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NATO ARMY ARMAMENTS GROUP (NAAG)

LAND CAPABILITY GROUP DISMOUNTED SOLDIER SYSTEMS (LCGDSS)

LCGDSS Proposal for Soldier Symbolology

Note by the Secretary

Ref. 1 AC/225(DSS)DS(2018)0002
2 AC/225(DSS)WP(2018)0001

1. Per decisions at the LCGDSS Fall 2018 Meeting (Ref.1), a proposal was developed by the C4ISA SG Chairmanship and the Netherlands, to provide basis for a consolidated LCGDSS input from a soldier perspective to the MCJSB IERHWG JSP^[1], to support the development of the new edition APP-6 on NATO Joint Military Symbolology.
2. This proposal, initially issued as a Working Paper (Ref.2), was agreed by LCGDSS under a silence procedure.
3. The agreed paper is now officialised as a formal document for forwarding to the attention of the JSP.

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1 Enclosure

[1] Military Committee, Joint Standardization Board, Information Exchange Requirements and Harmonization Working Group, Joint Symbolology Panel.



NLD review comments on APP-6 (D)(1) Soldier Symbology and proposals for change

Version 1.0 – 25-10-2018
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On DSS displays, soldiers are currently usually represented as a square, triangle or circle, with a single icon inside. This may change in the future influenced by the new hexagon shape introduced in APP-6(D)(1) (see Figure 1), but the general assessment is that on small displays, the soldier symbol will be limited to a shape with a single icon inside.

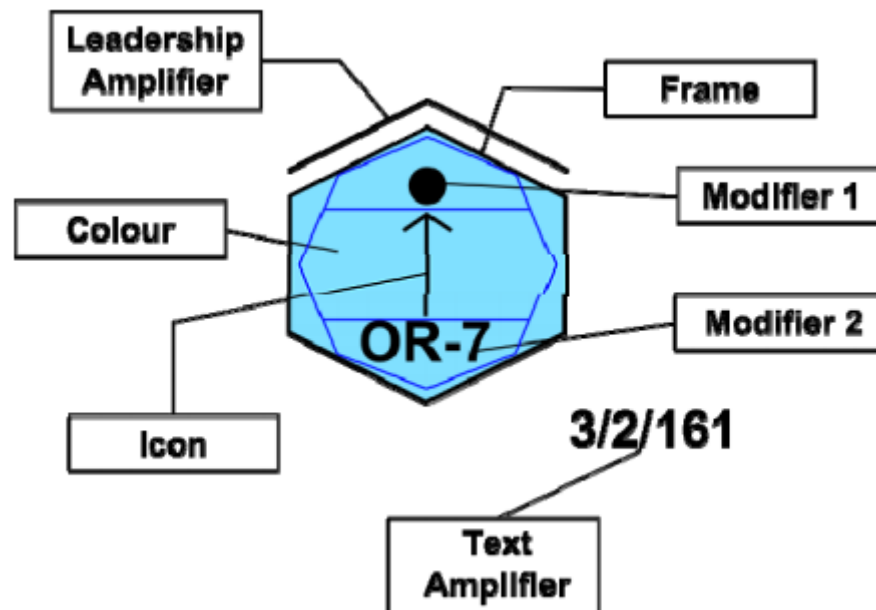


Figure 1 Dismounted Individual symbol composition (APP-6(D)(1), Figure 4-1)

As higher echelon C2 systems will most likely implement the full APP6-(D)(1), it is important that display of soldier symbols on both types of systems retains the most important information, which is the main sector icon. The sector 1 and 2 modifiers are then mainly used to contain auxiliary information.

An issue with the current specification is that there is a partial overlap between the main icons and sector 1 modifiers, which means that that some symbols can only be constructed using the sector 1 modifier (for example Liaison) and for some symbols there is a choice of using the main icon or the sector 1 modifier (for example Sniper, EOD).

There is also a substantial overlap between the sector 1 and 2 modifiers.

Think the APP-6(D)(1) soldier symbology can be improved by:

- Ensuring all relevant symbols are available as main icons.
- Reducing the overlap between the main sector and modifiers as much as possible.
- And if there is overlap, make the overlapping icon sets consistent.

In order to achieve this, changes are proposed to the main sector icon and modifier tables.

Analysis

The following categories of information are currently being covered by the main sector icon and modifiers:

- Activity/Task
 - Military (for example SWAT)
 - Civilian (for example Police)
- Weapon
- Echelon
- Functional Staff Area (J1, etc.)
- Rank (OF-1, WO-1 etc.)
- 'Mobility' (for example SKI)
- Special equipment (for example combat camera)

The current allocation of information category per sector is shown in Table 1 below. The +/- sign is used to indicate there is partial overlap.

Information Category	Main Sector	Sector 1	Sector 2
Activity/Task	+/-	+/-	
Weapon	+		
Echelon		+	
Functional Staff Area		+	+
Rank		+	+
Mobility			+
Special equipment		+	

Table 1 Current APP-6(D)(1) allocation per sector

What is clear from this table is that there are currently 7 types of information, but only 3 sectors that can be used to display a category! Not all combinations will be valid or sensible, but in principle most of them could be combined for a single soldier symbol. For example take a SOF platoon commander:

Information Category	Value
Activity/Task	SOF
Weapon	Automatic Rifle
Echelon	Platoon
Functional Staff Area	-
Rank	WO-1
Mobility	SKI
Special equipment	Combat Camera

Table 2 SOF Platoon Commander Symbol

If the LCGDDS/C4I Working Group would make a data model for the soldier symbology based on the current APP-6(D)(1), we would support separate properties for each type of information. However, only

3 can be displayed at the same time! A receiving system may also pick a different permutation of sectors for display.

If the C2 system would only supports Soldier Symbol creation based on the 3 sectors, the user would only be able to pick 3 categories!

Addressing this issue in general would go beyond the scope of a change proposal to APP-6(D)(1). It would either mean:

- Removing information categories altogether. For example:
 - Is it really necessary to support activity/task icons such as EOD, SWAT etc. These are types of units, individuals are always part of a unit, do we need to be able to redundantly display that an individual is part of a SWAT unit inside the individual's symbol? This would normally be handled by an ORBAT relationship and can be displayed outside the frame using the M amplifier (see Figure 2).
 - Do we need to support special equipment, if so why only combat camera, but not laser rangefinder, mine detector etc. ? Note there is also a V amplifier outside the frame to identify equipment type in text.
 - Is the rank of the individual really necessary for dismounted individual symbols? So far we have not seen any Soldier System that provides the capability to specify the rank for an individual, let alone display it on the symbol. Instead many soldier systems display the call sign (T amplifier) which indicates the role and implicitly the rank of the soldier.
- Adding additional amplifiers to the soldier system.
 - For example by moving the echelon outside sector 1 to a position above the symbol similar to units.

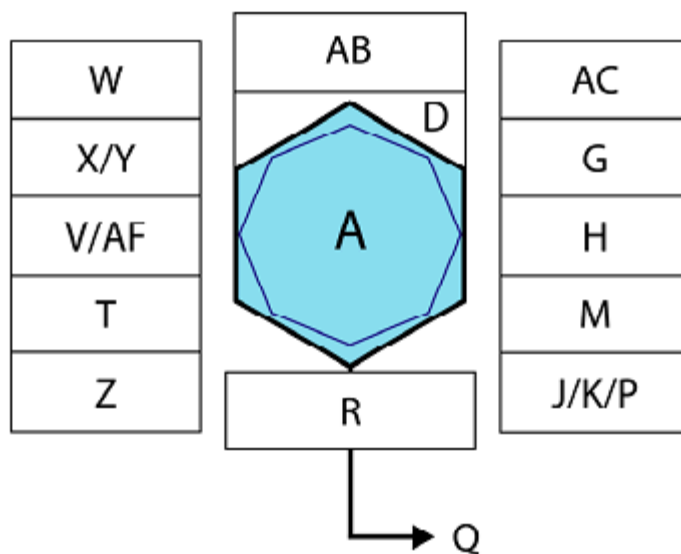


Figure 2 Icon, Modifier and Amplifier Fields, from APP-6(D)(1) Figure 4-3

Therefore the change proposal for now is limited to:

- Ensuring all relevant symbols are available as main icons.
- Reducing the overlap between the main sector and modifiers as much as possible.
- And if there is overlap, make the overlapping icon sets consistent.

Change proposal Overview

The proposed changes are shown in Table 3 below:

- The set of Activity/Task icons is harmonized between the main sector and sector 1.
- This remains the only duplication.
- All other duplication is removed.

Information Category	Main Sector	Sector 1	Sector 2
Activity/Task	+ (same as sector 1)	+ (same as main sector)	
Weapon	+		
Echelon		+	
Functional Staff Area		(removed)	+
Rank		(removed)	+
Mobility			+
Special equipment		(Moved to sector 2)	+

Table 3 Proposed changes

The proposed concept is that a dismounted individual symbol is constructed as follows:

- Option 1:
 - Main sector is used to display the weapon
 - Sector 1 displays:
 - The echelon for leadership symbols
 - Activity/Task of the individual for non-leadership symbols
- Option 2:
 - Main sector is used to display the Activity/Task of the individual.
 - Sector 1 is used to display the echelon for leadership symbols only.

Sector 3 is used to specify either additional:

- 'Mobility' (for example SKI)
- Special equipment (for example combat camera)
- Functional Staff Area (J1, etc.)
- Rank (OF-1, etc.)

We think the proposed changes greatly simplifies the use of soldier symbology. The list of proposed other changes and revised modifier tables are listed below.

List of other changes:

- Main sector icons for Infantry, Medic, Signaler and Reconnaissance are missing, they are only available as full frame icons. This means they can never be used in conjunction with sector modifiers.
 - *Proposal, add Infantry, MEDIC (with cross icon) and Signaler (with 'lightning' icon) Recon (icon) symbols to the main sector.*
 - *Proposal, subsequently remove the full frame icons, they seem to serve no particular purpose once the symbols have been added to the main sector and would just represent a special case. Scaling rules allow all main sector icons to fill the shape. See the extract*

from APP-6(D)(1) below.

4.2.5. Alternative Main Icon Symbol Sizes

Main icons shall be placed within the "MAIN" sector of the bounding octagon. Icons may be re-sized accordingly due to the presence or absence of modifiers in order to optimise legibility, in particular on handheld devices. (See Figure 4-6).

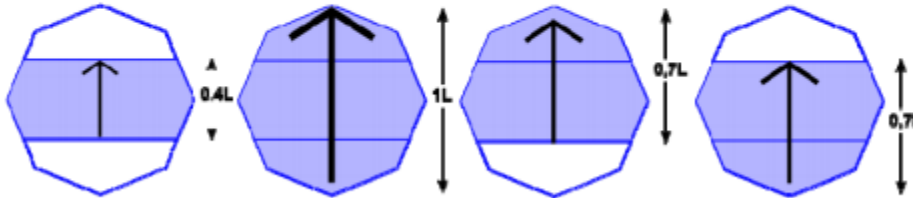


Figure 4-6: Alternative Main Icon Symbol Sizes.

- At the lower echelon levels, the distinction between commander (CDR) and second in command (SIC) is very important, but there is no graphical differentiation between the two with the command indicator. The distinction between CDR and SIC is also defined by STANAG 4677. The original soldier symbol proposal had a different leadership indicator for the SIC. We understand it was dropped after careful consideration.
 - Proposal: add 'CDR' and 'SIC' symbols to Dismounted Individual main sector icons.
- The Designated Marksman (as defined in STANAG 4677) is missing.
 - Propose to add it with icon "DM"

The table below shows the combined result of the proposed changes to table A-31

Entity	Entity Type	Entity Subtype	Code	Remarks
Military				
	Service/Branch			
		Infantry		Moved to main sector
		Medical		Moved to main sector
		Reconnaissance		Moved to main sector
		Signal		Moved to main sector
	Activity/Task			
		Explosive Ordnance Disposal (EOD)		
		Field Artillery Observer		
		Joint Fire Support		
		Liaison		
		Messenger		
		Military Police		
		Observer		
		Security		
		Sniper		
		Designated Marksman		New, from STANAG 4677
		Special operations Forces (SOF)		
		Medic		Copy full frame
		Signaler		Copy full frame
		Reconnaissance		Copy full frame
		Infantry		Copy full frame
		Close Protection		Copy sector 1
		Crowd and Riot Control		Copy sector 1
		SWAT		Copy sector 1
		Commander (CDR)		New, from STANAG 4677
		Second In Command (SIC)		New, from STANAG 4677
		Demolition (DEM)		Copy Sector 1
		Multinational		Copy Sector 1
		Multinational Specialized Unit		Copy Sector 1
Civilian				
	Activity Task			
		Police		
		NGO		Copy sector 1
		GO		Copy sector 1
Military				
	Lethal Weapons			
		<i>No changes, omitted for brevity</i>		
	Non Lethal Weapons			
		<i>No changes, omitted for brevity</i>		

Table A-32 – Sector 1 modifiers, revised table. Light grey rows are duplicates of the main sector icons

Unspecified		
Explosive Ordnance Disposal (EOD)		
Field Artillery Observer		Copy main sector icon
Joint Fire Support		Copy main sector icon
Liaison		Copy main sector icon
Messenger		Copy main sector icon
Military Police		Copy main sector icon
Observer		Copy main sector icon
Security		
Sniper		
Designated Marksman		New, from STANAG 4677
Special operations Forces (SOF)		Copy main sector icon
Medic		New, Copy full frame
Signaler		New, Copy full frame
Reconnaissance		New, Copy full frame
Infantry		New, Copy full frame
CDR		New, from STANAG 4677
SIC		New, from STANAG 4677
Demolition (DEM)		New, Copy Sector 2
Police		Copy main sector icon
NGO		
GO		
Multinational		
Multinational Specialized Unit		
Video Imagery (COMBAT CAMERA)		Moved to sector 2
J1 through J9		
OF-1 through OF-10		
OF-D		
OR-1 through OR-9		
WO-1 through WO-5		
(echelon) Individual through Brigade		

Table A-33 Proposed Sector 2 Modifiers

Unspecified		
Airborne		
Bicycle		
Mountain		
SKI		
Video Imagery (COMBAT CAMERA)		Moved from sector 1

J1 through J9		
OF-1 through OF-10		
OF-D		
OR-1 through OR-9		
WO-1 through WO-5		