NOT MEASUREMENT SENSITIVE

MIL-STD-2525B
30 January 1999

SUPERSEDING
MIL-STD-2525A
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DEPARTMENT OF DEFENSE INTERFACE STANDARD

COMMON WARFIGHTING SYMBOLOGY

AMSC N/A

AREA INST

FOREWORD

1. This standard is approved for use by all Departments and Agencies of the Department of Defense (DOD). Using human factors engineering research, the standard is designed to eliminate conflicts within various symbol sets and to bring a core set of common warfighting symbology under one DOD standard. MIL-STD-2525B is designed to equip DOD with a standard solution that provides sets of C4I symbols, a coding scheme for symbol automation and information transfer, an information hierarchy and taxonomy, and technical details to support systems. The standard provides support through interoperability and users' input, which are essential to ensure that the standard continues to meet the warfighter's requirements. MIL-STD-2525B is the primary reference that DOD uses to standardize warfighting symbology.

2. Joint standard symbology is synthesized from land-based, nautical, and aeronautical warfighting domains, and is an increasingly essential ingredient in the successful implementation of the Command, Control, Communications, Computers, and Intelligence for the Warrior (C4IFTW) concept. Joint warfighting has strengthened the requirement for the rapid exchange of information by the C4I systems community, expanding into the weapons control or engagement domain.

3. Recommendations, additions, deletions, and any pertinent data which may be of use in improving this document should be addressed to: Lead Standardization Activity (LSA), Center for Standards (CFS), ATTN: Information Standards Division, Parkridge III, 10701 Parkridge Blvd, Reston, VA 20191-4398 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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1. SCOPE

1.1 Scope. This standard provides common warfighting symbology along with details on its display and plotting to ensure the compatibility, and to the greatest extent possible, the interoperability of DOD Command, Control, Communications, Computer, and Intelligence (C4I) systems development, operations, and training. The standard addresses the efficient transmission of symbology information within the infosphere through the use of a standard methodology for symbol hierarchy, information taxonomy, and symbol identifiers. The standard applies to both automated and hand-drawn graphic displays. These symbols are designed to enhance DOD's joint warfighting interoperability by providing a standard set of common C4I symbols. Additional symbol sets may be provided as necessary when this document is updated.

1.2 Purpose. This standard is designed to provide the guidelines and criteria necessary for the development and display of standard C4I warrior symbology. The requirement to standardize C4I warfighting symbology in order to provide a family of symbology standards in support of the C4I for the Warrior (C4IFTW) concept was recognized at the 30 August 1993 meeting of the Military Communications-Electronics Board (MCEB). To satisfy these needs, common warfighting symbology standardization incorporates MIL-STD-2525B, *Common Warfighting Symbology*, a DOD symbol data repository, and supporting documentation such as the Symbology Information Technology Standards Management Plan (SITSMP), Configuration Management Plan, and Symbology Standards Management Committee (SSMC) charter (see figure 1).

1.3 Applicability. This standard applies to all DOD components directly or indirectly involved with C4I operations, system operations, system development, and training within the context of warfighting operations. MIL-STD-2525B will serve as the standard symbol set for all future DOD uses of C4I symbology. The standard can be applied to mapping/charting, weather, cockpit display, and engineering design symbology to the extent that it is usable by these communities. The standard will apply to all future use of symbols in two-dimensional and electronic display systems in C4I environments.

a. MIL-STD-2525B combines the symbology from two separate usage domains, referred to as the "force domain" and the "engagement domain." These domains use warfighting symbology in support of their C4IFTW functions. When integrated, this symbology provides the basis for a final standard solution for C4IFTW symbology.

b. Symbology used in the force domain has evolved from North Atlantic Treaty Organization (NATO) Standardization Agreement (STANAG) 2019 (APP 6), "Military Symbols for Land Based Systems," and U.S. Army Field Manual (FM) 101-5-1/Marine Corp Reference Publication (MCRP) 5-2A, *Operational Terms and Graphics*. Commanders and staff at all echelons use the symbols and graphics contained in these documents for planning and execution of ground force military operations. These symbols represent units, installations, equipment, and operations, and are used in automated C4I systems or to mark maps and overlays manually.

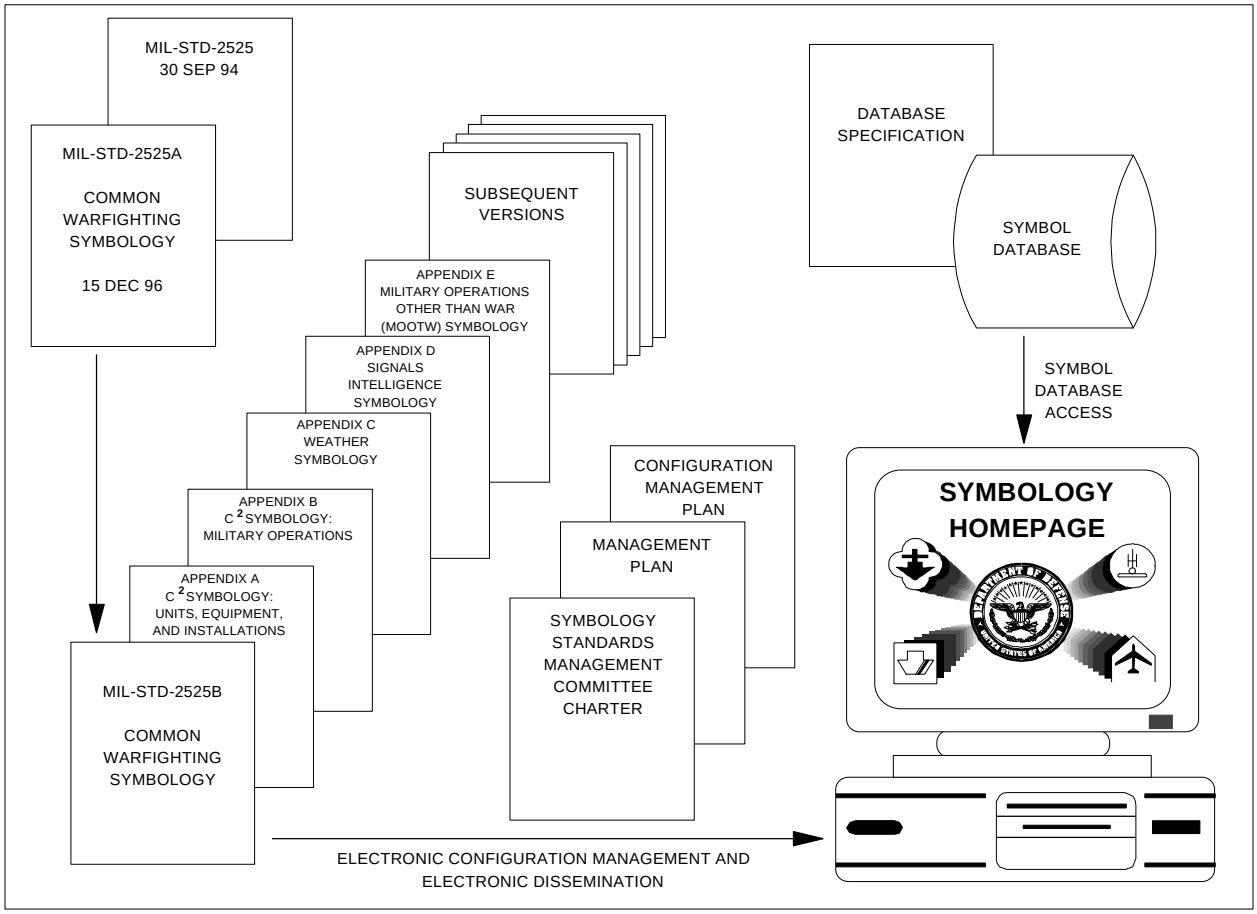


FIGURE 1. Common warfighting symbology documents.

c. Symbology used in the engagement domain has evolved from the requirement to plot sea and air tracks on cockpit, radar, weapons control, and command and control tactical displays. Joint Tactical Information Distribution System (JTIDS) and Naval Tactical Data System (NTDS) symbology, and most recently, "Display Symbology and Colors for NATO Maritime Units," have been the primary sources for track symbols used within the engagement domain.

d. MIL-STD-1787C-Aircraft Display Symbology has been developed to provide standards guidance regarding rotary and fixed wing cockpit displays. MIL-STD-1787C is in draft for planned FY99 release, and supersedes MIL-STD-1295A. Joint Service Specification Guide 1776 - Aircrew Systems is also in draft for early FY99 release, and includes cockpit system engineering and validation guidance.

1.4 Content. MIL-STD-2525B defines the composition, construction, and display of tactical symbols and tactical graphics. Each approved symbol set is presented in one of the five appendixes:

Appendix A - C^2 Symbology: Units, Equipment, and Installations
Appendix B - C^2 Symbology: Military Operations
Appendix C - METOC Symbology
Appendix D - Signals Intelligence Symbology
Appendix E - Military Operations Other Than War

Appendixes A through E contain tables listing symbol identification codes, hierarchy flowcharts, each approved symbol in the set, and any additional technical specifications specific to that set. Each of the warrior icons listed can be cross-referenced to the information hierarchy (taxonomy) and the symbol coding scheme provided in each symbol set's appendix. The information hierarchy provides an organization or structure for C4I warrior symbology, which encompasses the tactical information commonly exchanged via symbology. Each symbol category and icon is given a number that is cross-referenced to a symbol ID code. If common warfighting symbology (CWFS) is implemented to visually display or present symbology, the implementaion must comply with the provisions of this standard.

a. Symbols should comply with the National Imagery Transmission Format Standard (NITFS) when formed and disseminated. The NITFS implementation of the Computer Graphics Metafile (CGM), MIL-STD-2301, should be used for input interpretation and output generation of symbol representations. MIL-STD-2500 series should be used for file formation and digital exchange of imagery, symbology, and other imagery-related products. The symbol coding scheme in MIL-STD-2525B is the preferred code for all symbol transmissions in the DOD. If necessary, the coding scheme may be translated at the user system; however, to ensure interoperability, a common code for warrior symbol constructs developed using CGM across joint interfaces is necessary and is made standard in this document. Transmission vehicles are provided by the United States Message Text Format (USMTF) community's GRAPHREP-OVERLAY message and the Variable Message Format (VMF) community's OVERLAY message. These message formats are available to assist in symbology dissemination and are not mandated by MIL-STD-2525B when other forms of information transfer already in use are able to perform this function.

b. Additional icons, refinement of the hierarchy, refinement of the coding scheme, and additional tactical graphics will be developed and presented in future updates of this standard. Special symbol sets will be released as they are developed.

1.5 Changes. MIL-STD-2525B is designed to be flexible enough to accommodate change, further development and input from the operators and users. Changes to these symbols and the addition of new symbol sets will be introduced through the procedures defined in the Symbology Configuration Management Plan, which mandates that changes will be approved by a consensus of the voting members of the Symbology Standards Management Committee (SSMC). The staffing of configuration management items, called change proposals, will be in accordance with the procedures provided in JIEO Plan 3200, *Information Technology Standards Management Plan*, and JIEO Plan 9002, *Symbology Information Technology Standards Management Plan*.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, and 5 of this standard. This section does not include documents cited in other sections of this standard or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3, 4, and 5 of this standard, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and its supplement, cited in the solicitation.

STANDARDS

DEPARTMENT OF DEFENSE

FIPS Pub 10 Series	-	Federal Information Processing Standards Publications. Name of Standard: Countries, Dependencies, Areas of Special Sovereignty, and Their Principal Administrative Divisions (FIPS PUB 10-4).
MIL-STD-1472 Series	-	Department of Defense Design Criteria Standard: Human Engineering
MIL-STD-1787 Series	-	Aircraft Display Symbology
MIL-STD-2401 Series	-	World Geodetic System, WGS-84
MIL-STD-2500 Series	-	National Imagery Transmission Format for the National Imagery Transmission Format Standard.
MIL-STD-6016 Series	-	Department of Defense Interface Standard; Tactical Digital Information Link (TADIL) J Message Standard
MIL-STD-6040 Series	-	United States Message Text Formatting Program

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

(Copies of the Federal Information Processing Standards (FIPS) are available to Department of Defense activities from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. Others must request copies of FIPS from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161-2171.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

Technical Architecture Framework for Information Management, version 3.0, volume 8	-	DoD Human Computer Interface (HCI) Style Guide
Joint Publication 1-02	-	Department of Defense Dictionary of Military and Associated Terms
Joint Publication 3-59	-	Joint Doctrine for Meteorological and Oceanographic Support
AFM 51-12V2	-	Weather for Aircrews
APP-6	-	Military Symbols for Land Based Symbols
FM 34-3	-	Intelligence Analysis
FM 101-5	-	Staff Organizations and Operations
FM 101-5-1/MCRP 5-2A	-	Operational Terms and Graphics
STANAG 1241	-	NATO Standard Identity Description for Tactical Use
User Interface Specification for the Defense Information Infrastructure (DII)	-	Version 3.0
Joint Service Specification Guide 1776	-	Aircrew Systems

(Joint Publications are available from the Joint Staff, Washington, DC 20318-7000.)

2.3 Nongovernment publications. None referenced.

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

3.1 Acronyms used in this standard. The acronyms used in this standard are defined as follows:

AA	Assembly Area
A/C	Aircraft
AAM	Air-to-Air Missile
AAWC	Antiair Warfare Commander
ACA	Airspace Coordination Area
ACP	Air Control Point
ACV	Armored Combat Vehicle
AD	Air Defense
ADP	Automated Data Processing
AEW	1. Airborne Electronic Warfare 2. Airborne Early Warning
AF	Air Force
AGI	Auxiliary Group Intelligence
ANM	Acoustic Noise Monitor
APC	Armored Personnel Carrier
APOD	Aerial Port of Debarkation
APOE	Aerial Port of Embarkation
APP	Allied Procedures Publication
ASM	Antiship Missile
ASP	Ammunition Support Point
ASR	Alternate Supply Route
ASUW	Antisurface Warfare
ASW	Antisubmarine Warfare
ATAC	Air Transportable Acoustic Communications
BT	Bathythermograph
BSA	Brigade Support Area
C2	Command and Control
C3I	Command, Control, Communications, and Intelligence
C4I	Command, Control, Communications, Computers, and Intelligence
C4IFTW	C4I for the Warrior
CAP	Combat Air Patrol
CARP	Computed Air Release Point
CAS	Close Air Support

CASS	Command Activated Sonobuoy System
CATK	Counterattack
CENOT	Communications Intelligence Notation
CCP	Communication Check Point
CFA	Covering Force Area
CFL	Coordinated Fire Line
CGM	Computer Graphics Metafile
CID	Criminal Investigation Division
CIE	Commission Internationale de l'Eclairage
CINC	Commander in Chief
COLT	Combat Observation and Lasing Team
COMMZ	Communications Zone
CP	Check Point
C/S/A	CINCs, Services, and Agencies
CSAR	Combat Search and Rescue
CWFS	Common Warfighting Symbology
DCA	Defensive Counter Air
DGZ	Designated Ground Zero
DIA	Defense Intelligence Agency
DICASS	Directional Command Activated Sonobuoy System
DIFAR	Directional Frequency Analysis and Recording
DISA	Defense Information Systems Agency
DLIC	Detachment Left-in-Contact
DLRP	Data Link Reference Point
DOD	Department of Defense
DODISS	Department of Defense Index of Specifications and Standards
DRPR	Drawing Practices
DTG	Date-Time Group
EA	Electronic Attack
EC	Electronic Combat
ECM	Electronic Countermeasures
ELNOT	Electronic Intelligence Notation
EO	Electro-optical
EP	Electronic Protection
EPW	Enemy Prisoner of War
ERP	Engineer Regulating Point
ES	Electronic Warfare Support
EW	Electronic Warfare
EZ	Extraction Zone
FAADEZ	Forward Area Air Defense Zone
FC	Fire Control
FCZ	Forward Combat Zone

FEBA	Forward Edge of the Battle Area
FLB	Forward Logistics Base
FLET	Forward Line of Enemy Troops
FLOT	Forward Line of Own Troops
FM	Field Manual
FO	Frame Optional
FSCL	Fire Support Coordination Line
F/W	Fixed Wing
GPS	Global Positioning System
GSD	Graphical Situation Display
GZ	Ground Zero
HCI	Human Computer Interface
HFAC	Human Factors
HIDACZ	High-Density Airspace Control Zone
HL	Holding Line
H/MAD	High/Medium Altitude Air Defense
ICBM	Intercontinental Ballistic Missile
IFF	Identification, Friend or Foe
IFV	Infantry Fighting Vehicle
INST	Information Standards and Technology
IP	Initial Point
IRBM	Intermediate Range Ballistic Missile
ISB	Intermediate Staging Base
JAG	Judge Advocate General
JTIDS	Joint Tactical Information Distribution System
JPOTF	Joint Psychological Operations Task Force
JSEAD	Joint Suppression of Enemy Air Defenses
JSOTF	Joint Special Operations Task Force
LAB	Logistics Assault Base
LC	Line of Contact
LCCP	Large Communication Configured Package
LD	Line of Departure
LLLTV	Low-Light Level Television
LLTR	Low-Level Transit Route
LOA	Limit of Advance
LOC	Lines of Communications
LOFAR	Low Frequency Analysis and Recording
LOTS	Logistics Over-The-Shore
LP	Linkup Point
LRP	Logistics Release Point
LRS	Long Range Surveillance
MAGTF	Marine Air-Ground Task Force

MBA	Main Battle Area
MC&G	Mapping, Charting, and Geodesy
MCM	Mine Countermeasures
MEDEVAC	Medical Evacuation
MEZ	Missile Engagement Zone
MICV	Mechanized Infantry Combat Vehicle
MOOTW	Military Operations Other Than War
MP	Military Police
MPA	Maritime Patrol Aircraft
MRR	Minimum-Risk Route
MSD	Minimum Safe Distance
MSR	Main Supply Route
MTF	Medical Treatment Facility
NAI	Named Area of Interest
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, and Chemical
NFA	No-Fire Area
NFL	No-Fire Line
NIMA	National Imagery and Mapping Agency
NITFS	National Imagery Transmission Format Standard
NOTAM	Notice to Airmen
NTDS	Naval Tactical Data System
OBJ	Objective
OP	1. Observation Point 2. Observation Post
PAA	Position Area for Artillery
PDF	Principal Direction of Fire
PIM	Path of Intended Motion
PLD	Probable Line of Deployment
POD	Port of Debarkation
POE	Port of Embarkation
PP	Passage Point
PS	Personnel Services
PZ	Pickup Zone
QSTAG	Quadripartite Standardization Agreement
R3P	Rearm, Refuel, and Resupply Point
RAA	Rear Assembly Area
RAOC	Rear Area Operation Center
RCZ	Rear Combat Zone
RES	Reserve
RFL	Restrictive Fire Line
RGB	Red, Green, Blue
RL	Report Line

RO	Range Only
RO/RO	Roll-on/Roll-off
ROZ	Restricted Operations Zone
RP	Release Point
RPV	Remotely Piloted Vehicle
RV	Reentry Vehicle
S/SSM	Surface-to-Subsurface Missile
SAAFR	Standard use Army Aircraft Flight Route
SAM	Surface-to-Air Missile
SAR	Search and Rescue
SFOB	Special Forces Operations Base
SIF	Selective Identification Feature
SIGINT	Signals Intelligence
SL	Start Line
SLBM	Sea-Launched Ballistic Missile
SOF	Special Operations Forces
SP	1. Starting Point 2. Self-Propelled 3. Strong Point
SPOD	Seaport of Debarkation
SPOE	Seaport of Embarkation
SSM	Surface-to-Surface Missile
SSMC	Symbology Standards Management Committee
STANAG	Standardization Agreement (NATO)
SWG	1. Symbology Working Group 2. Surface Warfare Group
TAACOM	Theater Army Area Command
TAI	Target Area of Interest
TCP	Traffic Control Point
TF	Task Force
TGT	Target
TOT	Time on Target
TV	Television
TWS	Track While Scan
UAV	Unmanned Aerial Vehicle
UEI	Units, Equipment, and Installations
UF	Unframed
USA	United States Army
USMTF	United States Message Text Format
UTM	Universal Transverse Mercator
UWT	Under Water Telephone
UWTG	Under Water Tug
VDC	Virtual Device Coordinates
VLAD	Vertical Line Array Difar
VMF	Variable Message Format

V/STOL	Vertical/Short Take-Off and Landing
WFZ	Weapons Free Zone

3.2 Definitions used in this standard. Terms used in this document are defined as follows. The source of the definition is cited in parentheses.

a. Affiliation -the threat posed by the warfighting object being represented. The basic affiliation categories are unknown, friend, neutral, and hostile.

b. Area - 1. A flat piece of ground or open space. 2. A distinct space or surface, or one having a special function. Refer to FM 101-5-1/MCRP 5-2A for the definition of specific types of areas.

c. Assumed friend - A track which is assumed to be a friend because of its characteristics, behavior, or origin. (MIL-STD-6016)

d. Atmospheric environment phenomena - A term used to describe natural phenomena occurring in the envelope of air surrounding the Earth, including its interfaces and interactions with the Earth's solid or liquid surface.

e. Attribute - A distinctive feature or characteristic such as line, shape, color, texture (fill), edge, mass, and value.

f. Battlespace - A warrior's battlespace is the total, fluid, dynamic environment within which mission-derived operational objectives are pursued.

g. Boundary - 1. Something indicating a border or limit. 2. The border or limit indicated. Refer to FM 101-5-1/MCRP 5-2A for the definition of specific types of boundaries.

h. Combat Effectiveness - The ability of a unit to perform its mission. Factors such as ammunition, personnel, status of fuel, and weapon systems are assessed and rated. See FM 101-5.

i. Commission Internationale de l'Eclairage (CIE) - A color space chart widely used to describe the range of color seen by the human eye.

j. Contact - In air intercept, a term meaning, "Unit has an unevaluated target." (Joint Pub 1-02)

k. Engagement domain - An environment that is primarily based on the command and control of weapons systems and designed to facilitate rapid identification and judgment based on the need to engage or not to engage.

l. Engineering design symbology - Symbology used to design, plan, and develop engineering drawings in the chemical, electrical, civil, mechanical, and structural engineering fields.

m. Faker - A friendly track acting as a hostile for exercise purposes. (MIL-STD-6016)

n. Fields - A defined area in which a limited combination of alphanumeric and other characters, indicators, and/or abbreviations are grouped/situated in an established way around a symbol/icon, line, area, point, or boundary and used for the purpose of providing additional information about the associated object or battlespace geometry.

o. Force domain - An environment that is primarily based on the command and control (management of the battlespace) of units and forces.

p. Frame - The geometric border of a symbol that provides an indication of the affiliation, battle dimension, and status of a warfighting object.

q. Friend - A track belonging to a declared friendly nation. (MIL-STD-6016)

r. Graphic - All products of the cartographic and photogrammetric art.

s. Hostile - A track declared to belong to any opposing nation, party, group, or entity, which by virtue of its behavior or information collected on it such as characteristics, origin or nationality contributes to the threat to friendly forces. (MIL-STD-6016)

t. Icon - The innermost part of a symbol that provides a graphic representation of a warfighting object.

u. Indicator - One of several specific graphical additions to a symbol used to provide additional information pictorially vice textually.

v. Installation - A military camp or base.

w. Interoperability - The ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together. (Joint Pub 1-02)

x. Joker - A friendly track as a suspect for exercise purposes. (MIL-STD-6016)

y. Line - 1. A demarcation. 2. A border or boundary. Refer to FM 101-5-1/MCRP 5-2A for the definition of specific types of lines.

z. MC&G symbology - Symbology that represents natural and man-made features used in the production or display of maps, charts, and digital geospatial information.

aa. Meteorological symbology - Symbology used in weather/climatic forecasting.

ab. Modifier - Optional text or graphics that provide additional information about a symbol or tactical graphic.

ac. Neutral - A track or contact whose characteristics, behavior, origin, or nationality indicate that it is neither supporting nor opposing friendly forces. (MIL-STD-6016)

ad. Oceanic environment phenomena - A term used to describe natural phenomena occurring on or below the surface of the Earth's oceans and seas.

ae. Pending - A track which has not been subjected to the identification process. (MIL-STD-6016)

af. Phase Lines - Lines on map that are easily identifiable from a ground or air vantage point. They may include features such as ridge lines, tree lines, hilltops, roads, and rivers.

ag. Point - A position, place, or locality: SPOT. Refer to FM 101-5-1/MCRP 5-2A for the definition of specific types of points.

ah. Signals Intelligence (SIGINT) - 1. A category of intelligence comprising either individually or in combination all communications intelligence, electronics intelligence, and foreign instrumentation signals intelligence, however transmitted. 2. Intelligence derived from communications, electronics, and foreign instrumentation signals. (Joint Pub 1-02)

ai. Space environment phenomena (space weather) - A term used to describe natural phenomena occurring above 50 kilometers altitude.

aj. Staff - A straight line used as a headquarters indicator in a symbol or used to connect a symbol with its location on a map, chart, or display. The free end of the staff indicates the location of the track or object.

ak. Status - A determination or declaration as to whether a track's or object's location is existing/present or is planned/anticipated at the time that the symbology was generated or the time associated/presented with the symbology itself.

al. Suspect - A track which is potentially hostile because of its characteristics, behavior, origin, or nationality. (MIL-STD-6016)

am. Symbol - An object that presents information. (DOD Symbology Ad Hoc Working Group, 6 October 1994)

an. Symbol ID code - An alphanumeric code based on a database structure that provides the minimum elements required to construct the basic icon and/or a complete symbol. (Joint Pub 1-02)

ao. Tactical graphic - A category of warfighting symbology that provides information about objects necessary for battlefield planning and management.

ap. Tactical symbol - A category of warfighting symbology that provides information about the affiliation, battle dimension, status, and mission of a warfighting object.

aq. Text - Words, alphanumeric information, and other ASCII characters used to define or further designate the meaning of a symbol.

ar. Track - 1. A series of related contacts displayed on a plotting board. 2. The actual path of an aircraft above, or a ship on, the surface of the earth.

as. Unknown - An evaluated track which has not been identified. (MIL-STD-6016)

at. Virtual device - An idealized graphics device that presents a set of graphics capabilities to graphics software or systems via the Computer Graphics Interface. (ANSI X3.122)

au. Virtual device coordinates (VDC) - The coordinates used to specify position in the VDC space. These are absolute two-dimensional coordinates. (ANSI X3.122)

av. VDC extent - A rectangular region of interest contained within the VDC range. (ANSI X3.122)

aw. VDC range - A rectangular region within VDC space consisting of the set of all coordinates representable in the declared coordinate type and encoding format of the metafile. (ANSI X3.122)

ax. Warfighting symbology - Symbology used to plan and execute military operations in support of C4I functions. These symbols fall into two basic categories: tactical symbols and tactical graphics (see paragraph 4.3, symbol categories).

ay. Zone - A section of an area or territory set apart for a specific purpose. Refer to FM 101-5-1/MCRP 5-2A for the definition of specific types of areas.

4. GENERAL REQUIREMENTS

4.1 Objective. The display of warfighting symbology has evolved from a static, manual operation to include fully automated computer generation. This evolution has resulted in the fielding of many system-specific symbology implementations by the CINCs, Services, and Agencies (C/S/As) to meet the mission requirements of the warfighter. The "C4I for the Warrior" concept, signed by the Chairman of the Joint Chiefs of Staff in June 1992, brings together C4I functions to provide the warfighter with a seamless, real-time, true representation of the battlespace. The standardization of warfighting symbology shall play an integral role in achieving interoperability during joint service operations. While the primary focus of this standardization is the electronic generation of symbology, this effort must also support those mission requirements where symbology is hand drawn by the warfighter. In addition, this standard is designed so that all essential symbology information can be communicated to the warfighter on either a monochrome (i.e., black, white, or single color) or multicolor-capable display.

4.2 Organization. The purpose of warfighting symbology is to convey information about objects in the warfighter battlespace. The basic standard defines composition, construction, display, and transmission of common warfighting symbology. This chapter introduces the general requirements for warrior symbology by defining the general categories into which the symbology can be divided, explaining the symbol hierarchy, and outlining the use of special symbol sets. Appendixes A through E contain additional technical specifications applicable to each set, symbol ID code tables, hierarchy flowcharts, and the approved symbology in each set.

4.3 Symbology categories. This standard defines two categories of warfighting symbology: tactical symbols and tactical graphics. Each category can be characterized as to whether it contains point, line, or area objects. It is expected that C4I systems will implement those symbols and/or graphics needed to satisfy operational requirements.

4.3.1 Tactical symbols. The tactical symbol category consists of point objects that present information that can be pinpointed in one location at a particular point in time. A tactical symbol is composed of an icon, frame, and fill, and may include additional modifiers. The components provide information about the symbol’s affiliation, battle dimension, status, and mission. The size and shape of a symbol are fixed and remain constant, regardless of the scale of the background projection, unless changed by the operator.

4.3.2 Tactical graphics. The tactical graphics category consists of point, line, and area objects that are necessary for battlefield planning and management, but cannot be presented as tactical symbols alone. Tactical graphics can delineate responsibilities and missions, provide guidance, establish control measures, and identify items of interest. A tactical graphic is composed of an icon and may include additional modifiers. The size and shape of the point graphics remain fixed, while the size and shape of the line and area graphics are determined by drawing parameters provided by the operator and the scale of the background on which the graphic is placed.

4.4 Symbology hierarchy. A hierarchy number is used to identify the location of each tactical symbol and graphic in the information taxonomy defined for each symbology set. The first position of the hierarchy number represents which symbology set the symbol or graphic is assigned to. With the exception of the METOC symbology set, the second position of the hierarchy number is occupied by "X," which is used as a placeholder to indicate the symbol's variable affiliation. In the METOC set, which has no affiliation, the second position and beyond represent increasingly deeper branches of the hierarchy. In the remaining four symbology sets, this breakdown begins at the third position. The depth of a set's structure (and therefore, the possible length of a symbol's hierarchy number) is determined by the number of icons or graphics in a specific set. The hierarchy for each symbology set is illustrated in its appendix.

4.5 Use of standard and special symbology sets. As referenced earlier in paragraph 1.4, this standard provides five approved symbology sets—C^2 Symbology: Units, Equipment, and Installations; C^2 Symbology: Military Operations; METOC Symbology; Signals Intelligence (SIGINT) Symbology; and Military Operations Other Than War Symbology. The SSMC is responsible for the standardization of all the symbology sets except METOC, providing configuration management by reviewing and approving additions and changes to these symbols and graphics. While the standardized symbology sets are intended to address the C4I information needs of the warfighter, it is expected that information from other operational domains will need to be displayed in order to accurately portray the battlespace. Many of these other domains have published symbology standards or other documents addressing information requirements that parallel those addressed here. Although these other domains are outside the scope of the current document, it is desirable to make the symbology they publish available with this standard. Therefore, the SSMC identifies symbology sets of potential interest to the warfighter and includes them as appendixes to the current document as appropriate. The METOC symbology provided in appendix C is an example of a special symbology set included in this standard. Although METOC symbology was derived from AF 51-12 and sources accepted by the international community, it is considered a mandatory part of this standard and shall be followed when presenting METOC symbology in MIL-STD-2525 compliant systems. The content of special symbology sets is maintained by an operational community other than the SSMC and is not under configuration management by this group. As a result, the symbology is not harmonized with the current standard and may be inconsistent with the symbology requirements presented here.

4.6 Symbol set composition. The five approved symbol sets are presented in the appendixes to this standard. Appendixes A, D, and E contain point-based tactical symbols, while appendixes B and C contain point- , line- , and area-based tactical graphics.

5. DETAILED REQUIREMENTS

5.1 Objective. To promote interoperability at the information level within the area of warfighting symbology, it is necessary to define a standard set of rules for symbol construction and generation to be implemented in C4I systems. The rules in this standard are considered to be the minimum necessary to ensure that information about warfighting symbology is exchanged successfully across service and organizational boundaries. These rules are not intended to constrain the manner in which the symbology is used.

5.2 Organization. This section provides the detailed requirements concerning the composition, construction, display, and transmission of tactical symbols and tactical graphics considered essential to achieve interoperability. Display rules are provided which allow the degree of complexity of the resulting symbology to be tailored to operational requirements and system capabilities. Additional implementation guidance is provided in each appendix as it applies to the particular symbology set.

5.3 Composition of tactical symbols. A tactical symbol is composed of a frame, fill, and icon and may include text and/or graphic modifiers that provide additional information (see figure 2). The frame attributes (i.e., affiliation, battle dimension, and status) determine the type of frame for a given symbol. Fill color is a redundant indication of the symbol's affiliation.

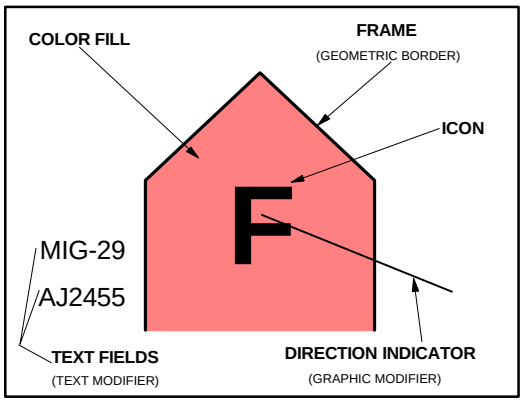


FIGURE 2. Symbol components.

5.3.1 Frame. The frame is the geometric border of a symbol that, when displayed, provides an indication of the affiliation, battle dimension, and status of a warfighting object. The frame may include modifiers (e.g., "U,""?,""J," and "K") that are placed inside or outside the border and help determine affiliation and/or dimension. If any of these modifiers is displayed in a symbol, it is considered to be an integral part of the frame. The frame serves as the base to which other symbol components and modifiers are added. Though sometimes optional, in most cases a frame surrounds an icon. Table I provides the approved frame shapes that depict affiliation and battle dimension for tactical symbols. A frame can be black or off-white depending on display background, or it can be colored, using the default colors in table XII, to provide redundant information about affiliation.

TABLE I. Frame shapes depicting affiliations and battle dimensions.

BATTLE DIMENSION / AFFILIATION	Unknown (Z)	ABOVE SURFACE		SURFACE				Sub-surface (U)	SOF (F)
		Space (P)	Air (A)	Ground(G)			Sea Surface (S)		
				Units	Equip-ment	Instal-lation			
PENDING (P) (YELLOW)									
UNKNOWN (U) (YELLOW)									
FRIEND (F) (CYAN)	N/A								
NEUTRAL (N) (GREEN)	N/A								
HOSTILE (H) (RED)	N/A								
ASSUMED FRIEND (A) (CYAN)	N/A								
SUSPECT (S) (RED)	N/A								
JOKER (J) (RED)	N/A								
FAKER (K) (RED)	N/A								

Note: Frames displayed with solid lines, as shown above, indicate status as present, i.e., the object exists at the location identified. See table II for examples of frames depicting planned or anticipated status.

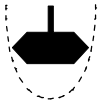
5.3.1.1 Affiliation. Affiliation refers to the threat posed by the warfighting object being represented. The basic affiliation categories are unknown, friend, neutral, and hostile. A quatrefoil frame shall be used to denote unknown affiliation, a circle or rectangle frame to denote friend affiliation, a square frame to denote neutral affiliation, and a diamond frame to denote hostile affiliation. A question mark centered in an "unknown" frame indicates that identification has not been determined and affiliation is pending. A question mark (?) in field E (see figure 3 and table III) of a "friend" or "hostile" frame indicates the uncertainty of the identification and shall identify the symbol as assumed friend or suspect. The letter J or K in field E of a "friend frame" is used to accommodate special exercise requirements and shall identify the symbol as joker or faker. Each of these affiliation categories is defined in paragraph 3.2. The codes for affiliation in the symbol ID code are included in the appendix for each symbology set.

5.3.1.2 Battle dimension. Battle dimension defines the primary mission area for the warfighting object within the battlespace. If the battle dimension cannot be or has not been determined, it is considered to be unknown. If the battle dimension is known, an object can have a mission area above the earth's surface (i.e., in the air or outer space), on the earth's surface, or below the earth's surface. If the mission area of an object is on the earth's surface, it can be either on land or sea. The ground dimension includes those mission areas on the land surface and is divided into units, equipment, and installations. The sea surface dimension includes those objects whose mission area is on the sea surface, whereas the subsurface dimension includes objects whose mission area is below the sea surface. As shown in table I, a frame open at the bottom shall be used to denote the air and space dimension, a closed frame shall be used to denote the ground and sea surface dimension, and a frame open at the top shall be used to denote the subsurface dimension. The codes for battle dimension in the symbol ID code are presented in the appendix for each symbology set. To clarify which battle dimension should be used for a given object, maritime surface platforms shall be depicted in the sea surface dimension, aircraft shall be depicted in the air/space dimension, and ground equipment shall be depicted in the ground dimension. Likewise, a landing craft whose primary mission is ferrying personnel or equipment to and from shore is a maritime unit and is represented in the sea surface dimension. However, a landing craft whose primary mission is to fight on land is a ground asset and is represented in the ground dimension. All units, regardless of service affiliation (i.e., an Army, Navy, or Air Force helicopter squadron), are depicted with a rectangle frame.

5.3.1.3 Status. Status refers to whether a warfighting object exists at the location identified (i.e., status is “present”) or will in the future reside at that location (i.e., status is “planned,” “anticipated,” “suspected,” or “on order”). Regardless of affiliation, present status is indicated by a solid line and planned status by a dashed line. In the latter case, if the icon in a tactical symbol is framed (see paragraphs 5.3.3 and 5.4.2), the symbol frame is a dashed line (see table II). If the icon is frame optional or unframed and is unfilled, the icon is a dashed line. If the icon is frame optional and contains a filled icon, the icon is displayed with a frame and the frame is a dashed line. Planned status cannot be shown if the symbol is an unframed filled icon or is displayed as a dot (see

paragraph 5.4.5). The codes for status in the symbol ID code are provided in the appendix for each symbology set.

TABLE II. Present and planned status for tactical symbols.

BATTLE DIMENSION / STATUS	AIR/SPACE	SURFACE			SUBSURFACE
		LAND		SEA SURFACE	
		UNITS	EQUIPMENT		
PRESENT POSITIONS (P) FOR FRAMED ICONS					
ANTICIPATED, PLANNED, SUSPECTED, OR ON ORDER (A) FOR FRAMED ICONS					
ANTICIPATED, PLANNED, SUSPECTED, OR ON ORDER (A) FOR UNFRAMED ICONS					

5.3.2 Fill. The fill is the interior area within a symbol. If a color fill is used in a framed symbol, it provides redundant information about the affiliation of the object. If a color fill is not used, the background of the symbol shall be transparent. In an unframed symbol, color shall be the sole indicator of affiliation, excluding text modifiers. Table I depicts the default colors that shall be used to designate affiliation when colored symbols are either hand-drawn or displayed electronically. This standard allows deviations from the default when systems require the capability to make distinctions among multiple types of forces, equipment, boundaries, etc. (e.g., to differentiate among coalition forces assigned a friend affiliation). Table XII provides additional information on how color is to be displayed in a symbol.

5.3.3 Icon. The icon is the innermost part of a symbol that, when displayed, provides an abstract pictorial or alphanumeric representation of a warfighting object. The icon in a tactical symbol portrays the role or mission performed by the object. This standard distinguishes between icons that must be framed or unframed and icons where framing is optional. The icons in the applicable appendix shall be used whenever a system displays any of the warfighting objects for which an icon is provided.

5.3.4 Modifiers. A modifier provides optional additional information about a symbol. The field ID, field title, description, and maximum allowable display and transmission lengths of symbol

modifiers are presented in tables III and XIII. The default placement of modifiers in fields around the symbol is shown in figure 3, and an example of each graphic modifier is included in figure 4. The placement of these modifiers applies to all tactical symbols regardless of battle dimension or whether the symbol is framed or unframed. Implementation guidance, where available, is provided in the appendix for each symbology set.

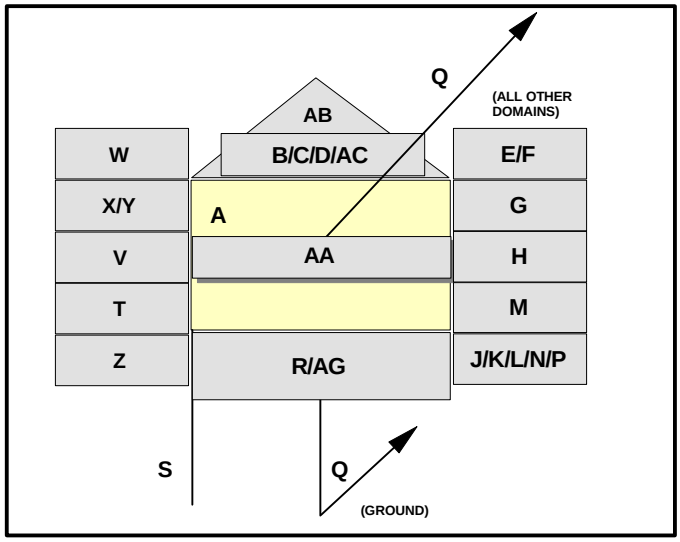


FIGURE 3. Field positions for tactical symbols.

TABLE III. Modifier field definitions and maximum display lengths for tactical symbols.

FIELD ID	FIELD TITLE	DESCRIPTION	U[1]	E[1/2]	I[1]	SI[1]	M[1]
A	Symbol Indicator	The innermost part of a symbol that represents a warfighting object (see paragraph 5.3.3).	G[3]	G	G	G	G
B	Echelon	A graphic modifier in a unit symbol that identifies command level (see paragraph 5.3.4.2, table IV, and figures 3 and 4).	G	-	-	-	G
C	Quantity	A text modifier in an equipment symbol that identifies the number of items present.	-	9[3]	-	-	-
D	Task Force Indicator	A graphic modifier in a unit symbol that identifies a unit as a task force (see paragraph 5.3.4.5 and figures 3 and 4).	G	-	-	-	G
E	Frame Shape Modifier (“U,”“?,”“J,” and“K”)	Graphic modifiers that help determine affiliation and/or battle dimension of an object (see paragraph 5.3.1 and table I).	G	G	G	-	G
F	Reinforced or Reduced	A text modifier in a unit symbol that displays (+) for reinforced, (-) for reduced, (±) reinforced and reduced.	3	-	-	-	3
G	Staff Comments	A text modifier for units, equipment and installations; content is implementation specific.	20	20	20	20	20

TABLE III. Modifier field definitions and maximum display lengths for tactical symbols. - Continued.

FIELD ID	FIELD TITLE	DESCRIPTION	U	E	I	SI	M
H	Additional Information	A text modifier for units, equipment, and installations; content is implementation specific.	20	20	20	20	20
J[4]	Evaluation Rating	A text modifier for units, equipment, and installations that consists of a one-letter reliability rating and a one-letter credibility rating: **Reliability Ratings:** A-completely reliable, B-usually reliable, C-fairly reliable, D-not usually reliable, E-unreliable, F-reliability cannot be judged. **Credibility Ratings:** 1-confirmed by other sources, 2-probably true, 3-possibly true, 4-doubtfully true, 5-improbable, 6-truth cannot be judged.	2	2	2	2	2
K	Combat Effectiveness	A text modifier for units and equipment that indicates unit effectiveness or installation capability.	5	-	5	-	3
L	Signature Equipment	A text modifier for hostile equipment; "!" indicates detectable electronic signatures.	-	1	-	1	-
M	Higher Formation	A text modifier for units that indicates number or title of higher echelon command (corps are designated by Roman numerals).	21	-	-	21	-
N	Hostile (Enemy)	A text modifier for equipment; letters "ENY" denote hostile symbols.	-	3	-	-	-
P	IFF/SIF	A text modifier displaying IFF/SIF Identification modes and codes.	5	5	5	-	5
Q	Direction of Movement Indicator	A graphic modifier for units, equipment, and installations that identifies the direction of movement or intended movement of an object (see paragraph 5.3.4.1 and figures 3 and 4).	G	G	G	-	G
R	Mobility Indicator	**Mobility indicator:** a graphic modifier for equipment that depicts the mobility of an object (see paragraph 5.3.4.3, figure 4, and table V).	-	G	-	-	-
R2	SIGINT Mobility Indicator	M = Mobile, S = Static, or U = Uncertain.	-	-	-	1	-
S	Headquarters Staff Indicator/Offset Location Indicator	**Headquarters staff indicator**: A graphic modifier for units, equipment, and installations that identifies a unit as a headquarters (see paragraph 5.3.4.7 and figures 3 and 4). **Offset location indicator**: A graphic modifier for units, equipment, and installations used when placing an object away from its actual location (see paragraph 5.3.4.8 and figures 3 and 4).	G	G	G	-	G
T	Unique Designation	A text modifier for units, equipment, and installations that uniquely identifies a particular symbol; track number. Identifies acquisition number when used with SIGINT symbology.	21	21	21	21	21

TABLE III. Modifier field definitions and maximum display lengths for tactical symbols. - Continued

FIELD ID	FIELD TITLE	DESCRIPTION	U	E	I	SI	M
V	Type	A text modifier for equipment that indicates type of equipment.	-	24	-	24	-
W[5]	Date/Time Group (DTG)	A text modifier for units, equipment and installations that displays traditional military Date/Time Group format: DDHHMMSSZMONYY.	20	20	20	20	20
X	Altitude/Depth	A text modifier for units, equipment, and installations that displays the altitude portion of GPS; flight level for aircraft; depth for submerged objects; height in feet of equipment or structures on the ground.	6	6	6	-	6
Y	Location	A text modifier for units, equipment, and installations that displays a symbol's location in degrees, minutes, and seconds (or in UTM or other applicable display format).	19	19	19	19	19
Z	Speed	A text modifier for units, equipment, and installations that displays velocity as set forth in MIL-STD-6040.	8	8	8	-	8
AA	Special C^2 Headquarters	A text modifier for units; indicator is contained inside the frame (see figures 3 and 4); contains the name of the special C^2 headquarters.	9	-	-	-	9
AB	Feint/Dummy Indicator	Feint or dummy indicator: A graphic modifier for units, equipment, and installations that identifies an offensive or defensive unit intended to draw the enemy's attention away from the area of the main attack (see paragraph 5.3.4.6 and figures 3 and 4).	G	G	G	-	G
AC	Installation	Installation: A graphic modifier for units, equipment, and installations used to show that a particular symbol denotes an installation (see paragraph 5.3.4.4 and figures 3 and 4).	G	G	G	-	G
AD	Platform Type	ELNOT or CENOT.	-	-	-	6	-
AE	Equipment Teardown Time	Equipment teardown time in minutes.	-	-	-	3	-
AF	Common Identifier	Example: "Hawk" for Hawk SAM system.	-	-	-	12	-
AG	Auxiliary Equipment Indicator	Towed sonar arrary indicator: A graphic modifier for equipment that indicates the presence of a towed sonar array (see paragraph 5.3.4.4, figures 3 and 4, and table VI).	-	G	-	-	-

Notes: 1. Column headings: U = units, E = equipment, I= installations, SI = signals intelligence (SIGINT), and M = military operations other than war (MOOTW).
2. Equipment includes air, space, sea surface, subsurface, and SOF, as well as land-based equipment as shown in table I.
3. Numeric entry indicates text modifier. "G" indicates graphic modifier. A dash (-) inside boxes indicates nonapplicable.
4. Field J: See FM 34-3, Intelligence Analysis, March 1990, pages 2-13 through 2-17 for complete definitions of evaluation ratings.
5. Field W: D = day, H = hour, M = minute, S = second, Z = Greenwich or local time, MON= month, and Y = year.

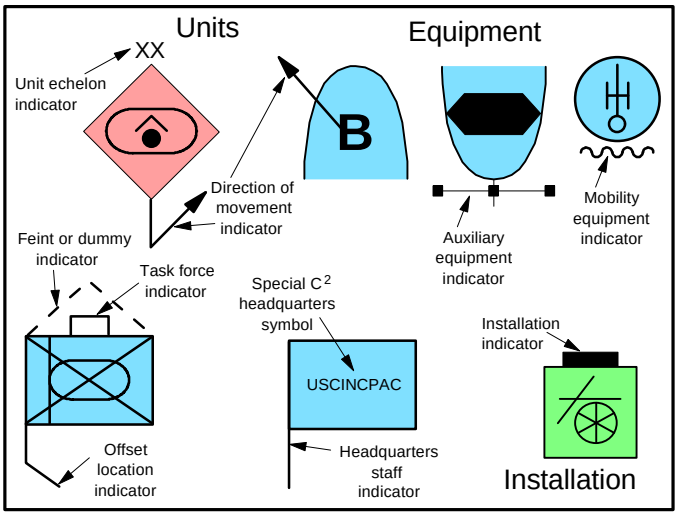


FIGURE 4. Graphic modifiers for tactical symbol modifiers.

5.3.4.1 Direction of movement indicator. The direction of movement indicator is an arrow or staff identifying the direction of movement or intended movement of an object. For land symbols, the indicator is an angled arrow extending downward from the bottom center of the frame or icon and pointing in the direction of movement. For all other tactical symbols, the indicator is an arrow extending from the center of the frame or icon and pointing in the direction of movement. The indicator is represented as field Q as defined in table III and is positioned as shown in figures 3 and 4.

5.3.4.2 Echelon indicator. The echelon indicator provides a graphic representation of command level, as shown in table IV. Echelon indicator codes are listed in table IV and the appendix for each symbology set. The indicator is represented in field B as defined in table III and is positioned as shown in figures 3 and 4.

TABLE IV. Echelon indicator.

INDICATOR	DESCRIPTION
Ø	TEAM/CREW
•	SQUAD
••	SECTION
•••	PLATOON/DETACHMENT
I	COMPANY/BATTERY/TROOP
I I	BATTALION/SQUADRON
I I I	REGIMENT/GROUP
X	BRIGADE

TABLE IV. Echelon indicator. - Continued

INDICATOR	DESCRIPTION
X X	DIVISION
X X X	CORPS
X X X X	ARMY
X X X X X	ARMY GROUP/FRONT
X X X X X X	REGION

5.3.4.3 Mobility indicator. The mobility indicator, which is only used for equipment, depicts the mobility feature of an object, as shown in table V. This indicator identifies mobility other than that intrinsic to the equipment itself. For example, the symbol for a self-propelled howitzer moving by train would include a railway mobility indicator, while the symbol for a self-propelled howitzer, a tank or other tracked vehicle would not have a mobility indicator. The indicator is represented in field R as defined in table III and is positioned as shown in figures 3 and 4.

TABLE V. Equipment mobility indicators.

MOBILITY SYMBOL	DESCRIPTION				
	UN-FRAMED	UNKNOWN	FRIEND	NEUTRAL	HOSTILE
WHEELED (LIMITED CROSS-COUNTRY)					
					
WHEELED (CROSS-COUNTRY)					
					
TRACKED					
					

TABLE V. Equipment mobility indicators. - Continued

DESCRIPTION					
MOBILITY SYMBOL	UN-FRAMED	UNKNOWN	FRIEND	NEUTRAL	HOSTILE
TOWED					
					
RAILWAY					
					
OVER-SNOW (PRIME MOVER)					
					
SLED					
					
PACK ANIMALS					
					
BARGE					
					

TABLE V. Equipment mobility indicators. - Continued

DESCRIPTION					
MOBILITY SYMBOL	UN-FRAMED	UNKNOWN	FRIEND	NEUTRAL	HOSTILE
AMPHIBIOUS					
					

5.3.4.4 Auxiliary equipment indicator. The auxiliary equipment indicator, which is only used for towed equipment, depicts the mobility feature of an array, as shown in table VI. This indicator identifies mobility other than that intrinsic to the equipment itself. The indicator is represented in field AG as defined in table III and is positioned as shown in figures 3 and 4.

TABLE VI. Auxiliary equipment indicators.

DESCRIPTION					
MOBILITY SYMBOL	UN-FRAMED	UNKNOWN	FRIEND	NEUTRAL	HOSTILE
TOWED SONAR ARRAY (SHORT)					
					
TOWED SONAR ARRAY (LONG)					
					

5.3.4.5 Installation indicator. The installation indicator is a shaded block used to show that a particular symbol denotes an installation. Although installations are included in the symbol hierarchy, the addition of an installation indicator can turn any tactical symbol into an installation. The indicator is represented in field AC as defined in table III and is positioned as shown in figures 3 and 4.

5.3.4.6 Task force indicator. The task force indicator is a bracket that identifies a unit as a task force. The indicator is represented in field D as defined in table III and is positioned as shown in figures 3 and 4. Task force codes are provided in appendix A.

5.3.4.7 Feint/dummy indicator. The feint or dummy indicator is a dashed inverted "V" that identifies an offensive or defensive unit intended to draw the enemy's attention away from the area of the main attack. The indicator is represented in field AB as defined in table III and is positioned as shown in figures 3 and 4.

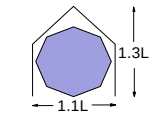
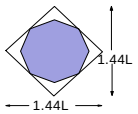
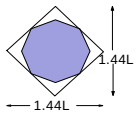
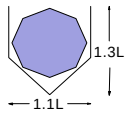
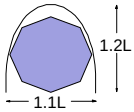
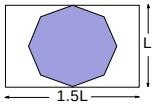
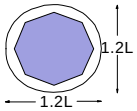
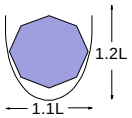
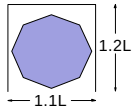
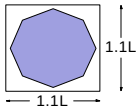
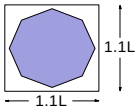
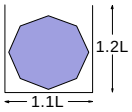
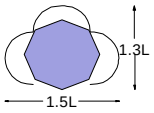
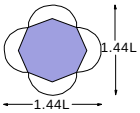
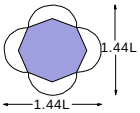
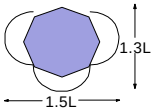
5.3.4.8 Headquarters staff indicator. The headquarters staff indicator is a line extending downward from the left side of the frame that identifies a unit as a headquarters. The indicator is represented in field S as defined in table III and is positioned as shown in figures 3 and 4.

5.3.4.9 Offset location indicator. The offset location indicator is used when placing an object away from its actual location. The indicator is a line extending downward from the left side of a frame or an appropriate anchor point on an icon. The offset location indicator differs from the headquarters staff indicator in that the former has an elbow extending to the actual location. In addition, the actual location (field Y) is given in latitude and longitude. The indicator is represented in field S as defined in table III and is positioned as shown in figures 3 and 4.

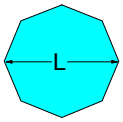
5.3.4.10 Text modifiers. Table III defines the specific content, length, and type of each text modifier. Not all text modifiers are applicable to all symbols. However, when any such modifier is displayed, it shall be defined in accordance with the contents of table III and positioned in accordance with figure 3. Air/space and sea track numbers are included in field T. Staff comments and additional information are contained in fields G and H, with the content of these fields being implementation specific so long as the maximum number of characters in each field is not exceeded. Although text modifiers are normally displayed around the symbol, the special C2 headquarters indicator—field AA as defined in table III—is contained inside the frame, as seen in figures 3 and 4.

5.4 Construction of tactical symbols. Tactical symbols are constructed by placing the icon within a bounding octagon (see figure 5 and table VII) and then centering the octagon in the drawn area. The frame, when used, is placed behind the icon and offset as necessary to contain the bounding octagon. This method of placement allows automated systems to overlay an icon on any of the frame shapes while ensuring that the icon does not extend beyond the frame.

TABLE VII. Symbol frame relative sizes.

AIR AND SPACE	SURFACE FRAMES (UNITS, EQUIPMENT, AND INSTALLATIONS)		SUBSURFACE FRAMES
	UNITS AND INSTALL-ATIONS	EQUIPMENT	
			
			
			
			

5.4.1 Relative size of symbol components. The relative size of each symbol component can be related to length (L), which is the default length and height of the bounding octagon.



The bounding octagon forms the basis of frame sizing.

FIGURE 5. The bounding octagon.

a. Frame size shall be determined in relation to a bounding octagon that defines the outer boundary for icons. Frame length and height should vary from L to 1.5L, depending on the particular frame shape. The minimum diameter of a dot shall be .15L.

b. In general, icons should not be so large as to touch the interior border of the frame. Figure 6 illustrates example exceptions to this size rule. The icons in this figure occupy the entire

frame and must, therefore, touch the interior border of the frame. The dimensions of unframed icons should be the same as framed icons.

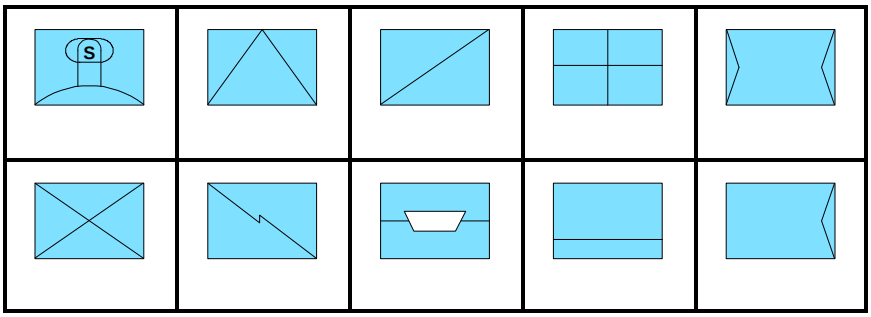


FIGURE 6. Example exceptions to icon placement.

c. The height of text information in a modifier will be .3L. The length of the lines in a direction of movement indicator should be the same as the height of the symbol frame. The headquarters staff indicator should extend a distance of one frame height below the bottom of the frame. When a symbol is reduced to a size smaller than three lines of text, the text will be positioned so that the symbol is centered relative to its associated field identifier text to maintain the relationship between the symbol and text.

5.4.2 Framing requirements. Framing requirements for individual icons are presented with each symbol and indicate whether an icon shall be framed, unframed, or whether framing is optional. Military ships (both sea surface and subsurface), military aircraft, military units, and installation icons are always associated with an affiliation and battle dimension, and so shall be framed. Only those icons specifically identified as unframed or frame optional shall be displayed without a frame. Framing requirements concerning the depiction of planned or present status are presented in paragraph 5.3.1.3.

5.4.3 Placement of icons. Although there are many exceptions for operational reasons, an icon is bounded by a bounding octagon (see figure 5), which is placed inside the frame.

a. The octagon shall be centered, with the frame offset vertically as necessary. The octagon shall be centered horizontally. Icons not bounded by the octagon extend to the frame wall.

b. Some land-based symbols contain multiple icons overlaid onto each other. The icons in these symbols may need to be shifted or reduced in size so that each is visible (see figure 7).

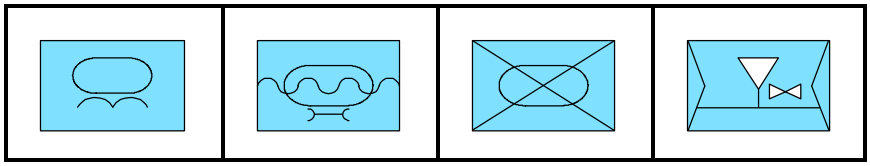
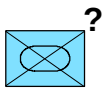


FIGURE 7. Examples of complex symbols with multiple icons.

5.4.4 Placement of modifiers. When symbol modifiers are displayed, the symbol itself should be centered within field A (see figure 3), and the position of all modifiers should remain the same regardless of whether the symbol is framed or unframed. While the relative placement of the fields should be maintained, implementation and size constraints within a system may require fields to be offset or not displayed. Text modifiers placed to the left of the symbol should be right justified, and text placed to the right should be left justified. When multiple text modifiers are displayed in a single field (e.g., E/F or J/K/L/N/P), they shall be ordered as shown in figure 3 and separated by a single space, and the spaces assigned to unused modifiers shall be collapsed to bring the text as close to the symbol as possible. Text modifiers placed above the symbol should be bottom justified and centered. Text below a symbol should be top justified and centered.

5.4.5 Symbol display hierarchy. C4I systems differ in their operational requirements concerning the amount of information about a warfighting object that needs to be displayed. As a result, this document standardizes those symbology elements required to achieve interoperability in information presentation, but allows flexibility in the symbol components and modifiers that are displayed to the warfighter. Display options range from complex (i.e., symbols include frame, fill, and icon) to primitive (i.e., symbols rendered as dots that denote the presence of an object at a specific location). Table VIII provides examples of display options that can be used in color and monochrome displays and can either be hand drawn or computer generated. Systems can select one or more display options for implementation based on operational requirements and display capabilities. If multiple options are available, the warfighter may be allowed to choose a single option for rendering all symbols, or to select different options based on the affiliation or battle dimension of the object and the amount of information required. For example, the warfighter may choose to display minimal information about friendly objects (displaying these symbols as dots) and maximal information about potential threats (displaying these symbols with frame, fill, and icon).

TABLE VIII. Tactical symbol display option hierarchy.

DISPLAY OPTION EXAMPLES		ATTRIBUTES
		Frame: ON (black or white depending on background) Fill: ON (use default color indicating affiliation) Icon: ON (black or white)
		Frame: ON (use default color indicating affiliation) Fill: OFF Icon: ON (use default color indicating affiliation)
		Frame: ON (black or white depending on background) Fill: OFF Icon: ON (black or white) Comments: Default option for monochrome implementation; replace black/white
		Frame: OFF (none) Fill: OFF Icon: ON (use default color indicating affiliation)
		Frame: ON (use default color indicating affiliation) Fill: OFF Icon: OFF (none) Comments: “?” and “U” are part of the frame and are displayed in this frame-only
		Frame: ON (monochrome system) Fill: OFF Icon: OFF (none) Comments: “?” and “U” are part of the frame and are displayed in this frame-only
		Frame: OFF (none) Fill: ON (use default color indicating affiliation) Icon: OFF (none)
		Frame: OFF (none) Fill: OFF (none) Icon: OFF (none) Comments: Use only to indicate location of symbol.

Note: Table VIII shows frame and fill color when displayed on a color monitor.

5.4.6 Adding temporary features to standard tactical symbols. Appendixes A and D contain the standard tactical symbols to be used in the C2 and the signals intelligence domains. The information taxonomy and symbol hierarchy included in these appendixes provide a logical structure from which to define a set of design rules for the construction of symbols. A single graphic feature or attribute was selected to represent each type of information known about a warfighting object, with the same feature included in the symbol whenever that type of information is represented. The description of an object in terms of its position within the information hierarchy directly maps to the graphic features included in the icon. For example, whenever a helicopter object is rendered, one feature of its icon is a "bow tie" graphic. Each icon was constructed from the combination of graphics consistent with its position within the hierarchy. The approach taken in this standard differs from the concept of icons as composites of graphic "primitives" in that the placement of a given feature may vary as needed to maximize legibility when the icon is displayed within a frame. When implementations require temporary extensions to the symbology provided in this standard, the following display rules apply:

a. Implementations shall not modify the frame shapes defined in this standard to indicate affiliation, battle dimension, and status.

b. Implementations shall use the default frame colors defined in this standard to indicate affiliation. If differentiation is needed within an affiliation category, additional colors should be used (i.e., for the frame or color fill) within that category, but the default colors for the other affiliations should not be changed. Hardware permitting, and unless specifically prohibited by system specification for operational reasons, implementation of this standard should provide for operator control of color to the individual icon level. The intent is maximum operational flexibility in those situations where the basic default colors are not sufficient for ready discrimination (i.e., multiple hostiles which must be differentiated from each other) and to assign a specific color to a special interest target without reference to its affiliation.

c. Implementations needing to display additional role or mission information about a warfighting object should use the icons in appendix A as the basis from which to create any temporary symbols. Figure 8 presents some of the graphic extensions that can be added to these icons. Whenever possible, the basic representation of the icon should not be altered; a graphic extension should be an addition to the basic icon and positioned to ensure that overall symbol legibility is not degraded. Figure 9 provides an example of how the basic icon is combined with an extension to produce a temporary symbol. Organizations requiring additional symbol modifiers shall submit change proposals to the Configuration Control Board for formal processing. Symbol modifiers being processed as change proposals may be incorporated for use into the originator’s systems, but will not be approved for use until formal Configuration Control Board processing is complete.

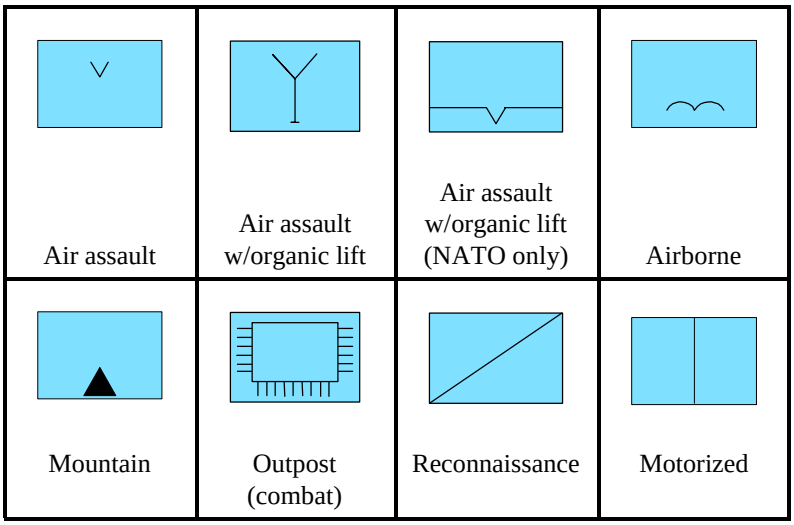


FIGURE 8. Examples of icon extentions.

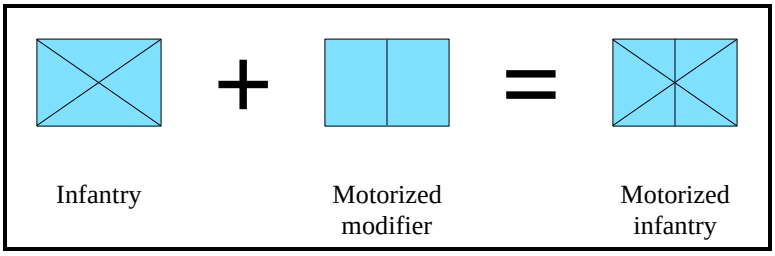


FIGURE 9. Extending the symbol.

5.5 Composition of tactical graphics. A tactical graphic is composed of an icon and may include text and/or graphic modifiers that provide additional information. Each of these components is described below.

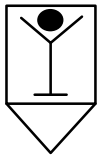
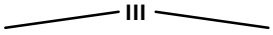
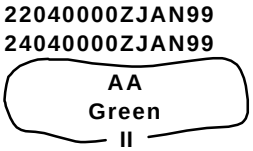
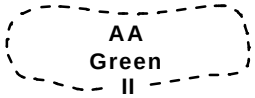
5.5.1 Icon. The icon provides a representation of natural and man-made features and locations on the ground and ground traces of aerial regions and can delineate responsibilities and missions, provide guidance, establish control measures, and identify items of interest. The icon may also indicate the affiliation and status of the battlespace object.

5.5.1.1 Affiliation. Affiliation refers to the threat posed by the battlespace object being represented. A tactical graphic can be black or off-white depending on display background, or affiliation can be indicated using color and/or text. If color is used, graphics denoting friend affiliation shall be shown in black, with other colors assigned in a manner consistent with the affiliation of the associated tactical symbols. By default, a graphic denoting hostile affiliation shall be shown in red. If red is not available, the graphic shall be drawn in black with the abbreviation

"ENY" placed on the graphic in at least two places. In addition, if color is available, graphics indicating obstacles shall be drawn in green; otherwise, all obstacles shall be shown in black.

5.5.1.2 Status. Status refers to whether a warfighting object exists at the location identified (status is "present") or will in the future reside at that location (status is "planned," "anticipated," "suspected," or "on order"). In general, line (including boundary lines) and area graphics shall be a solid line when indicating present status and a dashed line when indicating anticipated or planned status, as depicted in table IX. There are certain tactical graphics such as counter attach which are drawn in the 'present' status with dashed lines. The codes for status in the symbol ID code are provided in the appendix for each symbology set.

Table IX. Present and planned status for tactical graphics.

	POINT GRAPHICS	BOUNDARY LINE GRAPHICS	AREA GRAPHICS
PRESENT POSITION (P)			
ANTICIPATED, PLANNED, SUSPECTED, OR ON ORDER (A)			

5.5.2 Modifiers. A modifier provides optional additional information about a tactical graphic. The field ID, field title, description, and maximum allowable display lengths of tactical graphic modifiers are presented in table X. The default placement of modifiers in fields for points, lines, areas, boundaries, and NBC events is shown in figures 10 and 11, and an example of each modifier (both text and graphic indicators) is included in figure 12. As indicated in figure 10, certain fields can be displayed more than once within a tactical graphic. In some cases a tactical graphic may require multiple instances of a given modifier in order to fully create or represent an object: examples of these fields are H, T, W, and Y. The unnumbered fields should be filled before the numbered fields (i.e., fields W, H, and T should be used before fields W1, H1, and T1). As indicated in table X, not all modifiers are applicable to all tactical graphics. However, when any such modifier is displayed, it shall be defined in accordance with the contents of this table and positioned in accordance with figures 10 and 11.

TABLE X. Modifier field definitions and maximum display lengths for tactical graphics.

FIELD ID	FIELD TITLE	DESCRIPTION	P[1]	L[1]	A[1]	BL[1]	N[1]	B/C[1]
A	Symbol Indicator	The basic graphic (see paragraph 5.5.1).	G[2]	G	G	G	G	G
B	Echelon	A graphic modifier in a boundary graphic that identifies command level (see paragraph 5.5.2.2 and tables IV and VIII).	-	-	G	G	-	-
C	Quantity	A text modifier in a nuclear symbol that identifies the detonation in kilotons; yield (can be displayed in decimals).	-	-	-	-	6[2]	-
H	Additional Information	A text modifier for tactical graphics; content is implementation specific.	20	-	20	-	20	20
N	Hostile (Enemy)	A text modifier for tactical graphics; letters "ENY" denote hostile symbols	-	3	3	3	3	3
Q	Direction of Movement Indicator	A graphic modifier for nuclear, biological, and chemical (NBC) events that identifies the direction of movement (see paragraph 5.5.2.1 and figure 11).	-	-	-	-	G	G
S	Offset Location Indicator	A graphic modifier for points and nuclear, biological, and chemical (NBC) events used when placing an object away from its actual location (see paragraph 5.5.2.3 and figures 10, 11, and 12).	G	-	-	-	G	G
T	Unique Designation	A text modifier that uniquely identifies a particular tactical graphic; track number. **Nuclear:** delivery unit (missile, aircraft, satellite, etc.)	15	15	15	35	15	15
V	Type	A text modifier that indicates nuclear weapon type.	-	-	-	-	20	-
W[3]	Date/Time Group (DTG)	A text modifier that displays Date/Time Group format: DDHHMMSSZMONYY.	20	20	20	-	20	20
Y	Location (Latitude and Longitude)	A text modifier that displays a graphic's location in degrees, minutes, and seconds (or in UTM or other applicable display format).	19	19	19	19	19	19

Notes: 1. Column headings: P = points, L = lines, A = areas, BL = boundary lines, N = nuclear, B/C = bio/chem.
2. Numeric entry indicates text modifier. "G" indicates graphic modifier. A dash (-) inside boxes indicates nonapplicable.
3. Field W: D = day, H = hour, M = minute, S = second, Z = Greenwich or local time, MON= month, and Y = year.

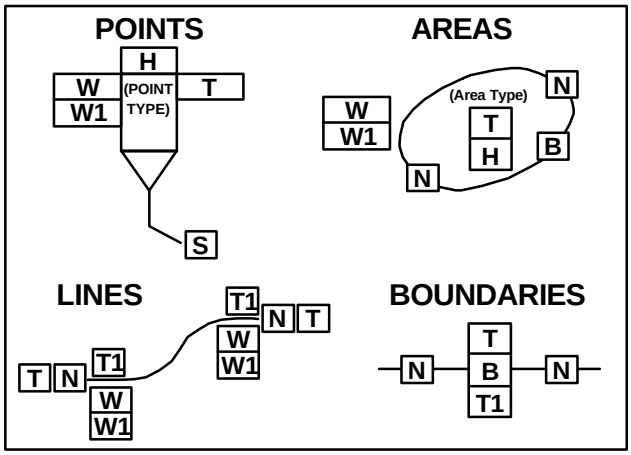


FIGURE 10. Placement of modifiers for points, lines, areas, and boundaries.

Notes: a. For lines, field T can include both the line designator and line name if available.
b. When placing a modifier inside an irregularly shaped area, it may be necessary to displace the modifier (see paragraph 5.4.4).

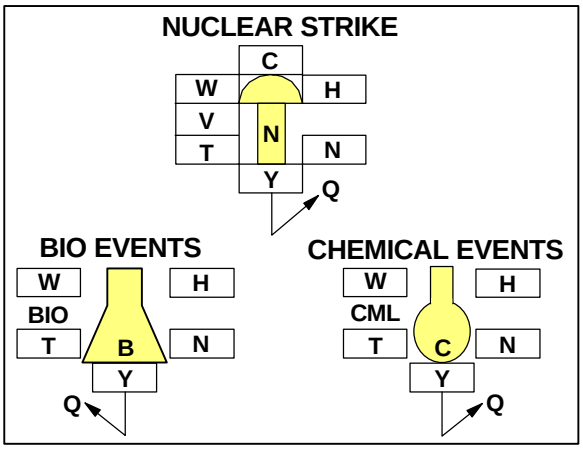


FIGURE 11. Placement of modifiers for NBC events.

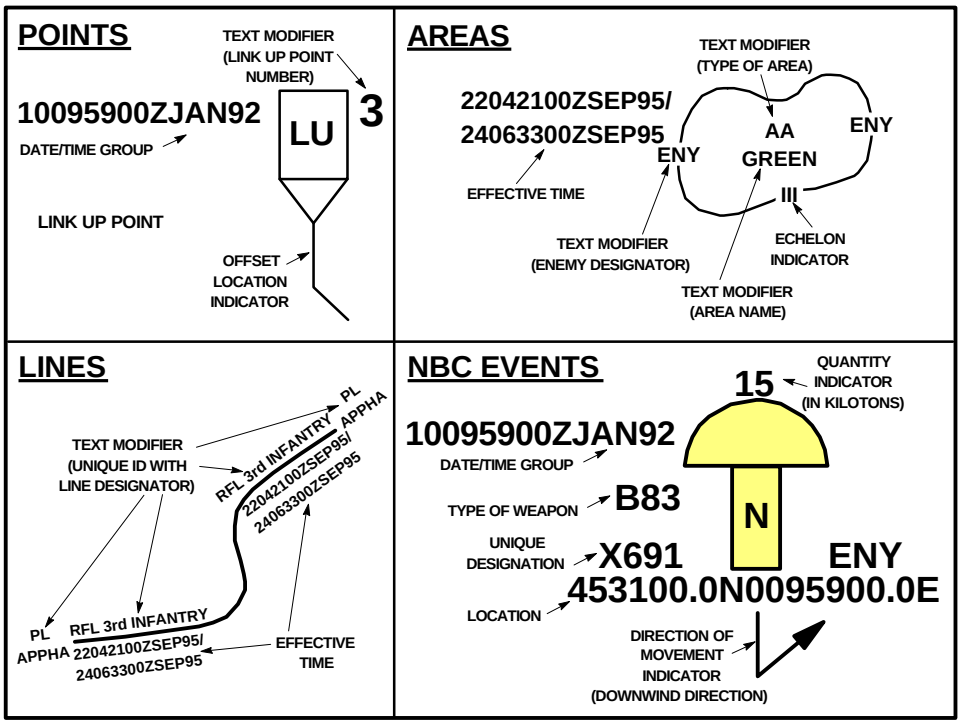


FIGURE 12. Graphic modifiers for tactical graphics.

5.5.2.1 Direction of movement indicator. The direction of movement indicator is an arrow identifying the direction of movement of nuclear, biological, and chemical (NBC) events. The arrow extends downward from the center of the NBC icon and points in the direction of movement. The indicator is represented in field Q as defined in table X and positioned as shown in figure 11.

5.5.2.2 Echelon indicator. The echelon indicator provides a graphic representation of command level and is used to show the element echelon on boundary lines. Echelon indicator codes are listed in table IV and the appendix for each symbology set. The indicator is represented in field B as defined in table X and positioned as shown in figure 10.

5.5.2.3 Offset location indicator. The offset location indicator is used when placing an object away from its actual location. The indicator is a line extending downward from an appropriate anchor point on an icon. The actual location (field Y) is given in latitude and longitude. The indicator is represented in field S in table X and positioned as shown in figures 10, 11, and 12.

5.5.2.4 Text modifiers. Table X defines the specific content, length, and type of each text text modifier. Additional information is contained in field H, with the content of this field being implementation specific, provided the maximum number of characters in each field is not exceeded.

5.6 Construction of tactical graphics. The rules for constructing tactical graphics vary depending on whether the object is point based or line or area based. The latter category of objects includes various forms of line graphics such as boundaries, areas of all shapes and sizes, and complex figures such as an air corridor.

5.6.1 Point graphics. A point-based graphic, such as a casualty collection point, is constructed in the same manner as an unframed tactical symbol. Rules concerning the relative size of symbol components and placement of modifiers in tactical symbols also apply to point-based graphics.

5.6.2 Line and area graphics. A line or area graphic is constructed using the anchor points, size, and orientation defined for the graphic. Appendix B includes these parameters for the line and area graphics in the C^2 domain. The size of the graphic is determined by these parameters and the scale of the background on which the graphic is placed. As a general rule, the line width and pattern height shall be scaled proportionally to the change in icon size required by its change in background scale (map or image). For tactical graphics, line width is dependent on the distance between the points to be depicted and may vary (i.e., be reduced or enlarged) as display scale changes.

5.7 Display rules for tactical symbols and tactical graphics. The following display rules address symbology size, color, line width, plotting, and orientation and apply to the implementation of both tactical symbols and tactical graphics.

5.7.1 Size. The size of a symbol or point graphic is directly related to the viewing distance of the operator from the display surface on which the object is presented. MIL-STD-1472 recommends a minimum size of 20 minutes of arc subtended visual angle (arc min.) for distinguishing targets of complex shape on a cathode ray tube, without regard to the effect of color coding. The following formula can be used to determine object size for a given implementation:

$$L = \frac{(VA)(D)}{(57.3)(60)}$$

where VA is the visual angle in arc minutes, D is the viewing distance in inches, and L is the object size in inches. Table XI presents the dimensions for tactical symbols at 20, 30, and 40 arc minutes for selected viewing distances. In general, medium to large object sizes (i.e., subtending 30-40 arc minutes) are recommended; however, implementors should conduct usability testing to determine the optimum size(s) at which warfighter performance is most effective.

TABLE XI. Minimum object size at selected viewing distances.

SYMBOL SIZE			
VIEWING DISTANCE (IN INCHES)	**20 ARC MIN.**	**30 ARC MIN.**	**40 ARC MIN.**
15	.087 in. (2.21 mm)	.131 in. (3.33 mm)	.175 in. (4.45 mm)
20	.116 in. (2.95 mm)	.175 in. (4.45 mm)	.233 in. (5.92 mm)
25	.145 in. (3.68 mm)	.218 in. (5.54 mm)	.291 in. (7.40 mm)
30	.175 in. (4.45 mm)	.262 in. (6.65 mm)	.349 in. (8.87 mm)
35	.204 in. (5.18 mm)	.305 in. (7.76 mm)	.407 in. (10.34 mm)
40	.233 in. (5.92 mm)	.349 in. (8.87 mm)	.465 in. (11.82 mm)

5.7.2 Color. It is important that implementations maximize the contrast between symbology and the display background in order to provide optimum discriminability.

a. For tactical symbols, this contrast can be provided by using black for the frame, icon, and modifiers when symbols are displayed on a light background, and using white for these elements when symbols are displayed on a dark background. Implementations choosing to display a color fill shall also display the appropriate icon from the symbol table. Implementors should select specific values (e.g., in CIE or RGB terms) for the default colors in table XII based on considerations such as operational requirements, hardware configuration, display background, and viewing conditions (e.g., ambient lighting). If a symbol includes a frame and an icon, both

components and any modifiers should be the same color (e.g., black, white, or one of the default colors indicating affiliation).

b. For tactical graphics, this contrast can be provided by using black for the graphic when it is displayed on a light background, and using white when it is displayed on a dark background. If color is used in a graphic, implementors should select specific values for the default colors in table XII based on the same considerations as for tactical symbols.

c. Implementors should comply with color guidance provided in the DOD Human Computer Interface (HCI) Style Guide and include sufficient usability testing to ensure effective operator performance when using the symbology. While color coding shall be the same throughout an implementation, color saturation may need to vary depending on the display option(s) selected for tactical symbols. For example, to ensure optimum symbol discriminability, different shades of red may be needed in a frame-only symbol as compared to the color fill in a symbol with a black frame and icon.

TABLE XII. Default colors for symbology.

DESCRIPTION	HAND DRAWN	COMPUTER GENERATED	
		ICON (RGB VALUE)	FILL (RGB VALUE)
Friend, Assumed Friend	Blue	Cyan (0, 255, 255)	Crystal Blue (128, 224, 255)
Unknown, Pending	Yellow	Yellow (255, 255, 0)	Light Yellow (255, 255, 128)
Neutral	Green	Neon Green (0, 255, 0)	Bamboo Green (170, 255, 170)
Hostile, Suspect, Joker, Faker	Red	Red (255, 0, 0)	Salmon (255, 128, 128)
METOC	Purple	Plum Red (128, 0, 128)	Light Orchid (226, 159, 255)
METOC	Brown	Safari (128, 98, 16)	Khaki (210, 176, 106)
Boundaries, lines, areas, text, icons, and frames	Black	Black (0, 0, 0)	Black (0, 0, 0)
(See note)	White	White (255, 255, 255)	Off-White (6% Grey) (239, 239, 239)

5.7.3 Line width. Because the frame of a tactical symbol indicates both the affiliation and battle dimension of an object, it is critical that line width be sufficient to ensure frame legibility and discriminability at normal viewing distance. The optimum line width may differ depending on

frame size and be affected by whether the frame is filled or unfilled or displayed in color or black/white. Similarly, the legibility of a tactical graphic is impacted by line thickness, especially when the size of an area graphic changes based on background scale. Usability testing should be performed to identify the optimum rendering for a given implementation.

5.7.4 Plotting. The plotting of tactial symbols and most point graphics shall be based on the geometric center of the symbol or graphic. The geometric center indicates the general vicinity of the center of mass of an object. Point graphics that do not use their geometric center for plotting shall be positioned based on their anchor point. Directions related to plotting are included in appendix B. If an offset location indicator is displayed with a symbol or graphic, the endpoint of the indicator shall show the object's location. If a group of tactical symbols is displayed at one location, the group may be enclosed with a bracket and the location of that group identified with an offset location indicator. Other display options for reducing clutter when symbols overlap or are collocated are considered to be implementation specific. The positional accuracy of symbology plotting is also considered implementation specific.

5.7.5 Orientation. The frame and icon in framed tactical symbols shall be displayed in the orientation shown in appendixes A, D, and E. Equipment in the land battle dimension can be rotated to face the direction of movement only when the symbol is unframed. Tactical graphics shall be displayed in the orientation shown in appendix B. Point graphics that are positioned based on their anchor point can be rotated 90 degrees when necessary to minimize interference with other symbology or terrain features.

5.8 Symbology transmission. Common warfighting symbology can be exchanged between MIL-STD-2525 compliant systems using the USMTF GRAPHREP Overlay Message. This message transmits a 15-character alphanumeric symbol ID code which provides the information necessary for a system to transmit and display a tactical symbol or graphic and its modifier fields. The information required to identify a symbol or graphic varies slightly between symbology sets; therefore, an entry may not be required in all 15 positions of the ID code. A null character is used to fill each unused position. The composition of the symbol ID code is provided in the appendix for each symbology set. The transmission requirements for modifier fields for both symbols and graphics are presented in table XIII. This table identifies the transmission length for each field and includes information about required format, where appropriate, as required by applicable transmission standards.

TABLE XIII. Transmission lengths for tactical symbols and tactical graphics[1].

FIELD ID	FIELD TITLE	U[2]	E[2]	I[2]	SI[2]	M[2]	P[2]	L[2]	A[2]	BL[2]	N[2]	B/C[2]	FORMAT
A	Symbol Indicator	*[3]	*	*	*	*	*	*	*	*	*	*	SYM-ID positions 3, 5-10[4]
B	Echelon	*	-	-	-	*	-	*	*	*	-	-	SYM-ID positions 11 and 12
C	Quantity	-	9[3]	-			-	-	-	-	6	-	-
D	Task Force Indicator	*	-	-			-	-	-	-	-	-	SYM-ID positions 11-12
E	Frame Shape Modifier	*	*	*	-	*	-	-	-	-	-	-	SYM-ID positions 3-4
F	Reinforced or Reduced	2	-	-	-	2	-	-	-	-	-	-	R = reinforced, D = reduced, RD = reinforced and reduced
G	Staff Comments	20	20	20	20	20	-	-	-	-	-	-	Free text
H	Additional Information	20	20	20	20	20	20	-	20	-	20	20	Free text
J[5]	Evaluation Rating	2	2	2	2	2	-	-	-	-	-	-	One letter and one number
K	Combat Effectiveness	5	-	5	-	5	-	-	-	-	-	-	-
L	Signature Equipment	-	1	-	1	-	-	-	-		-	-	-
M	Higher Formation	21	-	-	21	21	-	-	-		-	-	-
N	Hostile (Enemy)	-	3	-	-	-	-	3	3	3	-	-	-
P	IFF/SIF	5	5	5	-	5	-	-	-	-	-	-	-
Q	Direction of Movement Indicator	4	4	4	-	4	-	-	-	-	4	4	Number in degrees or mils, such as 090 degrees or 1600 mils

TABLE XIII. Transmission lengths for tactical symbols and tactical graphics. - Continued

FIELD ID	FIELD TITLE	U[2]	E[2]	I[2]	SI[2]	M[2]	P[2]	L[2]	A[2]	BL[2]	N[2]	B/C[2]	FORMAT
R	Mobility Indicator; Towed Sonar Array Indicator	-	*	-	-	-	-	-	-	-	-	-	SYM-ID code positions 11-12
R2	SIGINT Mobility Indicator	-	-	-	1	-	-	-	-	-	-	-	-
S	Headquarters Staff Indicator/ Offset Location Indicator	*	-	-	-	*	-	-	-	-	-	-	-
T	Unique Designation	21	21	21	21	21	21	21	21	35	15	15	-
V	Type	-	24	-	24	-	-	-	-	-	20	-	-
W[6]	Date/Time Group (DTG)	14	14	14	14	14	14	14	14	-	14	14	Alphanumeric field for date/time for transmission conforms with MIL-STD-2500B (YYYYMMDDHHNNSS)
X	Altitude/ Depth	6	6	6	-	6	-	-	-	-	6	6	-
Y[7]	Location	19	19	19	19	19	19	19	19	19	19	19	Conforms to decimal degrees format: xx.dddddhyyy.dddddh where xx = degrees latitude yyy = degrees longitude .ddddd = decimal degrees h = direction (N, E, S, W)
Z	Speed	8	8	8	-	8	-	-	-	-	-	-	-

TABLE XIII. Transmission lengths for tactical symbols and tactical graphics. - Continued

FIELD ID	FIELD TITLE	U[2]	E[2]	I[2]	SI[2]	M[2]	P[2]	L[2]	A[2]	BL[2]	N[2]	B/C[2]	FORMAT
AA	Special C[2] Headquarters	9	-	-	-	9	-	-	-	-	-	-	-
AB	Feint/Dummy Indicator	*	*	*	-	*	-	-	-	-	-	-	SYM-ID code positions 11-12
AC	Installation	*	*	*	-	*	-	-	-	-	-	-	SYM-ID code positions 11-12
AD	Platform Type	-	-	-	6	-	-	-	-	-	-	-	-
AE	Equipment Teardown Time	-	-	-	3	-	-	-	-	-	-	-	-
AF	Common Identifier	-	-	-	12	-	-	-	-	-	-	-	-
AG	Auxiliary Equipment Indicator	-	-	-	1	-	-	-	-	-	-	-	-

Notes: 1. The transmission lengths shown in Table XIII are in ASCII format.
2. Column headings: U = units, E = equipment, I= installations, SI = signals intelligence (SIGINT), and M = military operations other than war (MOOTW), P = points, L = lines, A = areas, BL = boundary lines, N = nuclear, and B/C = bio/chem.
3. An asterisk (*) indicates that the value is contained in the symbol ID code. Numeric entry indicates the number of alphanumeric characters in transmission fields. A dash (-) indicates nonapplicable.
4. Tactical symbols require function ID, symbol ID code positions 5 - 10. Tactical graphics require category and function ID, symbol ID code positions 3, 5-10.
5. Field J: See FM 34-3, Intelligence Analysis, March 1990, pages 2-13 through 2-17 for complete definitions of evaluation ratings.
6. Field W: Y = year, M = month, D = day, H = hour, N = minute, and S = second. All time is assumed to be Zulu.
7. Field Y: WGS-84 (MIL-STD-2410) is a mandated standard (see CJCSI 3900.1) which allows an unambiguous representation of positional information. Many mapping, charting, and geodetic products produced by other agencies and governments are not referred to in the WGS - 84. Parameters to transform these products to WGS - 84 are part of this standard.

5.9 Compliance Testing. Compliance testing should cover proper appearance of tactical symbols and graphics, how accurately systems assemble and parse symbol ID codes, and compliance with National Imagery Transmission Format Standard (NITFS). The particular compliance testing procedures are discussed below.

5.9.1 Proper appearance of tactical symbols. The following requirements apply to tactical symbols:

a. The first item that needs to be considered when testing a system for MIL-STD-2525 compliance is whether the tactical symbols, when displayed on screen, appear identical to the symbols listed in MIL-STD-2525. Framed symbols should appear framed. Unframed symbols should appear unframed. Finally, frame optional symbols, such as equipment, must be able to be depicted both framed and unframed. When unframed, the symbol must be rotatable to show orientation. Otherwise, it should have the orientation depicted in the standard. Text fields must

be properly placed and properly sized (.3 L, where L is the length used to determine the bounding octagon for tactical symbols) (see paragraph 5.4.2).

b. Frames must comply to MIL-STD-2525.

c. Attributes of color, shape, and size must comply with MIL-STD-2525.

d. Each symbol must be verified as one of the approved symbols (framed, if applicable).

e. Text and graphic modifiers must be depicted as described in MIL-STD-2525.

f. Symbols must be properly placed within the frame.

5.9.2 Correct assembly and parsing of symbol ID codes. A MIL-STD-2525-compliant system must be able to assemble the correct symbol from a symbol ID code it has been given. For example, having electronically received the following symbol ID code and the accompanying additional information, the system should display the correct representation of a heavy U.S. machine gun with a friend frame.

> Symbol ID code: sfgpewrh--mtusg with C = 200, G = "for reinforcements,"
> H = "added support for JJ," Q = 0450, R = mt (mobility rail), V = "machine gun,"
> W = "30140000ZSep97," Y = "0900000.0E570306.0N"

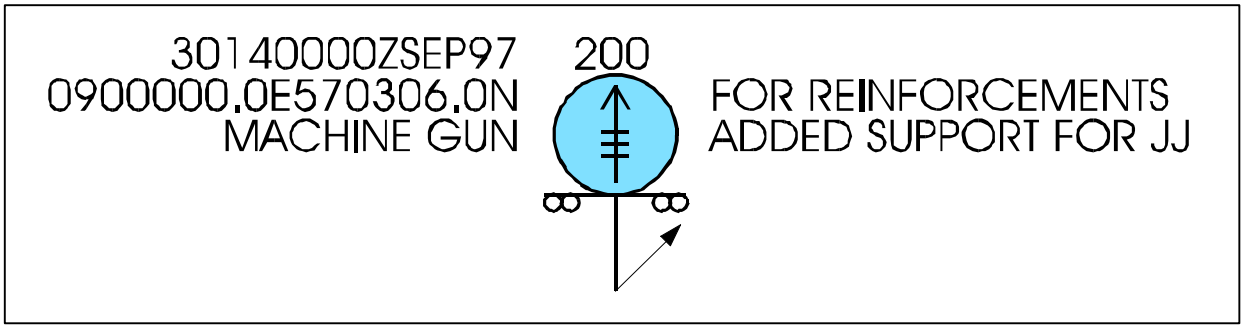


FIGURE 13. Example of proper tactical symbol representation.

Conversely, a symbol developed on the applicant MIL-STD-2525-compliant system must provide a symbol ID code that will produce the correct symbol when transmitted to another MIL-STD-2525-compliant system.

a. For tactical graphics, the applicant MIL-STD-2525-compliant system must not only accurately draw the graphic, but also accurately place and orient it on the map or image background. It is understood that the level of programming for a battlespace graphic is much more detailed to be compliant. While tactical symbols need only be centered on the location point, a

tactical graphic may be required to locate numerous points, replicate a pattern, and integrate the pattern—in the appropriate scale—on the map depicting the information.

5.9.3 Compliance to NITFS. If transmitted, Computer Graphic Metafile (CGM) files must provide:

a. Symbol compliance with metafile constructs within the National Imagery Transmission Format Standard bounded subset of CGMs as defined by MIL-STD-2301.

b. Minimum CGM statements.

c. Symbols constructed with origin at center of VDC extent at the geometric center of the symbol.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. MIL-STD-2525B is designed to enhance DOD's joint warfighting interoperability by providing sets of C4I symbols, a coding scheme for symbol automation and information transfer, an information hierarchy and taxonomy, and technical details to support C4I symbology systems.

6.2 Subject term (key word) listing.
C2 Symbology: Tactical Graphics
C2 Symbology: UEI
C4I
Graphic
Interoperability
METOC
MOOTW
Operations
SIGINT
SOF
Symbol
Tactical Graphics
Warfighter

6.3 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.