



ARCHIVED - Archiving Content

Archived Content

Information identified as archived is provided for reference, research or recordkeeping purposes. It is not subject to the Government of Canada Web Standards and has not been altered or updated since it was archived. Please contact us to request a format other than those available.

ARCHIVÉE - Contenu archivé

Contenu archivé

L'information dont il est indiqué qu'elle est archivée est fournie à des fins de référence, de recherche ou de tenue de documents. Elle n'est pas assujettie aux normes Web du gouvernement du Canada et elle n'a pas été modifiée ou mise à jour depuis son archivage. Pour obtenir cette information dans un autre format, veuillez communiquer avec nous.

This document is archival in nature and is intended for those who wish to consult archival documents made available from the collection of Public Safety Canada.

Some of these documents are available in only one official language. Translation, to be provided by Public Safety Canada, is available upon request.

Le présent document a une valeur archivistique et fait partie des documents d'archives rendus disponibles par Sécurité publique Canada à ceux qui souhaitent consulter ces documents issus de sa collection.

Certains de ces documents ne sont disponibles que dans une langue officielle. Sécurité publique Canada fournira une traduction sur demande.

CPRC

CANADIAN POLICE RESEARCH CENTRE



CCRP

CENTRE CANADIEN DE RECHERCHES POLICIÈRES

TR-01-95

**Comparative Performance of 9 mm Parabellum,
.38 Special and .40 Smith & Wesson Ammunition
in Ballistic Gelatin**

Dean B. Dahlstrom
Kramer D. Powley
Firearms Section
Forensic Laboratory
Royal Canadian Mounted Police
Regina, Saskatchewan

**TECHNICAL REPORT
September, 1994**

NOTE: Further information
about this report can be
obtained by calling the
CPRC information number
(613) 998-6343



HER MAJESTY THE QUEEN IN RIGHT OF CANADA (1997)
as represented by the Solicitor General of Canada.



SA MAJESTÉ LA REINE DU CHEF DU CANADA (1997)
représentée par le Soliciteur général du Canada.

Executive Summary

Currently the trend in police issue sidearms is the adoption of a high capacity pistol, in Calibre 9 mm Parabellum or .40 Smith and Wesson. The purpose of this paper is to compare terminal ballistic performance of commercially manufactured 9 mm Parabellum and .40 Smith and Wesson ammunition with the current Royal Canadian Mounted Police issue .38 Special 158 grain semi-wadcutter hollow-point (SWCHP) cartridge.

Ammunition supplied by various commercial manufacturers was chronographed and fired into 10% ordnance gelatin blocks under three conditions at distances of three metres and twenty-five or fifty metres, depending upon the barrel length of the firearm utilized as dictated by R.C.M. Police training standards. At each distance, 5 rounds of each type of ammunition was fired into bare gelatin, gelatin covered with clothing, and gelatin with pigs' ribs embedded one to two inches under the entrance surface.

The ability of a projectile discharged from a handgun, to incapacitate a human should be a subject of crucial importance to law enforcement agencies, since the handgun is usually the law enforcement agent's primary weapon of defence. Based on previous research, it is generally accepted that at handgun velocities temporary cavitation produced by a projectile is a minimal wounding agent, particularly in the case of torso shots. In such cases, the expansion of the bullet must be relied upon to physiologically incapacitate an individual. There must be sufficient blood loss to effectively disrupt the central nervous system, since psychological incapacitation is unpredictable. To achieve this desired result, a projectile should reach vital organs within the body and damage as much tissue as possible.

In 1982, Dr. M. Fackler of the Wound Ballistics Laboratory of the Letterman Army Institute of Research developed a scientific approach to the study of wound profiles based on an understanding of the effects of projectiles on body soft tissues. The procedure for the RCMP study was developed on the basis of Dr. Fackler's research with some additional modifications that more closely simulate actual field conditions.

The terminal performance of Calibers 9 mm Parabellum and .40 Smith and Wesson ammunition were measured with respect to penetration depth, expansion, weight retention, and percent weight retention. Results were recorded and compared to similar tests conducted for Calibre .38 Special .158 grain semi-wadcutter hollow-point ammunition. An easily interpreted tabular form of the resulting data was developed to assist law enforcement agencies in the selection of a suitable calibre and ammunition type for police use.

From the limited ammunition types tested, there are both Calibre 9 mm Parabellum and .40 Smith and Wesson ammunition which are comparable or exceed the terminal performance of the R.C.M. Police issue Calibre .38 Spl. 158 gr SWCHP ammunition. The significance of the performance difference is an issue which may only be determined by those agencies involved in the selection of a suitable firearm ammunition combination for law enforcement use. This selection process must be based upon individual force protocol and may rely upon factors outside the listed test events such as shooting through intermediary targets.

SUMMARY

		3m											
		BARE				CLOTH				RIB			
		Penetration	Expansion	Retained Wt.**	% Retention ***	Penetration	Expansion	Retained Wt.**	% Retention ***	Penetration	Expansion	Retained Wt.**	% Retention ***
	38 SW 5" 158gr	12 0250	0 6290	156 0380	98 76	12 9000	0 5638	156 3440	98 95	14 6500	0 6111	156 5600	99 09
4"	115 Win ST	9 2500	0 6597	113 4820	98 68	11 6000	0 5717	115 2720	99 80	9 5750	0 6553	111 0800	96 52
	115 Fed JHP	9 9250	0 6170	107 5240	93 50	11 2000	0 5901	114 8420	99 74	12 7250	0 5073	82 4000	71 65
	124 PMC Starfire	11 0000	0 6355	123 8520	99 47	13 2000	0 5646	124 3460	99 91	11 9000	0 6252	123 4400	99 55
	147 Fed Hydra Shok	12 2250	0 6292	145 2380	98 80	13 5750	0 5804	147 1840	99 92	13 9750	0 6443	147 3800	99 76
	147 Rem GS	13 8500	0 6152	146 9980	99 84	15 1000	0 6109	146 0140	99 33	15 2250	0 6064	146 0600	99 20
	147 Win BT	13 7250	0 6258	144 8400	98 53	15 3250	0 6160	147 1840	99 57	14 1500	0 6251	146 4000	99 20
	147 CCI GD	15 5000	0 5171	146 2200	99 44	16 7750	0 4795	147 0400	99 97	15 8250	0 4906	146 7800	99 81
	147 Win FMJ	29 1000	0 3522	146 6400	99 76	27 8250	0 3512	146 4600	99 63	23 0750	0 3536	146 4800	99 65
9"	115 Win ST	9 9750	0 5319	73 2040	63 66	9 8500	0 6186	107 6180	93 32	9 5750	0 5497	85 7200	74 54
	115 Fed JHP	12 2250	0 4889	68 8820	59 90	13 3500	0 5208	85 5820	74 42	11 3500	0 5335	80 5400	70 03
	124 PMC Starfire	9 7500	0 7144	122 8340	99 06	10 7000	0 6591	123 4500	99 52	8 8500	0 7144	118 3000	94 92
	147 Fed Hydra Shok	12 6000	0 6754	145 8900	99 07	12 0500	0 6508	146 2300	99 38	12 6750	0 5825	120 5000	81 97
	147 Rem GS	13 4000	0 6733	143 4520	97 59	13 5500	0 6408	146 1980	99 26	15 4750	0 6503	142 1200	96 60
	147 Win BT	14 7750	0 6203	146 6920	98 73	14 0000	0 6694	146 9380	99 07	16 0250	0 6205	131 1800	89 24
	147 CCI GD	12 6000	0 7205	147 1000	99 99	14 6750	0 6002	147 1000	99 93	13 4000	0 6311	147 3600	100 00
	147 Win FMJ	37 4500	0 3478	146 4500	99 63	31 4250	0 3525	146 0200	99 33	33 8000	0 3523	146 5333	99 68
4"	155 Fed Hydra Shok	12 7750	0 6145	156 2980	99 48	14 7000	0 6031	156 6240	100 00	12 9250	0 6592	147 6800	95 21
	155 Win ST	11 7750	0 6824	156 7220	99 75	13 7750	0 6427	155 7660	99 99	11 0250	0 7139	155 2000	99 85
	155 CCI GD	13 1750	0 7189	155 6600	100 00	13 0250	0 6645	155 2000	99 99	12 7750	0 6994	155 6400	100 00
	165 Fed Hydra Shok	13 4750	0 6261	159 9400	96 93	14 4750	0 6000	164 3000	99 58	13 3000	0 6151	162 4600	98 46
	180 Win Ranger SXT	13 2500	0 7079	179 1600	99 42	14 2500	0 7499	180 0120	99 87	12 0750	0 7089	179 1600	99 53
	180 Win Subsonic	14 6250	0 6565	177 9880	98 62	14 4250	0 6296	181 1980	100 00	13 7000	0 6345	165 9800	92 21
	180 Win FMJ	28 5750	0 3959	180 5000	100 00	28 3250	0 3975	180 4000	99 96	29 4500	0 3968	180 8800	100 00
	180 PMC Starfire	11 9250	0 7101	180 9500	99 94	13 3250	0 6510	180 5180	100 00	11 2000	0 7192	177 8400	98 43
180 CCI GD	13 4500	0 6914	182 6540	100 00	13 5500	0 6208	180 0260	99 92	13 3500	0 6555	179 9200	99 92	

		50m											
		BARE				CLOTH				RIB			
		Penetration	Expansion	Retained Wt.**	% Retention ***	Penetration	Expansion	Retained Wt.**	% Retention ***	Penetration	Expansion	Retained Wt.**	% Retention ***
	38 SW 5" 158gr	12 4500	0 6090	156 3480	98 95	13 3250	0 5847	156 3400	98 95	12 5250	0 6124	156 2000	98 86
4"	115 Win ST	10 4750	0 5831	114 6560	99 61	13 0500	0 5323	115 3400	99 90	9 8500	0 5956	110 1400	95 62
	115 Fed JHP	9 8750	0 6069	113 2340	98 39	13 5000	0 5250	114 9000	99 77	9 9250	0 6084	112 7600	98 05
	124 PMC Starfire	11 9250	0 5832	124 1920	99 87	15 8500	0 5255	124 8400	100 00	11 3750	0 6260	124 8000	100 00
	147 Fed Hydra Shok	12 0250	0 6125	147 2140	99 82	13 8750	0 5738	146 8400	99 66	11 5500	0 6397	146 7800	99 76
	147 Rem GS	13 8000	0 6125	149 0980	100 00	14 8750	0 6187	147 1800	99 97	13 5750	0 6172	147 0800	99 95
	147 Win BT	14 2000	0 6015	146 9700	99 95	16 0250	0 5864	147 4600	99 40	14 8250	0 6273	147 9000	99 89
	147 CCI GD	15 9750	0 4938	146 7600	99 82	17 3500	0 4639	146 8400	99 85	15 7250	0 4975	145 1600	98 73
	147 Win FMJ	24 1500	0 3520	146 6200	99 74	23 6500	0 3517	146 4400	99 62	29 3500	0 3510	146 8500	99 86
9"	115 Win ST	9 1750	0 6773	108 1600	94 00	9 7750	0 6342	114 8800	99 63	8 5250	0 6992	109 5200	95 32
	115 Fed JHP	10 2250	0 6471	108 2400	94 12	9 6500	0 6320	114 6400	99 44	9 5000	0 6129	103 4000	89 91
	124 PMC Starfire	11 0750	0 6780	123 5400	99 47	11 0250	0 6425	124 7000	99 98	9 9500	0 6630	124 0200	99 69
	147 Fed Hydra Shok	12 0750	0 7114	146 0000	99 32	12 8000	0 6352	146 8800	99 67	11 1750	0 6744	145 2800	98 83
	147 Rem GS	13 0500	0 6834	146 0000	99 29	14 0750	0 7018	147 2800	99 95	11 8250	0 6797	141 3200	96 14
	147 Win BT	13 4250	0 7385	147 7400	99 76	13 4500	0 6780	148 3600	100 00	12 8000	0 6745	147 4600	99 73
	147 CCI GD	12 5500	0 6398	147 0400	99 93	14 5000	0 5825	146 9200	99 90	12 9500	0 6307	146 8800	99 85
	147 Win FMJ	39 0000	*	*	*	27 7250	0 3510	146 4000	99 59	30 4500	0 3510	146 6000	99 73
4"	155 Fed Hydra Shok	13 0750	0 6491	155 4560	99 82	19 1250	0 4491	154 1600	99 43	12 9250	0 6146	142 9200	92 17
	155 Win ST	13 6500	0 6170	156 8480	100 00	17 0500	0 5578	155 2400	99 97	12 4500	0 6425	155 0400	99 92
	155 CCI GD	12 3000	0 6593	156 1800	99 96	14 1750	0 6145	155 2800	100 00	12 0000	0 6551	155 6600	100 00
	165 Fed Hydra Shok	12 9750	0 6235	163 7600	99 25	15 3250	0 5699	164 3000	99 58	13 5000	0 6092	164 3000	99 58
	180 Win Ranger SXT	13 5000	0 7167	179 7600	99 82	14 3000	0 7391	179 9800	99 94	12 6000	0 7245	178 3600	99 09
	180 Win Subsonic	13 4750	0 6625	179 7600	99 69	13 8500	0 6296	180 2600	99 66	12 4750	0 6500	177 4200	98 40
	180 Win FMJ	32 9000	0 3961	180 6200	100 00	30 7000	0 3955	180 3800	99 98	28 1750	0 3945	180 6800	100 00
	180 PMC Starfire	12 0750	0 7042	180 4200	99 88	16 3000	0 6122	179 7000	99 69	11 3250	0 6906	180 9600	99 54
180 CCI GD	13 9750	0 6326	180 2200	99 97	13 5750	0 6165	180 3400	99 98	12 8250	0 6441	179 9800	99 92	

* bullets not recovered

** Retained weight is the average of the recovered bullets' retained weight, uncorrected when they exceed the manufacturer's advertised bullet weight

*** % Retention figures are the average of the per cent retained weight. Recovered bullet weights greater than the manufacturer's advertised weight are recorded as 100% retained weight.

Introduction

Handguns have historically been the primary source of defence for regular duty law enforcement officers. Because it is the duty sidearm which is generally used in confrontational situations, the firearm ammunition combination must be relied upon to incapacitate a human aggressor.

In handgun projectile wounds, incapacitation is caused by two factors: 1) Psychological incapacitation and 2) Physiological incapacitation.

Psychological incapacitation is non-predictable and thus a model of reaction to being shot cannot be developed. "Psychological incapacitation is completely independent of any inherent characteristics of a specific bullet and is totally unrelated to the potential for any given bullet to cause physiological incapacitation."

Physiological incapacitation has been well documented and is the result of the mechanical effects of the projectile producing physical damage to the human body.

As a handgun bullet enters the human body it must first crush and destroy tissue. The space once occupied by this tissue is called the permanent cavity.³

Temporary cavity is "the lateral transient dispersion of tissue from the wound track" and at handgun projectile velocities the tissue generally does not stretch beyond its elastic limits and there is no significant contribution to the wounding mechanism.^{3,4-s}

Certain organs within the body including the brain, spleen, liver, and bones are more susceptible to damage from the temporary cavity due to their inelasticity; however, damage to these is limited. Overall, it is generally recognized that at handgun velocities temporary cavity is not a reliable wounding mechanism.

The only reliable method of stopping a human with a handgun bullet is to "decrease functioning capability of the central nervous system". This may be done in one of two ways: Type I is direct disruption of the central nervous system by bullet penetration. Type II is by lack of oxygen to the brain caused by bleeding. The only wounds which result in immediate incapacitation are those which damage the essential brain matter such as the brain stem or cervical spinal cord.⁷

Because the central nervous system occupies such limited space within the human body, it is not feasible to expect or tram for direct CNS shots, particularly in confrontational situations.

In non-direct central nervous system bullet injuries, the size and location of the wound are important. Wolberg states "The rate of incapacitation is directly proportional to the rate of blood flow and the organs or structures hit."¹⁴

Bullets must be able to penetrate deeply enough in order to disrupt major organs and blood vessels within the human torso to cause hemorrhaging which results in incapacitation. However, an individual who has been shot in the heart or major blood vessels may not be affected for many seconds or minutes.³ Therefore, the expectation that a bullet striking a vital organ aside from the brain will cause immediate incapacitation is a dangerous misconception.⁶

The exact quantity of blood loss a person can tolerate before collapsing is difficult to determine because it is dependant upon age, health, activity, presence of drugs or alcohol and psychological state. h&Kenny, however, states 2000 ml is the point at which "serious incapacitation" takes place.⁷ Newgard states that for blood loss greater than 25% of total volume, compensation will not adequately keep the brain and heart supplied with sufficient oxygen and progression of this condition will lead to irreversible shock and death.³

Vital anatomical structures are located deep within the body protected by various layers of tissue. The average thickness of an adult human torso is 9.4". The major blood vessels in the torso are located approximately 6" from the ventral skin surface. From oblique and transverse angles the heart and major blood vessels of the torso can be over 7.9" deep.* Bullets must be able to penetrate 12" of soft tissue the "minimum depth necessary to ensure disruption of the major organs and blood vessels in the torso from any angle and despite intermediate obstacles.⁸) Bullets that penetrate beyond 18" are wasting tissue disruption potential which could be used to make a larger hole in the ideal 12 to 15" range of penetration required for handgun bullets.*

Of the bullets which attain desired penetration depth, those of larger diameter are the most effective, crushing more tissue.^{2,6*9} Shape and configuration of the bullet can also be an important factor. Cutting is a variation of the crush factor and is far more efficient in disrupting tissue than is stretching.⁶ Expanded bullets which are sharp edged are more likely to cut tissue along the wound track compared to blunt edges which tend to stretch tissue aside during their passage.²⁻⁶

If handgun bullets fragment, wound severity is generally not increased since the bullet fragments are usually found within 1 cm of the main permanent cavity formed by the bullet path.*.*

The wound profile method for measuring the damage caused by penetrating projectiles was developed at the Wound Ballistics Laboratory of the Letterman Army Institute of Research in 1982. Its purpose was to clarify the interaction of penetrating projectiles with body soft tissues and establish a quantitative predictive model for human wounds.⁵ This method was based upon shooting projectiles into 10% ordnance gelatin at 4" C and recording the projectiles' penetration depth, its yaw pattern, its deformation (including fragmentation, and the size and location of the temporary cavity it produced). The wound ballistic profile method has been validated by Dr. Davis' colleagues at the Miami-Dade Medical Examiners office who conducted ballistic testing of swine tissue and gelatin and compared findings to that of gunshot victims at autopsy.⁵ Wolberg testing 147 grain

Subsonic Win 9 mm stated “this gelatin can be a useful predictor of this bullet’s penetration and expansion characteristics in shots in the human torso.”

Although 10% gelatin has many proponents, and Dr. M. Fackler’s wound profile is currently used by many researchers and police agencies, there are also critics.

Dr. Ragsdale in a letter to the editor of the Journal of American Medical Association states “Gelatin is in fact a very misleading tissue simulant, since a body comprises a complex array of layers with different densities around organs, supported by bone and enveloped by elastic skin.”

Ragsdale states a 20% gelatin concentration reproduces bullet retardation of animal tissue the size and shape of temporary cavities in pig muscle, and incurs a permanent cavity similar to tissue wounds.³

Ragsdale further states, “The simple expedient of injecting epoxy glue into permanent cavities in gelatin blocks details the structural complexity of radial fissures. They are actually an overlapping series of lobulated leaf-like projections that spiral (due to bullet spin) from the central track of penetration. This fissure complexity is a major cause for the imprecise correlation of fissure calculations and actual temporary cavity.” “The wound profile method of Fackler is basically the creation of a comparative series of sketches of the permanent cavities created in 10% gelatin with superimposed outlines of the temporary cavity, as inferred by mathematical calculations in view of the demonstrated lack of correlation between fissure calculations and actual temporary cavities, the Wound Profile diagrams cannot be taken as accurately showing likely cavitation effects in gelatin, let alone tissue.¹⁴

Various researchers have modified Dr. Fackler’s wound profile method by inserting bones or organs into 10% gelatin blocks. Dr. Lane and Ted Hallabough, Firearms Training Unit FBI, have conducted tests inserting swine femur into 10% ballistic gelatin blocks, advising swine bone is similar to human bone.”

Lewis, Clark and O’Connell stated, “The placement of organs in gelatin is of great value in studying the effects of missile trauma on various organs and tissues and produces a model which more closely simulates the human body than does gelatin alone.”⁶

“The symmetrical damage revealed in homogeneous translucent gelatin can be expected to be substantially modified if the incoming missile is destabilized by an intermediate target or strikes bone early in its penetration. Also, the complex structure of the human body has layers of variable density (skin, fat, muscle, fascia), and irregularly shaped viscera and visci variously filled with air and fluid. This complexity means there will be an almost infinite array of possible wound channel configuration, unlike those in homogeneous tissue simulant.” “Gelatin/bone target probably has more relevance to human wounding than a plain gelatin block, since the latter cannot be compared to the complex regional density differences within the body.”

Fackler states, "Since most shots in the human body traverse various tissues, we would expect the wound profiles to vary somewhat, depending on the tissue traversed. However, the only radical departure has been found to occur when the projectile strikes bone: this predictably deforms the bullet more than soft tissue, reducing its overall penetration depth, and sometimes altering the angle of the projectile's course. Shots traversing only soft tissue in humans have shown damage patterns of remarkably close approximation to the wound profiles."⁴

Kinetic energy and tissue trauma has been a subject debated in the modern concept of terminal wound ballistics. Duncan MacPherson in a paper presented at the Wound Ballistic seminar at the FBI Academy in 1/19-22/93 stated there is a lack of correlation between kinetic energy and damage in some physical processes. The reason for this is that physical damage is the result of stress (force per unit area), not energy. Higher kinetic energy usually increases the induced stress, but this stress only creates damage if it produces strains above the elastic limit. Most body tissues have a relatively high elastic strain limit, well above the level produced by handgun bullet temporary cavities. Since much of the kinetic energy of a bullet is associated with producing the temporary cavity volume, there is a lack of correlation between handgun bullet kinetic energy and wound trauma."⁵

Ragsdale states, "The severity of a wound is directly related to the amount of kinetic energy lost by the bullet in the body, because the kinetic energy of a missile is dissipated in bullet deformation and tissue damage. . . . Nine millimetre pistol wounds of the abdomen create haemorrhagic lesions on the intestinal walls that may look innocent but may develop into dangerous intestinal perforations if they are left untreated. . . . For a given aim point, the bullet producing the largest temporary cavity at the proper depth, defined by the location of vital organs, should have the greater likelihood of producing incapacitation."⁶

In the spring of 1994 it was determined that the Royal Canadian Mounted Police would adopt a new duty sidearm and ammunition combination, based upon the expected need for a higher capacity firearm.

Because the Federal .38 Spl. SWC HP ammunition fired from the S & W Model 10 in both 5" and 2" barrels had performed as required in police involved shootings by the RCMP, it was decided that the adoption of a new firearm ammunition combination would have to be as reliable.

The Royal Canadian Mounted Police Armourers did an exhaustive series of tests of submitted commercially manufactured semi-auto pistols in Calibers 9 mm and 40 S & W. At the completion of testing, a short list of firearms were submitted to the Firearms Section of Forensic Laboratory Regina for ammunition testing.

Previous research in the field of ammunition testing and terminal wound ballistic studies suggested that the wound profile method for measuring damage caused by penetrating projectiles should be followed with very few exceptions. Perhaps the most notable exception to this profile was the addition of pigs' ribs into the gelatin

as one of the test procedures. The reason it was felt this was necessary was based upon RCMP protocol. Members of the RCMP who encounter situations where the use of “deadly force” is warranted are trained to shoot for the ‘critical centre of mass’. In order for the bullet to penetrate to the desired vital organs, it is apparent from previously examined shootings within the Firearms Section, Forensic Laboratory Regina, that the projectile must pass through not only soft tissue but a combination of rib, muscle, and cartilage.

The addition of the pigs’ ribs used in testing, although similar in diameter to human ribs measured at autopsies and with connective tissue still present, was not meant to simulate human bone necessarily but to add a medium of different density that the bullet would likely strike in order to achieve desired outcome. The ribs were introduced during this test to determine and accentuate any undesirable attributes that a specific ammunition type may display during impact with a structure of different density, i.e. fragmentation, core jacket separation, non-expansion.

Based upon previous research and discrepancies in measuring temporary cavities, it was decided that no form of measurement for the temporary cavity would be included in this research.

Three tests were conducted with each firearm ammunition combination at two distances.

Distances of 3 m and 50 m were chosen based upon RCMP firearms training protocol. Three metres is the distance at which RCMP recruits must instinctively be able to hit critical centre of mass of their intended target, and 50 m is the maximum distance at which trainees are still expected and required to hit the centre of mass. The media used for the three test events were:

Test 1: bare 10% ballistic gelatin

Test 2: 10% ballistic gelatin covered with a layer of cotton undershirt material, 1 layer of shirt material, and a heavy RCMP stormcoat. Conditions which one would expect to encounter outdoors during a typical Canadian winter.

Test 3: 10% ballistic gelatin with marrow containing pigs’ ribs and connective tissue embedded 1 to 2” behind the entrance side of the gelatin block.

The 10% gelatin blocks were produced in molds 2 1" x 19" x 16" with each mold weighing approximately 130 lbs., to more closely simulate an adult human and to ensure that movement of the block was not a factor during testing.

Five rounds of each ammunition type firearm combination was fired into the gelatin block for each test type. In each case, the orientation of the projectile at rest, penetration, remaining bullet length, expansion, and retained bullet weight were recorded.

Twenty shots were fired into each block, avoiding intersection of fissures.

The gelatin was reheated only a maximum of two times and not heated to above the maximum of 40°C, so a possible change in gelatin properties would not be an introduced factor to the test procedures. Gelatin which contained pigs' ribs was not reused for any further testing.

Methods and Materials:

Two potential service pistols were submitted for testing by the Royal Canadian Mounted Police Armourer's Shop:

A Smith and Wesson Model 5943, Calibre 9 mm Parabellum with a four-inch barrel, Serial No. VAC 127 1 and a Smith and Wesson Model 4046, Calibre .40 Smith and Wesson with a four-inch barrel, Serial No. VAA3369.

A Beretta 92 Centurion and compact variation of the forementioned Smith pistols were also submitted but chronographed variations upon test firing were no greater than lot to lot variations, so they were not used in testing.

Two Royal Canadian Mounted Police service sidearms were also used in testing: 1) A Smith and Wesson, Model 10-5 revolver, Calibre .38 Spl. with a five-inch barrel, Serial No. 3D014 11, and 2) A Smith and Wesson, Model 10-5, Calibre .38 Spl. with a two-inch barrel, Serial No. 2D87607. Also a Force issue, Heckler and Koch (H&K) Model MP5, Calibre 9 mm Parabellum with a nine-inch barrel, Serial No. C3 15857, was tested.

All of the test pistols had approximately ten thousand rounds fired through them as received. The service revolvers had approximately 1500 rounds fired through them prior to testing.

Ammunition was submitted for testing by five commercial manufacturers in Calibers 9 mm Parabellum and .40 Smith and Wesson and consisted of the following:

9 mm Parabellum: 115 grain Federal Jacketed Hollowpoint
 115 grain Winchester Silver-tip
 124 gram PMC Star-fine
 147 grain Federal Hydrashok
 147 grain Winchester Black Talon
 147 grain Winchester Full Metal Jacket
 147 gram Remington Golden Saber
 147 grain Speer Gold Dot

.40 Smith & Wesson: 155 grain Winchester Silver-tip
 155 grain Federal Hydrashok
 155 grain Speer Gold Dot
 165 grain Federal Hydrashok
 180 grain Winchester Ranger SXT
 180 grain Winchester Full Metal Jacket
 180 grain Winchester Subsonic
 180 grain PMC Starfire
 180 grain Speer Gold Dot

In Calibre .38 Spl., the RCMP's adopted service round 158 gram Federal Semi-Wadcutter hollow-point ammunition was used for all tests.

Kind and Knox 250A ordnance gelatin Lot 30 was used as the tissue simulant for all tests. Dr. M. Fackler's recipe for manufacturing 10% ordnance gelatin as outlined by S. Post² and E. Thompson² was followed. The gelatin powder was mixed with cold water (7 - 10° C) in the ratio of 1000 g to 9000 ml.

The mixture was gently agitated and allowed to hydrate for two hours at room temperature.

The ordnance gelatin was heated in an Escan Model 104P60 60-gallon steam kettle and the solution was not allowed to exceed 40° C. Once the particulate matter had dissolved, the mixture was poured into plastic molds, measuring 2 1" x 19" x 16", which had previously been sprayed with vegetable oil to act as a release agent. The approximate weight of each completed mold was one hundred and thirty pounds.

Propionic acid was initially used in solution to prevent bacterial growth; however, because the molds were used within a five-day period, the addition of acid was eliminated and no bacterial growth was recorded as was initially reported by Lucien Haag.²²

Once the solution was poured into the molds, any foam on the surface was skimmed off and the molds were placed in a walk-in cooler and stored at 5° C.

Initially, the molds were not covered to prevent a build up of condensation, but were subsequently covered after an initial cooldown period.

When racks of pigs' ribs were embedded into the gelatin molds, the gelatin was first allowed to slightly cool. The racks were cut to fit dimensions of the mold and the ribs and connective tissue were slightly dried by patting to remove moisture and grease prior to insertion. The racks were then placed into the molds and suspended in place approximately one to two inches from the entrance surface with wire.

All gelatin blocks were allowed to set a minimum of sixty hours before any tests were conducted.

Prior to any gelatin blocks being tested, they were calibrated by shooting into them with Calibre .177 copper-coated B.B.'s from a Crossman, Model 766 Pneumatic rifle, Serial No. 380004954, and measuring both the velocity and penetration of the B.B.'s. Five pumps of the air rifle generated a velocity approximately the desired 590 feet per second, at an instrumental distance of 10 feet. All blocks were calibrated to achieve 8.5 ± 1.5 cm of penetration at a velocity of 590 feet per second. B.B.'s were fired initially into four corners of the blocks, two prior to testing and two after; however, after successive tests with very minute differences, only two corners were calibrated prior to testing.

Temperatures of the gelatin blocks were recorded prior to test shots and then again after to ensure no variation existed during test procedures. Once it was determined that only very slight (less than 1°C) variation existed temperatures were taken only prior to testing, measuring both in the centre of the block and at one corner.

All tested ammunition was fired from the test firearms and chronographed through a Model 4040 Chronograph manufactured by the Electronic Counters Division of MV Ordnance Industries, at an instrumental distance of twenty feet.

All test were conducted in a 125 meter single lane indoor range at a temperature of between 60-68° F. Shooting was from a sand bag rest for all test events.

Three tests were conducted at two distances for each firearm ammunition combination. With each test event there was no overlap of fissures allowed within the gelatin block, or that specific result was retested.

Test Event I was firing into bare gelatin at a distance of 3 m. Five rounds of each firearm ammunition combination was fired for this test and a total of twenty rounds was fired into each block.

Test Event II was a block of gelatin covered with a layer of 65/35 polyester/cotton mix T-shirt material whose weight was 145 grams/meter². This in turn was covered with a shirt produced with a 50/50 cotton/polyester mix and a weight of 200 grams/meter². An RCMP issue storm coat covered the other two materials. The storm coat was comprised of three layers: a nylon cotton mix shell with a weight of 170 grams/meter², a polyester insulation with a weight of 300 grams/meter², and a nylon lining with a weight of 84 grams/meter². Again, five rounds of each firearm ammunition combination was fired at the covered block, ensuring no random impact with buttons, zippers, etc.

The thud test was comprised of a gelatin block with pigs' ribs and connective tissue embedded one to two inches from the entrance surface. Five rounds of each firearm ammunition combination was recorded in this test as in the previous test.

At the completion of all firearm ammunition combinations for the three test events, distances were then varied to fifty meters, or twenty-five meters for the Smith and Wesson, Model 10-5, with a two-inch barrel following RCMP training protocol.

Upon completion of test events into each block (20 rounds), gelatin was removed in layers from the top surface using a fixed blade knife, so the bullet paths could be more easily observed. Bullet penetration depths were measured from the exterior of the entrance surface to the furthest point of the bullet, or in some situations to where the bullet path ended, the bullet having rebounded slightly within the gelatin.

Permanent cavity diameter was measured using a Mitutoyo Digimatic Caliper. This measurement, although recorded, was not presented for this particular research.

The bullets orientation at rest was recorded as well as fragmentation or core jacket separation.

Bullet penetration through the pigs' ribs was measured using a rod of known length to project into the bullet path. To determine what the bullet came into contact with when shooting through ribs, a finger was inserted into the block of gelatin to differentiate between muscle, or bone fragmentation. Measurements of the rib diameter was recorded for each test containing the racks of pigs' ribs.

When the bullets were removed from the gelatin, maximum and minimum expansions were recorded along with the remaining bullet length. Any protruding jacket fragments were included in these measurements. Black Talon bullets were measured from the tip of each protruding point for maximum expansion values.

Remaining length measurements of Hydrashok bullets were taken from the tip of the post to the base of the bullet or any portion of the jacket protruding beyond the base.

All recovered bullets were weighed after removing as much foreign material as possible. Those bullets which still weighed more than the reported weight were recorded as 100% weight retention. When bullets fragmented, the largest remaining fragment was measured and weighed.

Data:

The following data is presented in tabular form, Appendices 1 through 171.

Photographs appearing in Appendices 172 through 182 depict examples of fired and unfired bullets of all ammunition types under all test events.

Appendix 183 contains 2 photographs depicting 10% ordnance gelatin before and after a test event.

Results and Discussion:

Although terminal performance of the R.C.M. Police issue Calibre .38 Spl. 158 gr. SWCHP has been satisfactory, there are commercially manufactured ammunitions in Calibers 9 mm Parabellum and .40 S & W which exceed these performances in test medium. The heavier Calibre 9 mm Parabellum 147 gram hollow-point ammunitions manufactured by Winchester in their Black Talon round, Remington Golden Saber, and Federal Hydrashok ammunition compared favourably to the Calibre .38 Spl. round in most test events when comparing penetration depth, degree of expansion, weight retention, and percent retained weight of the fired bullet. Slight differences in bullet expansion may not be significant due to the experimental limitations and sample size. The significance of differences in % weight retention must be analyzed with respect to remaining bullet weight and degree of secondary projectiles as a result of bullet fragmentation. The Full Metal Jacketed Winchester 147 gram ammunition failed to expand after excessive penetration.

CCI 147 grain Gold Dot ammunition, although providing adequate penetration, had inadequate expansion when compared to the Calibre .38 Spl. R.C.M. Police adopted round.

The lighter 115 gram and 124 grain bullets in Calibre 9 mm Parabellum were all unacceptable performers, failing to penetrate 10% ordnance gelatin to the desired 12" depth, and for both the 115 gram bullets in particular, there was excessive fragmentation. In addition, the 124 grain PMC Starfire bullet, when discharged from the H & K Model MP5 submachine gun, failed to cycle the action due to the brass flowing into the fluted chamber preventing the cartridge case from being extracted or ejected from the weapon.

The majority of Calibre .40 Smith & Wesson ammunition types compared favourably to the current R.C.M. Police issue Calibre .38 Spl. round in all test events at both distances.

One exception to this acceptable performance was the Winchester 180 gram Full Metal Jacketed truncated cone bullet, which consistently had excessive penetration and inadequate expansion in all test events.

The Winchester Black Talon, or Ranger SXT bullet as it is now marketed, not only met all the terminal ballistic requirements in both Calibers 9 mm Parabellum and .40 Smith and Wesson, but it was the only bullet recovered which had extremely sharp deformed surfaces which may assist in the cutting of tissue along the wound track.

During the course of testing, many observations of ammunition/firearm performance were made and, although they do not pertain directly to the data recorded for this research, they may be significant to law enforcement agencies in the selection of a suitable duty sidearm ammunition combination:

The 158 grain SWCHP bullet when fired from the S & W Calibre .38 Spl. with a 2" barrel over-penetrates 10% ordnance gelatin and gelatin covered with layers of clothing; however, when ribs were embedded into the gelatin medium, both adequate penetration and expansion result. Although accuracy was not one of the test events in measuring ammunitions' terminal performance, it is obvious that a bullet must strike an intended target to achieve the desired result. For those test events at 50 m shooting the gelatin blocks from a sandbag rest using Calibre 9 mm Parabellum, 124 grain PMC Starfire ammunition was a challenge and a 200 round supply of ammunition was depleted prior to finishing the test events.

The H & K MP5 submachine gun was introduced as a test firearm because it is an R.C.M. Police issue firearm, and the adoption of any Calibre 9 mm Parabellum round would be used in this weapon as well as any handgun which may be chosen. From the tabular results, it is apparent that any performance problems associated with ammunition type were accentuated when fired from this submachine gun.

Conclusion:

From the limited ammunition types tested, there are both Calibre 9 mm Parabellum and .40 Smith and Wesson ammunition which are comparable or exceed the terminal performance of the R.C.M. Police issue Calibre .38 Spl. 158 gr SWCHP ammunition. The significance of the performance difference is an issue which may only be determined by those agencies involved in the selection of a suitable firearm ammunition combination for law enforcement use. This selection process must be based upon individual force protocol and may rely upon factors outside the listed test events such as shooting through intermediary targets.

Acknowledgements:

We would like to thank the R.C.M. Police Training Academy: Armourers, the Division Mess staff, and Stores for the use of their facilities and as continual sources of supply for special equipment and materials.

For their significant technical support we also thank Mrs. Nancy Wilson, Mr. Ed Perreux, Mr. Alan Laughlin, Mr. Brent Ostrum, and S/Sgt. Dave Hepworth.

References:

1. Fackler, Martin L., M.D., Police Handgun Ammunition Selection, Wound Ballistics Review 1992 Vol. 1, No. 3,32-37, Journal of the International Wound Ballistics Association.
2. Roberts, Gary K., D.Ds., Comparison of the Terminal Performance of 9 mm, .40 S & W, and .45 ACP JHP's, Wound Ballistics Review 1994, Vol. 1, No. 4,32-37, Journal of the International Wound Ballistics Association.
3. Newgard, K., M.D., The Physiological Effects of Handgun Bullets: The Mechanisms of Wounding and Incapacitation, Wound Ballistics Review 1992, Vol. 1, No. 3, 12-17, Journal of the International Wound Ballistics Association.
4. Wolberg, E., Paper submitted to the FBI Academy Wound Ballistics Workshop, 1/19-22/93.
5. Fackler, M. L., M.D., Summary of Remarks to the Wound Ballistic Seminar, FBI Academy, Quantico, Virginia, 1/20/93.
6. Fackler, M. L., M.D., Police Handgun Ammunition Selection, Wound Ballistics Review 1992, Vol. 1, No. 3, 32-37, Journal of the International Wound Ballistics Association.
7. McKenney, M. G., M.D., Summary of Remarks to the Wound Ballistic Seminar, FBI Academy, Quantico, Virginia, 1/19-22/93.
8. U.S. Department of Justice, FBI Academy, Firearms Training Unit: Handgun Wounding Factors and Effectiveness, 1989.
9. Jason, A. & Thompson, E. J., Ammunition Performance: Testing Data and Acceptance Criteria, Wound Ballistics Review 1994, Vol. 1, No. 4,26-28, Journal of the International Wound Ballistics Association.
10. Fackler, M. L., M.D., The Wound Profile and the Human Body: Damage Pattern Correlation, Wound Ballistics Review 1994, Vol. 1, No. 4, 12- 19, Journal of the International Wound Ballistics Association.
11. Wolberg, E. J., Performance of the Winchester 9 mm 147 Grain Subsonic Jacketed Hollow Point Bullet in Human Tissue and Tissue Simulant, Wound Ballistics Review 1991, Vol. 1, No. 1, 10- 13, Journal of the International Wound Ballistics Association.
12. Ragsdale, B.D., M.D., Letter to the editor. Journal of American Medical Association, Vol. 260, No.22, 1988.
13. Ragsdale, B. D., M.D., Epoxy Casts of Permanent Cavities in Ordnance Gelatin, The Journal of Trauma (China), Vol. 6, No. 2, 1990,2 14-22 1.
14. Ragsdale, B. D., M.D., Do Mathematical Calculations from Radial Fissures Accurately Estimate the True Temporary Cavity Size in Ordnance Gelatin? *Personal Communication.*

15. Lane, E., Dr., Summary of Remarks to the Wound Ballistic Seminar, FBI Academy, Quantico, Virginia, 1/19-22193.
16. Lewis R. H., Clark M. A. and O'Connell, K. J., Preparation of Gelatin Blocks Containing Tissue Samples for Use in Ballistic Research. The American Journal of Forensic Medicine and Pathology, Vol. 3., No.2, June 1982, Technical Notes 181-184.
17. Ragsdale, B.D. and Sohn, S.S. Comparison of the Terminal Ballistics of Full Metal Jacket 7.62 mm M80 (NATO) and 5.56 mm M193 Military Bullets: A Study in Ordnance Gelatin. Reprint from Journal of Forensic Sciences, May 1988, Vol. 33, No. 3,676-696.
18. MacPherson. Understanding Energy in Terminal Ballistics Wound Ballistic Seminar, FBI Academy, Quantico, Virginia, 1/19-22193.
19. Ragsdale, B.D., Gunshot Wounds: A Historical Perspective, Military Medicine, Vol. 149, 6:301, 1984.
20. Post, S., Lecture at First International Wound Ballistics Conference, Sacramento, CA, March 27, 1994.
21. Thompson, E., Ordnance Gelatin Testing Procedures. AFTE Journal 25(2): 87-107, 1993.
22. Haag, L.C. Ballistic Gelatin: Controlling variances in preparation and a suggested method for the calibration of gelatin blocks. AFTE Journal, Vol. 2 1(3):483-489, 1989.

Date: 94 APR 18 Bbl. Length: 2" Ammo Mfg.: Federal
 Make: S&W Serial No.: 2D87607 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed Velocity at 20 ft.

1 795.17
 2 787.65
 3 807.62
 4 808.02
 5 792.14
 AVG 798.12
 f/sec

Kinetic Energy at 20 ft.: 223.44 ft.lbs.

Calibration Velocity: 597.16 590.88 f/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 8.3 8.3 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.250	0.617	0.5305	0.5120	0.5213	157.14	99.46
2	12.250	0.592	0.5580	0.5355	0.5468	155.59	98.47
3	12.250	0.589	0.5470	0.5350	0.5410	156.20	98.86
4	13.000	0.598	0.5391	0.5310	0.5351	156.20	98.86
5	12.750	0.625	0.5025	0.4932	0.4979	155.97	98.72
AVG	12.700 inches	0.604 inches	0.5354 inches	0.5213 inches	0.5284 inches	156.22 grains	98.87 %

Notes:

- 1 Nose Forward
- 2 Nose Forward
- 3 Nose Forward
- 4 Nose Forward
- 5 Nose Forward

Date: 94 MAY 03 Bbl. Length: 2" Ammo Mfg.: Federal
 Make: S&W Serial No.: 2D87607 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed Velocity at 20 ft.

1 795.17
 2 787.65
 3 807.62
 4 808.02
 5 792.14
 AVG 798.12
 f/sec

Kinetic Energy at 20 ft.: 223.44 ft.lbs.

Calibration Velocity: 601.18 602.34 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.0 8.9 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.250	0.610	0.4985	0.4890	0.4938	156.32	98.94
2	13.875	0.608	0.4785	0.4765	0.4775	156.17	98.84
3	11.825	0.578	0.5280	0.5200	0.5240	155.55	98.45
4	12.250	0.639	0.4385	0.4315	0.4350	155.55	98.45
5	11.750	0.599	0.5235	0.5070	0.5153	156.17	98.84
AVG	12.550 inches	0.607 inches	0.4934 inches	0.4848 inches	0.4891 inches	156.96 grains	98.70 %

Notes:

- 1 Nose Forward
- 2 Nose Forward
- 3 Nose Forward
- 4 Nose Forward
- 5 Base Forward

Date: 94 APR 18 Bbl. Length: 2" Ammo Mfg.: Federal
 Make: S&W Serial No.: 2D87607 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed
Velocity at 20 ft.

1 795.17
 2 787.65
 3 807.62
 4 808.02
 5 792.14
 AVG 798.12
 ft/sec

Kinetic Energy at 20 ft.: 223.44 ft.lbs.

Calibration Velocity: 597.16 590.88 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 8.3 8.3 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	15.500	0.663	0.3770	0.3570	0.3670	158.17	98.84
2	18.750	0.650	0.3880	0.3805	0.3843	156.01	98.74
3	18.250	0.651	0.3985	0.3940	0.3963	155.88	98.65
4	23.750	0.659	0.3702	0.3600	0.3651	156.32	98.94
5	24.125	0.871	0.3725	0.3675	0.3700	156.90	99.30
AVG	20.876 inches	0.669 inches	0.3812 inches	0.3718 inches	0.3765 inches	156.25 grains	98.89 %

Notes:

- 1 Base Forward RCMP Storm Coat 3280-209 Sept/88
- 2 Nose Forward
- 3 Sideways
- 4 Nose Forward Hollow Point did not expand to bullet diameter
- 5 Nose Forward Hollow Point did not expand to bullet diameter

Date: 94 MAY 31 Bbl. Length: 2" Ammo Mfg.: Federal
 Make: S&W Serial No.: 2D87607 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed
Velocity at 20 ft.

1 795.17
 2 787.65
 3 807.62
 4 808.02
 5 792.14
 AVG 798.12
 ft/sec

Kinetic Energy at 20 ft.: 223.44 ft.lbs.

Calibration Velocity: 602.95 604.89 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.4 8.7 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	15.375	0.641	0.4440	0.4370	0.4405	156.90	99.30
2	15.375	0.666	0.3940	0.3880	0.3910	156.60	99.11
3	23.750	0.668	0.3580	0.3550	0.3565	157.30	99.56
4	21.875	0.656	0.3580	0.3520	0.3550	156.30	98.92
5	25.250	0.673	0.3650	0.3510	0.3580	156.80	99.24
AVG	20.326 inches	0.661 inches	0.3838 inches	0.3766 inches	0.3802 inches	156.78 grains	99.23 %

Notes:

- 1 Nose Forward RCMP Storm Coat 3280-055 Sept/88
- 2 Nose Forward
- 3 Nose Forward Curved Trajectory
- 4 Nose Forward
- 5 Nose Forward

Date: 94 JUN 07 Bbl. Length: 2" Ammo Mfg.: Federal
 Make: S&W Serial No.: 2D87607 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed Velocity at 20 ft.

1 795.17
 2 787.65
 3 807.62
 4 808.02
 5 792.14
 AVG 798.12
 ft/sec

Kinetic Energy at 20 ft.: 223.44 ft. lbs.

Calibration Velocity: 602.41 602.48 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.7 9.9 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	15.000	0.634	0.4620	0.4480	0.4555	156.40	98.99
2	12.500	0.574	0.5480	0.5280	0.5370	156.50	99.05
3	13.500	0.595	0.5600	0.5410	0.5505	156.80	99.24
4	12.875	0.557	0.5640	0.5380	0.5515	157.10	99.43
5	13.625	0.588	0.5470	0.5380	0.5425	161.20	100.00
AVG	13.600 inches	0.600 inches	0.6368 inches	0.6190 inches	0.6274 inches	157.60 grams	99.34 %

Notes:

- Nose Forward Muscle Rib Diameter .4400, .3275 inches
- Nose Forward Bone/Muscle+
- Nose Forward Bone
- Nose Forward Bone
- Nose Forward Curved Trajectory

Date: 94 JUN 07 Bbl. Length: 2" Ammo Mfg.: Federal
 Make: S&W Serial No.: 2D87607 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed Velocity at 20 ft.

1 795.17
 2 787.65
 3 807.62
 4 808.02
 5 792.14
 AVG 798.12
 ft/sec

Kinetic Energy at 20 ft.: 223.44 ft. lbs.

Calibration Velocity: 598.52 599.02 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.5 9.6 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.500	0.548	0.5920	0.5280	0.5600	155.80	98.61
2	10.750	0.553	0.5620	0.5490	0.5555	155.90	98.67
3	12.250	0.612	0.5280	0.5030	0.5160	155.90	98.67
4	12.500	0.618	0.5390	0.5260	0.5325	156.60	99.11
5	12.000	0.571	0.5520	0.5200	0.5360	155.70	98.54
AVG	11.800 inches	0.580 inches	0.6648 inches	0.6262 inches	0.6400 inches	156.98 grams	98.72 %

Notes:

- Nose Forward Bone Rib Diameter .4325 - .3015 inches
- Nose Forward Bone
- Nose Forward Bone
- Nose Forward Cartilage
- Nose Forward Bone

Date: 94 APR 18 Bbl. Length: 5" Ammo Mfg.: Federal
 Make: S&W Serial No.: 3D01411 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed Velocity at 20 ft.

1 885.27
 2 937.03
 3 935.10
 4 926.78
 5 924.56
 AVG 921.76
 f/sec

Kinetic Energy at 20 ft.: 298.02 ft.lbs.

Calibration Velocity: 597.16 590.88 f/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 8.3 8.3 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.000	0.459	0.6420	0.6225	0.6323	156.42	99.00
2	11.750	0.454	0.6475	0.6255	0.6365	156.30	98.92
3	12.750	0.463	0.6455	0.6160	0.6308	155.25	98.26
4	11.500	0.478	0.6245	0.6115	0.6180	157.11	99.44
5	12.125	0.450	0.6390	0.6180	0.6275	155.11	98.17
AVG	12.025 inches	0.460 inches	0.6397 inches	0.6183 inches	0.6290 inches	156.04 grains	98.76 %

Notes:

- 1 Nose Forward
- 2 Nose Forward
- 3 Sideways
- 4 Nose Forward
- 5 Sideways

Date: 94 MAY 02 Bbl. Length: 5" Ammo Mfg.: Federal
 Make: S&W Serial No.: 3D01411 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed Velocity at 20 ft.

1 885.27
 2 937.03
 3 935.10
 4 926.78
 5 924.56
 AVG 921.76
 f/sec

Kinetic Energy at 20 ft.: 298.02 ft.lbs.

Calibration Velocity: 601.18 602.34 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.0 8.9 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.750	0.507	0.6130	0.5850	0.5990	156.30	98.92
2	12.250	0.519	0.6190	0.6050	0.6120	155.70	98.54
3	11.875	0.504	0.6200	0.5890	0.6045	157.56	99.72
4	12.625	0.526	0.6120	0.5950	0.6035	156.32	98.94
5	12.750	0.468	0.6350	0.6170	0.6260	155.86	98.65
AVG	12.460 inches	0.606 inches	0.6198 inches	0.5982 inches	0.6090 inches	156.35 grains	98.95 %

Notes:

- 1 Base Forward
- 2 Nose Forward
- 3 Nose Forward
- 4 Nose Forward
- 5 Sideways

Date: 94 APR 18 Bbl. Length: 5" Ammo Mfg.: Federal
 Make: S&W Serial No.: 3001411 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed Velocity at 20 ft.

1 885.27
 2 937.03
 3 935.10
 4 926.78
 5 924.56
 AVG 921.75
 ft/sec

Kinetic Energy at 20 ft.: 298.02 ft.lbs.

Calibration Velocity: 597.16 590.88 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 8.3 8.3 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.750	0.501	0.6200	0.6055	0.6128	156.82	99.25
2	12.000	0.514	0.6045	0.5985	0.6015	156.63	99.13
3	13.000	0.550	0.5470	0.5385	0.5428	157.13	99.45
4	12.000	0.513	0.6060	0.5955	0.6008	155.72	98.56
5	14.750	0.640	0.4660	0.4560	0.4810	155.42	98.37
AVG	12.900 inches	0.644 inches	0.6687 inches	0.6688 inches	0.6638 inches	156.34 grains	98.96 %

Notes:

- 1 Nose Forward RCMP Storm Coat 3280-209 Sept/88
- 2 Nose Forward
- 3 Sideways
- 4 Nose Forward
- 5 Nose Forward

Date: 94 MAY 30 Bbl. Length: 5" Ammo Mfg.: Federal
 Make: S&W Serial No.: 3D01411 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed Velocity at 20 ft.

1 885.27
 2 937.03
 3 935.10
 4 926.78
 5 924.56
 AVG 921.75
 ft/sec

Kinetic Energy at 20 ft.: 298.02 ft.lbs.

Calibration Velocity: 591.93 584.80 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.2 9.2 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.250	0.544	0.5810	0.5790	0.5800	156.30	98.92
2	13.250	0.556	0.5790	0.5710	0.5750	157.10	99.43
3	13.125	0.532	0.6000	0.5910	0.5955	156.30	98.92
4	13.000	0.545	0.5900	0.5820	0.5860	156.20	98.86
5	13.000	0.515	0.5940	0.5800	0.5870	155.80	98.61
AVG	13.325 inches	0.638 inches	0.6888 inches	0.6806 inches	0.6847 inches	156.34 grains	98.96 %

Notes:

- 1 Nose Forward RCMP Storm Coat 3280-055 Sept/88
- 2 Nose Forward
- 3 Nose Forward
- 4 Nose Forward
- 5 Nose Forward

Date: 94 MAY 24 Bbl. Length: 5" Ammo Mfg.: Federal
 Make: S&W Serial No.: 3D01411 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed
Velocity at 20 ft.

1 885.27
 2 937.03
 3 935.10
 4 926.78
 5 924.56
 AVG 921.75
 f/sec

Kinetic Energy at 20 ft.: 298.02 ft.lbs.

Calibration Velocity: 610.50 614.78 f/sec
 Calibration Temp.: 5 6 °C
 Calibration penetration: 10.0 10.5 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.250	0.427	0.6250	0.6170	0.6210	156.80	99.11
2	15.000	0.419	0.6210	0.6010	0.6110	156.80	99.24
3	13.875	0.408	0.6260	0.5930	0.6105	157.40	99.82
4	15.125	0.402	0.6440	0.6120	0.6280	156.30	98.92
5	15.000	0.444	0.6110	0.5590	0.5850	155.70	98.54
AVG	14.650 inches	0.420 inches	0.6268 inches	0.5984 inches	0.6111 inches	156.56 grains	99.89 %

Notes:

- Nose Forward Muscle Rib Diameter .3230 - .3910 inches
- Nose Forward Muscle
- Sideways Bone
- Base Forward Bone
- Nose Forward Muscle

Date: 94 JUN 09 Bbl. Length: 5" Ammo Mfg.: Federal
 Make: S&W Serial No.: 3D01411 Bullet Wt.: 158 grains
 Model: 10-5 Caliber: .38 Spl Bullet Type: SWC HP
 Lot No.: 0291018

Chronographed
Velocity at 20 ft.

1 885.27
 2 937.03
 3 935.10
 4 926.78
 5 924.56
 AVG 921.75
 f/sec

Kinetic Energy at 20 ft.: 298.82 ft.lbs.

Calibration Velocity: 605.45 600.89 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.1 8.8 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.000	0.503	0.6190	0.6030	0.6110	157.00	99.37
2	12.750	0.493	0.6110	0.5950	0.6030	156.00	98.73
3	14.000	0.527	0.6010	0.5620	0.5815	156.10	98.80
4	12.125	0.501	0.6190	0.6010	0.6100	155.80	98.61
5	11.750	0.521	0.6220	0.6910	0.6565	156.10	98.80
AVG	12.525 inches	0.509 inches	0.6144 inches	0.6104 inches	0.6124 inches	156.20 grains	98.88 %

Notes:

- Nose Forward Bone Rib Diameter .3775 - .3680 inches
- Nose Forward Bone
- Nose Forward Bone
- Nose Forward Cartilage/Bone
- Nose Forward Cartilage

Date: 94 APR 20 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed Velocity at 20 ft.

1 1170.96
 2 1140.25
 3 1133.02
 4 1152.87
 5 1143.38
 AVG 1148.10
 f/sec

Kinetic Energy at 20 ft.: 336.52 ft.lbs.

Calibration Velocity: 598.44 600.10 f/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 10.0 10.1 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	9.750	0.377	0.6775	0.6290	0.6533	113.73	98.90
2	9.000	0.385	0.7265	0.6415	0.6840	113.11	98.38
3	9.625	0.419	0.6580	0.6165	0.6373	113.42	98.63
4	9.625	0.381	0.6270	0.6015	0.6143	114.04	99.17
5	8.250	0.358	0.7715	0.6480	0.7098	113.11	98.36
AVG	9.268 inches	0.384 inches	0.6921 inches	0.6273 inches	0.6697 inches	113.48 grains	98.68 %

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Sideways Jacket Fragmentation
- 3 Sideways Jacket Fragmentation
- 4 Sideways
- 5 Sideways

Date: 94 MAY 03 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed Velocity at 20 ft.

1 1170.96
 2 1140.25
 3 1133.02
 4 1152.87
 5 1143.38
 AVG 1148.10
 f/sec

Kinetic Energy at 20 ft.: 336.52 ft.lbs.

Calibration Velocity: 609.61 606.58 f/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.0 9.0 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	10.875	0.377	0.6030	0.5390	0.5710	115.43	100.00
2	10.000	0.428	0.6045	0.5500	0.5773	114.19	99.30
3	10.875	0.378	0.6265	0.5555	0.5910	114.81	99.83
4	10.375	0.424	0.8140	0.5710	0.5925	113.73	98.90
5	10.250	0.416	0.6255	0.5415	0.5835	115.12	100.00
AVG	10.475 inches	0.405 inches	0.6147 inches	0.5614 inches	0.5831 inches	114.66 grains	99.61 %

Notes:

- 1 Sideways
- 2 Sideways Jacket Fragmentation
- 3 Sideways
- 4 Sideways Jacket Fragmentation
- 5 Sideways

Date: 94 APR 20 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed
Velocity at 20 ft.

Kinetic Energy at 20 ft.: 336.62 ft.lbs.

1 1170.96
 2 1140.25
 3 1133.02
 4 1152.87
 5 1143.38
 AVG 1148.10
 ft/sec

Calibration Velocity: 560.27 595.41 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 8.5 9.5 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.750	0.379	0.5800	0.5590	0.5695	116.04	100.00
2	12.250	0.369	0.5750	0.5345	0.5548	115.74	100.00
3	11.250	0.393	0.5970	0.5435	0.5703	114.19	99.30
4	11.000	0.396	0.8160	0.5745	0.5953	114.65	99.70
5	11.750	0.360	0.5805	0.5565	0.5685	115.74	100.00
AVG	11.600 inches	0.379 inches	0.5897 inches	0.5636 inches	0.5717 inches	115.27 grams	99.80 %

Notes:

- 1 Sideways RCMP Storm Coat 3280-209
- 2 Sideways
- 3 Sideways Jacket Fragmentation
- 4 Sideways Jacket Fragmentation
- 5 Sideways

Date: 94 MAY 18 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed
Velocity at 20 ft.

Kinetic Energy at 20 ft.: 336.62 ft.lbs.

1 1170.96
 2 1140.25
 3 1133.02
 4 1152.87
 5 1143.38
 AVG 1148.10
 ft/sec

Calibration Velocity: 606.50 610.05 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.8 10.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.500	0.324	0.5460	0.5005	0.5233	116.00	100.00
2	14.000	0.316	0.5440	0.4945	0.5193	114.40	99.48
3	13.000	0.317	0.5675	0.4945	0.5310	115.10	100.00
4	11.875	0.301	0.5870	0.5190	0.5530	115.80	100.00
5	11.875	0.311	0.5640	0.5060	0.5350	115.40	100.00
AVG	13.060 inches	0.314 inches	0.5617 inches	0.5029 inches	0.5323 inches	115.34 grams	99.90 %

Notes:

- 1 Nose Forward RCMP Storm Coat 3250-105 Nov/87
- 2 Sideways Jacket Fragmentation
- 3 Base Forward
- 4 Nose Forward
- 5 Nose Forward

Date: 94 MAY 25 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed Velocity at 20 ft.

1 1170.96
 2 1140.25
 3 1133.02
 4 1152.87
 5 1143.38
 AVG 1148.10
 f/sec

Kinetic Energy at 20 ft.: 336.62 ft.lbs.

Calibration Velocity: 598.95 601.03 f/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.9 10.1 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	9.375	0.294	0.6640	0.6320	0.6480	111.40	96.87
2	9.125	0.339	0.6890	0.6280	0.6585	114.30	99.38
3	10.000	0.296	0.6880	0.6040	0.6460	115.40	100.00
4	8.375	0.313	0.7510	0.6630	0.7070	113.30	96.52
5	11.000	0.335	0.6710	0.5630	0.6170	101.00	67.83
AVG	9.676 inches	0.316 inches	0.6926 inches	0.6180 inches	0.6663 inches	111.08 grains	96.62 %

Notes:

- 1 Sideways Jacket Fragmentation Fat Rib Diameter .3415 - .4980 inches
- 2 Sideways Jacket Fragmentation Bone/Muscle
- 3 Sideways Bone/Muscle
- 4 Sideways Jacket Fragmentation Muscle
- 5 Sideways Jacket Fragmentation Bone

Date: 94 JUN 09 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed Velocity at 20 ft.

1 1170.96
 2 1140.25
 3 1133.02
 4 1152.87
 5 1143.38
 AVG 1148.10
 f/sec

Kinetic Energy at 20 ft.: 336.62 ft.lbs.

Calibration Velocity: 607.68 606.65 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.3 9.1 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.000	0.390	0.5980	0.5580	0.5780	113.20	98.43
2	9.625	0.368	0.6410	0.5630	0.6020	102.20	88.87
3	9.250	0.365	0.7000	0.5550	0.6275	104.40	90.78
4	9.250	0.420	0.6280	0.5600	0.5940	115.00	100.00
5	10.125	0.389	0.5970	0.5560	0.5765	115.90	100.00
AVG	9.860 inches	0.390 inches	0.6328 inches	0.5684 inches	0.5966 inches	110.14 grains	96.62 %

Notes:

- 1 Sideways Jacket Fragmentation Muscle Rib Diameter .3905 - .4280 in.
- 2 Sideways Jacket Fragmentation Bone/Muscle
- 3 Sideways Jacket Fragmentation Bone Core Fragmentation
- 4 Sideways Bone
- 5 Sideways Muscle

Date: 94 APR 27 Bbl. Length: 4.37 Ammo Mfg.: Winchester
 Make: Beretta Serial No.: E94986Z Bullet WL: 115 grains
 Model: 92 Centuron Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

**Chronographed
Velocity at 20 ft.**

1 1179.25
 2 1115.57
 3 1129.43
 4 1137.92
 5 1173.98
 AVG 1147.23
 f/sec

Kinetic Energy at 20 ft.: 336.02 ft.lbs.

Calibration Velocity: f/sec
 Calibration Temp.: °C
 Calibration penetration: cm

Test Type **Distance**
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1							
2							
3							
4							
5							
AVG	_____	_____	_____	_____	_____	_____	_____
	inches	inches	inches	inches	inches	grains	%

Notes:

- 1
- 2
- 3
- 4
- 5

Date: 94 APR 27 Bbl. Length: 3.55 Ammo Mfg.: Winchester
 Make: S&W Serial No.: TZZ 2994 Bullet Wt.: 115 grains
 Model: 3913 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

**Chronographed
Velocity at 20 ft.**

1 1163.06
 2 1150.75
 3 1136.36
 4 1121.08
 5 1096.25
 AVG 1133.60
 f/sec

Kinetic Energy at 20 ft.: 328.02 ft.lbs.

Calibration Velocity: f/sec
 Calibration Temp.: °C
 Calibration penetration: cm

Test Type **Distance**
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1							
2							
3							
4							
5							
AVG	_____	_____	_____	_____	_____	_____	_____
	inches	inches	inches	inches	inches	grains	%

Notes:

- 1
- 2
- 3
- 4
- 5

Date: 94 APR 20 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22-C-9593

Chronographed Velocity at 20 ft.

1 1200.77
 2 1186.52
 3 1183.15
 4 1152.07
 5 1133.27
 AVG 1171.16
 f/sec

Kinetic Energy at 20 ft.: 360.18 ft. lbs.

Calibration Velocity: 598.44 600.10 f/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 10.0 10.1 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	10.250	0.320	0.6355	0.6045	0.6200	110.33	95.94
2	10.500	0.332	0.6210	0.5840	0.6025	107.40	93.39
3	9.250	0.285	0.6485	0.6085	0.6285	107.40	93.39
4	9.500	0.352	0.6460	0.5955	0.6208	107.71	93.66
5	10.125	0.259	0.6290	0.5975	0.6133	104.78	91.11
AVG	9.925 inches	0.310 inches	0.6360 inches	0.5980 inches	0.6170 inches	107.62 grams	93.60 %

Notes:

- 1 Heavy Jacket Fragmentation
- 2 Heavy Jacket Fragmentation
- 3 Heavy Jacket Fragmentation
- 4 Heavy Jacket Fragmentation
- 5 Heavy Jacket Fragmentation

Date: 94 MAY 03 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22-C-9593

Chronographed Velocity at 20 ft.

1 1200.77
 2 1186.52
 3 1183.15
 4 1152.07
 5 1133.27
 AVG 1171.16
 f/sec

Kinetic Energy at 20 ft.: 360.18 ft. lbs.

Calibration Velocity: 615.23 604.38 f/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.2 8.7 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	9.875	0.380	0.6170	0.5870	0.6020	114.50	99.57
2	9.625	0.309	0.6190	0.6000	0.6095	107.40	93.39
3	9.875	0.374	0.6120	0.5770	0.5945	113.88	99.03
4	9.750	0.400	0.6390	0.5890	0.6140	114.96	99.97
5	10.250	0.357	0.6370	0.5920	0.6145	115.43	100.00
AVG	9.876 inches	0.364 inches	0.6248 inches	0.5890 inches	0.6069 inches	113.23 grams	98.39 %

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Sideways Jacket Fragmentation
- 3 Sideways
- 4 Sideways
- 5 Sideways

Date: 94 APR 20 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22-C-9593

**Chronographed
Velocity at 20 ft.**

1 1200.77
 2 1186.52
 3 1183.15
 4 1152.07
 5 1133.27

 AVG 1171.16
 f/sec

Kinetic Energy at 20 ft.: 350.18 ft.lbs.

Calibration Velocity: 560.27 595.40 f/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 8.5 9.5 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.375	0.360	0.6020	0.5780	0.5890	114.81	99.83
2	12.000	0.370	0.5585	0.5425	0.5505	115.27	100.00
3	10.875	0.445	0.6095	0.5835	0.5965	114.35	99.43
4	10.750	0.364	0.6300	0.5990	0.6145	115.43	100.00
5	11.000	0.368	0.8120	0.5875	0.5998	114.35	99.43
AVG	11.200 inches	0.381 inches	0.6024 inches	0.5777 inches	0.5901 inches	114.84 grains	99.74 %

Notes:

- 1 Sideways RCMP Storm Coat 3280 - 209
- 2 Sideways
- 3 Sideways
- 4 Nose Forward
- 5 Sideways Jacket Fragmentation

Date: 94 MAY 17 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22-C-9593

**Chronographed
Velocity at 20 ft.**

1 1200.77
 2 1186.52
 3 1183.15
 4 1152.07
 5 1133.27

 AVG 1171.16
 f/sec

Kinetic Energy at 20 ft.: 350.18 ft.lbs.

Calibration Velocity: 596.52 595.73 f/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.0 8.3 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	15.625	0.441	0.5010	0.4620	0.4815	115.30	100.00
2	11.625	0.362	0.5730	0.5580	0.5655	114.80	99.83
3	15.250	0.418	0.5150	0.4900	0.5025	115.50	100.00
4	12.000	0.374	0.5540	0.5420	0.5480	114.10	99.22
5	13.000	0.417	0.5410	0.5140	0.5275	114.80	99.83
AVG	13.600 inches	0.402 inches	0.5368 inches	0.5132 inches	0.5250 inches	114.90 grains	99.77 %

Notes:

- 1 Nose Forward RCMP Storm Jacket 3250-105 Nov/87
- 2 Nose Forward
- 3 Nose Forward
- 4 Nose Forward Jacket Fragmentation
- 5 Sideways

Date: 94 MAY 24 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22-C-9593

Chronographed Velocity at 20 ft.

1 1200.77
 2 1186.52
 3 1183.15
 4 1152.07
 5 1133.27
 AVG 1171.16
 f/sec

Kinetic Energy at 20 ft.: 360.18 ft.lbs.

Calibration Velocity: 609.16 611.70 f/sec
 Calibration Temp.: 6 5 °C
 Calibration penetration: 10.0 10.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.500	0.378	0.6450	0.6050	0.6250	109.00	94.78
2	15.000	0.443	0.4750	0.4130	0.4440	95.50	83.04
3	13.000	0.207	0.4740	0.4150	0.4445	57.20	49.74
4	11.875	0.332	0.6490	0.4810	0.5850	95.30	82.87
5	12.250	0.205	0.4900	0.4260	0.4580	55.00	47.83
AVG	12.726 Inches	0.313 Inches	0.6466 Inches	0.4680 Inches	0.6073 Inches	82.40 grains	71.66 %

Notes:

- 1 Sideways Jacket Fragmentation Muscle Rib Diameter .3235 - .3910 inches
- 2 Nose Forward Heavy Jacket Fragmentation Bone
- 3 Nose Forward Jacket Fragmentation Jacket/Core Separation Bone
- 4 Nose Forward Jacket Fragmentation Core Fragmentation Bone
- 5 Nose Forward Jacket /Core Fragmentation Jacket/Core Separation Bone

Date: 94 JUN 09 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 115 grains
 Model: 5943 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22-C-9593

Chronographed Velocity at 20 ft.

1 1200.77
 2 1186.52
 3 1183.15
 4 1152.07
 5 1133.27
 AVG 1171.16
 f/sec

Kinetic Energy at 20 ft.: 360.18 ft.lbs.

Calibration Velocity: 604.08 605.55 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.8 9.2 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	9.875	0.257	0.6270	0.5990	0.6130	113.50	98.70
2	10.750	0.284	0.6210	0.5850	0.6030	112.40	97.74
3	10.125	0.295	0.6040	0.5880	0.5960	114.10	99.22
4	9.250	0.264	0.6320	0.5800	0.6060	111.00	96.52
5	9.625	0.293	0.6400	0.6080	0.6240	112.80	98.09
AVG	9.926 Inches	0.279 Inches	0.6248 Inches	0.5920 Inches	0.6084 Inches	112.76 grains	98.06 %

Notes:

- 1 Sideways Jacket Fragmentation Muscle Rib Diameter .3570 - .3745 inches
- 2 Sideways Jacket Fragmentation Cartilage
- 3 Sideways Jacket Fragmentation Bone
- 4 Sideways Jacket Fragmentation Bone
- 5 Sideways Jacket Fragmentation

Date: 94 APR 19 Bbl. Length: 4" Ammo Mfg.: PMC
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 124 grains
 Model: 5943 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed
Velocity at 20 ft.

Kinetic Energy at 20 ft.: 317.14 ft.lbs.

1 1087.19
 2 1052.19
 3 1082.02
 4 1050.64
 5 1094.57
 AVG 1073.32
 ft/sec

Calibration Velocity: 602.63 603.65 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.5 9.1 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.250	0.367	0.6440	0.5930	0.6185	124.99	100.00
2	10.750	0.348	0.6670	0.6235	0.6453	122.37	98.89
3	10.750	0.333	0.6650	0.6165	0.6408	124.69	100.00
4	11.000	0.364	0.6510	0.6180	0.6345	124.84	100.00
5	11.250	0.376	0.6780	0.5990	0.6385	122.37	98.89
AVG	11.000 inches	0.368 inches	0.6610 inches	0.6100 inches	0.6366 inches	123.86 grains	99.47 %

Notes:

- 1 Sideways
- 2 Sideways
- 3 Sideways
- 4 Sideways
- 5 Sideways Jacket Fragmentation

Date: 94 MAY 03 Bbl. Length: 4" Ammo Mfg.: PMC
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 124 grains
 Model: 5943 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed
Velocity at 20 ft.

Kinetic Energy at 20 ft.: 317.14 ft.lbs.

1 1087.19
 2 1052.19
 3 1082.02
 4 1050.64
 5 1094.57
 AVG 1073.32
 ft/sec

Calibration Velocity: 609.61 606.58 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.0 9.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.125	0.421	0.6470	0.5585	0.6028	123.76	99.81
2	11.625	0.443	0.6460	0.5600	0.6030	124.53	100.00
3	11.875	0.434	0.5715	0.5400	0.5558	124.69	100.00
4	12.500	0.458	0.6110	0.5390	0.5750	124.53	100.00
5	11.500	0.435	0.6040	0.5550	0.5795	123.45	99.56
AVG	11.925 inches	0.438 inches	0.6158 inches	0.5606 inches	0.5832 inches	124.19 grains	99.87 %

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Sideways Jacket Fragmentation
- 3 Nose Forward
- 4 Sideways
- 5 Sideways

Date: 94 APR 19 Bbl. Length: 4" Ammo Mfg.: PMC
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 124 grains
 Model: 5943 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed
Velocity at 20 ft.

1 1087.19
 2 1052.19
 3 1082.02
 4 1050.64
 5 1094.57
 AVG 1073.32
 ft/sec

Kinetic Energy at 20 ft.: 317.14 ft. lbs.

Calibration Velocity: 598.09 597.94 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 10.0 9.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.250	0.465	0.5855	0.5290	0.5473	124.69	100.00
2	13.000	0.450	0.5890	0.5275	0.5583	124.53	100.00
3	13.125	0.450	0.6025	0.5420	0.5723	123.45	99.56
4	12.875	0.460	0.6400	0.5355	0.5878	124.53	100.00
5	13.750	0.458	0.5700	0.5450	0.5575	124.53	100.00
AVG	13.200 inches	0.466 inches	0.6034 inches	0.5368 inches	0.5646 inches	124.36 grams	99.91 %

Notes:

- 1 Sideways RCMP Storm Coat 3280-209
- 2 Sideways
- 3 Sideways Jacket Fragmentation
- 4 Sideways
- 5 Sideways

Date: 94 MAY 18 Bbl. Length: 4" Ammo Mfg.: PMC
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 124 grains
 Model: 5943 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed
Velocity at 20 ft.

1 1087.19
 2 1052.19
 3 1082.02
 4 1050.64
 5 1094.57
 AVG 1073.32
 ft/sec

Kinetic Energy at 20 ft.: 317.14 ft. lbs.

Calibration Velocity: 599.88 605.62 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.8 10.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	16.125	0.395	0.5390	0.5075	0.5233	124.90	100.00
2	14.875	0.426	0.5430	0.4995	0.5213	125.10	100.00
3	16.000	0.413	0.5375	0.4785	0.5080	124.80	100.00
4	16.750	0.410	0.5330	0.4815	0.5073	125.20	100.00
5	15.500	0.465	0.6190	0.5165	0.5678	124.20	100.00
AVG	16.860 inches	0.422 inches	0.5643 inches	0.4967 inches	0.5266 inches	124.84 grams	100.00 %

Notes:

- 1 Nose Forward RCMP Storm Jacket 3250-105 Nov/87
- 2 Nose Forward
- 3 Nose Forward
- 4 Nose Forward
- 5 Base Forward

Date: 94 MAY 26 Bbl. Length: 4" Ammo Mfg.: PMC
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 124 grains
 Model: 5943 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed
Velocity at 20 ft.

1 1087.19
 2 1052.19
 3 1082.02
 4 1050.64
 5 1094.57
 AVG 1073.32
 f/sec

Kinetic Energy at 20 ft.: 317.14 ft.lbs.

Calibration Velocity: 620.66 618.81 f/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 10.4 10.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.750	0.362	0.6480	0.6210	0.6345	124.00	100.00
2	11.125	0.391	0.6740	0.6100	0.6420	124.00	100.00
3	10.625	0.334	0.6840	0.6300	0.6570	123.30	99.44
4	14.000	0.443	0.5400	0.5300	0.5350	124.00	100.00
5	12.000	0.365	0.6960	0.6190	0.6575	121.90	98.31
AVG	11.900 inches	0.379 inches	0.6484 inches	0.6020 inches	0.6262 inches	123.44 grains	99.66 %

Notes:

- 1 Sideways Jacket Fragmentation Bone Rib Diameter .2690-.3725 inches
- 2 Sideways Jacket Fragmentation Bone
- 3 Sideways Bone/Muscle
- 4 Nose Forward Jacket Fragmentation Bone/Muscle
- 5 Sideways Jacket Fragmentation Bone/Muscle

Date: 94 JUN 09 Bbl. Length: 4" Ammo Mfg.: PMC
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 124 grains
 Model: 5943 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed
Velocity at 20 ft.

1 1087.19
 2 1052.19
 3 1082.02
 4 1050.64
 5 1094.57
 AVG 1073.32
 f/sec

Kinetic Energy at 20 ft.: 317.14 ft.lbs.

Calibration Velocity: 607.68 606.65 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.3 9.1 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.375	0.416	0.6915	0.5605	0.6260	124.80	100.00
2							
3							
4							
5							
AVG	11.375 inches	0.416 inches	0.6915 inches	0.5605 inches	0.6260 inches	124.80 grains	100.00 %

Notes:

- 1 Sideways Bone/Muscle
- 2 Ammunition supply deleted
- 3
- 4
- 5

Date: 94 APR 19 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Hydra-Shok JHP
 Lot No.: 2230603470

Chronographed
Velocity at 20 ft.

1 998.60
 2 1003.21
 3 1008.47
 4 1003.81
 6 1002.20
 AVG 1003.26
 ft/sec

Kinetic Energy at 20 ft.: 328.48 ft.lbs.

Calibration Velocity: 593.00 594.67 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.4 8.3 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.000	0.505	0.6415	0.6175	0.6295	145.67	99.10
2	11.750	0.447	0.6305	0.6180	0.6243	144.13	98.05
3	11.500	0.445	0.6425	0.6250	0.6338	146.14	99.41
4	11.750	0.476	0.6585	0.6185	0.6385	146.75	99.83
5	13.125	0.454	0.6370	0.6030	0.6200	143.50	97.62
AVG	12.226 inches	0.466 inches	0.6420 inches	0.6164 inches	0.6292 inches	145.24 grains	98.80 %

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Sideways Jacket Fragmentation
- 3 Sideways
- 4 Sideways
- 5 Sideways Jacket Fragmentation

Date: 94 MAY 04 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Hydra-Shok JHP
 Lot No.: 2230603470

Chronographed
Velocity at 20 ft.

1 998.60
 2 1003.21
 3 1008.47
 4 1003.81
 5 1002.20
 AVG 1003.26
 ft/sec

Kinetic Energy at 20 ft.: 328.48 ft.lbs.

Calibration Velocity: 606.35 601.40 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.3 9.3 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.125	0.490	0.6140	0.5910	0.6025	148.14	100.00
2	12.000	0.522	0.6270	0.6030	0.6150	147.22	100.00
3	12.500	0.513	0.6330	0.6030	0.6180	145.67	99.10
4	11.500	0.506	0.6410	0.6090	0.6250	147.52	100.00
5	12.000	0.511	0.6240	0.5800	0.6020	147.52	100.00
AVG	12.026 inches	0.508 inches	0.6278 inches	0.6072 inches	0.6126 inches	147.21 grains	99.82 %

Notes:

- 1 Nose Forward
- 2 Sideways
- 3 Sideways Jacket Fragmentation
- 4 Sideways Jacket Fragmentation
- 5 Sideways

Date: 94 APR 19 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Hydra-Shok JHP
 Lot No.: 2230603470

Chronographed
Velocity at 20 ft.

Kinetic Energy at 20 ft.: 328.48 ft.lbs.

1	998.60			
2	1003.21			
3	1008.47	Calibration Velocity:	597.62	592.17 ft/sec
4	1003.81	Calibration Temp.:	6	6 °C
5	1002.20	Calibration penetration:	9.3	9.3 cm
AVG	1003.26			

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.750	0.560	0.5730	0.5435	0.5583	148.14	100.00
2	12.000	0.522	0.5995	0.5770	0.5883	146.91	99.94
3	14.750	0.541	0.5725	0.5300	0.5513	147.37	100.00
4	12.500	0.513	0.6080	0.5820	0.5950	146.75	99.83
5	13.875	0.554	0.6760	0.5425	0.6093	146.75	99.83
AVG	13.575 inches	0.538 inches	0.6058 inches	0.5550 inches	0.5804 inches	147.18 grains	99.92 %

Notes:

- 1 Base Forward RCMP Storm Coat 3280 - 209
- 2 Nose Forward Jacket Fragmentation
- 3 Sideways
- 4 Nose Forward
- 5 Nose Forward

Date: 94 MAY 17 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Hydra-Shok JHP
 Lot No.: 2230603470

Chronographed
Velocity at 20 ft.

Kinetic Energy at 20 ft.: 326.48 ft.lbs.

1	998.80			
2	1003.21			
3	1008.47	Calibration Velocity:	596.52	595.73 ft/sec
4	1003.81	Calibration Temp.:	7	7 °C
5	1002.20	Calibration penetration:	9.0	8.3 cm
AVG	1003.28			

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.750	0.459	0.5940	0.5430	0.5685	146.50	99.66
2	13.000	0.457	0.6000	0.5510	0.5755	146.80	99.66
3	13.125	0.459	0.5790	0.5610	0.5700	147.20	100.00
4	14.500	0.459	0.6680	0.5220	0.5950	145.20	98.78
5	15.000	0.491	0.6210	0.4990	0.5600	148.50	100.00
AVG	13.875 inches	0.465 inches	0.6124 inches	0.5352 inches	0.5738 inches	146.84 grains	99.66 %

Notes:

- 1 Nose Forward Jacket Fragmentation RCMP Storm Coat 3250-105 Nov/87
- 2 Nose Forward
- 3 Sideways
- 4 Base Forward Jacket Fragmentation
- 5 Sideways

Date: 94 MAY 26 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Hydra-Shok JHP
 Lot No.: 2230603470

Chronographed Velocity at 20 ft.

1 998.60
 2 1003.21
 3 1008.47
 4 1003.81
 5 1002.20
 AVG 1003.26
 ft/sec

Kinetic Energy at 20 ft.: 328.48 ft.lbs.

Calibration Velocity: 620.66 618.81 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 10.4 10.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.500	0.452	0.8550	0.6280	0.6415	147.40	100.00
2	14.125	0.532	0.6920	0.5880	0.6400	147.80	100.00
3	13.375	0.533	0.7570	0.6330	0.6950	148.50	100.00
4	14.750	0.462	0.6570	0.5790	0.6180	145.20	98.78
5	14.125	0.467	0.6430	0.6110	0.6270	148.20	100.00
AVG	13.975 inches	0.489 inches	0.6808 inches	0.6078 inches	0.6443 inches	147.38 grains	99.76 %

Notes:

- 1 Sideways Bone Rib Diameter 2690 - .3720 inches
- 2 Nose Forward Bone
- 3 Sideways Bone
- 4 Nose Forward Jacket Fragmentation Bone
- 5 Sideways Bone/Muscle

Date: 94 JUN 09 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Hydra-Shok JHP
 Lot No.: 2230603470

Chronographed Velocity at 20 ft.

1 998.60
 2 1003.21
 3 1008.47
 4 1003.81
 5 1002.20
 AVG 1003.26
 ft/sec

Kinetic Energy at 20 ft.: 328.48 ft.lbs.

Calibration Velocity: 805.62 802.26 ft/sec
 Calibration Temp.: 8 6 °C
 Calibration penetration: 9.0 8.5 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.000	0.531	0.6390	0.5990	0.6190	145.90	99.25
2	11.875	0.471	0.6310	0.6820	0.6565	146.30	99.52
3	11.125	0.505	0.6860	0.6240	0.6450	147.40	100.00
4	11.625	0.509	0.6440	0.6120	0.6280	147.20	100.00
5	11.125	0.426	0.6710	0.6290	0.6500	147.10	100.00
AVG	11.660 inches	0.488 inches	0.6502 inches	0.6292 inches	0.6397 inches	146.78 grains	99.76 %

Notes:

- 1 Sideways Cartilage Rib Diameter .4115 - .4080 inches
- 2 Sideways Jacket Fragmentation Muscle/Cartilage
- 3 Nose Forward Cartilage
- 4 Nose Forward Cartilage
- 5 Sideways Cartilage

Date: 94 APR 19 Bbl. Length: 4" Ammo Mfg.: Remington
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Golden Saber JHP
 Lot No.: LY14 SA5801

Chronographed Velocity at 20 ft.

1 1029.65
 2 1000.88
 3 1007.05
 4 1012.35
 5 1023.75
 AVG 1014.74
 ft/sec

Kinetic Energy at 20 ft.: 336.04 ft.lbs.

Calibration Velocity: 593.00 594.67 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.4 8.3 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.500	0.425	0.6370	0.6015	0.6193	146.75	99.83
2	14.750	0.500	0.6440	0.6155	0.6298	148.14	100.00
3	14.000	0.544	0.6050	0.5630	0.5840	146.75	99.83
4	13.000	0.533	0.6415	0.6010	0.6213	146.60	99.73
5	14.000	0.440	0.6440	0.5990	0.6215	146.75	99.83
AVG	13.860 inches	0.488 inches	0.6343 inches	0.5960 inches	0.6162 inches	147.00 grains	99.84 %

Notes:

- 1 Sideways
- 2 Sideways
- 3 Sideways
- 4 Sideways
- 5 Sideways

Date: 94 MAY 04 Bbl. Length: 4" Ammo Mfg.: Remington
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Golden Saber JHP
 Lot No.: LY14SA5801

Chronographed Velocity at 20 ft.

1 1029.65
 2 1000.88
 3 1007.05
 4 1012.35
 5 1023.75
 AVG 1014.74
 ft/sec

Kinetic Energy at 20 ft.: 336.04 ft.lbs.

Calibration Velocity: 604.81 602.05 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.5 9.1 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.875	0.485	0.6440	0.5880	0.6160	149.22	100.00
2	13.250	0.453	0.6340	0.6030	0.6185	149.07	100.00
3	13.625	0.461	0.6320	0.5660	0.5990	148.53	100.00
4	13.875	0.463	0.6510	0.5810	0.6160	148.45	100.00
5	13.375	0.433	0.6320	0.5940	0.6130	149.22	100.00
AVG	13.800 inches	0.469 inches	0.6386 inches	0.5864 inches	0.6125 inches	149.10 grains	100.00 %

Notes:

- 1 Sideways
- 2 Sideways
- 3 Sideways
- 4 Sideways
- 5 Nose Forward

Date: 94 APR 19 Bbl. Length: 4" Ammo Mfg.: Remington
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Golden Saber JHP
 Lot No.: LY14SA5801

**Chronographed
Velocity at 20 ft.**

1 1029.65
 2 1000.88
 3 1007.05
 4 1012.35
 5 1023.75
 AVG 1014.74
 ft/sec

Kinetic Energy at 20 ft.: 336.04 ft.lbs.

Calibration Velocity: 597.62 592.17 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.0 9.3 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	16.250	0.469	0.5920	0.5470	0.5695	143.05	97.31
2	14.500	0.475	0.6395	0.5975	0.6185	146.60	99.73
3	14.500	0.439	0.6345	0.6095	0.6220	146.60	99.73
4	15.250	0.480	0.6450	0.5885	0.6158	146.91	99.84
5	15.000	0.500	0.6500	0.6070	0.6285	146.91	99.84
AVG	15.100	0.473	0.6322	0.5896	0.6109	146.01	99.33
	Inches	Inches	Inches	Inches	Inches	grains	%

Notes:

- 1 Sideways Jacket Fragmentation RCMP Storm Coat 3280-209
- 2 Sideways
- 3 Sideways
- 4 Sideways
- 5 Sideways

Date: 94 MAY 17 Bbl. Length: 4" Ammo Mfg.: Remington
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Golden Saber JHP
 Lot No.: LY14SA5801

**Chronographed
Velocity at 20 ft.**

1 1029.65
 2 1000.88
 3 1007.05
 4 1012.35
 5 1023.75
 AVG 1014.74
 ft/sec

Kinetic Energy at 20 ft.: 336.04 ft.lbs.

Calibration Velocity: 600.30 595.52 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.7 9.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	15.500	0.481	0.6310	0.6020	0.6185	147.10	100.00
2	15.000	0.458	0.6410	0.5960	0.6185	147.50	100.00
3	14.000	0.450	0.6550	0.5910	0.6230	147.40	100.00
4	15.500	0.471	0.6300	0.6060	0.6180	147.10	100.00
5	14.375	0.477	0.6330	0.6020	0.6175	146.80	99.86
AVG	14.875	0.467	0.6380	0.6094	0.6187	147.18	99.97
	Inches	Inches	Inches	Inches	Inches	grains	%

Notes:

- 1 Sideways RCMP Storm Coat 3250-105 Nov/87
- 2 Sideways
- 3 Sideways
- 4 Nose Forward
- 5 Nose Forward

Date: 94 MAY 25 Bbl. Length: 4" Ammo Mfg.: Remington
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Golden Saber JHP
 Lot No.: LY14SA5801

Chronographed Velocity at 20 ft.

1 1029.85
 2 1000.88
 3 1007.05
 4 1012.35
 5 1023.75
 AVG 1014.74
 f/sec

Kinetic Energy at 20 ft.: 336.04 ft.lbs.

Calibration Velocity: 598.95 601.03 f/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.9 10.1 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	15.250	0.369	0.6490	0.5670	0.6090	147.50	100.00
2	15.250	0.438	0.8510	0.5440	0.5975	141.10	95.99
3	15.125	0.362	0.6470	0.5800	0.6135	147.10	100.00
4	15.750	0.391	0.6560	0.5660	0.6110	147.10	100.00
5	14.750	0.420	0.6340	0.5700	0.6020	147.50	100.00
AVG	15.225 inches	0.396 inches	0.6474 inches	0.5654 inches	0.6064 inches	146.06 grains	99.20 %

Notes:

- 1 Sideways Fat/Muscle Rib Diameter .3410 - .4985 inches
- 2 Base Forward Jacket Fragmentation Bone
- 3 Sideways Bone
- 4 Base Forward Bone
- 5 Sideways Bone

Date: 94 JUN 09 Bbl. Length: 4" Ammo Mfg.: Remington
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Golden Saber JHP
 Lot No.: LY14SA5801

Chronographed Velocity at 20 ft.

1 1029.85
 2 1000.88
 3 1007.05
 4 1012.35
 5 1023.75
 AVG 1014.74
 f/sec

Kinetic Energy at 20 ft.: 336.04 ft.lbs.

Calibration Velocity: 604.08 605.55 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.8 9.2 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.000	0.446	0.6440	0.5800	0.6120	147.40	100.00
2	12.500	0.454	0.6450	0.6090	0.6270	147.20	100.00
3	13.500	0.439	0.6390	0.6080	0.6235	146.80	99.86
4	14.000	0.447	0.6470	0.5950	0.6210	146.80	99.86
5	14.875	0.496	0.6170	0.5880	0.6025	147.20	100.00
AVG	13.575 inches	0.456 inches	0.6384 inches	0.5960 inches	0.6172 inches	147.08 grains	99.95 %

Notes:

- 1 Sideways Bone Rib Diameter .3570 - .3745 inches
- 2 Sideways Bone
- 3 Sideways Cartilage
- 4 Sideways Cartilage
- 5 Base Forward Bone

Date: 94 APR 19 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed Velocity at 20 ft.

1 1044.93
 2 1021.66
 3 1040.80
 4 1039.50
 5 1049.32
 AVG 1039.24 ft/sec

Kinetic Energy at 20 ft.: 382.46 ft.lbs.

Calibration Velocity: 593.00 594.67 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.4 8.3 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.500	0.449	0.6525	0.5990	0.6258	144.75	98.47
2	13.500	0.430	0.6385	0.5889	0.6137	146.60	99.73
3	14.000	0.448	0.6845	0.5755	0.6300	141.97	96.58
4	13.125	0.448	0.6685	0.5730	0.6208	146.44	99.62
5	14.500	0.465	0.6805	0.5975	0.6390	144.44	98.26
AVG	13.726 inches	0.448 inches	0.6649 inches	0.5869 inches	0.6268 inches	144.84 grams	98.63 %

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Sideways
- 3 Sideways Heavy Jacket Fragmentation
- 4 Sideways
- 5 Sideways Jacket Fragmentation

Date: 94 MAY 04 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed Velocity at 20 ft.

1 1044.93
 2 1021.66
 3 1040.80
 4 1039.50
 5 1049.32
 AVG 1039.24 ft/sec

Kinetic Energy at 20 ft.: 382.46 ft.lbs.

Calibration Velocity: 806.35 801.40 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.3 9.3 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.875	0.481	0.6550	0.5490	0.6020	147.37	100.00
2	13.500	0.487	0.6320	0.5570	0.5945	148.45	100.00
3	14.875	0.483	0.6560	0.5610	0.6085	143.67	97.73
4	14.000	0.473	0.6300	0.5530	0.5915	147.37	100.00
5	13.750	0.483	0.6690	0.5530	0.6110	147.99	100.00
AVG	14.200 inches	0.477 inches	0.6484 inches	0.5546 inches	0.6016 inches	146.97 grams	99.66 %

Notes:

- 1 Sideways
- 2 Sideways
- 3 Sideways
- 4 Sideways
- 5 Sideways

Date: 94 APR 19 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed Velocity at 20 ft.

1 1044.93
 2 1021.66
 3 1040.80
 4 1039.50
 5 1049.32
 AVG 1039.24
 ft/sec

Kinetic Energy at 20 ft.: 362.48 ft.lbs.

Calibration Velocity: 598.09 597.94 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 10.0 9.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	17.000	0.509	0.6560	0.5695	0.6128	143.82	97.84
2	14.500	0.492	0.6640	0.5665	0.6153	147.83	100.00
3	14.250	0.485	0.6585	0.5825	0.6205	148.76	100.00
4	15.375	0.510	0.6570	0.5820	0.6195	147.52	100.00
5	15.500	0.484	0.6465	0.5770	0.6118	147.99	100.00
AVG	15.325 inches	0.496 inches	0.6564 inches	0.5755 inches	0.6160 inches	147.18 grains	99.57 %

Notes:

- 1 Sideways Jacket Fragmentation RCMP Storm Coat 3280-209
- 2 Sideways Jacket Fragmentation
- 3 Sideways Jacket Fragmentation
- 4 Base Forward Jacket Fragmentation
- 5 Sideways Jacket Fragmentation

Date: 94 MAY 17 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed Velocity at 20 ft.

1 1044.93
 2 1021.66
 3 1040.80
 4 1039.50
 5 1049.32
 AVG 1039.24
 ft/sec

Kinetic Energy at 20 ft.: 362.46 ft.lbs.

Calibration Velocity: 600.30 595.52 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.7 9.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	15.000	0.418	0.6160	0.5440	0.5800	148.40	100.00
2	16.500	0.435	0.6360	0.4940	0.5650	142.60	97.01
3	16.375	0.471	0.6920	0.5720	0.6320	148.60	100.00
4	15.500	0.533	0.6280	0.4880	0.5580	149.10	100.00
5	16.750	0.480	0.6800	0.5140	0.5970	148.60	100.00
AVG	16.025 inches	0.463 inches	0.6504 inches	0.5224 inches	0.5864 inches	147.48 grains	99.40 %

Notes:

- 1 Sideways RCMP Storm Coat 3250-105 Nov/87
- 2 Nose Forward Core Fragmentation
- 3 Sideways
- 4 Sideways
- 5 Base Forward

Date: 94 MAY 25 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet WL: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed
Velocity at 20 ft.

1 1044.93
 2 1021.66
 3 1040.80
 4 1039.50
 5 1049.32
 AVG 1039.24
 f/sec

Kinetic Energy at 20 ft.: 352.46 ft.lbs.

Calibration Velocity: 598.95 601.03 f/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.9 10.1 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.250	0.374	0.6330	0.5910	0.6120	142.60	97.01
2	14.000	0.370	0.6870	0.6140	0.6505	145.50	98.98
3	14.250	0.397	0.6310	0.5810	0.6060	147.50	100.00
4	14.000	0.382	0.6660	0.5880	0.6270	148.40	100.00
5	14.250	0.403	0.6620	0.5980	0.6300	148.00	100.00
AVG	14.150 inches	0.385 inches	0.6568 inches	0.5944 inches	0.6251 inches	146.40 grains	99.20 %

Notes:

- 1 Sideways Bone Rib Diameter .3410 - .4985
- 2 Sideways Core Fragmentation Bone
- 3 Sideways Muscle
- 4 Sideways Bone/Muscle
- 5 Sideways Bone

Date: 94 JUN 09 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet WL: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed
Velocity at 20 ft.

1 1044.93
 2 1021.66
 3 1040.80
 4 1039.50
 5 1049.32
 AVG 1039.24
 f/sec

Kinetic Energy at 20 ft.: 362.46 ft.lbs.

Calibration Velocity: 605.62 602.26 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.0 8.5 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	15.000	0.511	0.6990	0.6160	0.6575	148.60	100.00
2	15.875	0.527	0.6740	0.5820	0.6260	149.00	100.00
3	14.500	0.501	0.6870	0.5960	0.6415	146.30	99.52
4	14.625	0.508	0.6130	0.5390	0.5760	148.70	100.00
5	14.125	0.506	0.6700	0.5970	0.6335	148.90	99.93
AVG	14.828 inches	0.511 inches	0.6598 inches	0.5860 inches	0.6273 inches	147.90 grains	99.89 %

Notes:

- 1 Sideways Bone Rib Diameter .4115 - .4080 inches
- 2 Sideways Bone
- 3 Sideways Jacket Fragmentation Bone
- 4 Nose Forward Bone
- 5 Sideways Muscle

Date: 94 APR 27 Bbl. Length: 3.55 Ammo Mfg.: Winchester
 Make: S&W Serial No.: TZZ2994 Bullet Wt.: 147 grains
 Model: 3913 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed Velocity at 20 ft.

1 1047.12
 2 1046.46
 3 1041.02
 4 1013.58
 5 1045.37
 AVG 1038.71
 f/sec

Kinetic Energy at 20 ft.: 352.10 ft.lbs.

Calibration Velocity: f/sec
 Calibration Temp.: °C
 Calibration penetration: cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1							
2							
3							
4							
5							
AVG	_____	_____	_____	_____	_____	_____	_____
	inches	inches	inches	inches	inches	grains	%

Notes:

- 1
- 2
- 3
- 4
- 5

Date: 94 APR 27 Bbl. Length: 4.37 Ammo Mfg.: Winchester
 Make: Berretta Serial No.: E94986Z Bullet Wt.: 147 grains
 Model: 92 Centurian Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed Velocity at 20 ft.

1 1044.71
 2 1040.56
 3 1062.70
 4 1055.74
 5 1048.88
 AVG 1050.52
 f/sec

Kinetic Energy at 20 ft.: 360.16 ft.lbs.

Calibration Velocity: f/sec
 Calibration Temp.: °C
 Calibration penetration: cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1							
2							
3							
4							
5							
AVG	_____	_____	_____	_____	_____	_____	_____
	inches	inches	inches	inches	inches	grains	%

Notes:

- 1
- 2
- 3
- 4
- 5

Date: 94 JUN 21 Bbl. Length: 4" Ammo Mfg.: Speer
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed Velocity at 20 ft.

1 931.27
 2 936.33
 3 932.84
 4 921.15
 5 918.11
 AVG 927.94 f/sec

Kinetic Energy at 20 ft.: 281.01 ft.lbs.

Calibration Velocity: 612.59 613.12 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.8 10.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	15.000	0.424	0.5340	0.4990	0.5165	146.90	99.93
2	16.375	0.445	0.5500	0.5160	0.5330	146.40	99.59
3	16.000	0.445	0.5040	0.4880	0.4960	146.80	99.86
4	15.750	0.437	0.5490	0.4990	0.5240	147.20	100.00
5	14.375	0.436	0.5500	0.4820	0.5160	143.80	97.82
AVG	15.600 inches	0.437 inches	0.5374 inches	0.4988 inches	0.5171 inches	146.22 grains	99.44 %

Notes:

- Nose Forward
- Nose Forward
- Nose Forward
- Nose Forward
- Base Forward

Date: 94 JUN 23 Bbl. Length: 4" Ammo Mfg.: Speer
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed Velocity at 20 ft.

1 931.27
 2 936.33
 3 932.84
 4 921.15
 5 918.11
 AVG 927.94 f/sec

Kinetic Energy at 20 ft.: 281.01 ft.lbs.

Calibration Velocity: 602.85 598.66 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.5 9.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	16.125	0.522	0.4950	0.4750	0.4850	146.40	99.59
2	15.500	0.525	0.5030	0.4850	0.4940	146.90	99.93
3	16.250	0.538	0.4980	0.4730	0.4855	146.90	99.93
4	15.750	0.544	0.5010	0.4860	0.4835	146.50	99.66
5	16.250	0.523	0.5460	0.4960	0.5210	147.10	100.00
AVG	16.975 inches	0.530 inches	0.5086 inches	0.4790 inches	0.4838 inches	146.76 grains	99.82 %

Notes:

- Nose Forward
- Nose Forward
- Nose Forward
- Sideways
- Sideways

Date: 94 JUN 21 Bbl. Length: 4" Ammo Mfg.: Speer
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed Velocity at 20 ft.

Kinetic Energy at 20 ft.: 281.81 ft.lbs.

1 931.27
 2 936.33
 3 932.84
 4 921.15
 5 918.11
 AVG 927.94
 ft/sec

Calibration Velocity: 810.72 611.77 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.4 9.6 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	17.250	0.465	0.4960	0.4730	0.4845	147.00	100.00
2	16.750	0.448	0.4890	0.4670	0.4780	147.00	100.00
3	16.750	0.471	0.4820	0.4640	0.4730	147.00	100.00
4	18.375	0.481	0.4980	0.4730	0.4855	146.80	99.88
5	16.750	0.468	0.4860	0.4670	0.4765	147.40	100.00
AVG	16.776 inches	0.463 inches	0.4902 inches	0.4688 inches	0.4796 inches	147.04 grains	99.97 %

Notes:

- Nose Forward RCMP Storm Coat 3280-055 Sept/88
- Base Forward
- Base Forward
- Base Forward
- Nose Forward

Date: 94 JUN 23 Bbl. Length: 4" Ammo Mfg.: Speer
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed Velocity at 20 ft.

Kinetic Energy at 20 ft.: 281.01 ft.lbs.

1 931.27
 2 936.33
 3 932.84
 4 921.15
 5 918.11
 AVG 927.94
 ft/sec

Calibration Velocity: 596.81 596.00 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.9 8.9 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	17.000	0.551	0.4760	0.4560	0.4680	146.90	99.93
2	17.250	0.552	0.4860	0.4540	0.4700	147.30	100.00
3	17.625	0.554	0.4860	0.4440	0.4560	146.80	99.88
4	18.000	0.560	0.4650	0.4430	0.4540	146.30	99.52
5	18.875	0.547	0.4850	0.4620	0.4735	146.90	99.93
AVG	17.350 inches	0.563 inches	0.4760 inches	0.4618 inches	0.4639 inches	146.84 grains	99.85 %

Notes:

- Nose Forward RCMP Storm Coat 3280 - 357 /87
- Nose Forward
- Nose Forward
- Nose Forward
- Nose Forward

Date: 94 JUN 10 Bbl. Length: 4" Ammo Mfg.: Speer
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed Velocity at 20 ft.

1 931.27
 2 936.33
 3 932.84
 4 921.15
 5 916.11
 AVG 927.94
 ft/sec

Kinetic Energy at 20 ft.: 281.01 ft.lbs.

Calibration Velocity: 597.51 608.79 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.5 9.6 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	15.500	0.527	0.5050	0.4740	0.4895	146.90	99.93
2	15.750	0.528	0.5030	0.4880	0.4955	146.50	99.86
3	14.625	0.513	0.5140	0.4880	0.5010	147.10	100.00
4	16.250	0.514	0.5080	0.5020	0.5055	147.20	100.00
5	17.000	0.573	0.4800	0.4430	0.4815	146.20	99.48
AVG	16.826 inches	0.631 inches	0.5022 inches	0.4790 inches	0.4906 inches	146.78 grains	99.81 %

Notes:

- 1 Base Forward Bone Rib Diameter 3700 - .4095 inches
- 2 Base Forward Muscle
- 3 Sideways Bone
- 4 Base Forward Bone
- 5 Base Forward Cartilage

Date: 94 JUN 22 Bbl. Length: 4" Ammo Mfg.: Speer
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed Velocity at 20 ft.

1 931.27
 2 936.33
 3 932.84
 4 921.15
 5 918.11
 AVG 927.94
 ft/sec

Kinetic Energy at 20 ft.: 281.01 ft.lbs.

Calibration Velocity: 615.84 614.70 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.7 9.6 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	15.875	0.514	0.5550	0.4940	0.5245	147.10	100.00
2	14.125	0.490	0.5060	0.4710	0.4885	144.30	98.16
3	15.825	0.526	0.5040	0.4920	0.4980	146.60	99.73
4	16.750	0.547	0.4940	0.4740	0.4840	146.50	99.66
5	16.250	0.536	0.5080	0.4770	0.4925	141.30	96.12
AVG	16.726 inches	0.623 inches	0.5134 inches	0.4818 inches	0.4975 inches	146.16 grains	98.73 %

Notes:

- 1 Nose Forward Muscle Rib Diameter 3390 - .3720 inches
- 2 Nose Forward Bone
- 3 Nose Forward Muscle/Cartilage
- 4 Nose Forward Muscle/Cartilage
- 5 Nose Forward Bone

Date: 94 JUN 23 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: FMJ Subsonic Match
 Lot No.: 59GC3044

Chronographed
Velocity at 20 ft.

1 950.93
 2 975.42
 3 967.49
 4 978.28
 5 954.93
 AVG 966.41
 ft/sec

Kinetic Energy at 20 ft.: 304.16 ft.lbs.

Calibration Velocity: 618.66 615.78 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.7 9.7 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	31.825	0.654	0.3540	0.3500	0.3520	146.70	99.80
2	27.825	0.654	0.3530	0.3510	0.3520	146.20	99.46
3	22.375	0.658	0.3530	0.3510	0.3520	146.90	99.93
4	32.375	0.654	0.3530	0.3510	0.3520	146.80	99.73
5	31.500	0.654	0.3530	0.3530	0.3530	146.80	99.86
AVG	29.100 inches	0.656 inches	0.3532 inches	0.3512 inches	0.3522 inches	146.64 grains	99.76 %

Notes:

- 1 Nose Forward
- 2 Base Forward
- 3 Base Forward
- 4 Base Forward
- 5 Base Forward

Date: 94 JUN 24 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: FMJ Subsonic Match
 Lot No.: 59GC3044

Chronographed
Velocity at 20 ft.

1 950.93
 2 975.42
 3 967.49
 4 978.28
 5 954.93
 AVG 966.41
 ft/sec

Kinetic Energy at 20 ft.: 304.16 ft.lbs.

Calibration Velocity: 617.20 617.82 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.4 9.4 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	25.000	0.660	0.3530	0.3510	0.3520	146.70	99.80
2	25.250	0.663	0.3510	0.3510	0.3510	146.50	99.68
3	22.375	0.657	0.3540	0.3510	0.3525	146.60	99.73
4	22.500	0.657	0.3540	0.3510	0.3525	146.40	99.59
5	25.625	0.658	0.3530	0.3510	0.3520	146.90	99.93
AVG	24.150 inches	0.659 inches	0.3530 inches	0.3510 inches	0.3520 inches	146.62 grains	99.74 %

Notes:

- 1 Base Forward
- 2 Base Forward
- 3 Base Forward
- 4 Base Forward
- 5 Nose Forward

Date: 94 JUN 23 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: FMJ Subsonic Match
 Lot No.: 59GC3044

Chronographed
Velocity at 20 ft.

1 950.93
 2 975.42
 3 967.49
 4 978.28
 5 954.93
 AVG 965.41
 f/sec

Kinetic Energy at 20 ft.: 304.16 ft.lbs.

Calibration Velocity: 592.00 612.67 f/sec
 Calibration Temp.: 6 7 °C
 Calibration penetration: 9.2 9.7 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	35.250	0.655	0.3520	0.3500	0.3510	146.50	99.86
2	27.250	0.655	0.3530	0.3510	0.3520	146.80	99.86
3	23.750	0.654	0.3520	0.3490	0.3505	146.50	99.86
4	24.625	0.654	0.3530	0.3500	0.3515	146.00	99.32
5	28.250	0.654	0.3520	0.3500	0.3510	146.50	99.86
AVG	27.826 inches	0.654 inches	0.3524 inches	0.3500 inches	0.3512 inches	146.46 grains	99.83 %

Notes:

- 1 Base Forward RCMP Storm Coat 3280 - 357 /87
- 2 Nose Forward
- 3 Nose Forward
- 4 Base Forward
- 5 Base Forward

Date: 94 JUN 24 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: FMJ Subsonic Match
 Lot No.: 59GC3044

Chronographed
Velocity at 20 ft.

1 950.93
 2 975.42
 3 967.49
 4 978.28
 5 954.93
 AVG 965.41
 f/sec

Kinetic Energy at 20 ft.: 304.16 ft.lbs.

Calibration Velocity: 618.66 624.28 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.4 9.6 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	24.500	0.651	0.3520	0.3510	0.3515	146.20	99.46
2	23.250	0.656	0.3520	0.3510	0.3515	146.60	99.73
3	23.375	0.656	0.3530	0.3500	0.3515	146.40	99.59
4	24.750	0.656	0.3530	0.3510	0.3520	146.60	99.73
5	22.375	0.652	0.3530	0.3510	0.3520	146.40	99.59
AVG	23.650 inches	0.654 inches	0.3526 inches	0.3508 inches	0.3517 inches	146.44 grains	99.62 %

Notes:

- 1 Base Forward RCMP Storm Coat 3280 - 357 /87
- 2 Nose Forward
- 3 Base Forward
- 4 Base Forward
- 5 Nose Forward

Date: 94 JUN 07 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: FMJ Subsonic Match
 Lot No.: 59GC3044

Chronographed Velocity at 20 ft.

1 950.93
 2 975.42
 3 967.49
 4 978.28
 5 954.93
 AVG 965.41
 ft/sec

Kinetic Energy at 20 ft.: 304.16 ft.lbs.

Calibration Velocity: 602.12 603.28 ft/sec
 Calibration Temp.: 8 6 °C
 Calibration penetration: 9.5 9.8 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	24.500	0.857	0.3580	0.3500	0.3530	148.30	99.52
2	21.250	0.855	0.3530	0.3500	0.3515	148.50	99.88
3	24.125	0.851	0.3540	0.3510	0.3525	148.20	99.46
4	21.125	0.855	0.3520	0.3500	0.3510	148.60	99.73
5	24.375	0.680	0.3670	0.3530	0.3600	148.80	99.86
AVG	23.075 inches	0.660 inches	0.3564 inches	0.3508 inches	0.3536 inches	148.48 grains	99.65 %

Notes:

- Nose Forward Bone/Muscle Rib-Diameter .3315 - .4625
- Nose Forward Bone
- Base Forward Cartilage Sternum
- Nose Forward Bone
- Nose Forward Cartilage Sternum

Date: 94 JUN 22 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAC 1271 Bullet Wt.: 147 grains
 Model: 5943 Caliber: 9mm Bullet Type: FMJ Subsonic Match
 Lot No.: 59GC3044

Chronographed Velocity at 20 ft.

1 950.93
 2 975.42
 3 967.49
 4 978.28
 5 954.93
 AVG 965.41
 ft/sec

Kinetic Energy at 20 ft.: 304.16 ft.lbs.

Calibration Velocity: 615.84 614.70 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.7 9.6 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	32.000						
2	32.000						
3	32.000						
4	27.000	0.658	0.3520	0.3500	0.3510	147.10	100.00
5	23.750	0.686	0.3530	0.3490	0.3510	146.60	99.73
AVG	29.360 inches	0.672 inches	0.3525 inches	0.3495 inches	0.3510 inches	146.85 grains	99.86 %

Notes:

- Cartilage through blocks Not Recovered Rib Diameter .3390 - .3720 inches
- Bone through blocks Not Recovered
- Cartilage through blocks Not Recovered
- Nose Forward Cartilage
- Nose Forward Cartilage

Date: 94 MAY 03 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed Velocity at 20 ft.

1 1318.57
 2 1346.62
 3 1324.50
 4 1305.14
 5 1311.30
 AVG 1321.23
 f/sec

Kinetic Energy at 20 ft.: 446.67 ft.lbs.

Calibration Velocity: 595.66 600.46 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.9 9.0 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	10.000	0.466	0.6040	0.5235	0.5638	73.61	64.01
2	9.625	0.312	0.5310	0.4895	0.5103	68.20	59.30
3	10.000	0.539	0.5555	0.4880	0.5218	75.92	66.02
4	9.875	0.530	0.5445	0.4585	0.5015	68.82	59.84
5	10.375	0.463	0.6400	0.4840	0.5620	79.47	69.10
AVG	9.975 inches	0.462 inches	0.5750 inches	0.4887 inches	0.5319 inches	73.20 grains	63.66 %

Notes:

- 1 Sideways Heavy Fragmentation Core & Jacket
- 2 Sideways Heavy Fragmentation Core & Jacket
- 3 Nose Forward Heavy Fragmentation Core & Jacket
- 4 Nose Forward Heavy Fragmentation Core & Jacket
- 5 Sideways Heavy Fragmentation Core & Jacket

Date: 94 MAY 16 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed Velocity at 20 ft.

1 1318.57
 2 1346.62
 3 1324.50
 4 1305.14
 5 1311.30
 AVG 1321.23
 f/sec

Kinetic Energy at 20 ft.: 446.67 ft.lbs.

Calibration Velocity: 600.96 601.47 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.8 9.7 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.750	0.297	0.6450	0.4470	0.5460	82.70	71.91
2	8.875	0.292	0.7470	0.6740	0.7105	115.30	100.00
3	7.375	0.295	0.7880	0.6810	0.7345	114.00	99.13
4	9.000	0.290	0.7090	0.6660	0.6875	114.50	99.57
5	8.875	0.309	0.7630	0.6530	0.7080	114.30	99.39
AVG	9.176 inches	0.297 inches	0.7304 inches	0.6242 inches	0.6773 inches	108.16 grains	94.00 %

Notes:

- 1 Sideways Jacket Fragmentation Core
- 2 Sideways
- 3 Sideways Jacket Fragmentation
- 4 Sideways Jacket Fragmentation
- 5 Sideways Jacket Fragmentation

Date: 94 MAY 03 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed Velocity at 20 ft.

1 1318.57
 2 1346.62
 3 1324.50
 4 1305.14
 5 1311.30
 AVG 1321.23
 ft/sec

Kinetic Energy at 20 ft.: 445.67 ft.lbs.

Calibration Velocity: 595.66 600.46 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.9 9.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	8.750	0.361	0.7120	0.6490	0.6805	112.49	97.82
2	11.375	0.416	0.6035	0.5465	0.5750	106.48	92.59
3	10.500	0.389	0.5950	0.4870	0.5410	89.65	77.96
4	10.125	0.393	0.6350	0.5945	0.6148	116.51	100.00
5	8.500	0.460	0.7190	0.6445	0.6816	112.96	96.23
AVG	9.860 inches	0.404 inches	0.6529 inches	0.6843 inches	0.6186 inches	107.62 grains	93.32 %

Notes:

- 1 Sideways Jacket Fragmentation RCMP Storm Coat 3250-105 Nov/87
- 2 Sideways Core & Jacket Fragmentation
- 3 Nose Forward Core & Jacket Fragmentation
- 4 Nose Forward
- 5 Nose Forward Core & Jacket Fragmentation

Date: 94 MAY 18 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed Velocity at 20 ft.

1 1318.57
 2 1346.62
 3 1324.50
 4 1305.14
 5 1311.30
 AVG 1321.23
 ft/sec

Kinetic Energy at 20 ft.: 445.67 ft.lbs.

Calibration Velocity: 599.88 605.62 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.8 10.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	10.250	0.303	0.6645	0.5810	0.6228	114.20	99.30
2	10.250	0.338	0.6375	0.5910	0.6143	114.60	99.65
3	8.625	0.303	0.7165	0.6350	0.6758	114.30	99.39
4	10.000	0.389	0.6390	0.5935	0.6163	114.80	99.83
5	9.750	0.334	0.6875	0.5965	0.6420	116.50	100.00
AVG	9.776 inches	0.329 inches	0.6690 inches	0.5994 inches	0.6342 inches	114.88 grains	99.63 %

Notes:

- 1 Sideways Jacket Fragmentation RCMP Storm Coat 3250-105 Nov/87
- 2 Sideways Jacket Fragmentation
- 3 Sideways Jacket Fragmentation
- 4 Sideways Jacket Fragmentation
- 5 Sideways

Date: 94 JUN 06 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed Velocity at 20 ft.

1 1318.57
 2 1346.62
 3 1324.50
 4 1305.14
 5 1311.30
 AVG 1321.23
 ft/sec

Kinetic Energy at 20 ft.: 445.87 ft.lbs.

Calibration Velocity: 594.04 599.38 ft/sec
 Calibration Temp.: 6 8 °C
 Calibration penetration: 8.9 9.1 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	9.250	0.410	0.5380	0.5100	0.5240	68.90	59.91
2	8.825	0.482	0.7270	0.4800	0.6035	89.20	77.57
3	9.875	0.375	0.6060	0.4910	0.5485	104.10	90.52
4	10.750	0.385	0.5990	0.5070	0.5530	78.00	67.83
5	9.375	0.365	0.5320	0.5070	0.5195	88.40	76.87
AVG	9.576 inches	0.403 inches	0.6004 inches	0.4990 inches	0.5497 inches	85.72 grains	74.54 %

Notes:

- 1 Sideways Jacket Core Rib diameter .342 - .3945 Separation Major fragmentation Bone
- 2 Sideways Jacket Core Separation Major fragmentation Muscle
- 3 Sideways Jacket Core Separation Major fragmentation Bone
- 4 Sideways Core Fragmentation Muscle
- 5 Sideways Core Fragmentation Bone

Date: 94 JUN 08 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: Silvertip HP
 Lot No.: 26DH3276

Chronographed Velocity at 20 ft.

1 1318.57
 2 1346.82
 3 1324.50
 4 1305.14
 5 1311.30
 AVG 1321.23
 ft/sec

Kinetic Energy at 20 ft.: 445.87 ft.lbs.

Calibration Velocity: 603.72 599.95 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.7 9.2 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	8.875	0.285	0.7040	0.8580	0.6610	114.30	99.39
2	10.750	0.239	0.7360	0.8100	0.6730	106.00	92.17
3	7.875	0.284	0.8000	0.8310	0.7155	107.80	93.57
4	8.250	0.222	0.7430	0.6690	0.7060	113.60	98.78
5	8.875	0.255	0.7610	0.6800	0.7205	106.60	92.70
AVG	8.526 inches	0.253 inches	0.7488 inches	0.8496 inches	0.6992 inches	109.62 grams	95.32 %

Notes:

- 1 Sideways Jacket Fragmentation Muscle Rib Diameter .3325 - .3330 inches
- 2 Nose Forward Jacket Fragmentation Bone/Muscle
- 3 Sideways Jacket Fragmentation Bone
- 4 Sideways Jacket Fragmentation Cartilage
- 5 Sideways Major Jacket Fragmentation Bone

Date: 94 APR 20 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet Wt.: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22C9593

Chronographed Velocity at 20 ft.

1 1340.84
 2 1239.16
 3 1248.75
 4 1187.93
 5 1161.98
 AVG 1235.73
 f/sec

Kinetic Energy at 20 ft.: 389.86 ft.lbs.

Calibration Velocity: 596.45 598.66 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.7 9.8 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.000	0.229	0.4890	0.4575	0.4733	65.89	57.30
2	10.825	0.284	0.5305	0.4950	0.5128	69.28	60.24
3	12.000	0.250	0.4890	0.4890	0.4790	66.82	58.10
4	12.750	0.252	0.5460	0.4585	0.5013	68.51	59.57
5	12.750	0.284	0.5005	0.4555	0.4780	73.91	64.27
AVG	12.225 inches	0.260 inches	0.5110 inches	0.4667 inches	0.4889 inches	68.88 grains	59.90 %

Notes:

- 1 Sideways Jacket Fragmentation & Core
- 2 Nose Forward Jacket Fragmentation & Core
- 3 Sideways Jacket Fragmentation & Core
- 4 Sideways Jacket Fragmentation & Core
- 5 Sideways Heavy Jacket Fragmentation & Core

Date: 94 MAY 16 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet Wt.: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22C9593

Chronographed Velocity at 20 ft.

1 1340.84
 2 1239.16
 3 1248.75
 4 1187.93
 5 1161.98
 AVG 1235.73
 f/sec

Kinetic Energy at 20 ft.: 389.86 ft.lbs.

Calibration Velocity: 609.16 603.94 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 10.0 9.5 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	10.750	0.305	0.6500	0.6250	0.6375	107.60	93.57
2	9.500	0.374	0.6710	0.6470	0.6590	112.30	97.65
3	10.875	0.344	0.6760	0.6340	0.6550	107.20	93.22
4	10.000	0.293	0.6710	0.6220	0.6465	105.10	91.39
5	10.000	0.399	0.6500	0.6250	0.6375	109.00	94.78
AVG	10.225 inches	0.343 inches	0.6636 inches	0.6306 inches	0.6471 inches	108.24 grains	94.12 %

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Sideways Jacket Fragmentation
- 3 Sideways Jacket Fragmentation
- 4 Sideways Jacket Fragmentation
- 5 Sideways Jacket Fragmentation

Date: 94 APR 20 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet Wt.: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22C9593

Chronographed Velocity at 20 ft.

1 1340.84
 2 1239.16
 3 1248.75
 4 1187.93
 5 1181.98
 AVG 1235.73
 ft/sec

Kinetic Energy at 20 ft.: 389.86 ft.lbs.

Calibration Velocity: 596.45 598.66 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.7 9.8 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.500	0.463	0.4945	0.4600	0.4773	79.47	69.10
2	13.750	0.425	0.5755	0.4540	0.5148	91.20	79.30
3	13.250	0.281	0.5470	0.4690	0.5080	80.55	70.04
4	13.500	0.295	0.5185	0.4640	0.4913	78.24	68.03
5	12.750	0.432	0.6775	0.5475	0.6125	98.45	85.81
AVG	13.360 inches	0.378 inches	0.5626 inches	0.4789 inches	0.5208 inches	85.68 grains	74.42 %

Notes:

- 1 Base Forward Jacket Fragmentation RCMP Storm Coat 3280-209
- 2 Sideways Jacket Fragmentation
- 3 Sideways Jacket Fragmentation
- 4 Nose Forward Jacket Fragmentation
- 5 Sideways Jacket Fragmentation

Date: 94 MAY 18 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet Wt.: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22C9593

Chronographed Velocity at 20 ft.

1 1340.84
 2 1239.16
 3 1248.75
 4 1187.93
 5 1181.98
 AVG 1235.73
 ft/sec

Kinetic Energy at 20 ft.: 389.86 ft.lbs.

Calibration Velocity: 596.52 599.66 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.3 9.5 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	9.625	0.339	0.6465	0.6075	0.6270	113.10	98.35
2	10.250	0.452	0.6330	0.5890	0.6110	116.30	100.00
3	9.375	0.284	0.6620	0.6235	0.6428	113.90	99.04
4	9.500	0.276	0.6825	0.6070	0.6448	115.10	100.00
5	9.500	0.280	0.6555	0.6135	0.6345	114.80	99.83
AVG	9.660 inches	0.328 inches	0.6669 inches	0.6081 inches	0.6320 inches	114.64 grains	99.44 %

Notes:

- 1 Nose Forward Jacket Fragmentation RCMP Storm Coat 3250-105 Nov/87
- 2 Nose Forward
- 3 Nose Forward Jacket Fragmentation
- 4 Nose Forward
- 5 Sideways

Date: 94 JUN 06 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet WL: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22C9593

Chronographed Velocity at 20 ft.

1 1340.84
 2 1239.16
 3 1248.75
 4 1187.93
 5 1161.98
 AVG 1235.73
 f/sec

Kinetic Energy at 20 ft.: 389.86 ft.lbs.

Calibration Velocity: 594.04 599.38 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.9 9.1 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.750	0.218	0.5150	0.4680	0.4915	74.20	64.52
2	11.125	0.225	0.6340	0.4840	0.5590	101.40	88.17
3	14.000	0.241	0.4600	0.4340	0.4470	72.00	62.61
4	7.875	0.156	0.6270	0.5290	0.5780	66.80	58.09
5	12.000	0.208	0.7520	0.4320	0.5920	88.30	76.78
AVG	11.350 inches	0.210 inches	0.5976 inches	0.4694 inches	0.5335 inches	80.54 grains	70.03 %

Notes:

- 1 Nose Forward Jacket Fragmentation Bone Rib diameter .3421 - .3945
- 2 Sideways Major Jacket & Core Fragmentation Bone
- 3 Sideways Major Jacket & Core Fragmentation Muscle
- 4 Sideways Major Jacket & Core Fragmentation Bone
- 5 Sideways Major Jacket & Core Fragmentation Bone

Date: 94 JUN 08 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet WL: 115 grains
 Model: MP5 Caliber: 9mm Bullet Type: JHP
 Lot No.: 22C9593

Chronographed Velocity at 20 ft.

1 1340.84
 2 1239.16
 3 1248.75
 4 1187.93
 5 1161.98
 AVG 1235.73
 f/sec

Kinetic Energy at 20 ft.: 389.86 ft.lbs.

Calibration Velocity: 603.72 599.95 f/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.7 9.2 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	8.000	0.299	0.6540	0.6060	0.6300	109.50	95.22
2	9.500	0.266	0.6670	0.6220	0.6445	105.20	91.48
3	9.625	0.232	0.6310	0.5960	0.6135	105.00	91.30
4	10.000	0.295	0.6180	0.5430	0.5805	96.30	85.48
5	10.375	0.274	0.6510	0.5410	0.5960	99.00	86.09
AVG	9.500 inches	0.273 inches	0.6442 inches	0.5816 inches	0.6129 inches	103.40 grains	89.91 %

Notes:

- 1 Sideways Bone Rib Diameter .3875 - .3870 inches
- 2 Sideways Jacket Fragmentation Cartilage
- 3 Nose Forward Jacket Fragmentation Bone
- 4 Sideways Jacket & Core Fragmentation Bone
- 5 Sideways Jacket Fragmentation Bone

Date: 94 APR 27 Bbl. Length: 9" Ammo Mfg.: PMC
 Make: H&K Serial No.: C315857 Bullet Wt.: 124 grains
 Model: MP5 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed
Velocity at 20 ft.

1 1150.75
 2 1201.35
 3 1218.03
 4 1224.29
 5 1228.80
 AVG 1204.64
 ft/sec

Kinetic Energy at 20 ft.: 399.48 ft.lbs.

Calibration Velocity: 614.55 612.52 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.8 9.5 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	9.750	0.310	0.7390	0.6900	0.7145	122.22	98.56
2	9.000	0.282	0.7830	0.6720	0.7275	122.08	98.44
3	9.375	0.243	0.8100	0.6890	0.7495	123.76	99.81
4	9.750	0.276	0.7370	0.6990	0.7180	122.37	98.89
5	10.875	0.333	0.6730	0.6520	0.6625	123.76	99.81
AVG	9.750 inches	0.289 inches	0.7484 inches	0.6804 inches	0.7144 inches	122.83 grains	99.06 %

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Sideways Jacket Fragmentation
- 3 Sideways Jacket Fragmentation
- 4 Sideways
- 5 Sideways Jacket Fragmentation

Date: 94 MAY 16 Bbl. Length: 9" Ammo Mfg.: PMC
 Make: H&K Serial No.: C315857 Bullet Wt.: 124 grains
 Model: MP5 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed
Velocity at 20 ft.

1 1150.75
 2 1201.35
 3 1218.03
 4 1224.29
 5 1228.80
 AVG 1204.64
 ft/sec

Kinetic Energy at 20 ft.: 399.48 ft.lbs.

Calibration Velocity: 617.44 604.08 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.9 9.7 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	10.375	0.383	0.7450	0.6100	0.6775	122.60	98.87
2	11.000	0.378	0.6710	0.6350	0.6530	125.00	100.00
3	11.375	0.371	0.8380	0.6340	0.7360	123.70	99.76
4	11.250	0.358	0.8560	0.5780	0.6170	123.50	99.60
5	11.375	0.388	0.8070	0.6060	0.7065	122.90	99.11
AVG	11.075 inches	0.376 inches	0.7434 inches	0.6126 inches	0.6780 inches	123.54 grains	99.47 %

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Sideways Jacket Fragmentation
- 3 Sideways Jacket Fragmentation
- 4 Sideways
- 5 Nose Forward

Date: 94 APR 27 Bbl. Length: 9" Ammo Mfg.: PMC
 Make: H&K Serial No.: C315857 Bullet Wt.: 124 grains
 Model: MP5 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed Velocity at 20 ft.

1 1150.75
 2 1201.35
 3 1218.03
 4 1224.29
 6 1228.80
 AVG 1204.64
 f/sec

Kinetic Energy at 20 ft.: 399.49 ft.lbs.

Calibration Velocity: 599.74 593.75 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.0 8.8 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	10.750	0.354	0.7420	0.8070	0.6745	123.76	99.81
2	10.250	0.434	0.6870	0.8540	0.6705	123.76	99.81
3	10.500	0.379	0.6590	0.8370	0.6480	122.37	98.89
4	11.000	0.381	0.6880	0.8040	0.6460	123.14	99.31
5	11.000	0.439	0.6970	0.8160	0.6565	124.22	100.00
AVG	10.700 inches	0.397 inches	0.6946 inches	0.8238 inches	0.6691 inches	123.45 grains	99.82 %

Notes:

- 1 Sideways Jacket Fragmentation RCMP Storm Coat 3250-105 Nov/87
- 2 Sideways Jacket Fragmentation
- 3 Nose Forward Jacket Fragmentation
- 4 Sideways Jacket Fragmentation
- 5 Nose Forward Jacket Fragmentation

Date: 94 MAY 18 Bbl. Length: 9" Ammo Mfg.: PMC
 Make: H&K Serial No.: C315857 Bullet Wt.: 124 grains
 Model: MP5 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed Velocity at 20 ft.

1 1150.75
 2 1201.35
 3 1218.03
 4 1224.29
 6 1228.80
 AVG 1204.64
 f/sec

Kinetic Energy at 20 ft.: 399.49 ft.lbs.

Calibration Velocity: 596.52 599.66 f/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.3 9.5 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.000	0.385	0.7110	0.5840	0.6475	125.40	100.00
2	10.875	0.322	0.6610	0.5800	0.6205	124.00	100.00
3	11.125	0.399	0.6780	0.6010	0.6395	123.90	99.92
4	11.500	0.329	0.7005	0.8040	0.6523	125.20	100.00
5	10.825	0.323	0.7175	0.5880	0.6528	125.00	100.00
AVG	11.026 inches	0.352 inches	0.6936 inches	0.5914 inches	0.6426 inches	124.70 grains	99.98 %

Notes:

- 1 Sideways RCMP Storm Coat 3250 - 105 Nov/87
- 2 Sideways Jacket Fragmentation
- 3 Sideways
- 4 Sideways
- 5 Sideways

Date: 94 JUN 06 Bbl. Length: 9" Ammo Mfg.: PMC
 Make: H&K Serial No.: C315857 Bullet Wt.: 124 grains
 Model: MP5 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed Velocity at 20 ft.

1 1150.75
 2 1201.35
 3 1218.03
 4 1224.29
 5 1228.80
 AVG 1204.64
 ft/sec

Kinetic Energy at 20 ft.: 399.49 ft.lbs.

Calibration Velocity: 601.25 604.15 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.1 9.1 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	8.500	0.345	0.8700	0.8250	0.7475	112.90	91.05
2	8.625	0.307	0.7960	0.7240	0.7600	124.10	100.00
3	9.250	0.346	0.7110	0.6620	0.6865	125.20	100.00
4	8.750	0.328	0.6710	0.6410	0.6560	103.60	63.55
5	9.125	0.458	0.7400	0.7040	0.7220	125.70	100.00
AVG	8.860 inches	0.357 inches	0.7676 inches	0.6712 inches	0.7144 inches	118.30 grams	94.92 %

Notes:

- 1 Sideways Core Fragmentation Bone/Muscle Rib Diameter .3420 - .3945 inches
- 2 Nose Forward Bone
- 3 Sideways Muscle
- 4 Sideways Muscle
- 5 Nose Forward Bone

Date: 94 JUN 08 Bbl. Length: 9" Ammo Mfg.: PMC
 Make: H&K Serial No.: C315857 Bullet Wt.: 124 grains
 Model: MP5 Caliber: 9mm Bullet Type: Starfire JHP
 Lot No.: ELD9SFB054

Chronographed Velocity at 20 ft.

1 1150.75
 2 1201.35
 3 1218.03
 4 1224.29
 5 1228.80
 AVG 1204.64
 ft/sec

Kinetic Energy at 20 ft.: 399.49 ft.lbs.

Calibration Velocity: 603.72 599.95 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.7 9.2 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	10.250	0.359	0.7470	0.6490	0.6980	125.10	100.00
2	9.250	0.356	0.6950	0.6020	0.6485	123.30	99.44
3	10.625	0.385	0.6310	0.6050	0.6180	124.90	100.00
4	9.625	0.325	0.7330	0.6320	0.6825	123.90	99.92
5	10.000	0.390	0.7150	0.6210	0.6680	122.90	99.11
AVG	9.950 inches	0.363 inches	0.7042 inches	0.6218 inches	0.6630 inches	124.02 grams	99.69 %

Notes:

- 1 Sideways Bone/Cartilage Rib Diameter .3875 - .3870 inches
- 2 Sideways Bone/Muscle
- 3 Sideways Bone/Cartilage
- 4 Sideways Bone/Cartilage
- 5 Sideways Jacket Fragmentation Cartilage

Date: 94 APR 27 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Hydra-Shok JHP
 Lot No.: 2230603470

Chronographed Velocity at 20 ft.

1 1082.25
 2 1122.59
 3 1118.32
 4 1105.71
 5 1104.97
 AVG 1106.77
 f/sec

Kinetic Energy at 20 ft.: 399.75 ft.lbs.

Calibration Velocity: 605.84 606.65 f/sec
 Calibration Temp.: 6 8 °C
 Calibration penetration: 9.1 9.2 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.250	0.680	0.6720	0.6010	0.6365	145.21	98.78
2	13.375	0.598	0.6670	0.6300	0.6485	141.97	96.58
3	13.000	0.524	0.7000	0.6680	0.6840	147.22	100.00
4	11.000	0.596	0.7330	0.6840	0.7085	147.83	100.00
5	11.375	0.555	0.7260	0.6730	0.6995	147.22	100.00
AVG	12.600 inches	0.587 inches	0.6996 inches	0.6612 inches	0.6764 inches	148.89 grains	99.07 %

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Sideways
- 3 Sideways
- 4 Sideways Jacket Fragmentation
- 5 Sideways

Date: 94 MAY 16 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Hydra Shok JHP
 Lot No.: 2230603470

Chronographed Velocity at 20 ft.

1 1082.25
 2 1122.59
 3 1118.32
 4 1105.71
 5 1104.97
 AVG 1106.77
 f/sec

Kinetic Energy at 20 ft.: 399.76 ft.lbs.

Calibration Velocity: 600.96 601.47 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.8 9.7 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.375	0.438	0.7260	0.6630	0.6945	145.10	98.71
2	11.875	0.578	0.7300	0.6550	0.6925	146.40	99.59
3	12.000	0.408	0.7380	0.6880	0.7130	146.60	99.73
4	12.250	0.587	0.7520	0.6720	0.7120	146.30	99.52
5	11.875	0.475	0.7910	0.6990	0.7450	145.60	99.05
AVG	12.076 inches	0.499 inches	0.7474 inches	0.6764 inches	0.7114 inches	146.00 grains	99.32 %

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Nose Forward Jacket Fragmentation
- 3 Sideways Jacket Fragmentation
- 4 Nose Forward
- 5 Sideways Jacket Fragmentation

Date: 94 APR 27 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Hydra Shok JHP
 Lot No.: 2230603470

Chronographed Velocity at 20 ft.

Kinetic Energy at 20 ft.: 399.76 ft.lbs.

1 1082.25
 2 1122.59
 3 1118.32
 4 1105.71
 5 1104.97
 AVG 1106.77
 ft/sec

Calibration Velocity: 599.74 593.75 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.0 8.8 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.125	0.482	0.6440	0.5680	0.6080	148.14	99.41
2	12.000	0.519	0.6880	0.6150	0.8505	145.87	99.10
3	12.625	0.571	0.6650	0.6120	0.6385	147.68	100.00
4	12.000	0.483	0.8800	0.6330	0.8565	145.83	99.20
5	11.500	0.533	0.7300	0.6750	0.7025	145.83	99.20
AVG	12.060 inches	0.518 inches	0.6910 inches	0.6206 inches	0.6508 inches	146.23 grains	99.38 %

Notes:

- Nose Forward RCMP Storm Coat 3250 - 105 Nov/87
- Nose Forward Jacket Fragmentation
- Nose Forward
- Nose Forward Jacket Fragmentation
- Nose Forward Jacket Fragmentation

Date: 94 MAY 18 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Hydra Shok JHP
 Lot No.: 2230603470

Chronographed Velocity at 20 ft.

Kinetic Energy at 20 ft.: 399.76 ft.lbs.

1 1082.25
 2 1122.59
 3 1118.32
 4 1105.71
 5 1104.97
 AVG 1106.77
 ft/sec

Calibration Velocity: 596.52 599.66 ft/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.3 9.5 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.825	0.449	0.6270	0.6040	0.6155	147.50	100.00
2	13.000	0.414	0.6535	0.6205	0.6370	148.00	100.00
3	12.625	0.399	0.6735	0.6270	0.6503	145.20	98.78
4	12.000	0.390	0.6775	0.6240	0.6508	146.40	99.59
5	12.750	0.426	0.6425	0.6025	0.6225	147.30	100.00
AVG	12.800 inches	0.416 inches	0.6548 inches	0.6156 inches	0.6362 inches	146.88 grains	99.67 %

Notes:

- Sideways RCMP Storm Coat 3250 - 105 Nov/87
- Sideways
- Sideways Jacket Fragmentation
- Nose Forward Jacket Fragmentation
-

Date: 94 JUN 06 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Hydra Shock JHP
 Lot No.: 2230603470

Chronographed Velocity at 20 ft.

1 1082.25
 2 1122.59
 3 1118.32
 4 1105.71
 5 1104.97
 AVG 1106.77
 ft/sec

Kinetic Energy at 20 ft.: 399.75 ft.lbs.

Calibration Velocity: 601.25 604.15 ft/sec
 Calibration Temp.: 8 6 °C
 Calibration penetration: 9.1 9.1 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.000	0.497	0.6170	0.4510	0.5340	89.30	60.75
2	11.500	0.443	0.6710	0.6040	0.6375	144.50	98.30
3	11.500	0.412	0.7450	0.6110	0.6780	146.60	99.73
4	12.250	0.299	0.6620	0.4050	0.5335	101.90	69.32
5	14.125	0.599	0.5850	0.4740	0.5295	120.20	81.77
AVG	12.676 inches	0.460 inches	0.6560 inches	0.5090 inches	0.5825 inches	120.60 grains	81.97 %

Notes:

- Nose Forward Jacket Fragmentation Core Fragmentation Bone Rib Diameter .3420 - .3945 inches
- Nose Forward Jacket Fragmentation Bone
- Nose Forward Jacket Fragmentation Bone
- Nose Forward Major Jacket & Core Fragmentation Separation Muscle
- Nose Forward Core Fragmentation Bone

Date: 94 JUN 08 Bbl. Length: 9" Ammo Mfg.: Federal
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Hydra Shock JHP
 Lot No.: 2230603470

Chronographed Velocity at 20 ft.

1 1082.25
 2 1122.59
 3 1118.32
 4 1105.71
 5 1104.97
 AVG 1106.77
 ft/sec

Kinetic Energy at 20 ft.: 399.75 ft.lbs.

Calibration Velocity: 605.62 599.66 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.8 9.1 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.000	0.473	0.6940	0.6540	0.6740	145.50	98.98
2	9.750	0.438	0.7290	0.6070	0.6680	143.90	97.89
3	12.375	0.584	0.6990	0.6240	0.6610	146.00	99.32
4	11.125	0.484	0.7150	0.6410	0.6780	144.10	98.03
5	11.825	0.424	0.7210	0.6610	0.6910	146.90	99.93
AVG	11.175 inches	0.477 inches	0.7114 inches	0.6374 inches	0.6744 inches	145.28 grains	98.63 %

Notes:

- Nose Forward Cartilage Rib Diameter .3575 - .3465 inches
- Sideways Jacket Fragmentation Bone
- Sideways Cartilage
- Sideways Cartilage
- Nose Forward Bone/Cartilage

Date: 94 APR 27 Bbl. Length: 9" Ammo Mfg.: Remington
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Golden Saber JHP
 Lot No.: LY14SA5801

Chronographed Velocity at 20 ft.

1 1124.61
 2 1127.65
 3 1141.29
 4 1122.59
 5 1127.40
 AVG 1128.71
 f/sec

Kinetic Energy at 20 ft.: 415.76 ft.lbs.

Calibration Velocity: 614.55 612.52 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.8 9.5 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.750	0.542	0.7130	0.6500	0.6815	143.98	97.95
2	12.750	0.536	0.7820	0.6350	0.7085	146.14	99.41
3	14.125	0.555	0.7800	0.6090	0.6945	143.20	97.41
4	12.875	0.538	0.6690	0.5820	0.6255	146.91	99.94
5	13.500	0.515	0.7440	0.5690	0.6565	137.03	93.22
AVG	13.400 inches	0.637 inches	0.7378 inches	0.6090 inches	0.6733 inches	143.45 grams	97.59 %

Notes:

- 1 Nose Forward
- 2 Sideways
- 3 Sideways Lead Core Fragmentation
- 4 Sideways
- 5 Nose Forward Jacket Fragmentation Core Fragmentation

Date: 94 MAY 16 Bbl. Length: 9" Ammo Mfg.: Remington
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Golden Saber JHP
 Lot No.: LY14SA5801

Chronographed Velocity at 20 ft.

1 1124.61
 2 1127.65
 3 1141.29
 4 1122.59
 5 1127.40
 AVG 1128.71
 f/sec

Kinetic Energy at 20 ft.: 416.76 ft.lbs.

Calibration Velocity: 617.44 604.08 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.9 9.7 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.875	0.435	0.6610	0.5900	0.6255	144.40	96.23
2	12.750	0.408	0.8110	0.6320	0.7215	147.00	100.00
3	13.250	0.455	0.7250	0.6220	0.6735	147.00	100.00
4	13.375	0.443	0.7580	0.5220	0.6400	144.40	96.23
5	13.000	0.435	0.7060	0.6070	0.6565	147.20	100.00
AVG	13.060 inches	0.436 inches	0.7322 inches	0.5946 inches	0.6634 inches	146.00 grams	99.29 %

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Sideways
- 3 Sideways
- 4 Sideways
- 5 Sideways

Date: 94 APR 27 Bbl. Length: 9" Ammo Mfg.: Remington
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Golden Saber JHP
 Lot No.: LY14SA5801

Chronographed Velocity at 20 ft.

1 1124.61
 2 1127.65
 3 1141.29
 4 1122.59
 5 1127.40
 AVG 1128.71
 f/sec

Kinetic Energy at 20 ft.: 415.76 ft.lbs.

Calibration Velocity: 599.74 599.75 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.0 8.8 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.750	0.377	0.6460	0.6190	0.6325	148.45	100.00
2	13.375	0.387	0.6550	0.6020	0.6285	144.44	98.26
3	13.500	0.399	0.7590	0.5850	0.6720	148.75	99.83
4	13.000	0.408	0.7190	0.5350	0.6270	144.44	98.26
5	14.125	0.403	0.6960	0.5920	0.6440	146.91	99.94
AVG	13.660 inches	0.396 inches	0.6960 inches	0.5866 inches	0.6408 inches	146.20 grains	99.28 %

Notes:

- 1 Sideways RCMP Storm Coat 3250 - 105 Nov/87
- 2 Sideways Jacket Fragmentation
- 3 Sideways
- 4 Sideways Jacket Fragmentation
- 5 Sideways

Date: 94 MAY 18 Bbl. Length: 9" Ammo Mfg.: Remington
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Golden Saber JHP
 Lot No.: LY14SA5801

Chronographed Velocity at 20 ft.

1 1124.81
 2 1127.65
 3 1141.29
 4 1122.59
 5 1127.40
 AVG 1128.71
 f/sec

Kinetic Energy at 20 ft.: 415.76 ft.lbs.

Calibration Velocity: 601.32 601.11 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 10.0 9.5 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.625	0.430	0.8250	0.6790	0.7520	147.90	100.00
2	13.625	0.423	0.7435	0.6150	0.6793	147.60	100.00
3	14.375	0.419	0.7160	0.6550	0.6855	148.60	99.73
4	14.875	0.400	0.7730	0.5535	0.6633	147.00	100.00
5	13.875	0.420	0.7870	0.6710	0.7290	147.30	100.00
AVG	14.075 inches	0.418 inches	0.7689 inches	0.6347 inches	0.7018 inches	147.28 grains	99.96 %

Notes:

- 1 Sideways RCMP Storm Coat 3250 - 105 Nov/87
- 2 Nose Forward
- 3 Nose Forward
- 4 Sideways
- 5 Sideways

Date: 94 MAY 26 Bbl. Length: 9" Ammo Mfg.: Remington
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Golden Sabre JHP
 Lot No.: LY14SA5801

Chronographed Velocity at 20 ft.

1 1124.61
 2 1127.65
 3 1141.29
 4 1122.59
 5 1127.40
 AVG 1128.71
 f/sec

Kinetic Energy at 20 ft.: 416.76 ft.lbs.

Calibration Velocity: 620.66 618.81 f/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 10.4 10.0 cm

Test Type **Distance**
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.825	0.408	0.6940	0.6310	0.6625	147.10	100.00
2	15.625	0.396	0.6550	0.6360	0.6455	139.20	94.69
3	14.000	0.392	0.7640	0.6290	0.6965	147.50	100.00
4	16.375	0.451	0.6400	0.6020	0.6210	138.20	94.01
5	16.750	0.411	0.6650	0.5870	0.6260	138.60	94.29
AVG	15.475	0.412	0.6836	0.6170	0.6503	142.12	96.60
	inches	inches	inches	inches	inches	grains	%

Notes:

- 1 Sideways Muscle Rib Diameter .2690 - .3720 inches
- 2 Nose Forward Jacket Fragmentation Muscle
- 3 Nose Forward Muscle
- 4 Nose Forward Core Fragmentation Bone
- 5 Sideways Core Fragmentation Bone

Date: 94 JUN 08 Bbl. Length: 9" Ammo Mfg.: Remington
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Golden Sabre JHP
 Lot No.: LY14SA5801

Chronographed Velocity at 20 ft.

1 1124.61
 2 1127.65
 3 1141.29
 4 1122.59
 5 1127.40
 AVG 1128.71
 f/sec

Kinetic Energy at 20 ft.: 416.76 ft.lbs.

Calibration Velocity: 605.62 599.66 f/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.8 9.1 cm

Test Type **Distance**
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.500	0.442	0.6820	0.6280	0.6540	143.50	97.62
2	11.625	0.407	0.7920	0.6010	0.6965	145.00	98.64
3	13.125	0.492	0.7000	0.6280	0.6630	146.20	99.48
4	10.625	0.431	0.6880	0.6190	0.6535	125.20	85.17
5	12.250	0.439	0.8030	0.6600	0.7315	146.70	99.60
AVG	11.825	0.442	0.7330	0.6264	0.6797	141.32	96.14
	inches	inches	inches	inches	inches	grains	%

Notes:

- 1 Sideways Bone Rib Diameter .3575 - .3465 inches
- 2 Sideways Bone
- 3 Sideways Muscle
- 4 Sideways Jacket Fragmentation Bone
- 5 Nose Forward Cartilage

Date: 94 APR 25 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF31-33

Chronographed Velocity at 20 ft.

1 1028.81
 2 1131.99
 3 1106.19
 4 1128.67
 5 1112.10
 AVG 1181.55
 f/sec

Kinetic Energy at 20 ft.: 396.00 ft.lbs.

Calibration Velocity: 803.21 600.96 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 10.0 9.6 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.875	0.460	0.6750	0.5760	0.6255	147.37	100.00
2	14.375	0.529	0.7210	0.6130	0.6670	150.15	100.00
3	14.875	0.385	0.6390	0.6040	0.6215	137.65	93.64
4	14.875	0.426	0.6940	0.5570	0.6255	148.76	100.00
5	14.875	0.412	0.5950	0.5290	0.5620	149.53	100.00
AVG	14.776 Inches	0.442 Inches	0.6648 Inches	0.5758 Inches	0.6203 Inches	146.89 grains	98.73 %

Notes:

- 1 Sideways Slight Core Fragmentation
- 2 Sideways
- 3 Sideways Core Fragmentation
- 4 Nose Forward Slight Core Fragmentation
- 5 Nose Forward Slight Core Fragmentation

Date: 94 MAY 16 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed Velocity at 20 ft.

1 1028.81
 2 1131.99
 3 1106.19
 4 1128.67
 5 1112.10
 AVG 1181.55
 ft/sec

Kinetic Energy at 20 ft.: 396.00 ft.lbs.

Calibration Velocity: 609.16 603.94 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 10.0 9.5 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.250	0.380	0.7850	0.7130	0.7490	148.70	100.00
2	14.125	0.367	0.7350	0.7230	0.7290	145.20	98.78
3	13.000	0.339	0.7670	0.6990	0.7330	149.70	100.00
4	13.250	0.402	0.7860	0.7090	0.7475	147.80	100.00
5	13.500	0.420	0.7670	0.7010	0.7340	147.30	100.00
AVG	13.425 Inches	0.382 Inches	0.7680 Inches	0.7090 Inches	0.7385 Inches	147.74 grains	99.76 %

Notes:

- 1 Nose Forward
- 2 Sideways Jacket Fragmentation
- 3 Nose Forward
- 4 Nose Forward
- 5 Sideways Jacket Fragmentation

Date: 94 APR 26 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed Velocity at 20 ft.

1 1028.81
 2 1131.99
 3 1106.19
 4 1128.67
 5 1112.10
 AVG 1101.65 ft/sec

Kinetic Energy at 20 ft.: 396.00 ft.lbs.

Calibration Velocity: 601.61 603.72 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.3 9.2 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.375	0.516	0.7360	0.6350	0.6855	148.76	100.00
2	14.250	0.506	0.7050	0.6060	0.6555	148.75	99.83
3	13.625	0.413	0.7340	0.6100	0.6720	140.43	95.53
4	13.875	0.484	0.7370	0.6190	0.6780	149.84	100.00
5	13.875	0.449	0.7020	0.6100	0.6580	148.91	100.00
AVG	14.000 inches	0.474 inches	0.7228 inches	0.6160 inches	0.6694 inches	148.94 grains	99.07 %

Notes:

- 1 Nose Forward RCMP Storm Coat 3250-105 Nov/87
- 2 Nose Forward Core Fragmentation
- 3 Sideways Slight Core Fragmentation
- 4 Nose Forward Slight Core Fragmentation
- 5 Nose Forward

Date: 94 MAY 18 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed Velocity at 20 ft.

1 1028.81
 2 1131.99
 3 1106.19
 4 1128.67
 5 1112.10
 AVG 1101.65 ft/sec

Kinetic Energy at 20 ft.: 396.00 ft.lbs.

Calibration Velocity: 606.50 610.05 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.8 10.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.500	0.358	0.7800	0.6745	0.7273	148.80	100.00
2	13.500	0.355	0.7370	0.6615	0.6993	148.50	100.00
3	13.500	0.358	0.7165	0.6180	0.6673	148.90	100.00
4	13.375	0.379	0.6790	0.6000	0.6395	148.30	100.00
5	13.375	0.370	0.6975	0.6155	0.6565	147.50	100.00
AVG	13.460 inches	0.364 inches	0.7220 inches	0.6339 inches	0.6780 inches	148.36 grains	100.00 %

Notes:

- 1 Nose Forward RCMP Storm Coat 3250-105 Nov/87
- 2 Nose Forward
- 3 Sideways
- 4 Nose Forward
- 5 Nose Forward Core Fragmentation

Date: 94 MAY 26 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed Velocity at 20 ft.

1 1028.81
 2 1131.99
 3 1106.19
 4 1128.67
 5 1112.10
 AVG 1101.66
 ft/sec

Kinetic Energy at 20 ft.: 396.00 ft.lbs.

Calibration Velocity: 620.66 618.81 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 10.4 10.0 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	17.000	0.340	0.5970	0.4470	0.5220	109.40	74.42
2	15.000	0.392	0.7820	0.5970	0.6795	146.80	99.73
3	16.500	0.378	0.8940	0.5890	0.6315	141.00	95.92
4	15.625	0.366	0.6410	0.5810	0.6110	119.90	81.58
5	16.000	0.415	0.7150	0.6020	0.6585	139.00	94.56
AVG	16.026 inches	8.378 inches	0.6618 inches	0.6692 inches	0.6206 inches	131.18 grains	89.24 %

Notes:

- 1 Sideways Jacket/Core Fragmentation Jacket/Core Separation Rib Diameter .2690- .3725 inches
- 2 Nose Forward Core Fragmentation Bone
- 3 Nose Forward Core Fragmentation Bone/Muscle
- 4 Nose Forward Jacket/Core Fragmentation Jacket/Core Separation Curved Trajectory Bone
- 5 Sideways Core Fragmentation Muscle

Date: 94 JUN 08 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Black Talon SXT
 Lot No.: 30GF3133

Chronographed Velocity at 20 ft.

1 1028.81
 2 1131.99
 3 1106.19
 4 1128.67
 5 1112.10
 AVG 1101.66
 ft/sec

Kinetic Energy at 20 ft.: 396.00 ft.lbs.

Calibration Velocity: 605.62 599.66 ft/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.8 9.1 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.625	0.428	0.6930	0.6430	0.6680	148.20	100.00
2	12.500	0.402	0.7400	0.6610	0.7005	148.50	100.00
3	12.625	0.430	0.7070	0.6520	0.6795	147.40	100.00
4	13.125	0.431	0.8720	0.6440	0.6580	148.20	100.00
5	13.125	0.415	0.7310	0.6020	0.6665	145.00	98.64
AVG	12.800 inches	0.421 inches	0.7886 inches	0.6404 inches	0.6745 inches	147.46 grains	99.73 %

Notes:

- 1 Nose Forward Cartilage Rib Diameter .3465 - .3575 inches
- 2 Sideways Cartilage
- 3 Sideways Bone
- 4 Sideways Bone
- 5 Sideways Bone

Date: 94 JUN 22 Bbl. Length: 9" Ammo Mfg.: SPEER
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed
Velocity at 20 ft.

1 904.16
 2 1022.70
 3 1013.79
 4 1031.14
 5 1021.03
 AVG 998.66
 f/sec

Kinetic Energy at 20 ft.: 326.41 ft.lbs.

Calibration Velocity: 598.52 610.08 f/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.3 9.7 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.500	0.423	0.7590	0.6760	0.7175	146.90	99.93
2	12.625	0.417	0.8070	0.6700	0.7385	147.00	100.00
3	13.250	0.413	0.7830	0.6370	0.7100	147.00	100.00
4	11.875	0.421	0.7740	0.7030	0.7385	147.60	100.00
5	12.750	0.431	0.7520	0.6440	0.6980	147.00	100.00
AVG	12.600 inches	0.421 inches	0.7760 inches	0.6660 inches	0.7206 inches	147.10 grains	99.99 %

Notes:

- 1 Sideways
- 2 Sideways
- 3 Sideways
- 4 Sideways
- 5 Sideways

Date: 94 JUN 24 Bbl. Length: 9" Ammo Mfg.: SPEER
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed
Velocity at 20 ft.

1 904.16
 2 1022.70
 3 1013.79
 4 1031.14
 5 1021.03
 AVG 998.66
 f/sec

Kinetic Energy at 20 ft.: 326.41 ft.lbs.

Calibration Velocity: 617.20 617.82 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.4 9.4 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.875	0.447	0.6810	0.5580	0.6195	147.00	100.00
2	12.500	0.449	0.6600	0.5880	0.6240	147.00	100.00
3	12.000	0.440	0.7360	0.6190	0.6775	146.50	99.66
4	12.625	0.456	0.6770	0.5970	0.6370	147.60	100.00
5	12.750	0.437	0.6850	0.5970	0.6410	147.10	100.00
AVG	12.660 inches	0.446 inches	0.6878 inches	0.5918 inches	0.6398 inches	147.04 grains	99.93 %

Notes:

- 1 Sideways
- 2 Base Forward
- 3 Base Forward
- 4 Nose Forward
- 5 Sideways

Date: 94 JUN 22 Bbl. Length: 9" Ammo Mfg.: SPEER
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed Velocity at 20 ft.

1 904.16
 2 1022.70
 3 1013.79
 4 1031.14
 5 1021.03
 AVG 998.56
 f/sec

Kinetic Energy at 20 ft.: 326.41 ft.lbs.

Calibration Velocity: 608.31 601.24 f/sec
 Calibration Temp.: 7 7 °C
 Calibration penetration: 9.7 9.5 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.750	0.477	0.6500	0.5900	0.6200	147.30	100.00
2	13.500	0.457	0.6920	0.5990	0.6455	147.40	100.00
3	14.625	0.466	0.6730	0.5930	0.6330	146.80	99.86
4	14.750	0.499	0.6050	0.5230	0.5640	147.30	100.00
5	15.750	0.540	0.5910	0.4880	0.5385	146.70	99.80
AVG	14.676 inches	0.488 inches	0.6422 inches	0.5682 inches	0.6002 inches	147.10 grains	99.93 %

Notes:

- Sideways RCMP Storm Coat 3280 - 357 /B7
- Sideways
- Sideways
- Sideways
- Sideways

Date: 94 JUN 23 Bbl. Length: 9" Ammo Mfg.: SPEER
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed Velocity at 20 ft.

1 904.16
 2 1022.70
 3 1013.79
 4 1031.14
 5 1021.03
 AVG 998.56
 f/sec

Kinetic Energy at 20 ft.: 326.41 ft.lbs.

Calibration Velocity: 596.81 596.00 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.9 8.9 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.500	0.498	0.6440	0.5930	0.6185	146.90	99.93
2	13.750	0.479	0.6100	0.5480	0.5790	146.80	99.73
3	14.125	0.488	0.6180	0.5340	0.5760	146.80	99.86
4	15.125	0.505	0.6220	0.5430	0.5825	147.20	100.00
5	16.000	0.509	0.6310	0.4820	0.5565	147.10	100.00
AVG	14.500 inches	0.496 inches	0.6250 inches	0.5400 inches	0.5825 inches	146.92 grains	99.90 %

Notes:

- Sideways RCMP Storm Coat 3280-357 /B7
- Sideways
- Nose Forward
- Sideways
- Nose Forward

Date: 94 JUN 19 Bbl. Length: 9" Ammo Mfg.: SPEER
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed
Velocity at 20 ft.

1 904.16
 2 1022.70
 3 1013.79
 4 1031.14
 5 1021.03
 AVG 998.56
 ft/sec

Kinetic Energy at 20 ft.: 326.41 ft.lbs.

Calibration Velocity: 606.58 608.20 ft/sec
 Calibration Temp.: 6 7 °C
 Calibration penetration: 9.3 9.4 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.625	0.367	0.7180	0.6350	0.8785	147.40	100.00
2	12.500	0.359	0.7610	0.6180	0.6895	147.10	100.00
3	13.000	0.373	0.6700	0.6290	0.6495	147.30	100.00
4	12.875	0.375	0.6550	0.5890	0.6220	147.60	100.00
5	16.000	0.441	0.5500	0.4860	0.5180	147.40	100.00
AVG	13.400 inches	0.383 inches	0.6708 inches	0.6914 inches	0.6311 inches	147.36 grains	100.00 %

Notes:

- 1 Sideways Muscle Rib Diameter .2415 - .3410 inches
- 2 Sideways Muscle
- 3 Sideways Bone/Muscle
- 4 Sideways Bone/Muscle
- 5 Base Forward Bone

Date: 94 JUN 19 Bbl. Length: 9" Ammo Mfg.: SPEER
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: Gold Dot HP
 Lot No.: E12Y21

Chronographed
Velocity at 20 ft.

1 904.16
 2 1022.70
 3 1013.79
 4 1031.14
 5 1021.03
 AVG 998.56
 ft/sec

Kinetic Energy at 20 ft.: 326.41 ft.lbs.

Calibration Velocity: 609.31 606.58 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.6 9.3 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	11.750	0.377	0.7520	0.6530	0.7025	147.00	100.00
2	13.125	0.379	0.6870	0.6090	0.6480	147.50	100.00
3	12.750	0.404	0.6390	0.5620	0.6005	146.60	99.73
4	12.750	0.377	0.6690	0.6140	0.6415	146.80	99.86
5	14.375	0.452	0.5430	0.5790	0.5610	146.50	99.86
AVG	12.960 inches	0.398 inches	0.6580 inches	0.6034 inches	0.6307 inches	146.88 grains	99.85 %

Notes:

- 1 Sideways Muscle Rib Diameter .3985 - .4200 inches
- 2 Sideways Bone
- 3 Sideways Bone/Muscle
- 4 Sideways Muscle
- 5 Base Forward Bone

Date: 94 JUN 24 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: FMJ Subsonic Match
 Lot No.: 59GC3044

Chronographed Velocity at 20 ft.

1 980.20
 2 1069.29
 3 1073.42
 4 1081.08
 5 1067.01
 AVG 1054.20
 f/sec

Kinetic Energy at 20 ft.: 362.68 ft.lbs.

Calibration Velocity: 615.84 612.29 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.2 9.0 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	32.250	0.648	0.3510	0.3440	0.3475	146.30	99.52
2	35.000	0.648	0.3520	0.3440	0.3480	146.60	99.73
3	40.000						
4	40.000						
5	40.000						
AVG	37.450 inches	0.647 inches	0.3516 inches	0.3440 inches	0.3478 inches	146.45 grains	99.63 %

Notes:

- 1 Nose Forward
- 2 Nose Forward
- 3 Not Recovered - Through Blocks
- 4 Not Recovered - Through Blocks
- 5 Not Recovered - Through Blocks

Date: 94 JUN 24 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: FMJ Subsonic Match
 Lot No.: 59GC3044

Chronographed Velocity at 20 ft.

1 980.20
 2 1069.29
 3 1073.42
 4 1081.08
 5 1067.01
 AVG 1054.20
 f/sec

Kinetic Energy at 20 ft.: 362.68 ft.lbs.

Calibration Velocity: 615.84 612.29 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.2 9.0 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	39.000						
2	39.000						
3	39.000						
4	39.000						
5	39.000						
AVG	39.000 inches						

Notes:

- 1 Not Recovered - Through Blocks
- 2 Not Recovered - Through Blocks
- 3 Not Recovered - Through Blocks
- 4 Not Recovered - Through Blocks
- 5 Not Recovered - Through Blocks

Date: 94 JUN 24 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: FMJ Subsonic Match
 Lot No.: 59GC3044

Chronographed Velocity at 20 ft.

1 980.20
 2 1069.29
 3 1073.42
 4 1081.08
 5 1067.01
 AVG 1054.20
 ft/sec

Kinetic Energy at 20 ft.: 362.68 ft.lbs

Calibration Velocity: 615.64 612.29 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.2 9.0 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	36.250	0.646	0.3560	0.3500	0.3530	146.20	99.46
2	30.500	0.647	0.3560	0.3500	0.3530	145.50	98.98
3	30.000	0.648	0.3570	0.3480	0.3525	146.40	99.59
4	33.000	0.647	0.3560	0.3480	0.3520	146.10	99.39
5	27.375	0.650	0.3540	0.3500	0.3520	145.90	99.25
AVG	31.425 inches	0.648 inches	0.3568 inches	0.3492 inches	0.3525 inches	146.02 grains	99.33 %

Notes:

- Nose Forward RCMP Storm Coat 3280 - 357 /87
- Sideways
- Nose Forward
- Nose Forward
- Base Forward

Date: 94 JUN 24 Bbl. Length: 9" Ammo Mfg.: Winchester
 Make: H&K Serial No.: C315857 Bullet Wt.: 147 grains
 Model: MP5 Caliber: 9mm Bullet Type: FMJ Subsonic Match
 Lot No.: 59GC3044

Chronographed Velocity at 20 ft.

1 980.20
 2 1069.29
 3 1073.42
 4 1081.08
 5 1067.01
 AVG 1054.20
 ft/sec

Kinetic Energy at 20 ft.: 362.68 ft.lbs

Calibration Velocity: 613.05 616.07 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.2 9.2 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	30.375	0.651	0.3550	0.3470	0.3510	146.60	99.73
2	29.500	0.651	0.3550	0.3470	0.3510	146.50	99.66
3	23.625	0.649	0.3550	0.3470	0.3510	146.00	98.32
4	28.000	0.652	0.3550	0.3470	0.3510	146.70	99.80
5	27.125	0.647	0.3550	0.3470	0.3510	146.20	99.46
AVG	27.725 inches	0.650 inches	0.3560 inches	0.3470 inches	0.3510 inches	146.40 grains	99.59 %

Notes:

- Nose Forward RCMP Storm Coat 3280-357 /87
- Nose Forward
- Nose Forward
- Nose Forward
- Nose Forward

Date: 94 APR 25 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAA 3369 Bullet Wt.: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Hydra Shock JHP
 Lot No.: 110 168 H032

Chronographed Velocity at 20 ft.

1 1135.59
 2 1129.18
 3 1107.42
 4 1123.60
 5 1116.82
 AVG 1122.52
 ft/sec

Kinetic Energy at 20 ft.: 433.60 ft.lbs.

Calibration Velocity: 607.90 601.03 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.7 8.9 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.000	0.433	0.6200	0.6000	0.6100	154.30	99.55
2	12.250	0.497	0.6270	0.8020	0.6145	153.30	98.90
3	14.500	0.542	0.6080	0.5920	0.6000	160.80	100.00
4	12.375	0.468	0.6190	0.6020	0.6105	153.39	98.96
5	12.750	0.543	0.6580	0.6170	0.6375	159.70	100.00
AVG	12.776	0.487	0.6264	0.6026	0.6146	156.30	99.48
	Inches	Inches	Inches	Inches	Inches	grains	%

Notes:

- 1 Sideways Jacket Fragmentation
- 2 Nose Forward Jacket Fragmentation Core
- 3 Sideways
- 4 Sideways Jacket Fragmentation
- 5 Sideways

Date: 94 MAY 04 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAA 3369 Bullet Wt.: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Hydra Shock JHP
 Lot No.: 110168H032

Chronographed Velocity at 20 ft.

1 1135.59
 2 1129.18
 3 1107.42
 4 1123.60
 5 1116.82
 AVG 1122.52
 ft/sec

Kinetic Energy at 20 ft.: 433.60 ft.lbs.

Calibration Velocity: 613.27 612.52 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.3 9.1 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.375	0.472	0.6940	0.5620	0.6280	153.70	99.16
2	12.125	0.546	0.7380	0.5800	0.6590	156.32	100.00
3	12.250	0.469	0.7490	0.6150	0.6820	156.01	100.00
4	13.825	0.502	0.7010	0.5660	0.6335	156.32	100.00
5	13.000	0.400	0.6840	0.6020	0.6430	154.93	99.95
AVG	13.076	0.478	0.7132	0.6860	0.6491	156.46	99.82
	Inches	Inches	Inches	Inches	Inches	grains	%

Notes:

- 1 Sideways Jacket Fragmentation Jacket peeled on all bullets to almost jacket/core separation
- 2 Sideways
- 3 Sideways
- 4 Sideways
- 5 Sideways

Date: 94 APR 25 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAA 3369 Bullet Wt.: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Hydra Shok JHP
 Lot No.: 110 168H032

Chronographed Velocity at 20 ft.

1 1135.59
 2 1129.18
 3 1107.42
 4 1123.60
 5 1116.82
 AVG 1122.82
 ft/sec

Kinetic Energy at 20 ft.: 433.60 ft.lbs.

Calibration Velocity: 599.74 594.67 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.7 9.5 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	14.250	0.450	0.7020	0.5710	0.8365	155.08	100.00
2	14.000	0.400	0.6970	0.5690	0.8330	157.40	100.00
3	15.250	0.433	0.6480	0.5530	0.8005	158.32	100.00
4	14.750	0.470	0.5910	0.5610	0.5760	158.30	100.00
5	15.250	0.455	0.5770	0.5620	0.5695	156.01	100.00
AVG	14.700 inches	0.442 inches	0.6430 inches	0.5632 inches	0.6031 inches	166.82 grains	100.00 %

Notes:

- 1 Sideways RCMP Storm Coat 3250-105 Nov/87
- 2 Sideways
- 3 Sideways Core Fragmentation Small
- 4 Sideways
- 5 Sideways

Date: 94 MAY 30 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAA 3369 Bullet Wt.: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Hydra Shok JHP
 Lot No.: 110168H032

Chronographed Velocity at 20 ft.

1 1135.59
 2 1129.18
 3 1107.42
 4 1123.60
 5 1116.82
 AVG 1122.82
 ft/sec

Kinetic Energy at 20 ft.: 433.60 ft.lbs.

Calibration Velocity: 591.93 584.86 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.2 9.2 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	19.375	0.495	0.4710	0.4430	0.4570	154.40	99.61
2	19.000	0.497	0.4740	0.4280	0.4510	155.20	100.00
3	18.875	0.578	0.4430	0.4180	0.4295	154.30	99.55
4	20.000	0.492	0.3950	0.3910	0.3930	153.00	98.71
5	18.375	0.489	0.5870	0.4430	0.5150	153.90	99.29
AVG	19.126 inches	0.510 inches	0.4740 inches	0.4242 inches	0.4491 inches	154.16 grains	99.43 %

Notes:

- 1 Base Forward Jacket Fragmentation RCMP Storm Coat 3280-055 Sept/88
- 2 Nose Forward
- 3 Nose Forward Jacket Fragmentation
- 4 Nose Forward
- 5 Nose Forward Jacket Fragmentation

Date: 94 JUN 07 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAA 3369 Bullet Wt.: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Hydra Shock JHP
 Lot No.: 110168H032

Chronographed Velocity at 20 ft.

1 1135.59
 2 1129.18
 3 1107.42
 4 1123.60
 5 1118.82
 AVG 1122.62
 ft/sec

Kinetic Energy at 20 ft.: 433.60 ft.lbs.

Calibration Velocity: 602.41 602.48 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.7 9.9 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.875	0.356	0.7040	0.6130	0.6585	155.50	100.00
2	13.375	0.390	0.7670	0.6230	0.6950	154.90	99.94
3	12.250	0.373	0.7170	0.8270	0.6720	150.10	96.84
4	13.125	0.398	0.6810	0.6170	0.6490	152.10	98.13
5	12.000	0.371	0.6360	0.6070	0.6215	125.80	81.16
AVG	12.925 inches	0.370 inches	0.7010 inches	0.6174 inches	0.6692 inches	147.88 grains	95.21 %

Notes:

- 1 Sideways Muscle Rib Diameter .4400 - .3275 inches
- 2 Sideways Bone
- 3 Sideways Jacket/Core Fragmentation Peeled Bone
- 4 Sideways Bone/Muscle
- 5 Sideways Jacket/Core Fragmentation Peeled Muscle

Date: 94 JUN 08 Bbl. Length: 4" Ammo Mfg.: Federal
 Make: S&W Serial No.: VAA 3369 Bullet Wt.: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Hydra Shock JHP
 Lot No.: 110168H032

Chronographed Velocity at 20 ft.

1 1135.59
 2 1129.18
 3 1107.42
 4 1123.60
 5 1118.82
 AVG 1122.62
 ft/sec

Kinetic Energy at 20 ft.: 433.60 ft.lbs.

Calibration Velocity: 606.80 592.68 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.4 9.2 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.875	0.368	0.6020	0.5220	0.5620	125.00	80.65
2	13.375	0.394	0.7780	0.6120	0.6950	154.80	99.87
3	12.875	0.527	0.6090	0.5880	0.5985	155.30	100.00
4	11.825	0.414	0.6000	0.5320	0.5660	124.50	80.32
5	12.875	0.374	0.7070	0.5960	0.6515	155.00	100.00
AVG	12.925 inches	0.416 inches	0.6592 inches	0.5700 inches	0.6146 inches	142.92 grains	92.17 %

Notes:

- 1 Sideways Jacket/Core Fragmentation Jacket/Core Separation Muscle Rib Diameter .3055- .3575 in.
- 2 Sideways Core Fragmentation Bone
- 3 Sideways Muscle
- 4 Sideways Core Only Bone
- 5 Sideways Cartilage/Muscle

Date: 94 APR 25 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAA 3369 Bullet Wt.: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Silvertip HP
 Lot No.: 67EF6874

Chronographed Velocity at 20 ft.

1 1234.57
 2 1222.20
 3 1226.69
 4 1221.00
 5 1204.82
 AVG 1221.86
 ft/sec

Kinetic Energy at 20 ft.: 613.73 ft.lbs.

Calibration Velocity: 607.90 601.03 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 8.7 8.9 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	12.000	0.367	0.6910	0.6700	0.6805	157.86	100.00
2	11.500	0.399	0.7170	0.6820	0.6895	153.08	98.76
3	11.500	0.378	0.7030	0.6820	0.6925	159.41	100.00
4	11.375	0.393	0.7040	0.8770	0.6905	155.55	100.00
5	12.500	0.361	0.6670	0.6510	0.6590	157.71	100.00
AVG	11.775 inches	0.380 inches	0.6964 inches	0.6684 inches	0.6824 inches	156.72 grains	99.76 %

Notes:

- 1 Sideways
- 2 Nose Forward Jacket Fragmentation
- 3 Sideways
- 4 Sideways
- 5 Nose Forward

Date: 94 MAY 04 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAA 3369 Bullet Wt.: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Silvertip HP
 Lot No.: 67EF6874

Chronographed Velocity at 20 ft.

1 1234.57
 2 1222.20
 3 1226.69
 4 1221.00
 5 1204.82
 AVG 1221.86
 ft/sec

Kinetic Energy at 20 ft.: 613.73 ft.lbs.

Calibration Velocity: 613.27 612.52 ft/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.3 9.1 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.750	0.419	0.8280	0.5880	0.5960	157.25	100.00
2	14.000	0.435	0.8780	0.5700	0.6240	156.78	100.00
3	14.250	0.417	0.6300	0.5950	0.6125	156.17	100.00
4	13.875	0.408	0.6300	0.5800	0.6050	156.48	100.00
5	12.375	0.462	0.8750	0.6200	0.6475	157.56	100.00
AVG	13.658 inches	0.428 inches	0.6478 inches	0.5852 inches	0.6170 inches	156.85 grains	100.00 %

Notes:

- 1 Nose Forward
- 2 Sideways
- 3 Nose Forward
- 4 Sideways
- 5 Sideways

Date: 94 APR 25 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAA 3369 Bullet WL: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Silvertip HP
 Lot No.: 67EF6874

Chronographed
Velocity at 20 ft.

1 1234.57
 2 1222.20
 3 1226.69
 4 1221.00
 5 1204.82
 AVG 1221.86
 f/sec

Kinetic Energy at 20 ft.: 613.73 ft.lbs.

Calibration Velocity: 599.74 594.67 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.7 9.5 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.250	0.380	0.6960	0.6150	0.6565	154.83	99.95
2	13.125	0.398	0.6620	0.6290	0.6455	155.09	100.00
3	14.375	0.410	0.6580	0.6050	0.6315	156.01	100.00
4	13.875	0.388	0.6860	0.6000	0.6430	156.17	100.00
5	14.250	0.393	0.6520	0.6220	0.6370	158.63	100.00
AVG	13.776 inches	0.394 inches	0.6712 inches	0.6142 inches	0.6427 inches	156.77 grains	99.99 %

Notes:

- 1 Nose Forward RCMP Storm Coat 3250-105 Nov/87
- 2 Sideways
- 3 Nose Forward
- 4 Sideways
- 5 Sideways

Date: 94 MAY 31 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAA 3369 Bullet WL: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Silvertip HP
 Lot No.: 67EF6874

Chronographed
Velocity at 20 ft.

1 1234.57
 2 1222.20
 3 1226.69
 4 1221.00
 5 1204.82
 AVG 1221.86
 f/sec

Kinetic Energy at 20 ft.: 613.73 ft.lbs.

Calibration Velocity: 600.38 606.65 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.5 9.8 cm

Test Type

Gelatin
 Heavy Clothing
 Rib

Distance

3m
 25m
 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	17.625	0.381	0.5550	0.5150	0.5350	155.90	100.00
2	17.375	0.363	0.6090	0.5500	0.5795	155.10	100.00
3	18.125	0.391	0.5820	0.5000	0.5410	155.30	100.00
4	16.000	0.375	0.5940	0.5350	0.5645	154.80	99.87
5	16.125	0.368	0.5890	0.5490	0.5690	155.10	100.00
AVG	17.050 inches	0.376 inches	0.5868 inches	0.5298 inches	0.5678 inches	156.24 grains	99.97 %

Notes:

- 1 Nose Forward RCMP Storm Coat 3280-055 Sept/88
- 2 Nose Forward
- 3 Nose Forward
- 4 Nose Forward
- 5 Nose Forward

Date: 94 JUN 07 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAA 3369 Bullet Wt.: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Silvertip HP
 Lot No.: 67EF6874

Chronographed Velocity at 20 ft.

1 1234.57
 2 1222.20
 3 1226.69
 4 1221.00
 5 1204.82
 AVG 1221.86
 f/sec

Kinetic Energy at 20 ft.: 613.73 ft.lbs.

Calibration Velocity: 600.67 596.23 f/sec
 Calibration Temp.: 5 5 °C
 Calibration penetration: 9.7 8.8 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	10.875	0.314	0.7210	0.7060	0.7135	156.10	100.00
2	11.000	0.325	0.7520	0.6710	0.7115	155.90	100.00
3	10.750	0.328	0.7060	0.6620	0.6840	155.20	100.00
4	12.000	0.351	0.7770	0.7120	0.7445	154.90	99.94
5	10.500	0.260	0.7360	0.6960	0.7160	153.90	99.29
AVG	11.025 inches	0.315 inches	0.7384 inches	0.6894 inches	0.7139 inches	155.20 grains	99.85 %

Notes:

- 1 Sideways Muscle Rib Diameter .4245 - .5040 inches
- 2 Sideways Muscle
- 3 Sideways Bone
- 4 Sideways Bone
- 5 Sideways Jacket Fragmentation Muscle

Date: 94 JUN 08 Bbl. Length: 4" Ammo Mfg.: Winchester
 Make: S&W Serial No.: VAA 3369 Bullet Wt.: 155 grains
 Model: 4046 Caliber: 40 S&W Bullet Type: Silvertip HP
 Lot No.: 67EF6874

Chronographed Velocity at 20 ft.

1 1234.57
 2 1222.20
 3 1226.69
 4 1221.00
 5 1204.82
 AVG 1221.86
 f/sec

Kinetic Energy at 20 ft.: 613.73 ft.lbs.

Calibration Velocity: 603.72 599.95 f/sec
 Calibration Temp.: 6 6 °C
 Calibration penetration: 9.4 9.3 cm

Test Type Distance
 Gelatin 3m
 Heavy Clothing 25m
 Rib 50m

	Penetration Depth	Remaining Bullet Length	Bullet Expansion			Retained Weight	Per cent Retained Weight
			max	min	avg		
1	13.875	0.414	0.6350	0.5830	0.6090	155.40	100.00
2	11.750	0.347	0.7300	0.6600	0.6950	155.00	100.00
3	12.125	0.398	0.7420	0.6240	0.6830	154.40	99.61
4	13.000	0.411	0.5100	0.5840	0.5970	155.10	100.00
5	11.500	0.353	0.6460	0.6110	0.6285	155.30	100.00
AVG	12.450 inches	0.385 inches	0.6726 inches	0.6124 inches	0.6425 inches	155.04 grains	99.92 %

Notes:

- 1 Sideways Fat Rib Diameter .3330 - .3325 inches
- 2 Sideways Bone
- 3 Sideways Bone
- 4 Nose Forward Bone
- 5 Sideways Bone

SUMMARY

		3m											
		BARE				CLOTH				RIB			
		Penetration	Expansion	Retained Wt.**	% Retention ***	Penetration	Expansion	Retained Wt.**	% Retention ***	Penetration	Expansion	Retained Wt.**	% Retention ***
	38 SW 5" 158gr	12 0250	0 6290	156 0380	98 76	12 9000	0 5638	156 3440	98 95	14 6500	0 6111	156 5600	99 09
4" 9mm	115 Win ST	9 2500	0 6597	113 4820	98 68	11 6000	0 5717	115 2720	99 80	9 5750	0 6553	111 0800	96 52
	115 Fed JHP	9 9250	0 6170	107 5240	93 50	11 2000	0 5901	114 8420	99 74	12 7250	0 5073	82 4000	71 65
	124 PMC Starfire	11 0000	0 6355	123 8520	99 47	13 2000	0 5646	124 3460	99 91	11 9000	0 6252	123 4400	99 55
	147 Fed Hydra Shok	12 2250	0 6292	145 2380	98 80	13 5750	0 5804	147 1840	99 92	13 9750	0 6443	147 3800	99 76
	147 Rem GS	13 8500	0 6152	146 9980	99 84	15 1000	0 6109	146 0140	99 33	15 2250	0 6064	146 0600	99 20
	147 Win BT	13 7250	0 6258	144 8400	98 53	15 3250	0 6160	147 1840	99 57	14 1500	0 6251	146 4000	99 20
	147 CCI GD	15 5000	0 5171	146 2200	99 44	16 7750	0 4795	147 0400	99 97	15 8250	0 4906	146 7800	99 81
	147 Win FMJ	29 1000	0 3522	146 6400	99 76	27 8250	0 3512	146 4600	99 63	23 0750	0 3536	146 4800	99 65
9" 9mm	115 Win ST	9 9750	0 5319	73 2040	63 66	9 8500	0 6186	107 6180	93 32	9 5750	0 5497	85 7200	74 54
	115 Fed JHP	12 2250	0 4889	68 8820	59 90	13 3500	0 5208	85 5820	74 42	11 3500	0 5335	80 5400	70 03
	124 PMC Starfire	9 7500	0 7144	122 8340	99 06	10 7000	0 6591	123 4500	99 52	8 8500	0 7144	118 3000	94 92
	147 Fed Hydra Shok	12 6000	0 6754	145 8900	99 07	12 0500	0 6508	146 2300	99 38	12 6750	0 5825	120 5000	81 97
	147 Rem GS	13 4000	0 6733	143 4520	97 59	13 5500	0 6408	146 1980	99 26	15 4750	0 6503	142 1200	96 60
	147 Win BT	14 7750	0 6203	146 6920	98 73	14 0000	0 6694	146 9380	99 07	16 0250	0 6205	131 1800	89 24
	147 CCI GD	12 6000	0 7205	147 1000	99 99	14 6750	0 6002	147 1000	99 93	13 4000	0 6311	147 3600	100 00
	147 Win FMJ	37 4500	0 3478	146 4500	99 63	31 4250	0 3525	146 0200	99 33	33 8000	0 3523	146 5333	99 68
4" 40 S&W	155 Fed Hydra Shok	12 7750	0 6145	156 2980	99 48	14 7000	0 6031	156 6240	100 00	12 9250	0 6592	147 6800	95 21
	155 Win ST	11 7750	0 6824	156 7220	99 75	13 7750	0 6427	155 7660	99 99	11 0250	0 7139	155 2000	99 85
	155 CCI GD	13 1750	0 7189	155 6600	100 00	13 0250	0 6645	155 2000	99 99	12 7750	0 6994	155 6400	100 00
	165 Fed Hydra Shok	13 4750	0 6261	159 9400	96 93	14 4750	0 6000	164 3000	99 58	13 3000	0 6151	162 4600	98 46
	180 Win Ranger SXT	13 2500	0 7079	179 1600	99 42	14 2500	0 7499	180 0120	99 87	12 0750	0 7089	179 1600	99 53
	180 Win Subsonic	14 6250	0 6565	177 9880	98 62	14 4250	0 6296	181 1980	100 00	13 7000	0 6345	165 9800	92 21
	180 Win FMJ	28 5750	0 3959	180 5000	100 00	28 3250	0 3975	180 4000	99 96	29 4500	0 3968	180 8800	100 00
	180 PMC Starfire	11 9250	0 7101	180 9500	99 94	13 3250	0 6510	180 5180	100 00	11 2000	0 7192	177 8400	98 43
180 CCI GD	13 4500	0 6914	182 6540	100 00	13 5500	0 6208	180 0260	99 92	13 3500	0 6555	179 9200	99 92	

		50m											
		BARE				CLOTH				RIB			
		Penetration	Expansion	Retained Wt.**	% Retention ***	Penetration	Expansion	Retained Wt.**	% Retention ***	Penetration	Expansion	Retained Wt.**	% Retention ***
	38 SW 5" 158gr	12 4500	0 6090	156 3480	98 95	13 3250	0 5847	156 3400	98 95	12 5250	0 6124	156 2000	98 86
4" 9mm	115 Win ST	10 4750	0 5831	114 6560	99 61	13 0500	0 5323	115 3400	99 90	9 8500	0 5956	110 1400	95 62
	115 Fed JHP	9 8750	0 6069	113 2340	98 39	13 5000	0 5250	114 9000	99 77	9 9250	0 6084	112 7600	98 05
	124 PMC Starfire	11 9250	0 5832	124 1920	99 87	15 8500	0 5255	124 8400	100 00	11 3750	0 6260	124 8000	100 00
	147 Fed Hydra Shok	12 0250	0 6125	147 2140	99 82	13 8750	0 5738	146 8400	99 66	11 5500	0 6397	146 7800	99 76
	147 Rem GS	13 8000	0 6125	149 0980	100 00	14 8750	0 6187	147 1800	99 97	13 5750	0 6172	147 0800	99 95
	147 Win BT	14 2000	0 6015	146 9700	99 95	16 0250	0 5864	147 4600	99 40	14 8250	0 6273	147 9000	99 89
	147 CCI GD	15 9750	0 4938	146 7600	99 82	17 3500	0 4639	146 8400	99 85	15 7250	0 4975	145 1600	98 73
	147 Win FMJ	24 1500	0 3520	146 6200	99 74	23 6500	0 3517	146 4400	99 62	29 3500	0 3510	146 8500	99 86
9" 9mm	115 Win ST	9 1750	0 6773	108 1600	94 00	9 7750	0 6342	114 8800	99 63	8 5250	0 6992	109 6200	95 32
	115 Fed JHP	10 2250	0 6471	108 2400	94 12	9 6500	0 6320	114 6400	99 44	9 5000	0 6129	103 4000	89 91
	124 PMC Starfire	11 0750	0 6780	123 5400	99 47	11 0250	0 6425	124 7000	99 98	9 9500	0 6630	124 0200	99 69
	147 Fed Hydra Shok	12 0750	0 7114	146 0000	99 32	12 8000	0 6352	146 8800	99 67	11 1750	0 6744	145 2800	98 83
	147 Rem GS	13 0500	0 6634	146 0000	99 29	14 0750	0 7018	147 2800	99 95	11 8250	0 6797	141 3200	96 14
	147 Win BT	13 4250	0 7385	147 7400	99 76	13 4500	0 6780	148 3600	100 00	12 8000	0 6745	147 4600	99 73
	147 CCI GD	12 5500	0 6398	147 0400	99 93	14 5000	0 5825	146 9200	99 90	12 9500	0 6307	146 8800	99 85
	147 Win FMJ	39 0000	*	*	*	27 7250	0 3510	146 4000	99 59	30 4500	0 3510	146 6000	99 73
4" 40 S&W	155 Fed Hydra Shok	13 0750	0 6491	155 4560	99 82	19 1250	0 4491	154 1600	99 43	12 9250	0 6146	142 9200	92 17
	155 Win ST	13 6500	0 6170	156 8480	100 00	17 0500	0 5578	155 2400	99 97	12 4500	0 6425	155 0400	99 92
	155 CCI GD	12 3000	0 6593	156 1800	99 96	14 1750	0 6145	155 2800	100 00	12 0000	0 6551	155 6600	100 00
	165 Fed Hydra Shok	12 9750	0 6235	163 7600	99 25	15 3250	0 5699	164 3000	99 58	13 5000	0 6092	164 3000	99 58
	180 Win Ranger SXT	13 5000	0 7167	179 7600	99 82	14 3000	0 7391	179 9800	99 94	12 6000	0 7245	178 3600	99 09
	180 Win Subsonic	13 4750	0 6625	179 7600	99 69	13 6500	0 6296	180 2600	99 66	12 4750	0 6500	177 4200	98 40
	180 Win FMJ	32 9000	0 3961	180 6200	100 00	30 7000	0 3955	180 3800	99 98	28 1750	0 3945	180 6800	100 00
	180 PMC Starfire	12 0750	0 7042	180 4200	99 88	16 3000	0 6122	179 7000	99 69	11 3250	0 6906	180 9600	99 54
180 CCI GD	13 9750	0 6326	180 2200	99 97	13 5750	0 6165	180 3400	99 98	12 8250	0 6441	179 9800	99 92	

* bullets not recovered
 ** Retained weight is the average of the recovered bullets' retained weight, uncorrected when they exceed the manufacturer's advertised bullet weight
 *** % Retention figures are the average of the per cent retained weight. Recovered bullet weights greater than the manufacturer's advertised weight are recorded as 100% retained weight

.38 SPECIAL:
158 grain Federal Semi-wadcutter



9 MM Parabellum

115 grain Winchester Silvertip



147 grain Remington
Golden Saber



115 grain Federal Jacketed Hollowpoint



147 grain Winchester
Black Talon



124 grain PMC Starfire



147 grain Speer Gold Dot



147 grain Federal Hydrashok



147 grain Winchester Full
Metal Jacket



.38 SPECIAL:

158 grain Federal Semi-wadcutter



180 grain Winchester
Ranger SXT



.40 SMITH & WESSON:

155 grain Federal Hydrashok



180 grain Winchester
Subsonic



155 grain Winchester Silvertip



180 grain Winchester
Full metal Jacket



155 grain Speer Gold Dot



180 grain PMC Starfire



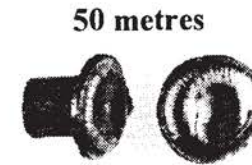
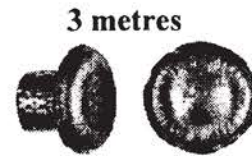
165 grain Federal Hydrashok



180 grain Speer Gold Dot



.38 SPECIAL fired from S&W 10-5 5" BBL:
 158 grain Federal Semi-wadcutter



**9 MM Parabellum
 fired from S&W 5943:**

3 metres

50 metres

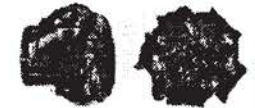
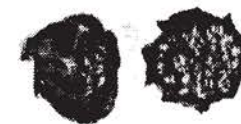
3 metres

50 metres

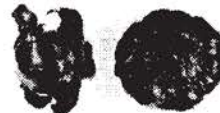
115 grain Winchester Silvertip



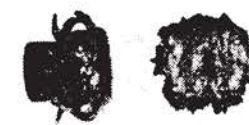
147 grain Remington
 Golden Saber



115 grain Federal
 Jacketed Hollowpoint



147 grain Winchester
 Black Talon



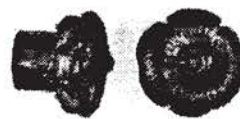
124 grain PMC Starfire



147 grain Speer Gold Dot



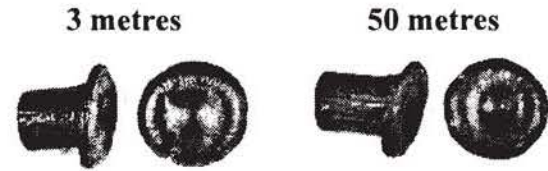
147 grain Federal Hydrashok



147 grain Winchester
 Full Metal Jacket



.38 SPECIAL fired from S&W 10-5 5" BBL:
158 grain Federal Semi-wadcutter



9 MM Parabellum
fired from S&W 5943:

3 metres **50 metres**

115 grain Winchester Silvertip



115 grain Federal
Jacketed Hollowpoint



124 grain PMC Starfire

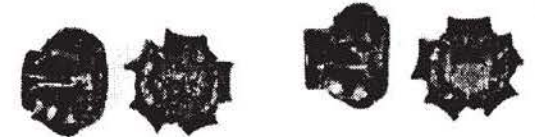


147 grain Federal Hydrashok

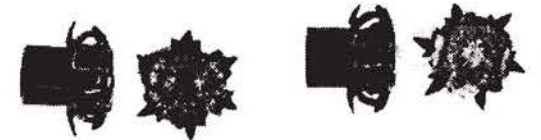


147 grain Remington
Golden Saber

3 metres **50 metres**



147 grain Winchester
Black Talon



147 grain Speer Gold Dot



147 grain Winchester
Full Metal Jacket



.38 SPECIAL fired from S&W 10-5 5" BBL:
158 grain Federal Semi-wadcutter



**9 MM Parabellum
fired from S&W 5943:**

3 metres 50 metres

115 grain Winchester Silvertip



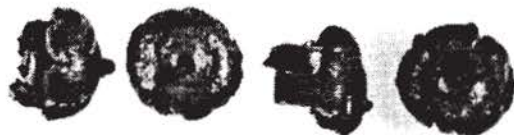
115 grain Federal
Jacketed Hollowpoint



124 grain PMC Starfire



147 grain Federal Hydrashok



3 metres 50 metres

147 grain Remington
Golden Saber



147 grain Winchester
Black Talon



147 grain Speer Gold Dot



147 grain Winchester
Full Metal Jacket



.38 SPECIAL fired from S&W 10-5 5" BBL:
158 grain Federal Semi-wadcutter

3 metres



50 metres



**9 MM Parabellum
fired from H&K MP5:**

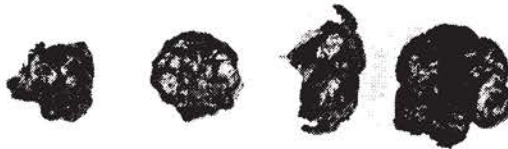
3 metres

50 metres

3 metres

50 metres

115 grain Winchester Silvertip



147 grain Remington
Golden Saber



115 grain Federal
Jacketed Hollowpoint



147 grain Winchester
Black Talon



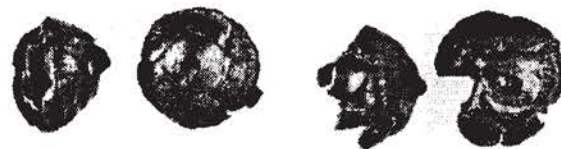
124 grain PMC Starfire



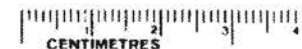
147 grain Speer Gold Dot



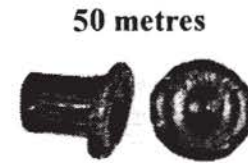
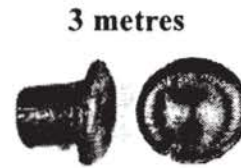
147 grain Federal Hydrashok



147 grain Winchester
Full Metal Jacket



.38 SPECIAL fired from S&W 10-5 5" BBL:
158 grain Federal Semi-wadcutter



**9 MM Parabellum
fired from H&K MP5:**

3 metres

50 metres

3 metres

50 metres

115 grain Winchester Silvertip



147 grain Remington
Golden Saber



115 grain Federal
Jacketed Hollowpoint



147 grain Winchester
Black Talon



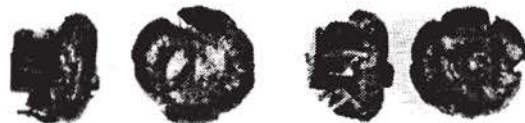
124 grain PMC Starfire



147 grain Speer Gold Dot



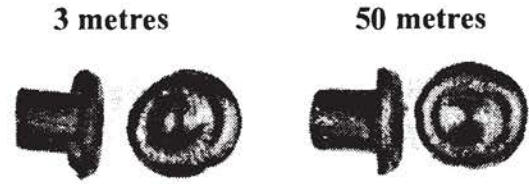
147 grain Federal Hydrashok



147 grain Winchester
Full Metal Jacket



.38 SPECIAL fired from S&W 10-5 5" BBL:
 158 grain Federal Semi-wadcutter



**9 MM Parabellum
 fired from H&K MP5:**

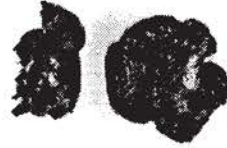
3 metres

50 metres

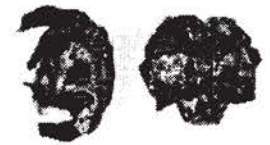
3 metres

50 metres

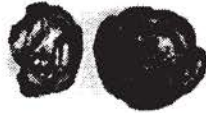
115 grain Winchester Silvertip



147 grain Remington
 Golden Saber



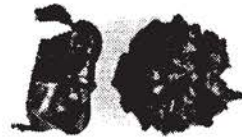
115 grain Federal
 Jacketed Hollowpoint



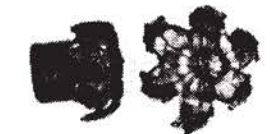
147 grain Winchester
 Black Talon



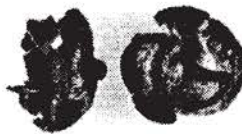
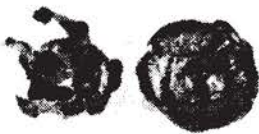
124 grain PMC Starfire



147 grain Speer Gold Dot



147 grain Federal Hydrashok



147 grain Winchester
 Full Metal Jacket



.38 SPECIAL fired from
S&W 10-5 5" BBL:
 158 grain Federal Semi-wadcutter

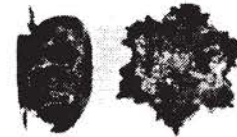
3 metres



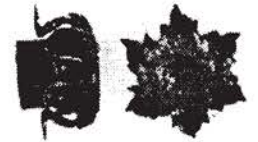
50 metres



3 metres



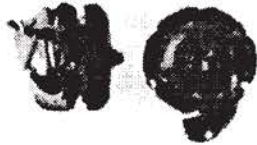
50 metres



180 grain Winchester
 Ranger SXT

.40 SMITH & WESSON
 fired from S&W 4046:

3 metres



50 metres



155 grain Federal Hydrashok

180 grain Winchester
 Subsonic



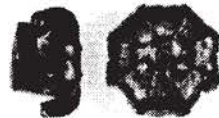
155 grain Winchester Silvertip



180 grain Winchester
 Full metal Jacket



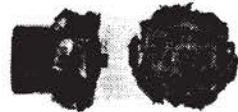
155 grain Speer Gold Dot



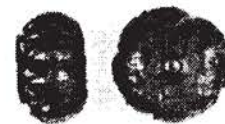
180 grain PMC Starfire



165 grain Federal Hydrashok



180 grain Speer Gold Dot

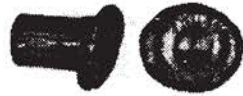


**.38 SPECIAL fired from
S&W 10-5 5" BBL:**
158 grain Federal Semi-wadcutter

3 metres



50 metres



**.40 SMITH & WESSON
fired from S&W 4046:**

3 metres

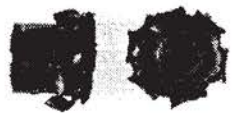


50 metres



155 grain Federal Hydrashok

155 grain Winchester Silvertip



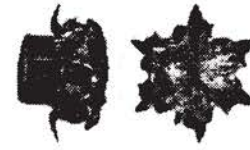
155 grain Speer Gold Dot



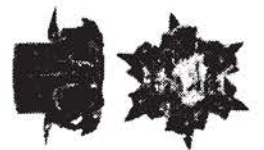
165 grain Federal Hydrashok



3 metres

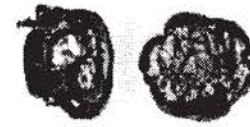


50 metres



180 grain Winchester
Ranger SXT

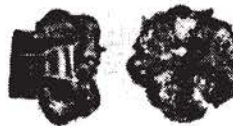
180 grain Winchester
Subsonic



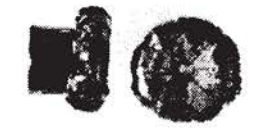
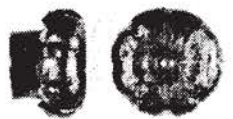
180 grain Winchester
Full metal Jacket



180 grain PMC Starfire



180 grain Speer Gold Dot



**.38 SPECIAL fired from
S&W 10-5 5" BBL:**
158 grain Federal Semi-wadcutter

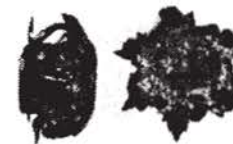
3 metres



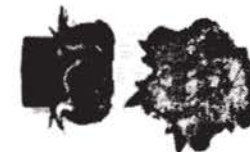
50 metres



3 metres



50 metres



180 grain Winchester
Ranger SXT

**.40 SMITH & WESSON
fired from S&W 4046:**

3 metres



50 metres



155 grain Federal Hydrashok

180 grain Winchester
Subsonic



155 grain Winchester Silvertip



180 grain Winchester
Full metal Jacket



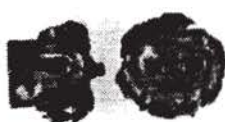
155 grain Speer Gold Dot



180 grain PMC Starfire



165 grain Federal Hydrashok



180 grain Speer Gold Dot

