and can easily be fired one-handed.

The M10's cocking handle is on the top of the weapon. The fire selector is on the side, and includes a safety. The cocking handle acts as a second manual safety, locking the bolt if twisted. There is a short collapsible stock that pulls out of the rear of the weapon, and a short web strap on the front that serves as a forward handle, giving a little more stability. A suppressor is available, which quiets but does not silence the weapon. Its use adds to the M10's stability. The Ingram is in service in Saudi Arabia, Portugal, and a number of other nations worldwide.

Ingram M11

Caliber:	.380in Auto
Length:	46cm, 22 (folded)
Weight:	1.8kg
Magazine:	16 (32 available)

The M11 is an even smaller version of the Ingram, firing the less powerful .380 Auto round. It functions in exactly the same manner as the larger M10, above, and has identical features. Although heavy for its size, it is one of the smallest submachineguns ever made, smaller even than most machine-pistols. The M11 looks almost exactly like the M10, pictured above.

Russian State Arsenals

State Arsenals of Russia and the former U.S.S.R.

AKSU-74

Caliber:	5.45x40mm Russian
Length:	68cm, 42 (folded)
Weight:	3.1kg
Magazine:	30

The AKSU is a variant of the Soviet AKS-74 assault rifle, which has been severely cut down to submachinegun size and functionality. Like its parent weapon, it is gas-operated, and the two are internally identical except in the length of the barrel and gas tube. The AKSU has a skeletal stock that folds to the left, latching to the side of the weapon, and an unusual cylindrical flash suppressor. The weapon is somewhat difficult to control.

SITES

SITES SpA, Italy

M4 Spectre

Caliber:	9mm Parabellum
Length:	58cm, 35 (folded)
Weight:	3.4kg
Magazine:	50 (30 available)

The Spectre was introduced in 1984, and is an unusual weapon in a number of regards. It was designed for police and counter-terrorist work, and one of the principal design goals was to create a weapon that could be drawn and fired without fumbling about with a lot of controls. To achieve this, the Spectre was given an internal safety, and a double-action trigger with a decocking lever. This allows it to operate just like a double-action pistol: the bolt is cycled when the weapon is loaded, and the hammer de-cocked. When the user wishes to fire, he or she simply pulls the trigger.

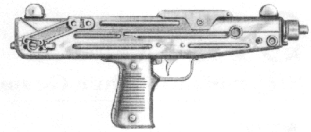
The Spectre is blowback-operated, and fires from the closed bolt. To keep the barrel cool, the bolt is designed to force air through and around it with every shot. The Spectre has a decocking lever, fire selector, and cocking handle on either side, making the weapon totally ambidextrous (although brass is ejected to the right—a potential hazard for lefties). The stock folds over to sit along the top. A unique magazine holds the ammunition in four columns instead of the normal two, giving it a higher capacity in less length than most submachine-gun magazines.

STAR

Star Bonifacio Echeverria SA, Spain

Z-84

Caliber:	9mm Parabellum
Length:	62cm, 41 (folded)
Weight:	3.3kg
Magazine:	30 (25 available)



It is no coincidence that the Z-84 bears and external resemblance to the Uzi submachinegun. Although a totally new design, the Z-84 operates in almost exactly the same way, and has many of the same characteristics. Its a blowback-operated weapon with a telescoping bolt. It was designed for reliable use under the most severe conditions, and can be fired one-handed.

The Z-84 has its fire selector on the left side of the weapon, with the cocking handle on the right. The manual safety is on the bottom, just behind the trigger. There is also an internal safety. The stock folds over the top. The Z-84 is in service with the Spanish army.

STERLING

Sterling Armament Co., UK

L2A3

***also* L2A1, L2A2**

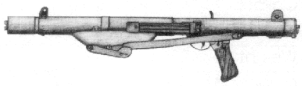
Caliber:	9mm Parabellum
Length:	69cm, 48 (folded)
Weight:	3.1kg
Magazine:	34 (10 available)

Although prototypes made it into some of the final battles, the Sterling was not really introduced until just after World War Two, and didn't enter service with the British army until 1953. A very simple weapon, the Sterling is remarkably robust and easy to use. It is blowback-operated.

The Sterling has its fire selector/manual safety on the left side, just above the pistol grip. The magazine fits on the left as well, with rounds ejecting to the right. The stock folds beneath the weapon. Despite its age, the Sterling is still in use with British forces, and those of about ninety other countries. Production went on until 1988, when Sterling closed its doors, but Royal Ordinance keeps spare parts and maintenance facilities. Two earlier versions, the A1 and A2, appeared in smaller numbers in the 1950s, but have only minor differences with the final A3 version.

L34A1

Caliber:	9mm Parabellum
Length:	86cm, 66 (folded)
Weight:	4.0kg
Magazine:	34 (10 available)



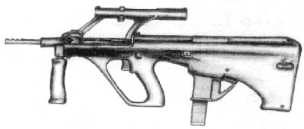
This weapon is a silenced version of the L2A3, above. It operates in exactly the same manner, and has the same features. The barrel is drilled with a number of small holes, to bleed away firing gases as the bullet moves down the barrel, reducing its velocity to below the speed of sound. As a result, the weapon does not need subsonic ammunition, but works very quietly firing standard ammo. Like the L2A3, the L34A1 is a robust and reliable weapon. It is in service with British forces.

STEYR

Steyr-Mannlicher GesmbH, Austria

AUG 9mm Para

Caliber:	9mm Parabellum
Length:	67cm
Weight:	3.6kg
Magazine:	32 (25 available)



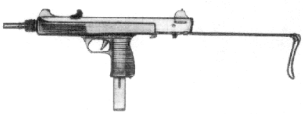
This is a 9mm weapon based on the AUG assault rifle. In fact, many of the components are the same, and the submachinegun can be ordered as a conversion kit for an existing rifle. The weapon is blowback-operated, and fires from a closed bolt. This, along with its long barrel, make the AUG Para an exceptionally accurate submachinegun.

Like the AUG rifle, the Para is fully ambidextrous, and even the ejection port can be switched from one side to the other. The fire selector has a single-shot setting, but even with it set on automatic fire, the two-stage trigger allows single shots. Although the Para does not have a collapsible stock, the bullpup configuration keeps the weapon reasonably short.

MPi 81

***also* MPi 69, MPi 69, 81 silenced**

Caliber:	9mm Parabellum
Length:	67cm, 47 (folded)
Weight:	3.5kg
Magazine:	32 (25 available)



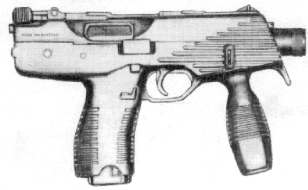
The MPi was designed to be a robust but inexpensive weapon, with Steyr's typical attention to detail. It is a simple design, a blowback weapon with a telescoping bolt. It cocks from the left and ejects on the right, and has an ambidextrous manual safety/fire selector as well as a two-stage trigger. There is also an internal safety. The original model 69 had the sling attached to the cocking lever—to cock, the user grasped the strap close to the weapon and pulled back. Many users found this inconvenient, and the model 81 was introduced with a standard cocking handle and sling. Aside from that change and a slightly higher rate of fire, the 81 is no different from the 69.

A silencer kit is available for both models. It includes a suppressor and a replacement barrel, drilled with a number of small holes to reduce bullet velocity to subsonic. Despite the fact that the barrel must be changed, the silencer kit can be installed in minutes with no special tools. It is efficient and low-maintenance.

TMP

Introduced in 1989, the Steyr TMP (Tactical Machine Pistol) is a very compact, lightweight weapon. Despite a recoil-operation similar to that of the Steyr AUG assault rifle, the TMP has about half the parts found in most submachineguns, making it very reliable. The entire receiver is made of plastic. The cocking handle is to the rear, and the safety/fire selector is ambidextrous. A second handgrip towards the front adds greatly to the weapon's controllability. As with all Steyr automatic weapons, the TMP has a two-stage trigger that allows the user to fire single shots even on the full automatic setting.

Caliber:	9mm Parabellum, 10mm, .41in AE
Length:	27cm
Weight:	1.7kg
Magazine:	25



WALTHER

Carl Walther Waffenfabrik, Germany

MPK

***also* MPL**

The MPK is the shorter of two submachineguns introduced by Walther in 1963. It is a blowback-operated weapon with a variant of the telescoping bolt concept—a large section of the bolt hangs over the barrel, keeping weight forward and adding to the stability of the weapon. The MPK has an interesting set of sights, combining open sights for quick acquisition with a second set of more accurate iron sights, for use when a careful aim is appropriate. The stock can fold to either side of the weapon. The MPL is a slightly longer version, but is otherwise identical. While both versions sold moderately well to police forces in Germany and abroad, it did not see much military use, and production ceased in 1987.

Caliber:	9mm Parabellum
Length:	66cm, 38 (folded), 75 (MPL), 46 (folded)
Weight:	3.2kg, 3.3 (MPL)
Magazine:	32

WEAVER

Weaver Arms Corp, USA

PKS-9 Ultralight

Caliber:	9mm Parabellum
Length:	68cm, 42 (folded)
Weight:	3.1kg
Magazine:	30 (25, 42 available)

The Weaver Ultralight is a conventionally-designed blowback-operated submachinegun with a telescoping bolt. It is a fairly lightweight and sturdy weapon, with a stock that can be folded or removed completely. The internal components are treated with a permanent lubricant that reduces maintenance requirements and eliminates the need for oiling. The basic Ultralight design is somewhat modular, and a number of accessories and alternate configurations are available.

ASSAULT RIFLES

CHAPTER THREE

ASSAULT RIFLES

The assault rifle is the basic infantry weapon of the late twentieth century. A concept born in the military research of World War Two, the evolution of assault rifles has led to a design philosophy that favors lightweight weapons with automatic-fire capability, high-velocity ammunition, and large magazine capacities, while giving up accuracy and lethality at extreme ranges. The newest generation of weapons focuses more than ever on compact size, and the three-round burst option appearing on most new entries into the field attests to a decreasing interest in sustained automatic fire from infantry rifles.

Weapon design is often dictated by development of ammunition, and that is certainly true in the history of assault rifles. Up through World War Two, infantry rifles were heavy bolt-action or semi-automatic weapons that fired large rounds with ranges up to and over 800 meters. During the war, however, Russia and Germany both experimented with light-weight cartridges—rounds that might bridge the gap between rifle and submachinegun ammunition. One of these rounds—the Russian 7.62mm—is in use today, in the AK47 and AKM rifles. After the war, NATO experimented with the same idea, resulting in the development and adoption of the 7.62 round now fired from the G3, FN-FAL, and dozens of other rifles and machineguns. These two new rounds led to the creation of the first true assault rifles, and have been adopted by most of the world's armies. But they had a lot in common with their older counterparts, and most 7.62 assault rifles are still heavy, long-range weapons.

In the late '50s, the M-16 was developed, entering service with the U.S. military early in the Vietnam war. The M-16 fired a new, lightweight, high-velocity round—the 5.56mm. The round had some clear advantages: its compact size meant that a larger magazine capacity was possible, more ammunition could be carried, and a weapon designed around it could be lighter and smaller than previous assault rifles. The lower-powered bullet made it easier to control on automatic fire. The bullet's diminutive size was made up for by its high speed, and although it didn't have the punch of the NATO 7.62mm, its lethality at close to medium ranges was comparable. But it had some disadvantages, as well. As its velocity tapered off, so did both its accuracy and impact, meaning that the effectiveness of a 5.56mm rifle dropped dramatically past 350 meters. Buildings, equipment, and even vegetation could affect the lightweight round's behavior much more than that of a heavier bullet. But many military theorists felt

that an infantry rifle didn't see much use at long range, and the popularity of the M-16 and other designs seems to minimize the importance of these disadvantages. The round was adopted as a standard by NATO in the late 1970s, and most European armies have adopted a 5.56mm rifle since.

With the exception of the 4.7mm caseless round being pursued by Heckler & Koch, there hasn't been much news on the rifle ammunition front for some time. But the evolution of the assault rifle has continued. New designs have been even more compact, with three European nations recently adopting bullpup rifles, and a plethora of carbine versions coming on the market. A three-round burst option is available on most new designs, with many weapons, such as the U.S. army's M-16A2, totally forgoing full automatic fire.

There are a number of fundamental designs for automatic rifle mechanisms. Two, however, stand out as the most prominent: the rotating-bolt mechanism and the roller-locked system. Virtually every modern combat rifle is based on one or the other design.

Both mechanisms are mechanically complex, but the basic principle is simple: energy from the firing of the round is used to operate the mechanism. Rifle cartridges are too powerful to rely on simple blowback operation. Hence the complexity of the designs—the mechanism must use the energy of the blast, but in a way that delays the opening of the breech until the bullet has left the weapon and it is safe to have an open chamber a few inches in front of the firer's nose.

The rotating bolt mechanism is a spin-off of the bolt action designs from the first half of the century. In most bolt-action rifles, including those made today, the bolt has a number of teeth, or cogs, along the edge of the breech face. The chamber has a like number of teeth around its mouth. When the operator pushes the bolt forward, the teeth on its rim pass between the teeth around the opening of the chamber. When the bolt is home, the operator rotates the handle downwards, and the teeth line up. The bolt is locked: it cannot slide backwards until it is rotated, allowing the teeth to once again pass between one another.

Rotating-bolt assault rifles use the same locking principle to keep the breech from blowing open. Instead of being unlocked by a handle, however, the breech is unlocked and opened mechanically. The bolt has two parts: a front section that closes the breech and locks with teeth, and a rear section, called a bolt carrier on many models, that creates the rotation necessary to operate the lock.

To see the entire process in action, consider the U.S. Army's M-16. When a bullet is fired and travels down the barrel of this weapon, it passes a small hole just a few inches from the end. Some of the gas behind the bullet bleeds into the hole, and, under pressure (the bullet still hasn't made it out of the weapon), runs back down a small tube in the handguard. When it makes it back to the receiver, it encounters the bolt carrier, which it pushes backwards with a great deal of force. The bolt carrier is wrapped around the bolt, and there is a pin sticking out of the bolt that fits into a spiraling slot in the side of the carrier. The bolt carrier moves rearward under the pressure from the gas, but the bolt itself is still locked in place, and cannot move. However, as the carrier slides back, the pin sticking out of the bolt travels along the spiralling grove, causing the bolt itself to rotate. The breech is

unlocked and is opened as the bolt begins to move rearward with the carrier, but by now the bullet is well clear of the weapon, and the gas pressure inside the chamber is down to a safe level.

The chamber is now open, and the rest of the action is pretty simple. The bolt and carrier move back under their own inertia. A spring-loaded extractor on the bolt drags the empty shell casing out of the chamber, flinging it out the ejection port as soon as it clears the breech. The bolt and carrier continue to move rearwards, re-cocking the firing hammer before running into a buffer located in the rifle butt, then being pushed back by a return spring (many weapons, including the M16, employ a buffer to absorb recoil and slow the rate of fire). While returning, the bolt strips the next round from the magazine and pushes it into the chamber. The bolt closes on the breech, but the carrier continues forward, and the pin-and-groove arrangement rotates the bolt back, re-locking it. The cycle is complete: the weapon is ready to be fired again.

Roller-locked designs use a radically different mechanism, but still rely on a two-part bolt to unlock the breech and delay its opening. The forward part of the bolt has a smooth breech face, and a pair of rollers set into its sides. The larger bolt carrier fits into the back of the front part so that a small, wedge-shaped protrusion can run up between the rollers. As the bolt moves forward inside of the receiver, these rollers, which barely protrude from the sides of the bolt, travel along rails set in the walls of the receiver housing. The rails end, however, right where the bolt stops as it closes the breech. The carrier moves forward a little farther, however, driving the wedge between the rollers. Just off the end of the rails, the rollers are forced out by the wedge. The bolt is locked—it cannot move rearward until the rollers pop back in, allowing them to slip over the ends of the rails.

To see this in action, look at another example: the Heckler & Koch G-3 rifle. As with the M-16, this rifle is gas-operated, siphoning off some of the cartridge gasses as they push the bullet down the barrel. Again, the gasses act on the rear part of the bolt, pushing it back. This withdraws the wedge, releasing the rollers and allowing them to retract until they can pass onto the rails. Once that happens, both parts of the bolt move rearwards together. The remainder of the action is essentially the same as that of the M-16, with one notable exception. Because the breech face is smooth, there is no extractor to pull the shell casing from the chamber. Instead, a small amount of remaining gas is used to blow the shell out. Flutes or grooves along the sides of the chamber allow the gas to get between the cartridge and the chamber wall, where it can push the shell out when the breech opens.

These two designs account for the vast majority of the assault rifles in use, as well as most of the semi-automatic rifles used in law enforcement, hunting, and sport shooting.

Operating an assault rifle is fairly easy. Most have five control devices: a charging handle, a fire-selection switch, a magazine release, a bolt catch, and of course the trigger. To load, a magazine is inserted into the magazine well, and the charging handle is pulled to the rear and released. This pulls back the bolt and carrier, cocking the hammer, then allows the return spring to drive the bolt home, chambering a round along the way. Once loaded, the weapon can be carried safely by rotating the fire selection lever to safe. It is fired by placing the fire selection lever in whichever mode the user desires—semi gives single

shots on each pull of the trigger, while auto continues to fire as long as the trigger is held and the ammunition holds up. Some weapons have a three-round-burst setting, and a few feature a two-stage trigger for fire selection—pull it back a little for one shot, all the way for automatic fire. Most assault rifles lock the bolt to the rear when the magazine runs dry, so that they can be reloaded by simply inserting a new magazine, then hitting the bolt catch. Almost all assault rifles fire from the closed-bolt position.

Because assault rifles are developed and built exclusively for the military market, there are not nearly as many models in existence as there are in other classes of firearm. True assault rifles are often hard to come by on the commercial market, as well, although there exist sporting versions of almost every model, capable of semi-automatic fire only.

BERETTA

Armi Beretta SpA, Italy

AR 70

***also* SC 70, SC 70 Short**

Caliber:	5.56mm
Length:	95cm, 71 (folded), 62 (Short), 58 (folded)
Weight:	3.9kg
Magazine:	30

A lightweight, gas-operated assault rifle, the AR 70 is an inexpensive yet well-built weapon that was designed to meet a growing need in the 1970s for weapons firing the 5.56mm round. It has few features that make it remarkable, but its cost and reliability led to sales to the Italian Special Forces and the militaries of a handful of countries, including Jordan and Malaysia. It was discontinued in favor of the 70/90, below.

Two variant models were produced: the SC 70, with a folding metal stock, and the SC 70 short, which further reduced length with a shortened barrel. Both weapons function identically to the AR 70.

AR 70/90

***also* SC 70/90, SCS 70/90**

Caliber:	5.56mm
Length:	100cm, 75 (folded), 98 (SCS 70/90), 73 (SCS 70/90 folded)
Weight:	4.4kg
Magazine:	30

Introduced in 1985 in response to the Italian army's search for a new assault rifle, the 70/90 is an upgraded design based on the earlier AR 70. It is a slightly more durable weapon, although it retains the AR 70's inexpensive manufacturing process. Selective fire is controlled by a two-stage trigger. Single-shot, three round burst, and full-auto options are all available, although the trigger mechanism must be adjusted internally for any two of the three. The weapon features a carrying handle, which can be removed to reveal a scope mount that easily takes most optical sights.

As with the AR 70, two variants are made. The SC 70/90 has a folding metal stock, while the SCS 70/90 has a folding stock and a shorter barrel. All three versions are in service with the Italian army.

CETME

Empresa Nacional Santa Barbara, Spain

CETME C

CETME (the Centro de Estudios Technicos de Materiales Especiales) is a design group that included engineers and weapons designers who came to Spain from Germany after World War Two. This accounts for the great similarity in design philosophy between CETME weapons and those of Heckler & Koch, another heir to the German WWII weapon designs. The CETME C is a 7.62mm assault rifle designed in the early 1970s, when the Spanish army called for a weapon that would fire the NATO standard 7.62mm round. It is gas-operated, with a roller-locked bolt. It fires from an open bolt when firing automatically, and a closed-bolt on single shot, and features an integral bipod. It is in service with the Spanish Army.

Caliber:	7.62mm
Length:	102cm
Weight:	5.0kg
Magazine:	20

CETME L

***also* CETME LC**

The CETME L is a reduced version of the Model C design, above, scaled down to fire the 5.56mm round. It is functionally the same as its predecessor, and began to see service with the Spanish army in 1988. A shortened version, the CETME LC, has a reduced barrel and a folding stock.

Caliber:	5.56mm
Length:	93cm, 86 (LC), 68 (folded)
Weight:	3.8kg, 3.6 (LC)
Magazine:	30

CIS

Chartered Industries of Singapore, Singapore

SR 88

In the late 1970s, Chartered Industries of Singapore sought to produce an inexpensive 5.56mm assault rifle for export. After experimenting with licensed versions of the M16 and designs by other companies, the SR 88 was developed. Similar in design to the M16, it is gas operated, using a rotating bolt. It has few innovations, but is offered with full auto capability, or in a version that fires single shots and three-round bursts. It is fairly durable and lightweight, and inexpensive. The M203 grenade launcher, made to mount on the M16, can be fitted to the SR 88.

Caliber:	5.56mm
Length:	97cm
Weight:	4.0kg
Magazine:	30 (20 availble)

COLT

Colt Industries, USA

M4 Carbine

Caliber:	5.56mm
Length:	84cm, 76 (folded)
Weight:	3.3kg
Magazine:	30 (20 available)

The M4 Carbine is a cut-down version of the M16, below. The barrel has been shortened by about a third, and the fixed stock has been replaced with one that telescopes, making the weapon even shorter. Operation and all other features are identical to the M16A1, so a user familiar with the latter will have no trouble operating the Carbine.

M16A2

***also* M16A1**

Caliber:	5.56mm
Length:	101cm
Weight:	3.9kg
Magazine:	30 (20 available)

Introduced in 1959, the Colt M16 was the first assault rifle to fire the 5.56mm cartridge. It is a gas-operated weapon firing from the closed-bolt position. The M16A2 is a recent variant that offers single-shot and three round burst firing options. It features a heavy barrel, fully adjustable sights, and a flange near the ejection port that protects left-handed firers from ejected cartridges. The carrying handle can double as an optical sight mount, and the forward handguards can be removed to fit the M203 40mm grenade launcher. Recoil is negligible, making the weapon very easy to fire. Because the design allows firing gases from the gas tube to flood the bolt carrier and receiver, the M16 is prone to malfunctions if not properly maintained. Operation and care are easy, however, so such problems do not normally arise.

The M16A2 is the current service rifle for the United States military forces. The A1, however, is still a common weapon in the U.S. and abroad. It is exactly the same as the A2, but has a lighter barrel, no brass-deflecting flange, and sights that are less convenient to adjust. It also lacks a three round burst option, allowing full automatic fire instead. One or both versions of the M16 are used by the Canadian and Israeli armies, as well as those of several Central American nations and the U.S.

M16 Commando

The M16 Commando is an even shorter version of the M16, with a barrel just half the length of the original. Like the Carbine, just above, it has a telescoping stock, and its features and functions are identical to the M16A1. The Commando looks just like its larger brethren, pictured opposite, except that the barrel ends just past the forward sight post.

Caliber:	5.56mm
Length:	79cm, 71 (folded)
Weight:	3.0kg
Magazine:	30 (20 available)

FN Herstal

FN Herstal SA, Belgium

FAL

***also* L1A1**

Caliber:	7.62mm
Length:	104cm
Weight:	4.8kg
Magazine:	20

Introduced in 1950, the FAL (Fusil Automatique Léger) is one of the most popular assault rifles ever developed, and certainly the most popular 7.62mm rifle. It is a well-designed gas-operated weapon that uses an unusual tilting-breech mechanism. The cocking handle is on the left side (most assault rifles have it on the right or top), allowing the user to keep his or her firing hand on the pistol grip when the weapon is charged. The FAL is generally found without the capability for automatic fire, and although it can be modified to allow it, does not handle well when fired automatically.

The FAL is or has been in service with the armies of over eighty nations, including most NATO members. A version called the L1A1 was made in the UK, and is functionally identical despite some minor differences in appearance and construction.

FNC

Caliber:	5.56mm
Length:	100cm, 77 (folded)
Weight:	4.2kg
Magazine:	30

Throughout the 1970s, FN experimented with several designs for an assault rifle firing the 5.56mm cartridge. An early version of the FNC was introduced in the late 70s, although the weapon did not enter production until 1982. A gas-operated weapon with a mechanism similar to that of the FAL, the FNC is a sturdy if unremarkable weapon. It has a folding stock. The FNC is in service with the Swedish and Belgian armies, as well as several Southeast-Asian countries.

GIAT

Groupement Industriel des Armements Terrestres, France

FA-MAS

***also* FA-MAS Commando**

Caliber:	5.56mm
Length:	76cm, 68 (Commando)
Weight:	3.9kg
Magazine:	25

Introduced in the early 1980s, the FA-MAS is an unusual-looking assault rifle. Its bullpup layout makes it quite compact without sacrificing accuracy—while its barrel is only marginally shorter than that of the M16, it is a full quarter-meter shorter. It is a blowback-operated weapon—unusual for an assault rifle, most of which are gas-operated. Single-shot and full-auto settings are standard, although the MAS can easily be modified to fire three round bursts. The weapon features a bipod, a long carrying handle that contains its iron sights, and a reversible ejection port that prevents brass from flying into the face of left-handed firers. The FA-MAS is in service with the French army, and has been sold to several nations in Africa and the Middle East.

The Commando version is identical to the standard FA-MAS, but has a slightly shorter barrel.

HECKLER & KOCH

Heckler & Koch GmbH, Germany

G3A3

***also* G3A4, G3K**

Caliber:	7.62mm
Length:	102cm, 84 (folded), 90 (G3K), 72 (folded)
Weight:	4.8kg
Magazine:	20

Introduced in 1959, the G3 is a gas-operated weapon firing the 7.62mm round. It was the first HK weapon to use the roller-locked breech mechanism, which it borrowed from a CETME design of the early 1950s (see the CETME rifles, covered above). Although made largely of easily-constructed components, the G3 is a very robust and reliable weapon. Several variants have appeared, with the A3 version being most common. The A4 has a collapsible stock, and the G3K is shortened even further with a cut-down barrel. Other variants had minor design differences, and appeared in small numbers.

G11

Caliber:	4.73mm Caseless
Length:	75cm
Weight:	4.2kg
Magazine:	50

With a design dating back to the late 1960s, the G11 is perhaps the most unusual assault weapon around. It arose from an attempt to develop a weapon with a very accurate three-round burst. Heckler & Koch designers decided that the best way to avoid muzzle climb was to have such a high rate of fire that recoil would not affect aim until all three rounds had already left the weapon. This idea led to experimentation with caseless ammunition, since the extraction process is a major restriction on a weapon's maximum rate of fire.

After twenty years and fifteen prototypes, the G11 has finished its development cycle. It has a totally unique bolt that contains the chamber. It rotates up to be loaded from a top-mounted magazine, then rotates back down so the loaded chamber faces into the barrel. The weapon is recoil-operated, with the entire mechanism moving backwards within the outer body of the weapon. It returns forward between each shot when fired on automatic or single-shot, but when fired on three round burst it continues backwards, not reaching the end of the receiver until all three rounds are clear. In this way the original design goals have been met—since no recoil is felt until the entire burst has been fired, all three rounds hit with equal accuracy. The rate of fire for three round bursts is so high that it sounds like a single, loud shot. Sustained automatic fire is at a much lower rate.

The G11 fires a caseless round specially designed for the weapon. It is comparable in power to the 5.56mm round, but much more compact. The bullet is embedded within the solid propellant, and the round is square in cross-section, so it looks like a small brick. This compact design and the round's light weight allow for a large magazine capacity, and the lack of a casing means that no ejection port is necessary, so there is no place for dirt to easily enter the weapon.

With a bullpup layout, the G11 is short, thick, and light. It is easy to operate, and features a 1x optical sight in a carrying handle. It was to have entered service with the German army in 1990, but the acquisition program was put on hold for reasons unrelated to the design. Nevertheless, a weapon with such an innovative and successful design is certain to find a market, and the G11 may enter full production in the near future.

G33E

***also* G33K**

Caliber:	5.56mm
Length:	94cm, 74 (folded)
	87 (G33K), 68 (folded)
Weight:	4.3kg, 4.2 (G33K)
Magazine:	25

The G33E is a 5.56mm assault rifle based closely upon the G3. In fact, many of its parts, including the trigger mechanism and bolt, are interchangeable with the latter. Normally made with single-shot and full automatic fire options, the G33E can be modified to allow a three round burst. It is available with a fixed or collapsible stock. The G33K is a shortened version, with a collapsible stock and cut-down barrel.

G41E

***also* G41K**

Caliber:	5.56mm
Length:	100cm, 81 (folded) 93 (G41K), 74 (folded)
Weight:	4.7kg, 4.6 (G41K)
Magazine:	30

In 1987 HK introduced its second 5.56mm assault rifle, the G41. Based on the G33, above, it has been modernized and differs in dimensions. In addition to a number of superficial and minor mechanical changes, the G41 offers a standard three round burst as well as single shot and full automatic fire, and an optical sight mount that easily accepts most scopes and night-vision devices. It is available with a fixed or collapsing stock, and in a shortened-barrel version, the G41K.

IMI

Israel Military Industries Ltd., Israel

Galil ARM

***also* Galil SAR**

Caliber:	5.56mm
Length:	95cm, 74 (folded), 84 (SAR), 61 (folded)
Weight:	4.8kg, 4.2 (SAR)
Magazine:	35 (50 available)

The Galil dates to the late 1960s, and is a design with its roots in the Soviet AK rifles. It is gas-operated, with a rotating-bolt mechanism that fires from the closed position. It features a folding metal stock (a fixed stock is available) and a bipod that doubles as a wire cutter. The SAR is a shortened version with a cut-down barrel. It is otherwise identical.

RSAF

Royal Small Arms Factory, Nottingham, UK

L85A1

***also* SA80**

Caliber:	5.56mm
Length:	78cm
Weight:	5.3kg
Magazine:	30

The design of the L85A1 (sometimes referred to as the SA80) goes back to the 1970s, but it did not complete development until 1985, when it entered service with the British army. It is a bullpup weapon, gas-operated and firing from a closed bolt. It features a 4x optical sight (see the SUSAT in the Sighting Devices section), as well as fold-down iron sights for emergency use. Despite a number of very good ideas in the design, early weapons suffered from manufacturing and design flaws, and the weapon has gained a bad reputation. It remains to be seen whether a number of changes to the manufacturing process will rectify the problems.

RUSSIAN STATE ARSENALS

State arsenals of Russia and the former U.S.S.R.

AKM

also AKMS, AK-47, AKS-47

Caliber:	7.62x39mm Russian
Length:	88cm, 65 (folded)
Weight:	4.8kg
Magazine:	30

The AK family of weapons is one of the most popular and highly-distributed in the world, with versions and variants in every ex-Soviet client state and many non-aligned nations as well. This is not without reason—the AK is well-built and very reliable. It is a gas-operated weapon that fires from the closed bolt position. Not without its faults, the AK must be charged every time it is reloaded (most weapons hold the bolt open when the magazine runs empty, so the user need only hit the bolt release and it will close, leaving the weapon cocked). It is also not very accurate at long range, despite its heavy bullet. The AKM is the most current variant. It is a little less expensive to manufacture than the AK-47, and has some minor design differences as well. Both weapons are offered in an "S" version, which has a folding stock that swings under the weapon. A number of AK-47 knock-offs are made around the world, many with different names or designations.

AK-74

also AKS-74

Caliber:	5.45x40mm Russian
Length:	93cm, 70 (folded)
Weight:	4.0kg
Magazine:	30

Introduced in the late 1970s, the AK-74 is the culmination of many years of experimentation by the Soviets in a small-caliber assault weapon. The AK-74 is essentially an AKM (above) rechambered for the Soviet 5.45 round (not the same as the pistol round in the same caliber), and it functions identically. Minor changes include a muzzle brake that reduces recoil and muzzle climb on automatic fire. The AK-74 replaced the AKM in the Soviet army and that of several Warsaw Pact nations. The AKS-74 has a skeletal stock that folds to the left.

SIG

SIG Swiss Industrial Company, Switzerland

SG 540

Caliber:	5.56mm
Length:	95cm
Weight:	3.6kg
Magazine:	30 (20 available)

The SIG SG 540 is an inexpensive 5.56mm assault rifle designed and built for export. It has few remarkable features, being gas operated and firing from a closed bolt. It is normally shipped with single-shot and full-auto capabilities, but can easily be modified to allow three round bursts as well. A bipod is available. The SG 540 is in service with fifteen or so nations in Africa, South America, and the Middle East.

SG 550

***also* SG 551**

Caliber:	5.56mm
Length:	100cm, 77 (folded), 83 (551), 60 (folded)
Weight:	4.5kg, 3.9 (551)
Magazine:	30 (20 available)

Designed specifically for the Swiss army and originally introduced in 1979, the SG 550 did not enter production or service until 1986. A 5.56mm assault rifle of conventional gas-operated design, the 550 has a number of unique features. The skeletal butt folds to the side, without unduly disturbing the balance of the weapon. Magazines are made of translucent plastic to allow the user to easily see how much ammunition is available, and they can be snapped together side-by-side for easy access when reloading. Selective fire allows single-shots, three round bursts, and full automatic fire. An integral mount easily accepts most scopes.

The SG 551 is a shorter version of the same weapon. It is functionally the same, and has the same features.

STEYR

Steyr-Mannlicher GesmbH, Austria

AUG

also AUG Carbine

Caliber:	5.56mm
Length:	79cm, 69 (Carbine)
Weight:	4.0kg
Magazine:	30 (42 available)

An unusual and exotic-looking weapon, the AUG (Armee Universal Gewehr) is a bullpup assault rifle firing the 5.56mm round. It is ergonomically designed, and has modular components allowing it to be converted to a light machinegun, a submachinegun, and a shorter carbine version, by simply changing barrels and breech mechanisms. All of the AUG weapons are covered in this text.

The AUG is gas-operated, using a rotating bolt and firing from the closed position. Fire selection is controlled by a two-stage trigger, and the weapon can be set by an internal switch to fire either three round bursts or full automatic fire (but not both), in addition to single shots. The safety and charging handle are ambidextrous, and the ejection port can easily be moved from one side to the other, making the AUG one of only two or three truly ambidextrous assault rifles around. Normally fitted with an integral 1.4x optical sight, the receiver can be replaced with one that exchanges the sight for a mounting bracket that will take custom sights or night-vision devices. The magazine is transparent, so the user can check his or her ammunition at a glance, and the forward grip folds up.

The AUG Carbine is a shortened version, differing only in barrel length. Despite its unusual appearance, the AUG is a very successful weapon. It entered service with the Austrian army in 1977, and has since been adopted by Australia, Ireland, New Zealand, and a number of other nations in Africa and the Middle East.

RIFLES

CHAPTER FOUR

RIFLES

The concept of the sniper—a sharpshooter who can take well-aimed shots at specific, high-value targets—is not new, but the use of specialized weapons for sniping is. Until very recently, sniping rifles were simply standard military weapons that, for one reason or another, proved to be unusually accurate, and which were fitted with scopes or other special sights. On a few occasions, precision sporting or match rifles were modified to accept the rigors of military use. Many sniper rifles in use today are modifications of existing military or civilian weapons, but the advent of purpose-built sniping rifles in the last couple of decades has broadened the field of weapons available to the professional. Additionally, the role of the sniper has changed and grown in conventional military operations, and has become important to law-enforcement as well.

Sniping rifles have three areas of application. Two are military: the use of sniping attacks against personnel (the oldest and best-known function of the sniper); and against equipment (a newer application, brought on by the advent of very high-powered rifles firing the .50in Browning or even larger rounds). The third is a law-enforcement application: the use of snipers in counter-terrorist, hostage-rescue, and other special operations. Law-enforcement sniping differs from the military activity in that the sniper usually has a great deal of time to prepare for a shot, is generally not at extreme range, and rarely requires much mobility or time in the field before or after the shot. On the other hand, the law-enforcement sniper must be very selective about his or her target (hostages are often involved), and must exercise a great deal of discipline. A first-shot kill can be critical to a larger operation. Consequently, law-enforcement sniping rifles must be as precise as possible, at least at short and medium ranges. They can often be adjusted by the user in numerous ways for comfort and accuracy. Military rifles, on the other hand, must be precise at longer ranges, but can sacrifice some precision (and customizing features) for durability and utility in the field.

Anti-material sniping rifles differ from both in that the target is often well-protected and difficult to damage. As a result, anti-material rifles must provide extreme power and range in a portable package, while fitting the same criteria as military anti-personnel rifles for durability and accuracy.

For a long time it was generally believed that true accuracy could only be achieved in a bolt-action weapon. This belief has some basis in logic—any movement or mechanical action by the bolt can conceivably affect a weapon's stability before the bullet has time to clear the barrel. As a result, many of the world's most accurate weapons continue to be bolt-action. But bolt-action weapons are slow and difficult to use, and generally require the user to take his or her eye and firing hand away from the firing position between shots. Recently, some excellent semi-automatic weapons, mostly out of Germany and Switzerland, have challenged the supremacy of the bolt-action design. Furthermore, the increased interest in very large-caliber anti-material weapons has fuelled the use of semi-automatic designs. These weapons have a great deal of natural recoil, much of which can be absorbed by the bolt mechanism. Bolt-action weapons have no mechanical action or buffer to protect the firer from their recoil. Semi-automatic and bolt-action rifles are both in common use today.

Changes to weapon design have not been limited to the creation of larger, more powerful rifles or the growing acceptance of semi-automatic operation. A whole new design philosophy has come about in recent years, with the principle goal of preventing any physical contact with the weapon from affecting the aim of the precision barrel. Even a moderate amount of pressure on a rifle's barrel can warp it ever so slightly, and even the slightest distortion can have a significant effect at long range. So many rifles made today feature "free-floating" barrels—the barrel only contacts the rest of the weapon at the breach end. All handguards, bipods, and other furniture are connected to the receiver, making no direct contact against the barrel. In this manner, distortions in the receiver (caused, for example, by the weight of the rifle resting on the bipod) do not affect the barrel. Another application of this design philosophy is the use of a "skeleton," either an external frame or an internal backbone. The skeleton keeps the weapon extremely rigid, preventing distortions in the receiver or furniture from affecting the barrel.

ACCURACY INTERNATIONAL

Accuracy International, UK

AI Covert

Caliber:	7.62mm subsonic
Length:	125cm
Weight:	6.7kg
Magazine:	10

The Covert is a suppressed version of the PM (below), which can be broken down for easy transportation and concealment. It will suppress standard ammunition, but requires subsonic ammunition for truly silent operation. A 6x, 10x, or 12x scope is supplied with the weapon, although others can be fitted easily. The Covert comes with a normal-looking medium-sized suitcase, into which it fits nicely when broken down.

AI PM Counter-terrorist

***also* L96A1**

Caliber:	7.62mm
Length:	112cm
Weight:	6.7kg
Magazine:	10

This weapon was designed from the ground up as a sniping rifle that would provide first-hit accuracy at extreme range, under extreme conditions. A bolt-action weapon, the PM entered service with the British army in 1986 as the L96A1, with a few modifications.

All of the PM's components are fixed to a rigid aluminum frame beneath the plastic stock, and the stock does not contact the barrel. This prevents any flexing of the stock from affecting aim. The bolt-action has a short follow, so the firer does not have to take his or her eye away from the scope while working the bolt. The weapon is fitted with a forward bipod, and a monopod under the butt, so the firer does not have to support it for long periods of time. A 12x scope is standard, although it can be replaced easily.

The L96A1 is essentially the same, but has iron sights, no monopod, and is fitted with a 6x scope.

BARRETT

Barrett Firearms Manufacturing Co.,USA

M82A1 Light Fifty

Caliber:	.50in Browning
Length:	145cm
Weight:	15.9kg
Magazine:	11

While at over fifteen kilos the Light Fifty may seem anything but light, it is well under half the weight of the M2HB machinegun, which until recently was the only major infantry weapon to fire the .50in Browning round. The M82A1 is a simple, rugged weapon that works much like a recoil-operated pistol. On firing, the barrel and bolt are both blown back until the round has cleared the weapon, whereupon the barrel stops and the bolt keeps moving to complete the cocking and loading cycle.

The Light Fifty is fitted with a muzzle brake and thick butt pad to protect the firer from the .50in round's powerful recoil. It comes with a bipod and 10x scope, and fold-up iron sights as a backup. The Light Fifty is in service with U.S. and other special forces.

M82A2

Caliber:	.50in Browning
Length:	141cm
Weight:	13.5kg
Magazine:	11

The M82A2 is a bullpup version of the A1, with the pistol grip placed forward of the magazine and the brace for the firer's shoulder moved up against the back of the magazine well. While the A2 is only slightly shorter than the original, the portion of the weapon that sticks out in front of the firer is considerably less, making it much more practical in even slightly restricting spaces. The A2 is functionally the same as the A1, and is fitted with the same features, minus the iron sights and bipod. In place of the latter is a forward pistol grip, allowing the firer to hold the rifle like a bazooka.

M90

Caliber:	.50in Browning
Length:	114cm
Weight:	10.6kg
Magazine:	5

The M90 is a smaller, lighter version of the M82, and is bolt-action. Because there is no semi-automatic mechanism to absorb recoil, the M90 is fitted with a muzzle brake that would look at home on a tank. It has no iron sights, but is equipped with a mount that will take almost any scope.

BERETTA

Armi Beretta SpA, Italy

Sniper

Caliber:	7.62mm
Length:	117cm
Weight:	5.7kg
Magazine:	5

The Beretta Sniper is a conventionally-designed bolt-action weapon with a wooden stock. Its barrel is free-floating, meaning that it does not contact the foreguard, so its aim cannot be affected by stress on the weapon's furniture. The Sniper is fitted with a flash suppressor/muzzle brake, a removable bipod, an adjustable cheek-piece and butt, and match-quality iron sights. A 1.5x - 6x zoom scope is available as an option, although the Sniper will easily mount almost any scope.

GIAT

Groupement Industriel des Armements Terrestres, France

FR-F2

***also* FR-F1**

Caliber:	7.62mm
Length:	114cm
Weight:	5.4kg
Magazine:	10

Introduced in 1984, the FR-F2 is a recent revision of the FR-F1, a sniping rifle that entered service with the French army and GIGN in the mid '60s. A match rifle design modified to meet military requirements, the FR-F2 is a bolt-action weapon featuring adjustable cheek and butt plates, a bipod, fold-down iron sights, and an adjustable trigger pull. It has an unusual plastic sleeve over the barrel to regulate barrel heat. A 4x scope is standard, although almost any scope can be fitted.

The older FR-F1 is essentially the same. It lacks the plastic barrel sleeve, and the bipod is less convenient. The scope mount is different, making the fitting of non-standard scopes more difficult. Remaining differences are superficial. Some FR-F1s chambering the now obsolete 7.5mm round were made.

GRENDEL

Grendel, Inc., USA

SRT

Caliber:	7.62mm
Length:	104cm, 76 (folded)
Weight:	3.2kg
Magazine:	9

The Grendel is a bolt-action 7.62mm rifle designed to be as light and portable as a 5.56mm. The barrel is thick, but fluted to save weight, and a muzzle brake is fitted to reduce felt recoil. There is an integral bipod. The stock is made of a lightweight plastic reinforced with glass fibre. The butt is hollow and open underneath, and folds under the weapon, enclosing the trigger guard and magazine. The Grendel has no integral sights, but will easily mount most scopes.

HECKLER & KOCH

Heckler & Koch GmbH, Germany

G3 SG/1

Caliber:	7.62mm
Length:	102cm
Weight:	6.0kg
Magazine:	20

The G3 SG/1 is simply an exceptionally accurate G3 assault rifle with a few improvements. During the G3 manufacturing process, weapons are tested for function and accuracy. Those that, for whatever reason, test above a certain threshold are set aside for conversion into the SG/1. An adjustable trigger is fitted, and a 1.5x - 6x zoom sight is supplied. All other features of the G3 (covered under Assault Rifles) are retained, and there is no functional difference between the SG/1 version and the original—in fact, the SG/1 can fire on full automatic. The G3 SG/1 is used by many German police forces.

The G3 SG/1 looks like the G3A3, pictured in the Assault Rifle section.

MSG 90

Caliber:	7.62mm
Length:	117cm
Weight:	6.5kg
Magazine:	5 (20 available)

Introduced in 1987, the MSG 90 is a purpose-built sniper rifle based on the roller-locked bolt design of the G3 and other Heckler & Koch weapons. A semi-automatic rifle, it was designed specifically for military applications. It has no iron sights, but features a 12x scope, an attachment point for a bipod, and adjustable butt, cheek-rest, and trigger. The scope can be removed and almost any other will mount easily.

PSG 1

Caliber:	7.62mm
Length:	121cm
Weight:	8.1kg
Magazine:	0 (5, 20 available)

The PSG 1 is a semi-automatic sniper rifle designed for police and covert operations use. It has a unique mechanism for silently closing the bolt, and is normally a single-shot weapon. It can be modified to accept a five- or twenty-round magazine, although loading from a magazine compromises its silent mechanical operation. The PSG 1 features an adjustable butt, cheek rest, and trigger. It has no iron sights, but comes with an integral 6x scope. It is a very accurate weapon.

IMI

Israel Military Industries, Ltd., Israel

Galil Sniper

Caliber:	7.62mm
Length:	112cm, 84 (folded)
Weight:	6.9kg
Magazine:	20

Based on the design of the Galil assault rifles, the Galil Sniper is a semi-automatic rifle firing the 7.62mm round. It has the same basic features found on the Galil ARs, but with a few modifications. The barrel is heavier and more accurate, and the weapon comes with an attached folding bipod. Standard iron sights are fitted, but there is also a scope mount on the left side, which doesn't interfere with the iron sights. A 6x scope is provided, but almost any other will fit easily. The Galil features an adjustable cheek rest and butt, and the buttstock folds for compact storage and transport. Unlike its assault rifle brethren, it has no automatic fire setting.

LEI

Law Enforcement International Ltd., UK

DeLisle Mark 3

Caliber:	.45in ACP
Length:	96cm
Weight:	3.8kg
Magazine:	4

The LEI DeLisle is based on a silent weapon used during the Second World War. It fires the .45in ACP round, ideally suited for silent firing due to its very low velocity. A bolt-action weapon, the Mark 3 is exceptionally quiet, producing only the noise of a the firing pin striking the primer. An unusual feature of the Mark 3 is its magazine, which collects the spent shell casings in a compartment behind the live rounds. The Mark 3's silencer lasts indefinitely and needs little maintenance.

DeLisle Mark 4

The DeLisle Mark 4, despite its name, owes little to the design of the Mark 3 or the wartime weapon that spawned it. It is a bolt-action rifle based on the Remington 700 (covered below), firing the 7.62 round. Using sub-sonic ammunition, it is almost entirely silent, but the designers decided not to sacrifice accuracy, and the weapon does little but suppress full-powered ammunition. The silencer is maintenance-free, and lasts indefinitely.

Caliber:	7.62mm subsonic
Length:	120cm
Weight:	4.5kg
Magazine:	4

PARKER-HALE

Parker-Hale Ltd., UK

Model 85

***also* Model 85 silenced**

The Parker-Hale Model 85 is a rugged purpose-built bolt-action sniping rifle. It features an adjustable butt and trigger pull, a pivoting bipod, and iron sights for emergency use. It does not come with a scope, but has an integral mount that will take almost any optical sight. The lightweight stock is made of fiberglass, and is available in camouflage patterns. A suppressor is also available, which silences subsonic ammunition and mutes standard rounds. Parker-Hale ceased production of the Model 85 in 1990, and the design was sold to Navy Arms in the U.S. The Model 85 is in service with the British army.

Caliber:	7.62mm
	7.62 subsonic (silenced)
Length:	121cm
Weight:	5.9kg
Magazine:	10

REMINGTON

Remington Arms Co., USA

M24

Introduced in 1988, the M24 is the newest sniping rifle to enter service with the U.S. army, and will eventually replace the M21 (below), which is currently in use with most units. It is a bolt-action weapon, based on Remington's Model 700 and a special trigger mechanism designed for custom match rifles. The stock is made of a Kevlar composite. The M24 features an adjustable butt, an attachable bipod, and a 10x scope. No iron sights are fitted, but almost any other scope can be used.

Caliber:	7.62mm
Length:	110cm
Weight:	6.5kg
Magazine:	6

Model 700

***also* M700**

Caliber:	5.56mm, 7.62mm
Length:	108cm
Weight:	3.3kg
Magazine:	6, 5 (7.62mm)

The Remington Model 700 was a very advanced sporting rifle when it was introduced in 1948, and it is still a popular weapon. It is a bolt-action rifle with a reputation for durability, accuracy, and ease of use. Only two calibers are covered here, but the Model 700 has been made in versions firing virtually every popular rifle round available. There are also variants with slightly longer or shorter barrels.

The M700 is a version used as a sniping rifle by the U.S. Marine Corps. It is essentially the same as the civilian model.

RUGER

Sturm, Ruger, & Co. Inc., USA

Mini-14

Caliber:	5.56mm
Length:	95cm
Weight:	3.0kg
Magazine:	10 (5, 20, 30 available)

Introduced in 1973, the Mini-14 is a scaled-down weapon that has its evolutionary roots in the U.S. army's M14 and M1 service rifles. It is a gas-operated rifle firing the 5.56mm cartridge. An enormously popular commercial and police rifle, the Mini-14 has spawned a number of variants and knock-offs.

RUSSIAN STATE ARSENALS

State Arsenals of Russia and the former U.S.S.R.

Druganov SVD

Caliber:	7.62x54mm Russian
Length:	123cm
Weight:	4.5kg
Magazine:	10

First seen in the early 1960s, the Druganov SVD is a gas-operated sniping rifle in service with the states of the former U.S.S.R. and Warsaw Pact. Although based on the AK assault rifles, the SVD was a new design from the ground up, and it has a reputation for extreme accuracy. It is fitted with a 4x scope that has limited passive IR capability, mounted on the left side of the weapon. Most other scopes will not fit on the weapon without some modification, but there are iron sights.

SIG

SIG Swiss Industrial Company, Switzerland

SSG 550

Developed from the SIG SG 550 assault rifle, the SSG 550 is a semi-automatic sniping weapon designed specifically for police use. Its mechanical design does not vary much from its assault rifle namesake, although it features a carefully crafted heavy barrel. It also has a fully adjustable grip and stock, allowing the user to alter the butt, cheek rest, angle of the pistol grip, and a hand rest on the grip to his or her preference. No iron sights are fitted, but almost any optical sight can be easily mounted.

Caliber:	5.56mm
Length:	113cm
Weight:	7.3kg
Magazine:	20 (30 available)

SPRINGFIELD

Springfield Armory Inc., USA

M21

Basically a modified version of the obsolete M14 rifle, the M21 is the U.S. army's current assault rifle, pending deployment of the M24 (above). Although no different in design from the M14, the M21 is crafted of superior materials and to higher tolerances. The result is an accurate, rugged combat sniping weapon. It is issued with a very good 3 - 9x zoom scope, but has iron sights as well and will take any other optical sight easily.

Caliber:	7.62mm
Length:	112cm
Weight:	4.4kg
Magazine:	20

STEYR

Steyr-Mannlicher GesmbH, Austria

AMR

Caliber:	15mm
Length:	200cm
Weight:	20kg
Magazine:	5 (8 available)

Designed for use against equipment rather that personnel, the AMR (Anti-Material Rifle) is a very heavy sniping weapon firing a new 15mm round. Bullpup in layout, the AMR is a semi-automatic weapon with a heavy muzzle brake and buffer, giving it the felt recoil of a powerful sporting rifle despite its massive round. It features a bipod and a rear monopod (so the firer doesn't have to support the weapon's weight for extended periods), and a large optical sight. The 15mm round, developed specifically for this weapon, fires a fin-stabilized flechette made of tungsten, and offers exceptional range. The AMR can be quickly broken down to be carried by two personnel.

SSG 69

***also* SSG-P, SSG-P Silenced**

Caliber:	7.62mm, 7.62 subsonic (Silenced)
Length:	114cm
Weight:	4.7kg, 5.0 (SSG-P)
Magazine:	5 (10 available)

Introduced in 1969, the SSG 69 is the Austrian army's sniping rifle. A bolt-action weapon, the SSG 69 is extremely accurate. It features a plastic stock with an adjustable-length butt, adjustable trigger pull, and a rotary magazine with a clear plastic end so the user can quickly check his or her ammunition status. The rotary magazine fits cleanly into the stock, with no protrusions, but there is a larger box magazine available that does not. Iron sights are fitted, but the weapon comes with 6x scope, and almost any other optical sight can be easily mounted.

The SSG-P variant is a modified version designed for police use. It has a heavier, higher-quality barrel, and no iron sights. There are a number of superficial changes as well, but the weapon is functionally identical.

Another variant is the SSG-P Silenced. This weapon comes with a large suppressor that effectively silences sub-sonic ammunition. The suppressor cannot be made to fit the other versions of the SSG, as extensive modifications to the barrel must be made.

TECHNIKA

Technika, Hungary

Destroyer

The Technika Destroyer is a recoil-operated semi-automatic sniper rifle designed specifically for military special operations. A version of a Soviet weapon, it is being marketed to the west, but the fact that it fires the uncommon Russian 12.7mm round is a limit to its popularity. Nevertheless, the Destroyer is a very accurate weapon. It comes with a 3x scope, and a bipod and large muzzle brake are standard. A custom mount is required before any other scope can be fitted.

Caliber:	12.7x107mm Russian
Length:	150cm
Weight:	17kg
Magazine:	10

Top Gun

The Top Gun is a bolt-action weapon firing the Russian 12.7mm round. Like the Destroyer, it is an ex-Soviet military design. The Top Gun is unique in that the pistol grip is attached to the bolt, and both are removed from the bottom of the weapon in order to load a round. While this may seem awkward, it actually makes for a fairly smooth action—after firing, the user simply pulls down on the pistol grip, loads a round with his or her non-firing hand, then replaces the grip and bolt, never taking the firing hand off the pistol grip. Like the Destroyer, the Top Gun comes with a bipod, a large muzzle brake, and a 3x scope. It dismantles quickly for easy transport.

Caliber:	12.7x107mm Russian
Length:	135cm
Weight:	12kg
Magazine:	0

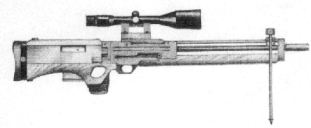
WALTHER

Carl Walther Waffenfabrik, Germany

WA-2000

Introduced in the early '80s, the WA-2000 is an unusual weapon, purpose-built as a sniper rifle. Designed with input from counter-terrorist units, the WA-2000 is a semi-automatic bullpup rifle. It has a pair of rails above and below the barrel, and comes with a folding bipod that mounts on the top rail, and can be moved along the rail for optimal positioning. A large muzzle brake greatly reduces the recoil, keeping the weapon on target for additional shots. The WA-2000 easily mounts most scopes and electro-optical sights.

Caliber:	7.62mm
Length:	91cm
Weight:	8.3kg
Magazine:	6



SHOTGUNS

CHAPTER FIVE

SHOTGUNS

In the days of the American frontier, the weapons available to the law enforcement officer were often limited by what was on hand. This probably accounts for the historical popularity of shotguns among American police agencies—a popularity that until recently has not extended beyond U.S. borders. Shotguns are common hunting and sporting weapons in the U.S., Europe, and elsewhere, but it is only in America that their police and military application has any history.

Despite the widespread use of shotguns in American law enforcement and military organizations, up until recently almost all weapons made were variants of commercial models. In the 1970s, however, interest in the shotgun as a riot control and police weapon grew in Europe and abroad, and weapons purpose-built for police use began to appear. Even more recently, the shotgun has been seriously considered as a close-in assault weapon, and a number of automatic shotguns have been developed. Most have gone no further than the prototype stage, but several have real potential to find sales and applications. Meanwhile, the trend among American law enforcement agencies has gone away from shotguns—while they are still very common weapons, many federal agencies have turned to submachineguns for high-volume, close-in fire.

The shotgun is a unique class of weapons, with definite advantages and equally definite disadvantages. They are enormously powerful weapons. With large bores and low muzzle velocities, they can fire a dizzying array of ammunition. They can spray shot over a wide area, making precise aim less important, and they often have a psychological effect as powerful as their physical potential. On the other hand, shotguns are not much good at longer ranges, where the velocity of their projectiles drops off quickly. They have a heavy recoil compared to weapons of similar firepower. The diversity of ammunition types and common practice of making ammunition with plastic or paper casing leads to problems with feed mechanisms and hot chambers. And the pump-action design of most shotguns is awkward in combat situations.

12-gauge shotgun shells are almost 19mm across, and are typically 70mm long, although several lengths are common. That's twice as wide and three times as long as a 9mm Parabellum round, so it's no wonder that shotguns are as powerful as they are. A typical OO-buckshot round (the most common round for combat applications) fires nine pellets, each with about the same energy as a .32in ACP bullet. These pellets spread out over distance. Within a few meters,

they remain close enough together to hit almost like a single projectile. By the time they've travelled fifty meters, however, they've spread out to a pattern about a meter wide. Accuracy, therefore, is less than critical—a shotgun firer can quickly point and shoot, and still have a good chance of one or more pellets hitting. The actual amount of spread varies according to the length of the weapon's barrel (shorter barrels spread faster), and with "choke," the amount of restriction at the end of the barrel. Open-choke weapons have no barrel restriction. Full-choke weapons reduce the diameter of the barrel right at the end, causing the shot to spread much faster. Some weapons have special chokes, or "shot diverters," that cause the shot to spread in rectangular or oval-shaped patterns. On most weapons, choke can be changed by unscrewing and replacing the diverter on the end of the weapon.

While there can be no doubt that shotguns offer great advantages in short-range tactical situations, they have their downside as well. Shotguns are heavy, and have powerful recoils, although they are not as hard to control as often portrayed. Spherical pellets lack the spin-stabilization of conventional bullets, so they lose velocity and power beyond 100 or so meters. Pump-action weapons are difficult to work in tight spaces, or when prone, and they require two hands. The internal magazines found in all pump-action and most semi-automatic shotguns are slow to load and unload. Semi-automatic shotguns are prone to feed problems, because the many different types of shotgun rounds don't always produce the excess energy needed to power the action, and the large, blunt cartridges don't load easily. Automatic shotguns face not just feed problems, but also heat build-up in the chamber, which can melt the plastic shell casings of the rounds.

Shotgun calibers are measured in a system of gauges, in which larger numbers indicate smaller diameter. These days, shotguns are made in 10, 12, and 20-gauge, with the overwhelming majority of police and combat shotguns being 12-gauge. Shotgun rounds come in several lengths, and not all weapons will accept all lengths. In addition, a bewildering array of ammunition types are made, firing a wide range of projectiles. Shotguns with built-in chokes have difficulty with some types of rounds, as do semi-automatic shotguns.

Most commercial and police shotguns are pump-action, with the user pulling quickly back on the handguard or fore-end to load a round from the internal magazine. The magazine itself is a tube, with the rounds contained end-to-end within, and is generally loaded through a spring-loaded door underneath. Semi-automatic and automatic shotguns are usually gas-operated.

BENELLI

Benelli Armi SpA, Italy

121 M1

Caliber:	12ga 70mm
Length:	99cm
Weight:	3.8kg
Magazine:	7

The 121 M1 is a semi-automatic shotgun based on a recoil-operated design unique to Benelli. The design allows a very fast action despite simple construction, making the 121 M1 sturdy and reliable as well as quick and easy to operate. It is in service with the British SAS, among other military and law-enforcement agencies.

M1 Super 90

Caliber:	12ga 65, 70, 76mm
Length:	104cm
Weight:	3.8kg
Magazine:	6 - 7 (dep. on length)

A semi-automatic shotgun, the M1 Super 90 is based on the mechanism of the 121 M1, above, but is an entirely new design. It has the same recoil operation, but is constructed of modern materials for weight savings and strength. Loading is quick and easy, and like the 121 the action is very fast. The M1 Super 90 is a well-built, reliable weapon.

BERETTA

Armi Beretta SpA, Italy

1201 FP3

Caliber:	12ga 70, 76mm
Length:	105cm
Weight:	3.2kg
Magazine:	5-6 (dep. on length)

The Beretta 1201 FP3 is a high-quality semi-automatic shotgun designed for police work. It is recoil-operated, with a conventional design and layout. It comes finished in matte black, with all metal parts coated in Beretta's protective "Bruniton."

M3P

Caliber:	12ga 70mm
Length:	115cm, 94 (folded)
Weight:	3.8kg
Magazine:	5

The M3P was specifically designed for police and security work, and offers the advantages of both semi-automatic fire and pump-action. Pump-action allows varying types of ammunition to be used without mechanical difficulties, including low-energy riot ammo. By twisting a ring at the front of the fore-end, the weapon is switched to semi-automatic fire, which is considerably faster. Although available with a fixed plastic stock, the M3P is normally fitted with a tubular stock that folds over the top of the weapon, to form a carrying handle. The M3P is one of only a few shotguns that feeds from a box magazine, allowing quick reloading and the ability to change ammunition types instantly.

RS202-M2

***also* RS202-M1, RS200P**

Caliber:	12ga
Length:	103cm
Weight:	3.3kg
Magazine:	5 - 6 (dep. on length)

Another weapon designed for police and security applications, the RS202-M2 is a robust pump-action shotgun. A simple design, it is easy to operate and maintain, and its internal magazine reloads relatively quickly. It fires any length cartridge and all types of ammunition.

The RS202-M1 is identical in operation, but lacks the perforated barrel shroud. It features fully adjustable sights. Both the M1 and M2 are spin-offs from an older model, the RS200P. A much more conventional weapon in appearance, the RS200P operates identically to the later models, differing only in having a slower loading mechanism and wooden furniture.

BERNARDELLI

Bernardelli SpA, Italy

B4

***also* B4/B**

Caliber:	12ga 70mm
Length:	95cm, 73 (folded)
Weight:	3.7kg, 3.3 (B4/B)
Magazine:	5 (3, 8 available)

Designed for military and security use, the Bernardelli B4 is a tough, durable shotgun that offers pump-action and semi-automatic fire. It is gas-operated, using a rotating bolt mechanism similar to that found in many assault rifles. It will fire any type or power of ammunition, even on semi-automatic, but allows pump-action as a backup. A small lever toggles between semi- and pump-, and the B4 features a grip safety and a box magazine feed system. The stock folds to the side, and there is a carrying handle that doubles as the sight.

The B4/B is a pump-only version. It is otherwise identical to the B4, but lighter.

CIENER

Jonathan Arthur Ciener, USA

Ultimate

Caliber:	12ga 70mm
Length:	57cm
Weight:	2.9kg
Magazine:	5

The Ciener Ultimate is a unique weapon intended to give users of the M16 assault rifle a close-in fire alternative. A heavily-modified Remington Model 870 (covered below), the Ultimate attaches to the handguard and bayonet lug of the M16, giving the rifle a tandem short-barreled shotgun beneath the rifle barrel. It operates identically to the Remington 870, and is fired just like the M203 grenade launcher: by shouldering the M16 and using the magazine as the pistol grip. Having no grip or stock, use of the Ultimate while not attached to the rifle is difficult and dangerous.

The Ultimate looks just like the Remington 870 (pictured on page 118), but has no butt-stock.

DAEWOO

Daewoo Precision Industry, South Korea

USAS-12

Caliber:	12ga 61mm
Length:	100cm
Weight:	5.1kg
Magazine:	12 (28 available)

The USAS-12 is a gas-operated shotgun designed especially for military use. It is available with full-automatic capability, or as a semi-automatic-only weapon. With a design very much like an assault rifle, the USAS-12 is relatively easy to handle, and has very little recoil for a shotgun. It uses a detachable box magazine, and a larger drum is available. Although a large weapon, the USAS-12 is easy to operate and maintain. Unfortunately, the quality of manufacture is not consistent, and some weapons have an tendency to malfunction frequently.

FRANCHI

Luigi Franchi SpA, Italy

SPAS-12

Introduced in 1979, the Franchi SPAS-12 is one of the first shotguns to have been designed from the ground up as a police weapon. It is a gas-operated semi-automatic/pump-action weapon with a strong reputation for reliability and a number of excellent features. Its folding stock has a unique loop which, when folded out to the side, becomes a brace that makes it possible to hold and fire the weapon with one hand. The SPAS-12 fires all types of 70mm 12-guage ammunition, although light-weight or low-energy ammo will not reliably work the semi-automatic mechanism, requiring use of the pump-action.

Caliber:	12ga 70mm
Length:	93cm, 71 (folded)
Weight:	4.4kg
Magazine:	7

SPAS-15

***also* SPAS-15 MIL**

The SPAS-15 is an upgraded design based on that of the SPAS-12, above. It entered production in 1984, and has a number of mechanical and dimensional differences from its predecessor, as well as some ergonomic changes. The SPAS-15 has a short barrel, and features a folding stock and a carrying handle that doubles as a mount for most optical sights and night-vision scopes. It is fed by a removable box magazine. Like the SPAS-12, it is gas-operated, and switches between semi-automatic and pump action as needed.

The SPAS-15 MIL is a military version designed to fire a special type of ammunition. The special rounds, manufactured by Fiocchi Munizioni in Italy, have the same dimensions as normal 70mm 12-guage ammunition, but are too powerful for most shotguns, and will not allow the breech to close if used in any weapon other than the SPAS-15 MIL. Normal rounds can also be fired by this weapon.

Caliber:	12ga 70mm
Length:	92cm, 70 (folded)
Weight:	4.2kg
Magazine:	6

HECKLER & KOCH

Heckler & Koch GmbH, Germany

HK 512

The HK 512 is a gas-operated semi-automatic shotgun of conventional design. It fires only 70mm cartridges, and is prone to malfunction if lightweight or low-energy rounds are used. A built-in choke disperses the shot into a vertical rectangle or oval, increasing the number of pellets likely to hit a single target, while decreasing the likelihood of stray pellets going on to hit someone else. The choke, however, is not removable, and makes the use of some rounds, like flares and CS gas shells, impossible.

Caliber:	12ga 70mm
Length:	102cm
Weight:	3.5kg
Magazine:	7

MOSSBERG

O. F. Mossberg & Sons Inc., USA

Model 500 ATP8

***also* ATP8C, ATP6, ATP6C**

Caliber:	12ga 70, 76mm
Length:	101cm, 76 (ATP8C), 96 (ATP6), 71 (ATP6C)
Weight:	3.5kg, 3.1 (ATP8C), 3.3 (ATP6), 2.9 (ATP6C)
Magazine:	8, 6 (ATP6, ATP6C)

The Mossberg 500-series are pump-action shotguns intended for military and police work. The basic design focuses on strength and reliability under extreme conditions, without too much weight or expense. All of the shotguns feature both an internal and a trigger safety, as well as a normal manual safety. Usually fitted with fixed furniture of wooden or synthetic construction, the ATP8 and 6 are available with folding stocks. A muzzle brake reduces recoil and muzzle climb, keeping the weapon steady for quick second-shot acquisition.

Four variants are available. The ATP8 is the standard model. The ATP6 has a shortened barrel and reduced magazine capacity, but is otherwise the same. Both are available in a "C" version (for "Cruiser"), which has a pistol grip but no stock. The Cruisers are designed for easy storage and retrieval in tight spaces, like vehicles.

PANCOR

Pancor Corporation, USA

Jackhammer

Caliber:	12ga 70mm
Length:	79cm
Weight:	5.1kg
Magazine:	10

The Pancor Jackhammer is an automatic shotgun with a unique and innovative design. It is gas-operated, working much like a revolver, with ammunition loaded in disposable cylinders. Other than the barrel, bolt, and a couple of mechanical components, the Jackhammer is made entirely out of a new, very tough plastic, reinforced with glass fibre. Ammunition cylinders are sold pre-loaded, although standard ammunition is fired, so used ones can be refilled. To reload the weapon, the user need only pop out the used cylinder (which contains the spent shells) and pop in a fresh one.

Designed much like an assault rifle in a bullpup layout, the Jackhammer is relatively easy to control. A two-stage trigger selects semi- or automatic fire. The Jackhammer features a carrying handle, and a decocking lever that acts as a manual safety. It is totally ambidextrous in function.

REMINGTON

Remington Arms Co., USA

870 P

***also* Model 870, M870 Mk1**

Caliber:	12ga 70mm
Length:	106cm, 77 (folded)
Weight:	4.0kg
Magazine:	7, 5 (Model 870)

A very popular commercial design that dates to the 1950s, the 870 P is a pump-action shotgun for police use. It is a simple and reliable weapon, and one of the most common in American police arsenals. The police version differs little from the Model 870 commercial version. Both are available with folding or fixed stocks, but the 870 P has a larger magazine. The M870 Mk1 is a version which has been in service with the U.S. Marine Corps since 1966. Differences between it and the police and commercial versions are superficial, although the Marine Corps version is only made with fixed wooden stocks.

WINCHESTER

U.S. Repeating Arms Co Inc, USA

1300 Defender

***also* 1300 Marine**

Caliber:	12ga 70, 76mm
Length:	97cm
Weight:	3.4kg, 3.5 (Marine)
Magazine:	7, 6 (Marine)

The Winchester 1300 Defender is a pump-action shotgun with a durable design. It is unique in having a breech that is partially unlocked by recoil, giving it a fast and easy operation. It is fitted with a tough plastic stock and fore-end, and the exterior is finished entirely in black. The 1300 Marine is functionally identical, although it has a smaller magazine. It is made to resist corrosion, with a treated receiver housing and internal parts and a stainless-steel barrel and magazine.

MACHINE GUNS

CHAPTER SIX

MACHINEGUNS

The concept of the machinegun goes back to the middle of the last century, although the doctrine to which it has been applied has changed continually since then. Early machineguns, starting with the hand-cranked, multi-barrelled Gatling gun, were used as artillery pieces, and could certainly not be lugged around with a highly-mobile infantry unit. In the First World War machineguns were employed as direct-fire infantry support weapons, but their size (and the fact that most were water-cooled) restricted them to a stationary, defensive role. It wasn't until the period between the wars that the first modern designs began to appear, and the modern doctrine of equiping low-level infantry units with their own machineguns took shape.

Machineguns can be broken into three arbitrary but conceptually useful categories. Light machineguns are designed for use by a single operator. They generally fire light ammunition, often trading away the high capacity of belt-fed systems for the convenience of box magazines. Heavy machineguns are almost always crew-served, and are generally too bulky and heavy for a single person to lug around. They are most often deployed on vehicles, or in defensive positions where they don't have to be moved much. Medium machineguns, often called general-purpose machineguns, provide a compromise. They are easily portable, but fire a hefty round and usually need some crew support. In this day and age the general-purpose machinegun is a fixture in every infantry unit, but the trend in design and doctrine is towards lighter weapons.

Machineguns are often belt-fed, although some models feed from box magazines. Belts come in two forms: continuous- and disintegrating-link. In continuous-link belts, the links are connected, and remain chained together even as they are disgorged from the weapon. In disintegrating belts, the links do not connect, and they fall out of the weapon individually. In both cases, the shell casings are popped out of the belt during the feeding process, and are ejected seperately.

Machineguns operate much like other types of automatic weapons. Like submachineguns, most fire from an open-bolt position. Before loading, the charging handle must be pulled to lock the bolt to the rear. Then a magazine is simply inserted, or, in the case of belt-fed weapons, a top cover is lifted and the first few rounds of the belt are laid across the sprockets that drive the feed system. The top cover is closed, and the weapon is ready to fire.

When firing, machineguns tend to bounce around a bit, so in order to maintain a decent aim the user must keep the butt tight against his or her shoulder. Many machineguns have a notch in the bottom of the stock, or even a handgrip, so that the user can pull the weapon in tight with his or her off hand. Short, controlled bursts are necessary to maintain control, and to keep barrel temperature down. Overheating is a problem with even light machineguns, due to the heavy volume of fire expected from them, so most allow the barrel to be changed. Barrel changes are generally required every couple hundred rounds of heavy fire.

To be truly effective, a machinegunner needs an assistant. Changing a hot barrel quickly generally requires two people, and feed problems can be minimized if there is someone to keep an eye on the belt. The assistant can also help in aiming, if the machinegun's powerful muzzle blast kicks up too much dust for the gunner to see clearly, and can clip together belts of ammunition as needed to ensure a continuous flow. Most light and even general-purpose machineguns can be operated without an assistant, but firing a machinegun requires full attention, so even a minor problem becomes a big one without someone around to lend a hand.

CETME

Empresa Nacional Santa Barbara, Spain

CETME Ameli

Caliber:	5.56mm
Length:	97cm
Weight:	6.4kg, 5.2 (alloy)
Magazine:	disintegrating belt

Introduced in 1982, the Ameli is a blowback-operated light machinegun based on the roller-locked bolt design of the CETME and HK rifles. It features an integral bipod, an easily-changed barrel, and a rate of fire that can be adjusted between two settings by making a minor internal change. It is compact and easy to strip and assemble. A lightweight version that makes maximum use of alloy components is available. The Ameli is in service with the Spanish and Mexican armies.

CIS

Chartered Industries of Singapore, Singapore

.50 CIS

Caliber:	.50in Browning
Length:	166cm
Weight:	33.0kg
Magazine:	disintegrating belt

Introduced in 1983, the .50 CIS was designed to provide a lightweight, modern alternative to the Browning M2 machinegun. The CIS is a simpler weapon, although not quite as durable. It is gas operated, firing from the open-bolt position. The barrel can be changed easily, and the weapon can be fed from either or both sides.

Ultimax 100

Caliber:	5.56mm
Length:	102cm
Weight:	4.9kg
Magazine:	100 (20, 30 available)

Designed for easy use by one man, the Ultimax 100 is a lightweight, reliable machinegun that was introduced in 1982. It is gas-operated, and fires from an open bolt. Its drum feed, very light weight, and almost negligible recoil make it exceptionally easy to handle, even for just one man. It features a bipod, a removable buttstock, and an easily changeable barrel.

COLT

Colt Industries, USA

M16A2 LMG

This weapon is a heavy-barreled light machinegun version of the M16A2 assault rifle. It varies little from the rifle in design or operation, but features an integral bipod and a forward hand grip. It is in service with the Canadian and Brazilian armies, among others.

Caliber:	5.56mm
Length:	100cm
Weight:	5.8kg
Magazine:	30

FN HERSTAL

FN Herstal SA, Belgium

MAG

The FN MAG (standing for Mitrailleur à Gaz) is a well-built, reliable weapon that is probably the most widely-used medium machinegun in the world today. A design evolved from weapons of the Second World War, the MAG is gas-operated and fires from an open bolt. It features a quick-change barrel and a bipod. It is in service in Belgium, Canada, Cuba, India, Israel, and South Africa, as well as dozens of other nations.

Caliber:	7.62mm
Length:	125cm
Weight:	10.9kg
Magazine:	cont. or dis. belt

Minimi

***also* M249 SAW, Para**

The Minimi, known in the U.S. army as the M249 Squad Automatic Weapon, is a simple, rugged, and very reliable light machinegun. It is gas operated, firing from an open bolt. A unique feed system allows it to take a disintegrating-link belt or a standard M16 box magazine. The rate of fire can be altered by making an adjustment to the gas tube. The barrel changes easily, and the weapon features and integral bipod. A shortened version, known as the Minimi Para, has a shorter barrel and a collapsible buttstock, but is otherwise identical. The Minimi is in service with Australian, Belgian, Canadian, Italian, and U.S. armies, among others.

Caliber:	5.56mm
Length:	104cm, 90 (Para), 74 (folded)
Weight:	6.8kg, 6.7 (Para)
Magazine:	disintegrating belt, 30

M2HB/QCB

***also* M2HB**

Caliber:	.50in Browning
Length:	165cm
Weight:	38.2kg
Magazine:	disintegrating belt

The M2HB/QCB is the most modern version of the M2 heavy machinegun in production. The M2 dates back to the 1930s, but is such a robust, reliable, well-built and useful weapon that it will probably continue in service for several more decades. It is recoil-operated, firing from the open bolt. Unlike many machineguns, it has a selective fire mechanism, allowing the user to fire single shots if desired. The weapon is very heavy, requiring a vehicle to be easily moved, or three people if ported manually.

The M2HB/QCB features an easily changed barrel. Versions produced through the 1970s, however, had fixed barrels (these go by the nomenclature M2HB). Despite the fact that the QCB version is available as a conversion kit for existing weapons as well as a whole new machinegun, many of the weapons with fixed barrels still exist. Other than the changeable barrels, these older weapons are identical. Versions of the M2 are in service with almost every military force in the western world.

HECKLER & KOCH

Heckler & Koch GmbH, Germany

HK 21E

Caliber:	7.62mm
Length:	114cm
Weight:	9.3kg
Magazine:	cont. or dis. belt

This is a blowback-operated medium machinegun firing from a closed bolt and using the same roller-locked mechanism found on most HK weapons. It is belt-fed, accepting either the German continuous-link or American disintegrating-link belts with equal ease. It features an easily-changed barrel and a fully-adjustable bipod that allows the gun to pivot a little. Fire is selective, with single-shot and three-round burst options as well as full-automatic fire. The 21E is in service with the Mexican army.

HK 23E

Derived through a long evolution from the G33 assault rifle, the 23E is a 5.56mm light machinegun. It is blowback-operated, firing from the open bolt and using the roller-locked bolt mechanism. It features a bipod, quick-change barrel, and selective fire that allows single-shot, three-round bursts, and automatic fire. The 23E is belt-fed, accepting continuous- or disintegrating-link belts.

Caliber:	5.56mm
Length:	103cm
Weight:	8.8kg
Magazine:	cont. or dis. belt

IMI

Israel Military Industries Ltd., Israel

Negev

***also* Negev short**

Introduced in 1988, the Negev is a gas-operated light machinegun firing from an open bolt. It features a bipod and a folding buttstock. Fire selection allows single shots and automatic fire, and the rate of fire can be varied by a switch on the gas tube. It is normally belt-fed, but can accept thirty-round box magazines as well. A short-barreled version is made, which is identical outside of length. The Negev is in service with the Israeli army.

Caliber:	5.56mm
Length:	102cm, 78 (folded), 89 (short), 65 (folded)
Weight:	7.2kg
Magazine:	dis. belt, 30

RHEINMETALL

Rheinmetall GmbH, Germany

MG42/59

***also* MG3**

Caliber:	7.62mm
Length:	122cm
Weight:	12.0kg
Magazine:	cont. or dis. belt

The MG42/59 is a design based directly on the most common German infantry machinegun of the Second World War. It is recoil-operated, firing from the open bolt and using the a roller-locked mechanism similar to that of the HK and CETME rifles. A unique barrel changing system pops the barrel out to the side, allowing the user to quickly and easily replace it without getting out of the firing position—most other machineguns require the user or an assistant to remove the barrel from the front. The MG42/59 is fitted with a removable bipod, and a tripod is available that includes a periscopic optical sight, so the user can operate the weapon with his head behind cover. The MG42/59 is in use with the Italian and Austrian armies (it is also manufactured by Beretta and Franchi in Italy). A variant, the MG3, is used by Germany, Greece, and Turkey. It has a number of small design differences, and varies slightly from the 42/59 in dimensions, but is functionally the same.

RSAF

Royal Small Arms Factory, Nottingham, UK

L86A1

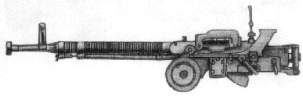
Caliber:	5.56mm
Length:	90cm
Weight:	5.4kg
Magazine:	30

This is a variant of the L85A1 assault rifle, modified to perform as a light machinegun. It is gas operated, firing from an open bolt, and has a long, heavy barrel for improved range and better performance with sustained fire. It features selective fire (automatic and single-shot), a bipod, and the SUSAT optical sight (covered in the Sighting Devices section). A pistol grip has been added beneath the butt, so the operator can hold the weapon snugly to his or her shoulder. The L86A1 is very accurate, especially on single-shots. It is in service with the British army.

Degtyarev DShKM

The DShKM entered service with the Soviet army in 1946, and was a variant of the DShK, a design dating to the 1930s. Although it is no longer in production, it was widely used in the Soviet Union, Warsaw Pact, and among Soviet client states, and is still a very common weapon in these and their successor nations, especially on military vehicles. Although a completely different design, its performance is comparable to that of the M2, covered above. Many DShKMs were issued with wheeled mounts, which convert to tripods.

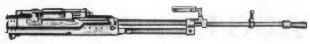
Caliber:	12.7x107mm Russian
Length:	159cm
Weight:	35.5kg
Magazine:	disintegrating belt



NSV

Introduced in 1969, the NSV is a heavy machinegun that has slowly been replacing the DShKM, above. It is a gas-operated weapon firing the same round as its predecessor. It is essentially the same in features and use, but is substantially lighter and features a quick-change barrel.

Caliber:	12.7x107mm Russian
Length:	156cm
Weight:	25.0kg
Magazine:	disintegrating belt



PKM

The PKM is a light machinegun firing the Russian 7.62x39mm round, the same cartridge fired by the AK-47 assault rifle. Feed is by a continuous-link belt held in a box under the weapon. Developed from the components of several other weapons, the PKM features a bipod and easily-changed barrel. It is prone to feed problems, but is nevertheless very common in Soviet Union's successor and client states.

Caliber:	7.62x39mm Russian
Length:	116cm
Weight:	8.4kg
Magazine:	continuous belt

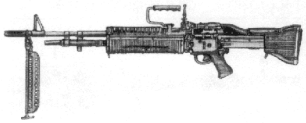
SACO

Saco Defense Inc., USA

M60E1

***also* M60E3**

Caliber:	7.62mm
Length:	110cm, 107 (E3)
Weight:	10.5kg, 8.6 (E3)
Magazine:	disintegrating belt



Introduced in the early 1960s, the M60 design is based on the bolt and feed mechanisms of two German weapons from World War Two. It is gas-operated, fires from the open-bolt position, and features a quick-change barrel and sturdy bipod. On early versions, the bipod and gas tube were attached to the removable barrel, making the entire assembly unduly heavy and the barrel-changing process awkward. On the E1 version, however, the bipod and gas tube stay with the weapon, making things easier all around. The M60 can be temperamental if not well maintained, but is generally a rugged and reliable weapon. It is in service with the U.S. and several other armies.

The M60E3 is functionally identical to the E1, but has a number of superficial changes to make it lighter and easier to handle. The gas-tube mounted bipod has been replaced with a lighter version mounted on the receiver, and a forward pistol grip allows easier shooting from the hip. Some minor operating changes make user-caused malfunctions less likely. The E3 has been adopted by the U.S. Marine Corps.

STEYR

Steyr-Mannlicher GesmbH, Austria

AUG HBAR

***also* AUG HBAR/T**

Caliber:	5.56mm
Length:	90cm
Weight:	4.9kg
Magazine:	42 (30 available)

This weapon is the light machinegun version of the Steyr AUG system, and is functionally the same as the AUG assault rifle and other members of the family. It is fitted with a heavier, longer barrel than the assault rifle, and fires from the open rather than closed bolt position. It can also be obtained without the AUG's optical sight, having a mounting bar for some other sighting mechanism in its place—this is referred to as the HBAR/T version. Standard magazines may be used, although the longer, 42-round magazine is better suited for a machine-gun role.

AMMO

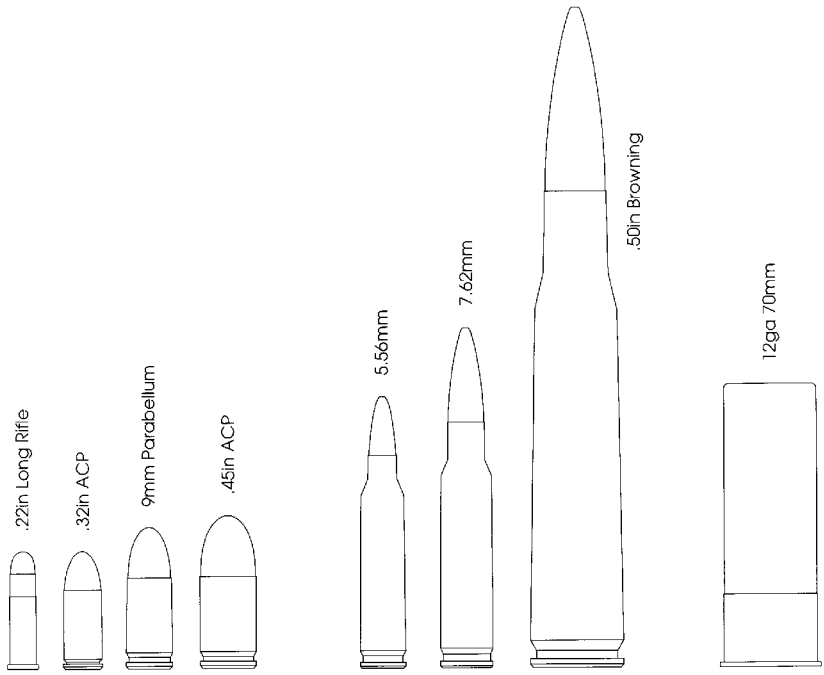
CHAPTER SEVEN

AMMUNITION

Weapon features, capabilities and performances vary much from model to model. It's easy, when looking at the vast array of weapons available, to ignore an important feature of any weapon system: ammunition. Ammunition has an enormous effect on weapon performance, in terms of damage potential, armor penetration, the likelihood of accidental collateral damage due to ricochets or blow-throughs, and even logistical concerns. Furthermore, the development of weapons and ammunition go hand-in-hand, so a basic understanding of ammunition types and applications is essential for a working knowledge of firearms in general.

Although the six preceding chapters break them down in a little more detail, the weapons covered in this book can be lumped into three basic classes—longarms, smallarms, and shotguns. This division is largely arbitrary, but it reflects three basic categories of ammunition: rifle rounds, pistol rounds, and shotgun rounds. Rifle rounds are fired by assault and sniping rifles, and machineguns. Pistol rounds are fired by submachineguns and, of course, pistols. Shotgun rounds are obviously fired by shotguns. But the distinction between these rounds does not begin or end with the types of weapons that use them. As you can see in the illustration opposite, which shows several representative rounds at actual size, there is a huge difference between the classes in both size and shape. This translates into significant differences in the performance characteristics of the rounds—the amount of damage they do, their effective ranges, and their utility in different types of weapons. Before looking at special types of ammunition and their applications, we must first address the basic performance of these three classes.

A firearm damages its target by hitting it very, very hard with a bullet. More technically, it transfers a large amount of energy from the propellant charge to one or more small projectiles, which carry the energy in kinetic form from the chamber to the target. Two factors determine how much energy a bullet carries (and consequently its potential damage): its mass and its velocity. These two factors are somewhat interchangeable—a bullet with a low mass may carry as much or more kinetic energy as a heavier round, if it has a much higher velocity. Velocity and mass also affect other aspects of the round's performance. For example, a high-velocity round will probably be accurate at much greater ranges than a slower bullet. Slower rounds are less likely to blow through a target, and will hence transfer a



higher proportion of their energy. They are also easy to silence, because their natural velocities are not much higher than the speed of sound.

Pistol rounds tend to be relatively low-velocity and high-mass. Compare the pistol and rifle rounds in the illustration above, and you can see how much shorter the pistol rounds are. Look also at the differences in caliber—a .45in ACP bullet is more than twice as big across as a 5.56mm rifle round, and only slightly smaller in width than the monster .50in Browning round. These short, stubby rounds make sense for pistols because the cartridges must be short enough to fit within the grip of an autoloader. Furthermore, pistol rounds don't need the power and range that rifle rounds have, because pistols have short, inaccurate barrels that don't lend themselves to long-range shooting. So pistol rounds are short, fat, and slow, relying on high mass, rather than high velocity, to give them lethal energy. They have short effective ranges, and are less likely to blow through their targets than typical rifle rounds.

In contrast, rifle rounds tend to be faster and proportionally lighter. Because they are so fast, they tend to have long effective ranges, and are likely to blow clean through their targets—or any cover in the way. But lightweight rifle rounds (a 5.56mm rifle bullet has about half the weight of a 9mm Parabellum pistol bullet) are not very determined, and can be knocked off course by things they hit in flight—even, in some cases, light vegetation. Rifle rounds also lose a lot of power when silenced, because so much of their energy is carried in their high velocity, and is lost if the round is slowed to below the speed of sound.

Shotguns go back to the opposite extreme, firing very heavy loads at velocities even lower than many pistols. With a glance at the table on the previous page, it's clear just from their size that shotgun rounds are very powerful. But because shot and shotgun-fired slugs move so slowly, they have very short effective ranges, and rapidly lose their velocity after travelling only a hundred meters or so. In fact, because shotgun rounds are non-aerodynamic in shape, they shed their speed particularly fast, losing both accuracy and lethality at range. In contrast, most pistols lose their accuracy at short ranges, but the bullet continues to travel at dangerous speeds for many hundreds of meters if unobstructed.

The illustration on the previous page clearly contrasts the proportions of the different types of rounds. It should also make obvious the big differences in total power. Rifle and shotgun rounds are considerably more powerful than pistol cartridges. That's an important distinction, as most popular books and movies don't recognize the enormous difference in power between pistols and submachineguns on the one hand, and assault rifles and machineguns on the other. While even the smallest pistol rounds can easily be lethal, they simply cannot compare to typical rifle rounds in their overall effect.

Ammunition Types

Shotgun rounds can fire an amazing variety of projectiles, including flares and grenades as well as slugs and shot. Rifle and pistol rounds are basically limited to bullets, although there are many types, each having different applications and advantages. There are two central concerns in ammunition design: penetration and energy transfer. Penetration is the ability to defeat armor, and to pass through cover in the bullet's path towards its target. Energy transfer is the ability of the bullet to deliver as much energy as possible to the target—thereby doing the most damage possible. Unfortunately, these two concerns are pretty much mutually exclusive. A bullet that easily penetrates cover and armor will probably blow right through its target, and any energy that leaves with it is wasted. On the other hand, a bullet designed to dump its energy in the target will probably do so in the first thing it hits, and it may not retain enough energy to pass through armor or cover.

The basic solid bullet is referred to as "ball" ammunition, and is usually made of lead wrapped in a jacket of copper. Ball ammunition serves a general-purpose role, compromising between energy transfer and penetration. The Geneva Conventions restrict the use of many of the specialized ammunition types covered below, so most military

forces stick to ball and tracer ammo. Tracer rounds are simply ball rounds with a tiny flare embedded in the rear of the bullet. As the bullet travels downrange, it makes a bright streak which aids in aiming. Tracers really only help when fired from an automatic weapon, and they can be damaging to a weapon's barrel. As a result, tracers are much more common in rifle than in pistol calibers.

Armor piercing rounds generally resemble ball ammunition, but are made slightly differently to increase their penetration potential. Most, especially among rifle rounds, are simply ball rounds with very hard steel or tungsten penetrators embedded within. Others are solid steel rounds coated with Teflon, which acts as a lubricant and helps the bullet pass through resistant material. In both cases, the bullet does not deform much when it passes through the target, so the energy transfer is minimal.

Hollowpoint (sometimes called "dum-dum") rounds are designed to increase energy transfer. Second to ball, hollowpoint is the most common type of ammunition around, being a favorite of police and hunters. Hollowpoint rounds have a hollow nose, or a nose filled with soft lead or plastic. When a hollowpoint round hits a solid object, the bullet deforms, mushrooming out and expanding its cross-section. It then rapidly loses velocity, transferring most or all of its energy to the target. Of course, the fact that hollowpoint rounds do not retain their shape means that they are poor penetrators, and they don't work well against armor or through cover. Hollowpoint rounds are commonly made in rifle and pistol calibers.

Even more effective at energy transfer are frangible rounds, the most notable of which is the Glaser Safety Slug (a brand name). Frangible rounds are designed to break apart when they strike a target. Glaser bullets are thin metal containers filled with light shot. When a Glaser round hits its target, it breaks open, and the shot spreads out. It quickly loses its velocity, transferring its energy to the target. Generally, there is no blow-through at all. Glaser rounds are extremely lethal against unarmored targets, but have almost no ability to penetrate armor. In fact, they tend to break up when passing through even light cover, especially if striking at an acute angle. Furthermore, they are very expensive.

An attempt to bridge the gap between penetration and energy transfer is a class of ammunition known collectively as accelerated energy transfer (AET) rounds. There are several AET designs, all of which incorporate some sort of lightweight, high-velocity bullet, often with an unusual shape. AET rounds are better than Glaser slugs at penetrating cover and light armor, but still rapidly shed their velocity when they strike softer material, like flesh. A relatively new development, AET rounds are not commonly found. Additionally, their odd shapes lead to feed problems in some weapons, causing frequent jams.

There are two other types of ammunition worth mentioning: blanks and subsonic rounds. Blanks are cartridges with no projectiles, and they rarely see serious use outside of training and filmmaking. Nevertheless, they have a few important characteristics that bear mentioning. Because the propellant gasses have no bullet in front of them, they do not build up to the same level of pressure as projectile rounds do. All gas-operated weapons must therefor be fitted with some sort of restricting device, or they will not function in an automatic or

self-loading mode when firing blanks. Blank adapters are simple, inexpensive, and easily-installed devices, but they are usually noticeable, and must always be removed before live ammunition can be fired.

Subsonic rounds are normal cartridges that have been cold-loaded (prepared with a reduced propellant charge) so that the bullet never exceeds the speed of sound. They are used in some silenced weapons. While many silenced weapons have some mechanism (usually bleed-holes in the barrel) to keep normal rounds from building up to supersonic speeds, many do not, and require cold-loaded rounds for truly silent operation. Any round fired at supersonic speed will create a loud crack (a small sonic boom), even if the muzzle blast is silenced.

Shotgun Ammunition

Shotguns fire a wide variety of ammunition types, in a broad range of calibers and sizes. All the weapons covered in this book fire 12-guage ammunition (10-guage and 20-guage weapons are also made for sporting purposes), but round lengths vary, and some weapons cannot fire all lengths of shells.

The most common type of shotgun ammunition is, not surprisingly, shot. Shot shells are filled with small, spherical projectiles that spread out as they leave the barrel, covering a large area. Shot comes in many sizes, and the smaller the size, the more that fits in a shell. In general, shot can be divided into two categories: birdshot and buckshot. Birdshot shells contain dozens of very small projectiles (a couple millimeters across), each carrying relatively little energy. Buckshot rounds concentrate the same amount of energy in fewer, larger projectiles. As a result, birdshot is lethal only at close ranges, and does not penetrate walls or other cover. Buckshot, on the other hand, is dangerous to much greater range, and has some power against light and medium cover.

A second common type of shotgun ammunition is slug. Slugs are solid lead projectiles, similar to ball ammunition fired from rifles and pistols. They are not shaped like bullets, however, and because they come imbedded within plastic wadding within the cartridge case, slug rounds look pretty much the same as shot shells. Shotgun slugs are very powerful (they are generally much larger than 7.62mm bullets), but are not particularly accurate, and do not have anywhere near the range of most rifle rounds. With their enormous weight and power, however, shotgun slugs will penetrate heavy cover at close and medium ranges.

There are many types of more specialized rounds available. Penetrator slugs work like armor-piercing rifle rounds—they contain heavy, hard cores (usually made of tungsten) within larger lead bodies. They are quite effective against armor, within a shotgun's limited range. CS Ferret rounds act like CS (tear gas) grenades, but are designed to break through limited cover. They can be fired through doors and light walls to fill an interior space with CS gas. Shotgun-

fired fragmentation grenades are available, although they are not nearly as powerful as their full-sized brethren. Flare rounds can be used for signalling, and there are two types of incendiary shells available. Incendiary grenade rounds fire projectiles that burst into flames on impact, while fireball rounds turns the shotgun into a flamethrower, shooting a twenty-meter gout of flame from the muzzle for three or four seconds.

The Right Ammo for the Job

Police work typically takes place in urban environments. Most confrontations are at close range, and the priority lies in incapacitating the target as quickly as possible, while avoiding collateral damage from ricochets or over-penetration. Consequently, hollowpoint rounds are very popular with police units. Glassier and AET rounds also fit the bill, but are expensive and/or untested, and so are rarely used by conventional police units.

Military considerations include logistical concerns, the staggering array of potential targets (from enemy personnel to aircraft to armored vehicles), and even Geneva Convention restrictions. Conventional military forces almost always go with a solid compromise—ball ammunition—sometimes throwing in a little tracer when appropriate.

Special operations groups, like counter-terrorist or hostage-rescue teams, have the greatest leeway in ammunition choice, and often face the most demanding requirements. Special operations require maximum stopping power—the enemy often holds all the cards (and sometimes some hostages, as well), so he cannot be given a chance to shoot back. Because special operations are generally short and decisive, expense and logistics are not a problem, so exotic ammunition types are acceptable.

Choosing the right kind of ammunition can be difficult, even after looking at the applications above. Obviously, the tradeoff between penetration and energy transfer must always be considered, generally based on how well-armored the enemy is expected to be. But there are other considerations, as well. High-penetration rounds increase the risk of collateral damage, especially in built-up areas. Compatibility within the group can be a concern, especially when away from supply lines for an extended period. Instant lethality may be necessary, especially with extremely dangerous foes. Range may dictate the use of longarms, while tight spaces suggest pistols and submachineguns firing less powerful rounds. In situations where quick target acquisition precludes careful aiming, nothing beats the wide target area of buckshot.

SIGHTING DEVICES

CHAPTER EIGHT

SIGHTING DEVICES

Although telescopic sights date from the last century, most of the major changes in sighting technology have occurred in the last few decades, and especially the last ten years. Telescopic sights allow a weapon user to aim at distant targets with much greater precision than the naked eye allows. But the sighting devices available today address two other functions of aiming: rapid target acquisition and operations in darkness. Laser sights and illuminators let the user get his weapon on target instantaneously, without even looking down the sights. Night-vision scopes and goggles allow the user to see and aim in darkness. The equipment in this section falls into three categories: illuminators and laser sights, night-vision gear, and scopes.

Laser sights are small devices that project a weak laser beam. The beam makes a bright dot where it hits the target, indicating the point at which a bullet will hit when the weapon is fired. Laser sights first appeared in the 1970s, but early models were heavy and large, and generally had to be custom-made. In the '80s laser sights became much more widespread, both commercially and in special-operations work. They also trimmed down in weight and bulk, so that some of the smallest are down to about the size of a AA battery. The technology is far from exhausted, and laser sights are likely to continue to get smaller, lighter, cheaper, and more common.

While most commercially-available laser sights project a dot in the visible-light spectrum (almost always red), laser sights for professional use are often in the infrared range. Infrared laser dots are invisible to the naked eye, requiring some sort of night-vision device to see. Because they are used with night sights or goggles, many IR lasers feature some divergence—that is, some of the beam spreads out around the aim point, dimly illuminating the area around the bright dot with infrared light. In this way, the laser acts as a sort of long-range IR flashlight, further improving the user's aim and target acquisition. Obviously, IR lasers are only useful in low light or darkness.

Most laser sights have a range of about two-hundred meters or so at night, about half that indoors during the day, and only fifty or fewer meters in bright sunlight. Longer ranges require not just more power, but also a more precise beam. All lasers spread somewhat, so in order to return a bright dot, a long-range laser sight must have a very tight beam. Even so, long-range laser sights often produce "dots" of a meter or more across at ranges over 1000 meters. Dots that big are

obviously useless for snipers requiring precise aim, but are sufficient for use with crew-served weapons such as machineguns and anti-tank rockets.

Another common device for rapid target acquisition is the flashlight illuminator—a small visible-light or infrared flashlight fixed to the weapon and pointing in the direction of aim. Not nearly as precise as lasers, flashlight illuminators provide instant, if inprecise, target acquisition, and let the user clearly see the target. Of course, they also announce the user's presence and location. Obviously, they are only useful in darkness.

The second category of sighting devices is electro-optics—night-vision equipment. Early night-vision gear was "active," meaning that the devices were able to see in the infra-red spectrum, but required a bright IR source (an infrared spotlight) to illuminate the target area. Active IR systems are large and bulky, and the IR light source is visible to anyone else using a night-vision system. Nearly all equipment made for personal use today is "passive," requiring no IR light source. Passive devices operate by enhancing ambient light in the visible and the near edge of the infrared spectra. Although this allows the use of IR lasers and illuminators invisible to the unaided eye, it doesn't let the user "see heat" in the way that thermal imaging systems (used in some sophisticated military equipment) do.

Night-vision devices come as scopes for weapon mounting, or as goggles which can be worn over the head. Night-vision binoculars and hand-held viewers are also available. All have essentially the same internal workings, although the scopes, binoculars, and viewers generally provide some magnification, and the scopes have aiming reticles. Images are monochromatic, with a green tint, and even the most modern are somewhat grainy, like a television set. The development of night-vision gear has progressed in steps, or generations, with current technology being third generation. Third-generation equipment gives bright, sharp images under starlight, and allows the user to see dimly even in the darkest interior spaces. A light source, such as an IR flashlight, is still a handy accessory when there is little or no ambient light. Many goggles have dim illuminators (often just an L.E.D.) to provide a little extra illumination for close tasks, like reading.

Scopes are the final type of aiming device covered herein. Most scopes are simply magnifying devices, generally increasing the image size by three to ten times. Imposed over the image is a reticle (or crosshair) that indicates the aim point. Aiming by reticle is much easier and more accurate than using iron sights, so even low-powered scopes can be advantageous (in fact, several modern assault rifles, including the HK G11 and the Steyr AUG system, have built-in scopes with little or no magnification). Unfortunately, scopes limit the user's field of view, and require more time to acquire the target.

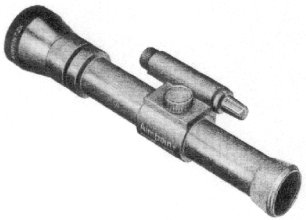
AIMPOINT

Aimpoint AB, Sweden

2-Power

***also* 3000**

Mag.:	2x, none (3000)
Dimensions:	22x5cm, 14x4cm (3000)
Weight:	0.2kg
Battery:	3V lithium (250-500hrs)



The Aimpoint 2-Power is a unique optical sight designed to combine the rapid target acquisition of a laser sight with the advantages of a 2x scope. Rather than crosshairs, the electronics put a small red dot on the scope image to indicate the point of aim. This dot is not a laser projection—it does not show up on the target itself, only in the scope image. To ensure that the fast-acquisition benefits of this sort of targeting are not lost, the Aimpoint has one of the widest fields of view of any optical sight.

The Aimpoint 3000 is similar to the 2-Power, except that it offers no magnification. It has an added feature, however—the indicator can be switched from a small, precise dot to a larger one that makes rapid acquisition even easier, although a little less precise. Both Aimpoint models can easily be fitted to most weapons, even pistols.

Laserdot

Dimensions:	10x3cm
Weight:	0.1kg
Battery:	3V lithium (15hrs)

This is a visible-light laser sight designed specifically to withstand the hard conditions and heavy recoils that often go along with military use. It can be fitted beneath the barrel or on top of most longarms, as well as on pistols. It is activated by a pressure switch that connects to the main unit via a 14cm cable, which can be mounted anywhere on the weapon. A toggle switch is also available.

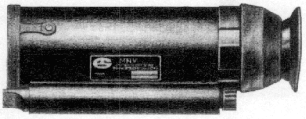
ARMSCOR

Armscor, South Africa

MNV

The Armscor MNV is a night-vision sight designed for military special-operations use. It is a rugged, compact design that requires no adjustments in the field, once it is zeroed. Image magnification is 2.6x. The MNV runs on regular AA batteries, and custom mounts are available for most assault rifles.

Mag.:	2.6x
Dimensions:	21x8cm
Weight:	1.0kg (w/o mount)
Battery:	2 AA (35-45hrs)



ARSOC

Arsoc Sprl, Belgium

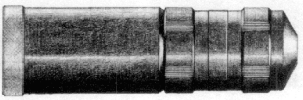
Dart

***also* Ariel**

The Arsoc Dart is a visible-light laser designed for police and special-operations use. With the proper custom mount, it can be made to fit most submachineguns, assault rifles, and many pistols. In all cases, the mounts are designed for quick installation and removal, and to not interfere with the weapon's normal sights.

The Ariel is identical to the Dart, except that it projects an infrared laser. The laser dot can only be seen using some sort of IR night-vision device. An optional diffusing cover can be attached, that allows the sight to be used as an IR illuminator, but still projects the laser dot in the center of the illuminated area.

Dimensions:	10x3cm
Weight:	0.1kg (w/o mount)
Battery:	BA 5567 NATO (8hrs)

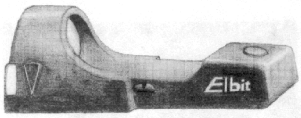


Elbit Computers

Elbit Computers Ltd., Israel

Falcon

Mag.:	none
Dimensions:	22x3cm
Weight:	0.4kg
Battery:	3V lithium (1000hrs)



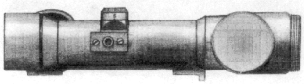
The Falcon is a unique sighting system that mounts on the muzzle end of an assault rifle and uses an aircraft-style heads-up display. A bright red dot is projected on a small transparent screen to indicate the point of aim. Since no scope is involved, the Falcon does not interfere with the user's field of view, and can easily and naturally be used with both eyes open. The Falcon was designed for use with the M16 and Galil, but custom mounts are available for most other assault rifles.

Hensoldt

M Hensoldt and Sohne Optische Werke AG, Germany

FERO-Z24

Mag.:	4x
Dimensions:	22x5cm
Weight:	0.3kg



The FERO-Z24 is a lightweight telescopic scope designed for sniping and observation at medium to long ranges (out to 600 meters or so). A rugged device, the FERO is built for the rigors of military use. It features an illuminated reticle for use in poor light and a no-glare coating on the optics, and has a moderate field-of-view. It easily fits most scope mounts, and is available with a quick-release clamp mount for all the HK rifles and submachineguns.

ZF 10x42

Mag.:	10x
Dimensions:	37x6cm
Weight:	0.4kg

The ZF 10x42 is a precision sight for use at long to extreme ranges—up to and beyond 1000 meters. It is ruggedly designed, and despite its precision optics is largely immune to environmental disturbances. It features a no-glare coating on the optical surfaces, and custom reticle patterns can be ordered. Because of its extreme magnification, the ZF 10x42 has a narrow field of view. Like the FERO-Z24, the ZF 10x42 can be fitted to most scope mounts, and a quick-release mount for HK weapons is available.

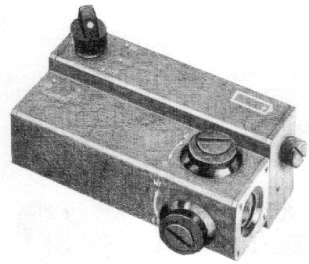
INTERN'L TECHNOLOGIES

International Technologies (Lasers) Ltd., Israel

Aim 1D

also Aim 1D LR

Dimensions:	10x6x5cm
Weight:	0.3kg
Battery:	2 AA (10-50hrs)



The Aim 1D is an infrared laser sight designed for military applications. It is very durable and compact, and with a custom mount can be attached to any weapon, from a pistol to a machinegun. It also provides some divergent illumination, meaning that it acts like a weak IR flashlight lighting the area around the bright aiming dot. Obviously, it must be used with some sort of night-vision device. The beam intensity is variable, allowing the user to save battery time if extended range is not needed. Operation is controlled by a toggle switch, although a pressure switch on a cable is available, allowing the user to control the laser from the pistol grip or any other point on the weapon. A waterproof version is available.

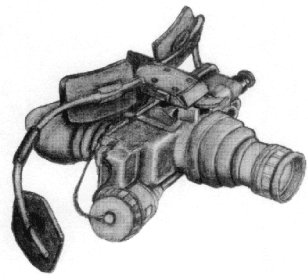
The Aim 1D LR is an extra-long range version of the same laser sight. It will project its beam up to 3000 meters, and is intended for use on heavy long-range weapons. Its divergence (the dot is 60cm across at 1000 meters) makes it too imprecise for use by snipers, except to illuminate the target.

ITT

ITT Defense, USA

AN PVS-7B

Mag.:	none
Weight:	0.7kg
Battery:	2 AA (30hrs)



The AN PVS-7B is a lightweight, rugged night-vision goggle unit. Like all the ITT sights and vision devices covered here, it uses third-generation tubes to provide very high resolution and sensitivity—much better than most other night-vision devices available. The AN PVS-7B can be mounted to a mask or hand-held.

F4939M

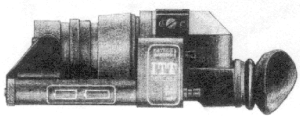
***also* F4939**

Mag.:	4.5x
Weight:	1.1kg
Battery:	2 AA (30hrs)

The F4939M is a night-vision binocular that provides excellent resolution and sensitivity for long-range viewing. It features a low-intensity IR illuminator and an automatic cut-off that protects the tubes (and the user's eyes) from intense lights. The F4939 has a slightly lower-quality imaging tube, but still provides good resolution and sensitivity. It looks almost identical to the AN PVS-7B, but has a much longer, wider objective lens.

F4961

Mag.:	none, 4x, 8x
Dimensions:	25x9x7cm
Weight:	0.6kg
Battery:	2 AA (20hrs)



Designed to provide an optical sight that can be used during both day and night, the F4961 is a compact scope with high sensitivity and resolution. It has a very wide field of view—about five times as wide as most optical sights. An integral mount fits most military weapons without any additional mounting equipment, and the sight sits with a relatively low profile when mounted. The user can switch between a crosshair reticle and a dot to indicate aim point, and an auto-brightness feature adjusts the image intensity to varying light levels. The F4961 is available with three levels of magnification—1x, 4x, and 8x.

F4965

Mag.:	3.6x
Dimensions:	27x8cm
Weight:	0.9kg
Battery:	2 AA (40-50hrs)

The F4965 is a night-vision scope designed for use on military weapons. It mounts easily on most weapons, and has very good resolution and sensitivity. The user can adjust the intensity of the crosshairs, or switch them off completely for unrestricted general viewing.

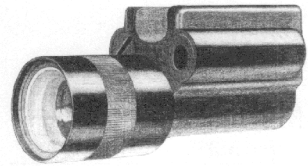
LASER PRODUCTS

Laser Products, USA

Sure-Fire 2

***also* Sure-Fire 1**

Dimensions:	vary
Weight:	0.2-0.4kg
Battery:	3V lithium (4-20 hours)



The Sure-Fire 1 and 2 are combination spotlight/laser sight mounts made for a variety of different weapons. They are designed to provide not just the advantages of laser sights, but also the even faster target-acquisition of a flashlight illuminator, all without requiring an extra hand to operate.

The Sure-Fire 2 is an integral unit, combining a compact three- or six- watt xenon flashlight with a small but very intense visible-light laser projector. The entire unit is about twelve centimeters long, varying according to the weapon for which it is made. It mounts below the barrel, near the muzzle. A switch on the side selects lamp, laser, or both, and the unit can be powered on and off by a toggle on the side or a pressure switch mountable elsewhere, connected by a short cable. The Sure-Fire 2 is available for a variety of weapons, including the HK MP5 submachinegun and a wide variety of shotguns and pistols (the one pictured fits the Beretta 92). In each case, the mounting is custom-designed for a low profile and solid fit with the weapon.

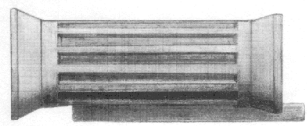
The Sure-Fire 1 is a larger system, consisting of a number of custom mounts with interchangeable lamps and lasers. Four options exist: a three-watt flashlight, a six-watt flashlight, and a visible and infrared laser. Each can be plugged into any Sure-Fire 1 mount, and changing lamps takes only a few seconds. Like the Sure-Fire 2, there are a number of custom mounts for pistols and longarms. A special module is available for attaching a second lamp to the side of the longarm mounts, although this module will not fit on the mounts made for pistols. Controls for the Sure-Fire 1 are identical to the Sure-Fire 2. Both Sure-Fire models are designed for rough use, but install easily. A waterproof version of each is available.

LEITZ

Ernst Leitz (Canada), Ltd., Canada

Elcan

Mag.:	3.5x
Dimensions:	16x7cm
Weight:	0.4kg



The Elcan is a compact optical sight designed for use at short to medium ranges in rigorous military environments. While its design has been optimized for placement on a Colt M16 modified by the removal of the carrying handle, the Elcan can be easily fitted to almost any weapon, and was specifically developed for use on unmodified M16s and the FN Minimi machinegun. The Elcan is tough, reliable, and almost totally immune to environmental stress. It features an illuminated reticle for low light use, and has a good field of view.

LITTON

Litton Electron Devices, USA

M973

***also* M972, AN/PVS 7**

Mag.:	none
Weight:	0.7kg
Battery:	2 AA (30 hours)

Having entered into service with the U.S. army in the late '80s under the nomenclature AN/PVS 7, the M972 and M973 are top-of-the-line modern night-vision goggles. They have wide fields of view, and are set far enough in front of the eye to allow decent peripheral vision. The M972 has good clarity and sensitivity, and an improved tube increases these traits even further in the M973. Both feature a dim IR illuminator, to increase visibility in extreme low-light conditions. Each can be hand-held, or mounted on a lightweight face mask that holds to the head by three straps and a mesh chinstrap.

M983

***also* M982**

Mag.:	none, 3x
Weight:	0.4kg
Battery:	AA (30hrs)

The M983 is a monocular vision device, designed to give night-vision capability to one eye while keeping the other adjusted to ambient conditions. This arrangement keeps the unit light and gives the user a wider field of view and better peripheral vision, if only on one side. The unit can be hand-held or fitted to the same sort of mask used for the M973 (above), where it covers the right eye. It includes an IR illuminator, and a magnifying lens is available that gives the unit 3x magnification. The M983 has excellent image quality and sensitivity, while the M982 is slightly inferior.

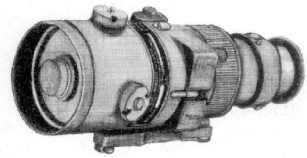
OPTIC-ELECTRONIC

Optic-Electronic Corp., USA

NVS-700

This night-vision scope is large and heavy compared to many of the high-end devices that have come out in the late '80s and early '90s, but is nevertheless very common among police and military forces. It is a reliable, rugged unit that will easily mount on most longarms. Image quality and sensitivity are good, although not nearly as good as more recent night-vision devices.

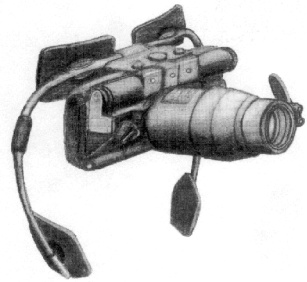
Mag.:	3.5x
Dimensions:	29x10cm
Weight:	1.8kg
Battery:	2 AA (60hrs)



NV38

The NV38 is a lightweight night-vision goggle. It is built around a high-quality tube that provides excellent sensitivity and resolution, with a good field of view. The unit mounts in a rigid mask that fits on the user's head with three straps. A switchable infrared lamp provides local illumination.

Mag.:	none
Weight:	0.8kg
Battery:	2 AA (25hrs)



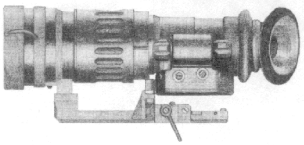
PILKINGTON

Pilkington Optronics, UK

Kite

***also* Maxi-Kite**

Mag.:	4x, 6x (Maxi)
Dimensions:	23x7cm, 36x10cm (Maxi)
Weight:	1.2kg, 1.5 (Maxi)
Battery:	2 AA (50hrs)

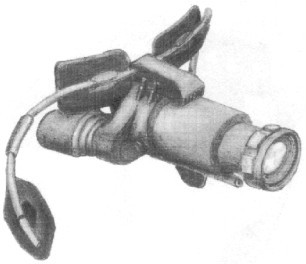


The Kite is a lightweight night-vision scope designed for military use. It is a sturdy design with a good field of view and a crisp, sensitive image, especially in very low-light conditions. With only an on-off switch and a reticle contrast knob, the Kite is easy to operate, even in the dark. It mounts easily to most longarms. The Kite is in service with the militaries of over thirty nations, including the British army.

The Maxi-Kite is a variant designed for longer-range use by snipers and with crew-served weapons. It is available as a unit, or as an easily-installable conversion kit for the Kite. It gives a higher magnification, but reduces the field of view.

Nova

Mag.:	none
Weight:	0.6kg
Battery:	2.7V (60hrs)



A very lightweight night-vision goggle, the Nova provides moderately good sensitivity and image clarity with a decent field of view. It is worn on a rigid face mask strapped to the user's head. A dim infrared lamp gives extra illumination for close tasks, like reading. The Nova is in service with the British army.

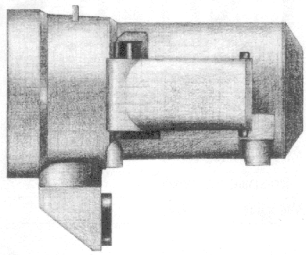
SIMRAD

Simrad Optronics, Norway

KN-250

A night-vision unit designed to be fitted to other scopes, cameras, and vision devices, the Simrad KN-250 makes up for its bulk with a number of unique features. The KN-250 mounts easily on top of almost any other scope or optical device, directing its image into the device's objective lens, to give it night sight capability. The original device's reticle is used for sighting, so the KN-250 needs no zeroing or adjustment once fitted. An excellent field of view is provided, and the KN-250's 1400-meter range far outstrips most night-vision scopes. As mentioned, it can be fitted to many cameras and other types of optical equipment as well as weapon sights. The crisp, high-sensitivity image cannot be overloaded by bright or sudden lights.

Mag.:	none
Dimensions:	19x10cm
Weight:	0.7kg
Battery:	2 AA (40-60hrs)



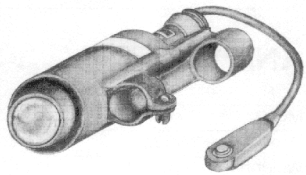
SOPELEM

SOPELEM, France

PS 2

The PS 2 is an infrared spotlight that mounts on a weapon, providing hands-free illumination and rapid target acquisition for users wearing night-vision goggles. The beam is very tight, providing a dot almost as small as a laser projection, surrounded by an area of diffused illumination. The PS 2 is activated by a pressure switch that can be mounted anywhere on the weapon, and which is connected to the unit by a short cable.

Dimensions:	10x3cm
Weight:	0.3kg
Battery:	2.7 V lithium (40hrs)



TN2-1

Mag.:	none
Weight:	0.5kg
Battery:	2.7 V lithium (30hrs)

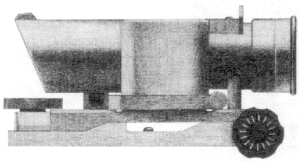
The TN2-1 is a night-vision goggle unit that provides moderate performance in a very lightweight package. It was designed for observation and weapons use at short ranges, or to allow a driver to operate a vehicle without lights. At less than half a kilogram, the TN2-1 provides decent sensitivity and image resolution with a good field of view, but it is not as sensitive as many other available units, and benefits from the use of an IR illuminator. It is worn mounted to a rigid mask that is strapped to the user's head.

UNITED SCIENTIFIC

United Scientific Instruments, UK

SUSAT L9A1

Mag.:	4x
Dimensions:	15x6cm
Weight:	0.5kg



Designed for the L85A1 assault rifle, the SUSAT (Sight Unit Small Arms Trilux) is a compact, lightweight, rugged optical sight that can mount on almost any longarm. It offers an exceptional field of view and simple operation. It is easily zeroed and adjusted, and features a variable-intensity reticle.

VARO-ELECTRON

Varo-Electron Devices, USA

AN/PVS 4

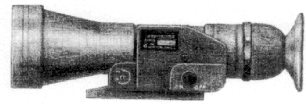
Mag.:	3.7x
Dimensions:	24x12cm
Weight:	1.5kg
Battery:	2 AA (30hrs)

The AN/PVS 4 is a night-vision scope designed for military use. An older model, it offers moderately good image sensitivity and clarity in a rather heavy package. Nonetheless, it is in service with the U.S. army and other military and police organizations. It features adjustable image and reticle brightness, as well as an automatic brightness controller that adjusts to varying levels of ambient light and prevents overload from muzzle flash or other sudden bright light sources. It has an excellent field of view, and is a very rugged design.

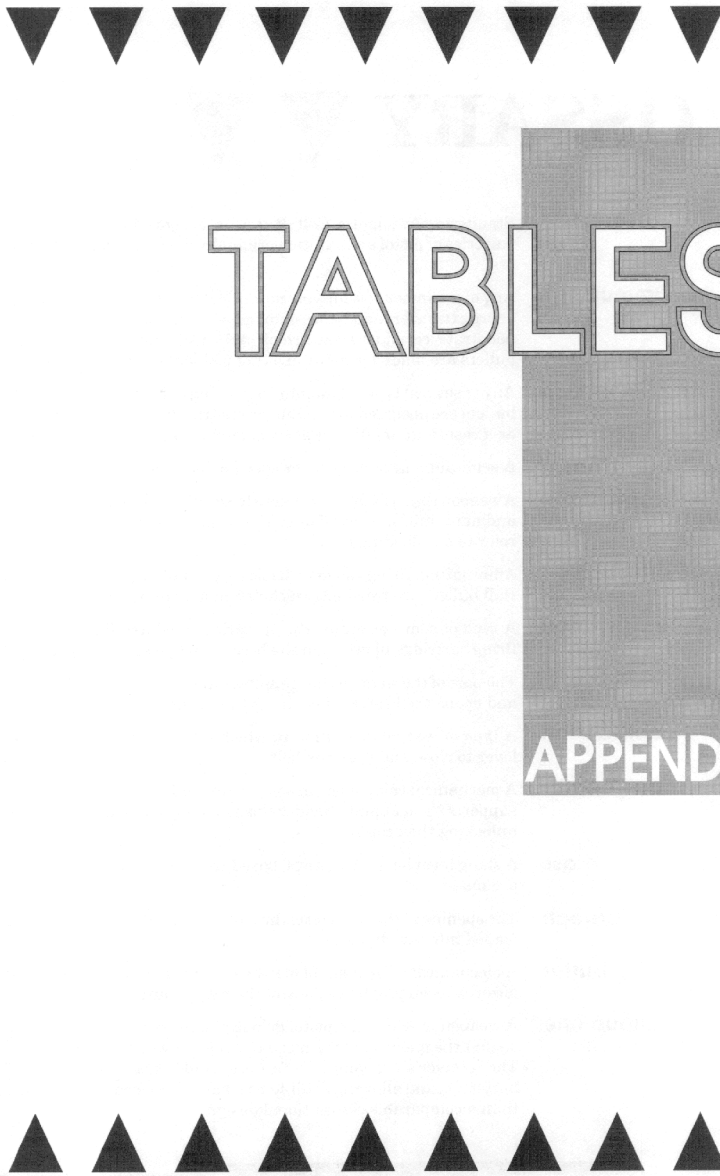
Aquila Mini 3000

***also* Aquila Mini 2500**

Mag.:	4x
Dimensions:	20x7cm
Weight:	1.1kg
Battery:	2 AA (40hrs)



The Aquila Mini is a rugged, compact, lightweight night-vision scope designed for military use. The model 3000 has excellent image quality and sensitivity, while the 2500 uses a less expensive imaging tube with lower sensitivity. Control knobs allow easy zeroing and adjustable reticle brightness, and the unit mounts easily on most longarms.


TABLES
APPENDICES

GLOSSARY

ACP Stands for Automatic Colt Pistol—a designation given to several varieties of pistol ammunition originally developed for Colt autoloaders.

AET ammunition Any of a number of relatively new bullet designs, intended to improve energy transfer (and hence damage) without sacrificing the ability to penetrate cover or even armor. AET (Advanced Energy Transfer) bullets are made for many existing pistol and rifle cartridges.

AP ammunition Any of several types of ammunition firing Armor-Piercing bullets. AP bullets are designed to maximize penetration through hard cover, but as a result are inefficient at transferring energy to their targets.

autoloader A semi-automatic firearm, or specifically a semi-automatic pistol.

automatic A weapon that will fire continuously, so long as the trigger is depressed and ammunition is available. The term is often used erroneously to refer to autoloading pistols.

ball ammunition Ammunition firing the most basic type of bullet: a solid hunk of lead. Ball bullets are frequently jacketed in a layer of copper.

blowback operation A type of semi- or automatic operation in which the blast from the firing cartridge blows open the breech and powers the firing cycle.

bolt The part of the weapon that chambers and extracts rounds as it closes and opens the breech. It contains the firing pin.

bolt-action A type of weapon operation in which the firer manually operates a lever to close and open the bolt.

bolt carrier A mechanical component in some semi- and automatic weapons that supports the bolt and provides the mechanical means for locking and unlocking the breech.

brass A slang term for shell casings, based on the material from which they are made.

breech The opening at the rear end of the barrel, through which cartridges are loaded into the chamber.

buffer A mechanical component of many semi- and automatic firearms, that absorbs recoil and helps control the rate of automatic fire.

bullpup rifle A weapon in which the pistol grip is placed forward of the magazine, so that the majority of the mechanism is set well back in the weapon. The receiver sits against the firer's shoulder, negating the need for a buttstock, and allowing a full-length barrel in a weapon much shorter than a comparable conventional design.

A short rifle.

carbine

A cartridge with no case, in which the propellant is formed into a solid block.

caseless round

The widened area at the rear of the barrel, from which the cartridge is fired.

chamber

The handle or knob by which a semi- or automatic weapon is cocked.

charging handle

A device that restricts the end of a shotgun barrel, causing shot to spread as it leaves the muzzle. An open choke (little or no restriction) causes the least spread, while a full choke (maximum restriction) causes the widest possible spread. Some special chokes, often called shot diverters, cause shot to spread in specific rectangular or elliptical patterns.

choke

A type of mechanical operation in which an automatic weapon begins and ends its firing cycle with the bolt closed and a cartridge in the chamber.

closed bolt

Mechanical operation that does not require the firer to cock the weapon by hand (although all autoloaders require the user to cock or cycle the bolt or slide before the first shot).

double action

A round that fails to fire.

dud

Any type of ammunition in which the bullet rapidly deforms (but does not disintegrate) on hitting its target. The term is often used synonymously with hollowpoint ammunition, although the two are not exactly the same.

dum-dum ammunition

An optical sight that electronically enhances incoming light to allow the user to see the target even in dim light or darkness. Often called a night-vision scope.

electro-optical sight

The mechanical component that pulls the empty cartridge case from the chamber.

extractor

A device at the muzzle of a weapon that reduces the flash of the weapon's firing. It helps conceal the firer, and prevents his or her being blinded at night by a bright muzzle flash.

flash suppressor

The forward handguard, generally beneath the barrel of a weapon.

fore-end

A design in which the barrel contacts the rest of the weapon only at the breech end. This aids in accuracy by isolating the barrel from stress placed on any other part of the weapon.

free-floating barrel

Those parts of a weapon, such as the buttstock and handguard, that aid in handling but do not serve a mechanical function.

furniture

A type of semi- or automatic operation in which some of the propellant gasses are diverted to power the firing cycle.

gas operation

A type of frangible ammunition (Glaser is a brand name) in which the hollow bullet contains many bits of small shot. Upon striking a target, a Glaser bullet breaks apart, preventing over-penetration and delivering total or near-total energy transfer.

Glaser ammunition

hollowpoint ammunition A type of ammunition in which the nose of the bullet is hollow, or filled with a very soft material. On hitting a target, a hollowpoint bullet expands rapidly, increasing energy transfer.

illuminator An aiming device consisting in a visible or infrared spotlight zeroed to a weapon's bore. Illuminators aid in target acquisition and rapid aiming in darkness, but do not provide an accurate aim point.

key grip The technician in charge of setting up camera tracks and scenery on a movie set.

magazine An internal or removable system that stores ammunition and feeds it into the weapon's action.

muzzle The front end of the barrel.

muzzle brake A device at the muzzle of a weapon that diverts emerging gases and directs them rearwards, countering some of the recoil force. Aimed upwards, muzzle brakes can also help counter the tendency of many automatic weapons to climb when fired.

open-bolt A type of mechanical operation in which an automatic weapon begins and ends its firing cycle with the bolt open and the chamber empty. Open-bolt weapons chamber a round at the beginning of the firing cycle, when the trigger is pulled, and this movement of the bolt can affect accuracy.

optical sight Any of a number of sighting devices in which the user looks through a lens at the target. Most optical sights provide some level of magnification, and some offer electronic light-enhancement for aiming in darkness.

primer The component at the end of the cartridge case that, when struck by the firing pin, explodes to ignite the propellant.

pump-action A type of weapon operation in which the firer manually pumps the fore-end to load and cock the weapon. Although some pump-action rifles are made for sporting purposes, pump action is generally used only in shotguns.

receiver The main body of a firearm, containing the bolt assembly and providing the frame for the weapon's mechanical operation.

recoil operation A type of semi- or automatic operation in which the blast from the firing cartridge blows back both the bolt and the barrel, which are locked together. Their movement unlocks them once the gas pressure in the chamber is safe, whereupon the firing cycle is continued by the bolt, moving under inertia.

reticle The visual image that indicates aim point within a scope or electro-optical sight. The reticle is often called a cross-hair, although many are not cross-shaped.

return spring The mechanical component in a semi- or automatic weapon that cushions the rearward movement of the bolt, then forces it to return forward.

revolver A type of pistol in which the ammunition is carried in and fired from a cylinder, which rotates to align each cartridge to the barrel for firing.

roller-locked bolt

A type of mechanism for locking a breech, in which a pair of rollers prevent the bolt from moving rearward until the bolt carrier is clear, by which time gas pressure within the chamber is at a safe level.

rotating bolt

A type of mechanism for locking a breech, in which a set of teeth set along the bolt face prevent the bolt from moving rearward until rotated by the bolt carrier, by which time gas pressure within the chamber is at a safe level.

safety

A device which interferes with the mechanism of a weapon, preventing accidental firing. Safeties may be manual (operated by a lever or switch on the weapon) or internal (disengaged automatically when and only when the trigger is pulled). Some weapons feature grip or trigger safeties, which prevent firing except when the weapon is properly held.

scope

see *optical sight*

selective fire

Operational design which allows the user to choose single shots or automatic fire, and sometimes three-round bursts.

semi-automatic

A weapon that fires one bullet for every pull of the trigger, automatically loading and cocking itself after each shot.

shot ammunition

Any type of ammunition that fires multiple non-ballistic projectiles from each cartridge. Shot ammunition is only made for shotguns.

shot diverter

see *choke*

silenced weapon

A weapon that prevents both bullet and propellant gasses from leaving the weapon at supersonic speeds, thus eliminating all but the mechanical noises of the weapon. Some silenced weapons are designed to fire normal ammunition, while others require the use of subsonic rounds.

silencer

A device which, when fitted to the muzzle of a weapon, reduces the velocity of fired bullets and propellant gasses to below the speed of sound, eliminating or reducing all but the mechanical noises of firing. Silencers reduce bullet accuracy and range as well as velocity, and, unlike most weapons with built-in silencers, require replacement of some internal parts after a limited number of firings. Because the gap between cylinder and barrel allows some supersonic gasses to escape, a silencer will not quiet a revolver.

single action

Mechanical operation that requires the firer to cock the weapon manually.

slide

The top portion of most autoloading pistols, which encloses the barrel and acts as the bolt and/or bolt carrier.

slug ammunition

A type of shotgun cartridge that fires a single semi-ballistic projectile.

speed loader

A device for rapidly reloading a revolver, which holds six cartridges in position so that they may all be inserted at once into the cylinder.

subsonic ammunition

Any cartridge with a reduced propellant charge, so that the bullet does not achieve supersonic speed.

suppressor A device which, when fitted to the muzzle of a weapon, traps propellant gasses and reduces their speed to below that of sound. This eliminates the weapon's muzzle report, but does not affect the supersonic crack of the bullet (although a subsonic round will fire silently). Because the gap between cylinder and barrel allows some supersonic gasses to escape, a suppressor will not quiet a revolver.

telescopic sight An optical sight with image magnification. Most telescopic sights have a fixed degree of magnification, while some can zoom from low to high magnification.

three-round burst A selective-fire option on some automatic weapons, which fires three cartridges for every one pull of the trigger.

tracer ammunition Ammunition in which the bullet contains a tiny flare at its rear that burns in flight, allowing the firer to see the bullet's path.

tube The electronic component in an electro-optical scope that enhances incoming light.

two-stage trigger A trigger mechanism that allows selective-fire control based on how far back the trigger is pulled. Typically, the weapon fires one round when the trigger is pulled to a point, then automatically if it is pulled further.

zero Precise alignment between a weapon's bore and its sights or sighting device. Any sighting device must be zeroed to a weapon upon attachment, or the weapon will not fire accurately. Zero can change from user to user.

Weapons in Use

Nation	Organization	Primary weapons
Angola	Army	RSA Tokarev TT-33 (pistol), RSA AKM (AR), RSA PKM, DShKM (MGs)
Argentina	Army	FN Browning HP (pistol), FN FAL (AR), FN MAG, M2HB (MGs)
Australia	Army	FN Browning HP (pistol), Colt M16A1, Steyr AUG (ARs), Colt M16 LMG, FN Minimi, FN M2HB (MGs)
	SAS (army special ops)	FN Browning HP (pistol), Colt M16A1 (AR), Saco M60 (MG)
Austria	Army	Glock 17 (pistol), Steyr AUG (AR), Rheinmetall MG49/52, FN M2HB (MGs), Steyr SSG 69 (rifle)
	Typical local police	Steyr GB (pistol)
Brazil	Army	Beretta 92 (pistol), HK G3A3, G33E (ARs), Beretta 12S, Walther MPK (SMGs), FN MAG, M2HB (MGs)
	Special Forces	Beretta 92 (pistol), HK G33E (AR), Colt M16A2 LMG (MG)
Canada	Army	FN Browning HP (pistol), Colt M16A2 (AR), Colt M16A2 LMG, FN M2HB (MGs)
	Special Service Force (army special ops)	Beretta 92 (pistol), Colt M16A2, M16 Commando (ARs), FN Minimi (MG)
Colombia	Army	FN Browning HP (pistol), HK G3A3 (AR), Walther MPK (SMG)
	GOES (CT)	(pistols vary), IMI Uzi (SMG)
El Salvador	Army	Colt M16A1, HK G3A3 (ARs), Colt M16A2 LMG (MG)
France	Army	MAB PA15 (pistol), GIAT FA-MAS (AR), FN M2HB (MG), GIAT FR-F2 (rifle)
	GIGN (CT)	Manhurin MR73 (pistol), HK MP5SD, MP5K, IMI Uzi (SMGs), FR-F2 (rifle)
	Legion Etrangere (army)	MAB PA15 (pistol), GIAT FA-MAS, FA-MAS Commando (ARs)
	Typical local police	Beretta 84, Manhurin MR73, or Walther PP (pistols)
Germany	Army	HK P7 (pistol), HK G3A3 (AR), IMI Uzi (SMG), Rheinmetall MG3 (MG)
	GSG9 (CT)	(pistols vary), HK MP5, MP5SD (SMGs), G3 SG/1 (rifle)
	Typical local police	HK P7, SIG-Sauer P220, or Walther PPK (pistols), Walther MPL (SMG), HK G3 SG/1 (rifle)
India	Army	FN Browning HP (pistol), FN FAL (AR), Sterling L2A3 (SMG), FN MAG (MG)
Iran	Army	Colt M1911A1 (pistol), HK G3A3 (AR), IMI Uzi (SMG), FN M2HB, Rheinmetall MG49/52 (MGs)
Israel	Army	Beretta 92 (pistol), Colt M16A2, IMI Galil ARM (ARs), IMI Uzi (SMG), FN MAG, IMI Negev (MGs), IMI Galil Sniper (rifle)
Italy	Army	Beretta 92 (pistol), Beretta 12S (SMG), Beretta AR70/90 (AR), FN Minimi, Rheinmetall MG 49/52 (MGs)
	NOCS "leatherheads" (CT)	Beretta 92 (pistol), Beretta M12S (SMG), Franchi SPAS-12 (shotgun)
	Special Forces (army)	Beretta 92 (pistol), Beretta AR70 (AR), Beretta 93R (SMG)
	Typical local police	Beretta 81 or 84 (pistols)
Jordan	Army	FN Browning HP (pistol), Beretta AR70, HK G33E (ARs), Saco M60 (MG)
	Special Forces (army)	FN Browning HP (pistol), Colt M16A1 (AR), Saco M60 (MG)
Mexico	Army	Colt M1911A1 (pistol), Colt M16A1 (AR), CETME Ameli, HK 21E (MGs)
Nigeria	Army	Walther P5 (pistol), HK G3A3 (AR), Beretta 12S, CZ 61 Skorpion (SMGs)
Peru	Army	Star 30M (pistol), FN FAL (AR), FN MAG (MG)

Weapons in Use

Nation	Organization	Primary weapons
Portugal	Army	Walther P5 (pistol), HK G3A3 (AR), MAC Ingram M10 (SMG), FN M2HB, HK 21E, Rheinmetall MG49/52 (MGs)
Russia	Army	RSA Makarov (pistol), RSA AK-74 (AR), RSA PKM, NSV (MGs), RSA Druganov SVD (rifle)
	Spetsnaz (army special ops)	RSA P6 (pistol), RSA AKSU (SMG)
	Typical local police	RSA PSM (pistol)
South Africa	Army	Beretta 92 (pistol), Galil ARM (AR), FN MAG (MG)
	Recon Commandos (army special ops)	Beretta 92 (pistol), Beretta AR70 (AR)
Spain	Army	Llama M82, Star 30M (pistols), CETME L (AR), Star Z84 (SMG), CETME Ameli, FN M2HB (MGs)
Switzerland	Army	SIG-Sauer P220 (pistol), SIG SG 550 (AR)
	Typical local police	SIG-Sauer P230 (pistol)
Thailand	Army	FN Browning HP (pistol), HK G33E (AR), IMI Uzi (SMG), Saco M60, FN M2HB (MGs)
	Special Forces (army)	Beretta 92 (pistol), Colt M16A2 (AR), Saco M60 (MG)
U. K.	Army	FN Browning HP (pistol), RSAF L85A1 (AR), Sterling L2A3, L34A1 (SMGs), RSAF L86A1 (MG), AI L96A1 (rifle)
	SAS (army special ops, CT)	FN BDA 9 (pistol), RSAF L85A1 (AR), HK MP5, MP5SD (SMG), AI PM (rifle), Beneili 121 M1 (shotgun)
	SBS (Marine special ops)	FN Browning HP (pistol), Colt M16A2 (AR), Sterling L34A1 (SMG)
U. S.	Army	Beretta 92F (pistol), Colt M16A2 (AR), FN Minimi, M2HB, Saco M60 (MGs), Remington M24 (rifle)
	Customs Service	SIG P225 (pistol), Steyr AUG Para (SMG), Steyr AUG (AR)
	Delta (army CT)	(pistols vary), Colt M16A2 (AR), Saco M60E1, HK 21 (MGs)
	Drug Enforcement Administration	SIG P225 (pistol), Colt 9mm (SMG)
	FBI	S&W 1076 (pistol)
	Marine Corps	Beretta 92F (pistol), Colt M16A2 (AR), Saco M60E3 (MG), Remington M700 (rifle), Remington M870 (shotgun)
	SEALs (navy special ops)	Beretta 92F, S&W Mk22 Mod 0 (pistols), Colt M16A2 (AR), HK MP5SD (SMG), Saco M60 (MG)
	Secret Service	SIG-Sauer P225 (pistol), IMI Uzi, MAC Ingram M10 (SMGs)
	SOCOM (army special ops)	Beretta 92F (pistol), Colt M16 Commando (AR), HK MP5K (SMG), Barret M82 (rifle)
	Typical local police	Beretta 92, Glock 17, S&W 10M&P (pistols), Colt M16A1 (AR), HK MP5 (SMG), Mossberg 500, Remington 870 (shotguns)

Note:

Many of the weapons listed on this table are domestically produced under license or as copies. Domestic versions may have minor cosmetic or feature differences, and often go by different local names.

Millennium's End Game Stats

Pistols

	Subskill Used	Speed	IA	Fire rate	Hands req'd	Eff. range	Action	Magazine	Ammunition
Pocket and Compact Autoloaders									
Astra A-60 .32	smallarm	0	14	4	1	45	semi	12 box	.32in ACP
Astra A-60 .380	smallarm	0	14	4	1	50	semi	13 box	.380in Auto
Beretta 81BB, 81	smallarm	0	13	4	1	45	semi	12 box	.32in ACP
Beretta 82BB	smallarm	0	13	4	1	45	semi	9 box	.32in ACP
Beretta 84F, 84, 84BB	smallarm	0	13	4	1	50	semi	13 box	.380in Auto
Beretta 85F, 85BB	smallarm	0	13	4	1	50	semi	8 box	.380in Auto
Beretta 92FS C, 92F C	smallarm	0	14	4	1	50	semi	13 box	9mm Para.
Beretta 92 F-M	smallarm	0	14	4	1	50	semi	8 box	9mm Para.
Beretta 950	smallarm	0	12	4	1	30	semi	8 box	.25in ACP
FN BDA 9C	smallarm	0	14	4	1	50	semi	7 box	9mm Para.
LaFrance Nova	smallarm	0	16	4	1	40	semi	6 box	9mm Para.
RSA PSM	smallarm	0	14	4	1	40	semi	8 box	5.45mm PSM
S&W 3913, 3914	smallarm	0	14	4	1	50	semi	8 box	9mm Para.
S&W 6904, 6906	smallarm	0	14	4	1	50	semi	12 box	9mm Para.
SIG-Sauer P228	smallarm	0	14	4	1	45	semi	13 box	9mm Para.
SIG-Sauer P230 .32	smallarm	0	14	4	1	45	semi	8 box	.32in ACP
SIG-Sauer P230 .380	smallarm	0	14	4	1	50	semi	7 box	.380in Auto
SITES M9 Resolver	smallarm	0	13	4	1	45	semi	9 box	9mm Para.
SITES M40 Resolver	smallarm	0	13	4	1	50	semi	9 box	.40in S&W
SITES M380 Resolver	smallarm	0	12	4	1	50	semi	8 box	.380in Auto
Star Firestar	smallarm	0	15	4	1	50	semi	7 box	9mm Para.
Tanfoglio Baby	smallarm	0	16	4	1	50	semi	12 box	9mm Para.
Walther P5 Compact	smallarm	0	13	4	1	50	semi	8 box	9mm Para.
Walther P-88 Compact	smallarm	0	14	4	1	50	semi	14 box	9mm Para.
Walther PP .22	smallarm	0	14	4	1	45	semi	8 box	.22in LR
Walther PP .25	smallarm	0	14	4	1	35	semi	8 box	.25in ACP
Walther PP .32	smallarm	0	14	4	1	45	semi	8 box	.32in ACP
Walther PP .380	smallarm	0	14	4	1	50	semi	8 box	.380in Auto
Walther PPK .22	smallarm	0	14	4	1	40	semi	7 box	.22in LR
Walther PPK .25	smallarm	0	14	4	1	30	semi	7 box	.25in ACP
Walther PPK .32	smallarm	0	14	4	1	45	semi	7 box	.32in ACP
Walther PPK .380	smallarm	0	14	4	1	50	semi	7 box	.380in Auto
Mid-sized Autoloaders									
Astra A-80, A-90, A-100 9mm	smallarm	0	14	4	1	50	semi	15 box	9mm Para.
Astra A-80, A-90, A-100 .45	smallarm	0	14	4	1	50	semi	8 box	.45in ACP
Beretta 92FS, et al	smallarm	1	14	4	1	75	semi	15 box	9mm Para.
Bernardelli P-018	smallarm	0	15	4	1	50	semi	16 box	9mm Para.
Browning High-power Mark 3S	smallarm	0	14	4	1	50	semi	13 box	9mm Para.
Calico M950	smallarm	2	16	4	1	75	semi	50 box	9mm Para.
Colt 2000	smallarm	0	14	4	1	50	semi	15 box	9mm Para.
Colt Delta Elite	smallarm	0	14	4	1	60	semi	7 box	10mm

Millennium's End Game Stats

Pistols (cont.)

	Subskill Used	Speed	IA	Fire rate	Hands req'd	Eff. range	Action	Magazine	Ammunition
Colt Double Eagle 9mm	smallarm	1	14	4	1	50	semi	9 box	9mm Para.
Colt Double Eagle 10mm	smallarm	1	14	4	1	60	semi	8 box	10mm
Colt Double Eagle .45	smallarm	1	14	4	1	50	semi	8 box	.45in ACP
Colt M1911A1	smallarm	1	15	4	1	50	semi	8 box	.45in ACP
CZ 75, CZ 85	smallarm	0	15	4	1	45	semi	15 box	9mm Para.
FN BDA 9	smallarm	0	15	4	1	50	semi	14 box	9mm Para.
FN High-power Mark 3 et al	smallarm	0	14	4	1	50	semi	13 box	9mm Para.
Glock 17	smallarm	0	16	4	1	60	semi	17 box	9mm Para.
Glock 19	smallarm	0	15	4	1	60	semi	15 box	9mm Para.
Glock 20	smallarm	0	16	4	1	70	semi	15 box	10mm
Glock 21	smallarm	0	16	4	1	50	semi	13 box	.45in ACP
Glock 22	smallarm	0	16	4	1	50	semi	15 box	.40in S&W
Glock 23	smallarm	0	15	4	1	50	semi	13 box	.40in S&W
HK P7K3 .22	smallarm	0	14	4	1	50	semi	8 box	.22in LR
HK P7K3 .380	smallarm	0	14	4	1	50	semi	8 box	.380in Auto
HK P7M8	smallarm	0	14	4	1	50	semi	8 box	9mm Para.
HK P7M10	smallarm	0	14	4	1	50	semi	10 box	.40in S&W
HK P7M13	smallarm	0	14	4	1	50	semi	13 box	9mm Para.
HK P9S, P9 9mm	smallarm	0	14	4	1	50	semi	9 box	9mm Para.
HK P9S, P9 .45	smallarm	0	14	4	1	55	semi	7 box	.45in ACP
HK VP70	smallarm	0	15	4	1	60	semi	18 box	9mm Para.
IMI Baby Eagle 9mm	smallarm	1	16	4	1	50	semi	16 box	9mm Para.
IMI Baby Eagle .40	smallarm	1	16	4	1	50	semi	10 box	.40in S&W
Llama M-82	smallarm	0	14	4	1	50	semi	15 box	9mm Para.
Llama M-87	smallarm	1	16	4	1	60	semi	15 box	9mm Para.
MAB PA15	smallarm	0	15	4	1	50	semi	15 box	9mm Para.
RSA Makarov PM	smallarm	0	14	4	1	50	semi	8 box	9x18mm R
RSA Tokarev TT-30	smallarm	0	13	4	1	50	semi	8 box	7.62x26mm R
Ruger P85 Mark II	smallarm	0	14	4	1	50	semi	15 box	9mm Para.
S&W 1006	smallarm	0	14	4	1	50	semi	9 box	10mm
S&W 1066, 1076	smallarm	0	13	4	1	60	semi	9 box	10mm
S&W 4006	smallarm	1	14	4	1	50	semi	11 box	.40in S&W
S&W 4506	smallarm	1	15	4	1	55	semi	8 box	.45in ACP
S&W 4516	smallarm	0	14	4	1	50	semi	7 box	.45in ACP
S&W 4566	smallarm	1	14	4	1	50	semi	8 box	.45in ACP
S&W 5903, 5904, 5906	smallarm	0	14	4	1	50	semi	14 box	9mm Para.
SIG-Sauer P220	smallarm	0	15	4	1	45	semi	9 box	9mm Para.
SIG-Sauer P225	smallarm	0	15	4	1	50	semi	8 box	9mm Para.
SIG-Sauer P226	smallarm	0	15	4	1	50	semi	15 box	9mm Para.
Star 30M, 30 PK	smallarm	0	17	4	1	60	semi	15 box	9mm Para.
Steyr GB	smallarm	0	17	4	1	50	semi	18 box	9mm Para.
Steyr SPP	smallarm	1	16	4	1	50	semi	15 box	9mm Para.
Tanfoglio TA90	smallarm	0	14	4	1	50	semi	15 box	9mm Para.
Walther P5	smallarm	0	14	4	1	50	semi	8 box	9mm Para.
Walther P-88	smallarm	0	14	4	1	45	semi	15 box	9mm Para.

Pistols (cont.)

	Subskill Used	Speed	IA	Fire rate	Hands req'd	Eff. range	Action	Magazine	Ammunition
Magnum Autoloaders									
IMI Baby Eagle .41	smallarm	1	16	4	1	70	semi	11 box	.41in AE
IMI Desert Eagle .357	smallarm	2	17	4	1	75	semi	10 box	.357in Mag.
IMI Desert Eagle .44	smallarm	2	17	4	1	70	semi	9 box	.44in Mag.
IMI Desert Eagle .50	smallarm	2	19	4	1	75	semi	8 box	.50in AE
Tanfoglio GT41	smallarm	0	14	4	1	70	semi	11 box	.41in AE
Mid-sized Revolvers									
Colt Agent	smallarm	0	12	3	1	60	rev	6 cyl	.38in Special
Colt Python .38	smallarm	1	16	3	1	60	rev	6 cyl	.38in Special
Manhurin MR73 .38	smallarm	0	12	3	1	60	rev	6 cyl	.38in Special
Ruger Speed-Six	smallarm	0	14	3	1	60	rev	6 cyl	.38in Special
S&W 10 M&P	smallarm	1	14	3	1	60	rev	6 cyl	.38in Special
Magnum Revolvers									
Colt Python .357	smallarm	1	16	3	1	75	rev	6 cyl	.357in Mag.
Manhurin MR73 .357	smallarm	0	12	3	1	65	rev	6 cyl	.357in Mag.
Ruger Security-Six, Service-Six	smallarm	0	14	3	1	70	rev	6 cyl	.357in Mag.
S&W 19	smallarm	1	14	3	1	70	rev	6 cyl	.357in Mag.
S&W 29	smallarm	2	16	3	1	70	rev	6 cyl	.44in Mag.
Silenced Pistols									
LaFrance Colt .45 Silenced	smallarm	3	14	4	1	55	semi	7 box	.45in ACP
LEI Mark 2	smallarm	1	16	4	1	40	semi	10 box	.22in LR
S&W Mk 22 Mod 0 Hush Puppy	smallarm	1	14	4	1	40	semi	8 box	9mm Para.
RSA P6	smallarm	1	14	4	1	40	semi	8 box	9x18mm R

Millennium's End Game Stats

Submachineguns

	Subskill Used	Speed	IA	Fire rate	Hands req'd	Eff. range	Action	Magazine	Ammunition
LSMGs/Machine Pistols									
Beretta 93-R	smallarm/auto	2	15	4/18	1	70	auto	20 box	9mm Para.
Bushman IDW	smallarm/auto	7	18	4/8[1]	1	60	auto	32 box	9mm Para.
Bushman IDW 10mm	smallarm/auto	7	18	4/8[1]	1	70	auto	32 box	10 mm
Bushman IDW .41inAE	smallarm/auto	7	18	4/8[1]	1	70	auto	32 box	.41in AE
CZ Model 61 Skorpion	smallarm/auto	4	14	4/14	1	80	auto	10 box	.32in ACP
CZ Model 63 Skorpion	smallarm/auto	4	14	4/14	1	90	auto	10 box	.380in Auto
CZ Model 68 Skorpion	smallarm/auto	4	14	4/14	1	110	auto	10 box	9mm Para.
Glock 18	smallarm/auto	0	15	4/22	1	55	auto	17 box	9mm Para.
HK MP5K, MP5KA4	smallarm/auto	4	16	4/15	1	125	auto/3[2]	30 box	9mm Para.
HK MP5KA1, MP5KA5	smallarm/auto	4	12	4/15	1	125	auto/3[2]	30 box	9mm Para.
IMI Micro-Uzi	smallarm/auto	3	14	4/21	1	80	auto	20 box	9mm Para.
IMI Micro-Uzi .45	smallarm/auto	3	14	4/21	1	80	auto	16 box	.45in ACP
MAC Ingram M11	smallarm/auto	3	13	4/20	1	60	auto	16 box	.380in Auto
Steyr TMP	smallarm/auto	1	16	4/8	1	60	auto	25 box	9mm Para.
Steyr TMP 10mm	smallarm/auto	1	16	4/8	1	70	auto	25 box	10mm
Steyr TMP .41	smallarm/auto	1	16	4/8	1	70	auto	25 box	.41inAE
Mid-Sized Submachineguns									
ARES Folding	smallarm/auto	5	16	4/11	2	140	auto	32 box	9mm Para.
Armscor BXP	smallarm/auto	6	22	4/18	2	140	auto	32 box	9mm Para.
Beretta Model 12, 12S	smallarm/auto	9	19	4/9	2	150	auto	32 box	9mm Para.
Calico M960A	smallarm/auto	6	22	4/11[3]	2	150	auto	50 box	9mm Para.
Colt 9mm	smallarm/auto	6	24	4/15	2	200	auto	20 box	9mm Para.
FAMAE	smallarm/auto	9	21	4/14	2	150	auto/3[2]	30 box	9mm Para.
HK MP5A5 et al	smallarm/auto	6	24	4/13	2	175	auto/3[2]	30 box	9mm Para.
HK MP5 PDW (unsilenced)	smallarm/auto	6	21	4/15	2	125	auto/3[2]	30 box	9mm Para.
HK MP5/10	smallarm/auto	6	24	4/17	2	180	auto/3[2]	30 box	10mm
HK MP5/40	smallarm/auto	6	24	4/16	2	160	auto/3[2]	30 box	.40in S&W
HK MP2000 (unsilenced)	smallarm/auto	6	22	4/15	2	150	auto/3[2]	30 box	9mm Para.
IMI Mini-Uzi	smallarm/auto	6	15	4/16	1	120	auto	20 box	9mm Para.
IMI Mini-Uzi .45	smallarm/auto	6	15	4/16	1	90	auto	16 box	.45in ACP
IMI Uzi	smallarm/auto	8	22	4/10	2	150	auto	20 box	9mm Para.
IMI Uzi .45	smallarm/auto	8	22	4/10	2	100	auto	16 box	.45in ACP
Intratec TEC-9	smallarm/auto	2	19	4/15	2	120	auto	20 box	9mm Para.
JATI Matic	smallarm/auto	3	21	4/10	2	150	auto	20 box	9mm Para.
MAC Ingram M10	smallarm/auto	6	15	4/18	1	120	auto	32 box	9mm Para.
MAC Ingram M10 .45	smallarm/auto	8	15	4/18	1	90	auto	32 box	.45in ACP
SITES M-4 Spectre	smallarm/auto	7	21	4/14	2	150	auto	50 box	9mm Para.
Star Z-84	smallarm/auto	8	23	4/10	2	150	auto	30 box	9mm Para.
Sterling L2A3 et al	smallarm/auto	7	23	4/9	2	150	auto	34 box	9mm Para.
Steyr AUG 9mm Para	smallarm/auto	8	27	4/12	2	200	auto	32 box	9mm Para.

Millennium's End Game Stats

Submachineguns (cont.)

	Subskill Used	Speed	IA	Fire rate	Hands req'd	Eff. range	Action	Magazine	Ammunition
Steyr MPi 69	smallarm/auto	9	22	4/9	2	150	auto	32 box	9mm Para.
Steyr MPi 81	smallarm/auto	9	22	4/12	2	150	auto	32 box	9mm Para.
Walther MPK	smallarm/auto	7	21	4/8	2	120	auto	32 box	9mm Para.
Walther MPL	smallarm/auto	8	22	4/8	2	140	auto	32 box	9mm Para.
Weaver PKS-9 Ultralight	smallarm/auto	7	21	4/17	2	150	auto	30 box	9mm Para.
Heavy Submachineguns									
FN P90	smallarm/auto	6	25	4/15	2	250	auto	50 box	5.7mm
HK MP 53	smallarm/auto	8	24	4/12	2	220	auto/3[2]	25 box	5.56mm
RSA AKSU-74	smallarm/auto	7	21	4/13	2	200	auto	30 box	5.45mm
Silenced Submachineguns									
CNI Type 64	smallarm/auto	9	22	4/17	2	90	auto	30 box	7.62X26mm R
HK MP5 PDW	smallarm/auto	8	21	4/15	2	80	auto/3[2]	30 box	9mm Para.
HK MP5SD1, MP5SD4	smallarm/auto	7	23	4/13	2	120	auto/3[2]	30 box	9mm Para.
HK MP5SD2, SD3, SD5, SD6	smallarm/auto	9	23	4/13	2	120	auto/3[2]	30 box	9mm Para.
HK MP2000 (silenced)	smallarm/auto	9	22	4/15	2	100	auto/3[2]	30 box	9mm Para.
KAC Colt 9mm Suppressed	smallarm/auto	9	23	4/15	2	140	auto	20 box	9mm Para.
Sterling L34A1	smallarm/auto	9	22	4/9	2	80	auto	34 box	9mm Para.
Steyr MPi 69 (silenced)	smallarm/auto	9	22	4/9	2	80	auto	32 box	9mm Para.
Steyr MPi 81 (silenced)	smallarm/auto	9	22	4/12	2	80	auto	32 box	9mm Para.

Assault Rifles

4.7mm ARs

HK G11	longarm/auto	8	28	4/10	2	400	auto/3[1]	50 box	4.7mm C

5.45mmR ARs

RSA AK-74, AKS-74	longarm/auto	9	24	4/11	2	300	auto	30 box	5.45mm R

Compact 5.56mm ARs

Beretta SC70 Short	longarm/auto	8	25	4/11	2	320	auto	30 box	5.56mm
Beretta SCS 70/90	longarm/auto	9	25	4/11	2	320	auto/3[2]	30 box	5.56mm
CETME LC	longarm/auto	9	25	4/13	2	280	auto	30 box	5.56mm
Colt M4 Carbine	longarm/auto	8	25	4/14	2	350	auto	30 box	5.56mm
Colt M16 Commando	longarm/auto	6	24	4/14	2	320	auto	30 box	5.56mm
GIAT FA-MAS Commando	longarm/auto	8	24	4/16	2	350	auto/3[2]	25 box	5.56mm
HK G33K	longarm/auto	9	25	4/12	2	320	auto/3[3]	25 box	5.56mm
HK G41K	longarm/auto	9	25	4/14	2	320	auto/3[3]	30 box	5.56mm
IMI Galil SAR	longarm/auto	9	25	4/11	2	280	auto	35 box	5.56mm
SIG SG 551	longarm/auto	9	25	4/12	2	350	auto/3[3]	30 box	5.56mm
Steyr AUG Carbine	longarm/auto	8	26	4/11	2	350	auto/3[2]	30 box	5.56mm

Millennium's End Game Stats

Assault Rifles (cont.)

	Subskill Used	Speed	IA	Fire rate	Hands req'd	Eff. range	Action	Magazine	Ammunition
Standard 5.56mm ARs									
Beretta AR70, SC70	longarm/auto	9	26	4/11	2	350	auto	30 box	5.56mm
Beretta AR70/90, SC70/90	longarm/auto	10	26	4/11	2	350	auto/3[2]	30 box	5.56mm
CETME L	longarm/auto	9	25	4/12	2	320	auto	30 box	5.56mm
CIS SR 88	longarm/auto	10	26	4/13	2	350	auto/3[2]	30 box	5.56mm
Colt M16A1	longarm/auto	10	26	4/13	2	350	auto	30 box	5.56mm
Colt M16A2	longarm/auto	10	26	4	2	350	3-rnd[4]	30 box	5.56mm
FN FNC	longarm/auto	10	26	4/11	2	350	auto	30 box	5.56mm
GIAT FA-MAS	longarm/auto	8	25	4/16	2	350	auto/3[2]	25 box	5.56mm
HK G33E	longarm/auto	9	25	4/13	2	350	auto/3[3]	25 box	5.56mm
HK G41E	longarm/auto	10	26	4/14	2	350	auto/3[3]	30 box	5.56mm
IMI Galil ARM	longarm/auto	9	26	4/11	2	300	auto	35 box	5.56mm
RSAF L85A1	longarm/auto	8	29	4/12	2	350	auto	30 box	5.56mm
SIG SG 540	longarm/auto	9	26	4/12	2	400	auto/3[3]	30 box	5.56mm
SIG SG 550	longarm/auto	10	27	4/12	2	350	auto/3[3]	30 box	5.56mm
Steyr AUG	longarm/auto	8	27	4/11	2	350	auto/3[2]	30 box	5.56mm
7.62x39mmR ARs									
RSA AKM et al	longarm/auto	9	23	4/10	2	300	auto	30 box	7.62x39mm R
7.62mm ARs									
CETME C	longarm/auto	10	26	4/10	2	600	auto	20 box	7.62mm
FN-FAL, L1A1	longarm/auto	10	27	4/12	2	650	auto	20 box	7.62mm
HK G3A3, G3A4	longarm/auto	10	26	4/9	2	600	auto	20 box	7.62mm
HK G3K	longarm/auto	9	25	4/9	2	550	auto	20 box	7.62mm

Submachinegun notes:

[1] This weapon has a variable rate of fire, which can be set by the user from 1 to 20 rounds per turn.

[2] This weapon allows single shots, three-round bursts, and full-auto fire.

[3] This weapon offers a variable rate of fire, from 1 to 25 rounds per turn. The fire rate must be set by the manufacturer.

Assault Rifle notes:

[1] This weapon allows single shots, three-round bursts, and full-auto fire. It employs a special buffer that allows all three shots in a burst to be fired with no recoil penalty.

[2] This weapon can be modified to allow single shots and three-round bursts, or single shots and full-auto fire.

[3] This weapon allows single shots, three-round bursts, and full-auto fire.

[4] This weapon fires single shots and three-round bursts only.

Millennium's End Game Stats

Rifles

	Subskill Used	Speed	IA	Fire rate	Hands req'd	Eff. range	Action	Magazine	Ammunition
5.56mm Bolt-Action Rifles									
Remington Model 700 5.56	longarm	9	29	1	2	500	bolt	6 int	5.56mm
7.62mm Bolt-Action Rifles									
AI PM, L96A1	longarm	10	30	1	2	800	bolt	10 box	7.62mm
Beretta Sniper	longarm	10	28	1	2	800	bolt	5 box	7.62mm
GIAT FR-F2, FR-F1	longarm	10	29	1	2	800	bolt	10 box	7.62mm
Grendel SRT	longarm	8	28	1	2	800	bolt	9 box	7.62mm
Parker-Hale Model 85	longarm	10	31	1	2	850	bolt	10 box	7.62mm
Remington M24	longarm	10	30	1	2	800	bolt	6 int	7.62mm
Remington Model 700 7.62	longarm	9	29	1	2	800	bolt	5 int	7.62mm
Steyr SSG 69, SSG-P	longarm	10	30	1	2	850	bolt	5 box	7.62mm
.50in Browning Bolt-Action Rifles									
Barrett Model 90	longarm	10	30	1	2	1200	bolt	5 box	.50in B
Technika Top Gun	longarm	10	33	1	2	1200	bolt	0	12.7x107mm R
5.56mm Semi-Automatic Rifles									
Ruger Mini-14	longarm	6	26	4	2	550	semi	10 box	5.56mm
SIG SSG 550	longarm	10	30	4	2	500	semi	20 box	5.56mm
7.62mm Semi-Automatic Rifles									
HK G3 SG/1	longarm/auto	10	28	4/9	2	750	auto	20 box	7.62mm
HK MSG 90	longarm	10	30	4	2	750	semi	5 box	7.62mm
HK PSG 1	longarm	10	32	4	2	750	semi	0[1]	7.62mm
IMI Galil Sniper	longarm	10	28	4	2	750	semi	20 box	7.62mm
RSA Druganov SVD	longarm	10	32	4	2	800	semi	10 box	7.62x54mm R
Springfield M21	longarm	10	29	4	2	850	semi	20 box	7.62mm
Walther WA 2000	longarm	10	33	4	2	850	semi	6 box	7.62mm
.50in Browning Semi-Automatic Rifles									
Barrett Model 82A1	longarm	11	32	4	2	1200	semi	11 box	.50in B
Barrett Model 82A2	longarm	10	31	4	2	1200	semi	11 box	.50in B
Steyr AMR	longarm	10	32	4	2	1200	semi	5 box	15mm
Technika Destroyer	longarm	11	32	4	2	1200	semi	10 box	12.7x107mm R
Silenced Rifles									
AI Covert	longarm	10	30	1	2	200	bolt	10 box	7.62mm[2]
LEI DeLisle Mark 3	longarm	10	25	1	2	80	bolt	4 box	.45in ACP
LEI DeLisle Mark 4	longarm	10	27	1	2	200	bolt	4 box	7.62mm[2]
Steyr SSG-P Silenced	longarm	10	30	1	2	200	bolt	5 box	7.62mm[2]
Parker-Hale Mod. 85 (silenced)	longarm	10	31	1	2	850	bolt	10 box	7.62mm[2]

Millennium's End Game Stats

Shotguns

	Subskill Used	Speed	IA	Fire rate	Hands req'd	Eff. range	Action	Magazine	Ammunition
Pump Shotguns									
Beretta RS200P	longarm	9	17	1	2	140	pump	6 int	12-ga
Beretta RS202-M1, M2	longarm	9	22	1	2	140	pump	6 int	12-ga
Bernardelli B4/B	longarm	8	20	1	2	100	pump	5 box	12-ga
Ceiner Ultimate	longarm	11[1]	19	1	2	70	pump	5 int	12-ga
Mossberg 500 ATP6	longarm	9	18	1	2	110	pump	6 int	12-ga
Mossberg 500 ATP6C	longarm	7	18	1	2	110	pump	6 int	12-ga
Mossberg 500 ATP8	longarm	10	18	1	2	130	pump	8 int	12-ga
Mossberg 500 ATP8C	longarm	8	18	1	2	130	pump	8 int	12-ga
Remington 870 P, M870 Mk1	longarm	10	21	1	2	140	pump	7 int	12-ga
Remington 870	longarm	10	21	1	2	140	pump	5 int	12-ga
Winchester 1300 Defender	longarm	9	16	1	2	100	pump	7 int	12-ga
Winchester 1300 Marine	longarm	10	16	1	2	100	pump	6 int	12-ga
Semi-Automatic Shotguns									
Benelli 121 M1	longarm	10	20	4	2	120	semi	7 int	12-ga
Benelli M1 Super 90	longarm	10	21	4	2	120	semi	7 int	12-ga
Beretta 1201 FP3	longarm	8	21	4	2	130	semi	6 int	12-ga
Beretta M3P	longarm	10	21	4	2	100	semi	5 box	12-ga
Bernardelli B4	longarm	9	20	4	2	100	semi	5 box	12-ga
Franchi SPAS-12	longarm	9	20	4	2	100	semi	7 int	12-ga
Franchi SPAS-15, SPAS-15 MIL	longarm	9	19	4	2	90	semi	6 box	12-ga
HK 512	longarm	10	20	4	2	100	semi	7 int	12-ga
Automatic Shotguns									
Daewoo USAS-12	longarm/auto	10	19	4/5	2	100	auto	12 box	12-ga
Pancor Jackhammer	longarm/auto	8	21	4/5	2	130	auto	10 box	12-ga

Rifle notes:

[1] This weapon can be modified to accept a five-round magazine.

[2] For truly silent operation, this weapon must use subsonic ammunition.

Shotgun notes:

[1] This weapon must be attached to an M16 assault rifle. The speed shown here is the combined value for the two weapons together.

Millennium's End Game Stats

Machineguns

	Subskill Used	Speed	IA	Fire rate	Hands req'd	Eff. range	Action	Magazine	Ammunition
5.56mm Machineguns									
CETME Ameli	autofire	10	24	14	2	400	auto[1]	belt	5.56mm
CIS Ultimax 100	autofire	10	25	9	2	400	auto[1]	100 box	5.56mm
Colt M16A2 LMG	autofire	10	26	11	2	400	auto[1]	30 box	5.56mm
FN Minimi	autofire	10	25	15	2	400	auto[1]	belt/30[2]	5.56mm
FN Minimi Para	autofire	9	24	15	2	400	auto[1]	belt/30[2]	5.56mm
HK 23E	autofire	10	25	13	2	400	auto/3[3]	belt	5.56mm
IMI Negev	autofire	10	25	12	2	400	auto	belt/30[2]	5.56mm
IMI Negev Short	autofire	9	24	12	2	400	auto	belt/30[2]	5.56mm
RSAF L86A1	autofire	8	29	13	2	400	auto	30 box	5.56mm
Steyr AUG HBAR	autofire	8	28	11	2	400	auto	42 box	5.56mm
7.62mm R Machineguns									
RSA PKM	autofire	10	27	12	2	400	auto[1]	belt	7.62mm R
7.62mm Machineguns									
FN MAG	autofire	10	26	14	2	750	auto[1]	belt	7.62mm
HK 21E	autofire	10	26	13	2	750	auto/3[3]	belt	7.62mm
Rheinmetall MG42/59, MG3	autofire	10	26	17	2	750	auto[1]	belt	7.62mm
Saco M60E1, E3	autofire	10	26	9	2	750	auto[1]	belt	7.62mm
.50in Browning Machineguns									
CIS .50 CIS	autofire	11	29	9	2	1100	auto[1]	belt	.50in B
FN M2HB/QCB	autofire	11	29	8	2	1100	auto[1]	belt	.50in B
12.7mm R Machineguns									
RSA Degtyarev DShKM	autofire	11	29	9	2	1100	auto[1]	belt	12.7mm R
RSA NSV	autofire	11	29	13	2	1100	auto[1]	belt	12.7mm R

Notes:

[1] This weapon has no selective-fire option: it fires on full-auto only.

[2] This weapon can accept a 30-round box magazine as well as belt-feed.

[3] This weapon allows single-shots, three-round bursts, and full-auto fire.

Millennium's End Game Stats

Ammunition

Pistol and Submachinegun Ammuntion

Caliber	Bullet Type	Delivered damage	Silenced damage
5.45x18mm Russian	Ball	14	14
	Hollowpoint	16	16
.22in Long Rifle	Ball	14	14
	Glaser	18	18
	Hollowpoint	16	16
.25in ACP	Ball	14	14
	Glaser	18	18
	Hollowpoint	16	16
.32in ACP	Ball	15	15
	Glaser	19	19
	Hollowpoint	17	17
.380in Auto	Ball	16	16
	Glaser	21	21
	Hollowpoint	18	18
9x18mm Russian	Ball	16	16
	Hollowpoint	18	18
7.62x26mm Russian	Ball	17	16
	Hollowpoint	20	18
9mm Parabellum	AET	21	20
	Armor Piercing	14	14
	Ball/Tracer	17	16
	Glaser	22	21
	Hollowpoint	20	18
.38in Special	Armor Piercing	14	14
	Ball	17	17
	Glaser	22	22
	Hollowpoint	20	20
10mm	AET	22	22
	Armor Piercing	15	15
	Ball	18	18
	Glaser	23	23
	Hollowpoint	21	21
5.7mm FN	Armor Piercing	16	14
	Ball/Tracer	19	14
.357in Magnum	Armor Piercing	16	14
	Ball	18	17
	Glaser	23	22
	Hollowpoint	21	20
.40in S&W	AET	22	22
	Armor Piercing	15	15
	Ball	18	18
	Glaser	23	23
	Hollowpoint	21	21
.41in Action Exp.	AET	24	22
	Armor Piercing	16	15
	Ball	19	18
	Glaser	25	23
	Hollowpoint	22	21
.45in ACP	AET	24	24
	Armor Piercing	16	16
	Ball	19	19
	Glaser	25	25
	Hollowpoint	22	22
.44in Magnum	Armor Piercing	16	15
	Ball	19	18
	Glaser	25	23
	Hollowpoint	22	21
.50in Action Exp.	Ball	20	19
	Glaser	26	25
	Hollowpoint	23	22

Millennium's End Game Stats

Ammunition (cont.)

Rifle, Assault Rifle, and Machinegun Ammuntion

Caliber	Bullet Type	Delivered damage	Silenced damage
5.45x40mm Russian	Armor Piercing	16	14
	Ball/Tracer	19	14
5.56mm	AET	20	17
	Armor Piercing	16	14
	Ball/Tracer	19	14
	Glaser	25	18
	Hollowpoint	22	16
7.62x39mm Russian	Armor Piercing	16	14
	Ball/Tracer	19	16
4.7mm HK Caseless	Armor Piercing	16	14
	Ball	19	14
7.62mm	AET	27	21
	Armor Piercing	19	14
	Ball/Tracer	22	17
	Glaser	27	22
	Hollowpoint	25	20
7.62x54mm Russian	Armor Piercing	19	14
	Ball/Tracer	22	17
.50in Browning	Armor Piercing	26	
	Ball/Tracer	31	
12.7x107mm R.	Armor Piercing	26	
	Ball/Tracer	31	

Shotgun Ammuntion

Caliber	Bullet Type	Delivered damage	Silenced damage
12ga.x65mm	Birdshot	7	
	Buckshot (00)	16	
	Penetrator Slug	21	
	Slug	23	
12ga.x70mm	Birdshot	7	
	Buckshot (00)	18	
	Penetrator Slug	21	
	Slug	23	
12ga.x76mm	Birdshot	8	
	Buckshot (00)	19	
	Penetrator Slug	22	
	Slug	24	

The Ultimate Firearms Resource

Ultramodern Firearms is the most complete reference on firearms available for any game. Dispensing with endless pages of tables and reams of figures, *Ultramodern Firearms* was written for you—the gamer, not the gun enthusiast. The text is clear, well-organized, and easy to use, focusing on the features, advantages, and uses of over 300 weapons and sights. 200 accurate, clear illustrations let you see what you're reading about.

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- A listing of more than fifty military, police, and special-operations organizations lets you know what weapons are used by the world's elite forces.

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