Request for comments (RFC) for an Universal Bullet Classification Scheme (UBCS)

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A bullet is a kinetic projectile and the component of firearm ammunition that is expelled from the gun barrel during shooting[1].

Handloading or reloading is the process of loading firearm cartridges or shotgun shells by assembling the individual components (case/hull, primer, powder, and bullet/shot), rather than purchasing completely assembled, factory-loaded ammunition[2].

As there is a million of different bullet types and constructions available for different calibres and physical parameters, such as weight, diameter, length and aspects of external/internal construction and composition, there is a need to classify them to provide a solution for the means of searching, identifying and comparison for the modern handloader.

Bullets are manufactured for different purposes and processes by a variety of commercial producers and still as of today, some are produced by handloaders themselves. This variety and more often than sometimes conflicting commercial interests lead to a nomenclature which is all but consistent and useful to identify specific types and construction of a bullet for a given purpose.

This RFC takes on to the challenge to provide means of identifying bullets solely by geometric and constructional features without taking individual calibre-specific parameters (such as weight, calibre, external or internal dimensions) into account. It's purpose only needs to suit the needs to identify a TYPE of bullet over the individual specifications of a given bullet for a individual application in a given calibre.

[1] https://en.wikipedia.org/wiki/Bullet
[2] https://en.wikipedia.org/wiki/Handloading

When taking up to this challenge, some obvious general parameters come up without being too specific to a certain bullet type manufactured and branded by individuals or commercial operations. These are:

- Purpose
  Is this bullet intended for hunting or target shooting? Is it designed and enhanced to produce special target ballistic effects or solely for a precision flight path?
- Geometry
  How and why are different physical parameters chosen, which make up the outer appearance of the bullet
- Construction
  What is the recipe, which assembles the bullets components in a designated way? (Jacket, core, bonding mechanism, materials)

Parameters

Purpose

The main parameter to classify an bullets purpose tends to be the necessity to align with the common main application of the bullet for shooting:

#	Parameter	Possible Values (suggestions)
1.1.	Application	Military, Self-Defense, Sport, Target Shooting, Benchrest, General Hunting, Big Game Hunting, Varmint Hunting, Other…

Along with this, the implied and intended target ballistic needs to be captured:

#	Parameter	Possible Values (suggestions)
1.2.	Target Ballistic	None (for target or benchrest), basic physical impact (IPSC, long range), expansion (for hunting), Armour Piercing (AP), Anti Material (AM) and possible others…

To comply with the requirements arising from 1.1. Application and 1.2. Target Ballistic the bullet is individually composed to fulfil the intended goals in ways which are specific to the given calibre (and the gun it is intended to be used with), by several external and internal features and the means of assembly of the above, such as:

External Features

Bullet Head

#	Parameter	Possible Values (suggestions)
2.1.	Head	Full Metal Jacket (FMJ), Soft Point (JSP), Total Metal Jacket (TMJ), Hollow Point (HP), Ballistic Tip (BT), Leadhead…

Bullet Ogive

#	Parameter	Possible Values (suggestions)
2.2.	Ogive	Pointed, Round, Wadcutter, Semi-Wadcutter, Cone-point bullet…

Bullet Tail

#	Parameter	Possible Values (suggestions)

2.3.	Tail	Flat, Boat-Tail, Hollow Base (open lead), Hollow Base (jacketed)…

Jacket Material

#	Parameter	Possible Values (suggestions)
2.4.	Jacket	None, Copper, Steel, Lead, Brass, Tomback…

Jacket Features

#	Parameter	Possible Values (suggestions)
2.5.	Jacket Features	Straight, Cannelured, Driving Bands, Sabot…

Internal Features

Core Material

#	Parameter	Possible Values (suggestions)
3.1.	Core	Copper, Steel, depleted Uranium, Lead, Brass, Tomback, TungstenCarbide, Custom…

Core Features

#	Parameter	Possible Values (suggestions)
3.2.	Core Features	None, Gas-Check, Custom…

And the type and composition of jacket and core assembly

Composition Features

#	Parameter	Possible Values (suggestions)
4.1.	Bonding	None, Solid, Interlock, Standard Bonding, Custom…

Examples

These examples contain information for the describes ten parameters for bullets commonly used in popular rounds given:

n	#	Parameter	.45 ACP (Sport)	7,62x51 (Hunting)	.357 Mag (CAS[3])
1	1.1.	Application	Sport	General Hunting	Sport
2	1.2.	Target Ballistic	None	Expansive	None
3	2.1.	Head	FMJ	Ballistic Tip (BT)	Leadhead
4	2.2.	Ogive	Round	Pointed	Semi-Wadcutter
5	2.3.	Tail	Flat	Boat-Tail	Flat
6	2.4	Jacket	Copper	Copper	None
7	2.5.	Jacket Features	Straight	Cannelured	Driving Bands
8	3.1.	Core	Lead	Lead	Lead
9	3.2.	Core Features	None	None	None
10	4.1.	Bonding	None	Interlock	Solid
UBCS Designation			S0F2F 2S4N4	H2B1B 2D4N3	S1L4F 4D4N4

[3] CAS = Cowboy Action Shooting

n	#	Parameter	.22 lr	7,62x54R (AP[4])	.223 Remington
1	1.1.	Application	Sport	Military	Sport
2	1.2.	Target Ballistic	None	Armour Piercing	None
3	2.1.	Head	Leadhead	TMJ	FMJ
4	2.2.	Ogive	Round	Pointed	Pointed
5	2.3.	Tail	Flat	Boat-Tail	Flat
6	2.4	Jacket	None	Copper	Copper
7	2.5.	Geometry	Driving Bands	Straight	Straight
8	3.1.	Core	Lead	TugstenCarbide	Lead
9	3.2.	Features	None	None	None
10	4.1.	Bonding	Solid	None	None
UBCS Designation			S0L2F 4D4N4	M3T1B 2T7N4	S0F1H 2C4N4

The intention is, to easily make decisions on which selection of values match best for a given bullet during the process of classification. Please note: the resulting designation for a given bullet type will neither identify the round itself, nor the calibre. The typical bullet characteristics for the typical 9mm Luger FMJ Bullet will result the same bullet type classification, as the bullet used in cal .45 ACP FMJ ammunition, not because they are identical, but because the bullets features are similar. Also, a shift-pattern algorithm iteration between letter and number values should provide better readability and inherent and simple format checking capabilities.

Parameter Values

1.1 Application

Application type classification would start with the question: “what purpose did this bullet originally serve? / what purpose was it designed for? / what is its intended applications by the manufacturer?”

Parameter Value	Parameter Meaning	Explanation / Hints
M	Military	What does the manufacturer say about the intended purpose of the bullet? When in doubt, select “other”
S	Sport	
H	Hunting	
V	Varmint Hunting	
B	Big Game Hunting	
D	Self-Defense	
R	Benchrest	
T	Target Shooting	
O	Other	

1.2 Target Ballistic

Parameter Value	Parameter Meaning	Explanation / Hints
0	None	Select, if this bullet was not designed for any special target ballistic effects
1	Basic Physical Impact	Select, if this bullet was designed to match basic physical impact requirements, such as IPSC power factor or long-range minimum penetration requirements

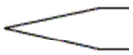
[4] AP = Armor Piercing

2	Expansion	Select, if the bullet was designed to provide improved target ballistics by expanding when entering tissue (such as for hunting purposes)
3	Armour Piercing	Select, if the bullet was specifically designed to penetrate special types of armour (such as military vehicles, body plates… etc.)
4	Anti Material	Select, if the bullet was designed to provide general capabilities to penetrate obstacles such as trees, walls, cars…

2.1 Head

Parameter Value	Parameter Meaning	Explanation / Hints
F	Full Metal Jacket (FMJ)	Full Metal Jacket with an open tail (core exposed)
S	Soft Point (Jacketed Soft Point – JSP)	Select, if the Bullet has a Soft-Point or JSP design
T	Total Metal Jacket (TMJ)	Full Metal Jacket with an closed (covered) tail (core not exposed)
B	Ballistic Tip	Select, if the bullet is equipped with a ballistic (Polymer) Tip
H	Hollowpoint	
L	Leadhead	Select, if the bullet is a lead bullet or has a lead jacket

2.2. Ogive

Parameter Value	Parameter Meaning	Explanation / Hints
1	Pointed	
2	Round	 Round or parabolic
3	Wadcutter	 Blunt
4	Semi-Wadcutter	
5	Cone-point bullet	
6	Truncated Cone	

2.3 Tail

Parameter Value	Parameter Meaning	Explanation / Hints
F	Flat	
B	Boat-Tail	
H	Hollow Base (open core)	
J	Hollow Base (jacketed)	

2.4 Jacket

Parameter Value	Parameter Meaning	Explanation / Hints
1	None	Material of the jacket. If bullet has no jacket or is a solid, select none
2	Copper	
3	Steel	
4	Lead	
5	Brass	
6	Tomback	

2.5 Jacket Features

Parameter Value	Parameter Meaning	Explanation / Hints
S	Straight	No jacket features
C	Cannelured	Jacket has a cannelure for crimping
D	Driving Bands	Jacket contains driving bands or bullet is castet with driving bands (no jacket)
T	Sabot	Jacket is designed to enclose sabot projectile

3.1 Core Material

Parameter Value	Parameter Meaning	Explanation / Hints
1	Copper	
2	Steel	
3	depleted Uranium	
4	Lead	
5	Brass	
6	Tomback	
7	TungstenCarbide	
8	Custom	

3.2 Core Features

Parameter Value	Parameter Meaning	Explanation / Hints
N	None	No specific core features used
G	Gas-Check	Core is sealed with gas check
H	Multicore	Two cores (H-configuration)
C	Custom	Any other special core feature

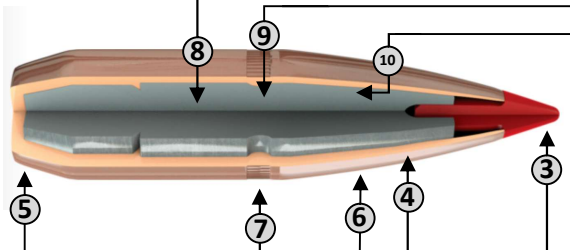
4.1 Bonding

Parameter Value	Parameter Meaning	Explanation / Hints
1	None	No special bonding was applied to bond core to jacket
2	Solid	Bullet is a solid design, select in conjunction with 2.4 = 1 None (no Jacket)
3	Interlock	Interlock bonding between core ans jacket
4	Standard Bonding	Standard heat bonding (soldering) was applied to join core and jacket
5	Custom	Custom (any) type of bonding was applied to join jacket and core

UBCS QuickChart

Example shown: Hornady SST

(see Manufacturers Data)



H$_1$ **2**$_2$ **B**$_3$ **1**$_4$ **B**$_5$ - **2**$_6$ **C**$_7$ **4**$_8$ **N**$_9$ **3**$_{10}$

1.1 Application	1.2 Target Ballistic	2.1 Head	2.2 Ogive	2.3 Tail	2.4 Jacket	2.5 Jacket Features	3.1 Core	3.2 Core Features	4.1 Bonding
M Military S Sport **H Hunting** V Varmint Hntg B Big Game Htg D Self-Defense R Benchrest T Target Shootg O Other	0 None 1 Bsc Phys. Imp **2 Expansion** 3 Armour Prcng 4 Anti Material	F F.M.Jacket (FMJ) S Soft Point (JSP) T T.M.Jacket (TMJ) **B Ballistic Tip** H Hollowpont (HP) L Leadhead	**1 Pointed** 2 Round 3 Wadcutter 4 Semi-Wadcutter 5 Cone-point bllt 6 Truncated Cone	F Flat **B Boat-Tail** H Hollow Base (open core) J Hollow Base (jacketed)	1 None **2 Copper** 3 Steel 4 Lead 5 Brass 6 Tomback	S Straight **C Cannelured** D Driving Bands T Sabot	1 Copper 2 Steel 3 depl. Uranium **4 Lead** 5 Brass 6 Tomback 7 Tungsten Carbide 8 Custom	**N None** G Gas-Check H Multicore C Custom	1 None 2 Solid **3 Interlock** 4 Standard Bonding 5 Custom