



# Defining & Classifying SALW:

Standardising the language of  
small arms and light weapons  
in the international context

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Doctor of Philosophy Based upon Published Work

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# Declaration

I declare that this thesis has been composed by myself and that the original work contained within this Critical Appraisal has not been submitted for any other degree or professional qualification at this or any other university.

I confirm that the work submitted is my own, except where I have included work which has formed part of jointly-authored publications. My contribution and those of the other authors to this work have been explicitly indicated below. I confirm that appropriate credit has been given within this thesis where reference has been made to the work of others.

*N.R. Jenzen-Jones*

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July 2023

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To summarise what amounts to nearly a decade of work in ten thousand words or fewer has offered a substantial challenge. Nonetheless, it is my sincere hope that the work presented herein—and in the three publications which underpin this Critical Appraisal—offers the first steps towards the development of a practical *lingua franca* for those of us engaged in contemporary arms studies and for those in the many and varied fields whose work involves defining or classifying small arms and light weapons. All errors remain my own.



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# Acronyms & Abbreviations

<b>AMI</b>	Arms and munitions investigation
<b>AOW</b>	Any other weapon [U.S. legal term]
<b>ARCS</b>	<i>ARES Arms &amp; Munitions Classification System</i>
<b>AP</b>	Associated Press
<b>ARES</b>	Armament Research Services
<b>ATF</b>	Bureau of Alcohol, Tobacco, Firearms and Explosives [also 'BATFE']
<b>ATT</b>	Arms Trade Treaty
<b>CIFTA</b>	<i>Convención Interamericana contra la fabricación y el tráfico ilícito de armas de fuego y municiones</i> ('Inter-American Convention Against the Illicit Manufacturing of and Trafficking in Firearms, Ammunition, Explosives, and Other Related Materials') [Spanish]
<b>CZ</b>	Česká Zbrojovka a.s. Uherský Brod
<b>DMR</b>	Designated marksman rifle
<b>ECCAS</b>	Economic Community of Central African States
<b>ECOWAS</b>	Economic Community of West African States
<b>FPC</b>	Firearms Policy Coalition
<b>GCA</b>	<i>Gun Control Act 1968</i>
<b>IGO</b>	Inter-governmental organisations
<b>ITI</b>	International Tracing Instrument
<b>MANPADS</b>	Man-portable air defence systems
<b>NATO</b>	North Atlantic Treaty Organization

<b>NFA</b>	<i>National Firearms Act 1934</i>
<b>NGO</b>	Non-governmental organisations
<b>NSSF</b>	National Shooting Sports Foundation
<b>OAS</b>	Organization of American States
<b>OSCE</b>	Organization for Security and Co-operation in Europe
<b>PDW</b>	Personal defence weapon
<b>PGE-SA</b>	Panel of Governmental Experts on Small Arms
<b>PKM</b>	<i>Pulemyot Kalashnikova Modernizirovanny</i> ('Kalashnikov's machine gun, modernised') [Russian]
<b>RAW</b>	Rifleman's Assault Weapon
<b>SADC</b>	Southern African Development Community
<b>SALW</b>	Small arms and light weapons
<b>SDV</b>	<i>Snayperskaya Vintovka Dragunova</i> ('Dragunov's sniper rifle') [Russian]
<b>SMAW</b>	Shoulder-Launched Multipurpose Assault Weapon
<b>SRAW</b>	Short-Range Assault Weapon
<b>UN</b>	United Nations
<b>UNGA</b>	United Nations General Assembly
<b>UNIDIR</b>	United Nations Institute for Disarmament Research
<b>UNODA</b>	United Nations Office for Disarmament Affairs
<b>UNROCA</b>	United Nations Register of Conventional Arms
<b>UNTOC</b>	United Nations Convention Against Transnational Organized Crime
<b>USMC</b>	United States Marine Corps

# Abstract

This Critical Appraisal explores the challenges and importance of defining small arms and light weapons (SALW) using precise and internationally applicable terminology. It draws on three of the author's earlier publications that collectively address the need for a robust framework to classify SALW based on their observable properties. By focusing on these inherent qualities, the author's research proposes a foundation for definitions which can transcend national and occupational boundaries. The Critical Appraisal highlights the deficiencies in existing definitions, which often lack nuance and fail to distinguish between key types of arms, relying instead on incomplete lists of examples or vague terminology. These limitations hinder effective international cooperation on SALW-related issues. The author's research emphasises the need to move away from extensional and role-based definitions towards intensional definitions based on the mechanical and physical characteristics of SALW. The Critical Appraisal highlights the significance of terminology for effective international collaboration and meaningful communication in the academic and lay contexts. It weaves together the evolving narrative of the three publications, starting with the co-edited handbook, *An Introductory Guide to the Identification of Small Arms, Light Weapons, and Associated Ammunition*, followed by the book chapter, 'Classifying Firearms', and culminating in the most recent publication, *The ARES Arms and Munitions Classification System (ARCS)*. The works underpinning this Critical Appraisal draw upon a variety of research techniques, including literature review, document analysis, technical analysis, legal review, mechanical assessments, and expert interviews. The Critical Appraisal underscores, in particular, the comprehensive and practical nature of ARCS, its adoption by esteemed organisations, and its relevance to fields such as political science, international relations, defence studies, and international law. Ongoing development of ARCS and other initiatives will continue to enhance technical communication surrounding SALW, promoting consistency and clarity in the classification of arms and munitions.



Nomina sunt consequentia rerum.

– Dante, *Vita Nuova*, XIII, 4.<sup>1</sup>

# I. Introduction

## Overview

At present, there is no universally accepted definition of a ‘small arm’, nor of a ‘light weapon’. Despite the centrality of these concepts to the international discourse on the trade and control of licit and illicit small arms and light weapons (SALW; i.e., firearms and other man-portable and crew-portable weapons), there remains significant inconsistency in how these terms and subsidiary terminology denoting different weapon types—such as ‘sub-machine gun’ or ‘rocket launcher’—are applied in various local, national, regional, and international contexts. Whilst the “precise and consistent use of terminology is essential to the accurate identification and analysis of arms and ammunition” (Jenzen-Jones & Schroeder, 2018b, p. 27), erroneous use is commonplace (Jenzen-Jones, 2022a, p. 8). Some errors are so frequent that they have become colloquially ‘correct’ by virtue of popular usage.<sup>2</sup>

Surprisingly, there has been relatively minimal effort on the part of inter-governmental organisations (IGOs) and non-governmental organisations (NGOs) to more precisely define these terms, or even to enumerate the specific weapon types which comprise the two broad classes of ‘small arms’ and ‘light weapons’. Rather, such organisations have either deferred to national definitions, or to the limited—typically extensional, of which more later—definitions contained in a handful of international instruments. Such definitions may draw on a range of inputs, including government publications, technical manuals, and national legislation—which often define small arms and light weapons differently (Jenzen-Jones & Schroeder, 2018b, p. 28).<sup>3</sup> The inconsistencies between these various definitions are largely a result of their development in distinct contexts and for a range of different purposes. Armed forces, for example, may focus on developing definitions which clearly communicate the military role a particular weapon is intended to fill. Manufacturers may use definitions which accord with their specific production practices, or which are flexible based on their perception of market trends.<sup>4</sup> States have developed definitions based on a wide range of inputs that vary regionally and between nations. In part to address this issue, some internationally-agreed definitions of SALW have been developed.

As we shall see, the most authoritative of these does not differentiate between key types of arms, instead simply providing an (incomplete) list of examples—couched in the terms “broadly speaking” and “inter alia”. It is the more specific ‘type’ definitions that are most frequently used in the day-to-day business of dealing with SALW issues, and an absence of clear and precise language is a detriment to international cooperation on such topics.<sup>5</sup> In addition to highlighting the issues inherent to

definitions that have been developed as a result of tensions between—and deference to—competing legal, political, and defence drivers, this Critical Appraisal also briefly assesses the development and implementation of a new set of definitions proposed by the author in Jenzen-Jones (2022). The findings presented herein have direct relevance to the domains of political science, international relations, defence studies, and international law.

Indeed, the precise and consistent use of terminology is foundational to developing, implementing, and enforcing effective international control measures (Jenzen-Jones & Schroeder, 2018b, pp. 27–28). The use of specific technical language also allows for precise, concise, and meaningful writing, which is as important in articles and reports intended for lay readers as it is in publications for academics and technical specialists. Whilst identification of SALW has long been the subject of specialist literature, “the definition and classification of these items has received only sporadic—and often limited or incomplete—attention” (Jenzen-Jones, 2022b, p. 10). The author has long worked to demonstrate the value in moving away from extensional and role-based definitions, towards intensional definitions in which SALW are clearly defined by their mechanical and physical characteristics. To do so, the author has employed a broad range of research techniques, including an extensive literature review, document analysis, technical analysis, legal review, mechanical assessments, and interviews with experts in a variety of disciplines. Basing the proposed definitions to the fullest extent possible on the mechanical characteristics of the weapons in question means that universal information can be recorded, allowing for an objective assessment of type regardless of how, why, or where a weapon is being used. This, in turns, allows for the much more precise classification of SALW—not least of all by providing a clear separating line between ‘small arms’ and ‘light weapons’. Grouping together SALW of similar mechanical and physical characteristics at different levels of specificity provides an invaluable tool which can be applied from the macro level (e.g., in reporting on the arms trade) to the micro (e.g., analysing individual weapons recovered from conflict zones).

## Published Works

This Critical Appraisal weaves together the research presented in three key published works by the author (see *Table 1.1* and *Figure 1.1*). The first, the handbook *An Introductory Guide to the Identification of Small Arms, Light Weapons, and Associated Ammunition* was co-edited<sup>6</sup> by this author and published by the Small Arms Survey in 2018 (Jenzen-Jones & Schroeder, 2018a). The *Introductory Guide* deals primarily with the topic of identifying SALW, but highlights the importance of classification and presents some early definitions of key categories. This foundation is built upon in the second publication, a book chapter titled ‘Classifying Firearms’, which appeared in *Firearms: Global Perspectives on Consequences, Crime and Control* (Jenzen-Jones, 2022a). Finally, the author’s research is presented—effectively fully formed—in the most recent publication of the trio: *The ARES Arms and Munitions Classification System (ARCS)* (Jenzen-Jones, 2022b). Most of the longer-term research that underpins the commentary

presented herein was conducted under the auspices of ARCS or its predecessor projects. The ARCS project was born out of a series of earlier projects conducted by ARES, both internally and on behalf clients, that sought to develop working definitions of certain small arms and/or light weapons for specific applications. For example, one previous output forms part of the Arms Trade Treaty legal commentary published in the highly regarded *Oxford Commentaries on International Law* series (Parker, 2016, §§2.229–2.230). Indeed, the *Introductory Guide* itself draws heavily upon the first ARCS work named as such (a prototype to ARCS version 1.1), presenting an early, pared-down version of the classification schema within its introductory chapter (Jenzen-Jones & Schroeder, 2018b, pp. 30–36) and incorporating simplified and/or prototypical versions of the definitions and glossary material now contained within ARCS in the majority of its subsequent chapters (Jenzen-Jones, 2018a; Jenzen-Jones & Ferguson, 2018a; 2018b; Jenzen-Jones, Ferguson & Williams, 2018). Likewise, ‘Classifying Firearms’ (written in 2021, but published in 2022) relied upon ARCS version 1.2, supplementing the ARCS classification schema with important historical and contextual information regarding key types of firearms.<sup>7</sup>

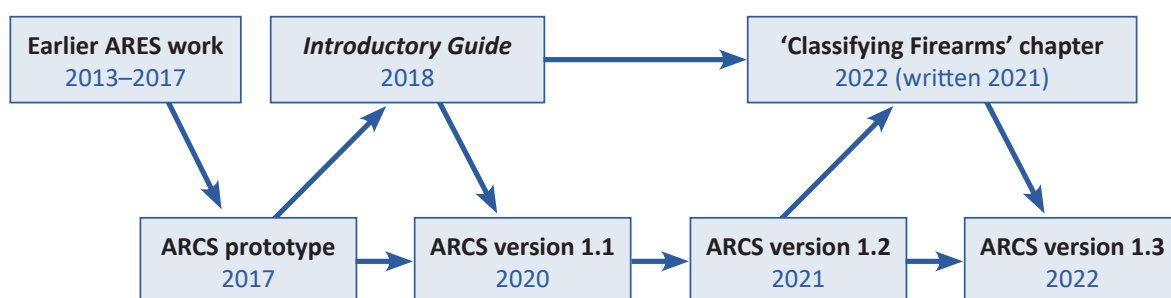
**Table 1.1 – Key Publications**

Publication Title	References	Description
An Introductory Guide to the Identification of Small Arms, Light Weapons, and Associated Ammunition	Jenzen-Jones & Schroeder, 2018a	Book
	Jenzen-Jones & Schroeder, 2018b	Book Chapter, Chapter 1: ‘Small Arms Identification: An Introduction’
	Jenzen-Jones & Ferguson, 2018a	Book Chapter, Chapter 3: ‘Weapons Identification: Small Arms’
	Jenzen-Jones, 2018a	Book Chapter, Chapter 4: ‘Weapons Identification: Small-calibre Ammunition’
	Jenzen-Jones, Ferguson & Williams, 2018	Book Chapter, Chapter 5: ‘Weapons Identification: Light Weapons and their Ammunition’
	Jenzen-Jones & Ferguson, 2018b	Book Chapter, Chapter 6: ‘Weapons Identification: Other Small Arms and Light Weapons’
‘Classifying Firearms’	Jenzen-Jones, 2018b	Book Chapter, Chapter 7: ‘Gathering Arms and Ammunition Data in the Field: Advice for Researchers’
	Jenzen-Jones, 2022a	Book Chapter, Chapter 2
The ARES Arms and Munitions Classification System (ARCS)	Jenzen-Jones, 2022b	Book
	Jenzen-Jones & Ferguson, 2022a	Book Section, ‘Classifying and Defining Small Arms & Light Weapons’
	Jenzen-Jones & Ferguson, 2022b	Book Section, ‘Small Arms Operating Systems’
	Jenzen-Jones & Ferguson, 2022c	Book Section, ‘SALW-adjacent Items not Classified by ARCS’
	Jenzen-Jones, Ferguson, Williams & Salvo, 2022	Book Section, ‘Defining Light Weapons’



**Figure 1.1** The covers to the three published works upon which this Critical Appraisal is based: Jenzen-Jones & Schroeder, 2018a; Jenzen-Jones, 2022a; Jenzen-Jones, 2022b (sources: Small Arms Survey; Routledge; ARES).

As the most refined version of the author’s ongoing research and development at the time of writing, ARCS version 1.3 (released in July 2022 as the first public version) is the primary publication upon which this Critical Appraisal is based. Version 1.3 of ARCS draws on the many iterations of the underlying work that preceded it,<sup>8</sup> including that of the *Introductory Guide* and ‘Classifying Firearms’. The relationships between the various iterations of ARCS and the other works underpinning this Critical Appraisal is depicted in *Figure 1.2*. The definitions contained within ARCS are based upon a historical and contemporary literature review, a multi-domain assessment of extant terminology, and consultation with dozens of subject-matter experts (Jenzen-Jones, 2022b, pp. 15–17). These include national and international lawyers and policymakers; senior staff in the military, law enforcement, intelligence, and manufacturing sectors; and academics, researchers, and other members of civil society.<sup>9</sup> Taken together, these definitions have been organised into logical classification schemata, providing users with the most robust method for categorising SALW thus far developed. ARCS definitions and classification schemata have been actively used in the preparation of research published by ARES and by various clients, and has been acknowledged or cited by a range of other governmental and non-governmental organisations.



**Figure 1.2** Relationship between the iterations of ARCS and the other publications underpinning this Critical Appraisal. Arrows indicate influence.

Whilst many international requirements related to arms and munitions are primarily concerned with the classification of SALW, this is enabled only by the existence of robust, workable definitions for these weapons. Such definitions can also be put to more technical use. Intensional definitions—based upon a weapon’s physical and mechanical characteristics, rather than nebulous conceptions of a weapon’s role—are a key enabler of arms identification, for example. Identification, in turn, enables other arms and munitions investigations (AMIs), such as tracking and tracing, to occur.<sup>10</sup> This Critical Appraisal therefore deals primarily with definitions, and secondarily with classification. Identification tasks are best enabled by referring to specific publications on the topic.<sup>11</sup> The data cut-off date for this Critical Appraisal is July 2022.

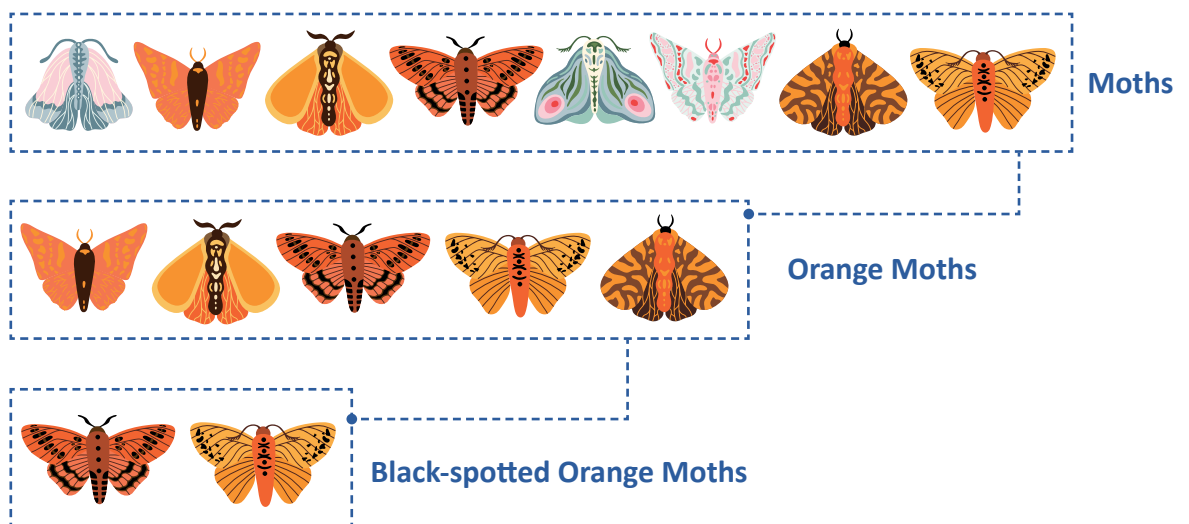
## II. Defining & Classifying SALW

### Overview

Definitions give meaning to terms. Generally, meaning can be understood as being either intensional (connotative) or extensional (denotative). The extension of a term consists of the objects to which the term may be correctly applied; the intension of a term instead refers to the set of attributes shared by all and only those objects to which the term correctly applies. All terms will possess both intensional and extensional meanings (Copi, Cohen & McMahon, 2014, pp. 95–103; Hempel, 1965, p. 138). For example, the extension of the term ‘firearm’ might refer to objects to which that label could be applied, such as revolvers, self-loading pistols, rifles, and shotguns.<sup>12</sup> The intension of the same term could be rendered as ‘a man-portable weapon which relies upon the combustion of propellant within a sealed chamber to generate gas used to propel a projectile in a controlled manner’.<sup>13</sup> Intensional definitions are developed in such a way as to convey a primarily connotative meaning. Definitions of physical objects which are developed on an intensional basis rely most often on the observable properties of the object in question to perform classification. This allows for a binary evaluation of the item—it either *is* or *is not* part of a given class. In the case of SALW, this provides much-needed clarity in distinguishing both between the broader classes of ‘small arms’ and ‘light weapons’, and between the lower classes that constitute the different common types of small arms and light weapons (the ‘Group’, ‘Type’, and ‘Sub-type’ levels within ARCS; Jenzen-Jones, 2022b, pp. 18–19).

Classifying objects and organisms in the world around us is “one of the most central and generic of all our conceptual exercises” (Bailey, 1994, p. 1). Classification is the process by which a set of objects are partitioned into classes or subclasses. The objects are grouped together according to one or more perceived similarities, and then divided according to one or more *fundamenta divisionis* (Lat., ‘the basis of division’) (Blackburn, 1996, p. 151). An important distinction is drawn between intensional and extensional classification. Marradi (1990) describes intensional classification as the “subdivision of the extension of a concept (*genus*) into several extensions corresponding to as many concepts of lower generality (*species*). The former and all the latter concepts have the same intension except for one aspect (*fundamentum divisionis*): on that account each species concept is a different partial articulation of the genus concept”. This is essentially the classical, Aristotelian pattern of definition (*per genus et differentiam*; Lat., ‘through genus and a difference’) that begins by citing the ‘genus’ to which a term belongs, and then locating the term within that genus by identifying the difference that gives the term its ‘species’ (Aristotle, ca. 350 BCE/1928, 103b(8); Blackburn, 1996, p. 282). Copi, Cohen, and McMahon (2014, p. 92) reiterate that, for most purposes, “intensional definitions are much superior to extensional definitions, and of all definitions that rely on intensions, those constructed by genus and difference are usually the most effective and most helpful”.

The process of intensional classification therefore relies upon the successive ‘unpacking’ of a concept, with each lower level providing more detail regarding the observable properties of an object and more clarity as to how it is properly located within the overall classification schema. For example, were we to classify moths (our *genus*) by colour (our *fundamentum divisionis*), the resultant class of ‘orange moths’ (our ‘species’) would be populated by all objects possessing all the properties of ‘mothness’, except those objects with any properties incompatible with ‘orangeness’. Continuing this process allows for the application of further *fundamenta divisionis* to differentiate with increasing detail. ‘Orange moths’ could be further derived to ‘black-spotted orange moths’, creating a class populated by all objects possessing all of the properties of ‘orange mothness’ (and, by extension, all of the properties of ‘mothness’ and ‘orangeness’), except those objects with any properties incompatible with ‘black-spottedness’. This process thus yields a hierarchical (acyclic) tree diagram in which each node (definition) along a directed path is more differentiated than any of its predecessors (see Figure 2.1).



**Figure 2.1** Three representative levels of classification for a nominal group of moths, each level more differentiated than any of its predecessors.

A variety of definitions already exist for SALW, both extensional and intensional. Definitions from a variety of sources can be found for the umbrella terms ‘small arms’ and ‘light weapons’, as well as for the specific types of weapons which make up these categories. As noted above, many such definitions are used by different stakeholders to different ends; as a result, definitions developed by a particular stakeholder may not be fit-for-purpose when used in other contexts. Definitions used at the international level often accord, at least in part, with those developed nationally, and particularly those developed by Western nations. These definitions—which are often derived from role-based military definitions, manufacturer definitions, or national legal definitions (Ferguson, 2019)—in turn influence definitions used by NGOs, IGOs, and even those contained within international and



multilateral instruments. These operationally derived definitions “are frequently imprecise and may cause confusion where they intersect with technical language” (Jenzen-Jones, 2022a, p. 8). As arms and munitions are often encountered divorced from their use context, definitions which rely upon the role of a weapon to communicate its features may be of limited use (Jenzen-Jones, 2021, p. 9).

Existing definitions of SALW can be loosely grouped into five broad categories, based on the party or parties which make use of them and/or their origin. These categories are:

1. Definitions contained within international and multinational instruments;
2. Definitions used by IGOs and NGOs;
3. Definitions used by end-users (e.g., military, law enforcement);
4. Definitions used by manufacturers; and
5. Definitions contained in national legislation.

Each of these will be addressed in turn, but, for the purposes of this Critical Appraisal, it is the first two categories, focusing on international applications, which are of most interest. A brief examination of the news media’s use of definitions of SALW is also presented below.

## **Definitions Intended Primarily for International Applications**

### **Definitions in international instruments**

As is often reiterated in public-facing documents—such as the *OSCE Document on Small Arms and Light Weapons*, published by the Organization for Security and Co-operation in Europe (OSCE)—there is not yet an internationally agreed-upon definition of SALW (OSCE, 2000, p. 1). Indeed, the international community did not pay much attention to the impacts of SALW on a global level until the mid-1990s. In 1992, United Nations (UN) Secretary-General Boutros Boutros-Ghali’s presented his *Agenda for Peace*—with no mention of small arms or light weapons (Boutros-Ghali, 1992). Some three years later, though, he used these terms in a *Supplement to an Agenda for Peace* (UNGA, 1995). This appears to be the first time that a UN Secretary-General placed the issue on the global stage, although no definitions were provided (Jenzen-Jones & Sasson, 2019). One of the earliest UN attempts at classifying SALW is summarised in the 1997 UN Report of the Panel of Governmental Experts on Small Arms (PGE-SA), which defines SALW as ranging from clubs, knives and machetes to “those weapons just below those covered by the United Nations Register of Conventional Arms” (e.g., mortars of a calibre less than 100 mm<sup>14</sup>) (UNGA, 1997, § III(24); UNODA, 1991). The United Nations Register of Conventional

Arms (UNROCA), established in 1991, aims to provide “[t]ransparency in the global reported arms trade” (UNROCA, n.d.). Whilst UNROCA pre-dated the PGE-SA report, SALW was not addressed by that mechanism until 2003, when the calibre threshold for mortars which states are to report was reduced to 75 mm, and man-portable air defence systems (MANPADS) were added to the reporting mandate (Herron, Marsh & Schroeder, 2011, p. 13). Voluntary reporting of other SALW (and, accordingly, a loose extensional definition seemingly inspired by the PGE-SA report) was introduced to that regime the same year.<sup>15</sup> The PGE-SA report roughly divided the ‘small arms’ from the ‘light weapons’, making the primary distinction of portability (UNGA, 1997, § III(24)).<sup>16</sup> It proved to be an important report, directly raising the international community’s awareness of issues related to the control of SALW and influencing definitions which would follow (Berman & Leff, 2008, pp. 8–9).

Within the framework of the UN small arms process, the International Tracing Instrument (ITI)<sup>17</sup> provides the authoritative definition of SALW (Jenzen-Jones & Schroeder, 2018b, p. 28.), and exhibits a direct lineage back to the PGE-SA report. The ITI draws largely from the 1997 report for its list of examples, but adds a definition in the chapeau which is close to that found in the legally-binding UN Firearms Protocol<sup>18</sup> of 2001 (UNGA, 2001, Art. 3(a)). The ITI definition reads:

*“For the purposes of this instrument, “small arms and light weapons” will mean any man-portable lethal weapon that expels or launches, is designed to expel or launch, or may be readily converted to expel or launch a shot, bullet or projectile by the action of an explosive, excluding antique small arms and light weapons or their replicas. Antique small arms and light weapons and their replicas will be defined in accordance with domestic law. In no case will antique small arms and light weapons include those manufactured after 1899:*

*(a) “Small arms” are, broadly speaking, weapons designed for individual use. They include, inter alia, revolvers and self-loading pistols, rifles and carbines, sub-machine guns, assault rifles and light machine guns;*

*(b) “Light weapons” are, broadly speaking, weapons designed for use by two or three persons serving as a crew, although some may be carried and used by a single person. They include, inter alia, heavy machine guns, hand-held under-barrel and mounted grenade launchers, portable anti-aircraft guns, portable anti-tank guns, recoilless rifles, portable launchers of anti-tank missile and rocket systems, portable launchers of anti-aircraft missile systems, and mortars of a calibre of less than 100 millimetres.” (UNGA, 2005, para. 4).*

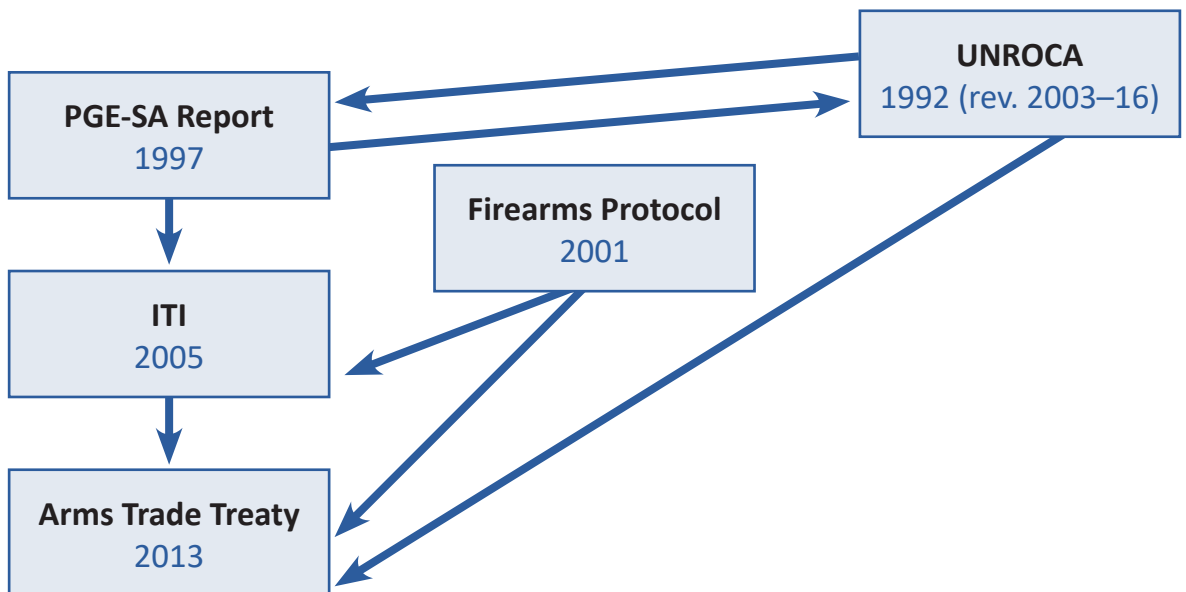
The main point of difference between the ITI and the Firearms Protocol is that the ITI adds “*or launches*” to the definition used in the latter instrument, presumably to allow for technical differences between small arms (firearms) and some light weapons (the latter not covered by the Firearms Protocol).<sup>19</sup> Perhaps the most useful part of the ITI definition, beyond the chapeau, is in the distinction of portability made *between* the categories of ‘small arms’ and ‘light weapons’—although even this is expressed in relatively vague terms.<sup>20</sup> The ITI broadly defines small arms as weapons designed for



individual use, and light weapons as weapons designed for use by two or three persons serving as a crew, although it notes that some may be carried and used by an individual.<sup>21</sup> Furthermore, whilst the chapeau of the ITI text defines SALW in broad terms that will capture most modern small arms and light weapons, there remain notable omissions of extant (e.g., flamethrowers<sup>22</sup>) and emergent or horizon (e.g., directed energy weapons,<sup>23</sup> mass drivers<sup>24</sup>) technologies.

The ITI goes on to include, *inter alia*, some examples of each category, though it does not further define them (UNGA, 2005, Art. II(4)). The omission of definitions for important types of widely distributed SALW leaves the international discourse without a clear set of type-specific definitions to draw on. Unfortunately, even some of the examples of types given in the ITI are problematic from a definitional standpoint (such as “assault rifle”, which is difficult to clearly define<sup>25</sup>), whilst others make little sense in plain English, much less technical language (e.g., “portable launchers of anti-tank missile and rocket systems”).<sup>26</sup> The ITI represents a political commitment by States and, as such, is not legally binding. Whilst it provides the most comprehensive definition of SALW at an international level, it is still lacking in many respects.

Other international instruments introduced in more recent years have typically relied upon pre-existing UN definitions. The Arms Trade Treaty (ATT), for example, makes *de facto* use of the ITI definitions.<sup>27</sup> In fact, UN instruments other than the ITI are sparse in their description of SALW, and most were clearly informed by the PGE-SA or ITI. *Figure 2.2*, below, illustrates the apparent relationships between selected UN instruments containing definitions of SALW. The PGE-SA remains the process which has exerted the most influence on later instruments; the ITI is at present the most authoritative.



**Figure 2.2** Apparent relationship of selected UN instruments containing definitions of SALW. Arrows indicate apparent influence.

### Definitions in multinational instruments

As the ITI was informed by the definitions in the PGE-SA report and the Firearms Protocol, so too have its broad definitions ‘filtered down’ to multinational instruments outside of the UN. Variations of the ITI definition and/or its list of examples are used in several regional instruments, all of which are legally binding on their various States Parties. The most recent of these is the 2012 revision of the OSCE *Document on Small Arms and Light Weapons*—regionally applicable to member states in Europe—which retains the OSCE’s definition of SALW adopted in 2000, itself an almost-verbatim copy of the definition included in the ITI (OSCE, 2000, p. 1; 2012, p. 1). The 2010 Kinshasa Convention (Central Africa)<sup>28</sup> also replicates the ITI definitions; SALW are: “any man-portable lethal weapon that expels or launches, is designed to expel or launch, or may be readily converted to expel or launch a shot, bullet or projectile by the action of an explosive, excluding antique small arms and light weapons or their replicas.” (ECCAS, 2010, Art. 2(a)).

The 2006 Economic Community of West African States (ECOWAS) Convention on SALW<sup>29</sup> (West Africa) largely draws on the ITI definition but makes the distinction between small arms, that are “[a]rms used by one person”, and light weapons, “designed to be used by several persons”. The ECOWAS Convention explicitly includes explosive weapons, such as rocket launchers, grenades, and landmines, in the category of small arms. It also states that the term ‘small arms’ includes firearms, but does not define the term ‘firearm’ (ECOWAS, 2006). The 2004 Nairobi Protocol<sup>30</sup> (East Africa) draws on the language of the 2001 Southern African Development Community (SADC) Protocol<sup>31</sup> (Southern Africa) in many places, which is similar to the ITI definition of SALW, but includes specific reference to “fully automatic rifles”<sup>32</sup> under the category of small arms, as well as incorporating the Firearms Protocol definition of a firearm. Despite their general similarities, there is confusion between these instruments as to whether ‘small arms’ or ‘firearms’ should be the top-level term. Whilst the SADC Protocol includes both small arms and light weapons within its definition of a ‘firearm’, for example, the Nairobi Protocol includes firearms within the category of small arms (SADC, 2001, pp. 3–4; RECSA/UNODA, 2004, p. 3). This is a substantially different interpretation of the terminology, and it is easy to see how regional tensions could be exacerbated by differing classification of SALW. Under the SADC protocol, for example, it could be reasonably argued that an anti-tank rocket launcher is a ‘firearm’—this is, of course, nonsensical, as two distinct operating principles are at play.<sup>33</sup>

Not all regional instruments define SALW explicitly. The 1997 CIFTA<sup>34</sup> (Americas), for example, predates the PGE-SA report, the Firearms Protocol, and the ITI, and does not include a definition for SALW (or even the phrases ‘small arms’ or ‘light weapons’). It does, however, provide a broad definition of a firearm as any barrelled weapon designed to expel a bullet or projectile, as well as “any other weapon or destructive device such as any explosive, incendiary or gas bomb, grenade, rocket, rocket

launcher, missile, missile system, or mine” (OAS, 1997).<sup>35</sup> In this case, a weapon such as a shoulder-fired rocket launcher would be considered a ‘firearm’ (contrary to usual specialist usage of the latter term), although the definition clearly applies more broadly to what we would consider SALW—and that would have been a more appropriate top-level term. Broadly speaking, regional instruments defer to the language found in the PGE-SA report or (more often) the ITI, and thus share issues with specificity, coverage, and imprecise terminology.

### **Definitions used by IGOs and NGOs**

Of the broader sets of definitions used at the international level, the largest variation in how SALW are defined is amongst the many NGOs and IGOs that interact with international small arms processes in one way or another. For practical purposes, these groups will nonetheless be addressed together, as research has shown that they have similar interactions with international and multinational programmes related to SALW (Hughes, 2018). As noted, most UN definitions stem from the 1997 UN Panel of Governmental Experts’ report (Jenzen-Jones & Sasson, 2019). The 1997 PGE-SA report also forms the basis for international instruments, such as the ITI, which in turn influences other instruments such as the ATT (Jenzen-Jones & Sasson, 2019). These largely extensional definitions are used by many UN agencies and, accordingly, by most of the NGOs and private companies that service such agencies. Despite the substantial variation amongst NGOs, think tanks, and private consultancies more broadly, many of the key organisations within the SALW field (e.g., the Geneva International Centre for Humanitarian Demining and the Small Arms Survey) use definitions which are broadly similar to those found in international instruments.

Some international organisations employ definitions for SALW that broadly follow the examples set by international processes, programmes, and instruments, but differ in minor ways. These are some of the most interesting points of difference to examine. For example, the UN and OSCE only include mortars of ‘less than 100 mm’ in their definitions (UNGA, 1997; OSCE, 2000). This excludes many common mortars in 100 mm and 120 mm calibre, often employed in much the same manner as their smaller calibre counterparts (in, for example 81 mm or 82 mm). The Small Arms Survey, by contrast, has specifically noted their inclusion of 120 mm mortars “as long as they can be transported and operated as intended by a light vehicle” (Small Arms Survey, n.d.).<sup>36</sup> Whilst there is substantial variation within the wider IGO and NGO community, the most influential organisations have tended to use definitions derived, whether directly or indirectly, from the 1997 PGE-SA report or the ITI. There are indications this is beginning to change, however.<sup>37</sup>

## Definitions Intended Primarily for Other Applications

Oftentimes, “erroneous, nebulous, or otherwise competing terminology can arise from non-technical contexts surrounding firearms” (Jenzen-Jones, 2022a, p. 8). Whilst the definitions used in international and regional normative and legal instruments are most relevant for our assessment of the ways in which SALW are defined in the international context, followed by those used by IGOs and NGOs, other definitions also merit a brief examination. Such definitions—whether generated by manufacturers, end-users (e.g., armed forces), national legislators, or other sources—have historically influenced the development of definitions at the international level. As we shall see, the “needs of legal, military, and marketing entities have historically resulted in terminology that has diverged from that used by arms specialists” (Jenzen-Jones, 2022a, p. 8). Whilst the news media does not typically originate definitions, they play an important role in promulgating their use and informing public understanding, and thus are also considered.

### End-users

End-users often have the most detailed or descriptive definitions of SALW, frequently driven by factors related to the practical employment of a weapon, such as crew size and calibre. For example, the British Ministry of Defence considers small arms to be ‘individual weapons’, whilst those that would be considered light weapons under ARCS—including heavy machine guns, automatic light grenade launchers, medium mortars, and light guided missile launchers—are referred to as ‘support weapons’ (British Army, n.d.).<sup>38</sup> The term ‘support weapon’ is often used by end-users nearly interchangeably with what may otherwise be considered light weapons, although there are areas of variation and overlap (Ferguson, 2019). In 1972, the North Atlantic Treaty Organization (NATO) introduced the terms “Individual Weapon”, “Light Support Weapon”, and “Medium Support Weapon” to encapsulate those arms most often carried by infantry at the squad (section), platoon, and company levels. By 1988, the British Army was using NATO terminology within its acquisition programmes, but in technical documents classified “Small Arms” as a subset of “Light Weapons” (along with “Area Target Weapons” and “Unguided Anti Armour Weapons”) (RMCS, 1988, p. 1.3; Ferguson, 2020, ch. 8 & 9). Nonetheless, the introduction to the Royal Military College of Science’s *Handbook of Light Weapons* makes clear that the issues surrounding imprecision in language have long been understood by specialists:

*“Despite everyday use and discussion of infantry weapons, there are still no fully agreed terms for members of the weapons family. What one manufacturer, or country, calls an automatic rifle, another may describe as a carbine or sub-machine gun” (RMCS, 1988, p. 1.1).<sup>39</sup>*

Because so many definitions for so many SALW originate with end-users—historically, and predominantly, the military—they are frequently defined in terms of their intended military role (e.g., the term “infantry weapons”, implying the specific use by not only a nation-state armed force, but by

a particular military formation—the infantry).<sup>40</sup> Of course, in some contexts, this may be useful. Within the military context, for example, it remains important to succinctly communicate the specific purpose of a given weapon for the organisation. The terms ‘individual weapon’ and ‘support weapon’ therefore communicate critical information about the military roles of weapons falling into these categories. Nonetheless, in the context of international controls targeting arms diversion and proliferation, for example, weapons are often divorced of any such role—by virtue of where and when they are encountered, as well as how they are employed by non-state users. A ‘general-purpose machine gun’, for example, might be considered a ‘support weapon’ in a Western military formation, perhaps issued on the basis of one per section. In a conflict zone, a similarly sized element of an unconventional force may employ five or six such weapons.<sup>41</sup>

Of course, all weapons are designed with one or more practical roles in mind, and a great deal of role-based terminology is in common usage and cannot be ignored. These terms often have somewhat vague boundaries, however, and it is often the case that a given weapon could be placed in different categories depending on the application of a term by various users. Indeed, whilst some role-based definitions retain a relatively clear meaning today, others are much more nebulous and confusing. The term ‘designated marksman rifle’ (DMR), for example, is today generally understood as one might expect: a rifle issued to designated marksmen. In its military usage, the term DMR is generally restricted to those rifles issued to armed forces at the section or squad level, or those with close physical and mechanical features (Ferguson, 2019).<sup>42</sup> The term is in relatively limited, primarily specialist, use. By contrast, the term ‘assault weapon’ is encountered with regularity. It is common in media reporting, for example, in which context it is frequently misused. Often used synonymously with the term ‘assault rifle’, ‘assault weapon’ is regularly employed in a fashion where neither term would be appropriate—to apply to civilian-held, semi-automatic-only rifles. Both ‘assault rifle’ and ‘assault weapon’ originate in the military context. The assault rifle concept was developed in Second World War-era Germany, where the term *Sturmgewehr* came to refer to a series of automatic rifles firing cartridges of reduced overall length—so-called ‘intermediate-calibre cartridges’.<sup>43</sup> Whilst the modern usage of the term ‘assault rifle’ has been varied, and various characteristics are considered diagnostic in different sources, all authoritative definitions agree that the weapon must be automatic, rather than restricted to semi-automatic fire (Ferguson, 2019). The term is frequently used, incorrectly, to describe semi-automatic-only rifles (see, for example, AP, 2017). In a similar fashion, the meaning of the term ‘carbine’ has evolved over time, and today is an “elastic one that may describe everything from a semi-automatic variant of what would otherwise be considered a sub-machine gun, to a rifle chambered for a full-power cartridge but featuring a relatively short barrel” (Jenzen-Jones & Ferguson, 2022a, p. 60). Historically, the term was applied specifically to specific military rifles of reduced size and weight—and often smaller calibre—issued to cavalry, artillery, and other units which did not require a ‘full-size’ rifle. Over time, barrel lengths of infantry arms have

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generally decreased, and the baseline for what is today considered ‘short’ has changed significantly (Ferguson et al., 2015).<sup>44</sup> Some manufacturers and armed forces continue to make regular use of the term ‘carbine’ as a counterpart to ‘rifle’, in distinguishing between shorter- and longer weapons of the same model or family. The U.S. military, for example, makes a distinction of this type between the M16 ‘Rifle’ (with a 39 5/8 inches, or 1,006 mm, overall length for the M16A4) and M4 ‘Carbine’ (29.75–33 inches, or 756–838 mm, for the M4A1)<sup>45</sup> models (U.S. Army, 1991; 2010; USMC, 2008a). The primary difference between these two weapons is their barrel length. Despite the continued use of the term in these contexts, ‘carbine’ is “too imprecise to meaningfully define any particular group of small arms in modern usage and often causes confusion” (Jenzen-Jones & Ferguson, 2018a, p. 74).<sup>46</sup>

The application of the term ‘assault weapon’ is even more problematic than that of ‘assault rifle’ or ‘carbine’. Except for its limited legal use in recent decades, the term is essentially meaningless as applied to small arms. In Canada, for example, the term ‘assault-style weapon’ has been widely used by politicians to refer to a variety of different firearms that have been prohibited or restricted by specific make and model, but does not describe any meaningful set of physical or mechanical characteristics. In fact, at the time of writing, the term ‘assault-style weapon’ is not defined in Canadian law at all (Tasker, 2020).<sup>47</sup> Much like the U.S. application of the term as introduced in the 1994 *Assault Weapons Ban*,<sup>48</sup> the contemporary Canadian political usage seems to be largely focused on the cosmetic, often referring to features that are present on both semi-automatic and automatic weapons, rather than key mechanical characteristics. This muddies the waters of intent, and creates a disconnect between policymakers’ public statements and the internal logic of the rulesets that are developed to enact political decisions. The misapplication of the term ‘assault weapon’—especially as a synonym for ‘assault rifle’—has been widely proliferated by politicians, the popular media, and the general public (Jenzen-Jones, 2021, p. 22). In military usage, where it originated, the term ‘assault weapon’ has most often been applied to an entirely different class of arms—light weapons, specifically those used to attack armoured vehicles or structures at short-to-medium range using high explosive payloads. The M47 Dragon light guided missile launcher is designed to attack enemy armour and has been referred to by the U.S. Army as an “assault weapon system” (U.S. Army, 1982), whilst the Brunswick Rifleman’s Assault Weapon (RAW) is an under-barrel, rocket-propelled explosive munition (Carpenter, 1978). The U.S. Marine Corps’ Shoulder-Launched Multipurpose Assault Weapon (SMAW) and its ill-fated successor, the Short-Range Assault Weapon (SRAW; see *Figure 2.3*), are also light weapons firing explosive munitions (USMC, 2005; USMC, 2008b). A 2005 press release from SRAW manufacturer Lockheed Martin describes the SRAW as a “direct-fire urban assault weapon”. In stark contrast to any firearm, the SRAW was able to “[breach] a triple-brick target, leaving a gap wide enough for troop entry” (Lockheed Martin, 2005). So, whilst the term ‘assault weapon’ has limited applicability in military contexts, is likely to be unhelpful in reference to small arms.





**Figure 2.3** A U.S. Marine armed with a Short-Range Assault Weapon (SRAW) light guided missile launcher. Note the numerous physical differences from semi-automatic rifles, a category of small arm sometimes also referred to as ‘assault weapons’ (source: USMC).

End-user definitions are, in most cases, fundamentally restricted by the operational (i.e., role-based) requirements of their originators. Definitions arising from the military or quasi-military context are typically—and necessarily—preoccupied with communicating important information about how a particular weapon is employed within the structure of the originating armed force. What’s more, many members of the armed forces simply do not have (or need) a deep technical understanding of SALW. Australian Army Major Greg Sheppard, a former senior range instructor and analyst at Army Lessons, remarked: “People have the impression that when soldiers talk about weapons, they know what they’re talking about ... even our best soldiers, our special forces, are very good at doing what we teach them to do—to shoot them—but very few of them know anything at all about guns” (Masters, 2019, p. 66). Definitions developed by law enforcement can often be divided into those developed for operational purposes (i.e., for digestion by end users of weapons), which poses similar issues to most military-origin definitions, or those used by specialised investigators and forensic personnel, which are most often derived from the legislation promulgating the laws such personnel are tasked to enforce. Nonetheless, the body of specialist expertise found in some parts of military and law enforcement organisations means that certain material originating with specialised end-users (e.g., definitions developed by explosive ordnance disposal units) may provide a useful source of technical information.

## Manufacturers

Manufacturers' definitions are often very broad, encompassing a range of arms based on what a given manufacturer produces. Many manufacturers do not differentiate between small arms and light weapons, for example, or consolidate all light weapons into a single 'other' category. Manufacturers may also make unusual distinctions between different types of small arms or light weapons. For example, Zastava Arms (Serbia) lists several small arms which would most often be considered rifles (e.g., the M05 C1, chambered for the 7.62 × 39 mm cartridge) as "submachine guns" (Zastava Arms, n.d.). Similarly, Fleming Firearms advertised a firearm that many specialists would consider to be an automatic rifle as a "machine pistol" in a print advertisement from the 1980s (see *Figure 2.4*). Manufacturers frequently employ role-based terminology, but this is often aspirational, driven by marketing and sales imperatives. Kalashnikov Concern (Russia) makes a distinction between their "bolt action rifles", such as the SV-98 and SV-99, and "sniper rifles" (Kalashnikov Concern, n.d.). The latter category includes only semi-automatic SVD-family weapons, despite the fact that the SV-98 and SV-99 are both generally understood to be more precise and would likely make better 'sniper rifles' in the current sense of that term.<sup>49</sup>



**Figure 2.4** *The Fleming Firearms 51K—an automatic rifle chambered for the full-power .308 Winchester rifle cartridge—is described in this company advertisement as a “machine pistol” (source: Fleming Firearms).*



Manufacturers, of course, need to be responsive to market trends—whilst aiming to set new ones. This results in manufacturers reflecting new, popular terminology to refer to certain categories of weapons. Česká Zbrojovka a.s. Uherský Brod (CZ) of the Czech Republic, for example, is one of many manufacturers to adopt the term “pistol caliber carbine” to refer to self-loading rifles chambered for handgun cartridges (CZ, n.d.). How such terminology is applied may vary according to market. In marketing toward civilians, Colt’s Manufacturing Company uses the term ‘modern sporting rifle’ to refer to some of their self-loading rifles patterned after the popular AR-15. When weapons of substantially the same design are offered to the law enforcement or military buyer, however, they are only referred to as ‘carbines’ or ‘rifles’ (Colt, n.d.(a); n.d.(b); n.d.(c)). The term ‘modern sporting rifle’ was widely promoted from 2009 onwards by the National Shooting Sports Foundation, in part to “make AR rifles acceptable firearms in the field, the woods and on the range” (NSSF, n.d.; *Outdoor Wire*, 2009; Peters, 2016). Manufacturers are also influenced by national legal considerations (see below). For example, several manufacturers catering to the American firearms market advertise weapons which would ordinarily be considered rifles as ‘pistols’, exploiting an unusual feature of the interpretation of U.S. law which has allowed for such firearms to avoid classification as federally regulated ‘short barrel rifles’ by the use of so-called ‘pistol braces’ or ‘stabilising braces’.<sup>50</sup> Because manufacturers’ terminology is often necessarily broad, and because it may change in line with market trends or other non-technical influences, it generally does not offer a suitable basis for a robust, comprehensive system for classifying SALW. However, technical resources produced by some manufacturers may still prove helpful.<sup>51</sup>

### National legislation

In national legislation, states most often define ‘firearm’ as a top-level term, rather than ‘small arms’ or ‘light weapons’ (Hughes, 2018). There are three features of modern firearms that often form the basis for how they are defined in national legislation: muzzle energy, operating system, and cosmetic features. A muzzle energy distinction is almost universal in Commonwealth states, and is common in Europe. The minimum muzzle energy for most states is well below that expected from any modern lethal-purpose small arms cartridge. The lowest muzzle energy limit noted amongst sample states was in Germany, at just 7.5 J, whereas the UK sets a practical muzzle energy (‘specially dangerous’) limit of 12 ft-lb (16.3 J) (*Waffengesetz 2002*, §2(1.1); Home Office, 2022; Hughes, 2018). In states with a muzzle energy restriction, non-lethal weapons and recreational items such as paintball markers, ‘gel blasters’, and even BB (‘airsoft’) guns<sup>52</sup> may be considered firearms or regulated in a like manner (Hughes, 2018; *Firearms Act 1973*).<sup>53</sup> There are many other areas for discrepancy in national legislation, too. With regard to antique firearms, many states follow the UN provisions outlined in the Programme of Action, considering firearms manufactured before 1899 to be antiques, and therefore not legally ‘firearms’.<sup>54</sup> Some states also classify components of firearms—especially pressure-bearing or other ‘critical’ components—as firearms.<sup>55</sup>

Whilst an assessment of the technical characteristics of a weapon—such as muzzle energy—form the basis for defining if an object is classified as a firearm in many states, there are other nations with laws that are more subjective, with many offering examples of flawed or imprecise laws which have been little changed since their introduction, or where vagaries in the law require more interpretation than might otherwise be expected. U.S. firearms law, in particular, has a lot to answer for when it comes to the promulgation of technically imprecise SALW terminology.<sup>56</sup> In addition to the issues with ‘assault weapons’ raised by the 1994 *Federal Assault Weapons Ban*, and the so-called ‘pistols’ that are anything but (described above),<sup>57</sup> certain firearms that almost all specialists would agree are, in fact, shotguns are legally classified as simply ‘firearms’ under the *Gun Control Act 1968* (GCA),<sup>58</sup> in another quirk of U.S. gun laws. Such weapons are described as “pistol grip firearms” in Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) guidance (ATF, 2013).<sup>59</sup> Mossberg, a major manufacturer of shotguns based in the United States, “offers two different types of firearms which are built on shotgun receivers and that fire shotgun shells that aren’t technically shotguns” (Cleckner, n.d.). U.S. federal law defines a shotgun as “[a] weapon designed or redesigned, made or remade, and intended to be fired from the shoulder and designed or redesigned and made or remade to use the energy of the explosive in a fixed shotgun shell to fire through a smooth bore either a number of projectiles (ball shot) or a single projectile for each pull of the trigger, and shall include any such weapon which may be readily restored to fire a fixed shotgun shell” (27 CFR § 479.11). The Mossberg 590 Shockwave (*Figure 2.5*, third down) would not meet this definition, despite being in all respects identical to the Mossberg 590 (*Figure 2.5*, top) from which it was derived, save for the lack of a buttstock and modified barrel length and grip. It would instead be classified as a ‘pistol grip firearm’ by the ATF, with one ATF publication referring to such weapons as “firearms with pistol grips that utilize a shotgun shell for ammunition” (ATF, 2013, p. 4). This is remarkably vague language, and would also include both handguns chambered for shotgun cartridges (e.g., the Harrington & Richardson Handy-Gun, typically classed by the ATF under the ‘any other weapon’ category) and conventional shotguns fitted with a pistol grip and shoulder stock (e.g., the Benelli M4), as well as those weapons that are grasped with two hands but not fired from the shoulder (e.g., the Mossberg 590 Shockwave) (ATF, 2009, pp. 7–8; 2013, p. 4). Modification of a ‘pistol grip firearm’ is fraught with legal jeopardy in the United States. If one purchased a Mossberg 590 Shockwave and removed the pistol grip, replacing it with a conventional stock (making the weapon less concealable), it would suddenly be considered a ‘short barrel shotgun’ subject to the provisions contained in the *National Firearms Act 1934* (NFA),<sup>60</sup> and the modifier may have committed a federal felony (Mossberg, 2017).<sup>61</sup> The NFA specifically seeks, in part, to regulate firearms “capable of being concealed on the person” (ATF, 2009, p. 7), making the legal distinctions applicable to the firearms depicted in *Figure 2.5* even less obvious to the layperson. In fact, all four of the firearms shown in *Figure 2.5* and described in *Table 2.1* would be classified differently under U.S. law, despite being mechanically near-identical and physically similar. Conversely, all four firearms would be classified as ‘shotguns’ under ARCS (Jenzen-Jones & Ferguson, 2022aa, pp. 51–57).



**Figure 2.5** Four models of American Mossberg 590-series shotguns, all pump-action designs with near-identical mechanical operation. The receiver of all four firearms is essentially the same component. Top to bottom: Mossberg 590 (7-shot capacity); Mossberg 590A1 Class III (6-shot); Mossberg 590 Shockwave (6-shot); Mossberg 590A1 Compact Cruiser (4-shot). The top firearm is considered a ‘shotgun’ under federal law, and is not subject to NFA restrictions. The second firearm is considered a ‘short barrel shotgun’ by the ATF, and is subject to NFA restrictions. The third firearm is considered a ‘pistol grip firearm’ by the ATF, and is not subject to NFA restrictions. The bottom firearm is considered an ‘any other weapon’ under federal law, and is subject to NFA restrictions. All four firearms pictured here are classified as ‘shotguns’ under ARCS (source: Mossberg).

**Table 2.1 – Comparative Classification of Selected Mossberg 590-series Shotgun Models**

Make & model	Mossberg SKU	Overall length	Barrel length	Capacity <sup>62</sup>	U.S. Federal classification	Subject to NFA restrictions?	ARCS classification (Sub-type)
Mossberg 590	50778	38.625 in. (981 mm)	18.5 in. (470 mm)	7	Shotgun	No	Manually operated shotgun
Mossberg 590A1 Class III	51689	33.75 in. (857 mm)	14 in. (356 mm)	6	Short barrel shotgun	Yes	Manually operated shotgun
Mossberg 590 Shockwave	50659	26.37 in (670 mm)	14.375 in (365 mm)	6	Pistol grip firearm	No	Manually operated shotgun
Mossberg 590A1 Compact Cruiser	51664	19.5 in. (495 mm)	10.25 in. (260 mm)	4	Any other weapon	Yes	Manually operated shotgun

Sources: Mossberg, 2016; 2017; Cleckner, n.d.; <www.mossberg.com>.

Despite the apparent concern about concealable firearms,<sup>63</sup> the NFA specifically excludes pistols and revolvers, but, perhaps even more confusingly, the ATF has suggested that fitting a handgun with a forward grip means it will be considered an ‘any other weapon’ regulated under the NFA because such a weapon “is not designed to be fired when held in one hand” (ATF, 2009, p. 9).<sup>64</sup> Of course, in modern usage, handguns are very rarely fired whilst grasped with only a single hand, much less “designed to be” (Jenzen-Jones, 2022b, p. 24; Jenzen-Jones & Ferguson, 2022aa, pp. 36–37). Not only can the addition of accessories with limited real-world impact change the classification of a firearm under U.S. law, accessories themselves can be classified as firearms. In defining what constitutes a “machine gun”<sup>65</sup> under the NFA (the definition of which was expanded by the GCA), the legislation includes not only complete weapons but also “the frame or receiver of any such weapon, any part designed and intended solely and exclusively, or combination of parts designed and intended, for use in converting a weapon into a machine gun, and any combination of parts from which a machine gun can be assembled if such parts are in the possession or under the control of a person” (27 CFR § 479.11). The ATF has previously determined that even small, non-essential components (such as an ‘auto sear’ or similar drop-in components which can convert a semi-automatic firearm to be capable of automatic fire) are, themselves, classified as ‘machine guns’ under U.S. law (ATF, 2009, pp. 11–12). Since 26 March 2019, so-called ‘bump stocks’ and similar devices which harness the recoil of a semi-automatic firearm to produce a faster rate of fire are also considered to themselves be ‘machine guns’ under federal law (ATF, 2018; 2019).<sup>66</sup>

It is clear that U.S. federal firearms laws—like those of many nations—are, broadly, not in agreement with technical specialists’ understanding of SALW types, and do not offer a good foundation for the adoption or development of definitions for use in the international context. Like many laws that are developed for a specific domestic purpose, U.S. firearms law is, in many cases, unnecessarily complex, and has been subject to patchwork amendment over time which has complicated matters further. In particular, ATF interpretation of existing U.S. laws<sup>67</sup> has been subject to frequent change, and remains byzantine to the point that a layperson may not readily understand whether or not making a seemingly simple modification to their firearm could constitute a serious breach of federal law.<sup>68</sup> Government agencies, like other ‘end users’ of definitions, may also broaden interpretations beyond their strict legal meaning, as practicality and their specific tasks dictate (for a dramatic example, see *Figure 2.6*).



**Figure 2.6** A portion of a digital display present at a Transportation Security Administration (TSA) checkpoint in Terminal 4 of the John F. Kennedy International Airport, New York City, in August 2022. The display presented a selection of prohibited or restricted items and reads, in part, “**No firearms including Nerf guns**” [emphasis in original] (source: N.R. Jenzen-Jones).

### News media

Broadly, journalists do not have the best reputation when it comes to precisely employing SALW terminology.<sup>69</sup> News media organisations most often draw upon definitions of SALW which have been previously relied upon by the outlet in question, or are derived from readily accessible sources which are viewed as ‘authoritative’, such as national legislation.<sup>70</sup> In some cases, however, style guides do provide more specific guidance. For many years, this guidance has often been questionable in nature. The *Associated Press Stylebook*, for example, previously described the terms ‘assault rifle’ and ‘assault weapon’ as follows:

*“Terms for military or police-style weapons that are shorter than a conventional rifle and technically known as carbines. The precise definitions may vary from one law or jurisdiction to another. Although the terms are often used interchangeably, some make the distinction that assault rifle is a military weapon with a selector switch for firing in either fully automatic or semi-automatic mode from a detachable, 10- to 30-round magazine. Comparatively lightweight and easy to aim, this carbine was designed for tactical operations and is used by some law enforcement agencies. ... An assault weapon is the civilian version of the military carbine with a similar appearance. This gun is semi-automatic, meaning one shot per trigger pull. Ammunition magazines ranging from 10 to 30 rounds or more allow rapid-fire capability. Other common characteristics include folding stock, muzzle flash suppressor, bayonet mount and pistol grip. Assault weapon sales were largely banned under federal law from 1994 to 2004 to curb gun crimes” (AP, 2017).*



In addition to broadly conflating the terms ‘assault rifle’ and ‘assault weapon’ and providing only a *potential* distinction between the two, the *Stylebook* claimed that an ‘assault weapon’ is a “civilian version” of the military assault rifle, and listed cosmetic features as identifiers—presumably drawing upon the confusion arising from the imaginative language employed in the United States’ 1994 *Federal Assault Weapons Ban*. The entry also relies on the imprecise term ‘carbine’ and includes the redundant term ‘fully automatic’ (see Jenzen-Jones, 2022b, p. 123). Recently, the AP has updated their guidance on the subject, with their sub-entry for “semi-automatic rifle, assault rifle, assault weapon” now reading:

*“The preferred term for a rifle that fires one bullet each time the trigger is pulled, and automatically reloads for a subsequent shot, is semi-automatic rifle. An automatic rifle continuously fires if the trigger is depressed and until its ammunition is exhausted.*

*Avoid assault rifle and assault weapon, which are highly politicized terms that generally refer to AR- or AK-style rifles designed for the civilian market, but convey little meaning about the actual functions of the weapon” [emphasis in original] (AP, 2022).*

The *AP Stylebook* is now broadly in agreement with ARCS, the *Introductory Guide*, and other authoritative technical publications. Nonetheless, there remain some issues with the entry. For example, the *Stylebook* suggests that both ‘assault rifle’ and ‘assault weapon’ refer to “rifles designed for the civilian market”, whereas true assault rifles are almost invariably designed for military and, sometimes, law enforcement applications. As we have seen, the term ‘assault weapon’ has only very limited use within a military context, applying primarily to certain light weapons which deliver an explosive payload, and are thus substantively different to rifles.

As news media organisations most often do not typically originate definitions—instead pointing to existing definitions, on a formal or informal basis—they present a diversity of terminology of varying quality. News publications are of limited value in developing new definitions. The definitions or descriptions given by news media may be helpful in assessing the broader public understanding of SALW terminology, however, and can provide useful insights into the expected general level of understanding held by an educated layperson. Archival media outputs also provide an interesting window into historical usage of arms-related terminology, and may assist in charting the rise and decline of a given word over time.

# III. Developing New Definitions

## Overview

As we have seen, definitions originating with end users, manufacturers, news media, and, in many cases, even national or regional legislation, may not be suitable for use at the international level. Further, those limited definitions that have thus far been used in this context are often not fit for purpose, frequently offering incomplete or incompatible terminology. As noted, the ITI is probably the most authoritative definition at the international level today, but is partially extensional in nature, omitting the important type-specific definitions that are needed for the everyday working discourse of arms and munitions specialists. Much of the extant terminology surrounding SALW, whilst not incorrect *per se*, is imprecise, and its use can lead to confusion—particularly when stakeholders from differing backgrounds seek to communicate.<sup>71</sup> In assessing existing definitions and seeking to craft new ones, the author has aimed to increase precision in the language of SALW so as to improve objectivity and intensionality. The necessity of this has been outlined herein, and the three publications underpinning this Critical Appraisal have each sought to develop this principle further, building upon one another such that a *lingua franca* will, it is hoped, begin to emerge. The approach followed by the author has therefore been to produce definitions which are clear and simple, preferring to acknowledge any complexities in explanatory notes. The resulting definitions are short, omitting any detail that might semantically rule in or out weapons otherwise generally regarded as fitting the description. They were exhaustively tested against a range of example types to ensure fitness for purpose. Much of the theory underlying the development of these definitions is presented herein, rather than cluttering up the publications upon which this Critical Appraisal is based. Conversely, the methodology by which definitions were reached is detailed in ARCS (Jenzen-Jones, 2022b, pp. 15–17).

As noted, weapons are frequently defined in terms of their intended military role, and in some contexts this is useful. In the context of international proliferation, weapons are often encountered either divorced of any such role (e.g., in transit), or in paramilitary or civilian hands (in which case they may be employed in entirely different or ill-defined roles<sup>72</sup>). Further, as history has evidenced, different classes of weapons may be employed in varying manners as technology and military doctrine evolve. For these reasons, the author has elected to omit direct reference to military roles where possible, in preference to physical and mechanical metrics. Hence, the definitions presented within ARCS are based to the fullest extent possible on the observable properties of the weapons in question. This can be expressed as the application of the ‘white room’ principle, judging an object solely on the basis of the observable properties apparent to the observer without contextual intrusion—i.e., by viewing the object in a hypothetical white room (Jenzen-Jones & Michael, 2021, p. 14). This approach

broadly follows the tenets of object analysis and interpretation in museology, the first step of which is to gather observable data through “sensory engagement with an artefact” (Pearce, 1994, p. 117). By using objective mechanical and physical characteristics as the bases for definitions, more universal information can be recorded, allowing researchers to identify and classify SALW, even if they are being used in a role which contrasts with their intended design.<sup>73</sup> Wherever possible, the definitions were also written with an eye toward future small arms trends and developments in order to maximise their relevance over time. Nonetheless, it is the author’s firm belief that any useful definitions in the field of arms and munitions studies should be revisited on a regular basis, being reassessed in light of technological developments and changes in language and its use. A quinquennial review is suggested in ARCS, with the author intending to commence the review process in 2025.

### Developing a Taxonomy

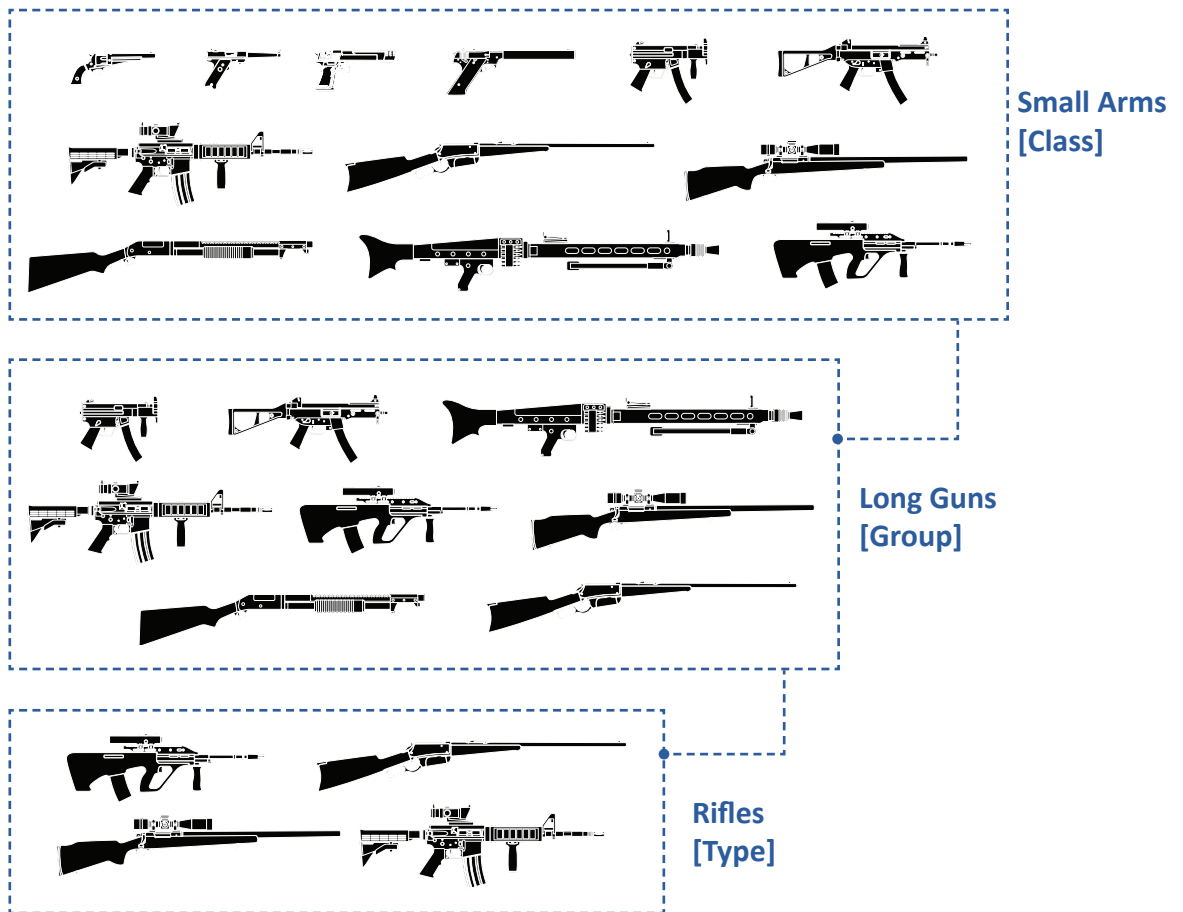
As small arms and light weapons are grouped together in the classical fashion outlined above, using a series of increasingly precise definitions describes the incrementally more specific placement of a given collection of items within the larger classification schema. *Figure 3.1* shows three levels of classification for small arms, using some of the definitions and a classification schema presented in ARCS (Jenzen-Jones, 2022b, p. 26). As with the example in *Figure 2.1*, each lower level of classification yields a set of items more differentiated from the whole than any of its predecessor sets. At the top level, the category of ‘Small Arms’ contains a broad range of weapons, united only by their fundamental principle of operation and man-portability.<sup>74</sup> The middle level shows a grouping of small arms which share more physical characteristics—all are grasped in a similar fashion<sup>75</sup> and thus share a similar form factor. At the lowest level depicted here, a specific physical characteristic is being singled out: all firearms at this level must possess a rifled barrel.<sup>76</sup> The relevant definitions for each of the classifying steps in this example are as follows:

**Small arm:** A firearm of less than 20 mm in calibre (Jenzen-Jones, 2022b, p. 32).

**Long gun:** A firearm which is grasped by placing the control hand and support hand in different locations, and which is typically fitted with a buttstock intended to be braced against the user’s shoulder when fired (Jenzen-Jones & Ferguson, 2022a, p. 50).

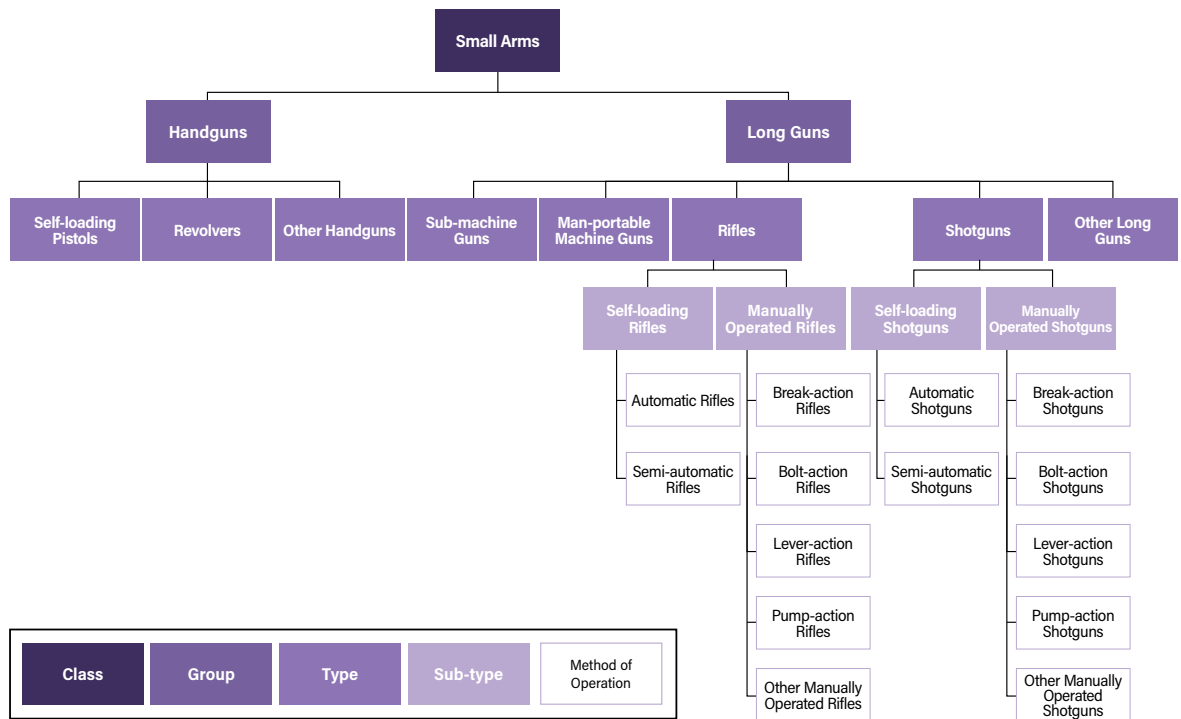
**Rifle:** A long gun with a rifled bore, primarily intended to fire individual bore-diameter projectiles (‘bullets’) (Jenzen-Jones & Ferguson, 2022a, p. 58).





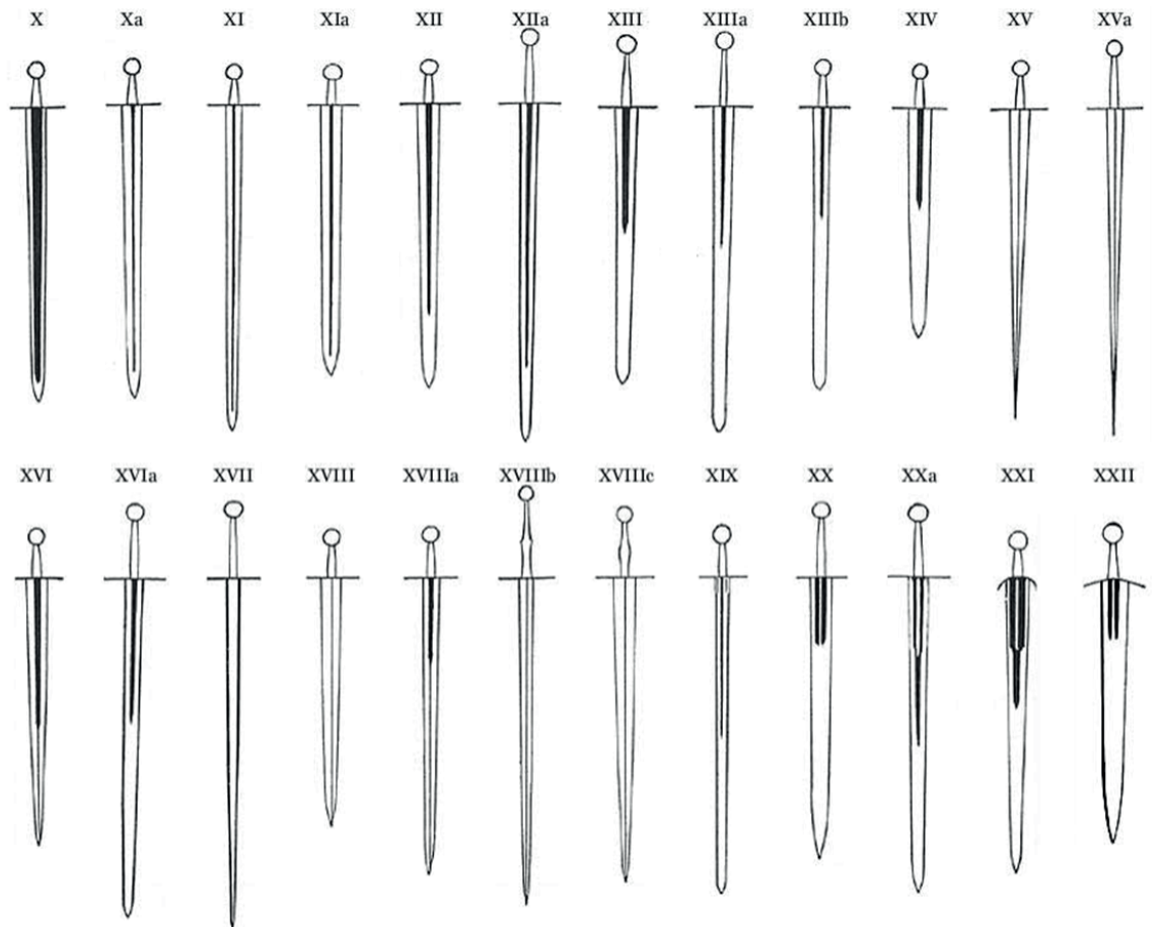
**Figure 3.1** Three levels of classification for small arms, as presented in ARCS. C.f. Figure 3.2, which shows the complete Small Arms Class schema for ARCS.

The process of intensional, generic classification as outlined above lends itself to the development of taxonomies, considering several *fundamenta divisionis* in succession to provide increasingly more detail (and more differentiation from the original set). This hierarchical approach also encourages the identification of key characteristics, allowing for the ready formation of classes that are both exhaustive and mutually exclusive. This, reciprocally, aids in the development of meaningful definitions. In the case of the research publications underpinning this Critical Appraisal, key characteristics were identified by the author and his various collaborators over the course of several years, relying primarily upon practical experience, informed by an extensive, multi-phase literature review (Jenzen-Jones, 2022b, pp. 14–17; ARES, 2017a; Ferguson, 2015; 2019). A review of how small arms and light weapons have been defined historically allows for a comparison of those key characteristics identified by other specialists throughout history, and a critical assessment of these was thus conducted to ensure that the alternative key characteristics (core building blocks for definitions) put forward by the author were fit for purpose. This process resulted in two Class-level classification schema within ARCS, one of which (Small Arms) is depicted in *Figure 3.2*.



**Figure 3.2** *The classification schema for the Small Arms Class within ARCS version 3.1 (source: Jenzen-Jones, 2022, p. 26).*

The proper application of a well-developed typology or taxonomy to a field of study allows for the systematic classification of objects in that field in a repeatable, verifiable manner. Physical objects are regularly classified in many fields. With the shared intent of studying and classifying material objects, including tools and weapons, one of the most obvious allied fields for arms studies to turn to is archaeology. In archaeology, a classification of recovered artefacts by their physical characteristics is understood to be critical to ordering data (Fagan & Durrani, 2013). Morphological typologies have been applied to a variety of objects studied by archaeologists, including weapons. In classifying swords, for example, physical features such as the hilt and pommel design, blade edge, and blade tip are used to distinguish between established types. Perhaps the most important sword typology in Western European archaeology was originated by Jan Petersen in 1919 (Petersen, 1919).<sup>77</sup> Petersen wrote a book on the classification (and dating) of Viking Age swords,<sup>78</sup> and established a typology that primarily relied on an analysis of a weapon’s hilt. This has been revised and interpreted by other scholars over time.<sup>79</sup> It has also been expanded upon, most notably by Ewart Oakeshott (see *Figure 3.3*), incorporating swords from other historical periods and regions (Oakeshott, 1960; 1964).<sup>80</sup> Dr. Alfred Geibig, writing in 1991, developed an intricate classification system based upon precise measurements of physical characteristics, rather than what he viewed as the subjective interpretation of differences in morphology (Geibig, 1991).



**Figure 3.3** An illustration of some of the blade types of swords classified using the typology developed by Ewart Oakeshott, which builds upon Petersen’s morphological approach to the classification of armes blanches. The basic physical similarity of all examines is apparent (source: Oakeshott, 1964).

However, the development and application of classification schemata in archaeology is often very different to the requirements of those for modern SALW practitioners. Whilst the terms ‘typology’ and ‘taxonomy’ are sometimes used synonymously, Bailey makes the distinction between conceptual, top-down typologies and empirical, bottom-up taxonomies (Green, 1996, pp. 328–329). In archaeology, simple typologies are most often used, frequently classifying objects across a single ‘level’ (i.e., by comparing unclassified objects to one or more simple comparators). This process most often considers one or more *fundamenta divisionis* simultaneously, in a simple operation. The process of classification has been described as “probably the single most basic analytical procedure employed in archaeology” (Adams, 2009). When classifying objects, archaeology makes the distinction between purely morphological typologies and what are called ‘functional classifications’, in which objects are classified according to their presumed use (Adams, 2009). In the context of comparatively complex mechanical objects, such as small arms and light weapons, classification must necessarily account for the function of a weapon, however the distinction between an object’s physical (and mechanical) characteristics and its (presumed) use remains an important and useful one. In aid of developing

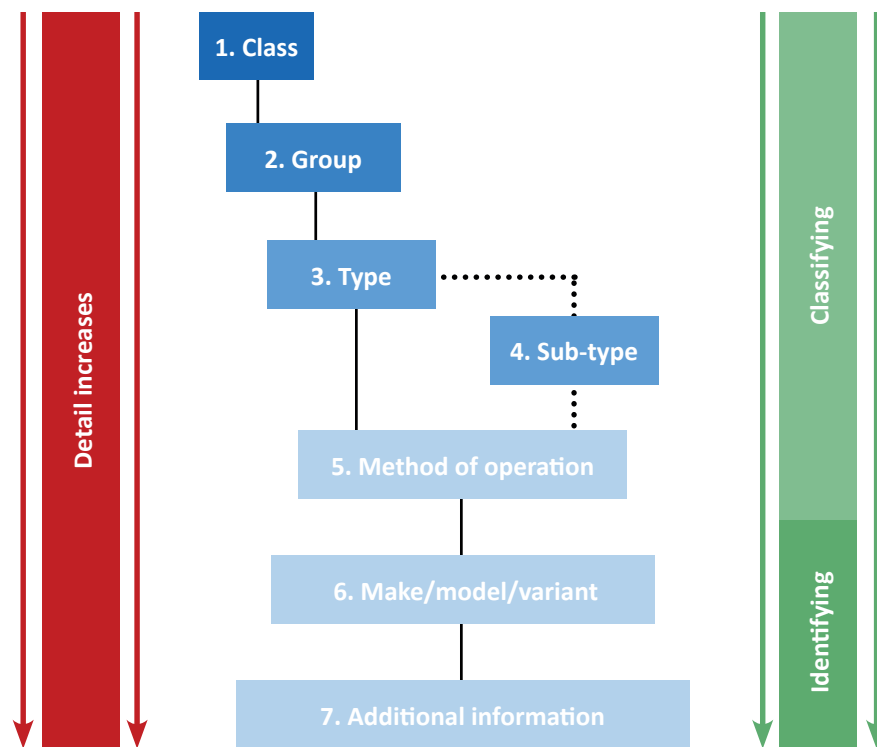
robust, intensional definitions in support of SALW taxonomy development, it is thus of tremendous importance to base the classification of SALW on empirically observable and measurable *inherent* characteristics rather than *presumed* uses (Bailey, 1994, p. 6). This approach was followed in ARCS:

*“The definitions are, wherever possible, derived solely or primarily from the observable technical characteristics of a weapon, rather than its perceived or actual role in contemporary conflict”* (Jenzen-Jones, 2022b, p. 17).

The study of SALW must also contend with more fundamental factors. Whilst an approach such as Oakeshott’s may be appropriate in the analysis of a discretely bounded objects with obvious physical characteristics, such as swords, the relative mechanical complexity of firearms and their distinction by mechanical characteristics (e.g., operating system) as well as physical characteristics, means that a more detailed approach is required. Additionally, whereas a group of swords from a broadly similar region and period may be readily assessed at a single ‘level’—exhibiting only minor variation between types—in order to satisfy the needs of most archaeologists, SALW definitions are constantly being queried by stakeholders with varying needs, from large-scale economic assessment to individual firearm examination. As such, a progressive approach to classification which considers several *fundamenta divisionis* and results in a multi-level taxonomy is of tremendous benefit.<sup>81</sup>

### Identification

The process of identifying a small arm or light weapon is distinct from defining and classifying it. Fundamental to the development of a fit-for-purpose taxonomy is a foundation of precise definitions for the objects to be classified. The goal of this Critical Appraisal is to present the robust nomenclature which underpins the classification of small arms and light weapons under ARCS. All three of the publications considered herein make clear the distinction between classifying and identifying arms and munitions, in some cases illustrating the transition from the former to the latter that occurs as increasing detail about a given weapon is accumulated (Jenzen-Jones & Schroeder, 2018b, pp. 30–31; Jenzen-Jones, 2022a, p. 9; 2022b, pp. 20–21). This distinction has been adopted by other organisations working on SALW issues, including the Small Arms Survey, most notably in the *Introductory Guide*, which “provide[s] the reader with a basic understanding of how to identify and analyse small arms and light weapons, and to track their proliferation” (Jenzen-Jones & Schroeder, 2018b, p. 26). This process is outlined in *Figure 3.4*.



**Figure 3.4** The levels of SALW classification as outlined in ARCS. From the top down, each level increases in detail (and, broadly, intentionality) and clarity, moving from the general classification task to that of identification. ARCS provides definitions for levels 1–4, in most cases, and defines additional key terms (most in the form of an extensive glossary) to assist with assessing SALW at levels 5–7. Further information on identification, especially at the make/model/variant level (level 6) is provided in Jenzen-Jones & Schroeder, 2018a (source: Jenzen-Jones, 2022b, p. 21).

## IV. Discussion & Conclusions

As we have seen, there has historically been little agreement on definitions within the different communities that work on SALW topics, much less between them. A combination of institutional inertia and discordant end-use cases meant that a broadly applicable set of definitions for SALW simply did not exist. When the author started exploring these issues nearly a decade ago, it was clear that a *lingua franca* would be necessary for the many researchers and practitioners working in fields requiring them to precisely define and classify SALW. The author has worked to develop solutions to these challenges over several years, culminating in the three publications referred to in this Critical Appraisal, as well as several other outputs. A broadly applicable, logically consistent, and *complete* set of intensional definitions for all common SALW did not exist publicly until the release of ARCS version 1.3 (Jenzen-Jones, 2022b) in July 2022.

### Limitations & Impact

The novelty and positive impacts the work notwithstanding, there are limitations to the publications appraised herein. The applicability of the classification schema and definitions developed in the publications underpinning this Critical Appraisal to various SALW under examination in a given context will vary based on variety of factors. These tools will not be appropriate for use under all circumstances, nor applicable to, or helpful for, all users. Where institutional classification tools and definitions are deeply engrained—such as in long-standing (particularly domestic) legal contexts—the application of ARCS may cause unnecessary confusion. Where end-users rely on role-based definitions to communicate important user information about a given weapon (e.g., in the armed forces), the acontextual approach of the ARCS definitions may prove unnecessary and cumbersome. And where an NGO or IGO must work closely with another body, ARCS may introduce friction between closely aligned users. Nonetheless, for a great many applications—and particularly for facilitating the precise discussion of SALW in international contexts—ARCS provides a meaningful baseline set of working definitions and allows for the straightforward classification of all common types of small arms and light weapons. That is, it achieves what it sets out to do:

*“ARCS is intended to contribute to consistency and clarity of reporting and communication between users and across user groups, keeping individuals and organisations on the same proverbial page in terms of nomenclature as well as classification”* (Jenzen-Jones, 2022b, p. 17).

Whilst the definitions contained within ARCS—particularly the Type-specific definitions—are an evolution of terminology and definitions developed for the other two publications under consideration herein, each of the three publications also makes important individual contributions to the literature, and the three work together to cover multiple important aspects of arms and munitions investigations.

The ‘Classifying Firearms’ chapter (Jenzen-Jones, 2022a) is targeted at practitioners and academics who are not technical specialists, and, being published by a major international academic publisher, is readily accessible through traditional academic research pathways. It offers a neat summary (with definitions) of the key types of firearms a researcher is likely to examine in their work, and provides readers with “a basic understanding of how firearms can be classified” (Jenzen-Jones, 2022a, p. 9). As a chapter in an edited volume, ‘Classifying Firearms’ is also likely to reach readers with broader research interests, thereby making a contribution to communicating the necessity of standardised terminology. It is limited somewhat in its broader impact by being the only one of the three publications that is not freely accessible online. The *Introductory Guide* (Jenzen-Jones & Schroeder, 2018a) has been more impactful, being one of the most-downloaded publications on the Small Arms Survey’s website in the years since it was published.<sup>82</sup> This handbook has seen particular success in its use as a training tool, having been used by ARES, the Small Arms Survey, and others in support of dozens of training engagements, providing an introduction to arms identification—and highlighting the importance of “[t]he precise and consistent use of terminology” (Jenzen-Jones & Schroeder, 2018b, p. 27)—to a wide range of researchers, analysts, journalists, and specialists in more than ten countries. The *Introductory Guide* is freely available via the Small Arms Survey’s website, and hundreds of printed copies have been distributed to interested readers and workshop attendees.

ARCS (Jenzen-Jones, 2022b) has been applied from the developmental stages to present day in a wide range of ARES outputs, including dozens of reports prepared for a range of government, commercial, and non-profit entities. In addition to serving as the standard classification and definition system used by ARES, ARCS has already been adopted by several other eminent organisations, including the Small Arms Survey (one of the most prominent international SALW research organisations),<sup>83</sup> the Royal Armouries (the UK’s national arms museum, home to an important collection of SALW),<sup>84</sup> the Cody Firearms Museum (regarded as one of the world’s premier firearms museums),<sup>85</sup> and *Armax: The Journal of Contemporary Arms* (the peak international publication promoting the scholarship of contemporary arms).<sup>86</sup> ARCS has further been used in materials prepared by or for the International Committee of the Red Cross, the Organisation for the Prohibition of Chemical Weapons, the Independent International Commission of Inquiry on the Syrian Arab Republic, the Center for Advanced Defense Studies, Syrian Archive, Mnemonic, and other governmental and nongovernmental organisations. Further, ARCS has already been cited or referred to in at least fifteen published or forthcoming peer-reviewed articles or books,<sup>87</sup> received specialist media and academic coverage,<sup>88</sup> formed the definitional foundation for an important edited volume on the global use of firearms,<sup>89</sup> been presented at international symposia,<sup>90</sup> and been featured in a museum exhibition and its accompanying catalogue—complete with a discussion of the white room principle (see *Figure 4.1*).<sup>91</sup> Printed copies have also been made available in limited quantities.

Opportunities to more widely disseminate the definitions and classification schema presented in the underlying publications remain. The author is continuing a programme of outreach to this effect. There are also opportunities to expand, review, and refine the underlying research over the coming years. For example, whilst the ARCS process examined existing definitions contained within international and multinational instruments, as well as those developed and used by IGOs/NGOs, end-users, manufacturers, national legislators, and the news media, future studies would also benefit from a detailed examination of the development and use of definitions within the online communities of firearms owners, particularly in the United States. At the time of writing, the development of ARCS is ongoing. Draft classification schema have been prepared for the ‘Heavy Weapons’ and ‘Munitions’ categories—completing the four Class-level branches of the ARCS tree diagram—and definitions for these categories are being written. The existing Class categories (i.e., Small Arms and Light Weapons) are also being refined, with further attention being paid to horizon technologies, such as mass drivers (notably railguns and coilguns) and directed-energy weapons (lasers, microwaves, particle beams, etc.). A series of ‘taxonomic keys’ are also being developed by the author. A visual aid which originated in the field of biology, taxonomic keys outline a step-by-step process (often structured as a series of dichotomous choices, to simplify use) for the identification or classification of an organism. Similar aids have been developed for non-organic objects, and it is hoped that a key enabling the rapid classification and identification of small arms and light weapons under ARCS will soon be available. It is anticipated that ARCS will be subject to periodic review, with suggestions for refinement invited from professionals in the contemporary arms studies field and allied disciplines.

## Conclusion

The publications underpinning this Critical Appraisal hold that an assessment of a weapon’s observable properties—that is, its inherent physical and mechanical characteristics—are the most appropriate foundation upon which to develop language suitable for use in the international context. This principle allows for the consideration of several *fundamenta divisionis* in succession to provide increasingly more detailed division of a set of objects, eventually organising precise definitions into useful classification schemata. The result is an approach to identification and classification which crosses borders, professions, and disciplines. The publications upon which this Critical Appraisal is based are already having an impact on the specialist communities in which they are most relevant, and have informed further academic study. It is the author’s hope that others will continue to contribute to the ongoing development of ARCS and other initiatives to improve the technical communication surrounding SALW.





## Notes

- 1 An earlier formulation (“*nos ... consequentia nomina rebus esse studentes ...*”) of this mediaeval adage appears in Justinian’s *Institutiones*, II(7), 3.
- 2 These errors include the misuse of terms such as ‘AK-47’, ‘assault weapon’, ‘high-powered’, and ‘clip’ (Jenzen-Jones & Schroeder, 2018b, p. 27).
- 3 *Cf.*, for example, the substantially different definitions of ‘assault rifle’ given in AP (2017) and Johnson (1970, p. 67); or the definitions of ‘sub-machine gun’ given in UNODC (n.d.); Macmillan (n.d.); and Jenzen-Jones (2022a).
- 4 For example, the term ‘personal defence weapon’ (PDW) first originated with NATO standardisation attempts in the 1970s, but was quickly conflated with a specific NATO requirement from the 1980s, before being co-opted by manufacturers who applied the term to a variety of weapons that would not have satisfied the issued requirements (Jenzen-Jones, 2022a, p. 8). Around the same time, the British military recognised the term “Personal Protection Weapons (PPW)”, describing these as “...normally revolvers or self loading [sic] pistols” (RMCS, 1988, p. 1.3). More recently, the name ‘Modern Submachine Carbine’ has been applied to a weapon that may otherwise be considered a PDW or sub-machine gun, further demonstrating the potential for overlap, fuzziness, and variability in manufacturer and end-user terminology (Johnson, 2009).
- 5 This has been communicated to the author by a variety of specialist in related fields, and is evidenced by the extensive work on definitions which the author and ARES have been commissioned to undertake on behalf of a range of international actors working cooperatively on these topics.
- 6 In addition to co-editing the publication in its entirety, the author also authored or was lead co-author on six of the handbook’s nine chapters: Jenzen-Jones & Schroeder, 2018b (Chapter 1); Jenzen-Jones & Ferguson, 2018a (Chapter 3); Jenzen-Jones, 2018a (Chapter 4); Jenzen-Jones, Ferguson & Williams, 2018 (Chapter 5); Jenzen-Jones & Ferguson, 2018b (Chapter 6); Jenzen-Jones, 2018b (Chapter 7). The author’s contribution to all co-authored material was greater than fifty per cent.
- 7 ARCS is designed, primarily, to classify contemporary arms. The term ‘contemporary arms’ is used in the sense established by *Armax: The Journal of Contemporary Arms*, to mean those arms and their ammunition developed or adopted after 1800 (Jenzen-Jones, 2021). Whilst ARCS deals primarily with small arms firing cartridge-based ammunition, it does contain a definition for muzzle-loading small arms (Jenzen-Jones & Ferguson, 2022b, p. 77). ARCS also focuses on lethal arms, and specifically excludes several “SALW-adjacent” items from classification, such as drill or dummy weapons, blank-firing weapons, air weapons, replica firearms, and less-lethal weapons (Jenzen-Jones & Ferguson, 2022c).
- 8 See, for example, Ferguson et al., 2015; ARES, 2017a; 2017b; 2018.
- 9 Several of these individuals have elected to remain confidential, but many are listed in the front matter to the three publications underpinning this Critical Appraisal, and within the acknowledgements herein.
- 10 See, for example, Jenzen-Jones & Schroeder, 2018b; Jenzen-Jones, 2018b.
- 11 See, for example, Jenzen-Jones & Schroeder, 2018a.
- 12 For definitions of arms and munitions terminology, the reader should refer to the extensive glossary incorporated into ARCS (Jenzen-Jones, 2022b, pp. 116–135).
- 13 See, for example, the ARCS Glossary entries for ‘Firearm’ and ‘Gun’ (Jenzen-Jones, 2022b, pp. 123–124).

- 14** The UNROCA was later amended to include mortars of 75 mm or greater in calibre (UNODA, 1991).
- 15** See UNIDIR, 2018, p. 4.
- 16** See also ‘Distinction by Destructive Potential & Calibre’ (Jenzen-Jones, 2022b, pp. 31–34).
- 17** Properly, the *International Instrument to Enable States to Identify and Trace, in a Timely and Reliable Manner, Illicit Small Arms and Light Weapons*.
- 18** Properly, the *Protocol against the Illicit Manufacturing of and Trafficking in Firearms, Their Parts and Components and Ammunition*. The Firearms Protocol supplements the United Nations Convention against Transnational Organized Crime (UNTOC).
- 19** See ‘Distinction by Destructive Potential & Calibre’ (Jenzen-Jones, 2022b, pp. 31–34).
- 20** Nonetheless, this was an important milestone, as most definitions prior to this had not clearly delineated the two classes (Ferguson et al., 2015). Some have only done so recently. For a long time, *The Weapons Law Encyclopedia* (Geneva Academy, 2017), for example, contained a definition of ‘small arms’, but no definition for ‘light weapons’.
- 21** See ‘Distinction by Portability’ (Jenzen-Jones, 2022b, pp. 28–30).
- 22** Flamethrowers do not “...expel or launch a shot, bullet or projectile by the action of an explosive...” (see Jenzen-Jones, Ferguson, Williams & Salvo, 2022, pp. 98–99).
- 23** E.g., lasers and masers, which operate on different principles to conventional SALW and do not propel a projectile.
- 24** E.g., coilguns and railguns, which do not operate on the same basic principles as conventional guns but still propel a projectile.
- 25** See, for example, Jenzen-Jones, 2022a: “The term ‘assault rifle’ was coined in Germany during the second world war (the English-language term being adapted from the German *sturmgewehr*) as an appellation for a series of compact automatic rifles firing [rifle] cartridges of a reduced length. ... Assault rifles are a specific sub-set of self-loading rifles (and, more specifically, of automatic rifles). Whilst assault rifles can be defined ... ambiguities remain with all definitions ... ‘assault rifle’ can be considered a role-based term and its use is therefore not recommended, except in specific contexts.”
- 26** “Portable anti-aircraft guns” are also given as an example, even though almost all of these are so heavy as to make their inclusion in the category of light weapons unlikely (Jenzen-Jones, 2022b, pp. 12; 29).
- 27** For more information on the legal considerations affecting the ATT, see Clapham, et al., 2016.
- 28** Properly, the *Central African Convention for the Control of Small Arms and Light Weapons, their Ammunition and all Parts and Components that can be used for their Manufacture, Repair and Assembly*.
- 29** Properly, the *ECOWAS Convention on Small Arms and Light Weapons, their Ammunition and Other Related Materials*.
- 30** Properly, the *Nairobi Protocol for the Prevention, Control and Reduction of Small Arms and Light Weapons in the Great Lakes Region and the Horn of Africa*.
- 31** Properly, the *Protocol on the Control of Firearms, Ammunition and Other Related Materials in the Southern African Development Community (SADC) Region*.
- 32** The term ‘fully automatic’ is redundant, and ‘automatic’ should be preferred (Jenzen-Jones, 2022b, p. 123).
- 33** Cf. Jenzen-Jones & Ferguson, 2022a, p. 34 (firearm) and Jenzen-Jones, Ferguson, Williams & Salvo, 2022, p. 93 (light rocket launcher).



- 34** Properly, the *Inter-American Convention Against the Illicit Manufacturing of and Trafficking in Firearms, Ammunition, Explosives, and Other Related Materials* (in Spanish, the *Convención Interamericana contra la fabricación y el tráfico ilícito de armas de fuego y municiones*).
- 35** Properly, the *Inter-American Convention Against the Illicit Manufacturing of and Trafficking in Firearms, Ammunition, Explosives, and Other Related Materials*, (A-63), Article II(3).
- 36** The Small Arms Survey ‘Definitions’ page is unclear as to whether or not mortars which range between 100 mm and 120 mm in calibre are included (“To this list, the Survey has added single-rail-launched rockets and 120 mm mortars as long as they can be transported and operated as intended by a light vehicle.”) (Small Arms Survey, n.d.).
- 37** See, for example, the Small Arms Survey’s publication of Jenzen-Jones & Schroeder, 2018a.
- 38** The notion of classifying a weapon by its primary purpose being to “support” other units is itself a type of role-based definition.
- 39** A similar statement is understood to be included in more recent editions, which are not publicly available.
- 40** Many definitions of SALW thus have their roots in terminology established by end users (Ferguson, 2019; Jenzen-Jones, 2019).
- 41** This was observed in Afghanistan, for example, where relatively small units of Taliban insurgents were observed carrying proportionally high numbers of weapons chambered for the 7.62 × 54R mm cartridge (such as the PKM, often considered a ‘general-purpose machine gun’, and the SVD, often considered a ‘designated marksman rifle’) to engage ISAF forces beyond the effective range of the 5.56 × 45 mm cartridge—achieving what was termed “overmatch” (Ehrhart, 2009; Jenzen-Jones, 2016, p. 22).
- 42** In contemporary military usage, the term almost invariably implies a self-loading rifle (sometimes an ‘accurised’ example) fitted with a telescopic sight and, typically, a bipod (Jenzen-Jones & Ferguson, 2022a, p. 121).
- 43** There is no broad agreement on what constitutes an ‘intermediate-calibre cartridge’, which is the source of much ambiguity when conceptualising the assault rifle today. ARES has defined an ‘intermediate-calibre rifle cartridge’ as “a rifle cartridge generating between 1,300 and 2,600 J of muzzle energy when fired from a barrel having a minimum length of 400 mm” (Jenzen-Jones, 2019). This definition has been absorbed into ARCS (Jenzen-Jones, 2022b, p. 46). Accordingly, an assault rifle is a selective-fire, automatic rifle fed from a detachable magazine and chambered for an intermediate-calibre rifle cartridge (Jenzen-Jones & Ferguson, 2022a, p. 52, n. 82). Except in specific contexts, the terms ‘self-loading rifle’ or ‘automatic rifle’ should be preferred (Jenzen-Jones, 2022a, p. 21).
- 44** Increasingly, barrel length is an optional variable. Modern rifles are often offered for sale with a variety of barrel-length options, and many can be easily retrofitted with a shorter barrel (Jenzen-Jones & Ferguson, 2022a, p. 60).
- 45** The M4 and M4A1 are fitted with four-position collapsible buttstocks, meaning they have a variable overall length.
- 46** Based upon their observable properties, weapons described by end users or manufacturers as ‘carbines’ will most often be classified as rifles under ARCS (Jenzen-Jones & Ferguson, 2022a, pp. 60–61).
- 47** This is also true of the term ‘assault weapon’. Additionally, semi-automatic firearms are routinely referred to, incorrectly, as ‘assault rifles’ by Canadian politicians and news media. The label ‘military grade’—again, essentially meaningless—is also used regularly (see, for example, Lamirande, 2020; Gollom &

- Nicholson, 2022; Bruemmer, 2023; Passifume, 2023).
- 48** Properly, the *Public Safety and Recreational Firearms Use Protection Act*.
- 49** The SVD is more often regarded as a DMR, in role-based terms.
- 50** The legal interpretations underpinning such firearms have changed several times, and, at the time of writing, efforts are underway to effectively ban the non-regulated use of firearms which would otherwise be considered NFA items if fitted with regular shoulder stocks rather than ‘pistol braces’ (see, for example, ATF, 2021a; 2021b; FPC, 2021). A detailed discussion of these issues would take more space than is available in this brief commentary. For further discussion, see, for example, CRS, 2021.
- 51** See, for example, Germershausen, 1982.
- 52** For more information on recreational and other items which replicate the appearance of firearms, see Jenzen-Jones & Ferguson, 2022c, pp. 101–112.
- 53** Indeed, whilst the UK’s limit of 12 ft-lb marks the distinction between those air weapons (other than air pistols) which can be freely purchased and those which require a Firearms Certificate to possess, the *Firearms Act 1968* as presently amended states that a “barrelled weapon of any description from which a shot, bullet or other missile, with kinetic energy of more than one joule at the muzzle of the weapon, can be discharged” constitutes a firearm under UK law, unless otherwise exempted (as is the case for some ‘airsoft’ devices, for example) (Home Office, 2022; 2023). This is a ludicrously low threshold for considering a device to be lethal, at odds with technical, historical, and lay understandings of the term. Such an approach also clashes with existing understandings of definitions used at the international level.
- 54** This is not universal, however, and even where this date is accepted, states may regulate ‘antique’ weapons differently. In the United States, for example, any firearm manufactured before 1898—and some replica firearms, specifically muzzle-loading guns—are not subject to most federal laws, unless they are otherwise restricted by the *National Firearms Act 1934* (18 USC § 921(a)(16); 6 U.S. Code § 5845(a)). By contrast, the UK has comparatively complex and restrictive laws governing the ownership of antique firearms, under which the operating system and chambering of a given weapon are considered to determine whether it constitutes an ‘antique firearm’ under British law (*The Antique Firearms Regulations 2021; Policing and Crime Act 2017*, § 58(2A–2H)). The cut-off date is, in many countries, entirely arbitrary, and, in the hypothetical case of two identical rifles made one day apart, one could be legally considered an ‘antique’ and the other a ‘modern’ firearm in some jurisdictions.
- 55** See, for example, the *Firearms Act 1968*, § 57; 27 CFR § 479.11.
- 56** Other states also use questionable terminology, of course, as can be seen in Canada’s recent use of the term ‘assault-style weapon’ (see earlier). However, the U.S. has an outsize effect on the lexical landscape due to the number of key SALW (and especially firearms) manufacturers resident there and the cultural influence of the U.S. firearms enthusiast, law enforcement, and legal communities.
- 57** This author had originally intended to illustrate the complexities of U.S. federal firearms laws using the ‘stabilising brace’ example, but the number of varied (sometimes contradictory) ATF rulings and correspondence, the changing positions of the agency toward weapons fitted with these components, and the ongoing push to change how such weapons are assessed made this impracticable within the limited space available for this section. See, for example,

- Curtis, 2019; Kraut, 2019; Richardson, 2020; ATF, 2020; 2021a; 2021b; FPC, 2021; James & Webb, 2022.
- 58** *Gun Control Act 1968*, Public Law 90-618 (app. 22 October 1968), 18 USC Chapter 44.
- 59** To confuse matters further, an advisory letter from the ATF to Mossberg as to how the Mossberg 590 Shockwave would be classified reads “The weapon ... is a “firearm” subject to GCA provisions; however, it is **not** a “firearm” as defined by the NFA.” [emphasis in original] (Curtis, 2017).
- 60** *National Firearms Act 1934*, 26 USC Chapter 53.
- 61** Even the method of carriage of the Shockwave could potentially change its legal classification, in what can only be described as a bizarre understanding of how physical objects should be defined and classified. According to Mossberg: “Do not carry the Mossberg Shockwave concealed. If this gun is carry [sic] concealed, it would be defined by the BATFE as an A.O.W. and the user could be charged with possession of an unregistered NFA weapon [a federal crime]” (Mossberg, 2017). The Chief of the ATF’s Firearms Technology Industry Services Branch echoed this sentiment in their letter to Mossberg classifying the new weapon: “Please note that if the subject firearm is concealed on a person, the classification with regard to the NFA may change” (Curtis, 2017).
- 62** Capacity figures are given here to include a full magazine and a chambered cartridge, or ‘+1’ (e.g., a seven-shot capacity of this type is sometimes expressed as ‘6+1’, indicating a magazine capacity of six rounds, plus one round chambered).
- 63** The NFA was a reaction, in part, to the comparatively widespread use of cut-down (‘sawn-off’) rifles and shotguns by criminal gangs, especially bank robbers, in the 1930s. See, for example, Vortisch, 2022.
- 64** In other words, sliding a plastic grip onto the rail of a handgun in a manner that has no effect whatsoever on its mechanical characteristics, method of operation, or effectiveness may constitute the commission of a federal felony in the United States.
- 65** This term is, confusingly, often rendered as ‘machinegun’ by the ATF in important documents (e.g., ATF, 2009, pp. 9–15).
- 66** “The term “machine gun” includes a bump-stock-type device, i.e., a device that allows a semi-automatic firearm to shoot more than one shot with a single pull of the trigger by harnessing the recoil energy of the semi-automatic firearm to which it is affixed so that the trigger resets and continues firing without additional physical manipulation of the trigger by the shooter” (27 CFR § 479.11).
- 67** In addition to the several key pieces of legislation at the national level, 45 states have enacted more than 350 firearms laws since December 2012—further complicating matters (Giffords Law Center, n.d.).
- 68** See, for example, ATF, 2021a; 2021b.
- 69** There are a number of notable exceptions, of course, and several organisations are working to correct the oversight. This author is proud to have delivered training courses to hundreds of journalists—mostly freelancers—seeking to improve the way they report on news involving arms or munitions.
- 70** In speaking to friends who are journalists, this author was told that many reporters rely on informal ‘newsroom’ definitions that are recycled internally, rather than official style guides or published definitions.
- 71** It is also important to note that various states, organisations, and authorities have used different terms for the same categories of weapon, and, in most cases, these have changed—sometimes substantially—over time. In consequence, developing more precise definitions for some groupings



- of weapons is not difficult, whilst others represent a more complex challenge.
- 72** It is not uncommon to see an ‘assault rifle’ used as a ‘sniper rifle’, or a light machine gun pressed into service in a marksman role, for example.
- 73** The primary objective is to objectively assess how best to classify a weapon. The role an arm may be pressed into is a secondary factor, which may be useful in the context of some types of AMIs.
- 74** Whilst the Small Arms class is comprised almost entirely of firearms (that is, man-portable guns), ARCS acknowledges that “non-firearm small arms do exist, such as ... the unique ‘Gyrojet’ range of weapons (and other similar developments) that fire miniaturised rockets” (Jenzen-Jones, 2022b, p. 32, n. 38). Some weapons of this type may also generate lethal effects through unconventional means, such as by delivering chemical or biological payloads (see, for example, Carpenter, 2021).
- 75** The importance of the placement of the ‘control’ and ‘support’ hands is described in ARCS (Jenzen-Jones, 2022b, pp. 24–25).
- 76** That is, a barrel bearing “[a] pattern of helical grooves in the bore of a barrel which are designed to impart spin to a fired projectile” (Jenzen-Jones, 2022b, p. 132).
- 77** It should be noted that Petersen’s work also deals with other types of *armes blanche*, including spears and axes.
- 78** This term is used here broadly, with the understanding that there are acknowledged distinctions and overlaps between various Norse, Carolingian, and Norman swords, amongst others (see, for example, Bilogrivić, 2013).
- 79** See, for example, Bilogrivić, 2013.
- 80** See, also, for example, Wheeler, 1927.
- 81** Taxonomies provide a curated system for classifying and applying nomenclature to objects, going beyond a simple typology to allow for more nuanced classification and providing a visual representation of the relationship between different groupings of objects.
- 82** Correspondence with the Small Arms Survey.
- 83** Beginning with Jenzen-Jones & Schroeder, 2018a.
- 84** Jones, 2021; correspondence with Jonathan Ferguson, Keeper of Firearms and Artillery at the Royal Armouries.
- 85** Correspondence with Danny Michael, Curator of the Cody Firearms Museum.
- 86** Jenzen-Jones, 2021.
- 87** Author’s review of literature.
- 88** Vining, 2019; Hlebinsky, 2021; FotAT, 2022; FIU, n.d.
- 89** Jenzen-Jones, 2022a.
- 90** Jenzen-Jones, 2019; 2020.
- 91** Jenzen-Jones & Michael, 2021; 2022.

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