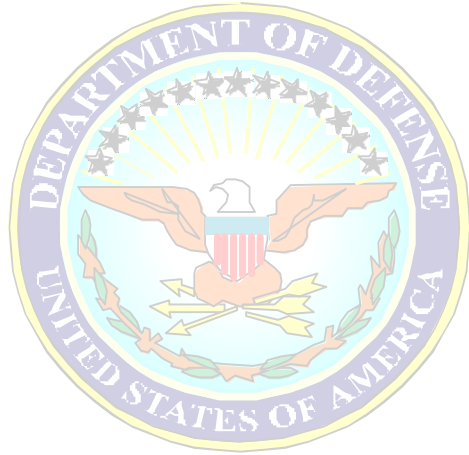# Department of Defense Guide to Uniquely Identifying Items

Assuring Valuation, Accountability and Control of Government Property

Version 1.5
June 7, 2005

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

Preface

This version 1.5 of the Guide to Uniquely Identifying Items distinguishes between the terms "DoD Item Unique Identification (IUID)" and "Unique Item Identifier (UII)". IUID is a system of marking items delivered to the Department of Defense with unique item identifiers that have machine-readable data elements to distinguish an item from all other like and unlike items.

The unique item identifier (UII) is defined in two separate contexts:

1. DoD UII Data Set. A UII is a set of data elements marked on an item that is globally unique and unambiguous. For items that are serialized within the enterprise identifier, the UII data set includes the data elements of enterprise identifier and a unique serial number (Construct #1). For items that are serialized within the part, lot or batch number within the enterprise identifier, the UII data set includes the data elements of enterprise identifier, the original part, lot or batch number, and the serial number (Construct #2).

2. Use. The generic term, UII, has evolved through usage to mean the concatenated UII as a common data base key without regard to the data set construct being used. In this context, the term "UII" may be used to designate UII Constructs #1 and #2, or the DoD recognized IUID equivalents of Global Individual Asset Identifier (GIAI), Global Returnable Asset Identifier (GRAI), Vehicle Identification Number (VIN), or Electronic Serial Number ((ESN), for cell phones only).

Summary of Changes from Version 1.4 (Posted to the DoD website on 20 April 2004) to Version 1.5:

a. The definition of item was updated on page 2.

b. The heading "Valuation of Items" was changed to "Valuation of Items for the IUID Registry" on page 10.

c. Figure 2 and the accompanying narrative on page 13 were revised to incorporate the policy of the Final DFARS Rule.

d. Updated Chapter 3 to include unique identification of legacy items in inventory and operational use.

e. Added new Figure 3 on page 15 on assigning virtual unique item identifiers to legacy items in operational use and inventory.

f. The discussion of DoD IUID equivalents on page 15 was modified to stress that the equivalents must comply with the IUID minimum data carrier requirement of Data Matrix ECC200 as established by IUID Business Rules 14 and 17.

g. The text under the section entitled "Serialization within the Part, Lot or Batch Number" on page 17 was revised to describe serialization within the part, lot or batch number.

h. Table 3 on page 18 was updated to add the IAC of "LD" for the Department of Defense Activity Address Code (DODAAC).

i. Table 4 on page 20 was changed to reflect serialization within the original part, lot or batch number.

j. A new section was added on page 21 on "Considerations for Suppliers".

k. Added new Figure 5 on page 22 on supplier considerations in machine-readable information marking.

l. Clarified that the concatenated UII is a common data element for item traceability in the last sentence of the section entitled "Use of the Unique Item Identifiers in Automated Information Systems" (top of page 25).

m. Updated and streamlined Appendix A.

n. Updated Appendix B.

o. Added new Business Rule 18 on page 39 concerning parent child relationships. Renumbered remaining business rules.

p. Deleted old Business Rule 35.

q.   Renumbered Rule 30 was revised on page 41.

r. Figure 6 was updated on page 46 and revised by adding Data Identifiers "11P" and "1T" and Text Element Identifiers "CAG" and "LOT".

s. Updated the section entitled "Using ANS MH 10 Data Identifiers" on page 46.

t. Updated the section entitled "Using EAN.UCC Application Identifiers" on page 49.

u. Corrected an error in the construction of the GTIN in the section entitled "Using EAN.UCC Application Identifiers" beginning on page 49.

v. The text on "The Collaborative AIT Solution" was revised on page 52.

w. A section on Construct #2 using TEIs was added on page 56.

x. Updated Appendix E.

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 a single hardware article or a single unit formed by a grouping of subassemblies, components, or constituent parts.[3]

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.[4]

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)[5], to include improved data quality and global interoperability and rationalization of systems and infrastructure.

- Improved item management and accountability.

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[3] DFARS 252.211-7003(a).

[4] 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).

[5] 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.

- Improved asset visibility and life cycle management.
- Clean audit opinions on item portions[6] of DoD financial statements.

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.

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

DoD Instruction 5000.64[7] 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 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.[8]

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.[9]

Financial Management. DoD Instruction 7000.14, Defense Financial Management Regulation, specifies that all DoD Components

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[7]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.

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

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

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.

Joint Total Asset Visibility. Joint total 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.[10]

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 Materiel Management Cataloging	Assign part number Request part number Assign stock number
Produce & Accept	Process Control	Apply & inspect item marking

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[10] "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.

Transport	Transportation	Track items
Stock	Stocking	Stock, locate and retrieve items Control item inventory
Order	Requisitioning	Request item supply
Supply	Shipping	Locate and ship items
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 Destruction and/or abandonment
Pay	Requirements	Settle invoices
Account	Inventories Financial Statements	Manage & control 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[11] 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.[12] 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.[13] 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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[11] DoD 4140.1-R, May 2003, chapter 5, section C5.7.3, addresses Unique Item tracking policy for logistics.

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

[13] 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.[14]

For materiel covered under DoD 4140.1-R, accountability records are established for all materiel received, regardless of cost.[15]

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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[14] Ibid, paragraph 5.3.3 contains the list of all data elements.
[15] 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	UII or IUID Equivalent Required	Unit Acquisition Cost (or price) Required	Valuation Method (Contract type)
CLIN/SLIN Items requiring UII or IUID 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 UII or IUID Equivalent contained within CLIN/SLIN delivered items. (LRU/Spares)	Yes. Application of maintenance plan (e.g. lowest repairable or replaceable unit by DoD); No dollar threshold for applicability.[16]	No	N/A
Other commercially marked items not requiring IUID. (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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[16] IUID Contract Data Requirements List (CDRL) Requirement, either as a part of, or associated with, the Material Inspection and Receiving Report. Example: The Joint Strike Fighter (JSF) contractor provides one UII and value corresponding with the tail number. The contractor also provides a list of UIIs in accordance with the CDRL internal to JSF, without item values.

Valuation of Items for the IUID Registry

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 within delivered 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. It shows the relationships between the components of the supply chain, the items qualifying for unique identification, and the delivery of the UII and CLIN/SLIN valuation.
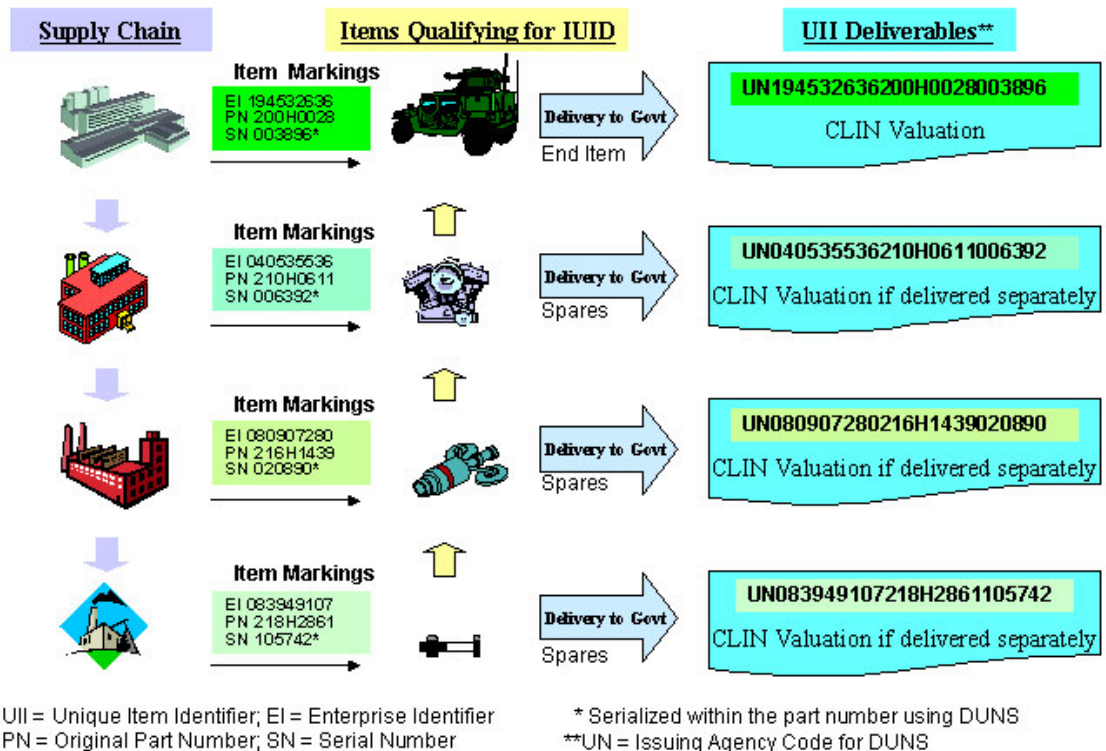
Figure 1. Valuation of Contract Line/Subline Item Numbers

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

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

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

Chapter 3
Determining Uniqueness of Items

WHAT IS AN ITEM?

As stated earlier in this guide, an item is a single hardware article or a unit formed by a grouping of subassemblies, components or constituent parts.[17] In this definition, hardware is a generic term dealing with physical items as distinguished from a capability or function, such as equipment, tools, implements, instruments, devices, sets, fittings, trimmings, assemblies, subassemblies, components and parts.[18]

DECIDING WHAT ITEMS ARE TO BE IDENTIFIED AS UNIQUE

Items Delivered Under Contracts and Legacy Items in Inventory and Operational Use

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 should be uniquely identified for DoD purposes when they are items delivered under contract or legacy items in inventory or use. The program manager is responsible for having items uniquely identified.

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[17] DFARS 252.211-7003(a).

[18] Joint Publication 1-02, DOD Dictionary.
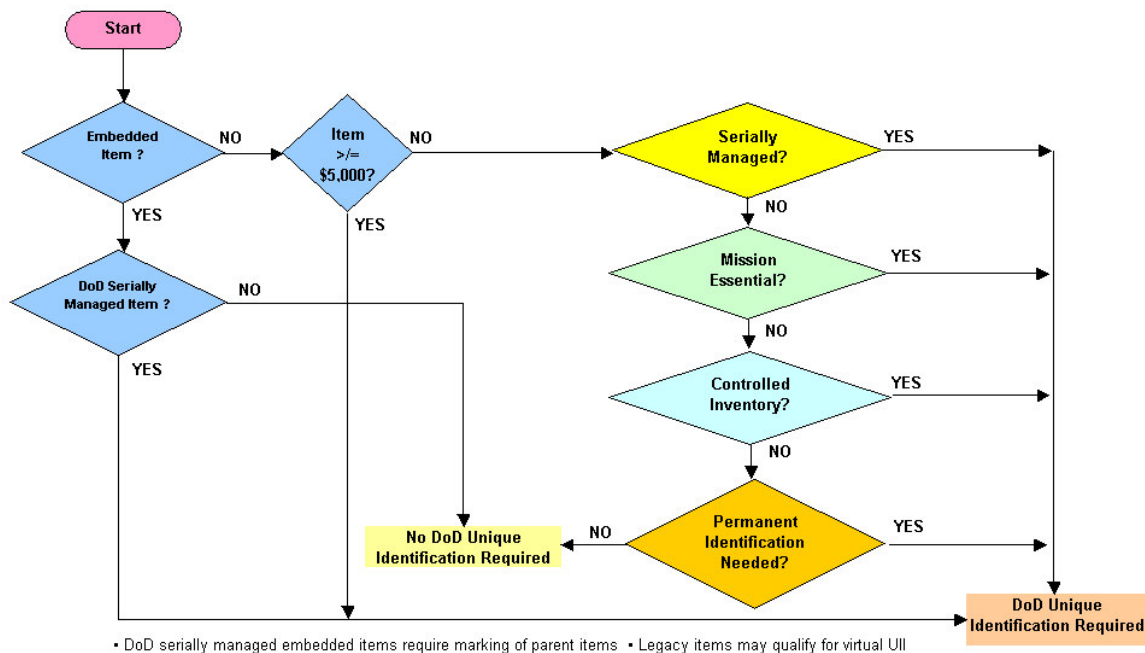
**Figure 2. Uniquely Identifying Items Delivered Under
Contract and Legacy Items in Inventory or Use**

Items will require unique item identification, or a DoD recognized unique
identification equivalent, for all property items delivered to the
Government under contract or in inventory or use if one or more of the
following applies: (1) All items for which the Government's unit
acquisition cost is $5,000 or more [19]; (2) Items for which the
Government's unit acquisition cost is less than $5,000, when *identified by
the requiring activity as* serially managed, mission essential or controlled
inventory[20]; (3) When the Government's unit acquisition cost is less than

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[19] 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.

[20] **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,)

$5,000 and the requiring activity determines that permanent identification[21] is required; (4) Regardless of value, (i) any DoD serially managed subassembly, component, or part embedded within an item and, (ii) the parent item (as defined in DFARS 252.211-7003(a))[22] that contains the embedded subassembly, component or part.

A distinction must be made between "serialized items" and "DoD serially managed" items when uniquely identifying embedded items in an item. While DoD may use an item that has been serialized by the manufacturer, DoD may not manage the item by means of its serial number. When DoD elects to serially manage an item it becomes "DoD serially managed". This means it is a tangible item used by DoD*, which is designated by a DoD, or Service Item Manager* to be uniquely tracked, controlled or managed in maintenance, repair and/or supply by means of its serial number[23].

Legacy Items in Operational Use and Inventory

Program and item managers will prepare implementation plans for implementation of IUID on legacy items in operational use and in inventory. Only those legacy items determined in these implementation plans to meet the IUID criteria specified in Figure 2 above will require UII marking. All Government property in the contractor's possession will require UII marking, without regard to value.

When applying unique item identification to legacy items already in the inventory and operational use[24], all serialized items used by DoD, which meet the IUID criteria and can be uniquely identified by their serial number, should be assigned virtual unique item identifiers (UIIs) (See the decision tree in Figure 3). In this case, the items subject to unique identification are not limited to just DoD serially managed items. The use of virtual UIIs is described in Guidelines for the Virtual Unique Item Identifier (UII), version 1.0, December 29, 2004.[25]

(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.

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

[22] "Parent item" means the item assembly, intermediate component or subassembly that has an embedded item with a unique item identifier or DoD recognized unique identification equivalent.

[23] A serial number is an assigned combination of numbers and/or letters to an item instance that separately identifies that item instance from all others.

[24] This is required by USD(AT&L) Memorandum, dated December 23, 2004, subject: Policy for unique identification (UID) of Tangible Personal Property Legacy Items in Inventory and Operational Use, Including Government Furnished Property (GFP), available for download at http://www.acq.osd.mil/dpap/UID/policy.htm.

[25] This guide is available for download at http://www.acq.osd.mil/dpap/UID/guides.htm.
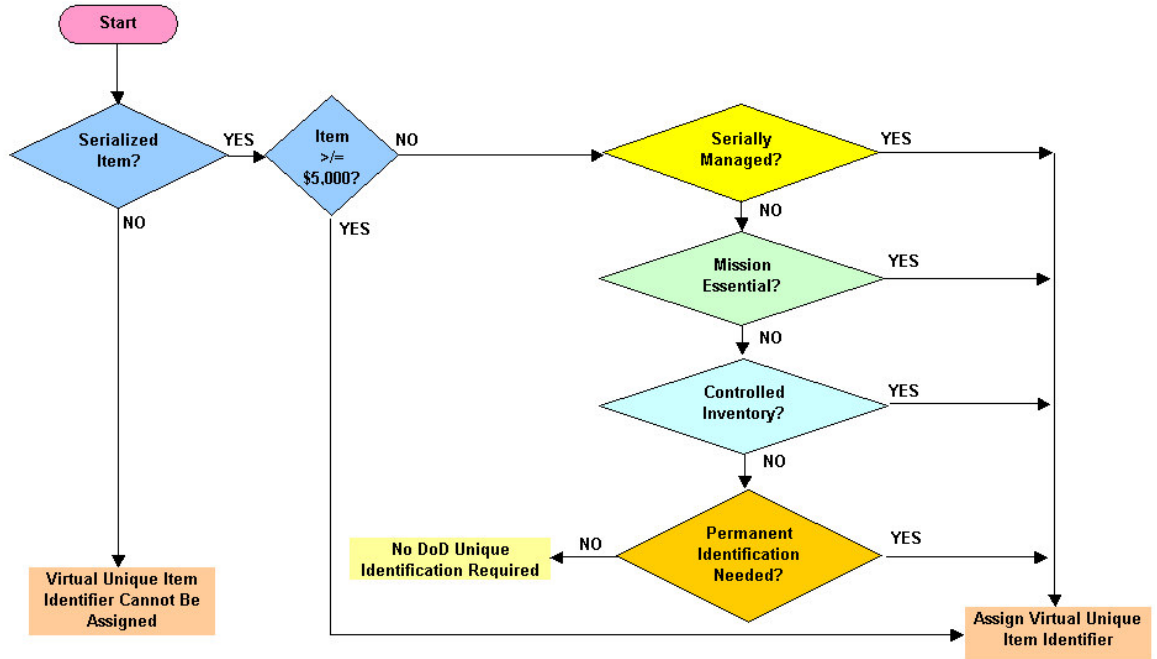
Figure 3. Assigning Virtual Unique Item Identifiers to Legacy Items In Operational Use and Inventory

DoD IUID Equivalents

Generally, a commercial identifier can be considered for use as a DoD IUID equivalent[26] 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, lot or batch number, (3) Must have an existing Data Identifier (DI) or Application Identifier (AI) listed in ANSI MH10.8.2, Data Identifier and Application Identifier Standard[27]. Provided that the item marks comply with Business Rule #14 for Data Matrix marking, the DoD recognizes four commercial unique identifiers as unique identification equivalents. They 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.

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[26] Subject to DoD approval.
[27] Also, Business Rule #17 requires that DoD IUID equivalents comply with the IUID minimum data carrier requirements, the Data Matrix ECC200 as specified in Business Rule #14.

DEFINING THE DATA ELEMENTS FOR THE UNIQUE ITEM IDENTIFIER

What is the Unique Item Identifier (UII)?

The unique item identifier (UII) is defined in two separate contexts:

1. <u>DoD UII Data Set</u>. A UII is a set of data elements marked on an item that is globally unique and unambiguous. For items that are serialized within the enterprise identifier, the UII data set includes the data elements of enterprise identifier and a unique serial number (Construct #1). For items that are serialized within the part, lot or batch number within the enterprise identifier, the UII data set includes the data elements of enterprise identifier, the original part, lot or batch number, and the serial number (Construct #2).

2. <u>Use</u>. The generic term, UII, has evolved through usage to mean the concatenated UII as a common data base key without regard to the data set construct being used. In this context, the term "UII" may be used to designate UII Constructs #1 and #2, or the DoD recognized IUID equivalents of Global Individual Asset Identifier (GIAI), Global Returnable Asset Identifier (GRAI), Vehicle Identification Number (VIN), or Electronic Serial Number ((ESN), for cell phones only).

The Notion of an Enterprise

The first is enterprise identification. An enterprise is the entity responsible for assigning a UII to an item. For purposes of unique item 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 [e.g., 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, Department of Defense Activity Address Code (DoDAAC), 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 constructing a UII is the unique identification of each item that the enterprise produces. Unique item 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, lot or batch 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, lot or batch number occurs when each item of a particular part, lot or batch number is assigned a unique serial number within the original part, lot or batch number assignment. The enterprise is responsible for ensuring unique serialization within the original part, lot or batch number.

Serialization Within the Enterprise Identifier

For items that are serialized within the enterprise identifier, the concatenated UII is a combination of the issuing agency code[28], 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 (e.g., 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, Lot or Batch Number

For items that are serialized within the part, lot or batch number, the concatenated UII is a combination of the issuing agency code, enterprise identifier, the original part, lot or batch number, and the serial number. The original part number is a combination of numbers and letters assigned by the enterprise (e.g., a manufacturer or vendor) at asset creation to a class of items with the same form, fit, function, and interface. Lot or batch number means an identifying number assigned by the enterprise to a designated group of items, usually referred to as either a lot or a batch, all of which were manufactured under identical conditions. The serial number within the part, lot or batch number is a combination of numbers and letters assigned by the enterprise (e.g., 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, lot or batch

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[28] 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.

number and serial number within the original part, lot or batch number provide the permanent identification for the life cycle of the item.

Issuing Agency Codes for Use in Item Unique Identification

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

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
LD	Department of Defense	DODAAC

Table 3. Issuing Agency Codes

INCLUDING UNIQUE ITEM IDENTIFIER (UII) DATA ELEMENTS ON AN ITEM

Derivation of the Unique Item Identifier

The unique item identifier (UII) for 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[29] machine-reads the data elements on the item and outputs the concatenated[30] UII. Therefore, it is not necessary to include the concatenated UII on the item as a separate data element. It is only required that the data elements required to derive the concatenated UII (enterprise identifier, serial number and, for Construct#2, original part, lot or batch number) be included on each item. The UII component data elements, at a minimum, shall be contained in a Data Matrix ECC200 symbol encoded in the syntax of ISO/IEC 15434 and using the semantics of ISO/IEC 15418[31] or ATA Common Support Data Dictionary (CSDD). 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. Table 4 shows how the UII is constructed from the data elements placed on the item and the business rule. When deriving the concatenated UII, the data qualifiers are eliminated from the final number.

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

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

[31] See Appendix D, The Mechanics of Unique Item Identification, for a detailed explanation of encoding the Data Matrix. ISO/IEC International Standard 15434, Information Technology–Syntax for High Capacity Automatic Data Capture Media. ISO/IEC International Standard 15418, Information Technology–EAN/UCC Application Identifiers and ASC MH 10 Data Identifiers and Maintenance.

	UII Construct #1	UII Construct #2	
Based on current enterprise configurations	If items are serialized within the Enterprise	If items are serialized within Part, Lot or Batch Number	
UII is derived by concatenating the data elements IN ORDER:	Issuing Agency Code* Enterprise ID Serial Number	Issuing Agency Code* Enterprise ID	
		Original Part # Serial Number	Lot or Batch # Serial Number
Data Identified on Assets Not Part of the UII (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.

**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 Item Identifier (UII) Construct Business Rule

Thus, there are two constructs for determining the UII for an item, depending upon whether the enterprise serializes items within the enterprise identifier or within the original part, lot or batch number. Although not used to determine the UII, 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.

Concatenated Unique Item Identifier Derivation Process

Figure 4 depicts how the UII for an item is derived and the business rule for generating the UII from the data elements placed on the item[32]. The AIT reader device will machine-read the data elements and output the concatenated UII 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 data qualifiers and associated business rules, are made by the enterprise assigning serialization to the item.

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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.
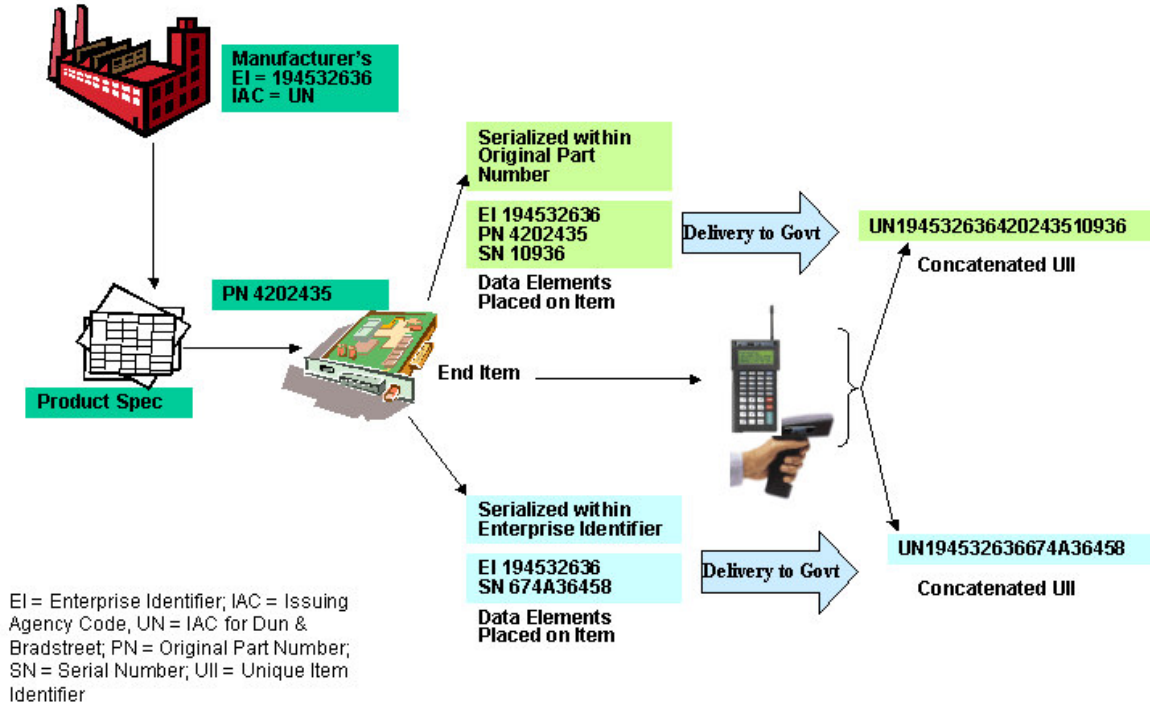
Figure 4. Unique Item Identifier (UII) Determination Process

Deciding Where to Place Data Elements for Item Unique Identification on Items

The UII data elements (enterprise identifier, serial number and, for Construct #2 only, original part, lot or batch 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 IUID marking, which are incorporated into end items, will be marked so that a UII can be derived.

Compliant Unique Item Identifier

For DoD purposes, a compliant UII is either a Construct #1, Construct #2, Global Individual Asset Identifier (GIAI), Global Returnable Asset Identifier (GRAI), Vehicle Identification Number (VIN), or Electronic Serial Number ((ESN), for cell phones only), whose data elements are encoded in a data matrix in the ISO/IEC 15434 syntax with ISO/IEC 15418 or ATA CSDD semantics.

Considerations for Suppliers

The implementation of IUID requirements means that qualifying items must be marked with machine-readable information (MRI). The Government requiring activity determines an item qualifies for unique identification if it meets the requirements of DFARS 211.274, Item

Identification and Valuation. The Government requiring activity identifies these qualifying items in paragraph (c)(1) of DFARS Clause 252.211-7003. The supplier shall place UII data elements (enterprise identifier, serial number and, for serialization within the part, lot or batch number only, original part, lot or batch number) in MRI media on items requiring marking, based on the criteria provided in MIL-STD-130L, Identification Marking of U.S. Military Property. The DoD minimum MRI requirement is the Data Matrix ECC200 symbol. It is to be applied either through labeling or direct part marking.

The implementation of part marking to uniquely identify items with MRI may require changes in the supplier's manufacturing and maintenance processes if these processes have not already been enabled to mark items with MRI. If item designs are final and do not enable MRI marking, changes to enable MRI marking must be incorporated in the engineering drawings and technical data that define the item[33]. Figure 5 illustrates some considerations faced by suppliers in developing a compliant approach to DoD IUID requirements using MRI part marking.
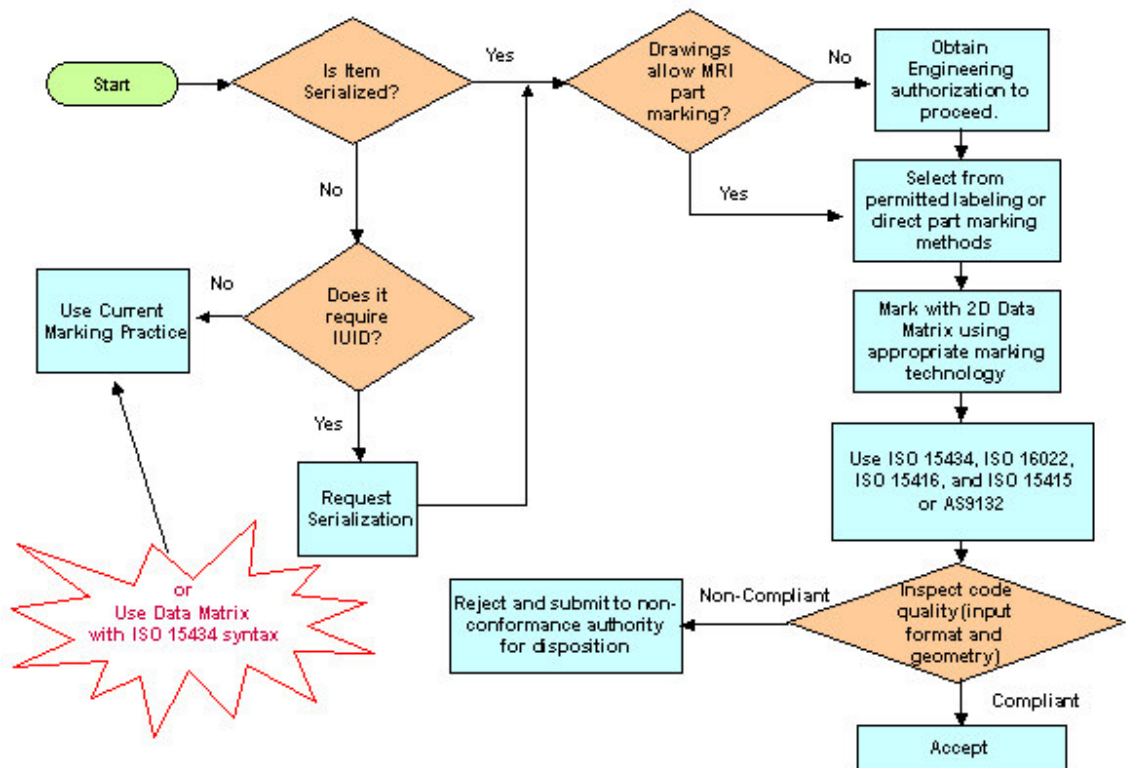
Figure 5. Supplier Considerations in Machine-Readable Information Part Marking

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[33] For guidelines on engineering and technical documentation changes to support UID, see "Guidelines for Engineering, Manufacturing and Maintenance Documentation Requirements for Unique Identification (UID) Implementation," Version 1.0, December 6, 2004, at http://www.acq.osd.mil/dpap/UID/guides.htm.

Deciding When to Place Data Elements on the Item to Derive the Unique Item Identifier

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[34]. 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, or trigger event, 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 a trigger event occurs include, but not limited to:

(a) Change in location where the item is taken out of service at one accountable entity and moved to another accountable entity to begin service. The item may be marked during this movement process either at the origin or destination, depending on the availability of marking equipment.

(b) Change in status where the item is taken out of service and placed in maintenance or returned to inventory. Maintenance status may include phase maintenance, scheduled servicing, depot rebuild or overhaul processes, and work-order processes during modification. The item should be marked while in maintenance or upon receipt at the inventory point.[35]

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[34] 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.

[35] This also applies to contractual maintenance arrangements; but it does not apply to normal contractor maintenance and calibration efforts.

(c) Change in program where the item is shifted from control of one program to another program. The item may be marked by either the losing or gaining program upon the transfer of accountability.[36]

(d) Change in organizational alignment where the item is moved from the custody of one organization to the custody of another organization, such as transfer of Government property from the custodian back to the DoD. The item should be marked by the organization that is losing custody, unless there is a previous agreement with the receiving organization.

Seek-and-Apply

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

Gated

The interception of items as they transit specific gates within the supply chain can ensure no item enters service without the data elements needed to construct a unique 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 sender 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 ITEM IDENTIFIERS 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 concatenated unique item identifier (UII) is created from the separate data elements placed on the item, the concatenated UII 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 concatenated UII; however the concatenated UII, the enterprise identifier, the serial number and, in the

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[36] This does not apply if the item is under control and accountability of the same entity.

case of Construct #2, the original part, lot or batch number will be captured separately at the time of initial Government receipt and acceptance. The concatenated UII shall be a common data element for item 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[37] 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 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.[38]

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[37]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.

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

Appendix A - Definitions

Key Definitions

Word or Phrase	Definition	Source
Automatic identification device	A device, such as a reader or interrogator, used to retrieve data encoded on machine-readable media.	252.211-7003
Compliant unique item identifier	For DoD purposes, a compliant UII is either a Construct #1, Construct #2, Global Individual Asset Identifier (GIAI), Global Returnable Asset Identifier (GRAI), Vehicle Identification Number (VIN), or Electronic Serial Number ((ESN), for cell phones only), all of which have their data elements encoded in a data matrix in the ISO/IEC 15434 syntax with ISO/IEC 15418 or ATA CSDD semantics.	DoD Guide to Uniquely Identifying Items
Concatenate	To link together in a series or chain.	Merriam-Webster Online Dictionary
Concatenated unique item identifier	1. For items that are serialized within the enterprise identifier, the linking together of the unique item identifier data elements in order of the issuing agency code, enterprise identifier, and unique serial number within the enterprise identifier; or 2. For items that are serialized within the original part, lot or batch number, the linking together of the unique item identifier data elements in order of the issuing agency code, enterprise identifier, original part, lot or batch number, and serial number within the part, lot or batch number.	252.211-7003

Word or Phrase	Definition	Source
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.	
Custodian	The enterprise that has stewardship accountability of an item, i.e., responsibility for the control of, transfer and movement of, and access to, equipment and material. Custody also includes the maintenance of accountability for equipment and material.	Based on the definition of "custody" from the JCS DoD Dictionary
Data carrier	The medium selected to record, transport or communicate data. For unique identification purposes, the data carrier is the Data Matrix symbol.	The American Heritage Dictionary

Word or Phrase	Definition	Source
Data Matrix	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 encodation schemes. Data Matrix is used for small item marking applications using a wide variety of printing and marking technologies. The data matrix symbol looks like this:	See ANSI/AIM BC11 International Symbology Specification - Data Matrix
Data qualifier	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
DoD item unique identification[39]	A system of marking items delivered to the Department of Defense with unique item identifiers that have machine-readable data elements to distinguish an item from all other like and unlike items. Items are marked with a Data Matrix, the contents of which are encoded in the syntax of ISO/IEC 15434 and the semantics of ISO/IEC 15418 or the ATA CSDD[40]. The Data Matrix contents may be either a Unique Item Identifier (Construct #1 or Construct #2) or a DOD recognized IUID equivalent.	211.274

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[39] Formerly known as DoD unique item identification.
[40] Text Element Identifiers are taken from the Air Transport Association Common Support Data Dictionary.

Word or Phrase	Definition	Source
DoD serially managed items	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. A distinction must be made between "serialized items" and "DoD serially managed" items. While DoD may use an item that has been serialized by the manufacturer, DoD may not manage the item by means of its serial number. When DoD elects to serially manage an item it becomes "DoD serially managed". This means it is a tangible item used by DoD*, which is designated by a DoD, or Service Item Manager* to be uniquely tracked, controlled or managed in maintenance, repair and/or supply by means of its serial number[41]	DUSD(Logistics & Material Readiness) Memorandum, September 4, 2002, Serialized Item Management
DoD recognized unique identification equivalent	A unique identification method that is in commercial use and has been recognized by DoD. The IUID equivalents are the Global Individual Asset Identifier (GIAI), Global Returnable Asset Identifier (GRAI), Vehicle Identification Number (VIN), and Electronic Serial Number ((ESN), for cell phones only). While the constructs are equivalent, they must be placed on the items in a Data Matrix symbol encoded with ISO 15434 syntax and semantics of ISO 15418 in order to be compliant with DoD IUID policy.	252.211-7003
Enterprise	The entity (e.g., a manufacturer or vendor) responsible for assigning unique item identifiers to items.	252.211-7003
Enterprise identifier	A code that is uniquely assigned to an enterprise by a registered issuing agency.	252.211-7003

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[41] A serial number is an assigned combination of numbers and/or letters to an item instance that separately identifies that item instance from all others.

Word or Phrase	Definition	Source
Equipment	A tangible article of personal property that is complete in-and-of itself, durable, nonexpendable, and needed for the performance of a contract. Equipment generally has an expected service life of one year or more, and does not ordinarily lose its identity or become a component part of another article when put into use. 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. It does not include real property, reparables, consumables or materials.	4140.1-R
Innate serialized identity	The essential inherent data elements that are physically and permanently placed on an item at original manufacture, subsequent overhaul, or during operations to distinguish it from all other like items, which can be read from either a human or machine-readable format. For contractors with possession of Government property, this may be the asset identification number they use to track the item.	Adapted from the definition of "innate" and "serial" in the American Heritage Dictionary and the definition of "unique item identifier" listed below.
Issuing agency	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
Issuing agency code	A code that designates an agency with authority to issue unique enterprise identifiers.	252.211-7003
Item	A single hardware article or unit formed by a grouping of subassemblies, components, or constituent parts.	252.211-7003(a)

Word or Phrase	Definition	Source
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.	AP16.61 4140.1-R
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.	4140.1-R
Legacy items	DoD-owned items and end items that have already been produced and deployed for use, or that have been produced and placed in inventory or storage pending issue for use.	USD(AT&L) Memorandum, dated 23 Dec 04, Policy for Unique Identification (UID) of Tangible Personal Property Legacy Items in Inventory and Operational Use, Including Government Furnished Property (GFP)
Lot/Batch number	An identifying number assigned by the enterprise to a designated group of items, usually referred to as either a lot or a batch, all of which were manufactured under identical conditions.	252.211-7003
Machine-readable media	An automatic information technology media, such as bar codes, contact memory buttons, radio frequency identification, or optical memory cards.	252.211-7003
Marking	The application of legible numbers, letters, labels, tags, symbols, or colors to ensure proper handling and identification during shipment and storage.	4140.1-R
Mission essential	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.	4140.1-R

Word or Phrase	Definition	Source
Operating materials and supplies	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	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
Parent item	The item assembly, intermediate component or subassembly that has an embedded item with a unique item identifier or DoD recognized unique identification equivalent.	252.211-7003
Personal property	Property of any kind or any interest therein, except real property.	JCS DoD Dictionary
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)	E2.1.12.3 5000.64
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.	AP16.104 4140.1R
Registration authority	Refers to the Nederlands Normalisatie-instituut (NEN), Registration Authority for ISO/IEC 15459, which is responsible for assigning codes to issuing agencies with conforming systems for issuance of unique enterprise identifiers.	252.211-7003

Word or Phrase	Definition	Source
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)	E2.1.12.2 5000.64
Serialization within the enterprise identifier	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, lot or batch number	Each item of a particular part, lot or batch number is assigned a unique serial number within that part, lot or batch number assignment. The enterprise is responsible for ensuring unique serialization within the part, lot or batch number within the enterprise identifier.	252.211-7003

Word or Phrase	Definition	Source
Unique item identifier	The unique item identifier (UII) is defined in two separate contexts: 1. <u>DoD UII Data Set</u>. A UII is a set of data elements marked on an item that is globally unique and unambiguous. For items that are serialized within the enterprise identifier, the UII data set includes the data elements of enterprise identifier and a unique serial number (Construct #1). For items that are serialized within the part, lot or batch number within the enterprise identifier, the UII data set includes the data elements of enterprise identifier, the original part, lot or batch number, and the serial number (Construct #2). 2. <u>Use</u>. The generic term, UII, has evolved through usage to mean the concatenated UII as a common data base key without regard to the data set construct being used. In this context, the term "UII" may be used to designate UII Constructs #1 and #2, or the DoD recognized IUID equivalents of Global Individual Asset Identifier (GIAI), Global Returnable Asset Identifier (GRAI), Vehicle Identification Number (VIN), or Electronic Serial Number ((ESN), for cell phones only).	252.211-7003
Unique item identifier type	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/dpap/UID.	252.211-7003
Unit acquisition cost	1. For fixed-price type line, subline, or exhibit line items, the unit price identified in the contract at the time of delivery; and **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
Virtual unique item identifier	The UII data elements for an item that have been captured in a database, but not yet physically marked on the item.	DoD Guide to Virtual Unique Item Identifiers, 29 Dec 04

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, Change 1	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
ISO/IEC Standard 16022	International symbology specification — Data Matrix
ISO/IEC Standard 15415	Bar code print quality test specification — Two-dimensional symbols
SAE AS9132	Data Matrix (2D) Coding Quality Requirements for Parts Marking
ATA	Common Support Data Dictionary

Appendix C - Business Rules (Version 3.5b)

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.

IUID BUSINESS RULES

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

- Contracts and Administration

- Accounting and Finance

- Unique Item Identifier (UII) 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, in operational use, 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 IUID 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 IUID Business Rules should be considered a work in progress that may not be finalized until the IUID 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 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 IUID.

Additional items are still in progress.

ACCOUNTING AND FINANCE (DRAFT)

These items are still in progress.

UII CONSTRUCTION AND PHYSICAL MARKING

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

Creating and Generating the Concatenated Unique Item Identifier

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

2. If the enterprise chooses to mark the concatenated UII 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 concatenated UII.

3. Data qualifiers (semantics) will define each machine-readable data element marked on the item.[42]

4. If an enterprise serializes items within the enterprise identifier, the concatenated UII 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[43]

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[42] See the *DoD Guide to Uniquely Identifying Items (Appendix D)* for a list of IUID 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 UII Construct #1.)

5. If an enterprise serializes items within part, lot or batch numbers, the concatenated UII 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[44]

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

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

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

6. The IAC shall be derived from the data qualifier for the enterprise identifier if it is not already provided[45]. The IAC is not required to be marked on the item.[46]

7. A specific set of data qualifiers will identify which UII Construct should be used to build the concatenated UII or if the concatenated UII is already marked on the item.[47]

8. If UII 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 UII Construct #1) or unique within the original part, lot or batch number (for UII Construct #2).

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

11. The concatenated UII will not change over the life of the item. Therefore, the component data elements of the concatenated UII 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 UII machine-readable code that can use a UII data qualifier for enterprise identifier. Other enterprise identifiers may be contained within the machine-readable code as long as they do not use a UII data qualifier.

13. Data elements not required to construct the concatenated UII shall remain discrete but may be contained within the same mark or media as the UII-required elements, as long as all the data elements contained in the mark or media are

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[43] Enterprise identifiers that are assigned by EAN.UCC contain the IAC prefix. The IAC should not be repeated when forming the concatenated UII.
[44] See footnote 43.
[45] See footnote 43.
[46] See the *DoD Guide to Uniquely Identifying Items (Table 3)* for a list of IACs.
[47] See the *DoD Guide to Uniquely Identifying Items (Appendix D)* for more details on these data qualifiers.

properly identified with a data qualifier. The UII data elements should appear first in the sequence.

14. The UII 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).[48] 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. The physical marks that contain the UII-required elements shall remain legible until the item is destroyed.

15. Where space is available, human readable information for UII 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 IUID equivalents. IUID equivalents shall comply with the IUID Business Rule for minimum data carrier requirements.[49]

Parent-Child Relationships

18. DFARS 211.274-2(a)(4) requires the unique identification, regardless of value, of (i) any DoD serially managed subassembly, component, or part embedded within a delivered item and, (ii) the parent item that contains the embedded subassembly, component or part. For purposes of complying with this requirement, the parent item for the embedded item UII or DoD recognized IUID equivalent will be the higher assembly, intermediate component or subassembly that is itself serially managed.

Metadata Requirements

19. The concatenated UII 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 concatenated UII is constructed.[50]

   - 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, lot or batch number string of characters (including special characters) will not exceed 32 characters, excluding the data qualifier.

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[48] See *MIL STD 130 L* (or a later version) for additional information on DoD-approved data carriers.

[49] See the *DoD Guide to Uniquely Identifying Items* for a list of approved IUID equivalents.

[50] This item is still under discussion, pending review by the IUID AIS Technical Interface Working Group (TIWG) and the UID Joint Requirements Implementation Board (JRIB), which will coordinate with the Business Enterprise Architecture (BEA).

- 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 concatenated UII data elements is 78. The use of shorter field lengths is encouraged for original part and/or serial numbers where feasible.

20. The concatenated UII string of data must have worldwide uniqueness (non-repeatable).

21. When constructing the concatenated UII:

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

Capturing the Unique Item Identifier

22. For activities after initial delivery, in support of the product life cycle, any entity that collects data about the item must be capable of associating the data with the concatenated UII in accordance with program requirements.

23. If the UII data matrix 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 concatenated UII using existing Business Rules.

24. Discovery of a duplicate concatenated UII will occur when the Government attempts to register the concatenated UII in the IUID Registry. If a true duplicate exists, the Government will work with the appropriate enterprise(s) to resolve the duplication.

25. In a database, once the concatenated UII is derived, it shall not be parsed to determine the original elements.

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

Using the Unique Item Identifier

27. The concatenated UII shall not be transferred from one item to another item once assigned and shall not be reused.

Items in operational use or in inventory

28. If an item is missing data elements required to construct the concatenated UII, 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, lot or batch number is missing or cannot be determined, obtain a part, lot or batch 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.

29. For legacy items that cannot be uniquely identified using UII Construct #1 or #2 or a DoD recognized IUID equivalent (serialization was not unique within enterprise identifier or part, lot or batch number), re-serialization to conform to Construct #1 or #2 is preferred.

30. If the original part, lot or batch number cannot be precisely determined, use the following method for establishing an original part, lot or batch number for the purposes of building the concatenated UII:

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

    - Second, use the current part, lot or batch number marked on the part at the time the UII is created.

31. If the item is unidentifiable, a concatenated UII should not be assigned.

32. Once the contract is modified to include the IUID requirements:

    - If the contract is for delivery of new items to the Government, follow IUID 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, 2006

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

34. 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.

35. A concatenated UII should be created for tangible personal property items owned by the Government in the possession of a contractor by using UII Construct #1, Construct #2, or a DoD recognized IUID equivalent.

36. A UII 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.[51]

37. Tangible personal property initially furnished to the contractor by the Government will use the UII provided by the Government. If none is provided, establish a UII using the criteria in Rules 33-35.

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.

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[51] For instructions on assignment of virtual UIIs, see the DoD Guideline for the Virtual Unique Item Identifier, Version 1.0, December 29, 2004, available at http://www.acq.osd.mil/dpap/UID/guides.htm.

Appendix D -The Mechanics of Item Unique Identification

STRUCTURING THE DATA ELEMENTS FOR ITEM 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 10, 11 and 12 represent how TEIs would be used in the collaborative solution.

Semantics

For the unique item identifier (UII) 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[52] 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 UII format, or a IUID equivalent. Table 5 shows the different data qualifiers for each of the data elements that are used for determining uniqueness.

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[52] 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 has submitted a request to add TEIs to ISO/IEC 15434.

Data Element	DI (Format 06)	AI (Format 05)	TEI (Format DD)
Enterprise Identifier • **CAGE/NCAGE** • **DUNS** • **EAN.UCC** • **Other Agencies**	**17V** **12V** **3V** **18V**[53]	 **95**	**CAG, MFR or SPL**[54] **DUN** **EUC**
Serial Number within Enterprise Identifier			**SER or UCN**[55]
Serial Number within Original Part Number	**S**	**21**	**SEQ**
Original Part Number	**1P**	**01**	**PNO**
Lot/Batch Number	**1T**	**10**	**LOT or BII**
Concatenated UIIs	**25S**[56] **I**[57] **22S**[58]	**8002**[59] **8003**[60] **8004**[61]	**UID**
Unique item identifier (not including the IAC)	**18S**[62]		**USN or UST**[63]
Current Part Number[64]	**30P**	**240**	**PNR**

Table 5. Data Qualifiers

[53] 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.

[54] 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. Identifies 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.

[55] SER **–** Part Serial Number (Serial Number within Enterprise) 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.

[56] 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 (For UII purposes, this has to be unique serialization within the EID that assigns the UII data elements). Thus, for UII purposes, 25S must represent the following string of concatenated elements – IAC + EID + Unique serial number within the EID, which directly corresponds to a concatenated UII using Construct #1.

[57] DI I identifies a U. S. Vehicle Identification Number – VIN.

[58] DI 22S identifies a cellular mobile telephone electronic serial number.

[59] AI 8002 identifies a cellular mobile telephone electronic serial number.

[60] AI 8003 identifies an EAN.UCC GRAI.

[61] 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.

[62] 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 UII Construct 1. This data element does not contain the IAC, which must be added.

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

[64] The current part number is not part of the UII. It is an additional data element that may be encoded in the ISO 15434 syntax and placed on the item in a separate data matrix symbol, or, in the case of severe space limitations, it may be encoded in the same data matrix along with the UII data elements (see MIL-STD-130L).

Syntax

The machine-readable symbology for UII is the Data Matrix ECC 200 (ISO/IEC 16022), which is a two-dimensional representation of ASCII characters. To permit translation of the encoded string of ASCII characters, the characters are ordered according to the precise rules of ISO/IEC International Standard 15434, Information Technology–Syntax for High Capacity ADC[65] Media—the "syntax."[66] Each data string is assembled beginning with a message header consisting of the compliance indicator and a record separator. The compliance indicator is the ASCII code for the three characters [,), and > which are assembled in that order—[)>. The record separator that follows the compliance indicator is also an ASCII-coded character but it does not have a printable representation. The convention for depicting the record separator uses $^R{}_S$ to represent the single ASCII-coded character. Because the record separator also appears at the end of the formatted data in the data string, it is known as the format trailer character. There are two other ASCII-coded characters that are used in UII encoding that do not have printable representations. They are the data element separator—$^G{}_S$—and the message trailer character—$^E{}_{OT}$. The hexadecimal and decimal codes for ASCII encoding for $^R{}_S$, $^G{}_S$ and $^E{}_{OT}$ can be obtained from ISO/IEC 15434.

The message header is followed by a two-character format code to identify the semantics of the formatted data elements. The format code, the data qualifiers and the data values in the remainder of the data string are separated using the data element separator— $^G{}_S$ —between each element of the formatted data. The formatted data is terminated using the format trailer character— $^R{}_S$ —after the last data element, and the data string is terminated using the message trailer character— $^E{}_{OT}$—to indicate the end.

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.

Figure 6 shows how the concatenated UII is constructed within Format Codes 05, 06 and DD with the various data qualifiers. High capacity AIT devices shall conform to ISO/IEC 15434. This is crucial to unique item identification, since the process of identifying and concatenating the data elements must be unambiguous[67].

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[65] ADC – Automatic Data Capture.

[66] Syntax—the way words are put together to form constructions, such as phrases and sentences. 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.

[67] 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 UII. See business rule number 12 in Appendix C.
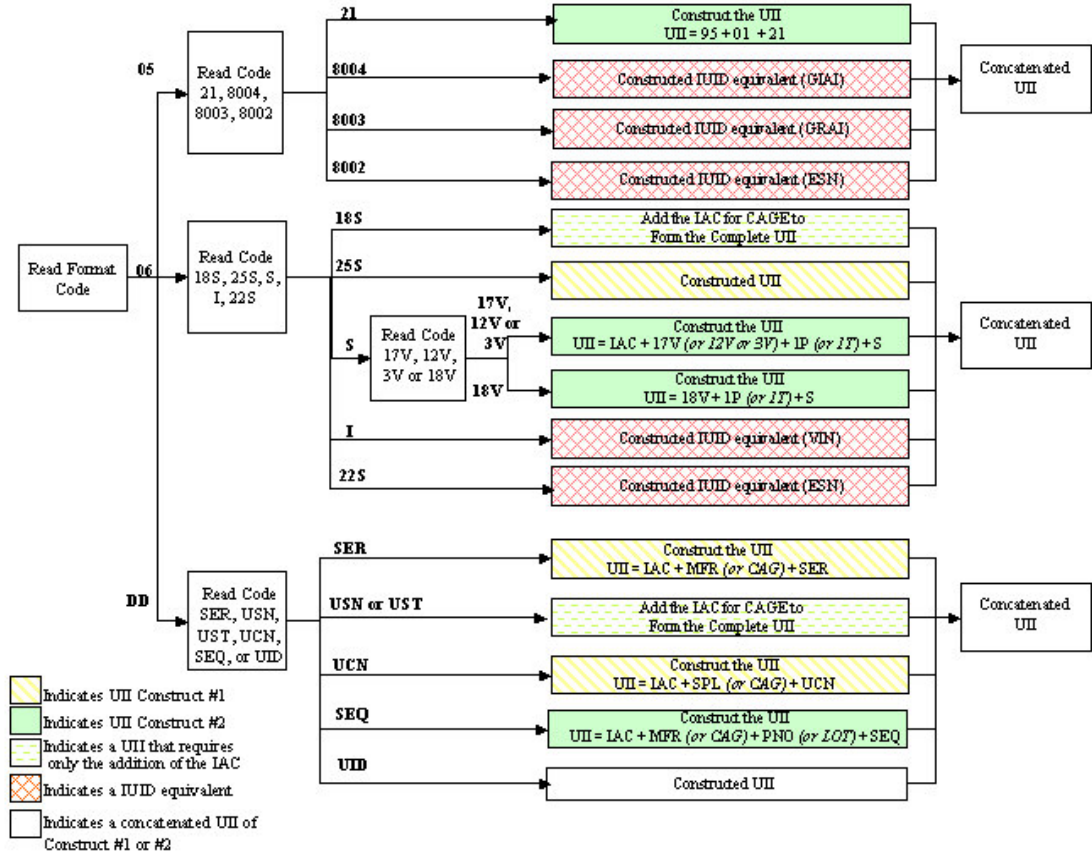
Figure 6. Concatenated Unique Item Identifier (UII) Construction

EXAMPLES OF SEMANTICS AND SYNTAX CONSTRUCTIONS FOR ITEM 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 4, of how the data elements would have to be encoded with data identifiers on the AIT media placed on or with the item for UII Construct #1.

Data Element	Data Identifier Format 06	Data Element Value	Encoded Data Element on AIT Media
Concatenated unique item identifier (including the IAC)	**25S**	**UN077991289 674A36458**	**25SUN077991289 674A36458**

46

Concatenated unique item identifier (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 UII 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:

$[)>^R{}_S$ = The Message Header consisting of a three-character compliance indicator and the Format Trailer Character $^R{}_S$ 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 = Concatenated UII including the IAC—As defined by the data identifier 25S (the IAC (UN) and DUNS Enterprise Identifier (077991289) and the Serial Number (674A36458))

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

$^E{}_{0T}$ = 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 UII concatenation.

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

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

Construct #2 – Serialization within the Original Part, Lot or Batch Number. Table 7 shows an example, using the data from Figure 4, of how the data elements would have to be encoded with data identifiers on the AIT media placed on or with the item for UII Construct #2.

Data Element	Data Identifier Format 06	Data Element Value	Encoded Data Element on AIT Media
Enterprise Identifier • **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 UII is to be concatenated in the order Issuing Agency Code/Enterprise Identifier/Original Part, Lot or Batch Number/Serial Number for an enterprise that serializes within the part, lot or batch number, the UII data elements would be encoded as follows using Format 06 for Data Identifiers of the ISO/IEC 15434 syntax:

$$[)>^R{}_S06^G{}_S12V077991289^G{}_S1P4202435^G{}_SS10936\ ^R{}_S\ ^E{}_{0T}$$

Where:

$[)>^R{}_S$ = The Message Header consisting of a three-character compliance indicator and the Format Trailer Character $^R{}_S$ 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

$^E{}_{0T}$ = 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 UII 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 concatenated UII output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be **UN07799128942024351O936**.

Using EAN.UCC Application Identifiers

<u>Construct #1 – Serialization within the Enterprise Identifier.</u> When using EAN.UCC Application Identifiers for purposes of unique identification, enterprises must use the General EAN.UCC Specifications[68] to construct the DoD IUID equivalent or the UII. Table 8 shows an example of the use of application identifiers in the context of the General EAN.UCC Specifications for UII Construct #1.

Data Element	Application Identifier Format 05	Data Element Value	Encoded Data Element on AIT Media
Concatenated unique item identifier, including the IAC[69]	**8004**	**06141411A0B9C3D6**	**800406141411A0B9C3D6**

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

For unique item identification, the Global Individual Asset Identifier (GIAI) is considered by the Department to be a IUID equivalent[70]. The data elements considered components of the IUID equivalent (i.e., EAN.UCC Company Prefix, Individual Asset Reference Number) are not required to be marked on the item, unless specifically required by the contract.[71]

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

$$[)>^R_S05^G_S\ 800406141411A0B9C3D6\ ^R_S\ ^E_{OT}$$

Where:

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

[69] 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 number. The holder of the EAN.UCC Company Prefix determines the structure and numbering of the individual asset reference number.

[70] A DoD recognized IUID equivalent means a unique item 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.

[71] This is an exception to IUID Business Rule #2. See Appendix C.

[)>^{R}$_S$ = The Message Header consisting of a three-character compliance indicator and the Format Trailer Character ^{R}$_S$ 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 Individual Asset Reference Number **(1A0B9C3D6)**

^{E}$_{0T}$ = 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 DoD IUID equivalent output from the AIT device, using the GIAI as the IUID equivalent, stripping away the overhead and syntax, would be **06141411A0B9C3D6**[72].

<u>Construct #2 – Serialization within the Part, Lot or Batch Number.</u>
Table 9 shows an example of the use of application identifiers in the context of the General EAN.UCC Specifications for UII 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**	**00614141999996**	**0100614141999996**
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 UII data elements would be encoded as follows under Format 05 for Application Identifiers of the ISO/IEC 15434 syntax:

[)>^{R}$_S$05^G$_S$ 0100614141999996 ^{G}$_S$ 211A0B9C3D6 ^{R}$_S$ ^{E}$_{0T}$

Where:

[)>^{R}$_S$ = The Message Header consisting of a three-character compliance indicator and the Format Trailer Character ^{R}$_S$ to indicate the end of a data format envelope

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

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™

00614141999996 = the GTIN™, which is composed of the EAN.UCC Company Prefix including the IAC as the leading character (**0614141)** and the Product Number **(99999), a check digit (6)** and leading zeros to a fixed length of 14 digits

21 = Application Identifier for serial number

1A0B9C3D6 = The serial number

$^E_{OT}$ = 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 concatenated UII output from the AIT device, stripping away the overhead and syntax would be **006141419999961A0B9C3D6[73]**.

Historic Use of Text Element Identifiers

Text Element Identifiers (TEIs)[74] are the preferred approach of the aerospace industry. The aerospace industry uses CAGE Code (TEI = MFR)[75] 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 identifier 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 moves TEIs into broader multi-industry use, they are in the process of establishing additional TEIs for DUNS Number (TEI = DUN), UCC Company Prefix (TEI = EUC), Serial Number within Part Number (TEI = SEQ), Original Part Number (TEI = PNO), and concatenated UII (TEI = UID) to encode text element identifiers other than Manufacturer (TEI = MFR), Serial Number (TEI = SER) and Current Part Number

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

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

[75] CAGE Code is also indicated by TEI = CAG . An enterprise identified by CAG need not be the manufacturer.

(TEI = PNR)[76]. 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.

The Collaborative AIT Solution

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 can be used to accommodate the use of only those TEIs needed for unique identification in the ISO/IEC 15434 syntax.[77]

DoD is seeking approval of the International Organization for Standardization to add a new format to ISO/IEC 15434 to support 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 IUID enhancements to business intelligence to support coalition operations. This solution uses the structure of ISO/IEC 15434 as the IUID 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. Items that are marked with the "DD' format code will not have to be remarked once a permanent ISO/IEC 15434 format code is assigned to TEIs. In addition, in support of the IUID collaborative solution, the Air Transport Association (ATA) Spec 2000 International Coordinating Group has approved the use of ISO/IEC 15434 syntax with TEIs as an alternative item marking

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[76] On October 26, 2004, the Air Transport Association (ATA) Spec2000 Coordinating Group approved the following Text Element Identifiers (TEIs) for usage: PNO (Original Part Number), SEQ (Serial Number) within Original Part Number) and UID (Unique Item Identifier). The PNO and SEQ TEIs will allow for the use of UII Construct 2 (i.e., serialization within part number).

[77] 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. To enable the collaborative solution utilizing the ISO/IEC 15434 syntax, the Department will use a special DoD-specific format header, designated as "DD", to indicate TEIs are being used in the collaborative solution.

method. Valid TEIs include only those approved by ATA for incorporation in the ATA Common Support Data Dictionary (CSDD) including those not yet published.

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 UII Construct #1 when the manufacturer serializes the item.

Data Element	TEIs[78]	Data Element Value	Encoded Data Element on AIT Media
Enterprise Identifier • **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 UII Construct #1, Manufacturer Serialization (DoD Format "DD")

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

$$[)>^R{}_SDD^G{}_SMFR\ 0CVA5^G{}_SSER\ 674A36458^R{}_S{}^E{}_0{}_T$$

Where:

$[)>^R{}_S$ = The Message Header consisting of a three-character compliance indicator and the Format Trailer Character $^R{}_S$ to indicate the end of a data format envelope

DD = A special 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

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

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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 UII 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 concatenated UII output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be **D0CVA5674A36458**.

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

Data Element	TEIs[79]	Data Element Value	Encoded Data Element on AIT Media
Enterprise Identifier • **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 UII Construct #1, Enterprise other than Manufacturer (DoD Format "DD")

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

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

[)>^{R}s = The Message Header consisting of a three-character compliance indicator and the Format Trailer Character ^{R}s to indicate the end of a data format envelope

DD = A special 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

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 UII 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 concatenated UII output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be **D0F3N510936**.

<u>Construct #2 – Serialization within the Original Part, Lot or Batch Number.</u> Table 12 shows an example of the use of TEIs in the collaborative solution for UII Construct #2 when the manufacturer serializes the item within the original part number.

Data Element	TEIs[80]	Data Element Value	Encoded Data Element on AIT Media
Enterprise Identifier • **CAGE**	**CAG**[81]	**0CVA5**	**CAG 0CVA5**
Original Part Number	**PNO**	**4202435**	**PNO 4202435**
Serial Number within Original Part Number	**SEQ**	**674A36458**	**SEQ 674A36458**

Table 12. Example of the Use of TEIs in the Collaborative Solution for UII Construct #2, Original Part Number Serialization (DoD Format "DD")

Recalling that the UII is to be concatenated in the order Issuing Agency Code/Enterprise Identifier/Original Part Number/Serial Number for an enterprise that serializes within the original part number, the UII 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:

$$[)>^R_S DD^G_S CAG\ 0CVA5^G_S PNO\ 4202435^G_S SEQ\ 674A36458^R_S{}^E o_T$$

Where:

$[)>^R_S$ = The Message Header consisting of a three-character compliance indicator and the Format Trailer Character ^R_S to indicate the end of a data format envelope

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

^G_S = A Data Element Separator used between data fields

CAG = TEI for Manufacturer CAGE code

0CVA5 = CAGE Code

PNO = TEI for Original Part Number

4202435 = Original Part Number

SEQ = TEI for Serial Number within the Original Part Number

674A36458 = Serial Number within the Original Part Number

$^E o_T$ = A Message Trailer which identifies the end of the message within the data stream

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[80] All TEIs are four characters in length, consisting of three letters followed by a space.
[81] The TEI of MFR may also be used to designate the manufacturer

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 UII 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 concatenated UII output from the AIT device, once the overhead and syntax are stripped away and the IAC has been added, would be **D0CVA54202435674A36458**

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
CAG	Text Element Identifier for CAGE
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
DoDAAC	Department of Defense Activity Address Code
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DUN	Text Element Identifier for DUNS Number
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
EUC	Text Element Identifier for EAN.UCC
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
IUID	Item Unique Identification
JCS	Joint Chiefs of Staff
JRIB	Joint Requirements Implementation Board
JTC 1	ISO/IEC Joint Technical Committee One
LB	Issuing Agency Code for ANSI T1.220 Numbers
LD	Issuing Agency Code for DoDAAC 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
PNO	Text Element Identifier for Original Part Number
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
SEQ	Text Element Identifier for Serial Number assigned within the Original Part Number
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; Text Element Identifier for Concatenated Unique Item Identifier
UII	Unique Item Identifier
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