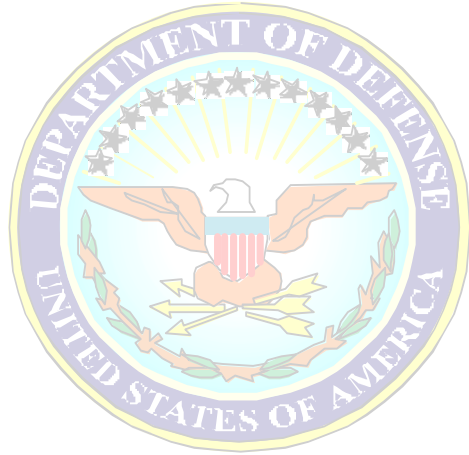# Department of Defense Guide to Uniquely Identifying Items



# Assuring Valuation, Accountability and Control of Government Property

Version 1.4
April 16, 2004

Office of the Principal Deputy Under Secretary of Defense
(Acquisition, Technology & Logistics)

# Preface

Summary of Changes from Version 1.3 (Posted to the DoD website on 8 December 2003) to Version 1.4:

a. Table 2, Contracts Requirements, was inserted under the topic heading "Establishing Acquisition Cost" on page 10. The remaining tables were renumbered.

b. The discussion of DoD unique identification (UID) equivalents was moved from a footnote and placed in the text on page 15. The Electronic Serial Number (ESN) for cellular telephones only was added.

c. Modified Table 3, Issuing Agency Codes, on page 17 by changing the Issuing Agency Code for CAGE to "D". Added "LH" for the European Health Business Communications Council.

d. Footnote 29 on page 18 was revised to address serialization within the lot/batch number.

e. Modified Figure 3, Unique Identification (UID) Determination Process, on page 19.

f. Table 5, Data Qualifiers, on page 40 was revised to list the Text Element Identifiers supported by the Air Transport Association (ATA) Common Support Data Dictionary (CSDD) and annotate those proposed TEIs whose future use is dependent upon ATA including them in the CSDD.

g. Figure 4, Unique Identification (UID) Construction, on page 41 was updated to include DoD UID equivalents.

h. Appendix A was updated to include the definitions from Defense Federal Acquisition Regulation Supplement (DFARS) 252.211-7003, Item Identification and Valuation. Definitions for Data Carrier and Data Matrix were also added. Definitions were placed in alphabetical order.

i. Appendix B was updated.

j. Appendix D was revised to address the use of Application Identifiers in UID Constructs #1 and #2. Also, the use of Text Element Identifiers (TEIs) is now restricted to UID Construct

#1 only, because the ATA CSDD does not include the necessary TEIs to support UID Construct #2. This use was illustrated for instances of serialization by the manufacturer and serialization by enterprises other than the manufacturer. Reference to ISO TS 21849 was deleted, because the ATA CSDD is the authoritative source for TEIs.

k. Appendix E was updated.

l. Administrative edits were made to DoD document number formats throughout.

# Table of Contents

# Chapter 1
# The Environment

## THE GOVERNMENT PROPERTY MANAGEMENT CHALLENGE

The General Accounting Office (GAO) aptly describes the challenge faced by today's managers of Federal Government property: "GAO and other auditors have repeatedly found that the federal government lacks complete and reliable information for reported inventory and other property and equipment, and can not determine that all assets are reported, verify the existence of inventory, or substantiate the amount of reported inventory and property. These longstanding problems with visibility and accountability are a major impediment to the federal government achieving the goals of legislation for financial reporting and accountability. Further, the lack of reliable information impairs the government's ability to (1) know the quantity, location, condition, and value of assets it owns, (2) safeguard its assets from physical deterioration, theft, loss, or mismanagement, (3) prevent unnecessary storage and maintenance costs or purchase of assets already on hand, and (4) determine the full costs of government programs that use these assets. Consequently, the risk is high that the Congress, managers of federal agencies, and other decision makers are not receiving accurate information for making informed decisions about future funding, oversight of federal programs involving inventory, and operational readiness".[1] Further, the Congress has demanded greater fiscal accountability from managers of federal government property.[2]

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[1] GAO-02-447G, Executive Guide, Best Practices in Achieving Consistent, Accurate Physical Counts of Inventory and Related Property, March 2002, page 6.

[2] Ibid, page 5: The GAO observes that "In the 1990s,the Congress passed the Chief Financial Officers Act of 1990 and subsequent related legislation, the Government Management Reform Act of 1994, the Government Performance and Results Act of 1993, and the Federal Financial Management Improvement Act of 1996. The intent of these acts is to (1) improve financial management, (2) promote accountability and reduce costs, and (3) emphasize results-oriented management. For the government's major departments and agencies, these laws (1) established chief financial officer positions, (2) required annual audited financial statements, and (3) set expectations for agencies to develop and deploy modern financial management systems, produce sound cost and operating performance information, and design results-oriented reports on the government's financial position by integrating budget, accounting, and program information. Federal departments and agencies work hard to address the requirements of these laws but are challenged to provide useful, reliable, and timely inventory data, which is still not available for daily management needs."

# THE DEFINITION OF ITEMS

For the purposes of this guide, an item is any article produced, stocked, stored, issued, or used.[3] Items can be classified into the categories of Equipment, Reparables, Material, and Consumables.

- Equipment is defined as items that are not held for sale or consumed in normal operations. This category 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 its intended use, that is, launchers, tanks, mobile machine shop, and vehicles, etc.4

- A reparable is 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.[5] Examples include aircraft engines, rotors, guidance systems, and electronic circuit boards.

- Material is defined as being of, composed of, or pertaining to physical substances.[6] Materials are items that may lose their identity when incorporated in an end item. (e.g., sheet metal). The 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. It does not include real property, reparables, or 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 (e.g. clothing and supplies).[7] For purposes of this guide, explosives are treated as consumable items; and bulk petroleum, oil and lubricants delivered by pipeline are excluded.

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[3] DoDI 5000.64.
[4] DoD 4140.1-R.
[5] Ibid.
[6] The American Heritage Dictionary.
[7] DoD 4140.1-R, op. cit.

# THE OBJECTIVES

Department of Defense (DoD) Instruction 5000.64, Defense Property Accountability, requires that accountability records be established for all property (property, plant and equipment) with a unit acquisition cost of $5,000 or more, and items that are sensitive or classified, or items furnished to third parties, regardless of acquisition cost. Property records and/or systems are to provide a complete trail of all transactions, suitable for audit.[8]

DoD 4140.1-R requires accountability and inventory control requirements for all property and materiel received in the wholesale supply system.

A key component of effective property management is to use sound, modern business practices.

In terms of achieving the desirable end state of integrated management of items, the collective DoD goal shared by all functional processes involved in property management is to uniquely identify items, while relying to the maximum extent possible on international standards and commercial item markings and not imposing unique Government requirements. Unique identification of items will help achieve:

- Integration of item data across the Department of Defense (hereafter referred to as the Department), and Federal and industry asset management systems, as envisioned by the DoD Financial Management Enterprise Architecture (FMEA)[9], 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 item portions[10] of DoD financial statements.

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[8] The Instruction states that property accountability systems and records should include data elements such as part number, national stock number, serial numbers, bar codes, or other unique identifiers (e.g., hull, building, aircraft tail numbers, vehicle registration, disposal turn-in document number, as may be appropriate and necessary).

[9] In June 2001, the Secretary of Defense established the Financial Management Modernization Program (FMMP) as one of his top priorities. The FMMP is developing the FMEA that will provide a blue print for modernizing and standardizing DoD business processes and systems, to include requirements to facilitate capturing information on items in property and inventory management systems.

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

# ITEM MANAGEMENT

The acquisition, production, maintenance, storage, and distribution of items require complete and accurate asset records to be effective, and to ensure mission readiness. Such records are also necessary for operational efficiency and improved visibility, as well as for sound financial management. Physical controls and accountability over items reduce the risk of (1) undetected theft and loss, (2) unexpected shortages of critical items, and (3) unnecessary purchases of items already on hand.

# THE PLAYERS

The principal functional stakeholders in item management are Engineering Management; Acquisition Management; Property, Plant and Equipment Accountability; Logistics Management and Accountability, and Financial Management. Asset visibility is crosscutting to these five functions. Their interests involve the following:

## Engineering Management. DoD Directive 5000.1, Defense Acquisition System, requires that acquisition programs be managed through the application of a systems engineering approach that optimizes total system performance and minimizes total ownership costs. A modular, open-systems approach is employed, where feasible. For purposes of item management, engineering plays a crucial role in the documentation of technical data that defines items and the configuration management of these items throughout their useful life.

## Acquisition Management. The Federal Acquisition Regulation (FAR) Part 45, Government Property, prescribes policies for furnishing Government property to contractors including the use, maintenance, management and reporting of Government-furnished property and contractor-acquired property, and for the return, delivery, or disposal of Government-furnished property and contractor-acquired property.

## Property, Plant and Equipment Accountability.
DoD Instruction 5000.64[11] provides a comprehensive framework for DoD property accountability policies, procedures, and practices; and 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,

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[11]It 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 for property, plant and equipment. Complements the accounting and financial reporting requirements contained in DoD 7000.14-R.

plant, and equipment (PP&E); and contains concepts useful for asset management throughout the Department, particularly for property in the possession of individual military units and end-users. 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.[12]

# Logistics Management and Accountability. DoD
Directive 4140.1, Materiel Management Policy, specifies policies for materiel management.  It is the Department's policy that:

- Materiel management is responsive to customer requirements during peacetime and war.

- Acquisition, transportation, storage, and maintenance costs are considered in materiel management decisions.

- Standard data systems are used to implement materiel management functions.

- The secondary item inventory is sized to minimize the Department's investment while providing the inventory needed to support peacetime and war requirements

- Materiel control and asset visibility are maintained for the secondary item inventory.

DoD 4000.25-M, Defense Logistics Management System (DLMS) Manual, prescribes logistics management policy, responsibilities, procedures, rules, and electronic data communications standards for the conduct of logistics operations in the functional areas of supply, transportation, acquisition (contract administration), maintenance, and finance.[13]

# Financial Management. DoD Instruction 7000.14, Defense
Financial Management Regulation, specifies that all DoD Components shall use a single DoD-wide financial management regulation for accounting, budgeting, finance, and financial management education and training. That regulation is DoD 7000.14-R. It directs financial management requirements, systems, and functions for all appropriated, non-appropriated, working capital, revolving, and trust fund activities. In addition, it directs statutory and regulatory financial reporting requirements.

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[12] Military Standard Transaction Reporting and Accounting Procedures (MILSTRAP).

[13] The DLMS is a system governing logistics functional business management standards and practices rather than an automated information system.

Asset Visibility. Asset visibility is the capability that provides Combatant Commanders, the Military Services, and the Defense Agencies with timely and accurate information on the location; movement; status; and identity of units, personnel, equipment, and supplies.[14]

# PROCESSES, ACTIVITIES AND ACTIONS

Item management involves many functional processes, activities and actions, all focused on operations involving items. These operations must be integrated and flow smoothly so that the needs of warfighters for items are satisfied when and where they occur. The functional processes, activities and actions impacting item management are arrayed in Table 1 in summary format to show how they are related and dependant.

| Functional Processes | Activities | Actions |
|---|---|---|
| Fund | Requirements | Identify needs |
| Acquire | Engineering<br>Materiel Management<br>Cataloging | Assign part number<br>Request part number<br>Assign stock number |
| Produce & Accept | Process Control | Apply & inspect item marking |
| Transport | Transportation | Track items |
| Stock | Stocking | Stock, locate and retrieve items<br>Control item inventory |
| Order | Requisitioning | Request item supply |
| Supply | Shipping | Locate and ship items |

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[14] "In every troop deployment this century, DoD has been plagued by a major difficulty—the inability to *see* assets as they flow into a theater and are in storage. This situation has led to direct and significant degradation in operational readiness. When assets in the pipeline are not visible, they are difficult to manage. Property is lost, customers submit duplicate requisitions, superfluous materiel chokes the transportation system, and the cycle continues. Assets at the retail level that are not visible and, therefore, not available for redistribution, further compound the degradation of operational readiness." Joint Total Asset Visibility Strategic Plan, January 1999, Joint Total Asset Visibility Office, DoD.

| Use | Receipt | Receive, install and use items |
|---|---|---|
| Repair | Maintenance | Restore reparable items |
| Rebuild | Overhaul | Refurbish items |
| Decommission | Demilitarization | Remove ownership markings, leave the Unique Identification data elements |
| Dispose | Disposal | Sell/recycle scrap<br><br>Destruction and/or abandonment |
| Pay | Requirements | Settle invoices |
| Account | Inventories<br><br>Financial Statements | Manage & control<br><br>Property valuation |

**Table 1.  Functional Processes Impacting Item Management**

# Chapter 2
# The Need to Uniquely Identify Items

## DIFFERENTIATING ITEMS THROUGHOUT THE SUPPLY CHAIN

The Department must, of necessity, uniquely identify the items to which it takes title to provide for better asset accountability, valuation and life cycle management. Unique identification provides the Department the opportunity to differentiate an individual item from all others. Unique identification of items provides the Department with the source data to facilitate accomplishment of the following:

- Improve the acquisition of equipment and performance based logistics services for the warfighter,

- Capture timely, accurate and reliable data on items (i.e., equipment, reparables, materials, and consumables),

- Improve life-cycle asset management, and

- Track items in the Department and industry systems for operational, logistic[15] and financial accountability purposes.

## ACCOUNTING FOR ACQUIRED ITEMS

Accountability of items begins when hardware (equipment and reparables), and supplies (materials and consumables) are acquired through purchase, lease, or other means, including transfer or fabrication, whether the hardware and supplies are already in existence or must be created, developed, demonstrated and evaluated.[16] DoD Instruction 5000.64 requires that accountability records be established for all property (i.e., property, plant and equipment) purchased, having a unit acquisition cost of over $5,000 or more, and items that are classified or sensitive, or items located at third parties, regardless of acquisition cost.[17] Property accountability records and systems should follow the 5000.64 exactly: part number, cost, national stock number, serial numbers, bar codes, or other unique identifiers (e.g., hull, building numbers, aircraft tail numbers,

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[15] DoD 4140.1-R, May 2003, chapter 5, section C5.7.3, addresses Unique Item tracking policy for logistics.

[16] See American Society for Testing and Materials Standard E-2135-02, Standard Terminology for Property and Asset Management.

[17] DoDI 5000.64, August 13, 2002, op. cit., paragraph 5.3.1.

vehicle registration, disposal turn-in document number, as may be appropriate and necessary), as well as other data elements.[18]

For materiel covered under DoD 4140.1-R, accountability records are established for all materiel received, regardless of cost.[19]

# CONTRACTOR-ACQUIRED PROPERTY ON COST-REIMBURSEMENT TYPE CONTRACTS

Title to property whose cost is reimbursable to the contractor passes to and vests in the Government upon: (1) Delivery to the contractor of an item purchased by the contractor and reimbursed as a direct cost under the contract, (2) Issuance of the property for use in contract performance; (3) Commencement of processing of the property or use in contract performance; or (4) Reimbursement of the cost of the property by the Government, whichever occurs first. The Government acquires title to all property purchased or fabricated by the contractor and may take title to Production Special Tooling in accordance with the contract clauses. However, if such items are to be delivered to the Government, they must be delivered under a contract line item or subline item.

# ESTABLISHING ITEM ACQUISITION COST

It is essential that contracts contain specific arrangements to capture the acquisition cost of all delivered items because the acquisition cost will form the basis for the entries made in the Department's financial statements and will determine the degree to which those statements comply with the requirements of the Federal Accounting Standards Advisory Board (FASAB). Ideally, acquisition cost for items would be recorded at the time these items are delivered to the Government.

## Using Contract Line Items.

All property delivered to the Government must be delivered on a contract line item or subline item. The acquisition cost of each item entering the Government property inventory is captured on the contract line item (CLIN) or subline (SLIN) item.

CLINs, and SLINs are established when the contract is structured prior to award and must be included for all items for which the Government will take delivery, either during the performance of or at completion of the contract. The estimated acquisition cost of property will be identified upon delivery.

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[18] Ibid, paragraph 5.3.3 contains the list of all data elements.
[19] See Section C5.3, Item Accountability, Control and Stewardship, DoD 4140.1-R.

Table 2 shows the preferred approach for identifying the acquisition cost of items delivered under a contract is for the items to be separately priced under CLINs or SLINs. Informational subline items are used to capture the acquisition cost for items to be delivered when separately priced CLINs or SLINs are not practicable. Informational SLINs used only for identification of acquisition cost have to be clearly marked as such so they are not confused with delivery, acceptance, and payment requirements of the contract. When the acquisition costs for like items differ, separate informational SLINs must be used to identify the acquisition cost for each of the items with a different acquisition cost.

| Deliverable | UID or UID Equivalent Required | Unit Acquisition Cost (or price) Required | Valuation Method (Contract type) |
|---|---|---|---|
| CLIN/SLIN Items requiring UID or UID Equivalent (Includes items delivered separately as spares). | Yes. All items valued over $5K/unit value. Use DoD decision tree to determine requirements under $5K per unit value. | Yes | Fixed Price- use CLIN/SLIN values. Cost Type-use contractor estimated costs. DoD will address delta $ from final total price. |
| Sub items requiring UID or UID Equivalent contained within CLIN/SLIN delivered end items.  (LRU/Spares) | Yes. Application of maintenance plan (e.g. lowest repairable or replaceable unit by DoD); No dollar threshold for applicability.[20] | No | N/A |
| Other commercially marked items not requiring UID. (CLIN/SLIN) | No. The DoD shall accept existing commercial markings. | Yes – All delivered items must be valued per unit. | Fixed Price- use CLIN/SLIN values Cost Type-use contractor estimated costs. DoD will address delta $ from final total price. |

**Table 2. Contracts Requirements**

The Contracting Officer will modify a contract to establish separate CLINs/SLINs prior to delivery of items that were not identified as contract deliverables at the time of contract award.

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[20] UID Contract Data Requirements List (CDRL) Requirement. Example: The Joint Strike Fighter (JSF) contractor provides one UID and value corresponding with the tail number. The contractor also provides a list of UIDs in accordance with the CDRL internal to JSF, without item values.

# Valuation of Items

Both the unique identification and the value of items that will be delivered under the contract need to be reflected in the Department's property accountability and management information systems. According to DoD Instruction 5000.64, acquisition cost should be the basis for valuation of property.

For fixed price contracts, the acquisition cost for items to be delivered is the fixed price paid by the Government.

For cost type contracts, the acquisition cost for items to be delivered is the Contractor's estimated cost at the time the item is delivered.

The acquisition cost of components delivered within end items need not be identified. Figure 1 contains an illustration of how CLINs/SLINs would be valued based on whether or not they are delivered separately from an end item. Item markings may be either the DoD UID or other commercial markings for items not requiring the DoD UID. It shows the relationships between the components of the supply chain, the items qualifying for unique identification, and the delivery of the UID and CLIN/SLIN valuation.
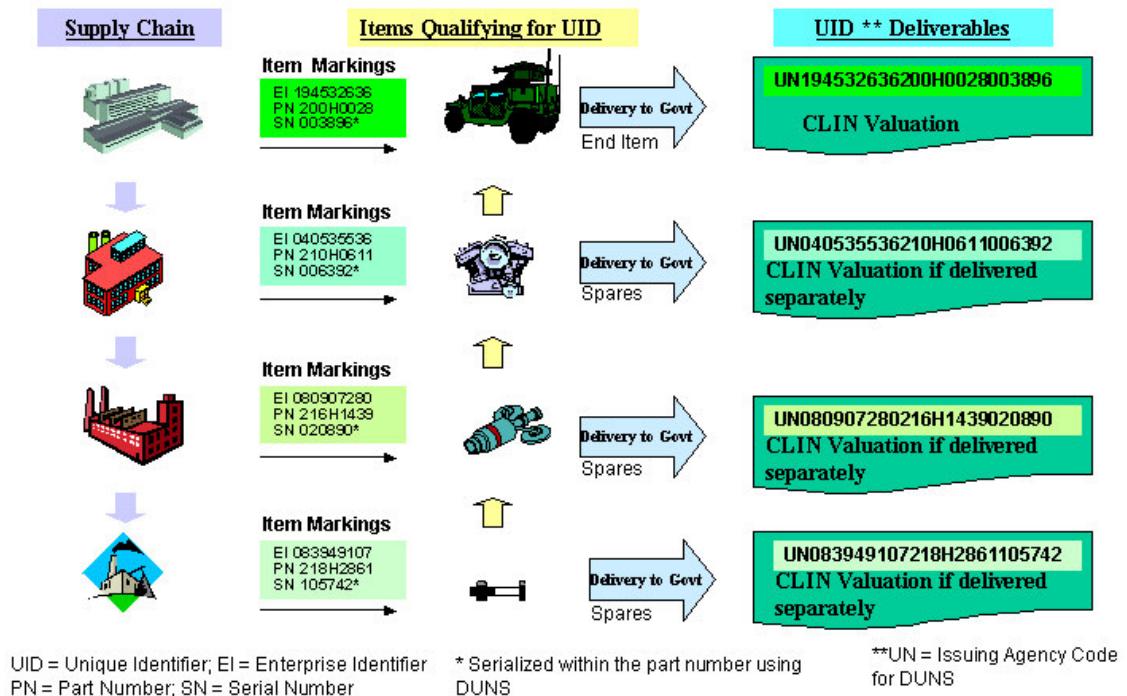


**Figure 1. Valuation of Contract Line/Subline Item Numbers**

An end item may be composed of embedded items, such as subassemblies, components and parts. The prime contractor will pass down appropriate specifications, including the UID marking requirements, to the tiered vendors for subcontracted subassemblies, components and parts.

Spares may be purchased directly from the vendors or through the prime. UID-qualifying spare items (subassemblies, components and parts) have to be marked appropriately with the UID data elements.

So, when the prime delivers the end item—that is one UID. The spares are delivered with their own UIDs. The Government has the option of asking the prime to deliver a list of all UIDs for UID-qualifying embedded items in the end item.

# Chapter 3
# Determining Uniqueness of Items

## WHAT IS AN ITEM?

An item is a single hardware article or a unit formed by a grouping of subassemblies, components or constituent parts. In the Department, an item is any article produced, stocked, stored, issued, or used;[21] or any product, including systems, materiel, parts, subassemblies, sets, and accessories.[22]

## DECIDING WHAT ITEMS ARE TO BE IDENTIFIED AS UNIQUE

The unique identification of items is driven by an integrated set of logistics, acquisition and financial requirements to track and identify item information. Figure 2 contains a decision tree for deciding what items[23] should be uniquely identified for DoD purposes. The program manager is responsible for having items uniquely identified.

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[21] DoDI 5000.64, 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."

[22] MIL HDBK 61A(SE), Configuration Management Guidance, 7 February 2001, page 3-8.

[23] **Equipment**—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 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.

**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 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.
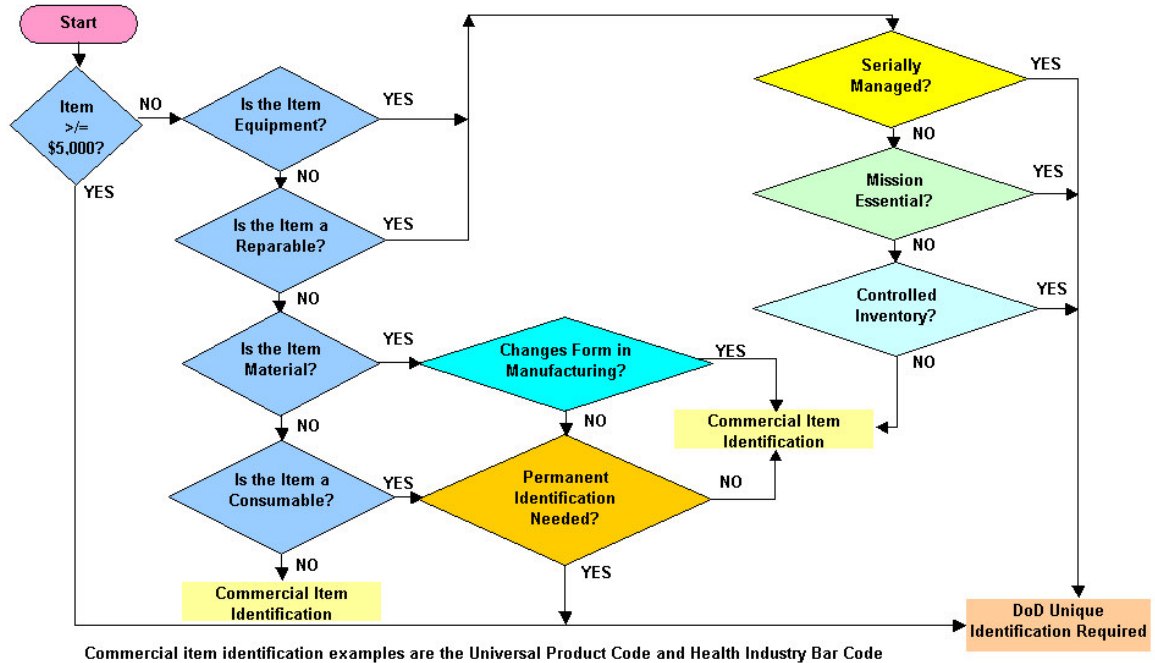
Commercial item identification examples are the Universal Product Code and Health Industry Bar Code

**Figure 2. Uniquely Identifying Items**

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 cost is $5,000 or more[24], (2) it is either a serially managed, mission essential or controlled inventory[25] piece of equipment or a reparable item, or a consumable item or material where permanent identification[26] is required, (3) it is a component of a delivered

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[24] The $5,000 value is the threshold for unique identification. While those items under $5,000 are not required to have property records if they are not sensitive or classified items, the program manager could decide to uniquely identify those items if there was a compelling reason, even though there would be no requirement to mark those under $5,000. The program manager would have to balance all considerations in the decision-making process.

[25] **Serially Managed**—Includes reparable items down to and including sub-component reparable 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 4100.39-M, Volume 10, Table 61); and safety controlled items. UID can be applied at the discretion of the program/item manager for pilferable items.

[26] Permanent identification may be needed to track precious metals or environmentally hazardous substances.

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item, if the program manager has determined that unique identification is required, or (4) a UID or a DoD recognized UID equivalent is available.

Generally, a commercial identifier can be considered for use as a DoD UID equivalent if it meets these criteria: (1) Must contain an enterprise identifier, (2) Must uniquely identify an individual item within an enterprise identifier, product or part number, and (3) Must have an existing Data Identifier (DI) or Application Identifier (AI) listed in ANSI MH10.8.2, Data Identifier and Application Identifier Standard. Some examples of commercial unique identifiers meeting these criteria that may be recognized as unique identification equivalents, depending on the circumstances, are the EAN.UCC Global Individual Asset Identifier (GIAI) for serially-managed assets, the EAN.UCC Global Returnable Asset Identifier (GRAI) for returnable assets, the ISO Vehicle Identification Number (VIN) for vehicles, and the Electronic Serial Number (ESN) for cellular telephones only.

In cases where it is not necessary to distinguish between individual items of a product, commercial marks such as the EAN.UCC Global Trade Item Number (GTIN), ANSI T1.220 COMMON LANGUAGE® Equipment Identification (CLEI) for telecommunications equipment, and the Health Industry Business Communications Council (HIBCC) code for non-pharmaceutical health-care products can be used. These identifiers are not considered DoD UID equivalents but will be accepted by DoD as commonly accepted commercial marks when unique identification is not required.

# DEFINING THE DATA ELEMENTS FOR UNIQUE IDENTIFICATION

## What is Unique Identification?

Unique identification is a set of data for 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 items.

## The Notion of an Enterprise

The first is enterprise identification. An enterprise is the entity responsible for assigning unique identification to an asset. For purposes of unique identification, an enterprise identifier will define each entity location that has its own unique, separate and distinct operation. An enterprise may be an entity such as a manufacturer, supplier, depot, program management office or a third party. An enterprise identifier is a code uniquely assigned to an enterprise by a registered issuing agency. An issuing agency 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, Allied Committee 135 Commercial and Government Entity (CAGE) Number, or the Coded Representation of the North American Telecommunication Industry Manufacturers, Suppliers, and Related Service Companies (ANSI T1.220) 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 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 item is assigned a serial number that is unique among all the 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 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 Identifier

For items that are serialized within the enterprise identifier, unique identification is achieved by a combination of the issuing agency code[27], 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

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[27] 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 agency that issued the enterprise identifier. The IAC can be derive from the data qualifier for the enterprise identifier and does not need to be marked on the item.

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 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

Table 3 contains a list of issuing agency codes (IACs). At the current time, IACs exist for five most commonly used enterprise identifiers. These IACs are "either 0 to 9" for the EAN.UCC Company Prefixes assigned by EAN.UCC, "LB" for ANSI T1.220 numbers, and "UN" for the DUNS assigned by Dun & Bradstreet, "D" for the CAGE assigned by Allied Committee 135, and "LH" for the EHIBCC assigned by the European Health Industry Business Communications Council.

| Issuing Agency Code | Issuing Agency | Enterprise Identifier |
| --- | --- | --- |
| 0 - 9 | EAN-International | EAN.UCC |
| LB | Telcordia Technologies, Inc | ANSI T1.220 |
| UN | Dun & Bradstreet | DUNS |
| D | Allied Committee 135 | CAGE |
| LH | European Health Industry Business Communications Council | EHIBCC |

**Table 3.  Issuing Agency Codes**

# INCLUDING UNIQUE IDENTIFICATION DATA ELEMENTS ON AN ITEM

## Derivation of Unique Identification

Unique identification of an item can be derived from the data elements included on the item by using a business rule (See Appendix C). The automatic identification technology (AIT) device[28] machine-reads the data elements on the item and outputs the concatenated[29] unique identification. Therefore, it is not necessary to include the concatenated unique identification on the item as a separate data element. It is only required that the data elements required to derive the concatenated unique identification (enterprise identifier, serial number and, for construct #2, original part number) be included on each item[30]. Table 4 shows how unique identification is constructed from the data elements placed on the item and the business rule[31]. When deriving the concatenated unique identification, the data qualifiers are eliminated from the final number.

| | 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*<br>Enterprise ID<br>Serial Number | Issuing Agency Code*<br>Enterprise ID<br>Original Part Number<br>Serial Number |
| Optional 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 (e.g., Dun and Bradstreet, EAN.UCC). The IAC can be derived from the data qualifier for the enterprise identifier and does not need to be marked on the item.<br>**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. | | |

**Table 4. Unique Identification (UID) Construct Business Rule**

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[28] Such devices are readers, scanners and interrogators.

[29] Concatenate means to link together in a series or chain.

[30] The UID component data elements, at a minimum, shall be contained in a Data Matrix ECC200 symbol. Data may be contained in other AIT media (e.g., contact memory buttons, linear bar codes, radio frequency identification, etc.) in addition to the Data Matrix.

[31] For items that have been traditionally serialized within the individual lot or batch number within the part number (serialization begins anew with each new lot/batch), the addition of a lot/batch number to UID Construct #2 to form Construct #2A may be necessary to assure uniqueness in only those situations where the use of construct #2 would not result in a unique number. In these cases, Construct #2A would be IAC + EID + Part # + Lot/Batch # + Serial #. This is considered a legacy practice and should not be employed on new acquisitions, which should serialize items within the enterprise or within the part number.

Thus, there are two constructs for determining unique identification, depending upon whether the enterprise serializes items within the enterprise identifier or within the original part number. Although not used to determine unique identification, other data elements, such as the current part number, may also be placed on the item. It is strongly recommended that an enterprise select one of the two constructs for exclusive use, rather than attempting to use both constructs within the same enterprise identifier.

# Unique Identification Derivation Process

Figure 3 depicts how unique identification for an item is derived and the business rule for generating the item unique identification from the data elements placed on the item[32]. The AIT reader device will machine-read the data elements and output the concatenated unique item identification for onward transmission to the appropriate automated information system (AIS). The decisions of which construct to use (see Table 4) to uniquely identify items, and use of the associated business rules, are made by the enterprise assigning serialization to the item.
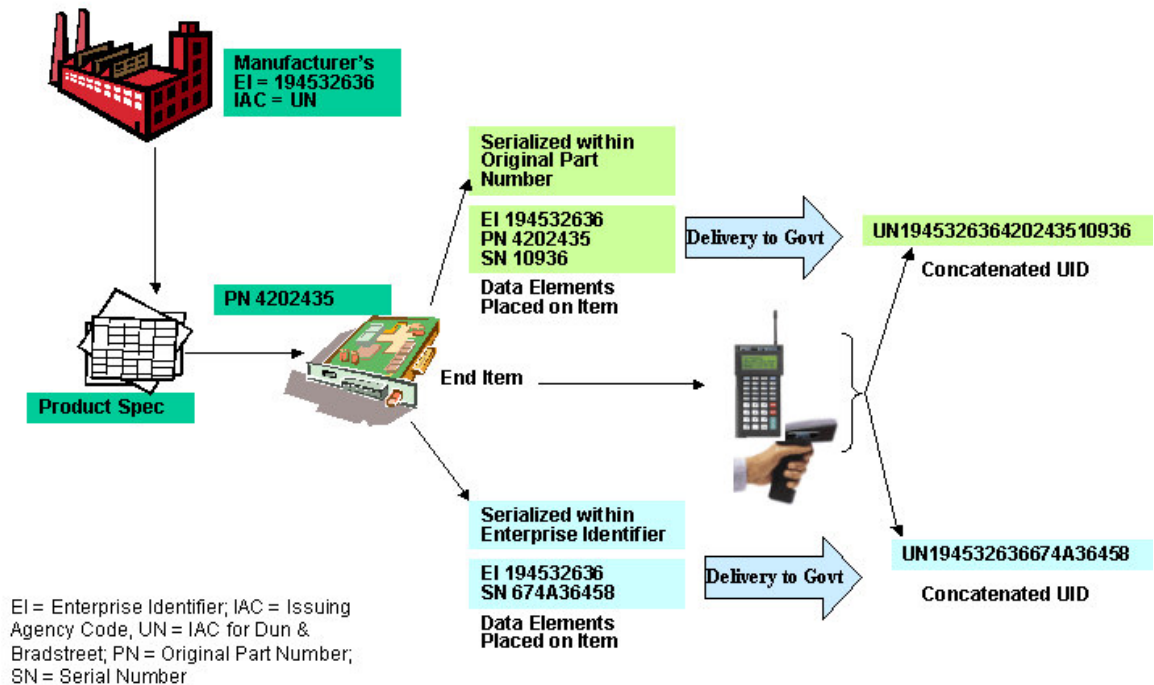


**Figure 3. Unique Identification (UID) Determination Process**

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[32] The identification of the agency issuing the enterprise identifier, or 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.

# 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 that qualify for UID marking, which are incorporated into end items, will be marked so that a UID can be derived.

# Deciding When to Place Data Elements on the Item to Derive the Unique Identification

Strategies that produce the greatest business advantage for the 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* strategies[33]. Requiring vendor-applied-at-source on future contracts for new equipment, major modifications, and reprocurements of end items and spares is important for sustainment, but has limited impact on a retrospective application program.

### 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

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[33] 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.

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 identification. Having identified an item at the gate which requires a unique identification, 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 IDENTIFICATION 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 item identification is created from the separate data elements placed on the item, the unique item identification 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 item identification; 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 item identification 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 5000.64[34] provides a comprehensive framework for DoD property accountability policies, procedures, and practices; and 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); and contains concepts useful for asset

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[34]It 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.

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.[35]

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[35] Military Standard Transaction Reporting and Accounting Procedures (MILSTRAP).

# Appendix A - Definitions

## Key Definitions

| Word or Phrase | Definition | Source |
|---|---|---|
| **Automatic identification device** | **Automatic identification device** means a device, such as a reader or interrogator, used to retrieve data encoded on machine-readable media. | 252.211-7003 |
| **Commonly accepted commercial marks** | **Commonly accepted commercial marks** means any system of marking products for identification that is in use generally throughout commercial industry or within commercial industry sectors. Some examples of commonly accepted commercial marks are: EAN.UCC Global Trade Item Number; Automotive Industry Action Group B-4 Parts Identification and Tracking Application Standard, and B-2 Vehicle Identification Number Bar Code Label Standard; American Trucking Association Vehicle Maintenance Reporting Standards; Electronic Industries Alliance EIA 802 Product Marking Standard; and Telecommunications Manufacturers Common Language Equipment Identification Code. | 252.211-7003 |
| **Concatenate** | **Concatenate** – to link together in a series or chain. (Merriam-Webster Online Dictionary) | |

| Word or Phrase | Definition | Source |
|---|---|---|
| **Concatenated unique item identification** | **Concatenated unique item identification** means—<br>1. For items that are serialized within the enterprise identifier, the linking together of the unique item identification data elements in order of the issuing agency code, enterprise identifier, and unique serial number within the enterprise identifier; or<br>2. For items that are serialized within the original part number, the linking together of the unique item identification data elements in order of the issuing agency code, enterprise identifier, original part number, and serial number within the part number. | 252.211-7003 |
| **Consumable Item** | AP16.13. **Consumable Item**. An item of supply (except explosive ordnance and major end items of equipment) that is normally expended or used up beyond recovery in the use for which it is designed or intended. | 4140.1R |
| **Consumables** | **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. | |

| Word or Phrase | Definition | Source |
|---|---|---|
| **Controlled Inventory** | **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) (See DoD 4100.39-M, Volume 10, Table 61); and safety controlled items. | |
| **Controlling Authority** | See Registration Authority | |
| **Data Carrier** | **Data Carrier** – The medium selected to record, transport or communicate data. (The American Heritage Dictionary). For unique identification purposes, the data carrier is the Data Matrix symbol. | |

| Word or Phrase | Definition | Source |
|---|---|---|
| **Data Matrix** | **Data Matrix** – Data Matrix is a two-dimensional matrix symbology containing dark and light square data modules. It has a finder pattern of two solid lines and two alternating dark and light lines on the perimeter of the symbol. A two-dimensional imaging device such as a charge-coupled device camera is necessary to scan the symbology. Data Matrix is designed with a fixed level of error correction capability. It supports industry standard escape sequences to define international code pages and special encoding schemes. Data Matrix is used for small item marking applications using a wide variety of printing and marking technologies (see ANSI/AIM BC11 International Symbology Specification - Data Matrix).  The data matrix symbol looks like this: | |
| **Data qualifier** | **Data qualifier** means a specified character (or string of characters) that immediately precedes a data field that defines the general category or intended use of the data that follows. | 252.211-7003 |
| **End Item** | AP16.33. **End Item**. A final combination of end products, component parts, and/or materials ready for its intended use, e.g., a ship, tank, mobile machine shop, or aircraft. | 4140.1R |
| **Enterprise** | **Enterprise** means the entity (e.g., a manufacturer or vendor) responsible for assigning unique item identifiers to items. | 252.211-7003 |
| **Enterprise identifier** | **Enterprise identifier** means a code that is uniquely assigned to an enterprise by a registered issuing agency. | 252.211-7003 |

| Word or Phrase | Definition | Source |
|---|---|---|
| **Equipment** | **Equipment** - 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 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. | |
| **Essential Item** | AP16.35. **Essential Item**. A support item or a repair part whose absence renders the supported system or end item inoperable. | 4140.1R |
| **General PP&E** | **General PP&E** consists of assets that meet all of the following criteria:<br>a.       Have an estimated useful life of two years or more;<br>b.       Are not intended for sale in the ordinary course of operations;<br>c.       Are acquired or constructed with the intention of being used or being available for use by the entity; and<br><br>Have an initial acquisition cost, book value or, when applicable, an estimated fair market value (see paragraph 060202 for definitions of these terms) that equals, or exceeds, the DoD capitalization threshold. The current DoD capitalization threshold is $100,000 for both General and Working Capital Funds. FMR, Vol 4, Chapter 6, Aug 2000, Property, Plant and Equipment | 7000.14 |
| **Issuing agency** | **Issuing agency** means 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 Allied Committee 135 Commercial and Government Entity (CAGE) Code). | 252.211-7003 |

| Word or Phrase | Definition | Source |
|---|---|---|
| **Issuing agency code** | **Issuing agency code** means a code that designates an agency with authority to issue unique enterprise identifiers. | 252.211-7003 |
| **Item** | **Item** - A generic term meaning any article produced, stocked, stored, issued, or used (DoDI 5000.64). | |
| **Item** | **Item** means a single hardware article or unit formed by a grouping of subassemblies, components, or constituent parts required to be delivered in accordance with the terms and conditions of this contract. | 252.211-7003 |
| **Item Essentiality** | See Mission Essential | |
| **Item Essentiality** | AP16.61. **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. | 4140.1R |
| **Item Identification** | **Item Identification** - Sufficient data to establish the essential characteristics of an item that give the item its unique character and differentiate it from other supply items (DoD 4140.1-R).<br><br>- Capable of being touched; material (The American Heritage Dictionary, Office Edition, July 1987). | |
| **Machine-readable** | **Machine-readable** means an automatic information technology media, such as bar codes, contact memory buttons, radio frequency identification, or optical memory cards. | 252.211-7003 |
| **Marking** | **Marking** - The application of legible numbers, letters, labels, tags, symbols, or colors to ensure proper handling and identification during shipment and storage (DoD 4140.1-R). | |

| Word or Phrase | Definition | Source |
|---|---|---|
| **Material** | **Material** - Of, composed of, or pertaining to physical substances (The American Heritage Dictionary, Office Edition, July 1987).  Materials are items that may lose their identity when incorporated in an end item. (e.g., sheet metal). | |
| **Material** | **"Material,"** as used in this subpart, means 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. | FAR 45 sub 45.3 |
| **Mission Essential** | **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). | |
| **Operating Materials and Supplies** | **Operating Materials and Supplies**. Operating materials and supplies consist of personal property to be consumed in normal operations. Excluded are (a) goods that have been acquired for use in constructing real property, (b) stockpile materials, and (c) inventory. FMR, Volume 4, Chapter 4, Operating Materials and Supplies and Stockpile Materials, January 1995. | 7000.14 |
| **Original part number** | **Original part number** means a combination of numbers or letters assigned by the enterprise at asset creation to a class of items with the same form, fit, function, and interface. | 252.211-7003 |

| Word or Phrase | Definition | Source |
|---|---|---|
| **Personal Property** | E2.1.27.1. **Personal Property**. Any property including military equipment, but excluding real property, consumable items, component parts of a higher assembly, or items that lose their individual identity through use. Some personal property is subject to capitalization if its cost exceeds the DoD capitalization threshold, has an estimated useful life of 2 years or more, is not intended for sale in the ordinary course of operations, is acquired or constructed with the intention of being used or being available for use by an entity. In assets such as software, copyrights, and similar intellectual assets are considered personal property so long as they meet these criteria. Cash, marketable securities (e.g., stocks and bonds), and accounts receivable are considered monetary (or liquid) assets rather than personal property. | 5000.64 |
| **Pilferable Items** | E2.1.12.3. **Pilferable Items**. Items that have a ready resale value or application to personal possession and that are, therefore, especially subject to theft. (See DoD 4100.39-M, Volume 10, Table 61) | 5000.64 |
| **Property Accountability Record** | AP16.104. **Property Accountability Record**. The official record of personal property, including inventory, owned by the Department that is maintained to identify the quantities of items on-hand, unit prices, locations, physical condition, receipt and issue records, authorized stock numbers, item descriptions, and other such information necessary to properly account for materiel and exercise other inventory management responsibilities. | 4140.1R |
| **Real Property** | **Real Property**. Fixed assets that are comprised of land and the rights to land; buildings to include capitalized additions, alterations, improvements, and rehabilitations; and other structures and facilities. Real property does not include personal property (weapons systems and other military equipment). (FMR, Vol 1) | 7000.14 |

| Word or Phrase | Definition | Source |
|---|---|---|
| **Registration Authority** | **Registration (or controlling) authority** refers to the Nederlands Normalisatie-instituut (NEN), Registration Authority for IAS/IEC 15459, which is responsible for assigning codes to issuing agencies with conforming systems for issuance of unique enterprise identifiers. | 252.211-7003 |
| **Reparable** | **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. | |
| **Sensitive Items** | E2.1.12.2. **Sensitive Items**. Items that require a high degree of protection and control due to statutory requirements or regulations, such as narcotics and drug abuse items; precious metals; items that are of a high value, highly technical, or a hazardous nature; and small arms, ammunition, explosives, and demolition material.  (See DoD 4100.39-M, Volume 10, Table 61) | 5000.64 |
| **Serialization within the enterprise identifier** | **Serialization within the enterprise identifier** means each item produced is assigned a serial number that is unique among all the tangible items produced by the enterprise and is never used again. The enterprise is responsible for ensuring unique serialization within the enterprise identifier. | 252.211-7003 |
| **Serialization within the part number** | **Serialization within the part number** means each item of a particular part number is assigned a unique serial number within that part number assignment. The enterprise is responsible for ensuring unique serialization within the part number within the enterprise identifier. | 252.211-7003 |

| Word or Phrase | Definition | Source |
|---|---|---|
| **Serially Managed** | **Serially Managed** - Includes reparable items down to and including sub-component reparable 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]. | |
| **Serially Managed Items** | **Serially Managed Items**. Populations of selected items will be identified and each item in the population permanently marked to enable serialized item management. Selection of the populations to be managed shall be based on the potential benefits that will accrue from the enhanced management capabilities and increased information to be made available. As a minimum, it is appropriate to consider selecting item populations from within the following categories:<br>• repairable items down to and including sub-component repairable unit level,<br>• life-limited, time-controlled, or items with records (e.g., logbooks, aeronautical equipment service records, etc,), and<br>• items that require technical directive tracking at the part number level.<br>**Three data elements will comprise the universally unique identification number for each serialized item:**<br>• Original Equipment Manufacturer (OEM) identification code [Contract and Government Entity (CAGE) preferred, Dun and Bradstreet Number, or UCC.EAN]<br>• OEM part or reference number, and<br>• OEM serial number (single use per manufacturer identification code) | DUSD(L&MR) |

| Word or Phrase | Definition | Source |
|---|---|---|
| **Unique identification** | **Unique identification** means a set of data marked on items that is globally unique, unambiguous, and robust enough to ensure data information quality throughout life and to support multi-faceted business applications and users. | 252.211-7003 |
| **Unique identification equivalent** | DoD recognized **unique identification equivalent** means a unique identification method that is in commercial use and has been recognized by DoD. All DoD recognized unique identification equivalents are listed at http://www.acq.osd.mil/uid. | 252.211-7003 |
| **Unique item identification** | **Unique item identification** means marking an item with a unique item identification that has machine-readable data elements to distinguish it from all other like and unlike items. In addition—<br>1. For items that are serialized within the enterprise identifier, the unique item identification shall include the data elements of issuing agency code, enterprise identifier, and a unique serial number.<br>**2.** For items that are serialized within the part number within the enterprise identifier, the unique item identification shall include the data elements of issuing agency code, enterprise identifier, the original part number, and the serial number. | 252.211-7003 |
| **Unique item identification type** | **Unique item identification type** means a designator to indicate which method of uniquely identifying a part has been used. The current list of accepted unique item identifier types is maintained at http://www.acq.osd.mil/uid. | 252.211-7003 |

| Word or Phrase | Definition | Source |
|---|---|---|
| **Unit acquisition cost** | Government's **unit acquisition cost** means—<br>1. For fixed-price type line, subline, or exhibit line items, the unit price identified in the contract at the time of delivery; and<br>2. For cost-type line, subline, or exhibit line items, the Contractor's estimated fully burdened unit cost to the Government for each item at the time of delivery. | 252.211-7003 |

# Appendix B - Where Does the Guidance Exist Today?

| Document Reference | Document Name |
|---|---|
| DFARS 252.211-7003 | Defense Federal Acquisition Regulation Supplement |
| MIL STD 129P w/Change 1 | Military Marking for Shipment & Storage |
| MIL STD 130L | Identification Marking of US Military Property |
| DoD 4140.1-R | DoD Supply Chain Material Management Regulation |
| DoDI 5000.2 | Operation of the Defense Acquisition System |
| DoDI 5000.64 | Defense Property Accountability |
| DoD 7000.14R | Financial Management Regulations |
| CJCSI 3170.1C | Requirements Generation System |
| DCMA One Book | DCMA reference material for contractors |
| DoD MIL HDBK 61A (SE) | Configuration Management Guidance |
| EIA Standard 836 | Configuration Management Data Exchange & Interoperability |
| ANSI/EIA 649 | National Consensus Standard for Configuration Management |
| ISO/IEC Standard 15418 | EAN/UCC Application Identifiers and ASC MH 10 Data Identifiers and Maintenance |
| ISO/IEC Standard 15434 | Syntax for High Capacity ADC Media |
| ISO/IEC 15459-2 Standard | Registration Procedures |

# Appendix C - Business Rules (Version 3.5)

## WHAT ARE BUSINESS RULES?

A Business Rule is a statement that defines or constrains some aspect of the business. It is intended to assert business structure or to control or influence the behavior of the business. Typical Business Rules include definitions of terms, facts relating terms to each other, constraints, and derivations.

## UID BUSINESS RULES

The following section includes the Business Rules for UID. The Business Rules for UID are divided into the following implementation categories:

- Contracts and Administration

- Accounting and Finance

- UID Construction and Physical Marking for:
    - o Items considered part of a new solicitation after January 1, 2004 (i.e., New Items)
    - o Items existing under contract or in inventory (i.e., Legacy Items)
    - o Items considered tangible personal property owned by the Government in possession of a contractor after January 1, 2005 (i.e., Property Management Items)
- Automated Information System (AIS) Technical Interface

As the UID implementation progresses, the UID Joint Requirements Implementation Board (JRIB) fully anticipates that there will be additions to these Business Rules and possibly slight modifications. The UID Business Rules should be considered a work in progress that may not be finalized until the UID effort is fully implemented.

# CONTRACTS AND ADMINISTRATION (DRAFT)

1. Within the same Contract Line Item Number (CLIN), there is no need for a contractor to segregate the same items delivered against different Accounting Classification Reference Numbers (ACRN).

2. For FAR Part 12 contracts and subcontracts:

    o Use existing commercial marking, if available, or

    o The Government can mark the item, or

    o The Government can request the contractor mark the item.

3. Foreign Military Sales (FMS) contracts are not exempt from UID.

Additional items are still in progress.

# ACCOUNTING AND FINANCE (DRAFT)

These items are still in progress.

# UID CONSTRUCTION AND PHYSICAL MARKING

# Items considered part of a new solicitation after January 1, 2004

**Creating and Generating the Unique Identification**

1. The UID shall be derived from its discrete, component data elements. The UID is not required to be marked on the item as a separate data element.

2. If the enterprise chooses to mark the UID as a discrete data element on the item, the component data elements must also be marked on the item as discrete data elements, in addition to the UID.

3. Data qualifiers (semantics) will define each machine-readable data element marked on the item.[36]

4. If an enterprise serializes items within the enterprise identifier, the UID shall be derived by combining the following data elements, in order:

    • The issuing agency code (IAC), which shall be derived from the data qualifier for the enterprise identifier if it is not already provided

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[36] See the *DoD Guide to Uniquely Identifying Items (Appendix D)* for a list of UID data qualifiers.

- The enterprise identifier, which shall be marked on the item

- The serial number, which shall be marked on the item
  *(Note: This is referred to as UID Construct #1.)*

5. If an enterprise serializes items within part numbers, the UID shall be derived by combining the following data elements, in order:

   - The IAC, which shall be derived from the data qualifier for the enterprise identifier if it is not already provided

   - The enterprise identifier, which shall be marked on the item

   - The original part number, which shall be marked on the item

   - The serial number, which shall be marked on the item
     *(Note: This is referred to as UID Construct #2.)*

6. The IAC shall be derived from the data qualifier for the enterprise identifier if it is not already provided. The IAC is not required to be marked on the item.[37]

7. A specific set of data qualifiers will identify which UID Construct should be used to build the UID or if the fully constructed UID is already marked on the item.[38]

8. If UID Construct #2 is used, the enterprise must maintain the original part number on the item for the life of the item.

9. 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).

10. The enterprise is responsible for ensuring that the part number is not duplicated within the enterprise.

11. 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.

12. The enterprise identifier of the enterprise that assigned the serial number to the item is the only enterprise identifier in the UID machine-readable code that can use a UID data qualifier for enterprise identifier. Other enterprise identifiers may be contained within the machine-readable code as long as they do not use a UID data qualifier.

13. 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 with a data qualifier. The UID data elements should appear first in the sequence.

14. The UID component data elements, at a minimum, shall be contained in a Data Matrix ECC200 symbol, as required by MIL STD 130 L (or a later version).[39] Data may be contained in other AIT media (e.g., contact memory buttons, linear

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[37] See the *DoD Guide to Uniquely Identifying Items (Table 3)* for a list of IACs.
[38] See the *DoD Guide to Uniquely Identifying Items (Appendix D)* for more details on these data qualifiers.
[39] See *MIL STD 130 L* (or a later version) for additional information on DoD-approved data carriers.

bar codes, radio frequency identification, etc.) in addition to the Data Matrix. The physical marks that contain the UID-required elements shall remain legible until the item is destroyed.

15. Where space is available, human readable information for UID data elements should be marked on the item.

16. High capacity Automatic Identification Technology (AIT) media shall utilize DoD-accepted syntax.

17. There are identification numbers used in the commercial sector that will be considered UID equivalents. UID equivalents shall comply with the UID Business Rule for minimum data carrier requirements.[40]

## Metadata Requirements

18. The UID is a non-parsable field, not to exceed 78 characters in length. Overhead characters, such as syntax and data qualifiers, are eliminated from the string when the UID is constructed.[41]

    • The IAC string of characters will not exceed 3 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.

    • The sum of the maximum number of characters for possible UID data elements is 78. The use of shorter field lengths is encouraged for part and/or serial numbers where feasible.

19. The UID string of data must have worldwide uniqueness (non-repeatable).

20. When constructing the UID:

    • Any spaces contained in the component data elements will be deleted

    • All special characters will be deleted from the enterprise identifier

    • All special characters, except for dashes (-) and forward slashes (/) will be deleted from the original part number and serial number

    • The UID may only contain uppercase English alphabet characters A through Z, numeric characters 0 through 9, and the special characters "-" and "/"

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[40] See the *DoD Guide to Uniquely Identifying Items* for a list of approved UID equivalents.
[41] This item is still under discussion, pending review by the UID AIS Technical Interface Working Group (TIWG) and the UID Joint Requirements Implementation Board (JRIB), which will coordinate with the Business Enterprise Architecture (BEA).

**Capturing the Unique Identification**

21. 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.

22. If the UID symbol is unreadable and if the human readable data qualifiers and data elements are adjacent to the symbol, the data elements shall be manually input to derive the UID using existing Business Rules.

23. Discovery of a duplicate UID will occur when the Government attempts to register the UID in its internal database. If a true duplicate exists, the Government will work with the appropriate enterprise(s) to resolve the duplication.

24. In a database, once the UID is derived, it shall not be parsed to determine the original elements.

25. A database shall be capable of using the UID or the combination of its component data elements to retrieve the data record associated with the item represented by the UID.

**Using the Unique Identification**

26. The UID shall not be transferred from one item to another item once assigned and shall not be reused.

# Items existing under contract or in inventory

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. The serial number must comply with Rule #9.

    - If the part number is missing or cannot be determined, obtain a part number from the in-service engineer or other appropriate authority.

    - If the serial number is missing, assign a serial number locally or centrally. In this case, the enterprise identifier for the item must be changed to represent the activity that assigned the serial number. The serial number must comply with Rule #9.

28. For legacy items that cannot be uniquely identified using UID Construct #1 or #2 or a UID equivalent (serialization was not unique within enterprise identifier or

part number), re-serialization to conform to Construct #1 or #2 is preferred. Use of Construct #2A is permitted as an interim solution.[42]

29. If the original part number cannot be precisely determined, use the following method for establishing an original part number for the purposes of UID:

   - First, use the current part number at the time of acquisition, if it can be determined.

   - Second, use the current part number at the time the UID is created.

30. If the item is unidentifiable, a UID should not be assigned.

31. Once the contract is modified to include the UID requirements:

   - If the contract is for delivery of new items to the Government, follow UID Business Rules for items considered part of a new solicitation.

   - If the contract is for support involving existing inventory items, the Program Manager will determine whether to follow existing Business Rules for new solicitations, items under contract, items in existing inventory, or some combination thereof.

# Items considered tangible personal property owned by the Government in the possession of a contractor after January 1, 2005

32. Tangible personal property items owned by the Government in the possession of a contractor will use the asset identification number used to track the item as the item's serial number within enterprise identifier.

33. Tangible personal property items owned by the Government in the possession of a contractor will use the enterprise identifier of the enterprise maintaining the serial number of the item.

34. A UID should be created for tangible personal property items owned by the Government in the possession of a contractor by using UID Construct #1.

35. For items that do not require a UID:

   - If the item is delivered with a commercial item mark, it is acceptable to the Government.

   - If an item is delivered without a commercial item mark, the contractor is not required to obtain one.

36. A UID is not required to be physically marked on tangible personal property items owned by the Government in the possession of a contractor unless the item is moved or delivered to a different location with a different enterprise identifier.

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[42] The Construct #2A is described in Footnote 31 in the *DoD Guide to Uniquely Identifying Items*.

37. Tangible personal property initially furnished to the contractor by the Government will use the UID provided by the Government.  If none is provided, establish a UID using the criteria in Rules 32-34.

38. Tangible personal property will also require markings or labels indicating Government ownership.

# AUTOMATED INFORMATION SYSTEMS (AIS) TECHNICAL INTERFACE

These items are still in progress.

# Appendix D -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 in industrial use are presented for American National Standard (ANS) MH 10.8.2 Data Identifiers (Tables 6 and 7) and EAN.UCC Application Identifiers (Table 8). The historic use of Air Transport Association Common Support Data Dictionary Text Element Identifiers (TEIs) is discussed. 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. Tables 9 and 10 represent how TEIs would be used in 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 qualifiers[43] have to define each data element placed on the item. Specific data qualifiers are used to tell the AIT devices whether to derive the unique identification by using Construct #1, Construct #2, an already constructed UID format, or a UID equivalent. Table 5 shows the different data qualifiers for each of the data elements that are used for determining uniqueness. The TEIs marked with (*) cannot be used for UID Construct #2 until they are incorporated in the Air Transport Association Common Support Data Dictionary.

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[43] There are three types of data qualifiers being used: Data Identifiers (DIs) (Format 06), Application Identifiers (AIs) (Format 05), and, within the aerospace industry, 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. ISO/IEC International Standard 15434, Information Technology–Syntax for High Capacity Automatic Data Capture Media, contains formats for using DIs and AIs in syntax encoding. DoD is preparing to submit a request to add TEIs to ISO/IEC 15434.

| Data Element | DI (Format 06) ISO/IEC 15434 | AI (Format 05) ISO/IEC 15434 | TEI ATA CSDD |
|---|---|---|---|
| **Enterprise Identifier**<br><br>• **CAGE/NCAGE**<br>• **DUNS**<br>• **EAN.UCC**<br>• **Other Agencies** | **17V**<br>**12V**<br>**3V**[44]<br>**18V**[45] | **95** | **CAG\*, MFR or SPL**[46]<br>**DUN\***<br>**EUC\*** |
| **Serial Number within Enterprise Identifier** | | | **SER or UCN**[47] |
| **Serial Number within Original Part Number** | **S** | **21** | **SEQ\*** |
| **Original Part Number** | **1P** | **01** | **PNO\*** |
| **Unique identification (including the IAC)** | **25S**[48] | **8004**[49] | |
| **Unique identification (not including the IAC)** | **18S**[50] | | **USN or UST**[51] |
| **Current Part Number**[52] | **30P** | **240** | **PNR** |

**Table 5. Data Qualifiers**

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[44] "3V" was re-instated on September 4, 2003 in the ANS MH10.8.2-xxxx, Draft Standard for Trial Use (a revision of ANS MH10.8.2-2002, Data Identification and Application Identifier Standard).

[45] Data identifier 18V is the concatenation of the Issuing Agency Code (IAC) + Enterprise Identifier (EID). This data identifier would be used for all other EIDs, which were assigned by an issuing agency that has an assigned IAC but does not have their own specific EID data identifier.

[46] MFR – Manufacturer CAGE Code. Identifies the manufacturer, government agency or other organization controlling the design and the part number assignment of the subject part. SPL – Supplier CAGE Code. The organization assigning a Unique Component Identification Number (UCN), where the organization is not the manufacturer, government agency, or other organization controlling the design of the serialized component.

[47] SER – Serial Number within Enterprise. The current definition in the CSDD for Part Serial Number is *"The manufacturer's serialized identity for an individual part, component or component end item."* UCN – Unique Component Identification Number. The UCN is the permanent tracking identity assigned to an in-service part in lieu of the manufacturer's serial number.

[48] 25S is a data identifier defined as the identification of a party to a transaction (as identified by data identifier 18V), followed by a supplier assigned serial number (unique serialization within the EID). Thus, 25S represents the following string of concatenated elements – IAC + EID + Unique serial number within the EID, which directly corresponds to a fully assembled UID using Construct #1.

[49] 8004 is the application identifier for the EAN.UCC Global Individual Asset Identifier (GIAI). The GIAI is up to 30 characters and is a combination of the EAN.UCC Company Prefix and an Individual Asset Reference, which is assigned by the holder of the EAN.UCC Company Prefix.

[50] "18S" was added on October 9, 2002 in the ANS MH10.8.2-xxxx, Draft Standard for Trial Use (a revision of ANS MH10.8.2-2002, Data Identification and Application Identifier Standard). In the case where the EID is the CAGE Code, data identifier 18S may be used. 18S is defined as the concatenation of the CAGE Code (EID) + Unique serial number within the CAGE Code. This is UID Construct 1. This data element does not contain the IAC, which must be added.

[51] USN – The concatenation of MFR + SER. UST – The concatenation of SPL + UCN. These elements do not contain the IAC, which must be added.

[52] The current part number is not part of the UID. It is an additional, optional data element that may be encoded in the ISO 15434 syntax with the UID.

# 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 identification. This is called "syntax"[53].
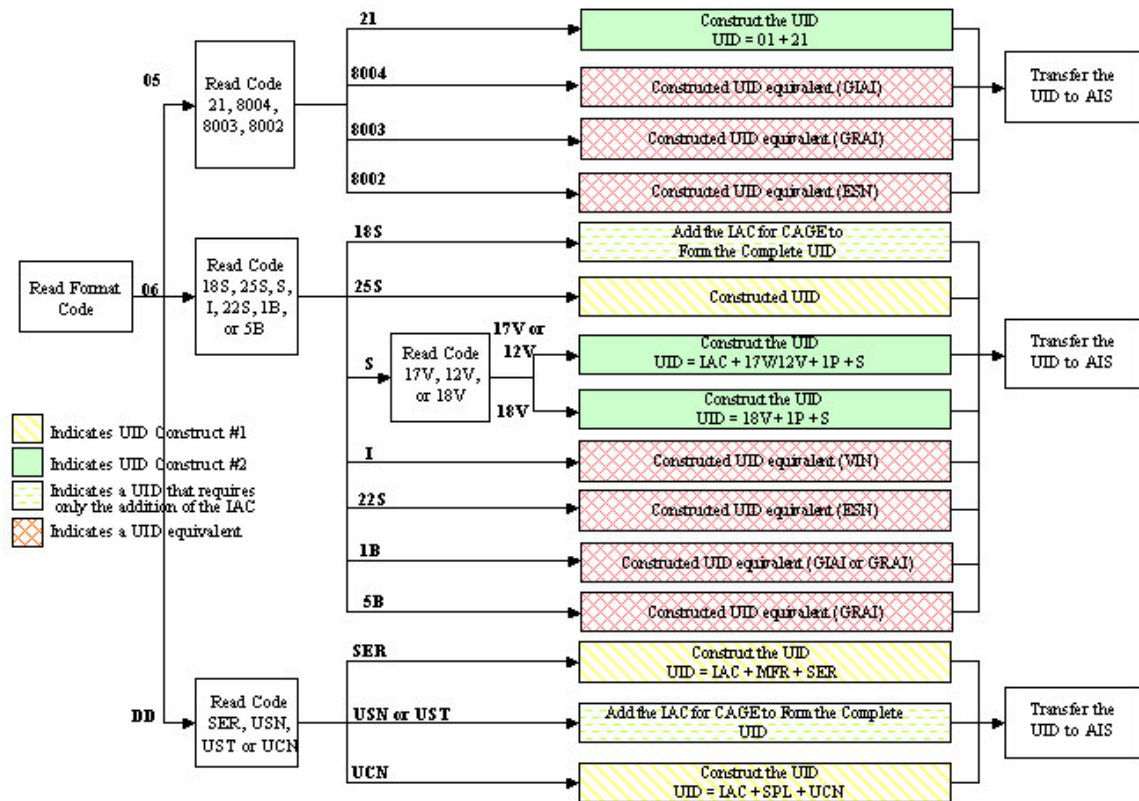


**Figure 4. Unique Identification (UID) Construction**

Figure 4 shows how the UID is constructed within Format Codes 05, 06 and DD with the various data qualifiers[54]. High capacity AIT devices shall conform to ISO/IEC International Standard 15434, Information Technology–Syntax for High Capacity ADC[55] Media. This is crucial to unique identification, since the process of identifying and concatenating the data elements must be unambiguous[56].

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

[54] It should be noted that the TEIs available in the ATA CSDD will only support Construct 1.

[55] ADC – Automatic Data Capture. 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.

[56] Enterprises may have a mark on the item such as a design authority, etc., but that mark will need a different enterprise identifier (EID) data qualifier than the EID data qualifier used for the UID. See business rule number 12 in Appendix C.

# EXAMPLES OF SEMANTICS AND SYNTAX CONSTRUCTIONS FOR UNIQUE IDENTIFICATION

## Using ANS MH 10 Data Identifiers

**Construct #1 – Serialization within the Enterprise Identifier.** Table 6 shows an example, using the data from Figure 3, of how the data elements would have to be encoded with data identifiers on the AIT media placed on or with the item for UID Construct #1.

| Data Element | Data Identifier Format 06 | Data Element Value | Encoded Data Element on AIT Media |
|---|---|---|---|
| **Unique identification (including the IAC)** | 25S | UN077991289 674A36458 | 25SUN077991289 674A36458 |
| **Unique identification (not including the IAC)** | 18S | 0CVA5674A3 6458 | 18S0CVA5674A3 6458 |

**Table 6. Example of the Use of Data Identifiers in Construct #1 (Format 06 of ISO/IEC 15434)**

The unique identification data elements would be encoded as follows using Format 06 for Data Identifiers of the ISO/IEC 15434 syntax:

$$[)>^R{}_S06^G{}_S25SUN077991289674A36458\,^R{}_S\,^E{}_{0T}$$

**or**

$$[)>^R{}_S06^G{}_S18S0CVA5674A36458\,^R{}_S\,^E{}_{0T}$$

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

**25S** = Data Identifier for the unique identification including the IAC (IAC + Enterprise Identifier + Serial Number)

**18S** = Data Identifier for unique identification not including the IAC and using CAGE as the Enterprise Identifier (CAGE + Serial Number)

**UN077991289674A36458** = UID including the IAC—As defined by the data identifier 25S (the IAC (UN) and DUNS Enterprise Identifier (077991289) and the Serial Number (674A36458))

**0CVA5674A36458** = UID not including the IAC—As defined by the data identifier 18S (the CAGE Enterprise Identifier (0CVA5) and the Serial Number (674A36458))

$^E o_T$ = 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 must have what agency (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.

When the AIT device reads the data qualifier for 25S, it will recognize that the data following the 25S is the UID for Construct #1, including the IAC. When the AIT device reads the data qualifier for 18S, it will recognize that the data following the 18S is the UID for Construct #1, not including the IAC and will add the IAC for CAGE to form the full UID.

For this example using ANS MH 10.8.2 Data Identifiers in Format 06 of ISO/IEC 15434, the unique identification output from the AIT device, once the overhead and syntax are stripped away, would be **UN077991289674A36458** or **D0CVA5674A36458**.

When using an already constructed UID such as 25S or 18S, if some or all of the data elements considered components of the UID (i.e., Enterprise Identifier, Original Part Number, and Serial Number) are specifically required by the contract to be separately identified, the data would be encoded as follows under Format 06 for Data Identifiers of the ISO/IEC 15434 syntax:

[)>$^R$s06$^G$s 25SUN077991289674A36458$^G$s12V077991289$^G$s1P4202435$^G$sS674A36458$^R$s $^E o_T$

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

**25S** = Data Identifier for serialization within the enterprise

**UN077991289674A36458** = UID—As defined by the data identifier 25S (the IAC (UN) and DUNS Enterprise Identifier (077991289) and the Serial Number (674A36458))

$^G$s = A Data Element Separator used between data fields

**12V** = Data Identifier for DUNS

**077991289** = DUNS Number

$^G_S$ = A Data Element Separator used between data fields

**1P** = Data Identifier for Original Part Number

**4202435** = Original Part Number

$^G_S$ = A Data Element Separator used between data fields

**S** = Data Identifier for Serial Number

**674A36458** = Serial Number within the enterprise identifier

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

It is important to note that when additional data elements, traditionally used to construct the UID accompany the 25S or 18S data identifier, the UID will be taken from the 25S or 18S data identifier only and not constructed from the discrete elements.

**<u>Construct #2 – Serialization within the Original Part Number.</u>** Table 7 shows an example, using the data from Figure 3, of how the data elements would have to be encoded with data identifiers on the AIT media placed on or with the item for UID Construct #2.

| Data Element | Data Identifier Format 06 | Data Element Value | Encoded Data Element on AIT Media |
|---|---|---|---|
| **Enterprise Identifier**<br>• **DUNS** | **12V** | **077991289** | **12V077991289** |
| **Original Part Number** | **1P** | **4202435** | **1P4202435** |
| **Serial Number within Original Part Number** | **S** | **10936** | **S10936** |

**Table 7. Example of the Use of Data Identifiers in Construct #2 (Format 06 of ISO/IEC 15434)**

Recalling that the unique identification 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 identification data elements would be encoded as follows using Format 06 for Data Identifiers of the ISO/IEC 15434 syntax:

$$\text{[)>}^R_S\text{06}^G_S\text{12V077991289}^G_S\text{1P4202435}^G_S\text{S10936 }^R_S{}^E_{O_T}$$

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

**077991289** = DUNS Code

**1P** = Data Identifier for Part Number assigned by supplier (Original)

**4202435** = Original Part Number

**S** = Data Identifier for Serial Number

**10936** = Serial Number within original part number

$^E_{O_T}$ = 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 agency (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 ANS MH 10 Data Identifiers in Format 06 of ISO/IEC 15434, the unique identification output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be **UN077991289420243510936**.

# Using EAN.UCC Application Identifiers

**Construct #1 – Serialization within the Enterprise Identifier.**  When using EAN.UCC Application Identifiers for purposes of unique identification, enterprises must use the General EAN.UCC Specifications[57] to construct the unique identification. Table 8 shows an example of the use of application identifiers in the context of the General EAN.UCC Specifications for UID Construct #1.

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[57] See http://www.uc-council.org/ean_ucc_system/stnds_and_tech/auto_id.html for information about the EAN.UCC System.

| Data Element | Application Identifier Format 05 | Data Element Value | Encoded Data Element on AIT Media |
|---|---|---|---|
| Unique identification, including the IAC[58] | 8004 | 06141411A0B9C3D6 | 800406141411A0B9C3D6 |

**Table 8. Example of the Use of Application Identifiers for Construct #1 (Format 05 of ISO/IEC 15434)**

For unique identification, the Global Individual Asset Identifier (GIAI) is considered by the Department to be a UID equivalent[59]. The data elements considered components of the UID (i.e., EAN.UCC Company Prefix, Original Part Number, and Serial Number) are not required to be marked on the item, unless specifically required by the contract.[60]

Using the General EAN.UCC Specifications, the minimum unique identification data elements would be encoded as follows under Format 05 for Application Identifiers of the ISO/IEC 15434 syntax:

$$[)>^R{}_S 05 {}^G{}_S\ 800406141411A0B9C3D6\ {}^R{}_S\ {}^E{}_{0T}$$

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 Global Individual Asset Identifier (GIAI)

**06141411A0B9C3D6** = GIAI, which is composed of the EAN.UCC Company Prefix including the IAC as the leading character (**0614141**) and the Serial Number **(1A0B9C3D6)**

$^E{}_{0T}$ = A Message Trailer which identifies the end of the message within the data stream

If some or all of the data elements considered components of the UID (i.e., EAN.UCC Company Prefix, Original Part Number, and Serial Number)

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[58] Within the General EAN.UCC Specifications, the Global Individual Asset Identifier (GIAI) is considered a UID equivalent. The application identifier (8004) indicates that the data field contains a GIAI. The GIAI is made up of the EAN.UCC Company Prefix and an individual asset reference, or serial number. The holder of the EAN.UCC Company Prefix determines the structure and numbering of the individual asset reference.

[59] A DoD recognized unique identification equivalent means a unique identification method that is in commercial use that can be used to uniquely identify DoD items that are purchased from commercial industries that use the unique identification equivalents.

[60] This is an exception to UID Business Rule #2. See Appendix C.

are specifically required by the contract to be separately identified, using the General EAN.UCC Specifications, the data would be encoded as follows under Format 05 for Application Identifiers of the ISO/IEC 15434 syntax:

**[)>ᴿₛ05ᴳₛ 800406141411A0B9C3D6ᴳₛ950614141ᴳₛ0100061414199999ᴳₛ211A0B9C3D6 ᴿₛᴱₒₜ**

Where:

**[)>** = A three-character compliance indicator

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

**05** = A format header which indicates application identifiers are being used

**ᴳₛ** = A Data Element Separator used between data fields

**8004** = Application Identifier for Global Individual Asset Identifier (GIAI)

**06141411A0B9C3D6** = GIAI, which is composed of the EAN.UCC Company Prefix including the IAC as the leading character (**0614141**) and the Serial Number (**1A0B9C3D6**)

**ᴳₛ** = A Data Element Separator used between data fields

**95** = Application Identifier for EAN.UCC Company Prefix

**0614141** = EAN.UCC Company Prefix including the IAC as the leading character

**ᴳₛ** = A Data Element Separator used between data fields

**01** = Application Identifier for Global Trade Item Number (GTIN™), used as an equivalent for Original Part Number

**00061414199999** = GTIN™, which is composed of the EAN.UCC Company Prefix including the IAC as the leading character (**0614141**) and the Product (Original Part) Number (**99999**) and leading zeros to a fixed length of 14 digits

**ᴳₛ** = A Data Element Separator used between data fields

**21** = Application Identifier for Serial Number

**1A0B9C3D6** = Serial Number

**ᴱₒₜ** = A Message Trailer which identifies the end of the message within the data stream

It is important to note that when additional data elements, traditionally used to construct the UID, accompany the GIAI, the UID must be taken from the AI 8004 GIAI only and not constructed from the discrete elements. Because of the way the elements are built, constructing the UID will not yield the same result as the GIAI.

For this example using Application Identifiers in Format 05 of ISO/IEC 15434, the unique identification output from the AIT device, using the GIAI as the UID, stripping away the overhead and syntax would be **06141411A0B9C3D6**[61].

**Construct #2 – Serialization within the Part Number.**  Table 9 shows an example of the use of application identifiers in the context of the General EAN.UCC Specifications for UID Construct #2.  In this construct, the GTIN™ is treated as the part number.

| Data Element | Application Identifier Format 05 | Data Element Value | Encoded Data Element on AIT Media |
|---|---|---|---|
| **Part Number** | **01** | **00061414199999** | **01000614199999** |
| **Serial Number** | **21** | **1A0B9C3D6** | **211A0B9C3D6** |

**Table 9. Example of the Use of Application Identifiers for Construct #2 (Format 05 of ISO/IEC 15434)**

Using the General EAN.UCC Specifications, the minimum unique identification data elements would be encoded as follows under Format 05 for Application Identifiers of the ISO/IEC 15434 syntax:

$$[)>{}^R_S 05{}^G_S\ 0100061414199999\ {}^G_S\ 211A0B9C3D6\ {}^R_S\ {}^E_{0_T}$$

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

**01** = Application Identifier for the GTIN™

**00061414199999**  = the GTIN™, which is composed of the EAN.UCC Company Prefix including the IAC as the leading character (**0614141**) and the Product Number **(99999)** and leading zeros to a fixed length of 14 digits

**21** = Application Identifier for serial number

**1A0B9C3D6** = The serial number

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[61] Since the IAC is the first digit of the Company Prefix, it is not necessary to add it in forming the concatenated UID.

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

For this example using Application Identifiers in Format 05 of ISO/IEC 15434, the unique identification output from the AIT device, stripping away the overhead and syntax would be **000614141999991A0B9C3D6**[62].

# Historic Use of Text Element Identifiers

Text Element Identifiers (TEIs)[63] are the preferred approach of the aerospace industry. The aerospace industry uses CAGE Code (TEI = MFR) to identify the manufacturer with serial number (TEI = SER) to provide unique identity of the item. The aerospace industry philosophy is no duplication of serial numbers within an enterprise, regardless of the product, so that a simple combination of Enterprise ID and serial number provides unique identification of that item forever. As revisions are implemented that change the form, fit or function of the part, the aerospace industry changes the part number (TEI = PNR) to reflect those changes. This is called "rolling the part number."

As aerospace attempted to move TEIs into broader multi-industry use, they determined that additional TEIs (CAGE {TEI = CAG}, DUNS Number {TEI = DUN}, UCC Company Prefix {TEI = EUC}, Serial Number within Part Number {TEI = SEQ}, Original Part Number {TEI = PNO}, UID elements {TEI = UID}) were required to encode text element identifiers other than Manufacturer (TEI = MFR) , Serial Number (TEI = SER) and Current Part Number (TEI = PNR)[64]. It was also determined that they needed a separator that would not be used within data, as opposed to the "/" used in ATA Spec 2000, Chapter 9. Finally, it was determined that an unambiguous header/trailer was needed to identify that the data fields represented were in Text Element Identifier form.

The needed non-data separator and unambiguous header/trailer were available in ISO/IEC 15434; Syntax for High Capacity ADC Media, and this gave rise to the Collaborative Solution.

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[62] Since the IAC is the first digit of the Company Prefix, it is not necessary to add it in forming the concatenated UID.

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

[64] These additional TEIs, however, are not yet supported by the ATA CSDD. This fact restricts the use of TEIs to UID Construct #1 only for the time being. Efforts are underway to add these additional TEIs to the ATA CSDD.

# The Collaborative AIT Solution[65]

The DoD has approved the use of ISO/IEC 15418 and ISO/IEC 15434 in its acquisitions. The DoD has established the collaborative solution "DD" format to enable the use of text element identifiers (TEIs) using the syntax of ISO/IEC 15434 until such time as the TEIs needed for unique identification are incorporated as approved semantics in ISO/IEC 15418. Although DoD has approved the use of ISO/IEC 15434, the collaborative solution "DD" format may be used to accommodate the use of only those TEIs needed for unique identification in the ISO/IEC 15434 syntax in the interim.

As evidenced by its approval of the use of ISO/IEC 15434, the Department, along with its industry and international partners, clearly prefers use of ISO/IEC 15434 format codes 05 and 06. Additionally, DoD is seeking ISO approval to add a new format to ISO/IEC 15434 to support Text Element Identifiers (TEIs). The Department values the formal ISO approval process and has submitted a proposal to the U. S. Technical Advisory Group to the 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 C. 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. The use of the collaborative solution format as described below should strictly be considered an interim approach.

# Using Text Element Identifiers in the Collaborative Solution

**Construct #1 – Serialization within the Enterprise Identifier by Manufacturer.** Table 10 shows an example of the use of TEIs in the collaborative solution for UID Construct #1 when the manufacturer serializes the item.

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[65] The text is highlighted to emphasize that the use of the collaborative solution format as described should be considered an interim approach.

| Data Element | TEIs[66] | Data Element Value | Encoded Data Element on AIT Media |
|---|---|---|---|
| **Enterprise Identifier**<br>• **CAGE** | **MFR** | **0CVA5** | **MFR 0CVA5** |
| **Serial Number within Enterprise Identifier** | **SER** | **674A36458** | **SER 674A36458** |

**Table 10. Example of the Use of TEIs in the Collaborative Solution for UID Construct #1, Manufacturer Serialization (DoD Format "DD")**

Recalling that the unique identification is to be concatenated in the order Issuing Agency Code/Enterprise Identifier/ /Serial Number for an enterprise that serializes within the enterprise identifier, the unique identification 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:

$$[)>^R_S DD^G_S MFR\ 0CVA5^G_S SER\ 674A36458^R_S{}^E o_T$$

Where:

**[)>** = 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

**MFR** = TEI for Manufacturer CAGE code

**0CVA5** = CAGE Code

**SER** = TEI for Serial Number within the Enterprise Identifier

**674A36458** = Serial Number within Enterprise Identifier

$^E o_T$ = 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 agency (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 CAGE is "D".

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

For this example using Format DD for TEIs in the ISO/IEC 15434 syntax, the unique identification output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be **D0CVA5674A36458**.

**Construct #1 – Serialization within the Enterprise by an Organization other than the Manufacturer.** Table 11 shows an example of the use of TEIs in the collaborative solution for UID Construct #1 when serialization is done by an organization other than the manufacturer of the item.

| Data Element | TEIs[67] | Data Element Value | Encoded Data Element on AIT Media |
|---|---|---|---|
| Enterprise Identifier<br><br>• CAGE | SPL | 0F3N5 | SPL 0F3N5 |
| Serial Number within Enterprise Identifier, other than Manufacturer | UCN | 10936 | UCN 10936 |

**Table 11. Example of the Use of TEIs in the Collaborative Solution for UID Construct #1, Enterprise other than Manufacturer (DoD Format "DD")**

Recalling that the unique identification is to be concatenated in the order Issuing Agency Code/Enterprise Identifier/Serial Number for an enterprise that serializes within the enterprise, the unique identification 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:

$$[)>^R_S DD^G_S SPL\ 0F3N5^G_S UCN\ 10936^R_S{}^E o_T$$

Where:

[)> = 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

**SPL** = TEI for CAGE code, Enterprise other than Manufacturer

**0F3N5** = CAGE Code

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

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**UCN** = TEI for Unique Component Number assigned by Enterprise other than the Manufacturer

**10936** = Unique Component Number

$^E$**o$_T$** = 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 agency (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 CAGE is "D".

For this example using Format DD for TEIs in the ISO/IEC 15434 syntax, the unique identification output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be **D0F3N510936**.

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.

# Appendix E -Glossary of Terms

| | |
|---|---|
| **ACRN** | Accounting Classification Reference Number |
| **ADC** | Automatic Data Capture |
| **AIS** | Automated Information System |
| **AIT** | Automatic Identification Technology |
| **ANS** | American National Standard |
| **ANSI** | American National Standard Institute |
| **ANSI/EIA** | American National Standard Institute/Electronic Industries Alliance |
| **ANSI T1.220 Number** | North American Telecommunication Industry Manufacturers, Suppliers, and Related Service Companies |
| **ASC** | Accredited Standards Committee |
| **ATA** | Air Transport Association |
| | |
| **CAGE** | Commercial And Government Entity |
| **CDRL** | Contract Data Requirements List |
| **CFO** | Chief Financial Officers |
| **CJCSI** | Chairman of the Joint Chiefs of Staff Instruction |
| **CLEI** | COMMON LANGUAGE® Equipment Identification |
| **CLIN** | Contract Line Item Number |
| **CSDD** | Common Support Data Dictionary published by the ATA |
| | |
| **D** | Issuing Agency Code for CAGE Numbers |
| **DCMA** | Defense Contract Management Agency |
| **DFARS** | Defense Federal Acquisition Regulation Supplement |
| **DLMS** | Defense Logistics Management System |
| **DoD** | Department of Defense |
| **DoDD** | Department of Defense Directive |
| **DoDI** | Department of Defense Instruction |
| **DUNS® Number** | Dun & Bradstreet Data Universal Numbering System number |
| | |
| **EAN** | European Article Numbering |
| **EAN.UCC** | European Article Numbering.Uniform Code Council |
| **EHIBCC** | European Health Industry Business Communications Council |
| **EIA** | Electronic Industries Alliance |
| **EID** | Enterprise Identifier |
| **ESN** | Electronic Serial Number |
| | |
| **FAR** | Federal Acquisition Regulation |
| **FASAB** | Federal Accounting Standard Advisory Board |

| | |
|---|---|
| **FMEA** | DoD Financial Management Enterprise Architecture |
| **FMIP** | Financial Management Improvement Plan |
| **FMMP** | DoD Financial Management Modernization Program |
| **FMR** | DoD Financial Management Regulation |
| **FMS** | Foreign Military Sales |
| | |
| **GAO** | General Accounting Office |
| **GIAI** | Global Individual Asset Identifier |
| **GRAI** | Global Returnable Asset Identifier |
| **GTIN**[TM] | Global Trade Item Number[TM] |
| | |
| **HIBCC** | Health Industry Business Communications Council |
| | |
| **IAC** | Issuing Agency Code |
| **ID** | Identification |
| **IEC** | International Electrotechnical Commission |
| **ISO** | International Organization for Standardization |
| **ISO/IEC 15418** | EAN/UCC Applications Identifiers and ASC MH 10 Data Identifiers and Maintenance |
| **ISO/IEC 15434** | Syntax for High Capacity ADC Media |
| **ISO/IEC 15459-2** | Unique Identifiers for Item Management |
| | |
| **JRIB** | Joint Requirements Implementation Board |
| **JTC 1** | ISO/IEC Joint Technical Committee One |
| | |
| **LB** | Issuing Agency Code for ANSI T1.220 Numbers |
| **LH** | Issuing Agency Code for EHIBCC Numbers |
| | |
| **MFR** | Text Element Identifier for CAGE Code of the Manufacturer |
| **MIL HDBK** | Military Handbook |
| **MIL STD** | Military Standard |
| **MILSTRAP** | Military Standard Transaction Reporting and Accounting Procedures |
| **MH 10** | The US Technical Advisory Group to ANSI |
| | |
| **NATO** | North Atlantic Treaty Organization |
| **NCAGE** | NATO Commercial And Government Entity |
| **NEN** | Nederlands Normalisatie-instituut |
| | |
| **OEM** | Original Equipment Manufacturer |
| **OSD** | Office of the Secretary of Defense |

| | |
|---|---|
| **PP&E** | Property, Plant and Equipment |
| **SC 31** | ISO Sub Committee 31 (Automatic Data Capture) |
| **SER** | Text Element Identifier for Serial Number assigned by the Manufacturer |
| **SLIN** | Sub Line Item Number |
| **SPL** | Text Element Identifier for CAGE Code of Enterprise other than the Manufacturer |
| **TC** | ISO Technical Committee |
| **TEI** | Text Element Identifier |
| **TG** | US TAG Technical Group |
| **UCC** | Uniform Code Council |
| **UCN** | Text Element Identifier for Unique Component Number assigned by Enterprise other than the Manufacturer |
| **UID** | Unique Identification |
| **UN** | Issuing Agency Code for DUNS Numbers |
| **USD (AT&L)** | Undersecretary of Defense for Acquisition, Technology and Logistics |
| **USN** | Text Element Identifier of Universal Serial Number formed by Concatenating MFR+SER |
| **UST** | Text Element Identifier of Universal Serial Tracking Number formed by Concatenating SPL+UCN |
| **US TAG** | U.S. Technical Advisory Group |
| **VIN** | Vehicle Identification Number |
| **WG** | ISO Working Group |