

- SYS-L/A/M
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DEFENCE



# What is a Loitering Munition?

A proposition for a NATO definition by the LCG DSS - LCMR&LM SG  
Land Combat Missiles, Rockets and Loitering munitions Sub Group



The beginning of wisdom is a  
definition of terms.

~ Socrates

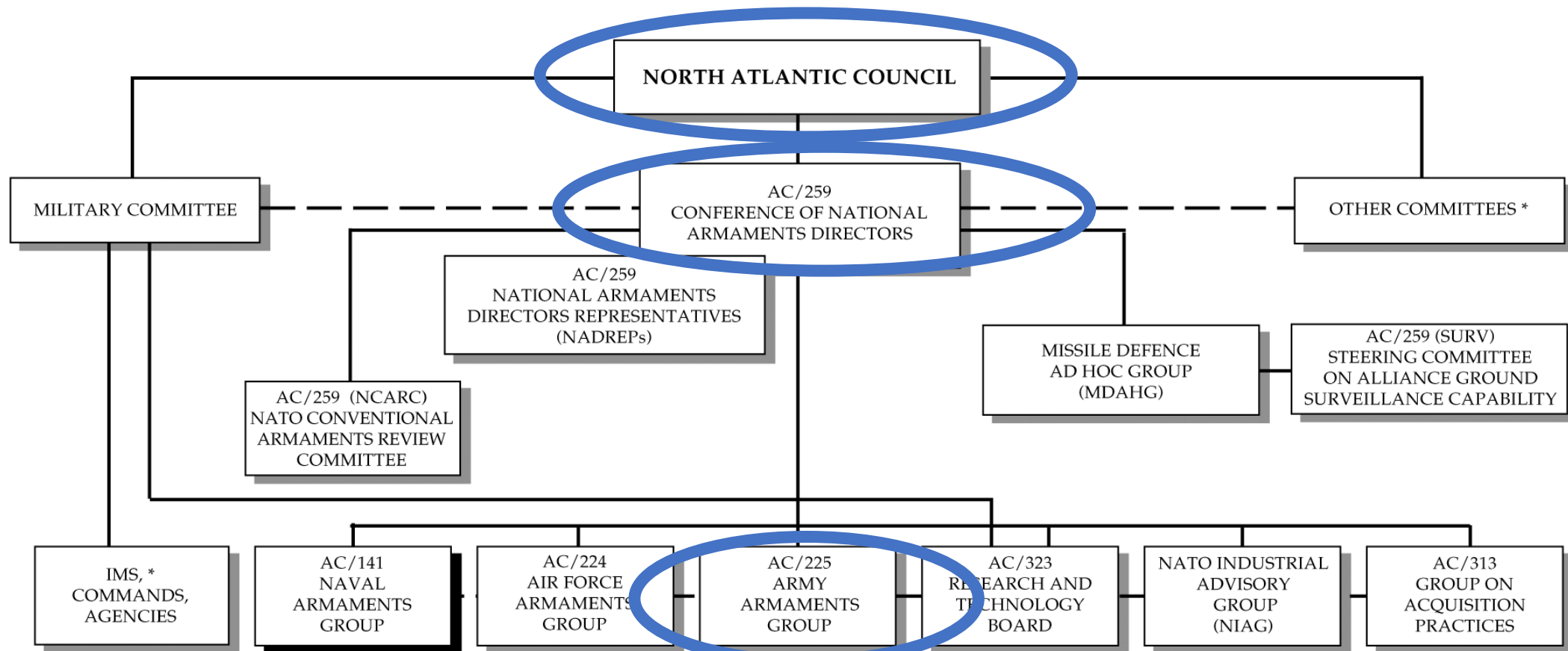
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# ■ The group

# *CNAD Organization and its relationships with other NATO Bodies*



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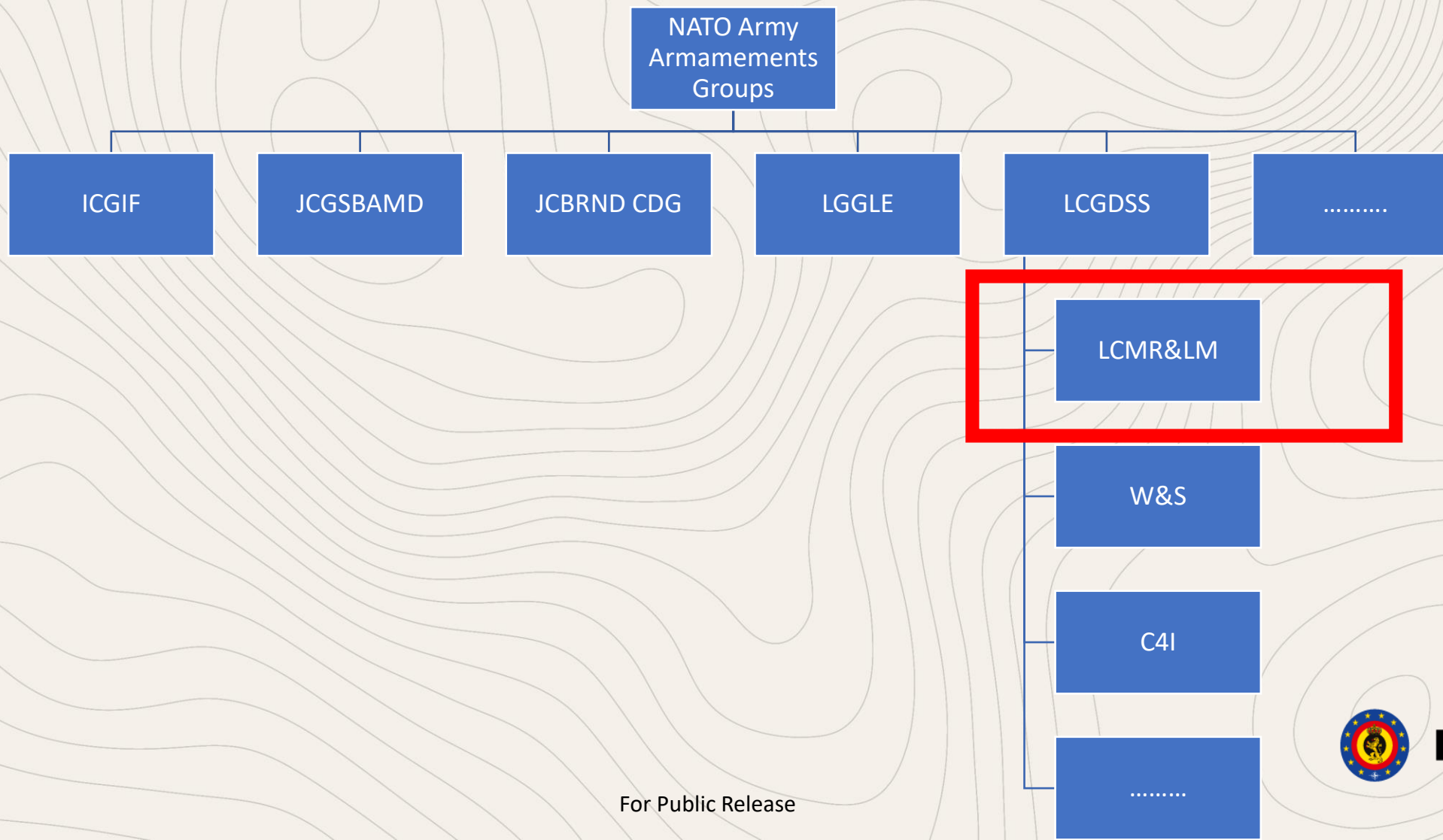
## LEGEND

- DIRECTION AND CONTROL
- - - - LIAISON

\* SOME BODIES SUCH AS THE DEFENCE REVIEW COMMITTEE REPORT TO THE DEFENCE PLANNING COMMITTEE WHICH IS COMPOSED OF REPRESENTATIVES OF THE COUNTRIES WHICH TAKE PART IN NATO'S INTEGRATED DEFENCE.

\*\* INCLUDING MAS

# Where is this group situated?





# ■ Scope of the LCGDSS LCMR&LM

- Three types of systems/weapons
  - Shoulder launched weapons
  - Guided anti-tank and/or multipurpose weapons
  - Loitering munitions **limited to Man Portable and Man Transportable**
- **Joint** approach

# The ToE's

<b>Terminology</b>	Coordination with NAAG ICGIF
<b>Architecture &amp; Standardisation</b>	Coordination with AC326
<b>Common Requirements</b>	Dormant awaiting initial output of ToE Terminology and Architecture & Standardisation
<b>Doctrine &amp; Concept of Employment / Operational Use</b>	Ongoing
<b>Legal, “Ethical” and Regulatory Frameworks</b>	Ongoing
<b>Joint Concept - Test &amp; Evaluation Centers Loitering Munition</b>	Ongoing



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# ■ Definition



# Loitering Munition -Definition

From the actual agreed upon NATO definition

*A munition able to remain in position over a target area following an aborted target and to be reassigned a target whilst in flight.*

To:

*An **Aerial Loitering Munition** is a **munition** following an operator influenced **flight path** (which can include to remain over a certain position) and is capable of non/beyond line-of-sight target verification and **precision attack**, has the ability to abandon an attack, can be re-assigned and is destroyed by functioning of its payload.*



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# Loitering Munition - Definition

An **Aerial Loitering Munition** is a **munition** following an operator influenced **flight path** (which can include to remain over a certain position) and is capable of non/beyond line-of-sight target verification and **precision attack**, has the ability to abandon an attack, can be re-assigned and is destroyed by functioning of its payload.

- **Munition: (NSO)**

*A complete device charged with explosives, propellants, pyrotechnics, initiating composition or chemical, biological, radiological, or nuclear material, for use in military operations, including demolitions.*

- **Flight path: (NSO)**

*The line connecting the successive positions occupied, or to be occupied, by an aircraft, missile or space vehicle as it moves through air or space.*

- **Precision Attack (NSO)**

*An attack that provides the ability to destroy or neutralize targets with a high degree of lethality, discrimination and accuracy.*



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# Loitering Munition - Definition

A **Ground Loitering Munition** is a self-propelled **munition** following an operator influenced path (including idle periods) and is capable of non/beyond line-of-sight target verification and **precision attack**, has the ability to abandon an attack, can be re-assigned and is destroyed by functioning of its payload.



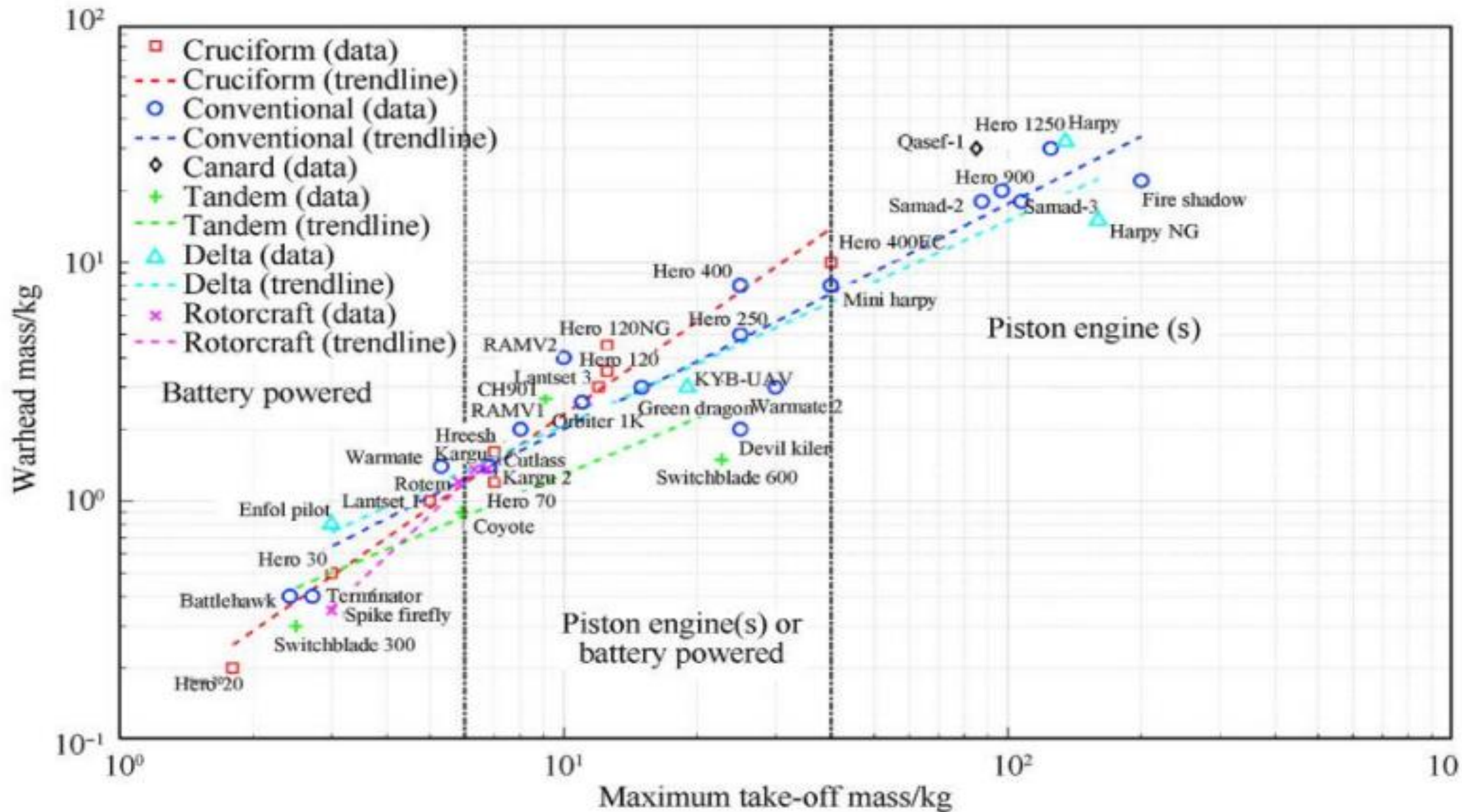
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# ■ Categorization





# Categorization



LM class	MTOM	Rec. max. op. alt.	Subcategory	Ref. UAS standard (adapted to LM)	Exemplary system
Class I Nano	< 4 kg	300 m AGL	Fixed-Wing	DoD UAS/Group 1 [21] STANAG 4670/I Micro [20] STANAG 4703/AEP-83 [35] EASA specific/cert. [22]	Aerovironment Switchblade 300 [11]
			Rotary-Wing		Raphael Spike Firefly [14]
Class I Micro	4 – 9 kg	300 m AGL	Fixed-Wing	DoD UAS/Group 1 [21] STANAG 4670/I Mini [20] STANAG 4703/AEP-83 [35] EASA specific/cert. [22]	WB Warmate [4]
			Rotary-Wing		IAI Rotem [24]
Class I Mini	9 – 15 kg	1100 m AGL	Fixed-Wing	DoD UAS/Group 2 [21] STANAG 4670/I Mini [20] STANAG 4703/AEP-83 [35] EASA specific/cert. [22]	IAI Green Dragon [12]
			Rotary-Wing		Diehl Libelle [5]
Class I Small	15 – 25 kg	1100 m AGL	Fixed-Wing	DoD UAS/Group 2 [21] STANAG 4670/I Small [20] STANAG 4703/AEP-83 [35] EASA specific/cert. [22]	UVision Hero 120 [3]
			Rotary-Wing		-
Class II	25 – 150 kg	5500 m MSL	Fixed-Wing	DoD UAS/Group 2 [21] STANAG 4670/I Mini [20] STANAG 4703/AEP-83 [35] EASA specific/cert. [22]	Elbit Skystriker [7]
			Rotary-Wing		-
Class III	150 – 600 kg	5500 m MSL	Fixed-Wing	DoD UAS/Group 3 [21] STANAG 4670/II [20] STANAG 4671 [34] EASA certified [22]	MBDA Fireshadow [6]
			Rotary-Wing	DoD UAS/Group 3 [21] STANAG 4670/II [20] STANAG 4702/AEP-80 [36] EASA certified [22]	-

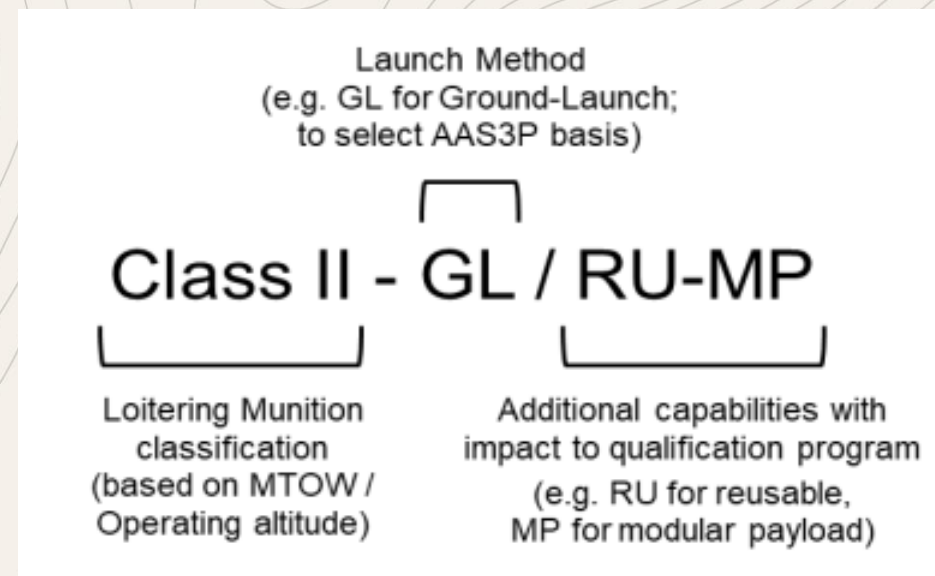


# ToE on Terminology

## Recommended Strategy

- Tag System to identify S3 relevant capabilities
- Tag catalogue to be enhanced in the future

Tag	Category	Description
ML	Launch	Man or hand launched system Apply AAS3P-10 (for soldier-mounted launch systems) or AAS3P-26 (for soldier-thrown/started systems; aft. promulgation)
GL	Launch	Ground, sea or underwater launched system (e.g., man-portable tube, or catapult launch); Apply AAS3P-11
VL	Launch	Vehicle launched system (ground/sea/underwater; e.g., vehicle tube launcher); Apply AAS3P-11
AL	Launch	Aircraft launched system (e.g., drop launch); Apply AAS3P-12
LC	Launch	Large-Caliber gun launched (>40 mm); Apply AAS3P-20
MC	Launch	Medium-Caliber gun launched (20...40 mm); Apply AAS3P-21 (after promulgated)
SC	Launch	Small-Caliber gun launched (<20 mm); Apply AAS3P-22
RT	Capability	Retrievable; Fuzing safety for transport required
RU	Capability	Directly or indirectly reusable; Implies RT cap.; Hazard and reliability measures required
MP	Capability	Modular interchangeable payloads with non-destructive characteristics (e.g., Warhead replacement by additional battery); High probability of UAS-certification necessity
SP	Capability	Safe Passage capability; Fuzing safety for overflying own forces required
WO	Capability	Wave-off capability; Disarming and Rearming required
AT	Capability	Participation in Air-Traffic; High probability of UAS-certification necessity
...	...	...



# Status of the ToE's

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■ PoCs