



INTRODUCTION

We welcome you to the UID Quarterly Fall 2007 Edition, brought to you by A2B Tracking Solutions as an educational service. In this issue you will find A2B's new White Paper, published here for the first time. You will also find clarification on changes to MIL-STD-130, and you will be walked through a part marking decision process for UID.

What you'll find in this issue:

UID Solutions - Read A2B's new White Paper, "Data Management Excellence – Eradicate UID Compliance Errors." Those who are charged with implementing UID on military bases and other legacy sites as well as contractors and manufacturers of end item deliverables will want to carefully weigh the evidence presented herein, in order to avoid a minefield of potential errors.

UID SOLUTIONS:

Data Management Excellence: Eradicate UID Compliance Errors With Data Management



The Situation

As IUID (item unique identification) compliance gains traction it is more important than ever to understand the role that proper data management plays in the compliance process. MIL-STD-130 and serialized item tracking are the DoD's response to the CFO Act of 1990. The standard calls for the creation of permanent Data Matrix marks on assets to ensure they can be tracked throughout their lifecycle.

IUID compliance requires several best-practice steps to ensure cradle-to-grave traceability. These steps include the creation of IUID labels and marks utilizing Construct 1, Construct 2 or the commercial equivalent, verifying the mark for quality standards, validating standards for formatting and syntax, harvesting the data and submitting the data directly to the IUID Registry or via WAWF. While those steps may seem straightforward, they represent the proverbial tip of the data management iceberg.



Opinion - Get the low down on what's new with MIL-STD-130M w/Change 1 & Verification, issued in June 2007, and the impact this new standard is likely to have on your UID process.

Vendor's Corner - Horizons Incorporated walks our readers through a decision-making process that has proven successful for those charged with UID parts marking.

UID Education - View a full schedule of UID Web Seminars, hosted by Data Capture Institute President and bar code pioneer David Collins as well as an additional UID/RFID Web Seminar series co-sponsored by epcSolutions and A2B Tracking.

News and Updates from A2B Tracking - Find out what has been happening at A2B.

Understanding the management of the data behind the compliance process is paramount to avoiding costly and time consuming errors that can result in noncompliance. In this White Paper we intend to point out the errors that result from improper data management, as reported by the IUID Program Office. In addition we will make the case for employing a software suite that has been developed specifically for proper IUID data management.

Those who are charged with implementing IUID on military bases and other legacy sites as well as contractors and manufacturers of end item deliverables will want to weigh carefully the evidence presented herein, in order to avoid a minefield of potential errors.

The Problems with Non-Conforming Systems

When well intentioned personnel decide to build IUID solutions internally, or to piece together partial solutions, they run numerous risks. For example, non conforming or incomplete systems can and often do produce duplicate IUIDs, non-conforming data and miss-marked, laser etched or dot peened data that is impossible to remove.

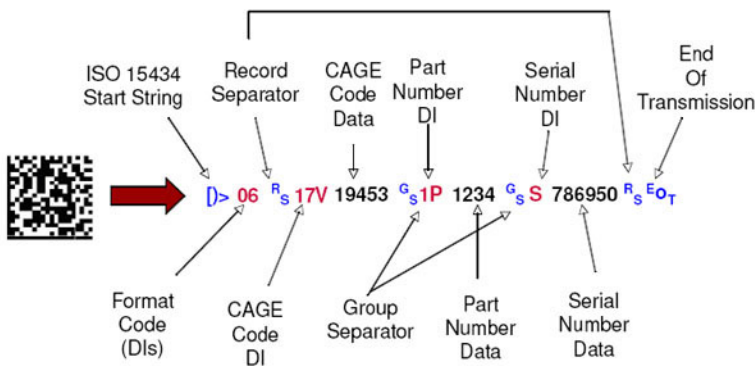
A review of common Registry submission errors highlights problems with managing data ranging from erroneous inclusion of text element identifiers (TEIs) in ULLs, to

incorrect use of part and serial numbers, to typos in pedigree fields, resulting in the inability to link the pedigree with the IUID.

Going it alone can prove costly indeed! Items that are incorrectly marked are akin to having an incorrect Social Security Number. As we all know, an incorrect or stolen Social Security Number results in loss of identity with resulting inability to collect Social Security and other benefits. It is essential that the data in the IUID are consistent and accurate per the call out of the ISO standard. An error in marking, which can occur for numerous reasons, means that the marked asset will never match the database. Moreover incorrectly marked assets cannot be associated with pedigree data. In other words, an incorrect UID equals an incorrect pedigree.

What Can Go Wrong

1. Items must receive a unique mark. Uniqueness requires encoding the correct data with as many as 50 alphanumeric characters. The data coding must contain the ISO 15434 start string, the format code data identifier (DI), record separators, the CAGE code DI, the CAGE code data, group separators, part number DI, part number data, serial number DI, serial number data and finally the end of transmission or EOT. Characters such as commas, dashes and ASCII code are not allowable. Creating this code is difficult; changing data within the code presents a high risk of error.
2. These unique marks must contain data that is consistent with the syntax and format of MIL-STD-130. A grocery item with a UPC code containing anything other than 13

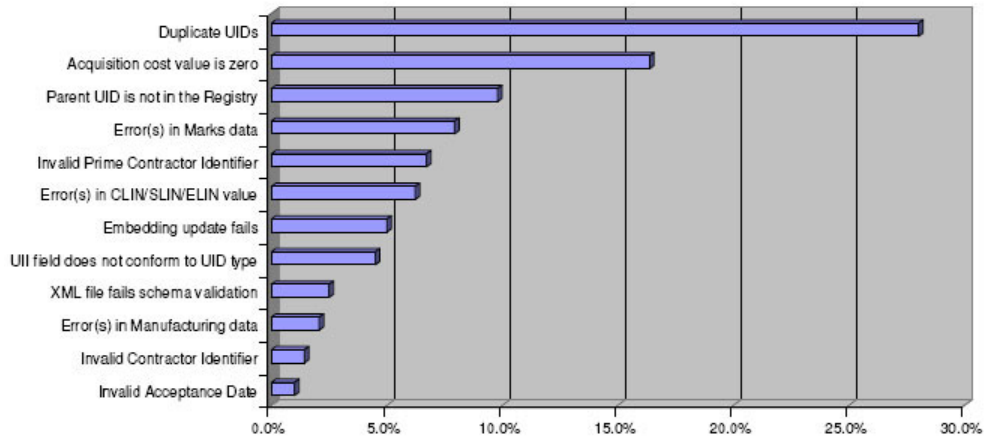


Source: DCMA WAWF/IUID Presentation - 2004

numeric characters or without the UPC standard for quality, formatting and syntax will not scan at check-out. The same is true of an IUID. Lacking standard data verification and validation provided by a data management system, many IUIDs cannot be submitted to the IUID Registry.

3. Problems also arise if data is being driven to the IUID Registry from an ERP system or a spreadsheet. As we

Top IUID Registry Submission Errors (as a % of total errors reported)



have seen previously, data must be unique and correct, but files must also be submitted in the proper format, in the correct Registry schema and they must also generate an audit trail. Once incorrect data is submitted or when data is submitted incorrectly, the mistake is difficult and time consuming to unravel. Furthermore, it may be quite some time before one learns that items have not been accepted. This creates particular headaches when contract payment and reconciliation is delayed.

4. The Registry calls for the ability to manage an IUID parent/child relationship correctly and accurately. That means IUIDs might be scanned in a configuration management-like environment, starting with an end item, progressing to its components, followed by the assemblies, the sub assemblies, and finally the lowest replaceable units (LRUs). If anything goes wrong in the IUID process, such as creation of an incorrect or duplicate mark or label resulting in incorrect IUID data, the data management process required to manage parent/child relationship information becomes impossible.

5. For legacy equipment either in use by the government or PIPC (property in possession of contractor) a Virtual UII may be registered, without marking the item directly. The registration process requires submitting the UII with a medium code of "DEFINED." Along with the UII, all the pedigree data for this item must be registered, including the serial number, part number, enterprise ID and all other elements that identify the item. In addition, the existing mark data must be registered within the mark loop in the registry XML. Virtually marked items MUST be physically marked by the custodian and the Registry must be updated when one of the following trigger events occurs: change of location from one entity to another; change in status (i.e. item taken out of service); change in program; change in organization (i.e. being returned from a contractor back to the government)

There are some serious pitfalls to avoid during a Virtual UII registration process. The first is failure to keep track of which items have been registered virtually and which are

2D mark compliant. Another is failure to track which item goes with which UII. This relationship must be maintained to ensure you are marking the appropriate item.

6. Further review of common errors, particularly with UID Construct 1 or UID Construct 2, when submitting data to the IUID Registry includes the following:

- * Omission of issuing agency code from the UII.
- * A common UII is reported for all items in a single submission or across multiple submissions, though the pedigree data is different for each item.
- * The original part number or the serial number is used as the UII instead of the full UII.
- * UIIs that contain a value that is not related to any of the pedigree fields.
- * UIIs or other pedigree fields contain typos such as omitting preceding zeros from the serial number pedigree value or from the UII, but not from both.
- * UIIs submitted when parts are not marked and there is no UII marking requirement on the procurement contract.
- * Unintentional change of the UID type of a given item to a value other than the one originally intended.

The Solution: Fail-safe UID Data Management

What those charged with UID compliance should demand is fail-safe data management. With the military's lean business practices, it is rare to find technology personnel with time on their hands and rarer still to encounter individuals who do not seek excellence.

UID is simple in concept: The item is marked, the data is harvested and that data is uploaded to a master database. That simple UID concept is a powerful tool for a lean military that operates alongside and in tandem with lean commercial enterprises. The ability to supply, replace, repair and replenish parts, just-in-time, without duplication and with total transparency is fundamental to the operation of the world's most powerful military. The efficiency afforded by UID is not a choice but an imperative, and those who support the military recognize the urgency of the UID movement.

While UID is simple in concept the back-end, if you will, of UID requires precise data management for success. There are several reasons why this is so. Start with the far flung arena where DoD assets are built and deployed – the whole world! Add to that the universe of DoD asset handlers, namely the manufactures, custodians and users who must participate in the UID process. Another consideration is the multiple industry and international quality standards and organizations that impact those who supply the military and ultimately feed into the

overall UID MIL-STD-130. And perhaps most important of all is a set of automatic identification technology (AIT) best practices, the foundation of conforming UID data management success.

One of those AIT best practices is ensuring that good data is collected and that the data remains associated with its pedigree throughout an asset's lifecycle. Given the deployment and complexity of many of the DoDs assets, the ability to employ sound data management, with filters at every step, is difficult in the extreme without a conforming data management system.

Some view the IUID Registry as a "bit bucket" where data is dumped with no practical use. Given the granular visibility available within the Registry, that would be lamentable. Movement is underfoot to evolve the Registry so that the data therein would become available for practical use, those handling logistics, configuration management and engineering, for example. This movement makes data integrity all the more important, right from the start, because inaccurate data will always "poison the well." Inaccurate data will never be trustworthy. Good data, on the other hand, ensures that this huge repository of information enables a more efficient military.

Leave UID Data Management to the Experts

A2B Tracking Solutions has been a staunch supporter of UID from the beginning. As AIT veterans, A2B developed a bar code asset tracking system (BCATS) for the FAA in the 1990s. It was at that time that the A2B staff became convinced of the need for granular visibility within the government and across the military. During the development of the BCATS program A2B had opportunity to study the complexities of government installations. Much of the AIT best practice methodology developed for BCATS was incorporated into UID.

With the introduction of UID in 2003, A2B was therefore in a unique position. As UID requirements were rolled out, A2B developers began work on UID Comply!® with the express purpose of producing COTS software that performs all the UID compliance and data management functions in one conforming package.

Because it follows AIT best practice, UID Comply! ensures that the errors inherent to non-conforming systems cannot occur. It is, quite simply, a fail-safe data management system with built-in checks for all UID requirements, from the creation, validation and verification of labels and marks to final upload to the IUID Registry or via WAWF. The UID Comply mobile computer not only enables data harvesting in remote locations, but it also acts as a filter to ensure that UID conforming data is imported and associated with the appropriate pedigree.

As a total UID data management system, UID Comply! stores all transactional history for each UID. It imports data from

existing legacy databases and systems, including ERP. It also enables printing of the IUID mark to virtually any printing device or method available such as CO2 lasers, YaG lasers, metal-photo, dotpeen, ink-jet, tesa® tape or polyester labels.

As mentioned earlier, a conforming data management system needs to address the parent-child relationship of embedded items, a feature that is supported by UID Comply! And the creation of virtual UIIs for legacy assets that may be deployed to the field and unavailable for marking is also supported.

When one considers the complexity of UID compliance, the potential for costly and time consuming errors, and the importance to the military of gaining visibility across its vast asset base, we feel the case for utilizing a conforming data management system, written by recognized AIT experts is compelling.

In short A2B believes that UID Comply!, which is installed at numerous military installations and scores of DoD suppliers throughout the nation is the gold standard for UID data management.

OPINION:

What's New: MIL-STD-130M w/Change 1 & Verification



The introduction of MIL-STD-130M w/Change 1 in June 2007 will have a significant impact on the way the Data Matrix UID symbol is verified when it is applied directly to parts. It is also likely to increase the use of verification report results, especially when the parts have been marked directly on their surface. The change is a result of the invocation of a new Direct Part Mark (DPM) Quality Guideline issued by AIM, specifically the AIM DPM-1-2006 Quality Guideline.

Early in 2005, the Department of Defense UID Program Office began to recognize the limitations of prior standards that were not designed for DPM, such as ISO/IEC 16022 (MIL-STD-130L) and ISO/IEC 15415 (MIL-STD-130L, w/Change 1). Parts were marked with what seemed to be good quality marks. These marks could be read by some readers, though not by all, and often the marks could not achieve acceptable verification scores using existing standards. For example, with dot peen marks on shiny aluminum the apparent contrast to the human eye was less than the 30% required in the MIL-STD-130, but it

could be read. A growing body of similar experience drove the development of a new marking standard in early 2005.

AIM Global, the international trade association representing automatic identification and mobility technology solution



providers, was asked to help develop a better standard. They pulled together a broad cross section of industry participation including marking companies, manufacturers of readers and verifiers, aerospace and defense industry end-users, and DoD representatives. This group of professionals immediately recognized the unique challenges of vision-based assessment driven by the camera's perception of mark quality as opposed to the human eye.

John O'Brien, UID Program Manager for Siemens, one of the participating organizations, has this to say: "In order to make effective measurements, you must standardize the way the camera captures the image. The group recognized that lighting can make a dramatic impact upon the image and that in order to effectively verify the quality of a mark, one must standardize the lighting. The result is the AIM DPM-1-2006 Quality Guideline."

In defining the Scope of the Guideline, the authors wrote:

"This document was developed to assess the symbol quality of direct marked parts, where the mark is applied directly to the surface of the item and the reading device is a two-dimensional imager."

MIL-STD-130, M w/Change 1 incorporates the AIM DPM-1-2006 Quality Guideline as the way to verify directly marked parts. It is used as an alternative to the methods established in earlier versions of the Mil-Std-130 such as ISO/IEC 15415 and AS9132.

Changes to ISO/IEC 15415

In the text of the AIM DPM-1-2006 Quality Guideline, the authors define a number of changes to ISO/IEC 15415. These include the following:

- * A different method for obtaining the test image.
- * A different method for creating the binary image.
- * A new method for choosing the aperture size.
- * An image pre-processing methodology for joining disconnected modules in a symbol.
- * A different process for determining the modulation parameter, which has been renamed cell modulation.
- * A different process for determining the symbol contrast parameter, which has been renamed cell contrast.
- * A different process for computing fixed pattern damage
- * A new parameter called minimum reflectance.

AIM DPM-1-2006 Quality Guideline establishes very

specific requirements for aligning the mark with the camera's image sensor (Section 6.1) as a foundation for all subsequent measurements. It also provides for very specific lighting angles and directions (Sections 6.2.1-6.2.5) in a total of nine (9) lighting configurations. MIL-STD-130M, w/Change 1 has adopted all lighting options from the AIM Guidelines except the dome light.

AIM DPM-1-2006 Quality Guideline also provides for a process to test each of the lighting methods and applies a method of image preprocessing (software) to the resulting image before measurements are obtained. Characteristics of the mark, including the new cell modulation and cell contrast measurements are calculated and reported in a new "DPM format."

Reporting the Verification Score

AIM DPM-1-2006 Quality Guideline requires changes in verification reporting to a format based upon the ISO/IEC 15415.

Report example: DPM3.0/08/640/30Q

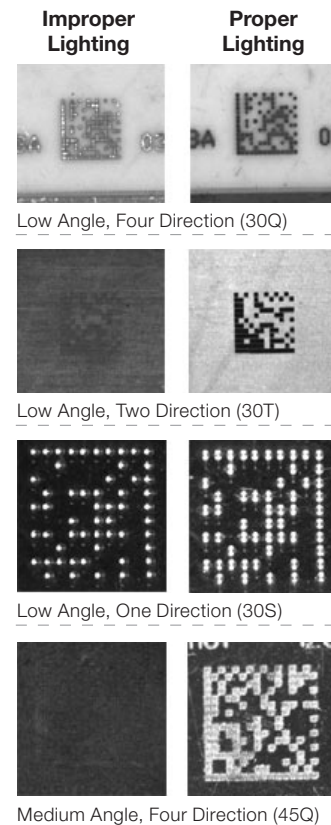
- * DPM - Represents AIM DPM-1-2006 Standard Applied
- * 3.0 - Overall Grade of 3.0 (B)
- * 08 = Aperture size in mils
- * 640 = Lighting wavelength used in nm.
- * 30Q = Lighting geometry used. (30 degree, illumination from all four sides)

The manufacturer is no longer limited to reporting the results of a single lighting method that may or may not achieve optimal scores. If AIM DPM-1-2006 is applied, the manufacturer has the choice of reporting the best overall score, along with the configuration that attained that score using the DPM format (above). This allows others downstream in the supply chain to review the verification report to determine the characteristics of the optimum reader for reading this DPM mark.

Conclusion:

The introduction of the new AIM DPM-1-2006 Quality Guideline will allow successful verification of many direct part marks that had not previously passed. Each of the newly specified lighting options could create conditions where the camera has a useful image and a successful result. (See examples) Verification results will provide better insight into downstream reader performance – more accurately predicting the type of reader needed to read a specific mark. In instances where the marking is done on label material, the previous requirements of ISO/IEC 15415 will continue to apply with the overall grade based on a single scan (not five scans).

Lighting Impact upon Image Capture and Subsequent Measurements for Verification



VENDOR'S CORNER:

A Thought Process for UID Parts Marking Decisions



As readers of UID Quarterly know, MIL-STD-130N requires that vast numbers of DoD parts or components be marked with a permanent, "life of the part" Data Matrix code. This requirement has Defense Contractors and Maintenance Depots scrambling to determine the materials and methods that will work for them, given their specific needs. End use applications and the environment in which parts operate differ wildly, of course, but what can or should remain the

same is the thought process by which UID parts marking decisions are made. The balance of this article will describe a process that has been shown to work.

First, Material: As was mentioned above, the environments in which parts operate range from benign to the most extreme imaginable. If your end use application may be characterized as benign, congratulations! You are one of the lucky few and any of several material choices should be suitable.

Given the business of DoD, however, it is far more likely that the component you are responsible for marking operates in conditions that may be described as harsh, if not



downright hostile, and it is for this reason that material selection should be the first consideration when it comes to the parts marking decision making process.

Under what conditions must your part and hence your label and/or mark survive? Will it be subjected to weathering and UV? Will it be subjected to extreme temperature cycles? Will it come in contact with chemicals, fuel, oil, hydraulic fluid or other fluids? Will it be subjected to salt spray? Does it operate under desert conditions, where equipment is sandblasted every time the wind blows? Over what period of time and in what combinations of these conditions must your part and your mark survive? These are the questions you need to think about and the answers to these types of questions will lead down the path of material selection, be it Plastic, Steel or Aluminum.

Next, Method: After having decided upon Material, the method used to construct a mark or label is the next consideration. That is, how is the mark to be created? Depending on the material, there are various methods:

- * Surface print methods, such as ink jet, thermal transfer or laser bonding, are additive in nature and involve the deposition of inks, toner or thermal resin.



- * Altered surface print methods, such as chemical etching or laser cutting, are considered to be subtractive in that material is being removed.



- * Integrated print or parts marking methods, such as photo anodized, are neither additive nor subtractive but are, instead, transformative as a result of processing.



Finally, with regard to Method, it is important to note that the (method) decision is not stand-alone in the sense that the same types of questions asked in the Material section above come into play here. Material comes first, but it is the proper combination of the Material and the Marking Method that will allow you to produce Data Matrix marks that satisfy the requirements of MIL-STD-130N and, more importantly, the rigors of the field environment.

Lastly, Make or Buy?: Sometimes it makes sense produce your own UID marks and labels on-site, when and where they are needed. Other times it's better to buy pre-printed marks or labels from a qualified source. Things to consider when making this decision include volume requirements (current and future demand), time sensitivity, facility requirements and personnel.

Summary: Defense Contractors and Maintenance Depots are required to comply with MIL-STD-130N. Vast numbers of DoD parts must be marked with permanent Data Matrix codes. The environment in which many parts operate is harsh. Depending on the end use application, therefore, care must be taken to ensure that the best and most suitable materials and marking methods are being selected. This article describes a thought process that has proven successful.

UID EDUCATION:

UID and RFID Educational Web Seminars

In our quest to provide ongoing education to those who are implementing UID and RFID we offer the following two seminar series:

UID Web Seminars From Data Capture Institute

David Collins, President of Data Capture Institute, has been engaged by A2B to present a series of UID Web Seminars as a non-commercial, educational service to those who are required to implement UID.

David is considered by many to be the “father of the bar code industry” having led the original bar code project, KarTrack, for Sylvania in 1959 and later founding Computer Identics Corp, the first company to manufacture bar code scanners. Over the years Collins and his team have overseen thousands



of bar code installations around the world. He is author of the popular 1992 book, “Using Bar Code – Why It’s Taken Over” and is a frequent keynote speaker and automatic data collection seminar presenter. As a member of the UID integrated product team (IPT) he is uniquely qualified to respond to the questions and concerns of companies of all sizes, including large, multi-national enterprises as they grapple with UID implementation.

Upcoming UID Web Seminar Dates
(Presented each day at 10:00 and 2:00 Eastern)
November 15
December 6
January 10
January 24

To register for any of these dates, email pchasse@a2btracking.com or click on this link: http://www.uidsolutions.com/webinar_signup.aspx

RFID, UID and WAWF Webinar by A2B Tracking and epcSolutions

epcSolutions, the authors of ThingsNet, the platform for the Internet of Business and the most installed Wal-Mart RFID solutions, and A2BTracking Solutions are teaming up to offer a webinar for RFID/UID solutions.

During this webinar you will receive a complete briefing on where UID and RFID came from and why it is important to the DoD and to you. You will also receive a simple, straightforward explanation of UID and RFID labeling,



verification, validation and uploading to the Wide Area Workflow (WAWF) and IUID Registry. Bar code and RFID experts from A2B and epcSolutions Inc. will also present a live demonstration of UID Comply!® software and RFIDTagManager.

Upcoming RFID, UID and WAWF Webinar Dates
(Presented at 2:00 Eastern)

November 29

December 12

To register phone 703-757-4470 or e-mail: webinars@epcsolutions.com.

NEWS AND ANNOUNCEMENTS FROM A2B TRACKING:

Latest Press Releases

10/25/2007 - UID Data Management White Paper Published by A2B Tracking

A2B Tracking Solutions Inc. has published a new White Paper titled "Data Management Excellence – Eradicate UID Compliance Errors with Data Management," aimed at Department of Defense (DoD) contractors and military...

9/19/2007 - A2B Tracking Solutions Names Trace Automation as Reseller Partner

A2B Tracking Solutions Inc, the leading provider of unique identification (UID) compliance products and services for Department of Defense (DoD) contractors and installations has added Trace Automation of Pittsburgh...

9/6/2007 - A2B Tracking Solutions at Atlanta UID Forum

A2B Tracking Solutions Inc, will be exhibiting the UID Comply!® Software Suite in booth # 26 at the UID & eBusiness Forum on September 11-13 at the Omni Hotel at CNN Center in Atlanta...

8/22/2007 - A2B Tracking Solutions, Inc. Taps Seagull Scientific Inc. for Second Annual Partner Excellence Award

A2B Tracking Solutions President Peter M. Collins presented that company's prestigious annual Partner Excellence Award today to Seagull Scientific President, Harold Boe at Seagull's Annual Global Sales Meeting in Seattle...

Vendor Excellence Award



We congratulate our colleagues at Seagull Scientific who earned A2B's annual Vendor Excellence Award, presented in recognition of exceptional products and service. The award was made by A2B President Peter Collins to Seagull President Harold Boe during Seagull's Global Sales Meeting in Seattle in late summer.

Upcoming Events



We are pleased to demonstrate UID Comply!® and to participate in the TACOM LCMC Item Unique Identification Road Show, sponsored by the US Army Tank and Automotive Command (TAOM) Life Cycle Management Command, on

SAE International

We will be exhibiting UID Comply!® at the DoD Maintenance Symposium in Orlando, FL on November 13-16. Look for us in booth #115.

UID QUARTERLY - A2B TRACKING SOLUTIONS - FALL 2007
207 HIGHPOINT AVENUE, PORTSMOUTH, RI 02871
TEL: 800-733-7592 | 401-683-5215 | FAX: 401-683-5219 | WWW.UIDSOLUTIONS.COM