



ACQUISITION,
TECHNOLOGY
AND LOGISTICS

OFFICE OF THE UNDER SECRETARY OF DEFENSE

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WASHINGTON, DC 20301-3000

JUL 29 2003

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Policy for Unique Identification (UID) of Tangible Items – New Equipment, Major Modifications, and Re procurements of Equipment and Spares

Unique Identification (UID) is a mandatory Department of Defense (DoD) requirement on all solicitations issued on or after January 1, 2004. I strongly encourage the Component Acquisition Executives to incorporate this policy into ongoing contracts where it makes business sense to do so.

Contracts shall require unique item identification, or a DoD recognized unique identification equivalent, for all property items delivered to the Government if: (1) the acquisition cost is \$5,000 or more, (2) it is either a serially managed, mission essential or controlled inventory piece of equipment or a repairable item, or a consumable item or material where permanent identification is required, (3) it is a component of a delivered item, if the program manager has determined that unique identification is required, or (4) a UID or a DoD-recognized UID equivalent is available. Existing government furnished property provided to contractors is exempt from this policy until January 1, 2005 when this policy becomes mandatory for all government furnished property incorporated into an end item. Unique identification will complement the Department's existing policy on serialized item management.

Component Acquisition Executives (CAEs) shall ensure their program managers understand the criticality of requiring UID and integrating this change into the appropriate business processes. All program managers for new equipment, major modifications, and re procurements of equipment and spares shall begin planning to apply Unique Identification (UID) on tangible items using the attached guidance. Wide Area Workflow (WAWF) will be modified to capture the UID associated with each item. DoD Components are expected to transition rapidly to the WAWF as a mandatory payment requirement by no later than January 1, 2005. I encourage the CAEs to promote and fund pilot programs to apply UID to legacy equipment and their supporting AISs. A Joint Implementation Requirements Board for UID will be established. This Board will focus on business rules for enabling all AISs to use the UID as a primary or alternate key to achieve a globally interoperable network-centric architecture for the integrated management of tangible items.

The Department, along with its industry and international partners, clearly prefers use of constructs described in ISO/IEC 15434 to achieve interoperability in business intelligence. However, this requires ISO approval to add a new format to ISO/IEC 15434



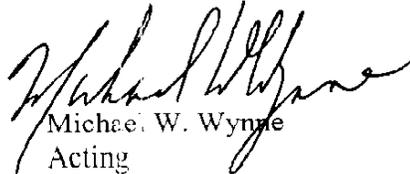
for those ATA Spec 2000 Text Element Identifiers (TEIs) used in UID. The Department values the formal ISO approval process and is preparing to submit a proposal to ISO/IEC JTC1/SC 31 seeking approval of a new format for the TEI addition. That approval process is lengthy, and, in the interim, a collaborative solution is necessary to create a near-term interoperable environment for UID enhancements to business intelligence to support coalition operations. This solution uses the structure of ISO/IEC 15434 as the UID syntax standard and the business rules in the attached Appendix A. If approved, the new format shall be used and replace the interim "DD" format described in this policy. Consideration and decisions on marking approaches should carefully weigh any impacts to changing from the "DD" format to an approved future format against any associated costs and strategic near term marking requirements. ISO/IEC 15434 is and will be the Department's preferred approach on all new solicitations. The use of the collaborative solution format as described in the attached Appendix B should strictly be considered an interim approach.

By October 1, 2003, the Director, Defense Procurement and Acquisition Policy will publish an interim rule that modifies the Defense Federal Acquisition Regulations to capture the acquisition cost of tangible items, and place UID on them coincident with their acquisition. A subsequent rule will be issued to finalize government furnished property requirements prior to January 1, 2005.

A DoD UID Program Management Office will be established to manage UID implementation. The Office charter will have a provision for completing its work and transferring any continuing efforts to the DoD Components. For the time being, the UID Integrated Product Team (IPT) will continue to work on issues in the following areas:

- Participate in the ISO/IEC SC 31 process to obtain approval of an amendment to ISO/IEC 15434.
- Develop policy modifications to MIL-STD-129, MIL-STD-130, DoD 4140.1-R, DoDI 5000.2, DoDI 5000.64, DoD 7000.14-R, CJCSI 3170.1C, DCMA One Book, and Military Handbook 61A to ensure synchronized policy execution.
- Publish an on-line users guide on UID requirements and application.
- Determine minimum architecture/systems requirements to capture UID information at inspection and acceptance and identify opportunities for rapid implementation.
- Oversee any UID demonstration programs.
- Develop training and education materials working in partnership with the Defense Acquisition University.
- Conduct outreach and communication to promote adoption of UID by the Department and its industry and international partners.

This guidance supersedes my memoranda of December 19, 2002 and April 4, 2003, where I promised to issue a mandatory UID policy no later than July 2003. Additional information and a DoD Unique Identification Guide are at <http://www.acq.osd.mil/uid>. The point of contact is Mr. Robert Leibrandt. Please address your questions to him at (703) 695-1099 or by email at robert.leibrandt@osd.mil.



Michael W. Wynne
Acting

Attachments:
As stated

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UNIQUE IDENTIFICATION GUIDANCE

The Department must uniquely identify tangible items to provide for better asset accountability, valuation and life cycle management. Unique identification provides the opportunity to differentiate an individual item from all others throughout the DoD Supply Chain, commencing with acquisition and terminating with disposal or reutilization. This guidance addresses how to uniquely identify tangible items.

ROLE OF UNIQUE IDENTIFICATION ACROSS DoD

To achieve the desirable end state of integrated management of tangible items, the DoD goal is to uniquely identify tangible items, while relying to the maximum extent possible on international standards and commercial item markings and not imposing unique Government requirements. Unique identification of tangible items will help achieve:

- Integration of item data across DoD, Federal and industry asset management systems, as envisioned by the DoD Business Enterprise Architecture (BEA)¹, to include improved data quality and global interoperability and rationalization of systems and infrastructure.
- Improved item management and accountability.
- Improved asset visibility and life cycle management.
- Clean audit opinions on tangible item portions² of DoD financial statements.

WHAT IS AN ITEM?

An item is a single article or a unit formed by a grouping of component or constituent parts. In the Department, an item is any article produced, stocked, stored, issued, or used;³ or any product, including systems, materiel, parts, subassemblies, sets, accessories, etc.⁴

Deciding What Items are to be Identified as Unique

The unique identification of tangible items is driven by an integrated set of logistics, acquisition and financial requirements to track and identify item information. Figure 1 contains a decision tree for deciding what tangible items⁵ should be uniquely identified

¹ The Business Management Modernization Program (BMMP) is developing the BEA that will provide a blue print for modernizing and standardizing DoD business processes and systems, to include requirements to facilitate capturing information on tangible items in property and inventory management systems.

² These financial statement portions are (1) Property, Plant and Equipment and (2) Operating Materials and Supplies.

³ Ibid, paragraph E2.1.20. MIL STD 130 defines an item: as "a non-specific term used to denote any unit or product including materials, parts, assemblies, equipment, accessories, and computer software."

⁴ MIL HDBK 61A(SE), *Configuration Management Guidance*, 7 February 2001, page 3-8.

⁵ **Equipment** - Tangible items that are not intended to be held for sale or consumed in normal operations. Includes military equipment, support equipment, general purpose equipment, special test equipment, and special tooling. Includes Class VII, Major End Items, a final combination of end products that is ready for

for DoD purposes. The program manager is responsible for having items uniquely identified.

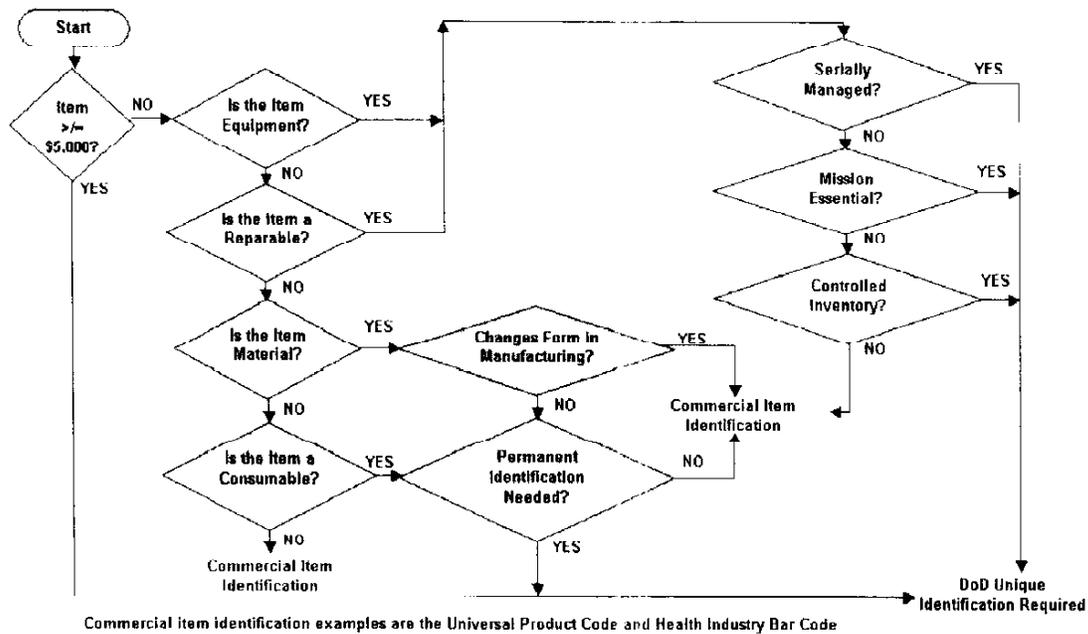


Figure 1. Uniquely Identifying Tangible Items

Commercial data elements on tangible items will be accepted as long as they meet data requirements and syntax for unique identification for the DoD. Generally, industry places sufficient information on items to distinguish between unlike items. The Global Trade Identification Number (GTIN) is an example of an acceptable commercial identification of commodity items. Health care products marked according to the Health Industry Bar Code (HIBC) Standard are another example of acceptable commercial

its intended use, that is, launchers, tanks, mobile machine shop, and vehicles, etc. (DOD 4140.1-R). It does not include real property, reparables, consumables or materials

Reparable - An item of supply subject to economical repair for which repair (at either depot or field level) is considered in satisfying computed requirements at any inventory level (DOD 4140.1-R). Examples include aircraft engines, rotors, guidance systems, and electronic circuit boards. Excludes medical equipment parts.

Consumables - A consumable is an item of supply that is normally expended or used up beyond recovery in the use for which it is designed or intended (DOD 4140.1-R) (e.g. clothing and supplies). For purposes of this decision tree, explosives are treated as consumable items; and bulk petroleum, oil and lubricants delivered by pipeline are excluded. For packaging purposes, the Department might request additional marks/information in the mark that vendors should be able to provide without difficulty, or significant expense.

Material - Of, composed of, or pertaining to physical substances (The American Heritage Dictionary, Office Edition, July 1987). Materials are tangible items that may lose their identity when incorporated in an end item. (e.g., sheet metal). FAR 45.301 defines material as property that may be incorporated into or attached to a deliverable end item or that may be consumed or expended in performing a contract. It includes assemblies, components, parts, raw and processed materials, and small tools and supplies that may be consumed in normal use in performing a contract.

identification because they include Labeler Identification Codes within each barcode to identify individual manufacturers or healthcare providers.

Contracts will require unique item identification, or a DoD recognized unique identification equivalent, for all property items delivered to the Government if: (1) the acquisition cost⁶ is \$5,000 or more, (2) it is either a serially managed, mission essential or controlled inventory⁷ piece of equipment or a repairable item, or a consumable item or material where permanent identification is required, (3) it is a component of a delivered item, if the program manager has determined that unique identification is required, or (4) a UID or a DoD recognized UID equivalent is available.

DEFINING THE DATA ELEMENTS FOR UNIQUE IDENTIFICATION

What is a Unique Identifier?

A unique identifier is a set of data for tangible assets that is globally unique and unambiguous, ensures data integrity and data quality throughout life, and supports multi-faceted business applications and users. There are two key considerations in the unique identification of tangible items.

The Notion of an Enterprise

The first is enterprise identification. An enterprise is the entity responsible for assigning the unique identifier to a tangible asset. Enterprise means a business organization or firm, which is defined as a commercial partnership of two or more persons⁸. For

⁶ The term "acquisition cost" means the amount paid for an item, plus transportation costs and other ancillary costs. Generally, the amount will be either the price of an item delivered under a fixed price contract, or the cost of an item, net of both trade and cash discounts, delivered under a cost type or time and materials contract, pending final price determination.

⁷ **Serially Managed** - Includes repairable items down to and including sub-component repairable unit level; life-limited, time controlled, or items requiring records (e.g., logbooks, aeronautical equipment service records, etc.); and items that require technical directive tracking at the part level [DUSD(Logistics & Material Readiness) Memorandum, September 4, 2002, Serialized Item Management].

Mission Essential/Item Essentiality - A measure of an item's military worth in terms of how its failure (if a replacement is not immediately available) would affect the ability of a weapon system, end item, or organization to perform its intended functions. (DOD 4140.1-R).

Controlled Inventory - Those items that are designated as having characteristics that require that they be identified, accounted for, segregated, or handled in a special manner to ensure their safeguard and integrity. Includes classified items (require protection in the interest of national security), sensitive items (require a high degree of protection and control due to statutory requirements or regulations, such as precious metals; items of high value, highly technical, or hazardous nature; and small arms), and pilferable items (items having a ready resale value or application to personal possession, which are especially subject to theft.) (DOD 4140.1-R); and safety controlled items. UID can be applied at the discretion of the program/item manager for pilferable items.

⁸ MIL STD 130 also defines manufacturer as "an individual, company, corporation, firm, or Government activity who: (a) Controls the production of an item, or (b) produces an item from crude or fabricated materials, or (c) assembles materials or components, with or without modification, into more complex items."

purposes of unique identification, an enterprise identifier will define each business location that has its own unique, separate and distinct operation. An enterprise identifier is a code uniquely assigned to an enterprise by a registration (or controlling) authority. A registration (or controlling) authority is an organization responsible for assigning a non-repeatable identifier to an enterprise [i.e., Dun & Bradstreet's Data Universal Numbering System (DUNS) Number, Uniform Code Council (UCC)/EAN International (EAN) Company Prefix, or Defense Logistics Information Service (DLIS) Commercial and Government Entity (CAGE) Number].

Unique Identification of Items

The other key aspect of UID is the unique identification of each item that the enterprise produces. Unique identification depends upon a combination of data elements, which is determined by how the enterprise serializes tangible items. There are two acceptable methods of serialization – (1) Serialization within the enterprise identifier, and (2) Serialization within the part number. Serialization within the enterprise identifier occurs when each tangible item is assigned a serial number that is unique among all the tangible items identified under the enterprise identifier and is never used again. The enterprise is responsible for ensuring unique serialization within the enterprise identifier. Serialization within the part number occurs when each tangible item of a particular part number is assigned a unique serial number within the original part number assignment. The enterprise is responsible for ensuring unique serialization within the original part number.

Serialization Within the Enterprise

For items that are serialized within the enterprise identifier, unique identification is achieved by a combination of the issuing agency code⁹, enterprise identifier and the serial number, which must be unique within the enterprise identifier. The unique serial number within the enterprise identifier is a combination of numbers or letters assigned by the enterprise (i.e., a manufacturer or vendor) to an item that provides for the differentiation of that item from any other like or unlike item and is never used again within the enterprise identifier. The data elements of enterprise identifier and unique serial number within the enterprise identifier provide the permanent identification for the life cycle of the item.

Serialization Within the Part Number

For items that are serialized within the part number, unique identification is achieved by a combination of the issuing agency code, enterprise identifier, the original part number, and the serial number. The original part number is a combination of numbers and letters assigned by the enterprise (i.e., a manufacturer or vendor) at asset creation to a class of items with the same form, fit, function, and interface. The serial number within the part

⁹ The issuing agency code, or IAC, is that assigned by the Registration Authority for ISO/IEC 15459-2, Registration Procedures. The current Registration Authority of ISO/IEC 15459-2 is NEN – Nederlands Normalisatie-instituut. The IAC represents the registration authority that issued the enterprise identifier. The IAC can be derived from the data qualifier for the enterprise identifier and does not need to be marked on the item.

number is a combination of numbers and letters assigned by the enterprise (i.e., a manufacturer or vendor) to an item that provides for the differentiation of that item from any other like item. The data elements of enterprise identifier, original part number and serial number within the original part number provide the permanent identification for the life cycle of the item.

Issuing Agency Codes for Use in Unique Identification

At the current time, issuing agency codes (IACs) only exist for two of the most commonly used enterprise identifiers. These IACs are “UN” for the DUNS enterprise identifier assigned by Dun & Bradstreet, and “0” for the EAN.UCC Company Prefix assigned by EAN.UCC. There is no IAC yet for the CAGE/NCAGE assigned by Allied Committee 135. Until such time as an IAC becomes available for the CAGE/NCAGE enterprise identifier, assigners of UIDs will have to use either their DUNS or EAN.UCC Company Prefix to construct the UID.

INCLUDING UNIQUE IDENTIFICATION DATA ELEMENTS ON A TANGIBLE ITEM

Derivation of the Unique Identifier

The unique identifier can be derived from the data elements included on the item by using a business rule (See Appendix C). This derivation occurs in the software of the automatic identification technology (AIT) device¹⁰ that machine-reads the data elements on the item. Therefore, it is not necessary to include the unique identifier on the item as a separate data element. It is only required that the unique identification data elements of enterprise identifier, serial number and, for construct #2, original part number be included on each item¹¹. Table 1 shows how the unique identifier is constructed from the data elements placed on the item and the business rule. When deriving the unique identifier, the data qualifiers are eliminated from the final number.

¹⁰ Such devices are readers, scanners and interrogators.

¹¹ The data elements can be included on the item by a variety of AIT media, such as linear bar codes, two-dimensional bar codes, optical memory cards, contact memory buttons, or radio frequency identification.

	UID Construct #1	UID Construct #2
Based on current enterprise configurations	If items are serialized within the Enterprise	If items are serialized within Part Number
UID is derived by concatenating the data elements IN ORDER:	(Issuing Agency Code)* Enterprise ID Serial Number	(Issuing Agency Code)* Enterprise ID Original Part Number Serial Number
Data Identified on Assets Not Part of the UID (Separate Identifier)	Current Part Number	Current Part Number
*The Issuing Agency Code (IAC) represents the registration authority that issued the enterprise identifier (i.e., Dun and Bradstreet, UCC EAN). The IAC can be derived from the data qualifier for the enterprise identifier and does not need to be marked on the item.		

Table 1. Unique Identifier (UID) Construct Business Rule¹²

Thus, there are two constructs for determining the unique identifier, depending upon whether the enterprise serializes tangible items within the enterprise identifier or within the original part number. Although not used to determine the unique identifier, other data elements, such as the current part number, may also be placed on the tangible item.

Unique Identification Derivation Process

Figure 2 depicts how the unique identifier is derived and the business rule for generating the item unique identifier from the data elements placed on the item¹³. The AIT reader device will machine-read the data elements and output the concatenated unique identifier for onward transmission to the appropriate automated information system (AIS). The decisions of which construct to use (see Table 1) to uniquely identify items, and use of the associated business rules, are made by the enterprise assigning serialization to the item.

¹² In instances where the original part number changes with new configurations (also known as part number roll), the current part number may be included on the item as a separate data element for traceability purposes.

¹³ The issuing agency code (IAC), is derived by the AIT device from the data qualifier for the enterprise identifier. The IAC is not placed on the item.

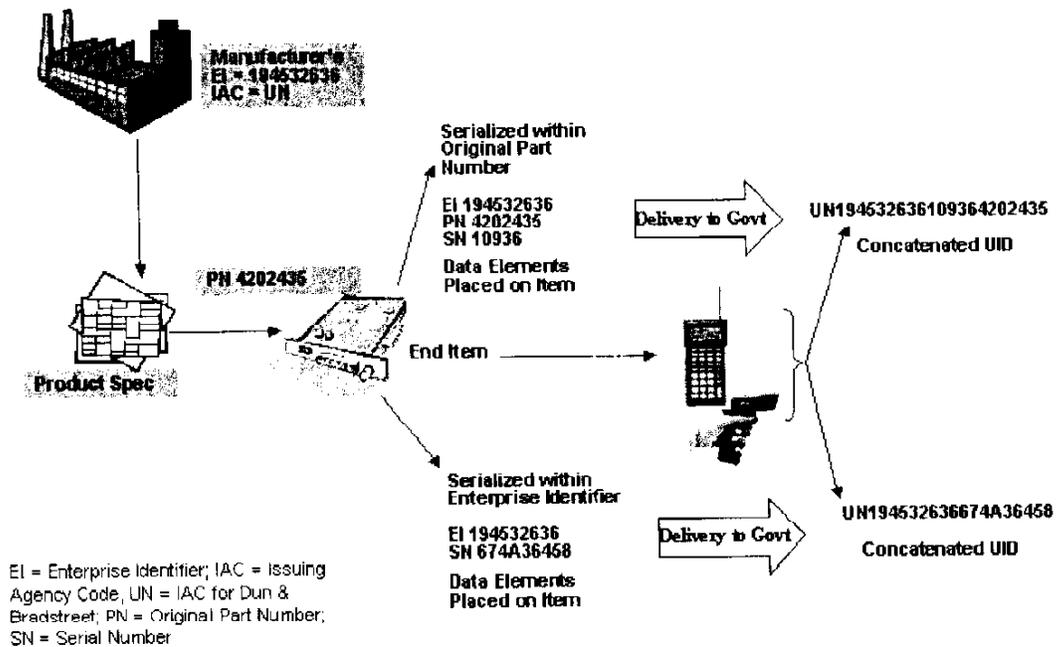


Figure 2. Unique Identifier (UID) Determination Process

DECIDING WHERE TO PLACE DATA ELEMENTS FOR UNIQUE IDENTIFICATION ON ITEMS

Data elements for unique identification (enterprise identifier, serial number and, for Construct 2 only, original part number) will be placed on qualifying items in accordance with the standard practice of MIL-STD-130, Identification Marking of U.S. Military Property. Commercial-off-the-shelf items incorporated into qualifying items will be marked to comply with unique identification requirements.

DECIDING WHEN TO PLACE DATA ELEMENTS ON THE ITEM TO DERIVE THE UNIQUE IDENTIFICATION

Strategies that produce the greatest business advantage for the tangible items at the lowest cost and in the shortest possible time should be considered. The question of how this could be done leads to a conclusion that the probable scenario would be a mixture of *vendor-applied-at-source*, *opportunity-based*, *seek-and-apply*, and *gated* strategies¹⁴. Requiring vendor-applied-at-source on future contracts for new equipment, major modifications, and procurements of end items and spares is important for sustainment, but has limited impact on a retrospective application program.

¹⁴ See Ronald W. Durant and Owen R. Thompson, "Concept of Operations for AIT in an Automated Maintenance Environment for Army Weapon Systems", Executive Summary and Report (Volume 2), AR130T1, March 2002.

Vendor-Applied-at-Source

Vendor-applied-at-source provides a relatively cheap and unobtrusive application option for future purchases; however, it will not provide the speed of response necessary to successfully implement a retrospective application program for legacy items.

Opportunity-Based Item Application

Opportunity-based item application can be done in the field or factory, wherever it is convenient to gain access to items either on an end item or available in a storage facility. Projected situations or processes where this might be deployed include phase maintenance, scheduled servicing, depot rebuild or overhaul processes, and work-order processes during modification.

Seek-and-Apply

The seek-and-apply strategy can be used for particular items held within service, either at the end item or in storage. This strategy is dependent on establishing the location and availability of items before deployment of application equipment and teams. The location of items can be determined through the supply chain management information systems and inventory control systems. This approach is dependent upon good legacy data, and will demand greater overhead of coordinated effort to effect access to the assets. By concentrating application efforts, the advantage is faster fielding of configuration management for specific items.

Gated

The interception of items as they transit specific gates within the supply chain can ensure no item enters service without the data elements needed to construct a unique identifier. Having identified an item at the gate which requires a unique identifier, the situation can be resolved by either diverting the item back to the vendor for application, provision of an application capability at the specific supply gate, or diversion of the item to a centralized application facility.

USE OF THE UNIQUE IDENTIFIER IN AUTOMATED INFORMATION SYSTEMS

In the Service or Agency material management and supporting automated information systems (AISs) (developed or maintained in compliance with FMIP/FMEA requirements), once the unique identifier is created from the separate data elements placed on the item, the unique identifier shall not be parsed to determine the original elements, since parsing and recombination of the elements will invariably result in the introduction of errors in the unique identifier; however the UID, the enterprise identifier, the serial number and, in the case of Construct #2, the original part number will be captured separately at the time of inspection and acceptance. The unique identifier shall be a primary pointer or key data element for traceability in all computational functions

including inventory acceptance, item accountability, storage, issue, receipt, valuation, maintenance, and disposal.

ROLES AND RESPONSIBILITIES FOR PROPERTY RECORDS

DoD Instruction 5000.64¹⁵ provides a comprehensive framework for DoD property accountability policies, procedures, and practices; assists DoD property managers, accounting and financial officers, and other officials in understanding their roles and responsibilities relating to property accountability. It establishes accountability policy for property, plant, and equipment (PP&E); contains concepts useful for asset management throughout the Department, particularly for property in the possession of individual military units and end-users. Section 5.3 addresses accountability records. It excludes property and materiel for which accountability and inventory control requirements are prescribed in DoD 4140.1-R and DoD 4000.25-2-M.¹⁶

¹⁵It integrates the broad requirements of the Federal Property and Administrative Services Act of 1949, as amended (Act of 30 June 1949, 63 Stat. 372), and the Chief Financial Officers (CFO) Act of 1990 into an overarching property accountability policy. Complements the accounting and financial reporting requirements contained in DoD 7000.14-R.

¹⁶ Military Standard Transaction Reporting and Accounting Procedures (MILSTRAP).

7. The IAC shall be derived from the data qualifier for the enterprise identifier. The IAC is not required to be marked on the item.
8. The list of DOD-accepted IACs can be found in the Unique Identification Guidance, Data Qualifiers Table.
9. The data qualifier associated with the serial number will identify which UID Construct is used to build the UID.
10. If UID Construct #2 is used, the enterprise must be capable of maintaining the original part number on the item for the life of the item as well as the current part number, in the case of configuration changes.
11. The enterprise is responsible for ensuring that the serial number is unique within the enterprise identifier (for UID Construct #1) or unique within the original part number (for UID Construct #2).
12. The enterprise is responsible for ensuring that the part number is not duplicated within the enterprise.
13. The UID will not change over the life of the item. Therefore, the component data elements of the UID will not change over the life of the item.
14. The enterprise identifier used to construct the UID shall be the only enterprise identifier marked on an item.¹⁸
15. Data elements not required to construct the UID shall remain discrete but may be contained within the same mark or media as the UID-required elements, as long as all the data elements contained in the mark or media are properly identified using the UID syntax and semantics rules.
16. The UID component data elements, at a minimum, shall be contained in a Data Matrix ECC200 symbol. The physical marks that contain the UID-required elements shall remain legible and non-transferable until the item is destroyed.
17. Where space is available, human readable information for UID data elements should be marked on the item.
18. High capacity Automatic Identification Technology (AIT) media shall utilize DOD-accepted syntax.

¹⁸ This item is still under discussion.

METADATA REQUIREMENTS

19. The UID is a non-parsable, alphanumeric, non-case sensitive field, not to exceed 50 characters in length. Overhead characters, such as syntax and data qualifiers, are eliminated from the string when the UID is constructed.¹⁹
 - The IAC string of characters will not exceed 2 characters
 - The enterprise identifier string of characters will not exceed 13 characters, excluding the data qualifier.
 - The original part number string of characters (including special characters) will not exceed 32 characters, excluding the data qualifier.
 - The serial number string of characters (including special characters) will not exceed 30 characters, excluding the data qualifier.
20. The UID string of data must have worldwide uniqueness (non-repeatable).
21. When constructing the UID²⁰:
 - Spaces will be deleted
 - Special characters will be deleted from the enterprise identifier
 - Special characters will not be deleted from part numbers and serial numbers

CAPTURING THE UNIQUE IDENTIFIER

22. For activities after initial delivery in support of the product life cycle, any entity that collects data about the item must be capable of associating the data with the UID in accordance with program requirements.²¹
23. In a database, once the UID is derived, it shall not be parsed to determine the original elements.
24. A database shall be capable of using the UID to retrieve the data record associated with the item represented by the UID.

USING THE UNIQUE IDENTIFIER

25. The UID cannot be reused once retired.

¹⁹ This item is still under discussion.

²⁰ This item is still under discussion.

²¹ This item is still under discussion.

SPECIAL RULES FOR EXISTING INVENTORY (Applies only to parts that are not marked with Machine Readable Information (MRI) today)

26. When marked, existing items shall be marked using UID Construct #2.
27. If an item is missing data elements required to construct the UID, use the following rules to create substitute numbers:
 - If the enterprise identifier is missing, use the enterprise identifier of the activity that will physically mark the item.
 - If the part number is missing or cannot be determined, obtain a part number from the in-service engineer²².
 - If the serial number is missing, assign a serial number locally. In this case, the enterprise identifier for the item must be changed to represent the activity that assigned the serial number.
28. If a UID cannot be constructed to ensure uniqueness from data elements on the item, the government Program Manager will determine if and what other data elements can be included with the part or serial number to obtain uniqueness.²³
29. If the item is unidentifiable, a UID should not be assigned.

ITEMS “UNDER CONTRACT”

30. Once the contract is modified to include the UID requirements:
 - If the contract is for delivery of new items to DOD, follow Rules 1 through 25.
 - If the contract is for support involving existing inventory items, the Program Manager will determine whether to follow Rules 1 through 25, the Special Rules for Existing Inventory (Rules 26 through 29), or some combination thereof.

²² This item is still under discussion.

²³ This item is still under discussion.

Appendix B -The Mechanics of Unique Identification

STRUCTURING THE DATA ELEMENTS FOR UNIQUE IDENTIFICATION

This Appendix explains how data elements are currently structured using semantics and syntax. The concepts of semantics and syntax, which are used to identify and structure data so it can be read by any AIT device, are explained. Examples of current structures are presented for ASC MH 10 Data Identifiers (Table 3) and Application Identifiers (Table 4) and ATA Spec 2000 Text Element Identifiers (Table 5). Since Data Identifiers (ISO/IEC 15434 Format 06) and Application Identifiers (ISO/IEC 15434 Format 05) are already approved by ISO, they are compliant with the collaborative solution. Table 6 represents the changes required to current ATA Spec 2000 marking/encoding to make them compliant with the collaborative solution.

Semantics

For the unique identification data elements to be “machine-readable” by any AIT device, they must be identified by some means such that the reader device can recognize, through its resident software, what data element it is reading. This is accomplished by employing the concept of “semantics”, which is literally “the meaning of language”. For the purposes of constructing machine-readable data elements, semantics take the form of data qualifiers. These data qualifiers²⁴ have to define each data element placed on the item. The serial number identifier is used to tell the AIT devices whether to derive the unique identifier by using Construct #1 or Construct #2. Table 2 shows the different data qualifiers contained within the standards for each of the data elements that are used for determining uniqueness.

²⁴ There are three types of data qualifiers being used. Data Identifiers (DIs) (Format 06), Application Identifiers (AIs)(Format 05), and Text Element Identifiers (TEIs). ISO/IEC International Standard 15418, Information Technology – EAN/UCC Application Identifiers and ASC MH 10 Data Identifiers and Maintenance, governs DIs and AIs. Air Transport Association (ATA) Common Support Data Dictionary (CSDD) defines TEIs used in ATA specifications. ISO/IEC International Standard 15434, Information Technology – Syntax for High Capacity ADC Media, contains formats for DIs and AIs. DoD is preparing to submit a request to add TEIs to ISO/IEC 15434.

Data Element	Data Identifier (Format 06) ISO/IEC 15434	Application Identifier (Format 05) ISO/IEC 15434	Text Element Identifier ATA Spec 2000
Enterprise Identifier <ul style="list-style-type: none"> • CAGE/NCAGE • DUNS • EAN.UCC (Most commonly used)	17V 12V	<i>TBD</i> ²⁵	CAG DUN EUC
Serial Number within Enterprise Identifier	18S	8004 ²⁶	SER
Serial Number within Original Part Number	S	21	SEQ
Original Part Number	1P	01	PNO
Current Part Number	30P	240	PNR

Blank boxes indicate the need for updates to the semantics within the standards

Table 2. Data Qualifiers

Syntax

Once the data elements are identified to the AIT device, the AIT device needs instructions on how to put the data element fields together to define the unique identifier. This is called “syntax”²⁷. High capacity AIT devices used in unique identification shall conform to ISO/IEC International Standard 15434, *Information Technology – Syntax for High Capacity ADC*²⁸ Media. This standard defines the manner in which the data is transferred to the high capacity ADC media from a supplier’s information system and the manner in which the data is transferred to the recipient’s information system. This is crucial to the unique identifier, since the process of identifying and concatenating the data elements must be unambiguous.

²⁵ This data qualifier is yet to be determined.

²⁶ 8004 is the application identifier for the EAN.UCC Global Individual Asset Identifier (GIAI). The format of the GIAI is the combination of the EAN.UCC Company Prefix (up to 14 numerical characters) and an Individual Asset Reference (up to 30 alpha numeric characters), which is assigned by the holder of the EAN.UCC Company Prefix.

²⁷ The way words are put together to form constructions, such as phrases and sentences.

²⁸ ADC – Automatic Data Capture.

EXAMPLES OF SEMANTICS AND SYNTAX CONSTRUCTIONS FOR THE UNIQUE IDENTIFIER

Using ASC MH 10 Data Identifiers

Table 3 shows an example, using the data from Figure 2, of how the data elements would have to be encoded with data identifiers on the AIT media placed on or with the item.

Data Element	Data Identifier Format 06	Data Element Value	Encoded Data Element on AIT Media
Enterprise Identifier • DUNS	12V	194532636	12V194532636
Serial Number within Enterprise Identifier	25S	674A36458	25S674A36458
Serial Number within Original Part Number	S	10936	S10936
Original Part Number	1P	4202435	1P4202435
Current Part Number	30P	4202435-01	30P4202435-01

**Table 3. Example of the Use of Data Identifiers
(Format 06 of ISO/IEC 15434)**

Recalling that the unique identifier is to be concatenated in the order Issuing Agency Code/Enterprise Identifier/Original Part Number/Serial Number for an enterprise that serializes within the part number, the unique identifier data elements would be encoded as follows using Format 06 for Data Identifiers of the ISO/IEC 15434 syntax:

$$[]>^R_s 06^G_s 12V194532636^G_s 1P4202435^G_s S10936^R_s E_{OT}$$

Where:

[]> = A three-character compliance indicator

R_s = A Format Trailer Character to indicate the end of a data format envelope

06 = A format header which indicates Data Identifiers are being used

G_s = A Data Element Separator used between data fields

12V = Data Identifier for DUNS code

194532636 = DUNS Code

1P = Data Identifier for part number assigned by supplier (Original)

4202435 = Original part number

S = Data Identifier for serial number within the original part number

10936 = Serial number within original part number

E_{OT} = A Message Trailer which identifies the end of the message within the data stream

When the AIT device reads the data qualifier for the enterprise identifier, it will have what registration authority (that is, the Issuing Agency Code) issued the enterprise identifier available in its software. The AIT device can then attach the Issuing Agency Code (IAC) to the beginning of the UID concatenation. In this example the IAC for Dun & Bradstreet is "UN".

For this example using Format 06 for ASC MH 10 Data Identifiers of ISO/IEC 15434, the unique identifier output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be UN194532636420243510936.

Using Application Identifiers

Table 4 shows an example, using the data from Figure 2, of the use of application identifiers.

Data Element	Application Identifier Format 05	Data Element Value	Encoded Data Element on AIT Media
Enterprise Identifier • EAN.UCC	TBD ²⁹	12345	TBD12345
Serialization within Enterprise Identifier	8004 ³⁰	12345674A36458	800412345674A36458
Serial Number within Original Part Number	21	10936	2110936
Original Part Number	01	4202435	014202435
Current Part Number	240	4202435-01	2404202435-01

Table 4. Example of the Use of Application Identifiers (Format 05 of ISO/IEC 15434)

²⁹ This application identifier has not yet been determined.

³⁰ 8004 is the application identifier for the EAN.UCC Global Individual Asset Identifier (GIAI). The format of the GIAI is the combination of the EAN.UCC Company Prefix (up to 14 numerical characters) and an Individual Asset Reference (up to 30 alpha numeric characters), which is assigned by the holder of the EAN.UCC Company Prefix.

Recalling that the unique identifier is to be concatenated in the order Issuing Agency Code/Enterprise Identifier/Original Part Number/Serial Number for an enterprise that serializes within the original part number, the unique identifier data elements would be encoded as follows using Format 05 for Application Identifiers of the ISO/IEC 15434 syntax:

${}] > {}^R {}_S 05 {}^G {}_S TBD12345 {}^G {}_S 0142024352 {}^G {}_S 2110936 {}^R {}_S {}^{E} {}_{OT}$

Where:

${}] >$ = A three-character compliance indicator

${}^R {}_S$ = A Format Trailer Character: to indicate the end of a data format envelope

05 = A format header which indicates Application Identifiers are being used

${}^G {}_S$ = A Data Element Separator used between data fields

TBD = Application Identifier for EAN.UCC code yet to be determined

12345 = EAN.UCC Code

01 = Application Identifier for original part number

4202435 = Original part number

21 = Application Identifier for serial number within the original part number

10936 = Serial number within original part number

${}^E {}_{OT}$ = A Message Trailer which identifies the end of the message within the data stream

When the AIT device reads the data qualifier for the enterprise identifier, it will have what registration authority (that is, the Issuing Agency Code) issued the enterprise identifier available in its software. The AIT device can then attach the Issuing Agency Code (IAC) to the beginning of the UID concatenation. In this example the IAC for EAN.UCC is "0".

For this example using Format 05 for Application Identifiers of ISO/IEC 15434, the unique identifier output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be 012345420243510936.

The use of Application Identifiers in the construct of serialization within the enterprise is different enough to merit an additional example using the data in Table 4. Recalling that the unique identifier is to be concatenated in the order Issuing Agency Code/Enterprise Identifier/Serial Number Within Enterprise, the unique identifier data elements would be encoded as follows using Format 05 for Application Identifiers of the ISO/IEC 15434 syntax:

${}] > {}^R {}_S 05 {}^G {}_S 800412345674A36458 {}^R {}_S {}^{E} {}_{OT}$

Where:

]> = A three-character compliance indicator

R_S = A Format Trailer Character to indicate the end of a data format envelope

05 = A format header which indicates Application Identifiers are being used

G_S = A Data Element Separator used between data fields

8004 = Application Identifier for serialization within the enterprise

12345674A36458 = Serial number within the enterprise, or Global Individual Asset Identifier, which is composed of the EAN.UCC Company Prefix (**12345**) and the Individual Asset Reference (**674A36458**)

F_{OT} = A Message Trailer which identifies the end of the message within the data stream

For this example using Format 05 for Application Identifiers of ISO/IEC 15434, the unique identifier output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be 012345674A36458.

Using Text Element Identifiers

Table 5 shows an example, using the data from Figure 2, of the use of TEIs.

Data Element	TEIs ³¹	Data Element Value	Encoded Data Element on AIT Media
Enterprise Identifier • DUNS	DUN	194532636	DUN 194532636
Serial Number within Enterprise Identifier	SER	674A36458	SER 674A36458
Serial Number within Original Part Number	SEQ	10936	SEQ 10936
Original Part Number	PNO	4202435	PNO 4202435
Current Part Number	PNR	4202435-01	PNR 4202435-01

**Table 5. Example of the Use of TEIs
(Chapter 9, ATA Spec 2000³²)**

³¹ All TEIs are four characters in length, consisting of three letters followed by a space.

³² ATA Spec 2000, Integrated Data Processing Materials Management, Chapter 9, Bar Coding, Revision 2002.1.

Recalling that the unique identifier is to be concatenated in the order Issuing Agency Code/Enterprise Identifier/Serial Number Within Enterprise for an enterprise that serializes within the enterprise, the unique identifier data elements would be encoded as follows using TEIs of ATA Spec 2000:

DUN 194532636/SER 674A36458³³

Where:

DUN = TEI for DUNS code

194532636 = DUNS code

/ = Field separator

SER = TEI for Serial number within enterprise identifier

674A36458 = Serial number within enterprise identifier

When the AIT device reads the data qualifier for the enterprise identifier, it will have what registration authority (that is, the Issuing Agency Code) issued the enterprise identifier available in its software. The AIT device can then attach the Issuing Agency Code (IAC) to the beginning of the UID concatenation. In this example the IAC for Dun & Bradstreet is "UN".

For this example using TEIs of ATA Spec 2000, the unique identifier output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be UN194532636674A36458.

The Collaborative AIT Solution

The Department, along with its industry and international partners, clearly prefers use of constructs described in ISO/IEC 15434 to achieve interoperability in business intelligence. However, this requires ISO approval to add a new format to ISO/IEC 15434 for those ATA Spec 2000 Text Element Identifiers (TEIs) used in UID. The Department values the formal ISO approval process and is preparing to submit a proposal to ISO/IEC JTC1/SC 31 seeking approval of a new format for the TEI addition. That approval process is lengthy, and, in the interim, a collaborative solution is necessary to create a near-term interoperable environment for UID enhancements to business intelligence to support coalition operations. This solution uses the structure of ISO/IEC 15434 as the UID syntax standard and the business rules in Appendix A. If approved, the new format shall be used and replace the interim "DD" format described in this guidance. Consideration and decisions on marking approaches should carefully weigh any impacts to changing from the "DD" format to an approved future format against any associated costs and strategic near term marking requirements. ISO/IEC 15434 is and will be the Department's preferred approach on all new solicitations. The use of the collaborative

³³ All TEIs are four characters in length, consisting of three letters followed by a space.

solution format as described below should strictly be considered an interim approach.

Using Text Element Identifiers in the Collaborative Solution

Table 6 shows an example, using the data from Figure 2, of the use of TEIs in the collaborative solution.

Data Element	TEIs ³⁴	Data Element Value	Encoded Data Element on AIT Media
Enterprise Identifier • DUNS	DUN	194532636	DUN 194532636
Serial Number within Enterprise Identifier	SER	674A36458	SER 674A36458
Serial Number within Original Part Number	SEQ	10937	SEQ 10937
Original Part Number	PNO	4202435	PNO 4202435
Current Part Number	PNR	4202435-01	PNR 4202435-01

Table 6. Example of the Use of TEIs in the Collaborative Solution

Recalling that the unique identifier is to be concatenated in the order Issuing Agency Code/Enterprise Identifier/Part Number/Serial Number for an enterprise that serializes within the part number, the unique identifier data elements would be encoded as follows using an interim, DoD-specific, Format DD (see note below) for TEIs utilizing the ISO/IEC 15434 syntax:

$[D]>^R S DD^G S DUN 194532636^G S PNO 4202435^G S SEQ 10936^R S E O T$

Where:

$[D]>$ = A three-character compliance indicator

R_S = A Format Trailer Character to indicate the end of a data format envelope

DD = A special, interim DoD-specific format header, which indicates TEIs are being used in the collaborative solution

G_S = A Data Element Separator used between data fields

DUN = TEI for DUNS code

³⁴ All TEIs are four characters in length, consisting of three letters followed by a space.

195432636 = DUNS Code

PNO_ = TEI for original part number

4202435 = Original part number

SEQ = TEI for serial number within the original part number

10936 = Serial number within original part number

E_{OT} = A Message Trailer which identifies the end of the message within the data stream

When the AIT device reads the data qualifier for the enterprise identifier, it will have what registration authority (that is, the Issuing Agency Code) issued the enterprise identifier available in its software. The AIT device can then attach the Issuing Agency Code (IAC) to the beginning of the UID concatenation. In this example the IAC for Dun & Bradstreet is "UN".

For this example using Format DD for TEIs using the ISO/IEC 15434 syntax, the unique identifier output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be UN195432636420243510936.

Note: ISO/IEC 15434, Syntax for High Capacity ADC Media, specifies a two-digit format header. Numbers 01- 09 and 11 are assigned. Numbers 00, 10 and numbers 12-99 are reserved for future use. This means that a format header for text element identifiers of the collaborative solution cannot be assigned a two-digit number without SC 31 approval, since all two digit numbers have been reserved. In the interim, to enable the collaborative solution utilizing the ISO/IEC 15434 syntax, the Department will use a special, interim DoD-specific format header, designated as "DD", to indicate TEIs are being used in the collaborative solution.