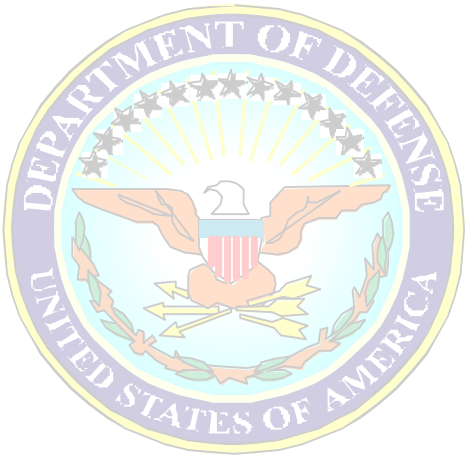
Department of Defense Guide to Uniquely Identifying Items



Assuring Valuation, Accountability and Control of Government Property

Version 2.0
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Office of the Deputy Under Secretary of Defense
(Acquisition, Technology & Logistics)

Preface

This Version 2.0 of the Department of Defense Guide to Uniquely Identifying Items replaces all previous versions.

Summary of Changes from Version 1.6 (Dated June 1, 2006) to Version 2.0:

a. Content changes were incorporated in the basic document:

- To include Department of Defense (DoD) Directive 8320.03, Unique Identification (UID) Standards for a Net-Centric Department of Defense, March 23, 2007, which provides for UID data standards development and implementation of the Department's UID strategy.
- To include DoD Instruction 8320.04, Item Unique Identification (IUID) Standards for Tangible Personal Property, June 16, 2008, which provides for IUID policy implementation.
- To update terminology and references associated with the DoD Business Enterprise Architecture.
- To include program manager and item manager roles in the item management discussion.
- To incorporate changes in DoDI 5000.64, Defense Property Accountability, November 2, 2006.
- To clarify applicability of DFARS 252.211-7003 to new equipment, major modifications, and reprocurements of equipment and spares.
- To clarify that alternative implementation is permitted provided that the acquired items are marked and registered no later than 30 days after receipt.
- To emphasize that embedded items that require IUID must be listed in the contract.
- To clarify the distinction among the concatenated UII, the UII data set, and the mark or data string containing the UII data set.
- To emphasize that Construct 2 contains an original part number or, when serialization is within a lot or batch,

contains a lot or batch number in lieu of the original part number.

- To provide additional guidance on the use of data qualifiers for single data elements that are sufficient to derive UIIs.
- To further clarify that the Global Returnable Asset Identifier (GRAI) must contain a unique serial number for DoD recognized IUID equivalent application.
- To emphasize the responsibility of the entity in the enterprise identifier to ensure the uniqueness of the UII at the time of its assignment and to emphasize the continuing nature of the responsibility.
- To further emphasize that the enterprise identifier in the UII is the entity that is responsible for compliance with the UII rules. An entity cannot commit another entity to that responsibility without authority. The fundamental principle is: Never use another entity's enterprise identifier in the UII without permission or direction from the competent authority for that enterprise identifier.
- To clarify and expand references to the enterprise identifier NCAGE.
- To remove redundant descriptions of UII Constructs #1 and #2.
- To remove guidance language related to evaluating items meeting the mission essential and controlled inventory criteria for possible exclusion. This guidance was inconsistent with IUID policy language associated specifically with mission essential and controlled inventory. Related annotations in Figure 2 and Figure 3 were removed.
- To clarify that the parent item of an embedded item may be chosen at any appropriate level of configuration above the level of the embedded item.
- To clarify that Sets, Kits and Outfits (SKO) may qualify for IUID based on the criteria applied to delivered items and that individual items in the SKO may qualify for IUID as embedded items in the parent SKO.
- To update the reference for the Coded Representation of the North American Telecommunications Industry Manufacturers, Suppliers, and Related Service Companies Number from ANSI T1.220 to ATIS-0322000. Table 3 was revised accordingly.

- To clarify that the issuing agency code (IAC) for the GS1 Company Prefix need not be derived because it is contained in each GS1 Company Prefix. The IAC should not be repeated when forming the concatenated UII.
- To clarify that the IAC for the data qualifiers 3V, 18V, 25S, EUC and UID need not be derived because it is contained in each data element. The IAC should not be repeated when forming the concatenated UII.
- To provide a method for identifying a traceability number that is not part of the UII. Table 4 was revised accordingly.
- To incorporate marking quality provisions of MIL-STD-130N in Figure 5.
- To clarify discussion of when to mark items.

b. Appendix A definitions were updated and edited for compatibility with original part number and lot or batch number usage, and other UII clarifications and distinctions as emphasized in the basic document.

c. Appendix B references were updated.

d. Appendix C was updated to version 4.0 of the Business Rules with content changes incorporated:

- To emphasize that both classified and unclassified contracts require IUID.
- To clarify that the concatenated UII may be derived from a single data element when using certain data qualifiers.
- To require that the marking of component data elements in addition to the concatenated UII be selected and specified explicitly.
- To clarify that an encoded UII data string may contain the component data elements in any order. The ordering of the elements into a valid UII is done after the decoding of the symbol.
- To emphasize that the enterprise identifier in the UII is the entity that is responsible for compliance with the UII rules and that an entity cannot use another entity's enterprise identifier in the UII without permission or direction from the competent authority for that enterprise identifier.
- To clarify that original part numbers and lot or batch numbers are mutually exclusive in the UII. In order to

avoid ambiguity, only one of those three types of original numbers may appear in the mark.

- To clarify that AIT devices determine the UII Construct from the specific set of data qualifiers.
- To allow the UII Construct #2 requirement to maintain the original part number or lot or batch number on the item for the life of the item to be satisfied by maintaining the data element containing the original part number or lot or batch number on the item for the life of the item (e.g., TEI UID).
- To emphasize that added data elements must not introduce ambiguity in the concatenation of the UII and must conform to all other business rules.
- To allow enterprise identifiers as added data elements provided that any additional enterprise identifier does not introduce ambiguity in the concatenation of the UII.
- To require that single data elements that are sufficient to derive UIIs (i.e., 18S, 25S, UID , UST , USN , and DoD recognized IUID equivalents) always be interpreted as the UII regardless of any apparent ambiguity introduced by additional data elements in the symbol.
- To clarify that ISO/IEC 15434 syntax is required for the Data Matrix ECC 200 symbol.
- To require that the concatenated UII not exceed 50 characters in length. Maximum field lengths for individual data elements are not changed, however the overall length limitation must be met.
- To prescribe the use of dashes(-) and slashes(/) in MH10.8.2 Data Identifiers (DIs) as significant characters for part numbers, lot or batch numbers, and serial numbers, and in DIs that are composed from these numbers (i.e., S, 18S, 25S, 1P, 30P and 30T).
- To prohibit the use of dashes and slashes as separators between component parts in a single data element that is formed from component parts.
- To caution users on practical limitations of implementing free text formats.
- To emphasize that prior to derivation of UIIs from backup information the existence of a UII shall be checked by querying the IUID Registry for confirmation of any identifiable information already marked on the item.

- To clarify that existing databases may use a combination of the UII component data elements to retrieve data records.
- To prohibit assigning more than one UII to an item.
- To clarify that Business Rules for Items in Operational Use or in Inventory apply in addition to Business Rules #1-#27.
- To clarify that the enterprise identifier used in marking a legacy item must be the enterprise identifier of the entity assigning and registering the UII of the item.
- To clarify that the choice to use or not use the existing part number and/or existing serial number of a legacy item as part of the UII under their EID is the responsibility of the entity assigning the UII as is the uniqueness of the resulting UII.
- To require that the original equipment manufacturer (OEM) enterprise identifier and manufacturer assigned serial number, if marked on the item and not a part of the UII, be registered.
- To clarify that an item that is not sufficiently identifiable to confirm serviceability should not be assigned a UII.
- To clarify that support contracts shall specify the extent to which IUID Business Rules for items in operational use or in inventory apply.
- To clarify that IUID is required for Government property in the possession of a contractor.
- To clarify that Business Rules for Items in Operational Use or in Inventory apply in addition to Business Rules #1-#32.

e. Appendix D was updated with content changes incorporated:

- To replace interim format indicator “DD” with the newly assigned format indicator “12” for use with Text Element Identifiers (TEIs). Items that have been marked with the format indicator “DD” do not have to be re-marked but further use of “DD” is not permitted.
- To update Table 5 to remove Application Identifiers (AIs) 95 and 10 which are no longer used to construct UIIs. These Application Identifiers may continue to be used as additional data elements. Data qualifiers for single data elements that are sufficient to derive UIIs were reordered and IUID equivalents were grouped together. The DI 30T was introduced to provide a method for identifying a traceability number that is not part of the UII.

- To clarify the distinction among TEIs LOT , LTN and BII .
- To expand the AI 8004 Global Individual Asset Identifier (GIAI) to include new GS1 procedures to convert a serialized Global Trade Identification Number (GTIN™) to a GIAI.
- To clarify the distinction between DIs 1P and 30P.
- To clarify the distinction between DIs 1T and 30T.
- To replace Figure 6 with new figures—Figure 6, Figure 7 and Figure 8. The new figures contain the required data qualifiers and the resultant concatenated UII for the UII constructs and the IUID equivalents. A separate figure is provided for each format indicator.
- To replace Table 6 and the accompanying examples for Construct #1 using DIs. The component data elements were eliminated from the previous examples. Selected component data elements are required when they are specified explicitly.
- To update Table 7 and the accompanying example for Construct #2 using DIs. New Table 7 uses the previous example for serialization within the original part number.
- To insert new Table 8 with a new example for serialization within the lot number.
- To update Table 9 and accompanying example for constructing the UII from the component elements of a serialized Global Trade Identification Number (GTIN™).
- To update and move Table 8 (renumbered new Table 10) and to clarify the accompanying example using the AI for the IUID equivalent GIAI. The example uses a GIAI using the individual asset reference number.
- To insert new Table 11 and the accompanying example introducing new GS1 procedures to convert a serialized Global Trade Identification Number (GTIN™) to a GIAI.
- To incorporate the replacement of the interim format indicator “DD” by format indicator “12” in the appropriate tables and figures. Items that have been marked with the format indicator “DD” do not have to be re-marked but further use of “DD” is not permitted.
- To update the examples for Construct #1 and Construct #2 using TEIs and the new format indicator “12”. The example for serialization within original part number was annotated to clarify that LOT , LTN or BII should be

substituted for PNO for serialization within the lot or batch number, as appropriate.

- To renumber Tables 10, 11 and 12 to Tables 12, 13 and 14 respectively.

f. Appendix E was updated and the unused CLEI was deleted.

g. Changes for compatibility with the changes reflected above, as well as various typographical, grammatical and format corrections, were made throughout.

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Chapter 1
The Environment

THE GOVERNMENT PROPERTY MANAGEMENT CHALLENGE

The Government Accountability 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]

[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) Directive 8320.03, Unique Identification (UID) Standards for a Net-Centric Department of Defense, March 23, 2007, provides for UID data standards development and implementation of the Department's UID strategy. It establishes policy and prescribes the criteria and responsibilities for creation, maintenance, and dissemination of UID data standards for discrete entities to enable on-demand information in a net-centric environment, which is an essential element in the accountability, control, and management of DoD assets and resources. It also establishes policy and assigns responsibilities for the establishment of the Department's integrated enterprise-wide UID strategy and for the development, management, and use of unique identifiers and their associated authoritative data sources in a manner that precludes redundancy. Item unique identification (IUID) is the fundamental element of the Department's strategy for the management of its tangible items of personal property. A corresponding DoD Instruction 8320.04, Item Unique Identification (IUID) Standards for Tangible Personal Property, has been issued for policy implementation.

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, DoD Supply Chain Material Management Regulation, 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.

[3] DFARS 252.211-7003(a).

[4] Property accountability records and systems shall contain the data elements specified in DoD Instruction 5000.64, paragraph 6.6, including part number, cost, national stock number, unique item identifier (UII) or DoD recognized item unique identification (IUID) equivalent, and other data elements listed.

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 Business Enterprise Architecture (BEA)[5], to include improved data quality and global interoperability and rationalization of systems and infrastructure.
- Improved item management and accountability.
- Improved asset visibility and life cycle management.
- Clean audit opinions on item portions[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

Program managers and item managers lead the coordinated efforts of various stakeholders. 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:

[5] On March 15, 2007, the DoD Business Transformation Agency (BTA) released the Business Enterprise Architecture (BEA 4.1), which defines the processes, roles, data structures, information flows, business rules, and standards required to guide improvements in the Core Business Missions (CBMs) of the Department.

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

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

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

Property, Plant and Equipment Accountability. DoD Instruction 5000.64[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.

[7] DoDI 5000.64 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. This instruction complements the accounting and financial reporting requirements contained in DoD 7000.14-R.

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

- 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 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

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

[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.

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 interdependent.

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
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, or otherwise obtained, having a unit acquisition cost of $5,000 or more, for leased assets of any value, for items that are classified or sensitive, for items furnished to or in the possession of third parties, and other property when otherwise required by law, policy, regulation, or Agency direction.[13] Property accountability records and systems shall contain the data elements specified in DoD Instruction 5000.64, paragraph 6.6, including part number, cost, national

[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, November 2, 2006, op. cit., paragraphs 6.2 through 6.5.

stock number, unique item identifier (UII) or DoD recognized item unique identification (IUID) equivalent, and other data elements listed.[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 in support of contract performance 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 and accepted by the Government.

Using Contract Line Items

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

[14] Ibid., paragraph 6.6 specifies the minimum data elements required.
[15] See Section C5.3, Item Accountability, Control and Stewardship, DoD 4140.1-R.

Table 2 shows that 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. Contract Requirements – Identifying Unit Acquisition Cost

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.

[16]DFARS 252.211–7003 requires a contract attachment to list embedded DoD serially managed subassemblies, components, and parts that are to be uniquely identified. The IUID data are reported at the time of delivery, either as part of, or associated with the Material Inspection and Receiving Report.

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 concatenated UII and CLIN/SLIN valuation.

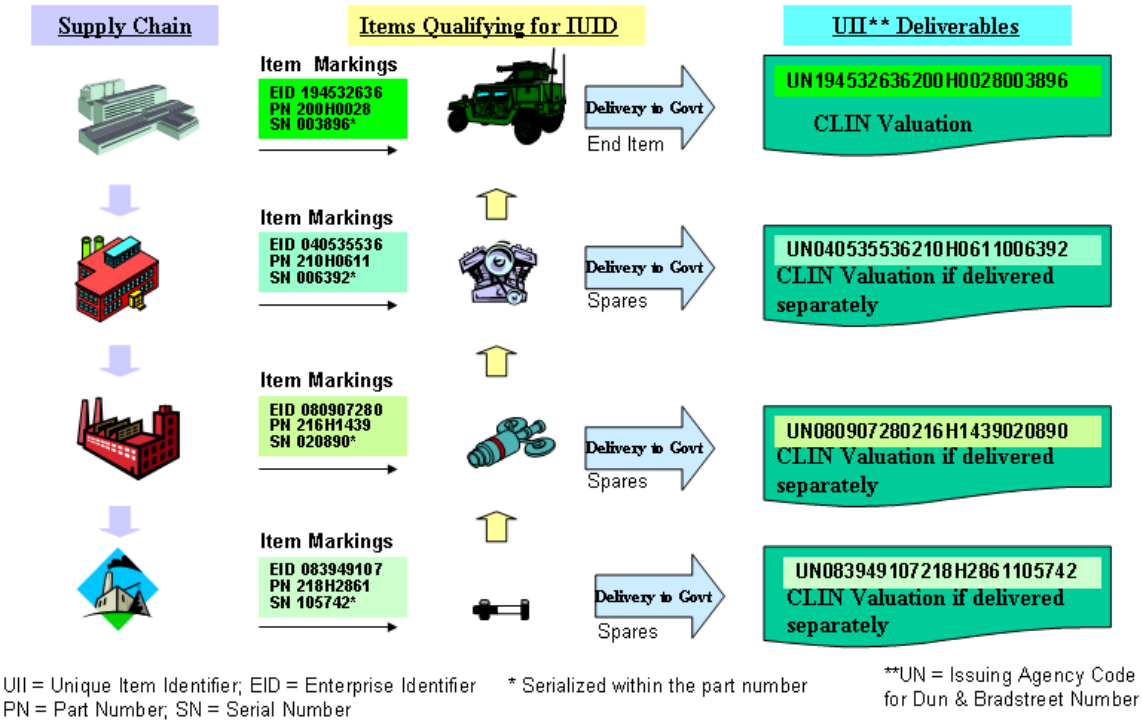

Figure 1. Valuation of Contract Line/Subline Item Numbers

A delivered item may be composed of embedded items, such as subassemblies, components and parts. The prime contractor will pass down appropriate specifications and contract requirements, including the IUID marking requirements where applicable, 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 prime will also be required to mark and register UII data elements for those DoD serially managed embedded items and their parent items in the delivered item.

Chapter 3
Requirements for Item Unique Identification

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, kits, outfits, 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

Item unique identification is driven by an integrated set of logistics, acquisition and financial requirements to identify and track item information. Figure 2 contains a decision tree for deciding what items should be uniquely identified for DoD purposes. The decision tree is a graphic representation of the text in DFARS 211.274-2. These criteria apply whether the items are delivered under contract or they are existing legacy items in inventory, in use, or undergoing maintenance, repair or overhaul. Items being delivered under contract, including new equipment, major modifications, reprocurements of equipment and spares, must include the contract clause Defense Federal Acquisition Regulation Supplement (DFARS) 252.211-7003 to invoke the IUID requirement.[19] Item unique identification of existing legacy items must be implemented separately. The program manager is responsible for having the appropriate items uniquely identified.

[17] DFARS 252.211-7003(a).
[18] Joint Publication 1-02, DoD Dictionary.
[19] DoDI 8320.04, paragraph 5.4.1, permits alternative implementation provided that the acquired items are marked and registered no later than 30 days after receipt.

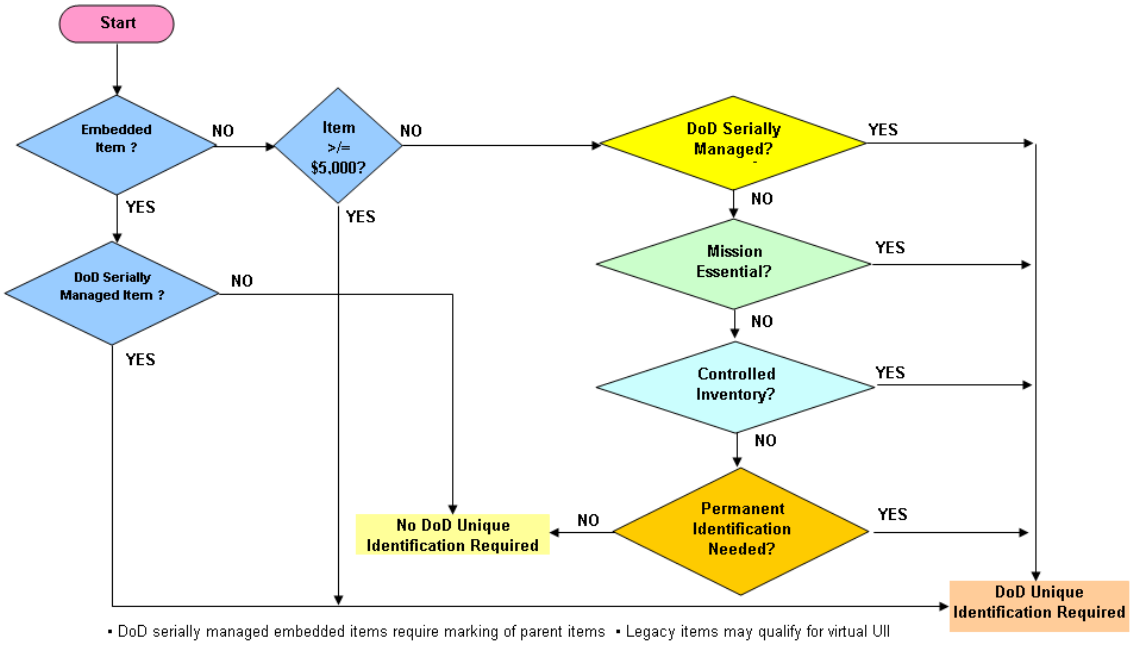

Figure 2. Uniquely Identifying Items Delivered Under Contract and Legacy Items in Inventory or Use

Items will require item unique 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 criteria apply (each discussed separately):

(1) All items for which the Government's unit acquisition cost is $5,000 or more;

(2) Items for which the Government's unit acquisition cost is less than $5,000, when *identified by the requiring activity* as DoD serially managed, mission essential[20] or controlled inventory;

(3) When the Government's unit acquisition cost is less than $5,000 and the requiring activity determines that permanent identification 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)) that contains the embedded subassembly, component or part.

UNIT ACQUISITION COST THRESHOLD

The first IUID criterion establishes the $5,000 value as the unit acquisition cost threshold for item unique identification. All items at this threshold or above are required to have item unique identification in accordance with the threshold requirement for establishing property records. Although DoDI 5000.64 does not require items under $5,000 to have property records unless they are leased assets of any value, items that are classified or sensitive, items furnished to or in the possession of third parties, or otherwise required by law, policy, regulation, or Agency direction, a program manager must examine the other IUID criteria to determine if items below the $5,000 threshold require item unique identification.

IUID OF ITEMS BELOW THE $5,000 THRESHOLD

There are three fundamental characteristics listed in the second IUID criterion to be considered in determining item unique identification requirements for items whose unit acquisition cost is less than $5,000. They are *DoD serially managed*, *mission essential* and *controlled inventory*.

DoD Serially Managed

A distinction must be made between “serialized items” and “DoD serially managed” items when uniquely identifying items less than $5,000. 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 manage an item by its serial number 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[20].

DoD serially managed items require UIIs. Serial numbers may be unique within a product or organization, but UIIs are globally unique. This permits an item to be uniquely distinguishable in different databases.

[20] 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 within a product or organization.

A broad variety of items fall into the DoD serially managed category through programs for serial number tracking, serialized item management, and unique item tracking. Examples of DoD serially managed items may include 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.[21]

Mission Essential

Item essentiality is a measure of an item's military worth in terms of how its failure would affect the ability of a weapon system, end item, or organization to perform its intended functions. Military mission essentiality is the composite effect of an item on the overall military mission based on the most critical significant application of the item.[22] The primary use of military mission essentiality is in supply chain management for determining resource allocations, determining degree of management intensity, and communicating essentiality among the DoD Components. An assessment of mission essentiality should include item essentiality and the degree to which it impacts on the overall military mission.

Controlled Inventory

The DoD employs item accountability, control, and stewardship procedures to ensure that assets are protected against waste, loss, negligence, unauthorized use, misappropriation, and compromise.[23] Controlled inventory items are 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. They include 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); pilferable items (items having a ready resale value or application to personal possession, which are especially subject to theft)[24]; and safety controlled items.

[21] DUSD(Logistics & Material Readiness) Memorandum, September 4, 2002, Serialized Item Management
[22] DoD 4140.1-R
[23] DoD 4140.1-R
[24] DoD 4100.39-M, Volume 10, Table 61

OTHER COMPELLING REASONS FOR ITEMS BELOW THE $5,000 THRESHOLD

This criterion provides the authority for the requiring activity to specify items for item unique identification based on other rationale. Some items that are under the $5,000 threshold and do not qualify for IUID under the stated criteria may benefit from permanent unique identification. The requiring activity that deems it appropriate to provide permanent unique identification for items may require IUID. Government property that will be placed in service in the possession of contractors is an example of items that should be marked with UIIs at the time of acquisition.

IUID OF EMBEDDED ITEMS REGARDLESS OF VALUE

Embedded items include subassemblies, components, or parts that are integral to the item being delivered. The embedded items that are serially managed by DoD require IUID. These items *must be listed in the contract* in order to clearly indicate which items are to be marked. This criterion is applied without regard to the value of the embedded item.

Each uniquely identified embedded item is contained within a higher assembly known as its parent item[25]. The parent item may be chosen at any appropriate level of configuration above the level of the embedded item provided that the parent item is a higher assembly, intermediate component or subassembly that is itself DoD serially managed. The parent item of a DoD serially managed embedded item is also required to have a UII. This criterion is applied without regard to the value of the parent item.

The supply management and repair concepts for embedded items and parent items may dictate that multiple tiers of embedded items and parent items are needed for complex systems.

IUID OF SETS, KITS AND OUTFITS

Sets, kits and outfits (SKO) are assemblages of components, support items, or mission specific and common tools in a container (bag, pouch, box, chest, van, trailer or shelter) that are used in association. SKOs are primarily designed to accomplish a specific mission or maintenance function. They are identified, cataloged, authorized and issued as a single unit. They may be made up of components, support items and tools

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

included in more than one class of supply; may include end items; may include components, support items and tools for which logistic responsibilities are assigned to more than one agency; and may include nonexpendable, durable, and expendable components, support items and tools. An SKO is an item of supply, configuration controlled by a part number or line identification number.

An SKO should have a UII if it meets the qualifying criteria for tracking and valuation purposes as long as it resides in the inventory. If any of the components of the SKO are DoD serially managed items, they would be uniquely identified separately as embedded items in the parent item. In this case the parent item is the SKO of which the DoD serially managed components are a part. The embedded item would not be separately valued, since the value of the embedded item is capitalized in the value of the SKO.

An SKO could be a set of components for a single assembly part, packaged together as a single part number, for inclusion into one assembly during a maintenance function or configuration change. This type of SKO is most often referred to as a kit. Once the kit is applied to an assembly, the kit is "consumed" and capitalized as part of the value of the assembly in which it is installed; and the UII for the kit would be retired. The assembly in which the kit is installed would become the new parent item for any embedded items from the kit.

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, including items undergoing maintenance, repair or overhaul, 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 assignment and registration of a UII, in accordance with the government property accounting rules.

When applying item unique identification to legacy items already in the inventory and operational use[26], all items that meet the IUID criteria should be assigned a UII and marked. If serialized items can be uniquely identified by their existing serial numbers and marking, virtual unique

[26] 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/pdi/uid/policy_and_regulations.html.

item identifiers (UIIs) can be assigned[27], based on all qualifying criteria, not just DoD serially managed items (see the decision tree in Figure 3).

A virtual UII enables the database entry of a UII and its associated data, while postponing the physical marking of the legacy item[28] with a two-dimensional Data Matrix symbol to the next opportunity to mark based on logistic and economic considerations. In addition to legacy items already in the inventory and operational use, DoD resident equipment[29] and spares in the possession of contractors may also be assigned virtual UIIs until an item is subject to transfer at which time the physical marking of the item must be accomplished. The use of virtual UIIs is described in the latest version of the *Guidelines for the Virtual Unique Item Identifier (UII)*.[30]

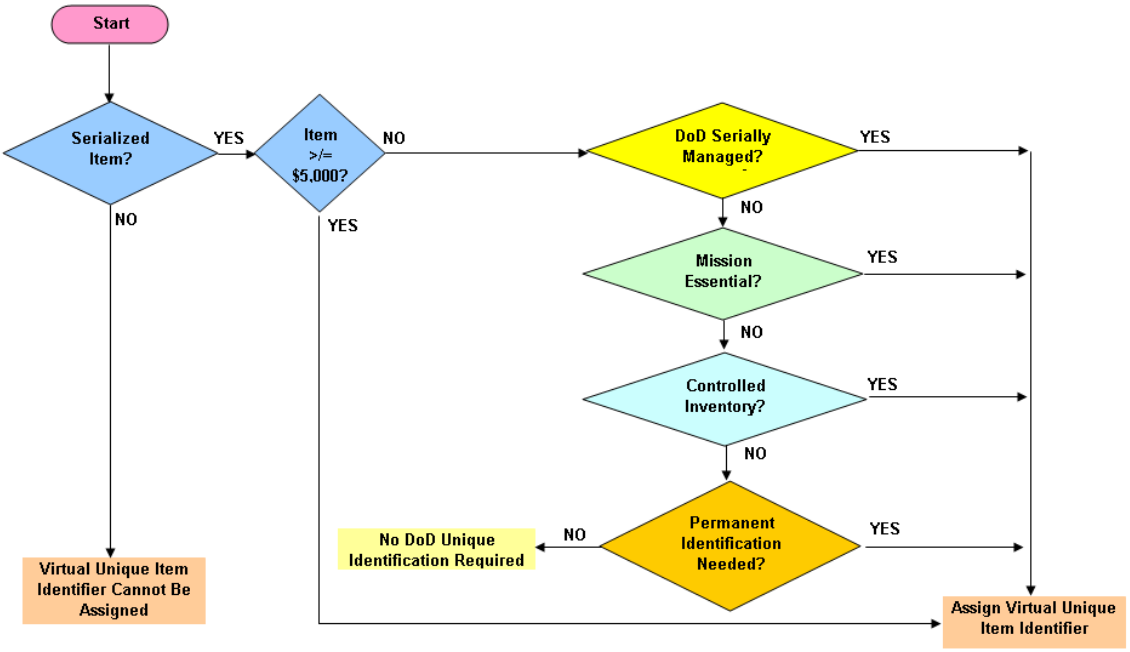

Figure 3. Assigning Virtual Unique Item Identifiers to Legacy Items in Operational Use and Inventory

[27] The enterprise identifier used in marking a legacy item must be the enterprise identifier of the entity assigning and registering the virtual UII. Use of the existing part number and/or existing serial number or re-serialization of a legacy item is the responsibility of the enterprise as is the uniqueness of the resulting UII. See Business Rules #28 and #29 in Appendix C.

[28] Virtual UIIs are not used for new items. New items must conform to DFARS 252.211-7003.

[29] *Resident equipment* is government owned property that is usually stationary within a contractor's facility.

[30] This guide is available for download at http://www.acq.osd.mil/dpap/pdi/uid/guides.html.

Chapter 4
Determining Uniqueness of Items

DEFINING THE DATA ELEMENTS FOR THE UNIQUE ITEM IDENTIFIER

What is the Unique Item Identifier (UII)?

The unique item identifier (UII) is a globally unique and unambiguous identifier that distinguishes an item from all other like and unlike items.

The UII is a concatenated value that is derived from a UII data set of one or more data elements. The UII data set is marked on items in a Data Matrix ECC 200 symbol. In applying the IUID rules and requirements, care should be given to the distinction among the concatenated UII, the UII data set, and the mark or data string containing the UII data set.

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 number or lot or batch number, and the serial number (Construct #2). In addition to the two constructs composed of multiple data elements, the UII data set may be represented by a single data element from which the UII can be derived.[31] The DoD recognized IUID equivalents of Global Individual Asset Identifier (GIAI), Global Returnable Asset Identifier (GRAI) when assets are serialized[32], Vehicle Identification Number (VIN), or Electronic Serial Number ((ESN), for cell phones only), each consisting of a single data element, are discussed later.

The Notion of an Enterprise

The first requirement is enterprise identification. An enterprise, in the context of IUID, is the entity responsible for assigning a UII to an item. This responsibility commits the entity to ensuring the uniqueness of the UII at the time of its assignment and continued uniqueness among future

[31] The single data elements from which the UII can be derived are listed in Table 5 along with their identifying data qualifiers. They are 18S, 25S, USN , UST and UID as well as the DoD recognized IUID equivalents (I, 22S, 8002, 8003 and 8004).

[32] The Global Returnable Asset Identifier (GRAI) must contain a unique serial number for DoD recognized IUID equivalent application. Other variations of the GRAI are unacceptable for IUID.

UIIs[33]. For purposes of item unique identification, an enterprise identifier will define each entity location that has its own unique, separate and distinct operation. An enterprise may be an entity such as a manufacturer, supplier, depot, program management office or a third party. An enterprise identifier is a code uniquely assigned to an enterprise by a registered issuing agency. An issuing agency is an organization responsible for assigning a non-repeatable identifier to an enterprise [e.g., Dun & Bradstreet's Data Universal Numbering System (DUNS) Number, GS1 Company Prefix (formerly Uniform Code Council (UCC)/European Article Numbering (EAN) International) Company Prefix), Allied Committee 135 NATO Commercial and Government Entity (NCAGE)/ Commercial and Government Entity (CAGE) Code, Department of Defense Activity Address Code (DoDAAC), or the Coded Representation of the North American Telecommunications Industry Manufacturers, Suppliers, and Related Service Companies (ATIS-0322000) Number].

Unique Identification of Items

The other key aspect of constructing a UII is the unique identification of each item that the enterprise produces. There are two acceptable constructs discussed here which are determined by how the enterprise serializes items. Later in this chapter specific commercially-used unique identifiers—DoD recognized IUID equivalents—are discussed for alternative use.

Serialization Within the Enterprise Identifier (Construct #1)

For items that are serialized within the enterprise identifier, the concatenated UII is a combination of the issuing agency code[34], 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

[33] The enterprise identifier (EID) in the UII is the entity that is responsible for compliance with the UII rules. An entity cannot commit another entity to that responsibility without authority. The fundamental principle is: Never use another entity's enterprise identifier in the UII without permission or direction from the competent authority for that enterprise identifier.

[34] 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 derived from the data qualifier for the enterprise identifier and is not marked separately on the item. The IAC for the GS1 Company Prefix need not be derived because it is contained in each GS1 Company Prefix. The IAC for the data qualifiers 3V, 18V, 25S, EUC and UID need not be derived because it is contained in each data element. The IAC should not be repeated when forming the concatenated UII.

identifier and unique serial number within the enterprise identifier provide the permanent identification for the life cycle of the item.[35]

Serialization Within the Part, Lot or Batch Number (Construct #2)

For items that are serialized within the part, lot or batch number, the concatenated UII is a combination of the issuing agency code[36], the enterprise identifier, the original part number or the 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 the same controlled conditions of production. 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 number or lot or batch number and serial number within the original part number or lot or batch number provide the permanent identification for the life cycle of the item.[37]

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 the six most commonly used enterprise identifiers. These IACs are "0 through 9" for the GS1 Company Prefixes assigned by GS1[38], "LB" for ATIS-0322000[39]numbers, "UN" for the DUNS assigned by Dun

[35] The UII's component data elements are separately encoded within the Data Matrix symbol—enterprise identifier and serial number. The IAC is contained within the format of specific component data elements or, for some data qualifiers, only one IAC is applicable for the data qualifier. Reader devices are programmed to use the embedded IAC, or to deduce the IAC from the data qualifier, but the IAC is not encoded as a separate data element in the Data Matrix symbol. When a UII is encoded in a single data element, such as 25S or UID , the concatenation of the IAC, enterprise identifier and unique serial number is accomplished prior to encoding.

[36] See footnote 34.

[37] The UII's component data elements are separately encoded within the Data Matrix symbol—enterprise identifier, original part number or lot or batch number, and serial number. The IAC is contained within the format of specific component data elements or, for some data qualifiers, only one IAC is applicable for the data qualifier. Reader devices are programmed to use the embedded IAC, or to deduce the IAC from the data qualifier, but the IAC is not encoded as a separate data element in the Data Matrix symbol. When a UII is encoded in a single data element, such as UID , the concatenation of the IAC, enterprise identifier, original part number (or lot or batch number) and unique serial number is accomplished prior to encoding.

[38] GS1 was formerly EAN.UCC. Both brand names may be encountered in reference to GS1 System standards, specifications and related terminology during an indeterminate transition period.

[39] Revision of ANSI T1.220-2000.

& Bradstreet, "D" for the NCAGE/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	GS1 Global Office[40]	GS1 Company Prefix[41]
LB	Telcordia Technologies, Inc	ATIS-0322000[42]
UN	Dun & Bradstreet	DUNS
D	Allied Committee 135	NCAGE/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 Concatenated UII

The concatenated 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[43] machine-reads the data elements on the item and can output the concatenated[44] UII. Therefore, it

[40] Formerly EAN-International.
[41] The first number in a GS1 Company Prefix indicates the Issuing Agency Code.
[42] Revision of ANSI T1.220-2000.
[43] AIT devices include readers, scanners, interrogators, and hybrid devices which may incorporate more than one automatic data capture technology. AIT devices with imaging capability are required to decode Data Matrix ECC 200 symbols.
[44] *Concatenate* means to link together in a series or chain.

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 additionally, original part number or lot or batch number) be included on each item.[45] The UII component data elements, at a minimum, shall be contained in a Data Matrix ECC 200 symbol encoded in the syntax of ISO/IEC 15434 and using the semantics of ISO/IEC 15418[46] or Air Transport Association (ATA) Common Support Data Dictionary (CSDD). Data may also be contained in human-readable information and/or other AIT media (e.g., contact memory buttons, linear bar codes, radio frequency identification, etc.) in addition to the Data Matrix ECC 200 symbol. Table 4 shows how the UII is constructed from the data elements placed on the item and the associated business rule. When deriving the concatenated UII, the data qualifiers are omitted from the concatenated UII.

[45] Specific data qualifiers are permitted for concatenated or partially concatenated UIIs in a single data element. See Appendix D, Table 5.

[46] See Appendix D, The Mechanics of Item Unique Identification, for a detailed explanation of encoding the Data Matrix. The full titles of the standards are: ISO/IEC International Standard 15434, Information Technology–Syntax for High Capacity Automatic Data Capture Media and ISO/IEC International Standard 15418, Information Technology–EAN/UCC Application Identifiers and FACT Data Identifiers and Maintenance (Note that ISO/IEC 15418 refers the user to ANS MH10.8.2 for technical content.).

<table>
<tr><th></th><th>UII Construct #1</th><th colspan="2">UII Construct #2</th></tr>
<tr><td>Based on current enterprise configurations</td><td>If items are serialized within the Enterprise</td><td colspan="2">If items are serialized within Part, Lot or Batch Number</td></tr>
<tr><td rowspan="2">UII is derived by concatenating the data elements IN ORDER:</td><td rowspan="2">Issuing Agency Code*
Enterprise ID
Serial Number</td><td colspan="2">Issuing Agency Code*
Enterprise ID</td></tr>
<tr><td>Original Part #
Serial Number</td><td>Lot or Batch #
Serial Number</td></tr>
<tr><td>Data Identified on Assets Not Part of the UII (Separate Identifier)</td><td>Current Part Number**
Other Traceability Number***</td><td colspan="2">Current Part Number**
Other Traceability Number***</td></tr>
<tr><td colspan="4">*The Issuing Agency Code (IAC) represents the registration authority that issued the enterprise identifier (e.g., Dun and Bradstreet, GS1). The IAC can be derived from the data qualifier for the enterprise identifier and is not separately marked on the item. The IAC for the GS1 Company Prefix need not be derived because it is contained in each GS1 Company Prefix. The IAC for the data qualifiers 3V, 18V, 25S, EUC and UID need not be derived because it is contained in each data element. The IAC should not be repeated when forming the concatenated UII.
**In instances where the part number changes with new configurations (also known as part number roll), the current part number shall be included on the item for traceability purposes and may be included as a separate data element. The original part number is never changed.
***The data identifier 30T has been designated for use as a traceability number that is not part of the UII. For example, applications may specify 30T for encoding lot or batch number when the lot or batch number is not required or desired in the UII.</td></tr>
</table>

Table 4. Unique Item Identifier (UII) Construct Business Rules

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

Concatenated UII 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[47]. The

[47] 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. The IAC for the GS1 Company Prefix need not be derived because it is contained in each GS1 Company Prefix. The IAC for the data qualifiers 3V, 18V, 25S, EUC and UID need not be derived

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 and guaranteeing its uniqueness.

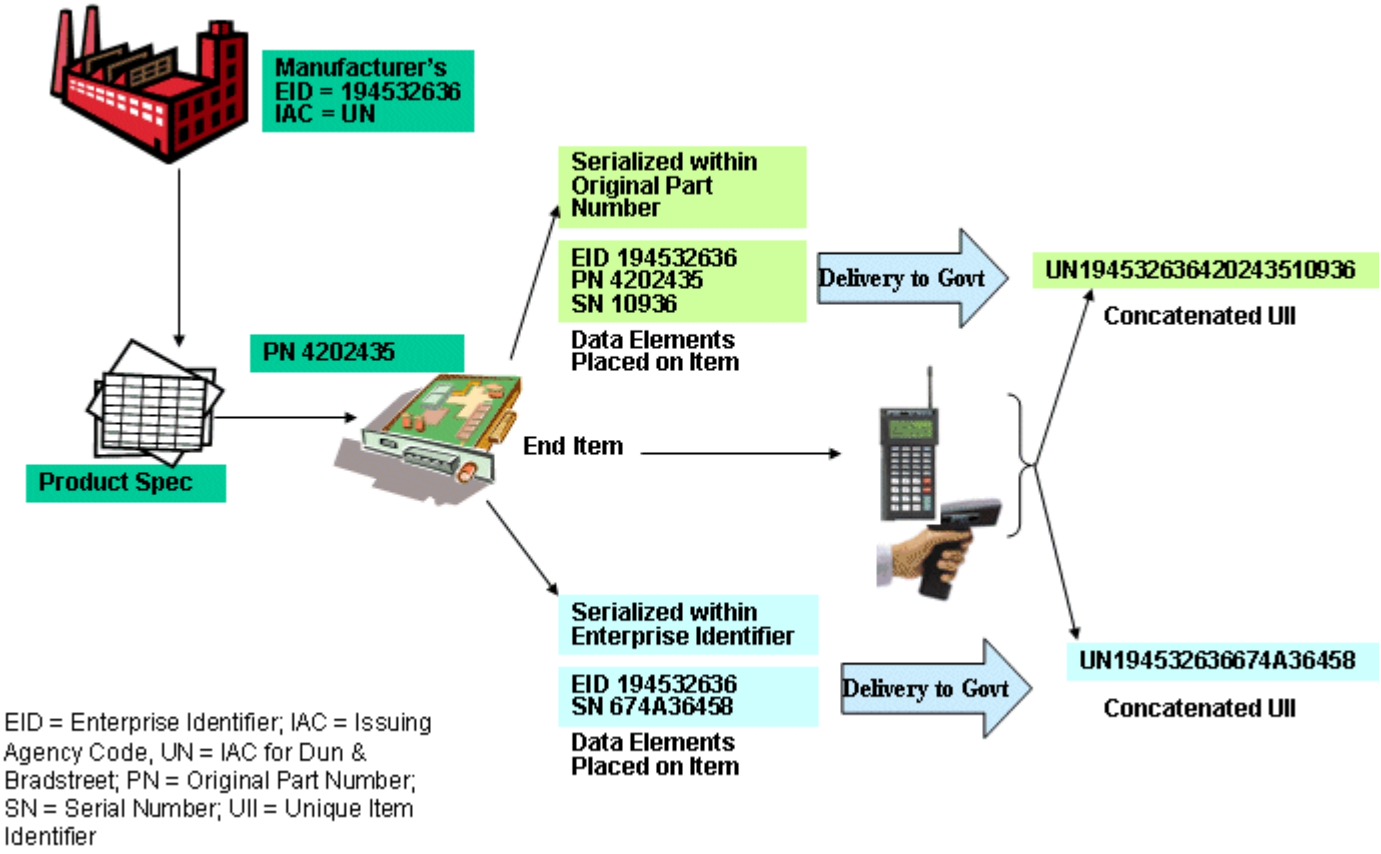

Figure 4. Concatenated UII Determination Process

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 number or 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, which states a preference for all marking to be machine-readable information using Data Matrix ECC 200 symbols. Commercial-off-the-shelf items that qualify for IUID marking, which are incorporated into end items, will be marked so that a concatenated UII can be derived.

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because it is contained in each data element. The IAC should not be repeated when forming the concatenated UII.

DOD RECOGNIZED IUID EQUIVALENTS

Generally, a commercial identifier can be considered for use as a DoD recognized IUID equivalent[48] 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 ANS MH10.8.2, Data Identifier and Application Identifier Standard. In addition, the item marks must comply with Business Rule #14 for Data Matrix ECC 200 symbol marking and Business Rule #17 which requires that DoD recognized IUID equivalents comply with the IUID minimum data carrier requirements.

The DoD recognizes four commercial unique identifiers as item unique identification equivalents. They are:

1. Global Individual Asset Identifier (GIAI) for serially-managed assets.
2. Global Returnable Asset Identifier (GRAI) for returnable assets which must contain a unique serial number for DoD IUID equivalent application. Other variations of the GRAI are unacceptable.
3. ISO Vehicle Identification Number (VIN) for vehicles.
4. Electronic Serial Number (ESN) for cellular telephones only.

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[49] (GRAI), Vehicle Identification Number (VIN), or Electronic Serial Number ((ESN), for cell phones only), whose data element(s) are encoded in a Data Matrix ECC 200 symbol using the ISO/IEC 15434 syntax with ISO/IEC 15418 or ATA CSDD semantics. Construct #1 and Construct #2 may be represented in a single data element, which is composed of the necessary data components, with an appropriate item unique identification data qualifier (i.e. 18S, 25S, USN , UST , or UID).

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 item 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,

[48] DoD recognized IUID equivalents (or IUID equivalents) are subject to DoD approval.

[49] The Global Returnable Asset Identifier (GRAI) must contain a unique serial number for DoD recognized IUID equivalent application. Other variations of the GRAI are unacceptable for IUID.

serial number and, for serialization within the part, lot or batch number only, original part number or lot or batch number) in MRI media on items requiring IUID marking, based on the criteria provided in the latest revision of MIL-STD-130, Identification Marking of U.S. Military Property. The DoD minimum MRI requirement for IUID is the Data Matrix ECC 200 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[50]. Figure 5 illustrates some considerations faced by suppliers in developing a compliant approach to DoD IUID requirements using MRI part marking.

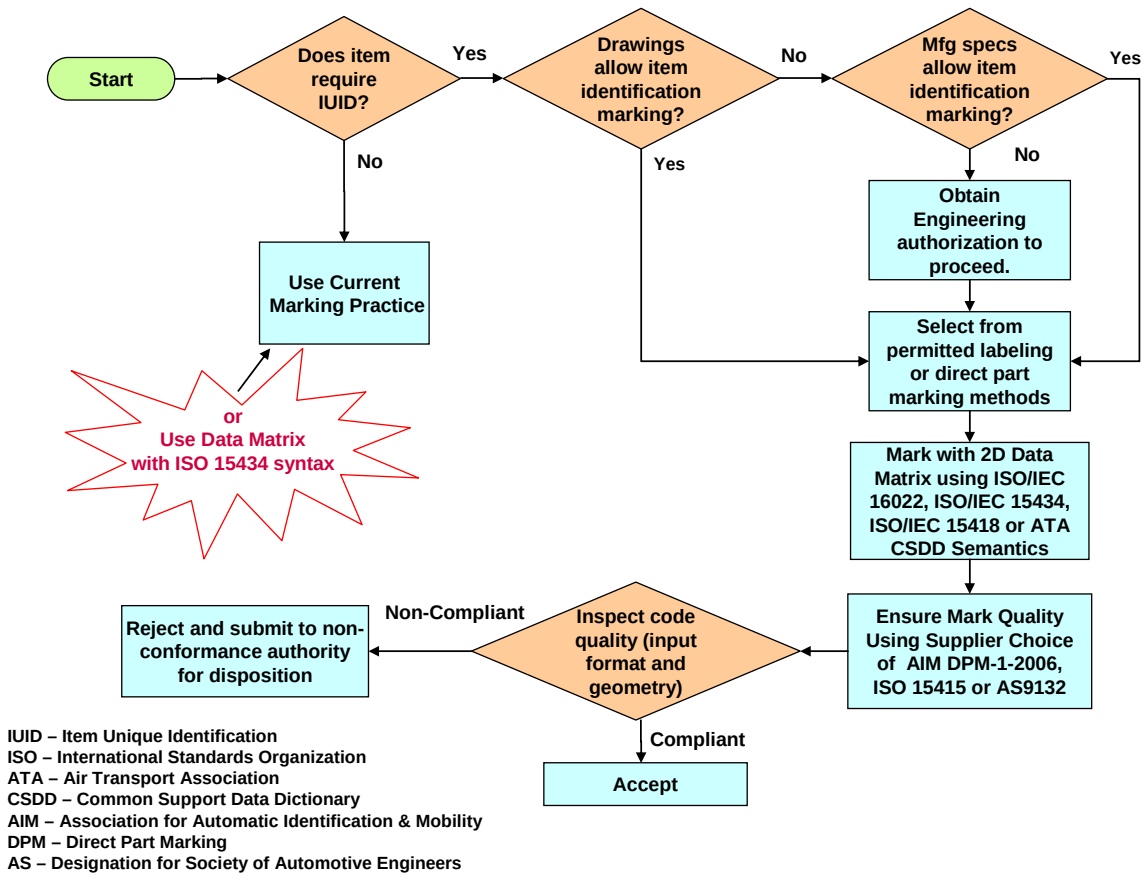

Figure 5. Supplier Considerations in Machine-Readable Information Part Marking

[50] For guidelines on engineering and technical documentation changes to support IUID, see the latest version of the *Guidelines for Engineering, Manufacturing and Maintenance Documentation Requirements for Item Unique Identification (IUID) Implementation*, at http://www.acq.osd.mil/dpap/pdi/uid/guides.html.

Deciding When to Place IUID Data Elements on the Item

Strategies that produce the greatest business advantage for the items at the lowest cost and in the shortest possible time should be considered first. The question of when to mark often 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[51]. Requiring vendor-applied-at-source on future contracts for new equipment, major modifications, and reprocurements of end items and spares is important and often the most cost effective 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 in operational use or available in a storage facility. Projected situations or processes where a trigger event occurs include, but are 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.[52]

(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.[53]

[51] 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.

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

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

(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 in operational use 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 (e.g. distribution depot or port of embarkation) can ensure no item enters service without a unique item identifier. Having identified an item at the gate which requires a unique item identifier, 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 BEA 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 case of Construct #2, the original part number or 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[54] 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.[55]

[54]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. This instruction complements the accounting and financial reporting requirements contained in DoD 7000.14-R.

[55] 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.	DFARS 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[56] (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 symbol using 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

[56] The Global Returnable Asset Identifier (GRAI) must contain a unique serial number for DoD recognized IUID equivalent application. Other variations of the GRAI are unacceptable for IUID.

Word or Phrase	Definition	Source
Concatenated unique item identifier	A globally unique and unambiguous identifier formed by the linking together of data elements. 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 (Construct #1). For items that are serialized within the original part number or 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 number or lot or batch number, and serial number within the original part number or lot or batch number (Construct #2). In addition to the two constructs composed of multiple data elements, the concatenated UII may be derived from a single data element (i.e., data qualifiers 18S, 25S, USN , UST , UID , I, 22S, 8002, 8003, or 8004).	DFARS 252.211-7003 (derived from)
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.	DoD 4140.1-R DoD 4100.39-M

Word or Phrase	Definition	Source
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 item unique identification purposes, the data carrier is the Data Matrix symbol.	The American Heritage Dictionary
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 item marking applications using a wide variety of printing and marking technologies. The Data Matrix symbol looks like this:  The Data Matrix ECC 200 which uses Reed-Solomon error correction is the specified symbol for IUID.	ISO/IEC 16022 Information technology - International Symbology Specification - Data Matrix

Word or Phrase	Definition	Source
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.	DFARS 252.211-7003
DoD item unique identification[57]	A system of marking and registering 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[58]. The Data Matrix contents may be either a Unique Item Identifier (Construct #1 or Construct #2) or a DoD recognized IUID equivalent.	DFARS 252.211-7003
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 manage an item by its serial number 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[59]	DUSD (Logistics & Material Readiness) Memorandum, September 4, 2002, Serialized Item Management

[57] Formerly known as DoD unique item identification.
[58] Text Element Identifiers are taken from the Air Transport Association Common Support Data Dictionary.
[59] 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
DoD recognized item unique identification equivalent (or IUID equivalent)	An item 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[60] (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 ECC 200 symbol encoded with ISO/IEC 15434 syntax and semantics of ISO/IEC 15418 in order to be compliant with DoD IUID policy.	DFARS 252.211-7003
Enterprise[61]	The entity (e.g., a manufacturer or vendor) responsible for assigning unique item identifiers to items.	DFARS 252.211-7003
Enterprise identifier	A code that is uniquely assigned to an enterprise by a registered issuing agency.	DFARS 252.211-7003
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.	DoD 4140.1-R

[60] The Global Returnable Asset Identifier (GRAI) must contain a unique serial number for DoD recognized IUID equivalent application. Other variations of the GRAI are unacceptable for IUID.

[61] The enterprise identifier in the UII is the entity that is responsible for compliance with the UII rules. An entity cannot commit another entity to that responsibility without authority. The fundamental principle is: Never use another entity's enterprise identifier in the UII without permission or direction from the competent authority for that enterprise identifier.

Word or Phrase	Definition	Source
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 (e.g., Dun & Bradstreet's Data Universal Numbering System (DUNS) Number, GS1 (formerly Uniform Code Council (UCC)/European Article Numbering (EAN) International) Company Prefix, Allied Committee 135 Commercial and Government Entity (NCAGE/CAGE) Code or DoD Activity Address Code (DODAAC)).	DFARS 252.211-7003
Issuing agency code	A code that designates an agency with authority to issue unique enterprise identifiers.	DFARS 252.211-7003
Item	A single hardware article or unit formed by a grouping of subassemblies, components, or constituent parts.	DFARS 252.211-7003
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 AP1.1.65
Item identification	Sufficient data to establish the essential characteristics of an item that give the item its unique character and differentiate it from other supply items.	DoD 4140.1-R AP1.1.66
Item unique identification equivalent	See DoD recognized item unique identification equivalent.	

Word or Phrase	Definition	Source
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 (lot or batch), all of which were manufactured under the same controlled conditions of production.	DFARS 252.211-7003 (derived from)
Machine-readable media	An automatic identification technology media, such as bar codes, contact memory buttons, radio frequency identification, or optical memory cards.	DFARS 252.211-7003
Marking	The application of legible numbers, letters, labels, tags, symbols, or colors to ensure the proper handling and identification during shipment and storage.	DoD 4140.1-R
Military Mission Essentiality	A code indicating the composite effect of an item on the overall military mission based on the most critical significant application of the item. It shall be used in determining resource allocations, determining degree of management intensity, and communicating essentiality among the DoD Components.	DoD 4140.1-R
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. (See FMR, Volume 4, Chapter 4, Operating Materials and Supplies and Stockpile Materials, January 1995.)	DoD 7000.14-R
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.	DFARS 252.211-7003

Word or Phrase	Definition	Source
Parent item	The item assembly, intermediate component or subassembly that has an embedded item with a unique item identifier or DoD recognized item unique identification equivalent.	DFARS 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)	DoDI 5000.64 E2.1.12.3 DoD 4100.39-M
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.	DoD 4140.1R AP1.1.111
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.	DFARS 252.211-7003 ISO/IEC 15459
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)	DoDI 5000.64 E2.1.12.2
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.	DFARS 252.211-7003

Word or Phrase	Definition	Source
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.	DFARS 252.211-7003
Sets, kits and outfits	Assemblages of components, support items, or mission specific and common tools in a container (bag, pouch, box, chest, van, trailer or shelter) primarily designed to accomplish a specific mission or maintenance function.	DoD Guide to Uniquely Identifying Items and DA PAM 700-60
Unique item identifier	A globally unique and unambiguous identifier that distinguishes an item from all other like and unlike items. The UII is a concatenated value that is derived from a UII data set of one or more data elements.	DFARS 252.211-7003 (derived from)
Unique item identifier data set	A set of one or more data elements marked on an item from which the concatenated UII can be derived. 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 number or lot or batch number, and the serial number (Construct #2). In addition to the two constructs composed of multiple data elements, the UII data set may be represented by a single data element, such as would be defined by the use of data qualifiers 18S, 25S, USN , UST or UID , or by a DoD recognized IUID equivalent, such as would be defined by the use of data qualifiers I, 22S, 8002, 8003, or 8004.	DFARS 252.211-7003 (derived from)

Word or Phrase	Definition	Source
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/pdi/uid/data_elements_and_formats.html.	DFARS 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 or undefinitized line, subline, or exhibit line items, the Contractor's estimated fully burdened unit cost to the Government at the time of delivery; and 3. For items produced under a time-and-materials contract, the Contractor's estimated fully burdened unit cost to the Government at the time of delivery.	DFARS 252.211-7003
Virtual unique item identifier	A UII of a legacy item that has been entered, along with its associated data, in the DoD Item Unique Identification (IUID) Registry, while postponing the physical marking of the item with a DoD IUID-compliant two-dimensional (2D) Data Matrix symbol to a more advantageous time based on logistic and economic considerations.	DoD Guide to Virtual Unique Item Identifiers, Version 1.2, 28 Nov 06

Appendix B - Where Does the Guidance Exist Today?

Document Reference	Document Name
DFARS 252.211-7003	Defense Federal Acquisition Regulation Supplement
DFARS 252.211-7007	Defense Federal Acquisition Regulation Supplement
MIL-STD-129	Military Marking for Shipment & Storage
MIL-STD-130	Identification Marking of US Military Property
DoD 4100.39-M	Federal Logistics Information System (FLIS) Procedures Manual
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 7000.14-R	Financial Management Regulations
DoDD 8320.03	Unique Identification (UID) Standards for a Net-Centric Department of Defense
DoDI 8320.04	Item Unique Identification (IUID) Standards for Tangible Personal Property
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 and Interoperability
ANSI/EIA 649	National Consensus Standard for Configuration Management
ISO/IEC 15415	Information technology—Automatic identification and data capture techniques—Bar code print quality test specification — Two-dimensional symbols
ISO/IEC 15418	Information technology—EAN/UCC Application Identifiers and FACT Data Identifiers and Maintenance
ISO/IEC 15434	Information technology—Syntax for High Capacity ADC Media
ISO/IEC 15459-2	Information technology—Part 2: Registration Procedures
ISO/IEC 16022	Information technology—International symbology specification — Data Matrix
ISO/IEC TR 24720	Information technology — Automatic identification and data capture techniques — Guidelines for direct part marking (DPM)
AIM DPM-1-2006	Direct Part Mark (DPM) Quality Guideline
SAE AS9132	Data Matrix (2D) Coding Quality Requirements for Parts Marking
ATA CSDD	Common Support Data Dictionary
ANS MH10.8.2	Data Identifier and Application Identifier Standard
These documents may have been revised since publication of this guide. Check for the latest version of the reference.	

Appendix C - Business Rules (Version 4.0)

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
- Unique Item Identifier (UII) Construction and Physical Marking for:
    - Items considered part of a new solicitation after January 1, 2004 (i.e., New Items)
    - Items existing under contract, in operational use, or in inventory (i.e., Legacy Items)
    - Items considered tangible personal property owned by the Government in possession of a contractor after January 1, 2005 (i.e., Property Management Items)

As the IUID implementation has progressed, additions, clarifications and modifications to these Business Rules have been made.

CONTRACTS AND ADMINISTRATION

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[62]:
    - The Government can mark the item, or
    - The Government can request the contractor mark the item.
3. Foreign Military Sales (FMS) contracts are not exempt from IUID.
4. Classified and unclassified contracts require IUID.

UII CONSTRUCTION AND PHYSICAL MARKING

Items Considered Part of a New Solicitation

Creating and Generating the Concatenated Unique Item Identifier

1. The concatenated UII shall be derived from its discrete, component data elements or single data element[63]. 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 single data element on the item, any component data elements specified by the contract[64] 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.[65]
4. If an enterprise serializes items within the enterprise identifier (EID), the concatenated UII shall be derived by combining the following data elements, in order[66]:
    - The issuing agency code (IAC), which shall be derived from the data qualifier for the enterprise identifier if it is not contained within the data element [67]

[62] Pursuant to the execution of a determination and findings.
[63] DI 25S, TEI UID and the DoD recognized IUID equivalents contain the complete UII in a single data element. DI 18S, TEI USN and TEI UST are sufficient to derive the UII from a single data element by adding the IAC prefix for CAGE (D).
[64] Configuration Management or other purposes may require marking of individual data elements. The contract must specify the data elements that are required beyond the UII and other MIL-STD-130 requirements.
[65] See the *DoD Guide to Uniquely Identifying Items (Appendix D)* for a list of IUID data qualifiers.
[66] An encoded data string may contain the component data elements in any order. The ordering of the elements into a valid UII is done after the decoding of the symbol.

- The enterprise identifier, which shall be marked on the item[68]
- The serial number unique within the enterprise, which shall be marked on the item *(Note: This is referred to as UII Construct #1.)*

5. If an enterprise serializes items within original part numbers or lot or batch numbers, the concatenated UII shall be derived by combining the following data elements, in order[69]:
    - The IAC, which shall be derived from the data qualifier for the enterprise identifier if it is not contained within the data element[70]
    - The enterprise identifier, which shall be marked on the item[71]
    - The original part number or lot or batch number[72], which shall be marked on the item
    - The serial number unique within original part number or lot or batch 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 contained within the data element [73]. The IAC is not required to be separately marked on the item.[74]
7. A specific set of data qualifiers will allow the automatic identification technology device to determine which UII Construct should be used to build the concatenated UII or if the concatenated UII is already marked on the item.[75]
8. If UII Construct #2 is used, the enterprise must maintain the data element containing the original part number or lot or batch number on the item for the life of the item. For example, when using TEI UID for a UII Construct #2 (i.e., the original part number or lot or batch number is contained within the data element), the TEI UID data element must be maintained on the item for the life of the item.

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[67] Enterprise identifiers that are assigned by GS1 contain the IAC prefix. The IAC for the data qualifiers 3V, 18V, 25S, EUC and UID need not be derived because it is contained in each data element. The IAC should not be repeated when forming the concatenated UII.

[68] The enterprise identifier in the UII is the entity that is responsible for compliance with the UII rules. An entity cannot commit another entity to that responsibility without authority. The fundamental principle is: Never use another entity's enterprise identifier in the UII without permission or direction from the competent authority for that enterprise identifier.

[69] An encoded string may contain the component data elements in any order. The ordering of the elements into a valid UII is done after the decoding of the symbol.

[70] See footnote 67.

[71] See footnote 68.

[72] Original part numbers and lot or batch numbers are mutually exclusive in the UII. In order to avoid ambiguity, only one of those three types of original numbers may appear in the UII. For serialization within the part number, use only the original part number in the UII. For serialization within the lot or batch number, use only the lot or batch number in the UII.

[73] See footnote 67.

[74] See the *DoD Guide to Uniquely Identifying Items (Table 3)* for a list of IACs.

[75] See the *DoD Guide to Uniquely Identifying Items (Appendix D)* for more details on these data qualifiers.

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 number or lot or batch number (for UII Construct #2).
10. The enterprise is responsible for ensuring that the original part number is not duplicated within the enterprise and that the combination of the original part number and the serial number is unique within the enterprise. If the lot or batch number is used to create the UII then the combination of the lot or batch number and the serial number must be unique 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 used in the UII identifies the enterprise that assigned the UII to the item. The UII machine-readable code shall not contain more than one enterprise identifier if ambiguity in constructing the UII would result.
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, provided that (1) all data elements contained in the mark or media are properly identified with a data qualifier, (2) the added data elements do not introduce ambiguity in the concatenation of the UII, and (3) the added data elements do not violate other business rules stated herein. Single data elements that are sufficient to derive UIIs (i.e., 18S, 25S, UID , UST , USN , and DoD recognized IUID equivalents) shall always be interpreted as the UII regardless of any apparent ambiguity introduced by additional data elements in the symbol. The UII data elements should appear first in the sequence.
14. The UII component data elements or single data element[76] and additional data elements shall be contained in a Data Matrix ECC 200 symbol, as required by the latest revision of MIL-STD-130.[77] Data may also be contained in human-readable information and/or 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 conform to the permanency and legibility requirements of MIL-STD-130 for the normal life expectancy of the item.
15. Where space is available, human-readable information for UII data elements should be marked on the item.
16. The Data Matrix ECC 200 symbol shall utilize DoD-accepted syntax[78].
17. There are identification numbers used in the commercial sector that are DoD recognized IUID equivalents. IUID equivalents shall comply with the IUID Business Rule #14 for minimum data carrier requirements.[79]

[76] DI 25S, TEI UID and the DoD recognized IUID equivalents contain the complete UII in a single data element. DI 18S, TEI USN and TEI UST are sufficient to derive the UII from a single data element by adding the IAC prefix for CAGE (D).
[77] See *MIL-STD-130* for additional information on DoD-approved data carriers.
[78] ISO/IEC International Standard 15434, Information Technology–Syntax for High Capacity Automatic Data Capture Media.

Parent-Child Relationships

18. DFARS 211.274-2(a)(4) requires the item 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 a higher assembly, intermediate component or subassembly that is itself DoD serially managed.

Metadata Requirements

19. The concatenated UII is a non-parsable field, not to exceed 50 characters in length (excludes overhead characters). Overhead characters in the data string, such as syntax and data qualifiers, are not part of the concatenated UII and are eliminated when the concatenated UII is constructed. The source protocols for specific data qualifiers may be more restrictive than the allowable field lengths of these rules. Refer to ANS MH 10.8.2 for AIs and DIs, and to ATA CSDD for TEIs, for specific limitations on field lengths and usage.[80]
    - The IAC string of characters shall not exceed 3 characters.
    - The enterprise identifier string of characters shall not exceed 13 characters, excluding the data qualifier.
    - The original part number or lot or batch number string of characters (including special characters) shall not exceed 32 characters, excluding the data qualifier.
    - The serial number string of characters (including special characters) will not exceed 30 characters, excluding the data qualifier.[81]
    - The sum of the maximum number of characters for possible concatenated UII data elements exceeds 50 characters. In order to meet the overall length limitation of 50 characters for the concatenated UII, it may be necessary to use field lengths for original part numbers, lot or batch numbers and serial numbers that are shorter than the maximum allowable field lengths for the individual data elements.
20. The concatenated UII 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

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[79] See the *DoD Guide to Uniquely Identifying Items (Chapter 4)* for a list of approved DoD recognized IUID equivalents.

[80] For example, serial number strings are not to exceed 30 characters however TEI SER is limited to 15 characters in accordance with the ATA CSDD.

[81] Leading zeroes in serial numbers are significant characters in the serial number string and in the concatenated UII. Avoiding the use of leading zeroes when creating serial numbers may preclude errors in data entry or data processing applications that do not recognize significant leading zeroes.

- All special characters, except for dashes (-) and forward slashes (/) will be deleted from the original part number, lot or batch 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 "/"[82]

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 other AIT media are present, these can be used in a backup mode to derive the UII or query the IUID Registry. If only 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. Prior to derivation of UIIs from backup information the existence of a UII shall be checked by querying the IUID Registry for confirmation of the UII using any identifiable information already marked on the item.
24. Discovery of a duplicate concatenated UII will occur when an attempt is made 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. Once the concatenated UII is derived, it shall not be parsed to determine the original elements.
26. A database containing information on IUID items shall be capable of using the concatenated UII or, for a legacy database, the combination of the UII component data elements or other physically marked data associated to the UII in the IUID Registry to retrieve the data record associated with the item represented by the concatenated UII.

Using the Unique Item Identifier

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

[82] The basic character set for Data Identifiers (MH10.8.2) does not include special characters, unless individually specified for a data identifier, or unless the application prescribes an expanded character set. For application in IUID the use of dashes (-) and slashes (/) is permitted in DIs as significant characters for part numbers, lot or batch numbers, and serial numbers, and in DIs that are composed from these numbers (i.e., S, 18S, 25S, 1P, 30P, 1T and 30T). Dashes and slashes may not be used as separators between component parts in a single data element that is formed from component parts. Free text formats, if used for additional data, are the responsibility of the user. AIT devices generally support ASCII and extended ASCII for encoding and decoding Data Matrix, while database applications may vary greatly.

Items in Operational Use or in Inventory

These rules apply in addition to Business Rules #1-#27.

28. Election to use or not use the existing part number and/or existing serial number as part of the UII for a legacy item is the responsibility of the enterprise assigning the UII[83], as is the responsibility for the uniqueness of the resulting UII within its EID.

29. Other than EID, legacy items may use the existing marked data elements in the format of either Construct #1 or #2, or using a DoD recognized IUID equivalent provided that:

    - Regardless of enterprise identification in existing marks, the enterprise identifier of the entity that is responsible for assigning the UII and ensuring its uniqueness shall be used.
    - The serial number used in the UII complies with Business Rule #9. If the existing serial number is missing or does not ensure uniqueness of the UII, the enterprise shall assign a serial number for the UII that complies with Business Rule #9.
    - The original part number or lot or batch number, if it is used in the UII, complies with Business Rule #10. If the original part number or lot or batch number is missing, cannot be determined or does not comply with Business Rule #10, obtain a part, lot or batch number for the UII from the in-service engineer or other appropriate authority. (See Business Rule #30)
    - The original equipment manufacturer (OEM) enterprise identifier and manufacturer assigned serial number, if marked on the item and not a part of the UII, shall be registered in the IUID Registry.

30. If the original part number or lot or batch number cannot be precisely determined, use the following method for establishing an original part number or lot or batch number for the purposes of building the concatenated Construct #2 UII:

    - First, use the part, lot or batch number at the time of acquisition, if it can be determined.
    - Second, use the part, lot or batch number marked on the part at the time the UII is created.

    Although this may result in the current part number or lot or batch number being used as the original part number or lot or batch number, the data qualifier for the UII data element must be the original part number or lot or batch number (i.e., 1P, PNO, 1T, LTN, LOT or BII). If the lot or batch number is used to create the UII then the combination of the lot number and serial number or batch number and serial number must be unique within the enterprise. See Business Rule #10.

[83] The EID used in marking a legacy item must be the EID of the entity assigning and registering the UII of the item.

31. If the item is unidentifiable[84], a concatenated UII should not be assigned.
32. For an on-going contract that 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 shall specify the extent to which IUID Business Rules for items in operational use or in inventory apply.

Items Considered Tangible Personal Property Owned by the Government in the Possession of a Contractor that Have Not Been Previously Marked

These rules apply in addition to Business Rules #1-#32.

33. A concatenated UII shall 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.
34. 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 the contractor's enterprise identifier.
35. 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.[85]
36. 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 Business Rules 33-35.
37. Tangible personal property items owned by the Government in the possession of a contractor also require markings or labels indicating Government ownership.

[84] The available information (or information that can be reconstructed) must be sufficient to identify an item and its essential data, including the part identity and configuration status, and any other factors relevant to the serviceability of the item.

[85] For instructions on assignment of virtual UIIs, see the latest version of the *DoD Guidelines for the Virtual Unique Item Identifier*, available at http://www.acq.osd.mil/dpap/pdi/uid/guides.html.

Appendix D - The Mechanics of Item Unique Identification

STRUCTURING THE DATA ELEMENTS FOR ITEM UNIQUE IDENTIFICATION

This Appendix explains how data elements are correctly 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 GS1[86] Application Identifiers (Tables 8 and 9). The historic use of Air Transport Association Common Support Data Dictionary Text Element Identifiers (TEIs) is discussed and examples using TEIs are presented (Tables 10, 11 and 12).

Semantics

For the unique item identifier (UII) data elements to be "machine-readable" by an 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[87] have to define each data element placed on the item. Specific data qualifiers are used to indicate to the AIT devices whether to derive the unique item identifier by using Construct #1, Construct #2, a single data element, or an IUID Equivalent. Table 5 shows the different data qualifiers for each of the data elements that are used for determining uniqueness.

[86] Formerly EAN.UCC.

[87] There are three types of data qualifiers being used: Data Identifiers (DIs) (Format Indicator 06), Application Identifiers (AIs) (Format Indicator 05), and, within the aerospace industry, Text Element Identifiers (TEIs) (Format Indicator 12, formerly DD). ISO/IEC International Standard 15418, Information Technology–EAN/UCC Application Identifiers and FACT 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 format indicators for using DIs, AIs and TEIs in syntax encoding.

Data Element	DI (ISO/IEC 15418) Format Indicator 06	AI (ISO/IEC 15418) Format Indicator 05	TEI (ATA CSDD) Format Indicator 12
Enterprise Identifier			
CAGE/NCAGE	**17V**	**-**	**MFR [89], SPL [90] or CAG**
DUNS	**12V**	**-**	**DUN**
GS1 Company Prefix	**3V**	**-**	**EUC**
DoDAAC	**7L**	**-**	**-**
Other Agencies	**18V[88]**	**-**	**-**
Serial Number within Enterprise Identifier	**-**	**-**	**SER [91] or UCN [92]**
Serial Number within Original Part Number (or Serial Number within Lot/Batch Number)	**S**	**21[93]**	**SEQ**
Original Part Number	**1P**	**01[94]**	**PNO**
Lot/Batch Number	**1T**	**-**	**LOT , LTN or BII [95]**
IUID using a Single Data Qualifier			
Complete UII	**25S[97]**	**-**	**UID**
CAGE + Serial Number within CAGE (does not contain the IAC)	**18S[98]**	**-**	**USN or UST**
IUID Equivalents			
VIN	**I[99]**	**-**	**-**
ESN[96]	**22S**	**8002**	**-**
GRAI		**8003[100]**	**-**
GIAI		**8004[101]**	**-**
Current Part Number (additional data element—not used in UII)[102]	**30P**	**240**	**PNR**
Lot/Batch Number (additional data element—not used in UII)[103]	**30T**	**-**	**-**

Table 5. Data Qualifiers for IUID Usage

[88] Data identifier 18V – the concatenation of the Issuing Agency Code (IAC) + Enterprise Identifier (EID). This data identifier would be used for EIDs, which were assigned by an issuing agency, having a registered IAC, that is not listed in this table.

[89] MFR – Manufacturer CAGE Code. Identifies the manufacturer, government agency or other organization controlling the design and the part number assignment of the subject part.

Syntax

The machine-readable symbology for UII is the Data Matrix ECC 200 (ISO/IEC 16022), which uses Reed-Solomon error correction. The symbol 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[104] Media—the "syntax."[105] Each data string is assembled beginning with a message header consisting of the compliance indicator

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[90] SPL – Supplier CAGE Code. Identifies the organization creating the UII, where the organization is not the manufacturer, government agency, or other organization controlling the design of the serialized component.

[91] SER – Part Serial Number (Serial Number within Enterprise). The SER is the manufacturer's serialized identity for an individual part, component or component end item.

[92] UCN – Unique Component Identification Number. The UCN is the permanent tracking identity assigned to an in-service part by an organization other than the manufacturer, government agency or other organization controlling the design of the subject part and used in lieu of the manufacturer's serial number.

[93] Serial number within the Global Trade Item Identification Number (GTIN™). When using the GS1 System to replicate construct #2, enterprises must use serialization within the GTIN™.

[94] GTIN™ is the 14-character identifier which uniquely identifies the company (enterprise) and its product (part number).

[95] LOT , LTN and BII . LOT – Lot Number, is a lot number that *is not* unique within the Enterprise Identifier but is unique within the Original Part Number (PNO). LTN – Enterprise Lot Number, is a lot number that *is* unique within the Enterprise Identifier. BII – Batch Item Identifier, is a subdivision of an LTN .

[96] ESN is a cellular mobile telephone Electronic Serial Number.

[97] 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 serialization within the enterprise.

[98] 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 data element does not contain the IAC, which must be added in decoding to form a concatenated UII using serialization within the enterprise.

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

[100] AI 8003 identifies a Global Returnable Asset Identifier (GRAI).

[101] AI 8004 is the application identifier for the Global Individual Asset Identifier (GIAI). The GIAI is up to 30 characters and is a combination of the GS1 Company Prefix and an Individual Asset Reference, which is assigned by the holder of the GS1 Company Prefix. A serialized Global Trade Identification Number (GTIN™) may also be converted to a GIAI using GS1 procedures.

[102] DI 30P 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-130). Use 1P when original part number *is* part of the UII.

[103] DI 30T lot/batch 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-130). Use 1T when lot/batch number *is* part of the UII.

[104] ADC – Automatic Data Capture.

[105] 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.

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 indicator to identify the semantics of the formatted data elements. The format indicator, 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 item identifier.

Figures 6, 7 and 8 show how the concatenated UII is constructed within Format Indicators 05, 06 and 12 with the various data qualifiers. Conformance to the syntax and semantics requirements is crucial to item unique identification, since the process of encoding, decoding, identifying and concatenating the data elements must be unambiguous[106].

[106] The enterprise identifier used in the UII identifies the enterprise that assigned the UII to the item. The UII machine-readable code shall not contain more than one enterprise identifier if ambiguity in constructing the UII would result. Data elements in addition to those required to construct the UII are permitted unless ambiguity in constructing the UII would result. See Business Rules #12 and #13 in Appendix C.

	Required Application Identifiers	**Resultant Concatenated UII**
Construct 1—Serialization within the enterprise		
Use an IUID Equivalent if appropriate ***Otherwise use Format Indicator 06 (see Figure 7) or Format Indicator 12 (see Figure 8)***	—	—
Construct 2—Serialization within the original part number or lot or batch number		
Serialization within the original part number[107] ***Or use an IUID Equivalent if appropriate*** ***Otherwise use Format Indicator 06 (see Figure 7) or Format Indicator 12 (see Figure 8)***	**01 & 21**	**<01> + <21>**
IUID Equivalents		
VIN **ESN** **GRAI** **GIAI**	***Use Format Indicator 06 (see Figure 7)*** **8002** **8003** **8004**	 **<8002>**[108] **<8003>** **<8004>**

Figure 6. Concatenated Unique Item Identifier (UII) Construction for Application Identifiers (Format Indicator 05)

[107] When using the GS1 System to replicate construct #2, enterprises must use serialization within the GTIN™.

[108] The enclosure of the Application Identifier in angle brackets, e.g. **<8002>**, is the notation used to indicate the value (character string) associated with the data qualifier.

	Required Data Identifiers	**Resultant Concatenated UII**
Construct 1—Serialization within the enterprise		
Complete UII	**25S**	**<25S>**[109]
CAGE + Serial Number within CAGE (does not contain the IAC)	**18S**	**D + <18S>**
Construct 2—Serialization within the original part number or lot or batch number		
Serialization within the original part number	**17V, 1P & S** **12V, 1P & S** **3V, 1P & S** **7L, 1P & S** **18V, 1P & S**	**D + <17V> + <1P> + <S>** **UN + <12V> + <1P> + <S>** **<3V> + <1P> + <S>** **LD + <7L> + <1P> + <S>** **<18V> + <1P> + <S>**
Serialization within the lot or batch number	**17V, 1T & S** **12V, 1T & S** **3V, 1T & S** **7L, 1T & S** **18V, 1T & S**	**D + <17V> + <1T> + <S>** **UN + <12V> + <1T> + <S>** **<3V> + <1T> + <S>** **LD + <7L> + <1T> + <S>** **<18V> + <1T> + <S>**
IUID Equivalents		
VIN	**I**	**<I>**
ESN	**22S**	**<22S>**
GRAI	***Use Format Indicator 05 (see Figure 6)***	
GIAI	***Use Format Indicator 05 (see Figure 6)***	

Figure 7. Concatenated Unique Item Identifier (UII) Construction for Data Identifiers (Format Indicator 06)

[109] The enclosure of the Data Identifier in angle brackets, e.g. **<25S>**, is the notation used to indicate the value (character string) associated with the data qualifier.

	Required Text Element Identifiers	**Resultant Concatenated UII**
Construct 1—Serialization within the enterprise		
Serialization within the enterprise (component data elements)	**MFR & SER** **SPL & UCN** **CAG & SER** **CAG & UCN** **DUN & SER** **DUN & UCN** **EUC & SER** **EUC & UCN**	**D + <MFR >**[110] **+ <SER >** **D + <SPL > + <UCN >** **D + <CAG > + <SER >** **D + <CAG > + <UCN >** **UN + <DUN > + <SER >** **UN + <DUN > + <UCN >** **<EUC > + <SER >** **<EUC > + <UCN >**
Complete UII	**UID**	**<UID >**
CAGE + Serial Number within CAGE (does not contain the IAC)	**USN** **UST**	**D + <USN >** **D + <UST >**
Construct 2—Serialization within the original part number or lot or batch number		
Serialization within the original part number	**MFR , PNO & SEQ** **SPL , PNO & SEQ** **CAG , PNO & SEQ** **DUN , PNO & SEQ** **EUC , PNO & SEQ**	**D + <MFR > + <PNO > + <SEQ >** **D + <SPL > + <PNO > + <SEQ >** **D + <CAG > + <PNO > + <SEQ >** **UN + <DUN > + <PNO > + <SEQ >** **<EUC > + <PNO > + <SEQ >**
Serialization within the lot or batch number	**MFR , LOT & SEQ** **SPL , LOT & SEQ** **CAG , LOT & SEQ** **DUN , LOT & SEQ** **EUC , LOT & SEQ** ***Use LTN or BII in place of LOT if appropriate.***	**D + <MFR > + <LOT > + <SEQ >** **D + <SPL > + <LOT > + <SEQ >** **D + <CAG > + <LOT > + <SEQ >** **UN + <DUN > + <LOT > + <SEQ >** **<EUC > + <LOT > + <SEQ >** ***Use LTN or BII in place of LOT if appropriate.***
Complete UII	**UID**	**<UID >**
IUID Equivalents		
VIN	***Use Format Indicator 06 (see Figure 7)***	—
ESN	***Use Format Indicator 05 (see Figure 6) or Format Indicator 06 (see Figure 7)***	
GRAI	***Use Format Indicator 05 (see Figure 6)***	
GIAI	***Use Format Indicator 05 (see Figure 6)***	

Figure 8. Concatenated Unique Item Identifier (UII) Construction for Text Element Identifiers (Format Indicator 12)

[110] The enclosure of the Text Element Identifier in angle brackets, e.g. **<MFR >**, is the notation used to indicate the value (character string) associated with the data qualifier.

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 two examples 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 Indicator 06	Data Element Value	Encoded Data Element on AIT Media
Complete UII	**25S**	**UN077991289 674A36458**	**25SUN077991289674 A36458**
CAGE + Serial Number within CAGE (does not contain the IAC)	**18S**	**0CVA5674A3 6458**	**18S0CVA5674A36458**

Table 6. Examples of the Use of Data Identifiers in Construct #1 Serialization within the Enterprise (Format Indicator 06 of ISO/IEC 15434)

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

[)>$^{R}_{S}$06$^{G}_{S}$25SUN077991289674A36458$^{R}_{S}^{E}_{T}$

or

[)>$^{R}_{S}$06$^{G}_{S}$18S0CVA5674A36458$^{R}_{S}^{E}_{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

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 complete UII (IAC + Enterprise Identifier + Serial Number)

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

18S = Data Identifier for CAGE + Serial Number within CAGE (does not contain the IAC)

0CVA5674A36458 = CAGE + Serial Number within CAGE (does not contain the IAC)—As defined by the data identifier 18S (CAGE Enterprise Identifier (0CVA5) and the Serial Number (674A36458))

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

When the AIT device reads the data qualifier for the enterprise identifier, it must have what agency (that is, the Issuing Agency Code) issued the enterprise identifier available in its software. The AIT device can then attach the Issuing Agency Code (IAC) to the beginning of the UII concatenation.

When the AIT device reads the data qualifier for 25S, it will recognize that the data following the 25S is a complete 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 a CAGE + Serial Number within CAGE (does not contain the IAC) for Construct #1 and will insert the IAC for CAGE (D) to form the concatenated UII.

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

Construct #2 – Serialization within the Original Part Number or Lot or Batch Number. Tables 7 and 8 show examples 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 Indicator 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 Serialization within the Original Part Number (Format Indicator 06 of ISO/IEC 15434)

The UII data elements may be encoded in any order. In this example the UII data elements would be encoded as follows using Format Indicator 06 for Data Identifiers of the ISO/IEC 15434 syntax:

[)>$^{R}_{S}$06$^{G}_{S}$12V077991289$^{G}_{S}$1P4202435$^{G}_{S}$S10936 $^{R}_{S}$ ^{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

06 = A Format Header which indicates Data Identifiers are being used

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

12V = Data Identifier for DUNS Code

077991289 = DUNS Code

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

4202435 = Original Part Number

S = Data Identifier for Serial Number

10936 = Serial Number within original part number

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

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

The UII data elements would be concatenated in the order Issuing Agency Code/Enterprise Identifier/Original Part Number/Serial Number. For this example using ANS MH 10 Data Identifiers in Format Indicator 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 **UN077991289420243510936**.

Data Element	Data Identifier Format Indicator 06	Data Element Value	Encoded Data Element on AIT Media
Enterprise Identifier • **DUNS**	**12V**	**077991289**	**12V077991289**
Lot Number	**1T**	**AA20070230**	**1TAA20070230**
Serial Number within Lot Number	**S**	**6109**	**S6109**

Table 8. Example of the Use of Data Identifiers in Construct #2 Serialization within the Lot Number (Format Indicator 06 of ISO/IEC 15434)

If serialization within the lot or batch number is used then the lot or batch number is used in place of the original part number to construct the UII. The UII data elements would be concatenated in the order Issuing Agency Code/Enterprise Identifier/Lot or Batch Number/Serial Number. The UII data elements would be encoded as follows using Format Indicator 06 for Data Identifiers of the ISO/IEC 15434 syntax:

[)>$^{R}_{S}$06$^{G}_{S}$12V077991289$^{G}_{S}$1TAA20070230$^{G}_{S}$ S6109 $^{R}_{S}$ ^{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

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

1T = Data Identifier for Lot Number assigned by supplier

AA20070230 = Lot Number

S = Data Identifier for Serial Number

6109 = Serial Number within lot number

$^{E}\mathbf{o}_{T}$ = 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 Dun & Bradstreet is “UN”.

For this example using ANS MH 10 Data Identifiers in Format Indicator 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 **UN077991289AA200702306109**.

Using GS1 Application Identifiers

Construct #1 – Serialization within the Enterprise Identifier. When using GS1[111] Application Identifiers for purposes of item unique identification, enterprises must use the General GS1 Specifications and the Guidelines for Department of Defense Unique Identification Markings Using the GS1 System[112] to construct the DoD recognized IUID equivalent or the UII data elements. Serialization within the enterprise identifier requires the use of a DoD recognized IUID equivalent. Subsequent pages include examples of DoD recognized IUID equivalents using application identifiers.

Construct #2 – Serialization within the Original Part Number or Lot or Batch Number. When using the GS1 System to replicate construct #2, enterprises must use serialization within the Global Trade Item Identification Number (GTIN™). The GTIN™ is the 14-character identifier which uniquely identifies the company (enterprise) and its product (part number). When properly associated with a serial number, a globally unique item identifier can be created. Table 9 shows an example of the use of AIs for UII Construct #2 when the enterprise serializes the item within the GTIN™.

Data Element	Application Identifier Format Indicator 05	Data Element Value	Encoded Data Element on AIT Media
GTIN™	**01**	**00614141999996**	**0100614141999996**
Serial number within GTIN™	**21**	**1A0B9C3D6**	**211A0B9C3D6**

Table 9. Example of the Use of Application Identifiers in Construct #2 Serialization within the GTIN™ (Format Indicator 05 of ISO/IEC 15434)

[111] Formerly EAN.UCC.

[112] See http://www.uc-council.org/ean_ucc_system/index.cfm for information about the GS1 System (formerly EAN.UCC System) and GS1 documents.

The UII data elements may be encoded in any order. In this example the UII data elements would be encoded as follows using Format Indicator 05 for Application Identifiers of the ISO/IEC 15434 syntax:

[)>$^{R}_{S}$05$^{G}_{S}$0100614141999996$^{G}_{S}$211A0B9C3D6$^{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

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 Global Trade Item Identification Number (GTIN™)

00614141999996 = GTIN™, which is composed of the GS1 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 = Serial Number within the GTIN™

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

The UII data elements would be concatenated in the order GTIN™/Serial Number. For this example using GS1 Application Identifiers in Format Indicator 05 of ISO/IEC 15434, the concatenated UII output from the AIT device, after stripping away the overhead and syntax, would be **00614141999996 1A0B9C3D6**[113].

IUID Equivalent – Global Individual Asset Identifier (GIAI) using the Individual Asset Reference Number. When using GS1[114] Application Identifiers for purposes of item unique identification, enterprises must use the General GS1 Specifications and the Guidelines for Department of Defense Unique Identification Markings Using the GS1 System[115] to construct the DoD recognized IUID equivalent or the UII data elements. Table 10 shows an example of the use of application identifiers in the context of the General GS1 Specifications for a GIAI using the Individual Asset Reference Number.

[113] Since the IAC is the first digit of the Company Prefix, it is not necessary to add it in forming the concatenated UII.
[114] Formerly EAN.UCC.
[115] See http://www.uc-council.org/ean_ucc_system/index.cfm for information about the GS1 System (formerly EAN.UCC System) and GS1 documents.

Data Element	Application Identifier Format Indicator 05	Data Element Value	Encoded Data Element on AIT Media
IUID Equivalent GIAI[116]	**8004**	**06141411A0B9C3D6**	**800406141411A0B9C3D6**

Table 10. Example of the Use of Application Identifiers for GIAI using the Individual Asset Reference Number (Format Indicator 05 of ISO/IEC 15434)

For item unique identification, the Global Individual Asset Identifier (GIAI) is considered by the DoD to be an IUID equivalent[117]. The data elements considered components of the IUID equivalent (i.e., GS1 Company Prefix, Individual Asset Reference Number) are not required to be marked on the item, unless specifically required by the contract.[118]

Using the General GS1 Specifications, the minimum DoD IUID equivalent data elements would be encoded as follows under Format Indicator 05 of the ISO/IEC 15434 syntax for Application Identifiers:

[)>$^{R}_{S}$05$^{G}_{S}$ 800406141411A0B9C3D6 $^{R}_{S}$ ^{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

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 GS1 Company Prefix including the IAC as the leading character **(0614141)** and the Individual Asset Reference Number **(1A0B9C3D6)**

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

[116] Within the General GS1 Specifications, the Global Individual Asset Identifier (GIAI) is considered a DoD recognized IUID equivalent. The application identifier (8004) indicates that the data field contains a GIAI. The GIAI is made up of the GS1 Company Prefix and an individual asset reference number. The holder of the GS1 Company Prefix determines the structure and numbering of the individual asset reference number.

[117] A DoD recognized IUID equivalent means an item unique identification method that is in commercial use and has been recognized by DoD.

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

For this example using Application Identifiers in Format Indicator 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**[119].

IUID Equivalent – Global Individual Asset Identifier (GIAI) using the Serialized Global Trade Item Number (GTIN™). Table 11 shows an example of the use of application identifiers in the context of the General GS1 Specifications for a GIAI using the Serialized GTIN™. The Application Identifier 8004 is also used for this construct but the composition of the data element value must be derived from the Global Trade Item Number (GTIN™) and a serial number. The General GS1 Specifications provide information on the GTIN™ and the method for creating the GIAI is described in the Guidelines for Department of Defense Unique Identification Markings Using the GS1 System.[120] In this construct, the GTIN™ is the 14-character identifier which uniquely identifies the company (enterprise) and its product (part number). When properly associated with a serial number, a globally unique item identifier can be created.

Data Element	Application Identifier Format Indicator 05	Data Element Value	Encoded Data Element on AIT Media
IUID Equivalent GIAI[121]	**8004**	**061414100332411A0B 9C3D6**	**8004061414100332411A0B 9C3D6**

Table 11. Example of the Use of Application Identifiers for GIAI using the Serialized GTIN™ (Format Indicator 05 of ISO/IEC 15434)

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

[120] See http://www.uc-council.org/ean_ucc_system/index.cfm for information about the GS1 System (formerly EAN.UCC System) and GS1 documents.

[121] Within the General GS1 Specifications, the Global Individual Asset Identifier (GIAI) is considered a DoD recognized IUID equivalent. The application identifier (8004) indicates that the data field contains a GIAI. The GIAI is made up of the GS1 Company Prefix and an individual asset reference number. The holder of the GS1 Company Prefix determines the structure and numbering of the individual asset reference number.

Using the General GS1 Specifications, the minimum UII data elements would be encoded as follows under Format Indicator 05 of the ISO/IEC 15434 syntax for Application Identifiers:

[)>$^{R}_{S}$05$^{G}_{S}$ 800406141410033241 1A0B9C3D6 $^{R}_{S}$ ^{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

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)

061414100332411A0B9C3D6 = GIAI, which is derived by a two-step method of modifying the GTIN™ **(10614141003324)** to create a new data element **(06141410033241)**[122] and concatenating a serial number **(1A0B9C3D6)** with the new data element.

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

For this example using Application Identifiers in Format Indicator 05 of ISO/IEC 15434, the concatenated UII output from the AIT device, stripping away the overhead and syntax would be **061414100332411A0B9C3D6**[123].

[122] The new data element is created by moving the first character of the GTIN™ to the last position of the GTIN™.

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

Historic Use of Text Element Identifiers

Text Element Identifiers (TEIs)[124] are the preferred approach of the aerospace industry. The aerospace industry uses CAGE Code (TEI = MFR)[125] 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 item 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 moved TEIs into broader multi-industry use, they determined a need to establish 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 (TEI = PNR)[126]. 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 collaborative solution was established to enable the use of text element identifiers (TEIs) selected from the ATA CSDD using the syntax of ISO/IEC 15434 until such time as the International Organization for Standardization could consider a new format indicator in ISO/IEC 15434 to support TEIs. In the interim DoD recognized "DD" as the format indicator for TEIs thereby permitting use of ISO/IEC 15434 as the IUID syntax standard.[127] DoD also recognized selected TEIs for IUID

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

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

[126] 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 original part number).

[127] ISO/IEC 15434, Syntax for High Capacity ADC Media, specifies a two-digit format indicator. All two-digit numbers (00-99) are assigned or reserved for future use. This means that a format indicator for text

usage from the ATA Common Support Data Dictionary (CSDD) and new TEIs that were proposed to support IUID. In addition, in support of the collaborative solution, the Air Transport Association (ATA) Spec 2000 International Coordinating Group approved the use of ISO/IEC 15434 syntax with TEIs as an alternative item marking method.

Since that time the International Organization for Standardization has added a new format indicator, "12", in ISO/IEC 15434 to support TEIs. The new format indicator "12" has replaced the interim format indicator "DD" previously prescribed in this guidance. Items that have been marked with the format indicator "DD" do not have to be re-marked but further use of "DD" is not permitted. Also, the TEIs that were proposed for IUID usage have been approved and incorporated into the ATA CSDD by the Air Transport Association.

Using Text Element Identifiers

Construct #1 – Serialization within the Enterprise Identifier by Manufacturer. Table 12 shows an example of the use of TEIs for UII Construct #1 when the manufacturer serializes the item.

Data Element	TEIs[128]	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 12. Example of the Use of TEIs for UII Construct #1, Manufacturer Serialization (Format Indicator 12 of ISO/IEC 15434)

element identifiers of the collaborative solution could not be assigned a two-digit number without ISO approval. To enable the collaborative solution utilizing the ISO/IEC 15434 syntax, the Department specified a special DoD-specific format indicator, designated as "DD", to indicate TEIs were being used in the collaborative solution.

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

The UII data elements may be encoded in any order. In this example the UII data elements would be encoded as follows using Format Indicator 12 for TEIs utilizing the ISO/IEC 15434 syntax:

[)>$^{R}_{S}$12$^{G}_{S}$MFR 0CVA5$^{G}_{S}$SER 674A36458$^{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

12 = A Format Header which indicates Text Element Identifiers are being used

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

MFR = TEI for Manufacturer CAGE code

0CVA5= CAGE Code

SER = TEI for Serial Number within the Enterprise Identifier

674A36458 = Serial Number within Enterprise Identifier

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

When the AIT device reads the data qualifier for the enterprise identifier, it will have what agency (that is, the Issuing Agency Code) issued the enterprise identifier available in its software. The AIT device can then attach the Issuing Agency Code (IAC) to the beginning of the UII concatenation. In this example the IAC for CAGE is “D”.

The UII data elements would be concatenated in the order Issuing Agency Code/Enterprise Identifier/Serial Number. For this example using Format Indicator 12 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**.

Construct #1 – Serialization within the Enterprise by an Organization other than the Manufacturer. Table 13 shows an example of the use of TEIs for UII Construct #1 when serialization is done by an organization other than the manufacturer of the item.

Data Element	TEIs[129]	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 13. Example of the Use of TEIs for UII Construct #1, Enterprise other than Manufacturer (Format Indicator 12 of ISO/IEC 15434)

The UII data elements may be encoded in any order. In this example the UII data elements would be encoded as follows using Format Indicator 12 for TEIs utilizing the ISO/IEC 15434 syntax:

[)>$^{R}_{S}$12$^{G}_{S}$SPL 0F3N5$^{G}_{S}$UCN 10936$^{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

12 = A Format Header which indicates Text Element Identifiers are being used

$^{G}_{S}$ = 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

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

attach the Issuing Agency Code (IAC) to the beginning of the UII concatenation. In this example the IAC for CAGE is "D".

The UII data elements would be concatenated in the order Issuing Agency Code/Enterprise Identifier/Serial Number. For this example using Format Indicator 12 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**.

Construct #2 – Serialization within the Original Part Number or Lot or Batch Number. Table 14 shows an example of the use of TEIs for UII Construct #2 when the manufacturer serializes the item within the original part number, PNO .[130]

Data Element	TEIs[131]	Data Element Value	Encoded Data Element on AIT Media
Enterprise Identifier • **CAGE**	**CAG**[132]	**0CVA5**	**CAG 0CVA5**
Original Part Number	**PNO**	**4202435**	**PNO 4202435**
Serial Number within Original Part Number	**SEQ**	**674A36458**	**SEQ 674A36458**

Table 14. Example of the Use of TEIs for UII Construct #2, Serialization within the Original Part Number (Format Indicator 12 of ISO/IEC 15434)

The UII data elements may be encoded in any order. In this example the UII data elements would be encoded as follows using Format Indicator 12 for TEIs utilizing the ISO/IEC 15434 syntax:

[)>$^{R}_{S}$12$^{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

12 = A Format Header which indicates Text Element Identifiers are being used

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

CAG = TEI for Manufacturer CAGE code

[130] An enterprise that serializes within lot or batch number would use LOT , LTN , or BII , as appropriate, in place of PNO .
[131] All TEIs are four characters in length, consisting of three uppercase letters followed by a space.
[132] The TEI of MFR may also be used to designate the manufacturer.

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

$^{E}\mathbf{o}_{T}$ = 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".

The UII data elements would be concatenated in the order Issuing Agency Code/Enterprise Identifier/Original Part Number/Serial Number. For this example using Format Indicator 12 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 Standards Institute
ANSI/EIA	American National Standards Institute/Electronic Industries Alliance
ASC	Accredited Standards Committee
ATA	Air Transport Association
ATIS-0322000 Number	North American Telecommunication Industry Manufacturers, Suppliers, and Related Service Companies Number
BEA	Business Enterprise Architecture
BII	Text Element Identifier for Batch Number
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
CLIN	Contract Line Item Number
CSDD	Common Support Data Dictionary published by the ATA
D	Issuing Agency Code for CAGE Codes
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 GS1 Company Prefix
FAR	Federal Acquisition Regulation
FASAB	Federal Accounting Standards Advisory Board
FMR	DoD Financial Management Regulation
FMS	Foreign Military Sales
GAO	Government Accountability Office
GIAI	Global Individual Asset Identifier
GRAI	Global Returnable Asset Identifier
GS1	Global Commerce Standards Organization formerly known as EAN.UCC
GTIN™	Global Trade Item Number™
HIBCC	Health Industry Business Communications Council
IAC	Issuing Agency Code
ID	Identification
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
ISO/IEC 15418	Information technology—EAN/UCC Applications Identifiers and FACT Data Identifiers and Maintenance
ISO/IEC 15434	Information technology—Syntax for High Capacity ADC Media
ISO/IEC 15459-2	Information technology—Unique Identifiers—Part 2: Registration Procedures
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 ATIS-0322000Numbers
LD	Issuing Agency Code for DoDAAC Numbers
LH	Issuing Agency Code for EHIBCC Numbers
LOT	Text Element Identifier for Lot Number within the Original Part Number
LTN	Text Element Identifier for Lot Number within the Enterprise
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
SKO	Sets, kits and outfits
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