



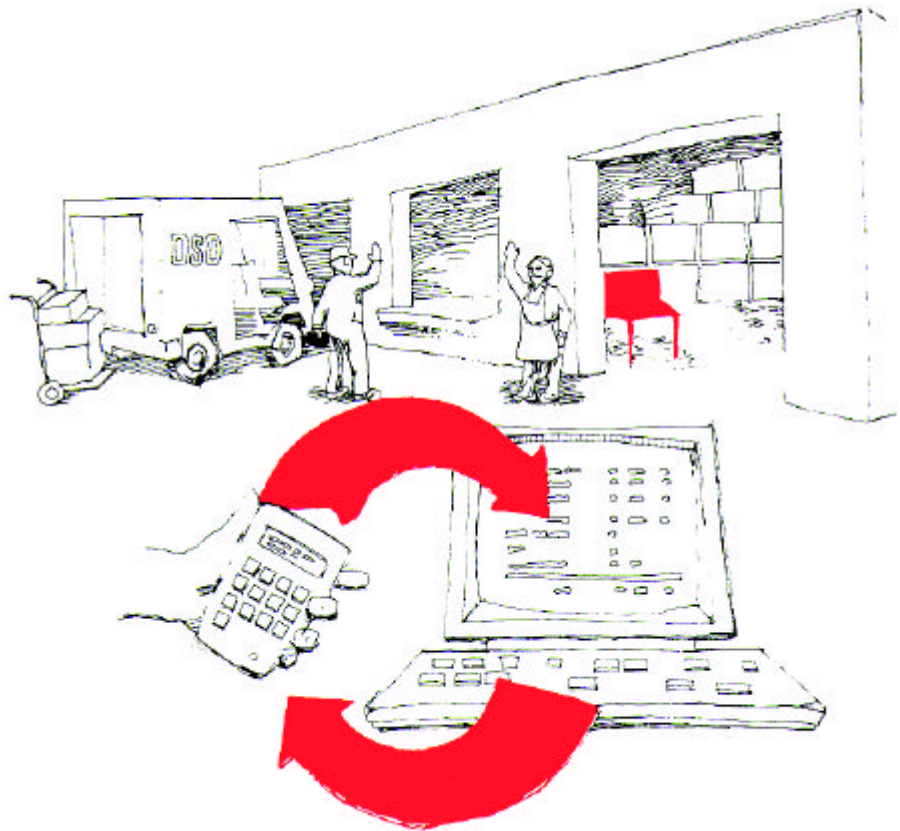
# UCS

*Uniform Communication Standard*

*for Direct Store Delivery (DSD)*

VERSION

005010UCS



Implementation Guide

## **DISCLAIMER**

The Uniform Code Council, Inc. (UCC) is providing this voluntary guide as a service to interested industries. This voluntary guide was developed through a consensus process of interested parties.

Although efforts have been made to assure that the guide is correct, reliable, and technically accurate, the UCC makes no warranty or representation, express or implied, that this guide is correct, will not require modification as experience and technological advances dictate, or will be suitable for any purpose or workable in any application, or otherwise. Use of the guide is with the understanding that the UCC has no liability for any claim to the contrary, or for any damage or loss of any kind or nature. If a user perceives a need for a change to the guide, it should contact the Uniform Code Council, Inc.

Users are cautioned that this is a voluntary industry guide. Should it conflict with government laws or regulations, the legal requirements supersede the guide.

**Copyright © 2004 Uniform Code Council, Inc.  
All Rights Reserved.**

In this publication the letters “U.P.C.” are used solely as an abbreviation for the “Universal Product Code,” which is a product identification system. They do not refer to the UPC®, which is a federally registered certification mark of the International Association of Plumbing and Mechanical Officials (“IAPMO”) to certify compliance with the Uniform Plumbing Code as authorized by IAPMO.

# TABLE OF CONTENTS

## SECTION I

<b>INTRODUCTION</b> .....	1
<b>Status of the UCS/DSD Standards</b> .....	1
<b>Message Format Standards</b> .....	1
Store-level associated transaction sets .....	2
Office-to-office associated transaction sets .....	2
<b>Communications Standards</b> .....	2
<b>Getting Started</b> .....	2

## SECTION II

<b>THE APPLICATION OF UCS TO SUPPORT DSD</b> .....	5
<b>Computerized DSD Route Accounting and Retailer</b>	
<b>Receiving Systems</b> .....	5
<b>Delivery Systems</b> .....	5
<b>Receiving Systems</b> .....	6
<b>System Linkage Via UCS at the Store Level</b> .....	7
<b>The Enhancement of UCS to Support DSD</b> .....	8
<b>The Importance of NEX/UCS to DSD</b> .....	10
<b>Some Features of the UCS/DSD Standards</b> .....	10
<b>Message Standards Architecture</b> .....	10
<b>The Delivery/Return Record Transaction Sets</b> .....	11
<b>DEX/UCS Communications Standards</b> .....	12
<b>Operational Scenarios For Using DEX/UCS at the</b>	
<b>Store Level</b> .....	13
<b>Direct Connect Interface Interchange With a Spot Sell Delivery</b> .....	13
<b>Expedited Check-in Procedures</b> .....	16
<b>Direct Connect Interface Interchange With a Pre-Sell Delivery</b> .....	18
<b>Direct Connect Interface Interchange for a Return</b> .....	18

## SECTION III

<b>THE UCS/DSD STANDARDS</b> .....	21
<b>DXS/DXE Header/Trailer Control Segments</b> .....	21
<b>The 894/895 Delivery/Return Transaction Sets</b> .....	22
<b>Record Set</b> .....	22
<b>Adjustment</b> .....	22
<b>Signature only</b> .....	23
<b>Adjustment Duels</b> .....	24
<b>Digital Signatures</b> .....	24
<b>Transaction Set Version</b> .....	25

<b>Special Item Identification Conventions</b> .....	25
Consignment items .....	26
Deposit items .....	26
Non-resale items .....	26
Shipping container identification .....	26
Product aggregations or groupings .....	26
<b>DEX/UCS COMMUNICATIONS STANDARDS</b> .....	27
<b>Direct Connect Interface Standard</b> .....	27
Reference Documents .....	27
Standards Precedence .....	28
Change Request Procedure .....	28
Direct Connect Interface Standard Overview .....	28
Mode of exchange .....	28
Session level .....	28
Data link level .....	29
Physical level .....	29
Usage Scenario .....	30
Suggested Design Features .....	31
Timer and response margins .....	31
Provision for multiple revision and level numbers .....	32
Error instructions .....	32
Related User Practice .....	32
Use of Comm IDs .....	32
 <b>SECTION IV</b>	
<b>USER SYSTEM DESIGN</b> .....	35
<b>General Features</b> .....	35
Providing cost data in the 894/895 transaction sets .....	35
Resolution of cost conflicts identified as the time of delivery .....	36
Archiving complete transaction sets .....	36
Operator friendly design .....	36
Compatible DEX/non-DEX procedures .....	36
Accessing items in the record .....	36
Handling multiple transaction sets in a single DXS/DXE envelope vs. handling multiple envelopes .....	36
Explicit operator instructions .....	37
Error instructions .....	37
Fallback procedures .....	38
Session reset .....	38
Closed out record sets .....	38
Simultaneous sessions and unclosed record sets .....	38
Display of unclosed record status .....	39
Abnormally closed record sets .....	39
<b>Supplier Systems</b> .....	40
Item sequence control .....	40
Aggregating items .....	40
Item descriptions in the 894 base record .....	40
Item descriptions for any GTIN in a delivery .....	40
Automatic acknowledgment response .....	41

<b>Retailer Systems</b> .....	41
Item checking options .....	41
Expedited check-in procedures .....	42
Simultaneous retailer sessions .....	42
Preservation of item sequence in the base record .....	43
Acceptance of unauthorized items .....	43
 <b>SECTION V</b>	
<b>SPECIAL CONVENTIONS</b> .....	45
 <b>SECTION VI</b>	
<b>MESSAGE FORMATS</b> .....	55
Introduction .....	55
DEX/UCS Control Segments .....	58
894 Delivery/Return Base Record .....	71
895 Delivery/Return Acknowledgment and/or Adjustment .....	97
 <b>SECTION VII</b>	
<b>DIRECT CONNECT INTERFACE STANDARD</b> .....	115
 <b>SECTION VIII</b>	
<b>CHANGE SUMMARY</b> .....	133
 <b>APPENDICES</b>	
A Code Source Reference .....	135
B Cyclic Redundancy Check (CRC) Generation .....	137
C Extended Data Element Information .....	145



SECTION I

# INTRODUCTION

This manual is intended as a guide for persons implementing or using UCS for direct store delivery. It is intended to be used in conjunction with the *UCS Standards Manual*, also available from the Uniform Code Council, Inc. Should any conflicts be found between this guide and the standards manual, the standards manual shall have precedence. (The most common source of such conflicts is likely to be changes to the standards not being completely incorporated into all affected parts of this guide.)

In supporting DSD, UCS has two parts: DEX/UCS (Direct EXchange) linking the computers of supplier and retailer at the store backdoor, and NEX/UCS (Network EXchange) linking their office computers over telephone lines. NEX/UCS is the natural extension of conventional UCS to DSD related messages such as delivery authorizations and statements. It provides a means for exchanging delivery data between the computers of delivery person and receiver at the store backdoor.

The primary focus of this manual is on the application of UCS at the store level. NEX/UCS complements DEX/UCS and is an equal partner. By using it to exchange pre-delivery data such as price, promotion, and authorization data, the files of both partners can be more efficiently and effectively maintained, especially with regard to timeliness, eliminating many of the conflicts and discrepancies that occur with conventional systems. And by using it for post-delivery messages, receivables/payables accounting can be streamlined.

Updates to this guide will be made as needed to make improvements and clarifications and to incorporate changes made to the standards. Each revised publication of this guide will be associated with the corresponding UCS Version.

## STATUS OF THE UCS/DSD STANDARDS

The key to using UCS is the standards that permit data exchange between business partners. These standards fall into two categories: communications standards and message format standards.

### Message Format Standards

With DSD, data exchange takes place at two levels: office-to-office and at the store backdoor. Each UCS message type or transaction set is normally associated with one or the other of these two levels. Nevertheless, all transaction sets use the same format structure or syntax and can, if desired, be exchanged at either level.

### **Store-level associated transaction sets**

UCS/DSD transaction sets normally associated with store-level exchange are the delivery/return records that supply the information conventionally provided by the paper DSD delivery or credit invoice. They are:

- 894 - Delivery/Return Base Record
- 895 - Delivery/Return Acknowledgment and/or Adjustment Record

These two transaction sets are described in detail in this guide, both in Section III - The UCS/DSD Standards of the reference guide.

### **Office-to-office associated transaction sets**

Of the office-to-office associated UCS transaction sets that can be used to support DSD, some are unique to DSD whereas others can be used to support warehouse supply as well.

Transaction sets developed specifically for DSD include:

- 878 - Product Authorization/Deauthorization
- 882 - Direct Store Delivery Summary Information (Statement)

Transaction sets of value to both DSD and warehouse distribution include:

- 820 - Payment Order Remittance Advice
- 879 - Price Information
- 888 - Item Maintenance
- 889 - Promotion Announcement

### **Communications Standards**

As noted above, there are now two distinct modes of communications in UCS, NEX/UCS for office-to-office data interchange and DEX/UCS for direct exchange.

The communications standard for NEX/UCS has been the exclusive means for data interchange in the warehouse environment. The communication standard for DEX/UCS is the means for data interchange at the store level in a direct store delivery environment. To verify the current version of the standard, see the latest issue of the UCS Standards.

## **GETTING STARTED**

Implementing UCS to support DSD is not a mysterious or highly complex process. Participants in the original DEX/UCS development program found that the effort of programming prototype systems for data exchange at the store backdoor was easier than anticipated. Implementing the NEX/UCS side is not exceedingly difficult either. Again, many of the participants implemented this part in the development program quite successfully. The detailed steps, while fairly numerous, are each relatively simple. Benefits are achieved as implementation progresses, functionalities are installed, and partners are added. There are a number of services and



packages available on the market that can help considerably. The key point is to start, as the sooner this is done, the sooner the benefits start coming in.

Perhaps the first step, after reviewing this guide, is to learn more about where your company is and what UCS/DSD is all about. One part of this task is internal: undertaking an inventory of systems and procedures presently in place, as well as planned, for supporting DSD functions, both at the delivery/receiving level and back at the office. The other part is external: learning more about the UCS program and also talking to your supplier or retailer business partners.

A key source of help on the external side is the Uniform Code Council, Inc., and its various programs and publications, including this one. There are two relevant reports in addition to the UCS Standards Manual that are available from the Uniform Code Council. These are:

- **Direct Store Delivery - Store-level Study**

This is the Arthur D. Little report published at the conclusion of the UCS/DSD study phase in April 1986. While it is not required reading for those wishing to implement UCS/DSD systems, it does provide additional background on direct store delivery and the benefits offered by UCS.

- **UCS for Direct Store Delivery - Development Program Report**

This second Arthur D. Little report was published at the conclusion of the DEX/UCS development program in December 1988. It provides details on the conduct of and findings from that program and provides further information on how UCS can be used to support DSD. Much of the material in that report, although organized differently, is presented in this guide.

An important source of implementation help is a large and diverse group of consultants and hardware, software, and network vendors offering various packages and services to support UCS. Included are providers of store-level delivery and receiving, mainframe applications, and EDI/UCS translation packages. Value-added network operators are also an important group.

One key implementation step is developing a DSD systems plan that includes appropriate provisions for incorporating both NEX and DEX/UCS. The key is to view the entire set of operations as a whole, with UCS providing key capabilities and benefits within it. The plan should start with an evaluation of where you are now and what development paths make most sense. Development and implementation steps should then be worked out based on the particular path and strategy chosen.

An important part of any development and implementation program is finding and working with one or two initial partners. Ideally, the initial partner would be one already experienced in using UCS for DSD. This is not necessary, however, as demonstrated by the development program participants who were all new to the game.

Retailers interested in taking advantage of UCS will find that getting partners is relatively easy. To start with, there are national DSD distributors who have participated in the development program and are now implementing operational systems. And there may be others in the retailer's operating area as well. Once under way, additional partners can be solicited by exerting "customer leverage."

With suppliers, on the other hand, much will depend on the retailers in their operating areas. If there are one or more already into UCS for DSD, they will be natural partner candidates. In fact, they will soon, no doubt, be demanding UCS interchange. On the other hand, a supplier may find that there are presently no UCS interested retailers in his area. Under those circumstances, the supplier has a choice. On the one hand, he can carry out preparation efforts in anticipation of retailer interest in UCS. Better however, would be to seek out one or more of the more innovative and effective retailers in his area and see whether interest in a joint development effort can be generated.

Of special interest to suppliers should be non-UCS retailers who have developed DSD receiving systems employing on-line data capture and/or turnaround documents. Supplier personnel, at least on the operating level, are well aware of how these systems lower delivery/receiving productivity. Moreover, such systems incorporate many of the building blocks needed for truly effective receiving systems that take advantage of UCS and provide productivity benefits for delivery person and receiving clerk alike. Hence, by soliciting their interest, the supplier can achieve a double advantage — finding a partner for getting started on UCS, and resolving an existing delivery productivity problem as well.

## SECTION II

---

# THE APPLICATION OF UCS TO SUPPORT DSD

---

Direct store delivery offers a strategically important arena for the application of electronic data interchange or EDI, especially because of the very large number of transactions involved. EDI is the computer-to-computer interchange of business data between independent business partners. It is of special interest where both parties have already computerized their own side of some joint business function and where EDI provides a means for linking these systems together. In the late 1970s, the computerization of purchasing and accounting functions by distributors and manufacturers sparked the development of UCS as a means for interchanging data to support these functions. Eight years later, the computerization of DSD delivery and receiving functions by supplier and retailer sparked a corresponding development of standards and technology to enable EDI to link these systems. Let's look first at these delivery and receiving systems.

## COMPUTERIZED DSD ROUTE ACCOUNTING AND RETAILER RECEIVING SYSTEMS

### Delivery Systems

On the supplier side, many DSD vendors, especially those using spot-sell systems, have implemented computerized route accounting systems. With these, the driver is provided with a portable, hand-held computer and a separate printer, usually left on the truck. At the time the order is worked out, the driver enters the appropriate quantities into the hand-held computer. Then, after computer pricing and extension, the delivery invoice or ticket is printed.

These computerized DSD route accounting systems offer a number of significant advantages to the supplier:

- The driver's productivity at the store is improved, since he no longer needs to compute extensions and totals.
- The time required for the driver to settle up his route accounts at the end of the day is greatly reduced.
- The invoice is mathematically correct and easy to read — a benefit to both supplier and retailer.
- Invoice data can be transferred directly into the supplier's office accounting systems, thereby eliminating key entry costs, delays, and opportunities for error.

- In some systems, computer decision support software helps the driver make better merchandising and replenishment decisions.

## Receiving Systems

Many retailers have, in turn, computerized their DSD receiving, creating their own records of items received, applying cost files they maintain themselves, and calculating their own version of amounts owed. With off-line receiving systems, the receiving clerk uses the supplier's paper delivery ticket to check in the delivery, but this ticket is then keypunched into the retailer's computer system back at the office. With on-line systems, the receiving clerk enters the items and quantities received into a hand-held or other terminal device as part of the check-in process. The advantage of this latter approach is that computer checking can be done at the time of delivery. The disadvantage is that data entry by the receiving clerk is inherently slower than key entry by a trained clerk working in an office environment.

Advantages to the retailer of computerized receiving systems include the following:

- The system detects any unauthorized items that the supplier attempts to deliver to the store. Such items are a special problem where the retailer scans at the front end, since they are not on file. On-line receiving systems have the added advantage of detecting unauthorized items at the time of delivery, rather than later.
- "Correct" prices and promotional allowances (i.e., those maintained in the retailer's files) are applied, thereby eliminating overcharges.
- Correct extension and total calculations are assured.
- Data files on replenishment velocity by item (useful in the absence of front-end scanners) can be accumulated, permitting sales and marketing analysis by item.

All in all, computerized DSD systems provide the retailer with stronger control over DSD items. This increase in control is especially strong with on-line receiving systems, where greater discipline over item checking can be achieved because the clerk is forced to count and key enter the quantities received for every item in the delivery.

Unfortunately, the increased control achieved with on-line receiving systems comes at the cost of slower check-in, resulting in a productivity loss by both delivery person and receiver. The problem comes not just in having to check every item, which certainly should be done if there is any reason to doubt the accuracy of supplier's delivery ticket, but also as a result of the cumbersome process of entering item identification data. This entry is usually done by using some form of wand or hand-held scanner to read the bar code on a sample of each different item in the delivery. Such bar codes are normally positioned to make scanning efficient at check-out, not check-in. On bread, for example, the code is usually on the bottom of the loaf, easy to access at the cash register scanner, but difficult to get at when loaves of bread are received in trays, stacked one on top of another.

## SYSTEM LINKAGE VIA UCS AT THE STORE LEVEL

Where both the DSD supplier and the retailer are equipped with computers to support delivery/receiving at the store level, electronic data interchange in the form of UCS becomes a natural means for linking them together. Let us consider some of the functional advantages that such linkage offers:

- By receiving an electronic record of the delivery invoice from the supplier's computer directly into the receiving computer, the retailer is able to capture the full details of this invoice in standard, computer-processable form.
- Retailers using item-oriented receiving systems already capture such data by one means or another. With UCS, however, they can be assured that their record of the transaction matches the supplier's. Billing discrepancies due to data entry errors and conflicts between supplier and retailer versions of the delivery record are thereby avoided.
- When computerized receiving systems are used, the receiving clerk and delivery person can spend considerable time searching for reasons why their respective invoice totals disagree. Frequently, the source is a pricing difference for one or more items buried within the invoice. With UCS delivery record transfer, such discrepancies can be automatically identified and flagged, eliminating the need for manual searches.
- Retailers using on-line receiving systems can, if they wish, eliminate the need to wand items in order to identify them to their computer, thereby saving time for both receiver and delivery person. Since the record of the items in the delivery is transferred into and available to the receiver's computer before the check-in process begins, the receiver can scroll through the items listed therein and call them out for blind checking of the delivery quantities. As each count is entered, the receiving computer can check this count against that contained in the delivery record and signal an alarm whenever a discrepancy is detected. More careful checks can then be made until both parties agree on the actual figure. (Following completion of the check-in process, any needed adjustments can then be transmitted back to the supplier's computer from the receiver's.)
- Retailers employing off-line, computerized receiving systems avoid the need to key enter the DSD data for subsequent computer processing.
- DSD suppliers benefit from the increased check-in speed and more streamlined accounting that is made possible by data interchange at the time of delivery.
- Through the use of digital signature techniques, electronically interchanged delivery records can be used as proof of delivery, thereby eliminating the need to process, store, and retrieve paper documents for this purpose. (DSD suppliers will continue to use paper invoices with customers not set up for electronic data interchange. For those that are, paper invoices may also be used as scratch, working documents at the time of delivery and for backup in the event of computer failure. At the end of each delivery day, however, such invoices can be thrown away.)

## THE ENHANCEMENT OF UCS TO SUPPORT DSD

UCS stands for Uniform Communications Standard, not System. It is, in fact, an interface standard that enables the computer systems of separate organizations to interchange data. Prior to transmission and following receipt, each company uses its own internal systems to process the data using its own formats. As in its warehouse transaction applications, UCS as applied to DSD does not dictate how business is done between business partners, nor does it dictate how individual companies design their internal systems and carry out their business operations. (Of course, it enables them to streamline these systems and operations.)

In extending UCS to direct store delivery, it was not necessary to develop a standard or systems approach separate from that used to support warehouse applications. Rather, the existing form of UCS was enhanced to accommodate new operational features and capabilities not previously encountered. These include:

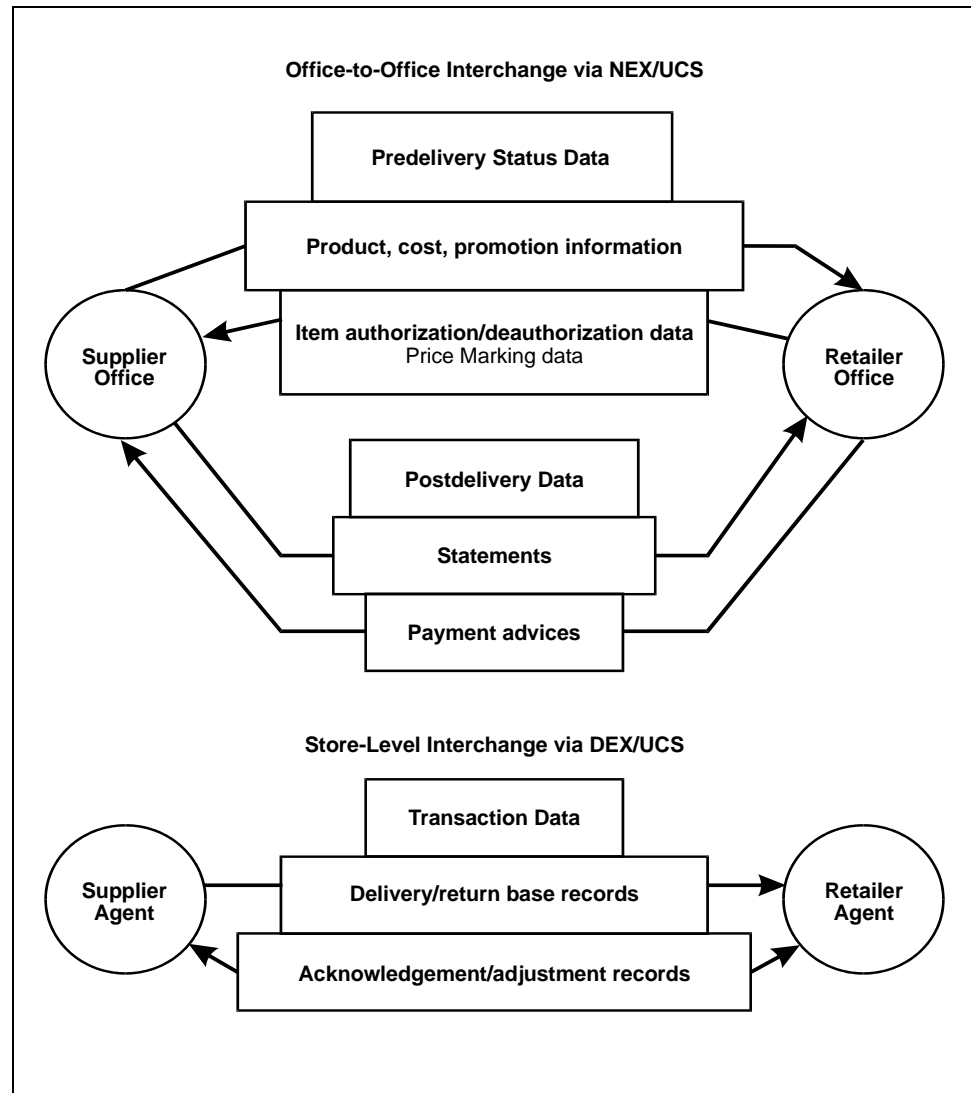
- The need to deal with new message types unique to DSD, such as statements and item delivery authorizations.
- A greater need for messages that apply to a collection of locations with breakout detail for individual locations.
- The opportunity to exchange data electronically at face-to-face meetings between supplier and retailer at the store level.

This enhanced form of UCS has two channels of data interchange:

- Between the computer facilities at the offices of the two parties, using public networks. NEX/UCS (Network EXchange UCS) is used to designate this form of interchange.
- Between computer devices of the two parties, face to face, by means of direct links not employing a network. DEX/UCS (Direct EXchange UCS) is used to designate this form of data interchange.

(Under these definitions, NEX/UCS was the exclusive form of data interchange used to support supplier-to-distributor UCS at the warehouse level.)

UCS/DSD is the term used to refer to the overall use of UCS to support direct store delivery transactions and data interchange. Figure 1. Enhanced UCS for Direct Store Delivery shows how enhanced UCS is used to support this activity. In it, we see two channels of communication between supplier and retailer, one at the office level using NEX/UCS, and the other at the store level using DEX/UCS.



**Figure 1. Enhanced UCS for Direct Store Delivery**

The figure shows that representative message types transmitted via NEX/UCS include product, cost, and promotion information, item authorizations, retail prices for supplier marking purposes, statements, and payment advices. Some of these transaction sets (e.g., price and promotion data and payment advices) are the same as those used for warehouse distributed products. Others have been specially developed to support DSD (e.g., item authorizations).

The key messages transmitted via DEX/UCS at the store level are the Delivery/Return Base Record (Transaction Set 894) and its associated Delivery/Return Acknowledgment and/or Adjustment Record (895). These records are used together as a set to replace the traditional paper delivery invoice.

Just as NEX/UCS can be used to transmit messages in support of a variety of business functions, including both DSD and supplier-to-warehouse transactions, so also can DEX/UCS. To be sure, it will be used first to streamline DSD data interchange at the store level. But in time, we expect that retailers may use it at the

store level to transfer data concerning shipments from their own warehouses. Similarly, it may be used at the warehouse level to interchange data concerning shipments received there from manufacturers.

## **THE IMPORTANCE OF NEX/UCS TO DSD**

While the majority of attention in the sections and chapters of this guide are devoted to DEX/UCS and its use at the store level, we must emphasize that NEX/UCS is equally important in achieving the full benefits that UCS offers.

Direct store delivery has traditionally been an accounting “mess,” especially as retailers have shifted to computing their own delivery invoice totals from item-level receiving data. Not only is the number of delivery/return transactions large (there are over 500 million DSD deliveries annually to food stores in the U.S.), but the file maintenance task required to track items and costs is enormous. Data on items and costs must be maintained for each retail location, and when the frequency of change is multiplied by the large number of locations, the task becomes a burdensome one. Reconciliation between supplier totals and retailer totals has become a major task because of the all too common discrepancies that occur in cost and promotion files. The only sensible answer is to automate file maintenance by having the initiator of any change transmit it via NEX/UCS to his business partners. As this approach is put in place, we expect that the current high rate of retailer/supplier costing discrepancies and attendant reconciliation work will decline to negligible levels.

## **SOME FEATURES OF THE UCS/DSD STANDARDS**

Before proceeding to describe how UCS is used operationally to support DSD, it is useful to describe some of the functional features of the standards themselves.

### **Message Standards Architecture**

The transaction sets currently used in NEX/UCS employ a particular message format or syntax, first developed in the mid-seventies by the Transportation Data Coordinating Committee (TDCC). This architecture has undergone minor revisions since that time. Today, the architecture used by UCS for retail buyer/seller transactions is the same as that used by the ANSI ASC X12 for buyer/seller trading channels outside the grocery industry.

In enhancing UCS to support direct exchange, it was found that this same transaction set syntax and architecture could be used for DEX/UCS as well. Only the control headers and trailers used to enclose these transaction sets needed modification. (NEX/UCS uses a two-level system of header/trailer envelopes, whereas a simpler, single header/trailer envelope has been developed for the more constrained computing environment of DEX/UCS.)

This approach permits the UCS transaction sets to be independent of the choice of transmission mode. Although the DSD delivery/return transaction sets will normally be interchanged via DEX/UCS, they can be transmitted via NEX/UCS if desired. For example, the 894 base record can be transmitted in advance via NEX/UCS where the shipment is sent via a third-party carrier, especially if the shipment will take at



least a day to be delivered. In addition, some wholesalers may choose to transmit a delivery record by this means as soon as they know what they will be shipping. NEX/UCS transmittal can also be useful for sending a proof of delivery backup copy of the delivery record in the event of a dispute. Of course, the reverse arrangement can also apply: transaction sets normally sent via NEX/UCS can, if desired, be exchanged via DEX/UCS.

### **The Delivery/Return Record Transaction Sets**

A pair of transaction sets to be used in place of the conventional, paper DSD invoice has been developed and tested and is now operational. While they are described in more detail in Section III - The UCS/DSD Standards, it is useful to describe some of their features here:

- The delivery/return transaction sets have been designed to conform to a fundamental property of UCS and electronic data interchange more generally: data is transmitted from sender to receiver as a package and as a single event, not interactively. If the sender subsequently wishes to send more data or if the recipient wants to send other data back, a new and separate message is required.
- They have the capability to:
  - Handle either deliveries or returns,
  - Capture and exchange adjustments made to the delivery/return during the receiving process,
  - Maintain a full audit trail of the adjustments, and
  - Accommodate digital signatures in order to permit paperless DSD. (The digital signature is attached automatically as part of the record generation and transmission process. The signature verifies the identity of the sender. It also protects the integrity of the record, since its numerical value depends not only on the secret encryption key known only to the sender but also on the contents of the record.)
- There are two DSD delivery/return transaction sets:
  - The 894 Delivery/Return Base Record, and
  - The 895 Delivery/Return Acknowledgment and/or Adjustment Record.
- The base record is always prepared by the supplier, and normally contains all of the delivery/return record data that needs to be furnished by the supplier to the retailer.
- As its name implies, the acknowledgment/adjustment record is used for two purposes:
  - To make changes or adjustments to the cumulative delivery or return record.
  - To attach the sender's signature to the record. (The base record and each acknowledgment/adjustment record contains the signature of its respective sender.)

- Once a record has been transmitted, it cannot be altered. Adjustments and additions are made by transmitting additional acknowledgment/adjustment records.
- When a new value for a data element is transmitted by means of an acknowledgment/adjustment record, this value always supersedes all prior values sent by the same party. Whether it supersedes values transmitted by the other party depends on the data element in question. With item identities and quantities, the latest value must always rule, because a single value must be agreed to at the time of delivery. With such data elements as item prices, partners may use adjustments to enable each party to record his own view of the proper value, for adjudication at a later date. In such situations, the latest values from each of the two parties have meaning.
- Acknowledgment/adjustment records can be transmitted by the receiver to the supplier and vice versa, and in any sequence.
- A complete delivery/return record set consists of the base record plus all acknowledgment/adjustment records. It is always terminated by a signature-only acknowledgment record (no adjustment data) sent in the opposite direction from the previously transmitted record (be it a base record or an adjustment record). Where the base record is correct and no adjustments are needed, the record set consists of the base record sent by the supplier plus a signature-only acknowledgment record sent back by the receiver. Where an adjustment is needed, there will normally be three records in the set: the base record from the supplier, an adjustment record from one party to the other, and then a signature-only acknowledgment record sent in the opposite direction. While the receiver may usually send the adjustment record, it can be sent by the supplier, if desired.

### **DEX/UCS Communications Standards**

In addition to the above message standards, electronic data interchange requires a set of communications standards. Whereas message standards are concerned with the format, content, and interpretation of the data interchanged, the communications standards are concerned with how the data is transmitted from the sender's computer device to the receiver's. In contrast to NEX/UCS where transmission takes place over public networks, DEX/UCS takes place directly.

If the delivery person is equipped with a hand-held computer device, communication with the retailer's computer system can take place using the direct connect interface standard. With this standard, the two computers are connected by means of an electrical cable with standard plugs and a defined communications protocol.

With some modes of DSD delivery, the delivery person may not be equipped with the normal hand-held, route accounting computer. One example is where the shipment is delivered by a third-party motor carrier or parcel delivery service. Another is where the supplier employs a sales-merchandising force for order taking and a separate delivery force for bringing product into the store. With such systems, the sales-merchandiser is the one likely to be equipped with a hand-held, not the driver.

## OPERATIONAL SCENARIOS FOR USING DEX/UCS AT THE STORE LEVEL

With the above as background, we can now provide a number of operational scenarios describing how data interchange can be accomplished using DEX/UCS at the store backdoor. This exchange takes place as part of the delivery/receiving process, which will vary depending upon the particular systems and procedures employed by receiver and delivery person. Hence, the scenarios provided are representative of what can happen but are not prescriptive and exhaustive. UCS is a standard that specifies the format of messages exchanged and how the communications are accomplished. It does not specify or dictate how the participants' internal systems are designed or used.

### Direct Connect Interface Interchange With a Spot Sell Delivery

Let us start with a description of how data interchange takes place when a spot sell delivery is made using the direct connect interface standard. For this scenario, we assume that the delivery person has a hand-held computer device and uses it for route accounting purposes.

- As a first step, the driver/sales person goes into the store, checks and cleans up his product on his assigned shelves, and key enters needed delivery quantities into his hand-held. (He may also check for stales and key enter quantities for credit. However, we will consider the return process later.)
- The driver then goes back to his truck, picks out the items to be delivered from on-board inventory, and makes up a load to bring into the store. He will also usually print out a paper invoice using a printer installed on the truck. This paper invoice is the document of record for non-DEX/UCS customers and can serve as a useful scratch working copy where DEX/UCS is used.
- The driver then brings the delivery into the store and assembles it for check-in in the receiving area.
- Normally, the electronic record in the driver's hand-held will be stored using an internal format unique to the supplier's particular system. Before it can be transmitted into the receiver's computer, it must be converted into the standard UCS format — the 894 Delivery/Return Base Record. A software package specifically designed for this purpose is required. Conversion takes a second or so. With most supplier systems, it will be run as part of the driver-invoked transmit process.
- To transmit the base record into the retailer's receiving system, the driver must connect his hand-held using the standard connector cord with plugs on both ends. One end plugs into a socket in his hand-held, and the other plugs into a socket (possibly mounted on the wall in the receiving area) connected to the retailer's system. Typically the supplier provides the male connector and the retailer provides the female connector.
- When the data transmission takes place depends upon how the retailer has designed his system. With some receiving systems, it may be necessary for the receiving clerk and the driver to work together in order to carry out the data

transfer. However, the DEX/UCS direct connect interface standard has been designed to permit unattended data transfer. If the retailer's system takes advantage of this feature, the driver can simply plug into the retailer's socket and transmit the base record, even though the receiving clerk may well be elsewhere attending to a different supplier or doing something else. Identifying data in the communications header and in the base record itself allows the retailer's system to identify the supplier to whom the base record belongs.

- Once the base record has been received into the retailer's system, it must be converted into the retailer's internal format for interpretation and processing. (The original UCS formatted version should, however, be retained for archival and audit purposes, since its specific content affects the integrity of the supplier's digital signature which is part of the record.)
- Even before check-in takes place, the retailer's system can then check the base record, looking for any items not on file (i.e., unauthorized). It can also check for conflicts between the costs, charges, and allowances contained in the base record (if the supplier chooses to supply this optional data) and those on the retailer's file. Normally, any such conflicts will merely be noted for the record, thereby aiding in subsequent conflict resolution back at the accounting office. What to do about any such conflicts is the retailer's choice.
- At this point, the receiving clerk can check in the delivery. Note that the DEX/UCS related steps described up to this point have taken up very little time on the part of the delivery person and the receiving clerk. Transmittal will have required only a very few seconds on the part of the delivery person, above and beyond what he would normally do with a non-DEX/UCS customer. Receiving the data will have required no time whatsoever on the part of the receiving clerk, so long as his system is designed to take advantage of the unattended data transfer capability of the standard. How the check-in process is carried out depends upon the systems and procedures selected by the retailer.
- With many on-line, computerized receiving systems, the receiving clerk will be equipped with a hand-held terminal or computer. With DEX/UCS, the delivery data will already have been transferred into the retailer's computer and will, therefore, be available on his hand-held. Hence, the system can be designed to display first the Global Trade Item Numbers (GTIN) (formally called U.P.C. codes) of any unauthorized items not on file. The delivery person is responsible for identifying the particular items from these Global Trade Item Numbers (GTINs), and the receiving clerk can reject or accept them according to rules established by his organization.
- Once any unauthorized items are taken care of, the receiving clerk can check in the delivery. One approach is to have the hand-held display the GTINs, item descriptions (off the retailer's file), and unit of measure for each item in the delivery record. Preferably, the items should be displayed according to their sequence in the delivery record, since smart suppliers will make this sequence match the physical order for check-in. As each item is displayed, the receiving clerk can call it out for counting and then key in that quantity (using the appropriate unit of measure displayed, such as eaches or cases). If it matches the quantity received in the electronic record, the hand-held can give a positive

response, such as a friendly beep. If it doesn't, the hand-held can give a negative response, such as an unfriendly buzz. Once alerted to the latter, the receiving clerk and driver can recount the item until they are mutually satisfied that they have agreed on the correct quantity, which is then entered into the receiver's hand-held. If it ends up being different from the quantity in the base record, this corrected value will be sent back to the driver's computer via an adjustment record as discussed below.

- Other receiving procedures are also possible. If, for example, the retailer does not provide the receiving clerk with a hand-held terminal or computer, a paper receiving ticket can be used for the check-in process instead. For example, the receiving clerk may use the driver's delivery ticket as in conventional receiving. Once check-in is completed, any corrections can be entered into the retailer's computer using whatever form of non-portable terminal device is provided.
- As an alternative, the receiving clerk might use a paper receiving ticket generated on a printer connected to the retailer's computer. This ticket can be printed in background mode following unattended receipt of the base record while the receiving clerk is doing something else. It has the advantage over the supplier's printed ticket of being in the receiving clerk's standard format. Also, unauthorized items can be highlighted. Again, once check-in is completed, the receiving clerk can enter any corrections into his computer using whatever terminal entry device is employed with his system.
- Actions following check-in depend upon whether or not any discrepancies are detected.
- If there are no discrepancies, the delivery record set is closed out by a signature-only 895 Acknowledgment and/or Adjustment Record transmitted from the retailer's computer system to the supplier's. In operational practice, there is no real work to do. The receiving clerk, upon completing the check-in process, merely closes it out with no corrections. The receiving system, on finding no corrections, can automatically create a signature-only acknowledgment record and prepare it for transmission back to the delivery person's computer via DEX/UCS.

If the retailer's system is designed for unattended data transfer, the receiving clerk need do no more. Rather, the delivery person, at his convenience, can go back and plug into the retailer's receiving socket and initiate a "request to receive" operation. The retailer's computer, upon identifying the requesting party's identity from data in the communications header, then transmits back the signature-only acknowledgment.

- If a discrepancy in the base record is found, it must be communicated as an adjustment by means of an 895 Acknowledgment and/or Adjustment Record (containing adjustment data in addition to the digital signature that is always attached). While an adjustment record can be sent in either direction between the supplier and the receiver, it will normally in this scenario be sent from receiver to supplier. An adjustment is required to communicate a receiving discrepancy such as the wrong item or count. It can also be used to communicate back the

retailer's version of an item cost, allowance or charge, if it differs from that in the supplier's base record.

With unattended data transfer, the receiving clerk can conclude the check-in process much as before, closing out the process after having made any needed receiving corrections and then going on to other tasks such as checking in someone else. (If the only adjustments to be made are in costing data, the receiving clerk does nothing different from the no-adjustment scenario above, although his system may notify him that such costing adjustments will be transmitted back.) As before, the delivery person, at his convenience, can go back and plug into the retailer's receiving socket and initiate a "request to receive" operation. The retailer's computer, upon identifying the requesting party's identity from data in the communications header, then transmits back the acknowledgment.

- After receiving adjustment data, the delivery person must transmit back a signature-only 895 acknowledgment in order to close out the record set. This record can also be transmitted back to the retailer's computer in unattended mode if the receiving system is so designed. Some supplier systems may be designed to transmit this record back automatically in response to the receipt of an 895 record, even though it has adjustment data in it. Other delivery systems may be designed so that operator review of the adjustments is required before the signature-only record is sent back. Perhaps the best approach is where driver review is required for item/quantity adjustments but not for cost, allowance, or charge adjustment data. Wherever driver review is required, the delivery person's system should be designed so that the record set must be closed out by the transfer of a signature-only acknowledgment (possibly after further adjustments) before the driver can switch his hand-held onto some other delivery application.

### **Expedited Check-in Procedures**

Retailers, in the interests of improving the productivity of both receiving clerk and delivery person, can employ a number of methods for expediting the check-in process. One feature of the 894/895 DSD delivery/return record set is that it provides a very useful data history on the accuracy of different supplier's delivery records. Those who provide very accurate delivery records will have no or very few adjustments involving item identity and count, whereas those with inaccurate records will require many such adjustments records with many adjustment lines. By compiling delivery histories of different suppliers, a retailer can rate their accuracy and tailor his receiving procedures to the accuracy of their data. Those with poor accuracy can be subjected to very exhaustive check-in procedures whereas those with high accuracy can be rewarded with expedited procedures.\*

---

\*In order to keep score on vendor errors, they must be captured in 895 adjustment records. Hence, if a missing item is "back on the truck," the shortage must be recorded as an adjustment, rather than allowing the driver to go back and get the missing merchandise. If the extra stock is absolutely needed, it can be brought in and accounted for using a second delivery record.

Expedited procedures include a variety of approaches, including the following:

- Merely making a count of the total number of units received across all items and comparing this count with the total provided in the base record. If the count agrees, the delivery can be accepted. If it doesn't, all of the items can then be counted and checked individually.
- Counting specified groups of items. The 894/895 DSD record transaction sets permit items to be identified by aggregation groupings, if desired. For example, all soft drink labels in the same package type and size can be so grouped. Then, if desired, counts can be made and checked for each such aggregation grouping.
- Counting a sample of items received. For example, the receiving system can be programmed to select a few items at random from the delivery base record and call them out for a count by the receiver. If the counts for these items are correct, the entire delivery can be accepted, whereas if there is a discrepancy, a complete count can be required.

This approach can be further refined where mixed product is delivered in totes or other shipping containers or on pallets. The 894/895 DSD delivery record permits the tote, container, or pallet in which each item is placed to be identified. Hence, the receiving system can be designed to call for one, a few, or all items in one or several containers to be checked. Again, if these check out, the entire delivery can be accepted, whereas if there is a discrepancy, a complete count can be required.

- Under some circumstances such as when the receiving dock is badly congested by several deliveries, a retailer may choose to capture the delivery record of an accurate supplier and accept the delivery with no check-in count at all.
- Some suppliers with especially accurate delivery records may be allowed to bypass the check-in process routinely, being subject to random spot checks just to keep the system "honest." Under this arrangement, the supplier can be required to bring his delivery into the receiving area first, and then transmit the delivery record under unattended mode into the retailer's receiving system. After a brief pause, the delivery person can initiate a "request to receive" transmission instruction. The receiving system can either accept the delivery by returning a signature-only 895 acknowledgment or it can signal the need for a random spot check by indicating that no such record is available. By requiring that the delivery be brought in prior to learning whether a check will be made, temptation to cheat the system can be reduced.

Expedited check-in procedures of this kind, based on the observed accuracy of supplier delivery records, can further serve as a very positive incentive to the supplier for providing accurate records in the first place. One need only picture a delivery person having to first wait and then be subjected to a time-consuming and exhaustive check-in while another is immediately waved through with little or no check-in at all. Imagine the impact on this delivery person when he learns that the expedited check-in is available to him too, once he compiles a history of high accuracy in his own delivery records.

### **Direct Connect Interface Interchange With a Pre-sell Delivery**

The scenario for using the direct connect interface standard with a pre-sell delivery system is essentially the same as with the spot sell system. Since the order is known in advance, the electronic record for the delivery will normally be loaded into the delivery person's hand-held at the time the truck is loaded. Whether or not it is converted into the UCS format and loaded in that form or converted at the time of transmission is a design detail left up to the individual supplier. Adjustments and the exchange of 895 records is exactly the same as with spot sell, since all of the processing associated with such exchange takes place at the time of delivery.

### **Direct Connect Interface Interchange for a Return**

Returns are handled in essentially the same way as deliveries. The same 894/895 DSD delivery/return transaction sets are used, but are merely coded as being a credit (return) rather than debit (delivery) transaction. Whether the returns or deliveries are checked first depends upon the procedures that the retailer chooses to use.

Many retailers prefer to process returns first, with the supplier removing them from the store before bringing in fresh product. Unfortunately, this sequence is often inconvenient for spot sell suppliers with non-DEX/UCS computerized route accounting systems. The problem comes with the printing of the credit invoice. After going into the store to check for out-of-code product and to determine delivery quantities, the driver must go out to the truck to print the credit invoice (at least if the printer is installed on the truck rather than in a portable case). To save time going back and forth, the driver would prefer at that time to also pick out the delivery merchandise and bring it into the store.

With DEX/UCS, this problem can be avoided with the following procedure:

- First the driver goes to the shelves, pulls the stales and enters into his hand-held both the delivery and return quantities.
- He then takes the return product to the receiving area, transmits the return base record into the receiver's systems, and then checks the return out with the receiving clerk. (This procedure won't work if the retailer's receiving system requires the supplier's printed ticket to be used for check-in/out.)
- Once the returns are checked, the driver can take them out to the truck and pick out the delivery items. At this time, he can print out both the delivery and return paper tickets and bring them into the store with the delivery. A signed credit (return) ticket can then be given to the retailer at the time of delivery check-in, in the event that the retailer is not yet comfortable with electronic, digitally signed records as proof of delivery/return.

With pre-sell systems, the quantities to be returned may also be known in advance of the delivery call. For example, a separate sales/merchandise manager may at the time of order taking have identified and pulled out the return items to be collected by the driver. In such situations, the driver can transmit the return base record together with the delivery base record into the retailer's receiving computer as a single set. The DEX/UCS standard permits several individual transaction sets to be enclosed in a single header/trailer envelope and transmitted together. Upon receipt, the retailer's



system can then identify which is the delivery record and which is the return, accessing first whichever the receiver and retailer procedure dictates. (Note also, that some retailers with large stores may wish to have separate delivery records for deliveries by the same supplier to different departments. Here again, these separate records can be transmitted in a single envelope and then processed separately.)



## SECTION III

# THE UCS/DSD STANDARDS

This guide addresses those UCS standards that are important to DSD at the store level: the DEX/UCS communications standards and header/trailer control segments, and the 894/895 delivery/return transaction sets.

At the outset, it must be stressed that DEX/UCS is not unique to direct store delivery. DSD is merely the first application area making use of this communications mode for UCS. In time, we anticipate that DEX/UCS will be used to support other functions as well, such as the exchange of warehouse delivery data at the retail store level or the exchange of manufacturer-to-wholesaler delivery data at the warehouse level.

The standards specific to the DEX/UCS communications mode fall into two categories: the communications standards and the DXS/DXE header/trailer control segments. Any and all UCS transaction sets can, if desired, be exchanged via DEX/UCS when enclosed within the DXS/DXE header/trailer envelope.

In a corresponding fashion, we should also note the 894/895 delivery/return transaction sets comply with all of the rules of UCS. While they will be mainly used at the store level to exchange DSD delivery/return data via DEX/UCS they can be used more broadly as well. For example, they can be exchanged at the office-to-office level using the NEX/UCS communications mode, and they can be used to exchange data for other types of deliveries such as warehouse shipments.

## DXS/DXE Header/Trailer Control Segments

A new envelope, consisting of a DXS Application Header and a DXE Application Trailer, has been created for general use in DEX/UCS. This envelope is a creature of the direct exchange communications mode rather than any particular transaction set exchanged by means of this mode. Hence, if any UCS transaction set, be it a DSD delivery/return record or something else, is transmitted via DEX/UCS, the DEX/UCS envelope must be used. But if the same transaction set is transmitted via NEX/UCS, the normal (NEX) header/trailer envelopes must be used. There, a two-layer envelope (inner and outer) is used, in contrast to the simpler, one-layer approach in DEX/UCS.

The DXS header contains the following data:

- UCS Comm ID of the sender.
- The Functional ID, identifying the functional or application group to which the transaction sets that follow belong. Transaction sets belonging to different functional groups cannot be mixed within the same envelope. (The 894 and 895 delivery/return transaction sets belong to functional group "DX.")

- The version. This code indicates the version and release of the transaction sets that follow. All must be at the same version and release level.
- Transmission control number — a sender-unique number for this particular transmission.
- UCS Comm ID of the intended recipient (optional).
- Test indicator (optional) that can be used to indicate whether the transaction set data is being sent for production or test purposes.

The DXE trailer contains the same transmission control number as in the header plus a count of the total number of transaction sets included.

## The 894/895 DELIVERY/RETURN TRANSACTION SETS

There are two DSD delivery/return transaction sets:

- 894 - Delivery/Return Base Record, and
- 895 - Delivery/Return Acknowledgment and/or Adjustment Record.

Basic features of these transaction sets are described below.

### Record Set

A record set consists of a base record plus one or more (nine maximum) acknowledgment and/or adjustment records. The acknowledgment/adjustment records are sequentially numbered 1, 2, . . . All but the last one are used to provide adjustment data. The record set is terminated by a signature-only record, a special form of acknowledgment/adjustment (see below).

A record set is used to document either a delivery or a return transaction, not both. Where both take place, a separate record set is needed for each.

The base record is generated by the DSD supplier and transmitted to the customer/receiver. It contains the basic data concerning the specifics of the delivery or return. (If both parties find that everything is correct, this base record will contain all of the supplier-generated data needed to document the transaction. Only a signature-only acknowledgment from the receiver is then required to complete the record set.)

Acknowledgment and/or adjustment records are used to provide supplementary data, make adjustments, and terminate the record set. They can be generated by either party and exchanged in any sequence (e.g., B-A, A-B, A-B, B-A, . . .).

Acknowledgment and/or adjustment records can be of two types:

- **Adjustment:** These provide new (supplementary or correction) data. Data elements in the adjustment record are used for two purposes: to identify what is being adjusted and to provide the adjustment data itself. Section VI - Message Formats describes the detailed contents of the 895 acknowledgment/ adjustment transaction set takes care to show how the data elements are used to accomplish these two purposes.

Adjustment data replaces prior data or provides new data entries, so that latest values always apply, at least for the particular party furnishing the data. For example, a party may correct an item quantity or price by listing the item in an adjustment record with a new value for the quantity or cost. Such new values always replace prior values furnished earlier by the same party. Whether they replace the value furnished by the other party depends upon business agreements made separately by the specific business partners. Such agreements are not specified by the standard. We anticipate that most partners will agree that the last value for a delivery or return quantity is the value that both parties agree to, since quantities can be physically verified only at the time that delivery/return and data interchange take place. On the other hand, many partners may decide that each party is free to designate their own version of an item cost or allowance, with no agreement by the other party implied by the data exchange.

- **Signature only:** An acknowledgment containing no new adjustments and indicating that the party sending this record accepts the data up to this point and is closing out the record set. A signature-only acknowledgment must be transmitted **in the reverse direction** from the immediately preceding adjustment or base record. Once a signature-only acknowledgment has been sent, the record set is closed and no further acknowledgment/adjustment records can be added.

The typical exchange sequence is as follows:

- Where no adjustment records are required, the record set will consist of a base record sent by the supplier, followed by a signature-only acknowledgment record sent by the receiver.
- Where adjustments must be made, they can normally be accomplished by a single adjustment record, followed by a signature-only acknowledgement record in the reverse direction. We expect that most adjustments will be made and transmitted by the receiver, with a signature-only acknowledgment then being sent back by the supplier. On the other hand, some participants may find it useful to have the supplier generate and send the adjustment, with the receiver then sending back the terminating, signature-only acknowledgment. The standard permits either approach to be used.

The base record and the various acknowledgment/adjustment records are tied together into a record set by means of the following features:

- The supplier assigns a delivery/return number to the base record. This number is then entered into each acknowledgment/adjustment record of the same record set. (The receiver is also free to assign his own transaction number to the record as well. However, this number is only introduced to the record set when he transmits his first acknowledgment/adjustment record.)
- There is a Record Integrity Check (RIC) contained at the end of each record whose value is calculated from the data contents of that record. Each acknowledgment/adjustment record also lists near the start the value of the RIC from the previous record (e.g., from the immediately preceding acknowledgment/adjustment record, if there is one, or from the base record, if there isn't.) The RIC values thereby provide positive control over the integrity of the record set.

## Adjustment Duels

Users are cautioned against installing system features that could lead to adjustment duels, i.e., repetitive adjustments back and forth in which each party readjusts the same variable back to his own version. Adjustments can be initiated by two means: by the operator and by the system. We trust that proper operator training will prevent a supplier and a receiver from engaging in an endless and fruitless adjustment duel caused by their own actions. On the other hand, proper system design is needed to avoid system initiated dueling. Such system initiated adjustments are typically produced by file conflicts such as the detection of an unauthorized item or an “incorrect” price or allowance.

There are two ways in which system initiated duels can be “designed out.” One is to require operator “approval” before a system-requested adjustment can be transmitted. Then, the operator can be trained to veto any such system request the second time around. The other is to build the veto into the system itself so that a variable value transmitted once (either in the base record or in an adjustment record) is not transmitted a second time.

## Digital Signatures

Near the end of the base record and near the end of each acknowledgment/adjustment record is a digital signature data element. Digital signatures are calculated using a secret key of the sender’s choosing, with the contents of the record being processed to arrive at the signature value which is then automatically appended by the sender’s system when the transaction set is transmitted. The signature value is, therefore, sensitive not only to the secret key but also to the contents of the record. Any alteration of the record will destroy the integrity of the signature. Thus, the signature can be used to verify both the authenticity of the sender and the integrity of the contents of the transaction set. Beyond this, the standard assigns no particular significance, legal or otherwise, to the signature.

The algorithm used to generate the digital signature is not specified by UCS. While it’s choice is left to the user, the following guidelines are offered:

- The signature should be generated using a secret key known only to the sender’s organization. (Normally, the key should be buried inside the compiled system software in a way not directly accessible to the system operator.)
  - The sender’s organization should maintain a log of the algorithm and key used in order to be able to recalculate and verify the signature at a future date.
  - While the message recipient cannot verify the authenticity of a signature directly, such verification could be done by a third party arbitrator in the event of a dispute. To make such potential arbitration effective, the sender’s organization should not only maintain a log of the algorithm and secret key used but should also change the algorithm and key (or an algorithm used to generate the key) no more frequently than once a week. By this means, a file of other transactions using the same algorithm and key (or key generator) could be used to verify the authenticity of the log.

- The algorithm should generate the signature by processing the contents of selected segments up to the signature data segment. With this approach, the signature is a function of not only the secret key but also some of the contents of the transaction set. Section VI - Message Formats specifies which segments should be used in the 894 and 895 transaction sets for calculation of the electronic signature.
- The encryption algorithm selected for signature generation should be sufficiently complex to provide needed security but easy and quick to apply. While some users may choose to make use of the well-known DES algorithm, we suspect that it is more complex and secure than needed for the DSD application. A simpler algorithm has been developed by the National Physical Laboratory of Great Britain. While neither Arthur D. Little, Inc., nor the Uniform Code Council, Inc., makes any claims or representations concerning its capabilities, a description of the NPL algorithm together with its implementation in the C programming language have been developed for distribution by the UCC on request.

### Transaction Set Version

The same transaction set version rules used elsewhere in UCS apply to the exchange of delivery/return transaction sets with one minor modification. This modification is required, not because of the DEX/UCS mode of communication but because of the multiple record nature of a delivery/return record set.

In general, UCS requires users to support two versions of the standard — the current (new) version and the previous (old) version. During the period of time that these two versions are active, users must be able to receive and process both versions but can choose to send in either the old or the new. In practice, this means that users must update their software so that it can **receive** the new version from the start of the time period in question. Then, they are free to choose the date at which to switch over their **sending** from the old to the new.

With the 894/895 delivery return transaction sets, the rule is modified by requiring that all acknowledgment/adjustment records in a record set be in the same version as the base record. Hence, it is the DSD supplier — the sender of the base record — who determines whether the entire set will be in the old or the new version, and it is the retailer who must be able to handle both.

This rule works out well with respect to the computing capabilities of the equipment used by the DSD supplier and retailer. The DSD supplier must normally implement DEX/UCS on a hand-held computer — a relatively constrained computing environment. Since the supplier chooses the version level to be used and the timing of when to switch from the old to the new, he can program his system to handle only one version at any one time. The retailer, on the other hand, employs a mini- or microcomputer that can store much larger programs as well as data files. Hence, this party is the one that is better positioned to support both old and new versions at the same time.

### Special Item Identification Conventions

There are a number of conventions regarding the handling of special items that are worth noting here, even though they are covered in detail in Section V - Special Conventions.

### **Consignment items**

When an item is first delivered on consignment, no charge is made at the time of that delivery. Rather, a charge is made when the item is subsequently sold or, more typically, when the sold item is subsequently replenished. A charge is also made if the item is taken off consignment but not returned at that time. Consignment allowances are handled by means of the G72 Allowance or Charge data segment as described in Section V - Special Conventions.

### **Deposit items**

Deposit charges, both for deliveries and returns, are handled in two ways, depending upon whether or not the deposit item is directly associated with a resale item.

If it is (e.g., deposit bottles containing soft drinks for resale), the deposit is accounted for by means of the G72 data segment (Allowance or Charge) associated with the resale item itself.

If it isn't (e.g., empty bottles being returned), a deposit item is accounted for directly in its own G83 Line Item Detail data segment using the Product/Service ID Qualifier and Product/Service ID data elements, and then using the G72 segment for the deposit charge per unit.

### **Non-resale items**

Sometimes it is necessary to document the delivery or return of an item not intended for resale, such as a display rack. Such items do not have GTINs and are handled in much the same way, using the Product/Service ID Qualifier and Product/Service ID data elements.

### **Shipping container identification**

With some deliveries it is useful to identify the tote, container, packing case, pallet, or whatever in or on which the item in question is packed. Here, we can use the Product/Service ID Qualifier and ID in the G83 Line Item Detail data segment to identify the shipping container.

### **Product aggregations or groupings**

Some retailers may find it preferable to check in deliveries by counting product groupings or aggregations rather than individual items or stock keeping units (sku's). For example, soft drinks might be checked in by package type and size groupings, with all flavors and labels combined. Apparel such as pantyhose might be grouped by style number, with different sizes and colors combined.

To do this, the retailer and supplier must work together to agree on the groupings or aggregations they wish to use. Then, the grouping or aggregation to which each item belongs can be identified in the delivery/return record, using the Product/Service ID Qualifier and ID for that item.



## DEX/UCS COMMUNICATIONS STANDARDS

As discussed in Section II - The Application of UCS To Support DSD, Section E.3, the direct connect standard is appropriate where both parties to the exchange have computer devices that can be plugged together.

### Direct Connect Interface Standard

The DEX/UCS direct connect interface standard provides a means for directly linking two computers together via an electrical connection for the purpose of UCS data interchange. A draft version of this standard was tested in the DEX/UCS development program and then refined, based on operational experience. It has now been issued as Revision 01 and should be viewed as an operational standard.

### Reference Documents

The following documents are referenced in this standard and are of value for the understanding and application of this standard:

- *UCS Standards Manual*

This manual contains the actual direct connect interface standard as well as related standards such as those for all UCS transaction sets. It can be obtained from the Uniform Code Council, Inc.

Uniform Code Council, Inc.  
7887 Washington Village Drive, Suite 300  
Dayton, Ohio 45459  
Tel: 937-435-3870  
Fax: 937-435-7317  
Email: [info@uc-council.org](mailto:info@uc-council.org)  
Web: [www.uc-council.org](http://www.uc-council.org)

Other ANSI X12 standards can be obtained from:

Data Interchange Standards Association, Inc.  
7600 Leesburg Pike, Suite 430  
Falls Church, Virginia 22043  
Tel: 703-970-4480  
Fax: 703-970-4488  
Web: <http://www.disa.org>

- American National Standard (ANSI) X3.28-1976, *American National Standard Procedures for the Use of the Communications Control Characters of the American National Standard Code for Information Interchange in Specified Data Communications Links*

This standard can be obtained from:

American National Standards Institute  
25 West 43rd Street, 4th Floor  
New York, NY 10036  
Tel: 212-642-4900  
Fax: 212-398-0023  
Email: [info@ansi.org](mailto:info@ansi.org)  
Web: <http://www.ansi.org>

## Standards Precedence

The DEX/UCS direct connect interface standard is based in large part on ANSI X3.28, employing a number of specific options from within that much broader standard. In the DEX/UCS standard and this companion user guide, we have attempted to comply with all pertinent ANSI X3.28 specifications.

## Change Request Procedure

All change requests must be submitted to the Uniform Code Council, using the EAN.UCC electronic change request form available from [http://www1.ean-ucc.org/change\\_request/](http://www1.ean-ucc.org/change_request/). Once the change request has been received, the UCC will acknowledge receipt. The request will be considered in accordance with the procedure promulgated by EAN.UCC relating to procedures for Global Standards adoption and modification.

All sections of the change request form must be completed.

## Direct Connect Interface Standard Overview

The direct connect interface standard has been designed to directly link two computer devices together for data transfer purposes using an electrical cable with standard plugs. While details of the standard are covered in Section VII - Direct Connect Interface Standard of the Reference Guide, major features are as follows:

- **Mode of exchange:** This standard is designed to support the type of communications needed for electronic data interchange, where a complete message is transferred from one party to the other as a complete package. Hence, it is not designed for conversational or interactive communication at the application level. Following the initial handshake exchanges, the message is transmitted as a series of one or more blocks, and then the session is terminated.
- **Session level:** At the session level, establishment and termination control procedures are those specified in Subcategory 2.3 of ANSI X3.28. This subcategory is designed for use with two stations that are on a non-switched, point-to-point link and where both stations may bid for master status. It provides two important functionalities for DEX/UCS data interchange:
  - **Bi-directional message transfer:** A message can be sent in either direction between the initiating party and the responding party. The direction is established by the initiating party, by sending a “request to send” or a “request to receive” instruction in the initial handshake transmission. Once, the responding station answers back with the second, identifying handshake transmission, master status is assumed by whichever station is appropriate for the requested direction of message transfer. If the initiating station issued a request to send instruction, it assumes master status and sends the message. If a request to receive message was sent, the responding station assumes master status and sends the message, if any.
  - **Unattended message transfer:** As described in the scenarios in Section II - The Application of UCS To Support DSD, the initiating party may plug into an unattended socket of the responding computer and issue a request to send or a request to receive instruction. In the former situation, the initiating party

may then transmit a message (one or more UCS transaction sets enclosed within a DXS/DXE header/trailer envelope) to the responding computer. In the latter situation, the initiating party can request the responding computer to send back any messages intended for the initiating computer. Identification of both the initiating and responding computers is provided in headers exchanged as part of the initial handshaking process.

- **Data link level:**

- **Transmission timing, speed, and code:** Data is transmitted asynchronously, one start bit and one stop bit, at 9600 bits/second in the form of 8-bit bytes. These bytes consist of 7 ASCII information bits with no parity (eighth bit zero), except that the full 8 bits are used for sending the block CRC-16 (see below). Asynchronous transmission was selected because some hand-helds are not well equipped to handle synchronous transmission.
  - **Flow control:** No flow control is provided since it would have required a fourth-conductor, dedicated wire and contacts, or full-duplex capabilities to handle XON/XOFF control characters.
  - **Block size:** Messages are sent as a series of variable length blocks, with a maximum size of 245 bytes each.
  - **Message transfer blocking protocol:** Message transfer control procedures are governed by Subcategory D1 of ANSI X3.28: Message-independent Blocking with Cyclic Checking, Alternating Acknowledgments, and Transparent Heading and Text. This subcategory permits the message to be sent as a series of one or more blocks, with error checking on each and retransmission of those not properly received. In addition, it provides the receiving station with the ability to delay transfer of subsequent blocks if it has difficulty in keeping up. While this subcategory permits the transmission of binary files using all 256 combinations of 8-bit bytes, DEX/UCS does not take advantage of this capability. All message bytes are standard ASCII characters and cannot be confused with control characters. The only place where the full binary capability of the 8-bit byte is used is in the 16-bit cyclic redundancy check (CRC) used to check that the block was received correctly.
  - **Cyclic redundancy check (CRC-16):** UCS uses the CRC-16 cyclic redundancy check in two distinctly different places, not to be confused. In the direct connect interface standard, it uses it as a means for checking the accuracy of transmitted message blocks, with the CRC-16 applied to each block, expressed as a binary, 16-bit number, and appended to the end of it. In the 894 and 895 transaction sets, the CRC-16 algorithm is applied to the contents of the entire transaction set. It is then expressed in the form of four hexadecimal numbers and inserted into the G85 data segment, located just before the SE trailer segment at the end of the transaction set. This latter number is not checked as part of the communications process, although it can be checked at the applications level following receipt of the entire message.
- **Physical level:** Each device must be provided with a standard, 1/4" telephone jack (socket) of the type traditionally used in old-style telephone switchboards and now used in stereo receivers for headphones (the large, not the mini-socket).

Connection is accomplished by means of a three-conductor cable, with male plugs at each end and with the ring and tip contacts on the two connected to each other in reverse. Devices should send using RS232C compatible bipolar signal levels, and be able to receive at either these bipolar or TTL unipolar levels of zero and +5 VDC. Devices should further be designed and constructed to survive electro-discharge levels as specified in FCC Part 68 regulations for telephone equipment, applied in any combination between tip, ring, and ground.

### Usage Scenario

The typical DEX/UCS data interchange process using the direct connect interface standard consists of three consecutive transmission sessions — two handshake sessions and one message exchange session as follows:

1. The initiating party (the supplier in DSD applications) begins the process by plugging into his partner's system and assuming master status for the first handshake session. This is done by sending an ENQ control character and waiting for a proper response before sending the first handshake session header block and then terminating this first session.

There are three important pieces of data provided in this header block by the initiator:

- The initiator's UCS Comm ID, used to identify this party.
- An operation request, indicating whether the initiating party wishes to send or receive data.
- A list of communications standard (as opposed to transaction set) revision and level numbers that the initiating party is capable of operating at. (At present, there is only one of each in the standard.)

2. The responding party then assumes master status for the second handshake session. It sends an ENQ control character back to the initiating party and, following proper response, sends the second handshake session header block before terminating this session.

There are also three important pieces of information in this header block:

- A response code indicating possible error conditions and whether the responding system is ready to proceed.
- The responding party's UCS Comm ID, identifying this party.
- A statement of the revision and level number to be used during the third, data transfer session. (At present, the choice can only be R01L01, as these are the only ones in the standard.)

3. In the third session, the appropriate party assumes master status and sends the entire message (one or more transaction sets enclosed within a DXS/DXE header/trailer envelope) by means of a series of message blocks, and then terminates the session. If the initiating party had included a "request to send" instruction in the first header block, it will assume master status. If it contained a "request to receive" instruction, the responding party will assume master

status, so long as there is a message waiting to be sent. (If there isn't, the responding station will have so advised using the appropriate response code in the second handshake session.)

### Suggested Design Features

While not explicitly part of the direct connect interface standard, there are a number of recommended design features that will enhance the use of the standard:

- **Timer and response margins:** In a communications session, various ASCII control characters are sent and returned to control the data exchange session. While not specified in the standard itself, systems designers should provide margins for response and error so that timing does not introduce problems. In particular, we suggest the following:
  - **Response time:** Upon receiving an enquiry, acknowledgment, or block terminating character, a station should wait a brief period of time, 10 milliseconds or so, before answering back as appropriate. Some computing devices used for DEX/UCS can only operate in half- and not full-duplex mode. Such devices require a short period of time to switch over from send to receive. If the response is too fast, it can be received before switch over is complete and, therefore, missed.
  - **Intersession pause:** As noted above in the Usage Scenario Section, the DEX/UCS data interchange process consists of three consecutive transmission sessions — two handshake sessions and one message exchange session. Before initiating the second or third session, the initiating party should pause briefly, 100 milliseconds or so, to avoid possible confusion in processing control characters associated with the end of one session and the beginning of the next. Such a pause is especially helpful between the second and third session when both are sent in the same direction (i.e., when the party originating the entire data exchange process requests data to be sent back by the other party).
  - **Timer A margin:** Upon sending an enquiry or completing the transmission of a block, the sending station starts Timer A (set equal to one second) and then waits for a proper response. If the receiving station is not immediately ready, it can respond back with a WACK, after which the sending station sends an ENQ to see whether the receiving station is ready yet. To avoid problems, the receiving station should not wait until the full Timer A limit of one second before responding with a WACK. Rather, it should allow a margin for error, responding back after 950 milliseconds or so. Moreover, there is little point in the sending station sending the next ENQ immediately after receiving the WACK. In order to cut down on the workload of the receiving station, it is better to wait a period of time, perhaps 100 to 500 milliseconds.
  - **Timer B margin:** In a similar fashion to the above, the receiving station uses Timer B set at 100 milliseconds to protect against its nonrecognition of a block terminating character by the sending station. If the sending station wishes to pause while sending data, it can avoid Timer B time-out by periodically sending TSYN characters as fillers. In theory, such characters must be sent at least every 100 milliseconds prior to the resumption of regular data transmis-

sion. To avoid any danger of time-out, it is advisable to wait no longer than 90 milliseconds.

- **Provision for multiple revision and level numbers:** The direct connect interface standard is designed to accommodate multiple revisions and levels. In the first handshake transmission, the initiating station provides in the header block a list of revision and level numbers it is capable of processing. In the second handshake transmission, the receiving station answers back in its header block with the (highest possible) revision and level from this list, if any, that it is capable of handling and which should be used in the message transmission session. At present, the direct connect interface standard has only a single operational revision and level number — R01L01. In implementing this single pair, designers may find it convenient to hard code the second handshake response of R01L01. On the other hand, they should design their systems from the start to receive a multiple list of revision/level numbers from the initiating party in the first handshake block, looking for R01L01 as one of the entries. If this approach is taken, there will be no problem in dealing with partners implementing higher revisions and levels if and when issued.
- **Error instructions:** For a variety of reasons, something can go wrong during the data exchange process. When it does, the systems should tell the operator what to do to cope with the problem. Explanations concerning the nature of the problem should be non-technical and provided only to the extent needed by the operator for proceeding intelligently. Technical explanations such as “transmit abort due to invalid acknowledgment or time-out” are not particularly illuminating to most delivery and receiving people, although such messages might well be retained internally for subsequent use by systems people.

### Related User Practice

There are also user practices that will enhance the use of the standard, e.g.

- **Use of Comm IDs:** As part of the two handshake transmissions, each of the two computer systems will have provided the other with its UCS Comm ID. The initiating party sends its Comm ID to the responding station in the header of the first handshake transmission, and the responding station sends back its Comm ID in the header of the second handshake transmission.

The UCS Comm ID is a ten-digit identifying number. The first six digits are assigned by the UCC and uniquely identify each UCS user company. The user is free to select the last four, and may assign different ones for different purposes.

Normally, the two systems will make use of this identifying data as follows:

- **Identification of Responding Party by Initiator When Sending Data:** Almost certainly, the initiating system will want to check for the proper identity of the responding system when operating in the request to send mode. Usually the operator of the initiating system will key in some form of identification of the party he is planning to communicate with before sending the first handshake transmission. If the response handshake transmission contains a Comm ID different from the one expected, the initiating system should exit to a recovery procedure and inform its own operator of this specific problem. (Note: Since this error condition is not detected until receipt of the second

handshake transmission by the initiating party's system, no indication of this problem can be provided in the transmissions themselves.)

– **Identification of Responding Party by Initiator When Requesting Data:**

Whether or not to require the system operator to key in the identity of his intended partner when he initiates a request to receive is a matter of system designer choice. Under some circumstances, the system may already know who the other party is supposed to be (as, for example, when a system seeks to receive an 895 acknowledgment/adjustment record after previously exchanging an 894 base record that has not yet been closed out). If the initiating system does check and does find that a wrong Comm ID is received, it can exit to a recovery procedure and inform its own operator of this specific problem as in the paragraph immediately above. On the other hand, if the system does not insist on a correct Comm ID, it can use the one received to tag the message received for originator identification purposes. This latter function can, however, be equally well carried out using the Comm ID in the DXS header data segment contained in the message itself.

- **Identification of Initiating Party by Responder:** The responding party can use the Comm ID received in the first transmission to identify the initiating party. Under many circumstances (as, for example, when the retailer's system is operated in an unattended mode), this will be the only means for identifying the initiator. Where the initiating party sends a request to send, the responding party can use this identification, if desired, to determine whether the sender is authorized and also to label the received message. (Note that the sender's Comm ID is also contained in the DXS header segment of the message itself.) Where the initiating party sends a request to receive, the responding party can use this identification not only to check authorization but also to determine which message, if any, to send back. For whatever reason, if the responding station determines that the initiator's Comm ID is improper, it can send back in the second handshake transmission a Response Code of "01" (Unrecognized Comm ID).

When the direct connect interface standard is used to support DSD at the store level, Comm IDs are used only at the communications level. In the 894/895 transaction sets, both parties are identified by means of Duns numbers and location codes. Hence, it is these latter identifiers and not the Comm IDs that are preserved in stored records.

In using DEX/UCS, suppliers will usually find it worthwhile to maintain a file of the Comm IDs of their retailer partners and to make use of them when exchanging data. By this means, an attempt to erroneously transmit the wrong retailer's base record can be detected at the transmission level upon receipt of a conflicting Comm ID in the second handshake transmission. If this is not done, the error will only be detected by the retailer and only after the contents of the 894 record are interpreted.

Retailers, on the other hand, may find it unnecessary to maintain files of the Comm IDs of their suppliers, as their only use of this ID is for addressing outbound 895 records once the 894 base records have been received and checked. In other words, the retailer need only temporarily note down the sender's Comm ID when the 894 base record(s) is received. Then, it can be used to identify the appropriate supplier

when he subsequently plugs in to request the return transmission of any 895 acknowledgment/adjustment records. Once all such record sets for that supplier are closed out, the temporary notation of the supplier's Comm ID can be erased.



## SECTION IV

# USER SYSTEM DESIGN

UCS, when used to support direct store delivery at the store level, provides a standard means for linking the underlying delivery and receiving systems of supplier and retailer. The DEX/UCS communications standard specifies how the data is communicated and the 894/895 transaction sets specify how the data is to be formatted and interpreted.

As interface standards, they quite properly do not address internal, user system design issues, such as how the data is created in the first place or how it is used once received. Nor do they specify how the delivery/receiving operation is to be carried out procedurally. These choices are quite properly left up to individual user choice, permitting system variety and innovation. The UCS standards are used only where needed, to permit compatibility between systems and to make data interchange possible.

In implementing UCS for direct store delivery, the standards should be viewed not in isolation but as an element of an overall delivery or receiving system used in combination with partner systems. In the DEX/UCS development program, participants quickly grasped the importance of such an integrated approach to UCS and user system design.

In this section, we share ideas concerning suggested internal systems design features. These suggestions are not prescriptive, nor are they part of the UCS standards. They are included here in the belief that the sharing of ideas concerning useful internal system features and procedures can be a positive force for advancing the general state of the art. Also, in the belief that the documentation of experiences, mistakes, and lessons learned by those who have gone ahead can help others that follow to move forward more quickly.

## GENERAL FEATURES

While not part of the UCS standards, the following system and procedural design features of relevance to both retailer and DSD supplier are worthy of note:

- **Providing cost data in the 894/895 transaction sets:** Cost and related data such as charges and allowances are optional in the 894/895 record sets.

Normally, we expect that suppliers will routinely provide cost data in the 894/895 transaction sets in order to be able to “price” the delivery or return. (Such a capability is needed anyway if the supplier has any cash customers.)

The situation is a bit more complex for retailers. In order to feed back conflicting costs, retailers must maintain item cost files at the store level. Some may feel that this capability imposes an excessive burden in terms of system complexity and

file maintenance work. Some of the suppliers in the development program, however, found it very useful to receive conflicting cost data back from the retailer at the time of delivery. With such data, conflicts can be resolved and file errors fixed more quickly and easily than if done thirty days later at payment time. Also, repeated discrepancies in subsequent transactions and the extra work entailed thereby for both retailer and supplier can be eliminated. Hence, retailers are encouraged to design their systems to be capable of feeding back conflicting cost data.

- **Resolution of cost conflicts identified at the time of delivery:** While the 894/895 transaction sets enable conflicting cost data to be exchanged, resolution of such conflicts should normally not be attempted at the time of delivery. Usually, neither the delivery person nor the receiver has the knowledge or authority to do so. Hence, such data should be exchanged for information purposes only, with resolution being carried out later by appropriate office personnel.
- **Archiving complete transaction sets:** The validity of a digital signature can only be verified by recalculating it using the complete 894 or 895 transaction set to which it is appended. For this reason as well as for audit trail purposes, there is value in being able to retrieve or regenerate the complete set of 894 plus associated 895 transaction sets rather than just the final outcome. The integrity of the full set can be preserved by storing it in its complete form. Alternatively, it can be stored using some kind of summary form from which the original version can be regenerated. (For example, one might strip out the user's own cost elements from the individual transaction sets, keeping them in a master file that can be applied when needed to any record in a specified date range.)
- **Operator friendly design:** System designers should work closely with experienced delivery/receiving people when developing system procedures. Differences between good and poor design can have considerable impact on operator productivity and error rates. Moreover, good system design will minimize training time and cost.
- **Compatible DEX/non-DEX procedures:** Both delivery and receiving systems must be designed to operate with both DEX/UCS and non-DEX/UCS partners. Procedures for these two partner environments should be compatible and common where possible, so that operator confusion is avoided.
- **Accessing items in the record:** For a variety of reasons, either the delivery person or the receiver may wish to access the data on a particular item in the delivery/return record set stored in his computer. User systems should be designed to provide such access via sequence number, Global Trade Item Number (GTIN), or where appropriate, by keying in the product/service ID for the item or group of items. (The latter can be used for deposit and non-resale items, aggregation codes, and shipping container identity.) In addition, the user should have the capability to scroll through the items in sequence.
- **Handling multiple transaction sets in a single DXS/DXE envelope vs. handling multiple envelopes:** In DEX/UCS, a transmission event consists of sending one or more transaction sets (of the same functional group) enclosed in a single envelope consisting of a DXS/DXE header/trailer pair of control segments. Hence, one or more transaction sets can be sent at the same time, but in only one

envelope at a time. Additional envelopes can be sent only as separate transmission events, using the direct connect interface communications standard.

In the store-level DSD application, several 894 or 895 records can be transmitted together in a single envelope. For example, the delivery person may well transmit both a delivery and a return base record at the same time. Also, if retailer and supplier so wish, separate delivery and/or return records for different retailer departments can be generated and then transmitted together in the same envelope. The retailer, in turn, may transmit back several 895 acknowledgment/adjustment records in the same envelope. Both retailers and suppliers should design their systems to be capable of managing the receipt of such multiple transaction sets in the same envelope.

DEX/UCS does not require that all transaction set messages intended for a particular party be transmitted at the same time in the same envelope. Hence, a retailer may choose to package up the 895 acknowledgment/adjustment record for a delivery in a separate envelope from that used to enclose the corresponding 895 record for the return. If a supplier uses the unattended data transfer capability of the direct connect interface standard to retrieve 895 records from the retailer's system, it may be necessary to make more than one retrieval attempt. A successful request to receive attempt does not imply that all messages intended for the requesting party have been transmitted and received. Perhaps the best way to make sure that none are left behind is to repeat automatically any request to receive operation until a "no message" response code is returned.

- **Explicit operator instructions:** User systems should provide explicit instructions to their operators concerning where they are in the delivery/receiving process and what to do next. One retailer experimented with two different receiving systems, one with an explicitly directed set of screens and procedures and the other with a much more general and flexible procedures menu. The more directive system was found to be superior, with operators finding it much less confusing.

One should note, however, that the tests were not run long enough to evaluate these two systems from the point of view of an "expert" operator. Perhaps good systems should have directive screens but with some form of escape mechanism allowing expert operators to access more flexible procedures if desired.

- **Error instructions:** When something goes wrong, the systems should tell the operator what to do to cope with the problem. Explanations concerning the nature of the problem should be non-technical and provided only to the extent needed by the operator for proceeding intelligently. A technical explanation such as "transmit abort due to invalid acknowledgment or time-out" is not particularly illuminating to most delivery and receiving people, although it might well be retained internally for subsequent use by systems people.

On the other hand, consider the scenario where a delivery person following check-in goes back and plugs in to retrieve his signature-only acknowledgment record. Suppose the retailer's system failed for one reason or another to have it ready. In such a situation the retailer's system when queried will respond back to the supplier's with an electronic code indicating that there is no message. If this occurs, the supplier's system should provide some message to its operator such as "No message available, see receiving clerk."

- **Fallback procedures:** System designers should work out fallback procedures for all conceivable operational or systems failures. One major category is outright failure of either the retailer's or supplier's system. If the retailer's, the supplier can proceed as with a non-DEX/UCS customer. If desired, the 894 base record plus 895 acknowledgments can be exchanged later via NEX/UCS. If the supplier's system fails, the retailer can also use his normal procedures for non-DEX/UCS suppliers. If desired, the supplier could later send an "empty" base record via NEX/UCS to the retailer, receiving back the retailer's complete record for the delivery as an adjustment record.
- **Session reset:** Participants found a variety of reasons for wishing to void a partial transaction and start over. The 894/895 transaction sets provide no capability for exchanging void codes or similar codes. Rather, the supplier's and retailer's system should each provide its operator with the capability to void a partial record set and start over (while possibly retaining a copy for audit trail purposes).

It would be unwise to attempt to design in the capability to back up and do a partial restart as, for example, by permitting the sender to retransmit the last acknowledgment/adjustment record once it had already been accepted at the communications protocol level by the recipient. (Such a need might arise if, for example, the recipient somehow accidentally erased it.) Such multiple transmits could lead to considerable trouble, especially since no carefully defined procedures for both parties are spelled out in the standards. Hence, if the need to backup arises, the procedure should be to start over at the beginning, with the transmission of the base record.

Voiding and start over procedures must permit the user to get back to where he would have been if the voided exchange had not taken place at all. Hence, if an internal transaction number had been assigned to the delivery, it should be possible to use this transaction number over again. Also, with pre-sell systems in which the delivery record is created prior to the delivery call, it must be possible to recover this original record in order to transmit it again.

- **Closed out record sets:** A record set consists of an 894 base record and one or more 895 acknowledgment/adjustment records, closed out by the generation and **successful transmittal** of an 895 signature-only record back to the sender of the immediately preceding record, be it base or acknowledgment/adjustment. (Hence, a record set should not be closed out when the terminating signature-only acknowledgment is generated, but only after the communications protocol shows that it has been successfully transmitted and received.)

Once closed, a record set should be "locked up" so that it cannot be further adjusted by the system operator. If the need for an adjustment is detected following record set close out (for example, if an item is found to be defective) the adjustment must be handled by an entirely new record set.

- **Simultaneous sessions and unclosed record sets:** Systems should be designed to manage several partially complete and unclosed record sets at the same time. To be sure, it is good practice for supplier and receiver to work together to complete one delivery/receiving operation before going on to the next. Also, the

receiver should normally finish working with one supplier before going onto another. On the other hand, acknowledgment or adjustment records may not be immediately transmitted once they have been generated, especially because of the unattended transfer capability of the communications standard. Hence, each system may well need to keep track of several partially completed record sets while the operator goes from one to the next.

To illustrate, let us consider the following example:

- To start, supplier A comes in and transmits both a delivery and a return base record in the same envelope. Hence the receiving computer immediately has two partially completed record sets to contend with right from the beginning.
- Suppose the return is checked first and an adjustment is required. The receiving clerk will enter the necessary data and instruct his computer to make up the appropriate adjustment record for transmittal back to the supplier. As far as the receiving clerk is concerned, he has now completed that transaction. But the adjustment record will reside in some outbound message buffer until the supplier plugs in and requests it. Typically, he will not do this until the delivery has been checked as well.
- Now suppose the delivery checks out satisfactorily and the receiving clerk instructs his computer to generate a signature-only acknowledgment for that record set. It too will be placed in the outbound message buffer, possibly in the same envelope as the return adjustment, waiting for pickup by the supplier. Before the supplier does so, the receiver may well check in suppliers B and C.
- When supplier A finally plugs in and requests any messages for him, he receives both the adjustment record for the return and the signature-only acknowledgment record for the delivery. Receipt of the latter closes out that record set, but the return record set is still open. To close it, supplier A must transmit back a signature-only acknowledgment record.
- Finally, there is always the chance that on reviewing the adjustment record, the supplier may find a problem requiring further adjustment. Hence, he may need to go back to the receiving clerk and reopen the unclosed transaction for further work. The receiver's system must, therefore, have the capability of accessing this unclosed record set for further processing.
- **Display of unclosed record status:** System designers should develop display indicators and screens that clearly communicate to the operator the presence of and detailed status of unclosed record sets. Of special importance are methods to make sure that the supplier completes and closes out all open record sets before leaving one retail location and going onto the next.
- **Abnormally closed record sets:** User systems should be designed to execute an abnormal record set close if and when necessary. One form of abnormal close would be to void the record set as called for above. An abnormal close would also be needed, however, if the partner's system were to fail in the middle of an exchange session or if the driver did indeed get to the next stop miles away before discovering that the prior set had not been closed. Under such conditions, the data in the abnormally closed record set can have considerable, if not full value.

When an abnormal close is made, it would be useful to provide a means for the operator to code the abnormal close according to the validity of the partial record set. Possible condition categories could be:

- Record set voided.
- Record set data complete except for close.
- Record set incomplete.

## SUPPLIER SYSTEMS

Many of the details of the DSD supplier's system will depend upon the type of delivery system employed, be it spot sell, pre-sell with or without separate sales/merchandisers and delivery persons, or drop ship. Where spot sell is used or where the pre-sell sales/merchandiser makes the delivery, the use of a hand-held computer with the direct connect interface standard is the natural choice. Suppliers who drop ship may consider a variety of options such as sending the base record in advance using NEX/UCS or with the goods in a data carrier. The latter option requires agreement with the retailer as to the data carrier reading capability that the retailer will provide.

Irrespective of the details of the supplier's delivery system, there are a number of basics concerning suggested design and practice that are worth noting:

- **Item sequence control:** Delivery systems should permit the operator to control the sequence of items in the delivery record, so that it can be made to match the natural, physical delivery and check-in sequence.
- **Aggregating items:** There are many situations where the supplier can usefully aggregate groups of items in the 894 base record (while still preserving their individual item identity). Examples include items having a common package or style, or identifying the pallet, tote, or container in or on which the item is packed (see Section B.5 of Section III - The UCS/DSD Standards). With such supplementary data, interested retailers can employ a variety of methods for expediting check such as those discussed in Section F.2 of Section II - The Application of UCS To Support DSD.
- **Item descriptions in the 894 base record:** The 894 delivery/return base record allows the supplier to provide a short description of each item by means of data element 878 in the G83 line item detail data segment. (While data element 878 is called "cash register description," there is no intent for this description, provided by the supplier, to match the item description used by the retailer at his front-end scanner.) This data element is useful for identifying items that may not be in the retailer's system.
- **Item descriptions for any GTIN in a delivery:** The DSD supplier must be able to describe any delivered item given its GTIN. The need arises when the retailer's system rejects an item because it can't be found on the authorized item file. In such an event, the only information the retailer has is the rejected GTIN.

The supplier has several options for providing the needed description so that the rejected item can be identified and removed from the delivery. One is to provide item descriptions in the 894 base record. Another is to give the delivery person

the capability of looking up the item description in a supplementary file using its GTIN. Such a file can be provided in the delivery person's hand-held or in a notebook or other printed file carried on his person when he visits the store.

- **Automatic acknowledgment response:** Suppliers may find it useful to build automatic acknowledgment response into their systems to facilitate the completion of the DEX/UCS interchange process. With such a capability, the supplier's hand-held system could, under appropriate conditions, automatically generate and transmit a signature-only 895 acknowledgment record back to the retailer's system after receiving an 895 adjustment record from the retailer. Suppliers may find such automatic response to be useful if and when the adjustment data from the retailer is concerned with such things as costs and allowances, not items and quantities.

An 895 transaction set is defined as an adjustment record if any of the data segments in the range from G88 through G84 are used. Of these data segments, only G89, the line item detail adjustment segment, pertains to item identity and delivery/return quantities. An explicit rule for determining whether any items or quantities have been affected is provided in Section V - Special Conventions.

## RETAILER SYSTEMS

Retailers can design their receiving systems in a variety of ways to facilitate the delivery/receiving process. Worth noting here are the following design feature possibilities:

- **Item checking options:** A fundamental part of the check-in process is verifying the accuracy of the items and quantities in the delivery or return. While a number of approaches are possible, the normal procedure is to check through the items in the delivery record, identify and count each, and verify that each count matches that in the base record. (Quantities should be counted according to the unit of measure specified in the base record. Hence, this unit of measure must be displayed by the receiver's system.) This can be accomplished in a number of ways, including the following:

- The receiver's hand-held can display each item in the base record in turn, with the receiving clerk calling out each for identification and count. With this approach, blind counting can be employed, as the hand-held need not display the stored quantity until the receiving clerk has first entered his independent count.

This approach requires that the base record be accessible to the receiver's hand-held unit. With many receiving systems, the base record is transmitted by the supplier's system into the retailer's micro- or minicomputer base unit which is physically separate from the hand-held. Hence the record must be subsequently transferred (usually after checking it for unauthorized items) to the hand-held. This transfer is easily accomplished where the hand-held is linked to the base unit by an FM radio link. If it is not, some time may be lost while the receiving clerk carries out the record transfer process prior to check-in.

- Blind receiving can be carried a step further by requiring the receiving clerk to enter both item identity as well as item quantity data. To use this approach, the receiving clerk must either scan the item bar code or key in the item GTIN. Either approach is time consuming and reduces the productivity of both delivery person and receiver. Retailers should consider carefully whether they believe that blind item identification really adds improved control and is worth the extra cost.
- Another receiving approach is to use a retailer-printed receiving ticket for check-in. With proper design, the retailer's system can receive the base record from the supplier, check it for unauthorized items, and print out the receiving ticket all in background mode while the receiving clerk is attending to other duties. Hence, no time is lost in preparing the ticket. The receiving clerk can note any discrepancies on the ticket during check-in, and then key enter them into some form of terminal once the check-in has been completed. This approach has the disadvantage of not permitting blind receiving, as the receiving ticket displays the quantities from the base record. In addition, some extra time is required to key enter any adjustments after the check-in process has been completed.
- **Expedited check-in procedures:** Perceptive retailers may find it productive and useful to employ a variety of expedited check-in procedures with supplier's who have compiled a history of accurate records. A variety of such procedures is described in Section F.2 of Section II - The Application of UCS To Support DSD.
- **Simultaneous retailer sessions:** Retailer systems should be designed to process a number of different record sets simultaneously if the unattended data transfer capability of the standard is to be utilized. For example, several base records may have been received and initially processed for unauthorized items, etc., while the receiving clerk is checking in someone else. Also, several 895 acknowledgment/adjustment records may have been generated from earlier deliveries but not yet picked up. Clearly, it would be useful to permit the receiving system to handle this mix of partially completed record sets.

Retailers may well find it wise to design their systems so that the receiving clerk is required to complete the physical check-in process for one transaction before going onto the next. Hence, the system could be designed so that once the actual check-in for a particular 894 base record is started, it must be completed and the appropriate 895 adjustment or acknowledgment record triggered (or the partial record set voided) before the receiving clerk can call up the next delivery or return record for check-in. (An exception to this approach might be the capability to check the contents of one tote or pallet completely and then to go on to a different job before returning to the next tote or pallet in the first delivery.)

Requiring the receiver to complete one check-in process before going onto the next should not be confused with completing and closing out the record set. The record set cannot be closed out until the supplier has received an 895 signature-only acknowledgment, or has returned an 895 signature-only acknowledgment after receiving an 895 adjustment record. Until this has happened, the receiver's system must leave the record set open and have the capability of going back to it for further processing.



- **Preservation of item sequence in the base record:** The retailer's receiving system should preserve the item sequence contained in the base record, so that it can be used during check-in. In the development program, some system designers as a matter of housekeeping habit, sorted the items in the delivery record by GTIN when converting from UCS to internal format. This sort destroyed the receiving sequence and made check-in unnecessarily arduous and time consuming.
- **Acceptance of unauthorized items:** Under some circumstances, a retailer may find it useful to accept an unauthorized item. It is up to the individual retailing organization to specify the conditions under which such items should be accepted. Receiving systems should be designed to accommodate the acceptance of such items when appropriate. Of special importance are procedures for entering item-associated data, including description and retail price, and for making this latter data available to front-end scanning equipment.

In addition to these specific design feature suggestions, we should also note that the full benefits of UCS for direct store delivery can only be realized through the use of NEX/UCS at the office-to-office level as well as DEX/UCS at the store level. By using NEX/UCS to exchange pre-delivery data such as price, promotion, and authorization data, the files of both partners can be more efficiently and effectively maintained, especially with regard to timeliness, eliminating many of the conflicts and discrepancies that occur with conventional systems. And by using NEX/UCS for post-delivery messages, receivables/payables accounting can be streamlined.



## SECTION V

# SPECIAL CONVENTIONS

## UCS VERSIONS FOR DEX VS. NEX

Because of the difficulty of making software changes to some hand-held microcomputers, a special policy has been adopted regarding the applicability of UCS version updates to DEX/UCS data interchange. The rules are as follows:

- When the 894/895 DSD transaction sets are exchanged by the conventional means of NEX/UCS, the normal version rules for UCS apply. These rules are as follows:

“UCS and WINS users are required to support two versions of the standard - the current version and the previous version. The previous version of the standard must be supported for six months after the implementation of the new version. After six months - the previous version is dropped. UCS and WINS users should be able to receive both versions - current and previous, and be able to send either the current or previous version.”

- When the 894/895 transaction sets are exchanged using DEX/UCS, the DEX/UCS version should be used and so identified in the DXS header. Version applicability rules at present are as follows:
  - Version 004010 will continue to be the current version until January 2005. Hence, Version 005010 cannot be used in DEX/UCS exchanges by either supplier or retailer before this date.
  - January 2005, Version 005010 will become the current version and 004010 will become the previous version for DEX/UCS.
  - July 2005, only Version 005010 will be effective. Version 004010 will be discontinued at that time.
- From time to time, new NEX/UCS changes may be made to the underlying data elements and data segments used in the 894 and 895 transaction sets that do not affect how these transaction sets are used to support DSD. Such changes need not impact 894/895 usage, as the DEX/UCS version rules will continue to generate 894/895 transaction sets that comply with such later version rules then in effect.

## ROUNDING

When rounding off numerical quantities, the quantity should be rounded up when the most significant truncated digit is five or more, and the quantity should be rounded down when the most significant truncated digit is four or less. Following this convention should minimize the occurrence of pricing adjustments caused by differences in the rounding procedures of exchanging partners.

When rounding at the line item level (G83 segment), round to two decimal positions at each line item extension and then sum the result into the Total Invoice Amount (G8402) with two decimal positions. If there are allowances or charges present in the G72 segment, then they should be added or subtracted from the Item List Cost (G8308) before multiplying by the quantity in G8302.

## DEPOSIT ITEMS

Deposit charges, both for deliveries and returns, are handled in two ways, depending upon whether or not the deposit item is directly associated with a resale item.

### Deposit Items Not Directly Associated With Resale Items

A deposit item not directly associated with a resale item (e.g., empty bottles being returned), is accounted for in a G83 Line Item Detail segment to specify the deposit item ID and the number of deposit items. The G72 Allowance or Charge segment is then used to indicate the deposit amount per unit. Deposit conventions are as follows:

**G8302 - QUANTITY:**

- Set equal to the number of deposit units.

**G8303 - UNIT OR BASIS FOR MEASUREMENT CODE:**

- Should be set equal to “EA” for each, even if the deposit item is a physical case (CA for case would imply a case of cases).

**G8304 - U.P.C./EAN CONSUMER PACKAGE CODE:**

- Not used.

**G8305 - PRODUCT/SERVICE ID QUALIFIER:**

- Set equal to “DI” to indicate a deposit item.

**G8306 - PRODUCT/SERVICE ID:**

- Must be used to identify the deposit item (usually the GTIN).

**G8307 - U.P.C. CASE CODE:**

- Not used.

**G8308 - ITEM LIST COST:**

- Set equal to zero. The deposit unit amount will be expressed in G7205 Allowance or Charge Rate which follows this G83 segment.

**G8309 - PACK:**

- Not used.

**G8310 - CASH REGISTER ITEM DESCRIPTION:**

- Can optionally be used to describe the deposit item (even though the title of the data element implies an item for resale). Such a description can be useful when G8306 contains the identifying code.

The cost of the deposit item is included in G8403 (Total Deposit Dollar Amount) as well as in G8402 (Total Invoice Amount) in the G84 Delivery/Return Record Totals. It is calculated by multiplying the unit cost in G7205 by the quantity in G8302.

### **Deposit Items That Are Directly Associated With Resale Items**

The deposit item unit charge amount should be accounted for in a G72 Allowance or Charge segment associated with the G83 Line Item Detail segment for that item. Deposit conventions to be used here are as follows:

#### **G7201 - ALLOWANCE OR CHARGE CODE:**

- Use Code 525 (Deposit Charge - Resale Item) when the deposit charge is associated with an item for resale.
- Use Code 550 (Deposit Charge - Non Resale Item) when the deposit charge is not associated with an item for resale.

#### **G7202 - METHOD OF HANDLING:**

- This code should be set equal to “02,” off invoice. This means that deposit charges are added onto the total invoice amount.

#### **G7203 - ALLOWANCE OR CHARGE NUMBER:**

- Use of this data element is optional and can be used by the supplier to code the particular type of deposit item to which the charge is being applied. Since the deposit item is fairly well implied by the product item with which it is associated, the need for identification here will normally not be strong.

#### **G7204 - EXCEPTION NUMBER:**

- Not to be used.

#### **G7205 - ALLOWANCE OR CHARGE RATE:**

- This data element should always be used to document the deposit charge in dollars per unit.

#### **G7206 - ALLOWANCE OR CHARGE QUANTITY:**

#### **G7207 - UNIT OF MEASURE CODE:**

- Apply normal rules here.

#### **G7208 - ALLOWANCE OR CHARGE TOTAL AMOUNT:**

#### **G7209 - ALLOWANCE OR CHARGE PERCENT:**

#### **G7210 - DOLLAR BASIS FOR PERCENT:**

#### **G7211 - OPTION NUMBER**

- Do not use these data elements for deposit charges.

The deposit charge should be included in G8403 (Total Deposit Dollar Amount) as well as in G8402 (Total Invoice Amount) in the G84 Delivery/Return Record Totals. It is calculated by multiplying the charge per unit listed in G7205 by the number of units — the quantity contained in G7206 if used; otherwise, the quantity contained in G8302 for the associated resale item.

## NON-RESALE ITEMS

Sometimes it is necessary to document the delivery or return of an item not intended for resale, such as a display rack. Such items are handled in much the same way as empty deposit bottles. The main difference is that the Product/Service ID Qualifier is set equal to “NR” to designate a non-resale item. As above, the Product/Service ID is used to identify the particular item.

The G83 Line Item Detail segment is coded as follows:

### G8302 - QUANTITY

- Set equal to the number of non-resale units.

### G8303 - UNIT OR BASIS OF MEASUREMENT CODE:

- Should normally be set equal to “EA” for each.

### G8304 - U.P.C./EAN CONSUMER PACKAGE CODE:

- Should not be used.

### G8305 - PRODUCT/SERVICE ID QUALIFIER:

- Should be set equal to “NR” to indicate a non-resale item.

### G8306 - PRODUCT/SERVICE ID:

- Must be used to identify the non-resale item. Either a code or description can be used.

### G8307 - U.P.C. CASE CODE:

- Should not be used.

### G8308 - ITEM LIST COST:

- Should state the unit cost per non-resale item in dollars.

### G8309 - PACK

- Should normally not be used.

### G8310 - CASH REGISTER ITEM DESCRIPTION:

- Can optionally be used to describe the non-resale item (even though the title of the data element implies a resale item). This description can be useful if the item is identified by a code rather than a generic description in G8305.

## SHIPPING CONTAINER IDENTIFICATION

With some deliveries it is useful to identify the tote, container, packing case, pallet, or whatever in or on which the item in question is packed. Here again, we can use the Product/Service ID Qualifier and ID.

In this application, there are two possible Product/Service ID Qualifiers that may be used. If the tote/container is marked with a EAN.UCC Serial Shipping Container Code (SSCC), “UO” is used as the qualifier. If some other, generic identifier or mark is used, “UF” is used as the qualifier.

The Product/Service ID is used to furnish the identification itself. With “UF” it can be any alphanumeric mark up to 30 characters in length (e.g., “Tote 3 of 5”). With “UO”, only the EAN.UCC Serial Shipping Container Code (SSCC) should be used.

The Product/Service ID Qualifier and ID are used here somewhat differently than with deposit and non-resale items above. The tote/container ID is used to provide data that supplements the data for the item itself (identified in turn by means of the appropriate GTIN consumer package in data element G8306. In contrast, there is no associated GTIN for empty deposit and non-relale items

When tote/containers are identified, all items in the same tote/container should be listed consecutively in the delivery/return base record.

Details of the G83 Line Item Detail segment for an item being associated with a tote/container are as follows:

G8302 - QUANTITY

G8303 - UNIT OR BASIS OF MEASUREMENT CODE:

G8304 - U.P.C./EAN CONSUMER PACKAGE CODE:

– Should not be used.

G8305 - PRODUCT/SERVICE ID QUALIFIER:

EN - EAN/UCC - 13

“Data structure for the 13 digit EAN.UCC Global Trade Item Number (GTIN)”

EO - EAN/UCC - 8

“Data structure for the 8 digit EAN.UCC Global Trade Item Number (GTIN)”

UK - GTIN 14-digit Data Structure

“Data structure for the 14 digit EAN.UCC Global Trade Item Number (GTIN)”

UP - UCC - 12

“Data structure for the 12 digit EAN.UCC Global Trade Item Number (GTIN). Also known as the Universal Product Code (U.P.C.)”

G8306 - PRODUCT/SERVICE ID:

G8307 - U.P.C. CASE CODE:

– Should not be used.

G8308 - ITEM LIST COST:

G8309 - PACK

G8310 - CASH REGISTER ITEM DESCRIPTION:

– For the item.

G8311 - PRODUCT/SERVICE ID QUALIFIER:

UO - Designates a tote/container marked with an EAN.UCC Serial Shipping Container Code (SSCC).

UF - Designates a tote/container marked with a generic identification.

G8312 - PRODUCT/SERVICE ID:

- Contains the generic identification code, mark, or description (e.g., “Tote 3 of 5”) or the EAN.UCC Serial Shipping Container Code (SSCC) for the container in which the item is packed.

## PRODUCT AGGREGATIONS OR GROUPINGS

Some retailers may find it preferable to check in deliveries by counting product groupings or aggregations rather than individual items. For example, soft drinks might be checked in by package type and size groupings, with all flavors and labels combined. Apparel such as pantyhose might be grouped by style number, with different sizes and colors combined.

To do this, the retailer and supplier must work together to agree on the groupings or aggregations they wish to use. Then, the grouping or aggregation to which each item belongs must be identified in the delivery/return record, and the retailer must design the receiving software so that groupings and their quantity subtotals can be used in the check-in process.

The group to which each item belongs can be identified by means of the Product/Service ID Qualifier and ID. This time, the ID Qualifier is set equal to “AC” for aggregation code and the ID itself is used to identify the group. As with the tote/container IDs, this data supplements the identification of the item or case, provided in G8305 and G8306.

When product groupings are identified, all items belonging to the same aggregation group should be listed consecutively in the delivery/return base record.

Details of the G83 Line Item Detail segment for an item associated with an aggregation group are as follows:

G8302 - QUANTITY

G8303 - UNIT OR BASIS OF MEASUREMENT CODE:

G8304 - U.P.C./EAN CONSUMER PACKAGE CODE:

- Should not be used.

G8305 - PRODUCT/SERVICE ID QUALIFIER:

EN - EAN/UCC - 13

“Data structure for the 13 digit EAN.UCC Global Trade Item Number (GTIN)”

EO - EAN/UCC - 8

“Data structure for the 8 digit EAN.UCC Global Trade Item Number (GTIN)”

UK - GTIN 14-digit Data Structure

“Data structure for the 14 digit EAN.UCC Global Trade Item Number (GTIN)”

UP - UCC - 12

“Data structure for the 12 digit EAN.UCC Global Trade Item Number (GTIN). Also known as the Universal Product Code (U.P.C.)”

G8306 - PRODUCT/SERVICE ID:



G8307 - U.P.C. CASE CODE:

- Should not be used.

G8308 - ITEM LIST COST:

G8309 - PACK

G8310 - CASH REGISTER ITEM DESCRIPTION:

- For the item.

G8311 - PRODUCT/SERVICE ID QUALIFIER:

- Set to AC to indicate that an aggregation group is being identified in G8312.

G8312 - PRODUCT/SERVICE ID:

- Contains the identification code, style, or description (e.g. “12-oz. cans”) of the aggregation group to which the item belongs..

## CONSIGNMENT ITEMS

When an item is first delivered on consignment, no charge is made then. Rather, a charge is made when the item is subsequently sold or, more typically, when the sold item is subsequently replenished. A charge is also made if the item is taken off consignment but not returned at that time.

Deliveries of items being placed on consignment can be handled in much the same way as normal items, with the item identification and delivered quantity being provided in the G83 Line Item Detail of the base record. In that same segment, the item list cost can be entered in data element G8308 to indicate the consignment obligation that the retailer is assuming.

The G72 Allowance or Charge segment can then be used to provide an offsetting allowance to cancel the charge. This can be accomplished on an item-by-item basis by using the G72 segment at the item level, or on an overall basis by using the G72 segment at the record level.

If done item by item, the G7201 Allowance or Charge Code is set equal to “70” to indicate an offsetting consignment allowance, and the G7205 Allowance or Charge Rate is set equal to the same unit cost (but with negative sign) that was entered in G8308 for the item in question. No quantity need be entered in G72 so long as the consignment quantity is the same as the delivered quantity. If it isn’t, the consignment quantity should be entered into G7206 (Allowance or Charge Quantity) and the appropriate unit of measure should be entered into G7207 (Unit of Measure Code).

Allowances for items placed on consignment can be dealt with using a G72 Allowance or Charge segment at the record level, if desired. If this is done, the consignment allowance must be expressed as a total (negative) amount, rather than built up item by item.

Corresponding operations can be employed using a return record to take an item off consignment. If it is removed from the store, the item identification, quantity removed and unit cost should be entered into the G83 Line Item Detail Record. Then,

the G72 Allowance or Charge should be used, either at the item or record level, to account for the offsetting consignment debit (against the credit).

If the G72 Allowance or Charge segment is used at the item level to take items off consignment, the G7205 Allowance or Charge Rate should be set equal to the same unit cost that was entered in G8308 for that item (but with negative sign here). No quantity need be entered in G72 so long as the quantity taken off consignment is the same as the returned quantity. If it isn't, the returned quantity should be entered into G8302 (Quantity) of the G83 Line Item Detail segment and the off-consignment quantity should be entered into G7206 (Allowance or Charge Quantity) of the G72 Allowance or Charge segment.

If the G72 Allowance or Charge segment is used at the record level to take items off consignment, the consignment allowance must be expressed as a total (negative) amount, rather than built up item by item.

If more items are taken off consignment than are returned, the retailer will end up with a payment obligation. This is accomplished by means of an allowance against a return or credit, resulting in a double negative or payment obligation due the supplier from the retailer.

### **Consignment Allowances at the Item Level**

The G72 Allowance or Charge segment can be used at the item level to account for consignment allowances as follows:

G7201 - ALLOWANCE OR CHARGE CODE:

- This element should be set equal to "70" to indicate a consignment allowance.

G7202 - METHOD OF HANDLING:

- Use as appropriate.

G7203 - ALLOWANCE OR CHARGE NUMBER:

G7204 - EXCEPTION NUMBER:

- Not needed.

G7205 - ALLOWANCE OR CHARGE RATE:

- This data element should normally be used and should normally have the same magnitude as G8308 (Item List Cost) in the G83 Line Item Detail segment for this item. However, here the quantity must be negative in order to obey the algebraic sign convention for allowances and charges.

G7206 - ALLOWANCE OR CHARGE QUANTITY:

G7207 - UNIT OF MEASURE CODE:

- These data elements are used together if the quantity being placed on or taken off consignment differs from the quantity being delivered or returned. (The latter is listed in data element G8302 of the Line Item Detail segment for this item.)

G7208 - ALLOWANCE OR CHARGE TOTAL AMOUNT:

G7209 - ALLOWANCE OR CHARGE PERCENT:

G7210 - DOLLAR BASIS FOR PERCENT:

- G7208, or G7209 and G7210 together, can be used in place of G7205 to express the size of the consignment allowance, applying normal rules for the G72 data segment. (G7208 or G7209 must be negative in order to obey the algebraic sign convention for allowances and charges.)

G7211 - OPTION NUMBER

- Not needed.

### Consignment Allowances at the Record Level

The G72 Allowance or Charge segment can be used at the record level to account for consignment allowances as follows:

G7201 - ALLOWANCE OR CHARGE CODE:

- This element should be set equal to “7” to indicate a consignment allowance.

G7202 - METHOD OF HANDLING:

- Use as appropriate

G7203 - ALLOWANCE OR CHARGE NUMBER:

G7204 - EXCEPTION NUMBER:

- Not needed.

G7205 - ALLOWANCE OR CHARGE RATE:

- This data element should normally not be used at the record level since different items will normally have different values.

G7206 - ALLOWANCE OR CHARGE QUANTITY:

G7207 - UNIT OF MEASURE CODE:

- These data elements are used together or not at all. They should be used if and only if G7205 is used to provide an allowance rate (negative quantity), in which case the rate is applied to the G7206 quantity.

G7208 - ALLOWANCE OR CHARGE TOTAL AMOUNT:

G7209 - ALLOWANCE OR CHARGE PERCENT:

G7210 - DOLLAR BASIS FOR PERCENT:

- G7208, or G7209 and G7210 together, can be used to express the size of the consignment allowance, applying normal rules for the G72 data segment. (G7208 or G7209 must be negative in order to obey the algebraic sign convention for allowances and charges.)

G7211 - OPTION NUMBER

- Not needed.

## FREE GOODS

When delivering consumer items which are free due to a special promotion, the total quantity of all goods ordered or invoiced at the regular cost should be stated in the G83 segment as G8302 (DE380 Quantity) and G8308 (DE237 Item List Cost). Use the G72 segment to provide the details of the free goods offering.

### Example:

A supplier delivers 11 units of a product, giving one unit free. The regular cost of the product is \$1.55 each. The Delivery/Return Base Record Transaction Set (894) example is as follows:

#### *G83 Line Item Detail/DSD Segment*

G8301	DSD Sequence Number	1
G8302	Quantity	11
G8303	Unit or Basis of Measure Code	EA (Each)
G8305	Product/Service ID Qualifier	UP
G8306	Product/Service ID	001234542345
G8308	Item List Cost	1.55

#### *G72 Allowance or Charge Segment*

G7201	Allowance or Charge Code	1 (Free Goods)
G7202	Method of Handling Code	02 (Off Invoice)
G7205	Allowance or Charge Rate	-1.55
G7206	Allowance or Charge Quantity	1
G7207	Unit or Basis of Measure Code	EA (Each)

## SECTION VI

---

# MESSAGE FORMATS

---

## INTRODUCTION

This section is concerned with transaction set standards: the DXS/DXE control segments, the 894 Delivery/Return Base Record, and the 895 Delivery/Return Acknowledgment and/or Adjustment Record. In each of these, a number of definitions and notation conventions employed or described in detail in the *UCS Standards Manual*. While the standards manual is the authoritative source and has precedence over comments made here, the following are worth noting.

### Transaction Set Syntax

In UCS, messages are transmitted in the form of transaction sets, with each corresponding to a structured business document. Each different type of transaction set is given a name and a number. Of relevance to UCS for DSD at the store level are transaction set 894, the Delivery/Return Base Record, and transaction set 895, the Delivery/Return Acknowledgment and/or Adjustment Record.

A transaction set is composed of a series of segments which are, in turn, made up of data elements. A data element provides an individual piece of information, such as a name or a quantity. A segment provides a logical collection of data elements, such as the name and address of a party to the transaction or the quantity, identification, and cost of an item in an order.

A segment starts with a segment identifier, then contains one or more data elements, and ends with a segment terminator. The segment identifier is a unique code consisting of two or three alpha/numeric characters. Hence, each segment in a transaction set is explicitly identified there, even though the transaction set itself places strong controls on the permissible sequence of segments in it. (A specific segment may be used in several different transaction sets.) An asterisk (\*) delimiter is used to separate one data element from the next, as well as the first from the segment identifier. In DEX/UCS, where data is transmitted in the form of ASCII characters, the segment terminator consists of the ASCII control characters CR and LF.

Each data element used in UCS is defined in the Data Element Dictionary contained in the *UCS Standards Manual*. It is listed there according to its numerical code identifier, consisting of a two-to-four digit number.

In contrast to segments, the data elements contained in a transaction set are not explicitly labeled there. Instead, each data element in a segment is identified by its sequential position, with the definition of the segment specifying which data element is the first, which is the second, and so forth. If an optional data element is left out, successive delimiters must be used to indicate its unused position. An exception to this rule is where one or more optional data elements are left out at the end of a

segment. Here, the segment terminator can be used to terminate the segment at the appropriate, earlier point in the segment.

### Classification of Data Elements and Segments

The data element and segment classifications, important to the edit and audit procedures incorporated in the EDI standards, are defined as follows:

- **M - Mandatory:** This segment or data element must be used in this place.
- **C - Conditional:** The presence of this data element is dependant on the presence or absence of other data elements in the same segment. NOTE: The conditional classification applies only to data elements. Segments can only be mandatory or optional.
- **O - Optional:** Available information that may be useful to the message receiver and may be included in the transaction set at the option of the sender.

### Data Element Relationship Requirements

Frequently, requirements apply to combinations of data elements in a segment, expressed in a form such as R0102 or P0305. The letter is used to specify the type of requirement and the numbers thereafter refer to the data elements in the segment to which the rule applies. For example, R030506 applies the R-type requirement to the third, fifth, and sixth data elements in the segment. The types of requirements are as follows:

- **P - Paired:** Indicates that if any one of the referenced data elements is present, they all must be present. (This requirement can apply to more than two data elements.)
- **R - Required:** Indicates that at least one of the referenced data elements must be present. More than one is also allowed.
- **E - Exclusive:** Indicates that one and only one of the referenced data elements may be present.
- **C - Conditional:** Indicates that if the first referenced data element is used, then all remaining referenced data elements must be used.
- **L - Conditional paired:** Indicates that if the first referenced data element is used, then at least one of the remaining referenced data elements must be used.

### Data Element Types

Data elements can be of the following types:

- **Numeric - Nm:** Implied decimal point m character positions before the end. (For example, N2 means that the number 12345 should be interpreted as 123.45)
- **Decimal - Rm:** Decimal point explicitly required, with m being the *maximum* number of decimal fraction digits permitted. The decimal is required for all fractional values. For integer values, it should not be transmitted. The decimal point character, if used, is not included in the maximum/minimum character count for the data element.

- **Alpha/Numeric - AN** (For DEX/UCS, leading spaces are not allowed)
- **Date - D:** Expressed CCYYMMDD, where CC is the first two digits of the year.
- **Time - TM:** Expressed HHMM in twenty-four hour time.
- **Identification - ID:** Expressed as a code, as defined for the data element in question in the Data Element Dictionary.

### Use of Signed Numeric Fields

All quantitative data elements are assumed to be positive or zero unless preceded by a minus (–) sign, subject to the following restrictions:

- All data elements that express quantities (e.g.: pieces, cases, pounds, percentages) are always positive or zero.
- Data elements which increase the monetary amount due the seller are positive. (With DSD returns, the retailer is considered to be the seller.)
- Data elements which decrease the monetary amount due the seller are negative and must be preceded by a minus (–) sign.
- Temperatures may be positive or negative.

### Data Element Length

Each data element has a specified range of lengths, expressed in the form M-N with M being the minimum length and N the maximum length. Decimal points and numeric signs are not counted as part of the length.

### Loops

The UCS syntax provides the capability for a series of repetitive iterations of segment sequences, or loops, as well as for different levels of loops (i.e., for loops within loops). A loop header segment is used to show where each loop starts, and a loop trailer segment is used to show where it ends. Each of these segments contains a loop identifier indicating the level of the loop. These segments provide useful control information to generalized transaction set generation and interpretation software. In DSD applications at the store level, however, software is likely to be designed to deal specifically with only the 894 and 895 delivery/return record transactions sets used there. Such software can take advantage of the fact that these two transaction sets each contain only a single loop, used to provide a series of segments applying successively to the individual line items in the delivery. Hence, these systems need not have the capability to manage a complex series of different loops. (For further details on loop syntax and structure, please refer to the *UCS Standards Manual*.)

### Transaction Set Version

The 894 and 895 transaction sets in this implementation and user guide have an associated version/release number, coded in the X12 recommended format, e.g. 005010UCS where 005 is the version, 010 is the release, and UCS indicates the industry subset of the X12 standard.

## DEX/UCS CONTROL SEGMENTS

The control segments defined in this section include the header and trailer segments for each transmission and the bounded loop segments LS and LE.



**Segment: DXS DEX/UCS Application Header****Purpose:** To provide identification and control information.**Comments:** **A** DXS01 is the sender's Comm ID.**B** DXS05 is the receiver's Comm ID.**Notes:** The purpose of this control segment is to provide identification and control information. It must appear as the first data segment in any DEX/UCS transmission.**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ DXS01	402	<b>Communications ID</b> A unique string of characters that identifies the transmitting company <b>DXS01 contains the sender's Communications Identification Number. Note: UCS users must acquire a Comm ID from the Uniform Code Council, Inc, before starting DEX/UCS transmissions.</b>  The UCS Comm ID is a ten-digit number assigned by the UCC and uniquely identifies each UCS user. The user is free to select the last four, and may assign different ones for different purposes. It is the sender's responsibility to inform message receivers in advance of the specific ten-digit number that will be used in any specific situation.	M AN 1/10
➤ DXS02	479	<b>Functional Identifier Code</b> Code identifying a group of application related transaction sets <b>DX</b> Direct Exchange Delivery and Return Information (894, 895)	M ID 2/2
➤ DXS03	480	<b>Version / Release / Industry Identifier Code</b> Code indicating the version, release, subrelease, and industry identifier of the EDI standard being used, including the GS and GE segments; if code in DE455 in GS segment is X, then in DE 480 positions 1-3 are the version number; positions 4-6 are the release and subrelease, level of the version; and positions 7-12 are the industry or trade association identifiers (optionally assigned by user); if code in DE455 in GS segment is T, then other formats are allowed <b>A code indicating the version and release of the UCS standards being used here.</b>  For UCS transaction sets such as 894 and 895, the code is expressed in the form 005010UCS, where 005 is the version, 010 is the release and UCS indicates the industry subset of the X12 standard.  All transaction sets following this DXS Application Header must be coded in the particular version and release listed in this header.  In a sequence of exchanges consisting of the 894 base record and one or more 895 acknowledgment/adjustment records forming a single record set, all acknowledgment/adjustment records must use the same version and release as used in the base record.	M AN 1/12
➤ DXS04	404	<b>Transmission Control Number</b> A unique number assigned to the transmission group by the sender  In a sequence of transmissions of a base record and one or more acknowledgment/adjustment records, each new transmission by the same party should have a different transmission control number.	M NO 1/5
DXS05	402	<b>Communications ID</b> A unique string of characters that identifies the transmitting company <b>The Comm ID is used here to identify the intended recipient of the transmission. Use here is optional.</b>	O AN 1/10
DXS06	376	<b>Test Indicator</b> Code indicating whether data enclosed by this interchange envelope is test or production <b>P</b> Production Data <b>T</b> Test Data	O ID 1/1

**Segment: DEX** DEX/UCS Application Trailer

**Purpose:** To specify end of application message.

**Comments:** **A** The control number is the same as that used in the corresponding header.

**Notes:** The purpose of this control segment is to delineate the transactions and provide control information. It must appear as the last data segment in each DEX/UCS transmission.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ <b>DXE01</b>	<b>404</b>	<b>Transmission Control Number</b> A unique number assigned to the transmission group by the sender <b>DXE01 must contain the same control number that was contained in DXS04 for this transmission.</b>	<b>M NO 1/5</b>
➤ <b>DXE02</b>	<b>97</b>	<b>Number of Transaction Sets Included</b> Total number of transaction sets included in the functional group or interchange (transmission) group terminated by the trailer containing this data element <b>Contains the total count of the transaction sets (irrespective of whether or not they were of the same kind) contained in this transmission envelope.</b>	<b>M NO 1/6</b>

**Segment: LS Loop Header****Purpose:** To indicate that the next segment begins a loop**Semantic: 1** One loop may be nested contained within another loop, provided the inner nested loop terminates before the outer loop. When specified by the standard setting body as mandatory, this segment in combination with "LE", must be used. It is not to be used if not specifically set forth for use. The loop identifier in the loop header and trailer must be identical. The value for the identifier is the loop ID of the required loop segment. The loop ID number is given on the transaction set diagram in the appropriate ASC X12 version/release.**Comments: A** LS is a control segment. LS is always used in conjunction with a corresponding loop trailer (end) - LE, as illustrated below. The LS and LE indicate the start and end of a loop but are not part of the iteration of the loop.**LOOP NESTING**

Loop "A" Header (LS "A")  
  Loop "B" Header (LS "B")  
    Loop "C" Header (LS "C")  
    Loop "C" Trailer (LE "C")  
    Loop "D" Header (LS "D")  
    Loop "D" Trailer (LE "D")  
  Loop "B" Trailer (LE "B")  
Loop "A" Trailer (LE "A")

Neither LS nor LE is used if the data within the loop is not used.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
LS01	447	<b>Loop Identifier Code</b> The loop ID number given on the transaction set diagram is the value for this data element in segments LS and LE	<b>M AN 1/6</b>

**Segment: LE Loop Trailer****Purpose:** To indicate that the loop immediately preceding this segment is complete**Semantic: 1** One loop may be nested contained within another loop, provided the inner nested loop terminates before the other loop. When specified by the standards setting body as mandatory, this segment in combination with "LS", must be used. It is not to be used if not specifically set forth for use. The loop identifier in the loop header and trailer must be identical. The value for the identifier is the loop ID of the required loop beginning segment. The loop ID number is given on the transaction set diagram in the appropriate ASC X12 version/release.**Comments: A** LE is a control segment. LE is always used in conjunction with a corresponding loop header (start) - LS, as illustrated below. The LS and LE indicate the start and end of a loop but are not part of the iteration of the loop.**LOOP NESTING**

Loop "A" Header (LS "A")  
  Loop "B" Header (LS "B")  
    Loop "C" Header (LS "C")  
      Loop "C" Trailer (LE "C")  
    Loop "D" Header (LS "D")  
      Loop "D" Trailer (LE "D")  
    Loop "B" Trailer (LE "B")  
  Loop "A" Trailer (LE "A")

Neither LS nor LE is used if the data within the loop is not used.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
LE01	447	<b>Loop Identifier Code</b> The loop ID number given on the transaction set diagram is the value for this data element in segments LS and LE	<b>M AN 1/6</b>

## UCS

# 894 Delivery/Return Base Record

This X12 Transaction Set contains the format and establishes the data contents of the Delivery/Return Base Record Transaction Set (894) for use within the context of an Electronic Data Interchange (EDI) environment. The transaction set can be used to enable a Direct Store Delivery (DSD) vendor to communicate the details of a DSD delivery and is to be used during the check-in procedure.

The Delivery/Return Base Record is generated by the DSD supplier and transmitted to the customer/receiver. It contains the basic data concerning the specifics of the delivery or return. (If both parties find that everything is correct, this base record will contain all of the supplier-generated data needed to document the transaction. Only a signature-only acknowledgment from the receiver is required to complete the record set).

## Header

PAGE #	POS. #	SEG. ID	NAME	REQ. DES.	MAX USE	LOOP REPEAT
64	0100	ST	Transaction Set Header	M	1	
65	0200	G82	Delivery/Return Base Record Identifier	M	1	
67	0250	N9	Extended Reference Information	O	>1	

## Detail

PAGE #	POS. #	SEG. ID	NAME	REQ. DES.	MAX USE	LOOP REPEAT
68	0100	LS	Loop Header	O	1	
		LOOP ID - 0100				9999
69	0200	G83	Line Item Detail/Direct Store Delivery	O	1	
74	0300	G22	Pre-Pricing Information	O	1	
75	0400	G72	Allowance or Charge	O	10	
78	0500	G23	Terms of Sale	O	20	
80	0600	LE	Loop Trailer	O	1	

## Summary

PAGE #	POS. #	SEG. ID	NAME	REQ. DES.	MAX USE	LOOP REPEAT
81	0100	G72	Allowance or Charge	O	20	
84	0200	G23	Terms of Sale	O	20	
86	0300	G84	Delivery/Return Record of Totals	M	1	
87	0400	G86	Signature Identification	M	1	
88	0500	G85	Record Integrity Check	M	1	
89	0600	SE	Transaction Set Trailer	M	1	

**Segment: ST Transaction Set Header**

**Level:** Header

**Loop:** \_\_\_\_

**Usage:** Mandatory

**Max Use:** 1

**Purpose:** To indicate the start of a transaction set and to assign a control number

- Semantic:**
- 1 The transaction set identifier (ST01) is used by the translation routines of the interchange partners to select the appropriate transaction set definition (e.g., 810 selects the Invoice Transaction Set).
  - 2 The implementation convention reference (ST03) is used by the translation routines of the interchange partners to select the appropriate implementation convention to match the transaction set definition. When used, this implementation convention reference takes precedence over the implementation reference specified in the GS08.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES		
➤ ST01	143	<b>Transaction Set Identifier Code</b> Code uniquely identifying a Transaction Set <b>894</b> Delivery/Return Base Record	M	ID	3/3
➤ ST02	329	<b>Transaction Set Control Number</b> Identifying control number that must be unique within the transaction set functional group assigned by the originator for a transaction set <b>Contains a unique transaction set control number assigned by the sender (i.e. the DSD supplier) to this particular record.</b>	M	AN	4/9
ST03	1705	<b>Implementation Convention Reference</b> Reference assigned to identify Implementation Convention	O	AN	1/35

**Segment: G82 Delivery/Return Base Record Identifier****Level:** Header**Loop:** \_\_\_\_**Usage:** Mandatory**Max Use:** 1**Purpose:** To transmit identifying numbers, dates, and other basic data relating to the transaction set

- Comments:**
- A** When G8201 equals "D" (debit), information in this segment is for a delivery. When G8201 equals "C" (credit), information in this segment is for a return.
  - B** G8203 is the receiver's DUNS number.
  - C** G8205 is the supplier's DUNS number.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ <b>G8201</b>	<b>478</b>	<b>Credit/Debit Flag Code</b> Code indicating whether amount is a credit or debit <b>C</b> Credit <b>D</b> Debit	<b>M ID 1/1</b>
➤ <b>G8202</b>	<b>861</b>	<b>Supplier's Delivery/Return Number</b> Identifying number assigned by the supplier to the transaction  <b>This is the transaction number that the supplier assigns to this particular record set. This same number must be entered into the corresponding G8703 data element of all acknowledgment/adjustment records, both supplier and retailer generated, belonging to this set.</b>  <b>Multiple adjustments can be uniquely identified by using the combination of the Sender's Communications ID (DXS01) and the Supplier Delivery/Return Number (G8202 and G8703) within a single DXS/DXE envelope. The supplier must assure that the Supplier Delivery/Return Number (G8202 and G8703) is unique within the DXS/DXE envelope.</b>  <b>Some suppliers may choose to use the same G8202 number to identify both the delivery record and the return record associated with a common delivery/return visit. As a result, unique identification of a specific transaction may require reference to the G8201 credit/debit flag in combination with the G8202 delivery/return number.</b>	<b>M AN 1/22</b>
➤ <b>G8203</b>	<b>860</b>	<b>D-U-N-S Number</b> Identifying number assigned by Dun & Bradstreet (Data Universal Numbering System)	<b>M ID 9/9</b>
➤ <b>G8204</b>	<b>862</b>	<b>Receiver's Location Number</b> Number assigned by the customer that when combined with receiver Duns number uniquely identifies the receiving location  <b>G8203 and G8204 are used to uniquely identify the receiving party and the location (e.g., store and/or department) where this delivery/return is to take place. These numbers must be assigned by the receiver's organization and communicated to the supplier in advance. The DUNS plus 4 can be used by placing the DUNS Number in G8203 and the four digit suffix in G8204 (left justified).</b>  <b>Receiving companies are free to use this pair of numbers as they find most suitable to their needs, so long as they can be fixed and communicated to the supplier in advance of delivery. Since any DUNS number assigned to a particular retailing establishment must necessarily be unique to that business entity, there is no possible way that different retailers can use common identifying number sets.</b>	<b>M AN 1/6</b>
➤ <b>G8205</b>	<b>860</b>	<b>D-U-N-S Number</b> Identifying number assigned by Dun & Bradstreet (Data Universal Numbering System)  <b>G8205 must be assigned and communicated to the receiving organization in advance.</b>	<b>M ID 9/9</b>

➤	G8206	871	<b>Supplier's Location Number</b>	M	AN	1/6
			Number assigned by supplier that provides uniqueness when combined with sender Duns number			
			G8205 and G8206 are assigned by the supplier's organization and are used for uniquely identifying this delivering party. The DUNS plus 4 can be used by placing the DUNS Number in G8205 and the four digit suffix in G8206 (left justified).			
			G8206 can be assigned at the time of delivery and may vary from day to day. Hence, the receiver cannot use this location number to identify the validity of a specific DSD supplier.			
			The supplier can assign values to these elements in much the same way as the receiver assigns numbers to G8203 and G8204. The DUNS Number or Numbers will be unique to the supplier's business organization, and greater specificity can be achieved through the location number and by choosing from among multiple DUNS Numbers assigned to that organization. If desired, the supplier's location number can be used to specify a particular route and driver. It is for this latter reason that the supplier must have the freedom to change location numbers without advance notice.			
			Supplier organizations having multiple invoicing/payment locations should assign DUNS number/location codes in a way that permits retailers to differentiate easily among these different locations. If a variety of location codes is used by the supplier to designate different servicing warehouses, routes, and possibly drivers, different DUNS Numbers, if available, should preferably be used to differentiate among different invoicing/payment locations.			
➤	G8207	872	<b>Physical Delivery or Return Date</b>	M	DT	8/8
			Actual or intended date of physical delivery or return expressed in format CCYYMMDD where CC represents the first two digits of the calendar year			
			G8207 is used to specify the actual date (if the message is generated at that time) or the intended date (if the message is generated in advance) of physical delivery or return.			
	G8208	873	<b>Product Ownership Transfer Date</b>	O	DT	8/8
			Date which is meaningful for both supplier and distributor for various mutually defined purposes (i.e., date of product ownership transfer) expressed in format CCYYMMDD where CC represents the first two digits of the calendar year			
			G8208 is optional, being any date which is meaningful for both supplier and distributor for various mutually defined purposes. It can be used for such purposes as price effectivity and ownership and liability transfer.			
	G8209	324	<b>Purchase Order Number</b>	O	AN	1/22
			Identifying number for Purchase Order assigned by the orderer/purchaser			
	G8210	323	<b>Purchase Order Date</b>	O	DT	8/8
			Date assigned by the purchaser to Purchase Order expressed in format CCYYMMDD where CC represents the first two digits of the calendar year			
			G8209 and G8210 can be used as indicated where the customer has placed an order in advance and has assigned a number to it.			
	G8211	146	<b>Shipment Method of Payment</b>	O	ID	2/2
			Code identifying payment terms for transportation charges			
			G8211 is used to identify payment terms for transportation charges where they are not included in the cost of the goods. Where this code is used, the freight charges themselves can be stated in the G72 segment at the record level.			
	G8212	625	<b>COD Method of Payment Code</b>	O	ID	1/1
			Code indicating method of payment acceptable for C.O.D. charge collection			
			G8212 is used to define a method of payment acceptable by the depositor for COD charge collection. The presence of any code in this element indicates that payment must be made on delivery.			



**Segment: N9 Extended Reference Information****Level:** Header**Loop:** \_\_\_\_**Usage:** Optional**Max Use:** >1**Purpose:** To transmit identifying information as specified by the Reference Identification Qualifier**Syntax: 1 R0203**  
At least one of N902 or N903 is required.**2 C0605**  
If N906 is present, then N905 is required.**Semantic: 1** N906 reflects the time zone which the time reflects.**Notes:** This segment is used to provide tax reference numbers in a DEX/UCS environment and container identification numbers in a NEX/UCS environment.**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
<b>N901</b>	<b>128</b>	<b>Reference Identification Qualifier</b> Code qualifying the Reference Identification <b>08</b> Carrier Assigned Package Identification Number <b>This code is used to provide a third party delivery service tracking number when using the 894 transaction set in a NEX/UCS environment.</b> <b>4G</b> Provincial Tax Identification <b>4O</b> Canadian Goods & Services or Quebec Sales Tax Reference Number <b>LA</b> Shipping Label Serial Number <b>EAN.UCC Serial Shipping Container Code (SSCC). This code is normally used in the NEX/UCS environment.</b>	<b>M ID 2/3</b>
<b>N902</b>	<b>127</b>	<b>Reference Identification</b> Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier	<b>C AN 1/50</b>
<b>N903</b>	<b>369</b>	<b>Free-form Description</b> Free-form descriptive text	<b>C AN 1/45</b>
<b>N904</b>	<b>373</b>	<b>Date</b> Date expressed as CCYYMMDD where CC represents the first two digits of the calendar year	<b>O DT 8/8</b>
<b>N905</b>	<b>337</b>	<b>Time</b> Time expressed in 24-hour clock time as follows: HHMM, or HHMMSS, or HHMMSSD, or HHMMSSDD, where H = hours (00-23), M = minutes (00-59), S = integer seconds (00-59) and DD = decimal seconds; decimal seconds are expressed as follows: D = tenths (0-9) and DD = hundredths (00-99)	<b>C TM 4/8</b>
<b>N906</b>	<b>623</b>	<b>Time Code</b> Code identifying the time. In accordance with International Standards Organization standard 8601, time can be specified by a + or - and an indication in hours in relation to Universal Time Coordinate (UTC) time; since + is a restricted character, + and - are substituted by P and M in the codes that follow	<b>O ID 2/2</b>

**Segment:** **LS** Loop Header

**Level:** Detail

**Loop:** \_\_\_\_

**Usage:** Optional

**Max Use:** 1

**Purpose:** To indicate that the next segment begins a loop

**Semantic:** **1** One loop may be nested contained within another loop, provided the inner nested loop terminates before the outer loop. When specified by the standard setting body as mandatory, this segment in combination with "LE", must be used. It is not to be used if not specifically set forth for use. The loop identifier in the loop header and trailer must be identical. The value for the identifier is the loop ID of the required loop segment. The loop ID number is given on the transaction set diagram in the appropriate ASC X12 version/release.

**Comments:** **A** See Figures Appendix for an explanation of the use of the LS and LE segments.

**Notes:** The loop header is used to indicate that the next segment begins a loop. It is used once, before all of the loop iterations are made. Here, it indicates the beginning of line item detail records.

#### Data Element Summary

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
LS01	447	<b>Loop Identifier Code</b> The loop ID number given on the transaction set diagram is the value for this data element in segments LS and LE Here, this data element is set equal to 0100.	<b>M AN 1/4</b>

**Segment: G83 Line Item Detail/Direct Store Delivery****Level:** Detail**Loop:** 0100      **Usage:** Optional      **Max Use:** 9999**Usage:** Mandatory**Max Use:** 1**Purpose:** To specify the basic, and most frequently used line item data for the delivery record transaction**Syntax: 1 R0405**

At least one of G8304 or G8305 is required.

**2 P0506**

If either G8305 or G8306 is present, then the other is required.

**3 C0709**

If G8307 is present, then G8309 is required.

**4 P1112**

If either G8311 or G8312 is present, then the other is required.

**Comments: A** G8303 qualifies G8302.**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ G8301	204	<b>Direct Store Delivery Sequence Number</b> Direct Store Delivery sequential number of the line item detail or a new line item detail <b>This sequence number serially labels the individual G83 segments in the base record. Then, in an 895 Acknowledgment/Adjustment Record, the sequence number can be used to reference and identify the particular G83 record being adjusted. G83 segments in the base record should be numbered sequentially: 1, 2, 3, ...</b>	<b>M NO 1/4</b>
➤ G8302	380	<b>Quantity</b> Numeric value of quantity <b>The quantity must always be positive. (An apparent need for a negative quantity indicates that the transaction should be communicated in the return record rather than the delivery record, or vice-versa).</b> <b>The quantity expressed here is the one against which the delivery/return physical count should be compared at the time of check in/out. To avoid confusion at that time (e.g., between counts of cases vs. eaches), user systems should be designed to display or print the unit of measure code as well as the quantity when the comparison is being made.</b>	<b>M R3 1/15</b>
➤ G8303	355	<b>Unit or Basis for Measurement Code</b> Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken <b>G8302 and G8303 are used together and specify the quantity of the delivery/return.</b> <b>BX</b> Box <b>CA</b> Case <b>CT</b> Carton <b>DZ</b> Dozen <b>EA</b> Each <b>Where "EA" is used as the unit of measure for DSD delivery/receiving and the item is identified by a GTIN, the unit of measure is the retail selling unit as defined by that code.</b> <b>GA</b> Gallon <b>KE</b> Keg <b>KG</b> Kilogram <b>LB</b> Pound <b>PK</b> Package <b>PL</b> Pallet/Unit Load	<b>M ID 2/2</b>

		TK Tank	
		UN Unit	
G8304	766	<b>U.P.C./EAN Consumer Package Code</b>	<b>C AN 12/12</b>
		Code (Universal Product Code - U.P.C.) identifying the retail shelf unit; consists of 2 high order digits identifying the system (U.S. Grocery = 00, 06 or 07, U.S. Drug = 03); the next ten digits are manufacturer ID: 5, Item ID: 5	
		<b>NOT USED BY THE RETAIL INDUSTRY</b>	
		<b>G8305 and G8306 are used to identify the item level GTIN.</b>	
G8305	235	<b>Product/Service ID Qualifier</b>	<b>C ID 2/2</b>
		Code identifying the type/source of the descriptive number used in Product/Service ID (234)	
		<b>See External Code Source 41 in Appendix A for reference document.</b>	
		<b>DI Deposit Item Number</b>	
		<b>Used for deposit items such as empty bottles that do not contain products for resale.</b>	
		<b>G8306 identifies the deposit item, using an identifying code, usually a GTIN.</b>	
		<b>The cost of this item is included in G8403 (Total Deposit Dollar Amount) as well as in G8402 (Total Invoice Amount) in the G84 Delivery/Return Record Totals.</b>	
		<b>Deposit items containing product for resale should not be accounted for here, but rather in a G72 Allowance or Charge data segment associated with that item.</b>	
		<b>If some form of identifying code is used in G8306, a free-form description of the deposit item can be entered in G8310, Cash Register Item Description, even though the item is not a resale item.</b>	
		<b>EN EAN/UCC - 13</b>	
		<b>Data structure for the 13-digit EAN.UCC Global Trade Item Number (GTIN).</b>	
		<b>EO EAN/UCC - 8</b>	
		<b>Data structure for the 8-digit EAN.UCC Global Trade Item Number (GTIN).</b>	
		<b>NR Non-resaleable item (excluding deposit) number</b>	
		<b>Used to identify items (other than deposit items) that are not for resale (e.g., display racks).</b>	
		<b>G8306 identifies the non-resale item, using either a code or description.</b>	
		<b>If a cost is provided for this item, it is included in G8402 (Total Invoice Amount) but not in G8403 (Total Deposit Dollar Amount) in the G84 Delivery/Return Record Totals.</b>	
		<b>If some form of identifying code is used in G8306, a free-form description of the deposit item can be entered in G8310, Cash Register Item Description, even though the item is not for resale.</b>	
		<b>UK GTIN 14-digit Data Structure</b>	
		<b>Data structure for the 14-digit EAN.UCC Global Trade Item Number (GTIN).</b>	
		<b>UP UCC - 12</b>	
		<b>Data structure for the 12-digit EAN.UCC Global Trade Item Number (GTIN). Also known as the Universal Product Code (U.P.C.).</b>	
		<b>VN Vendor's (Seller's) Item Number</b>	
		<b>If the product delivered or returned is identified by means of some form of vendor number rather than by means of a GTIN, G8305 should be coded as "VN" and the item number itself should be provided in G8306.</b>	
		<b>A vendor code should be used as the means for identifying the product only as a last resort. If at all possible, the appropriate GTIN should be used instead.</b>	

G8306	234	<b>Product/Service ID</b> Identifying number for a product or service <b>G8306 is some form of identification number, qualified by G8305.</b>	C	AN	1/48
G8307	438	<b>U.P.C. Case Code</b> Code (Universal Product Code - U.P.C.) including two high order digits identifying the "system" (U.S. Grocery = 00, 06 or 07; U.S. Drug = 03); using the U.S. Grocery system, the next ten digits are: Manufacturer (5) Case Code (5) <b>NOT USED BY THE RETAIL INDUSTRY</b> <b>G8311 and G8312 should be used to identify the case level GTIN.</b>	O	AN	12/12
G8308	237	<b>Item List Cost</b> Gross unit cost within the appropriate price bracket for a line item <b>This is the gross unit cost expressed in decimal dollars per delivery/receiving unit of measure (cf. G8303) within the appropriate price bracket for the line item. (Hence, the extended list cost is equal to the unit cost listed in G8308 multiplied by the quantity in G8302).</b> <b>The cost is always positive. On a return record, it indicates the cost used in calculating the amount to be paid to the retailer for the returned product.</b>	O	R4	1/9
G8309	356	<b>Pack</b> The number of inner containers, or number of eaches if there are no inner containers, per outer container <b>This is the number of retail units (identified by the consumer package GTIN in G8306) per secondary container (identified by the case GTIN in G8312).</b>	C	N0	1/6
G8310	878	<b>Cash Register Item Description</b> The cash register description of an item <b>This data element can be used to provide a description of the item for use in the check-in process. It is limited to a maximum of twenty characters.</b> <b>Although the name of this data element is "Cash Register Item Description", its use in this transaction set has no relationship to a cash register. The item description used here is provided by the DSD supplier and is quite independent from how the retailer might choose to describe it at the front-end scanner.</b>	O	AN	1/20
G8311	235	<b>Product/Service ID Qualifier</b> Code identifying the type/source of the descriptive number used in Product/Service ID (234) <b>See External Code Source 41 in Appendix A for reference document.</b> <b>AC Aggregation Code (Used to Consolidate Part Families)</b> <b>Used to identify an aggregation or grouping (e.g., a style) to which this item belongs and which can be treated as a set for check-in count purposes.</b> <b>G8305 and G8306 are used to identify the specific item or case.</b> <b>G8312 provides the item's aggregation or group identification.</b> <b>All items belonging to the same aggregation should be listed consecutively in the delivery/return record.</b> <b>EN EAN/UCC - 13</b> <b>Data structure for the 13-digit EAN.UCC Global Trade Item Number (GTIN).</b> <b>EO EAN/UCC - 8</b> <b>Data structure for the 8-digit EAN.UCC Global Trade Item Number (GTIN).</b>	C	ID	2/2

**UC** Product Variant

See External Code Source 41 in Appendix A for reference document.

A supplemental encoding of additional numbers is appended to the item code on some products to provide additional information normally of interest to the supplier only. For example, a two-digit suffix is used with magazines to designate the issue, and a five-digit suffix is appended to paperback books to provide title information. Usually, retailers do not attempt to read or use these suffix numbers.

If a supplier wishes to provide this additional suffix data in the delivery/return record, it can be entered in G8312, with G8311 coded as "UC". When this is done, the regular GTIN must be provided in G8306.

**UF** User-Defined Shipping Container Identifier

Used to identify the tote, container, shipping case, or pallet in or on which this item is packed.

G8305 and G8306 are used to identify the item.

G8312 provides the tote, shipping container, or pallet identification or mark in or on which the item is packed, using a user-defined generic identifier or description.

**UK** GTIN 14-digit Data Structure

Data structure for the 14-digit EAN.UCC Global Trade Item Number (GTIN).

**UO** EAN.UCC Serial Shipping Container Code (SSCC)

See External Code Source 98 in Appendix A for reference document.

G8312 provides the tote, shipping container, or pallet identification or mark in or on which the item is packed, using an EAN.UCC Serial Shipping Container Code (SSCC).

**UP** UCC - 12

Data structure for the 12-digit EAN.UCC Global Trade Item Number (GTIN). Also known as the Universal Product Code (U.P.C.).

**WA** Random Weight Aggregation Code

Used to identify a random weight aggregation or grouping to which this item belongs and which can be treated as a set for check-in purposes. Use of this code indicates that receiving should take place at the group level, with the group quantity being the total number of G83 segments with an identical group identifier in G8312. Item level receiving will allow adjustments to the item weight.

There can be a separate G83 segment for each random weight item.

G8302 should contain the actual weight of the random weight item indicated in this G83 segment only.

G8303 should contain code LB (Pounds), KG (Kilograms) or other weight-related codes.

G8306 should contain the GTIN which should be the same value for all like items.

G8308 should contain the cost per unit of measure referenced in G8303.

G8312 should contain a descriptor for the group, e.g. "5 LB CHEESE".

All items belonging to the same aggregation/group should be listed separately in the delivery/return record, with the same value in G8311 and G8312.

<b>G8312</b>	<b>234</b>	<b>Product/Service ID</b>	<b>C AN 1/48</b>
Identifying number for a product or service			

G8311 and G8312 can be used to identify the case level GTIN and will allow a supplier to use G8305 and G8306 to identify the type of item and at the same time, use G8311 and G8312 to specify a second type of identifier such as the user-defined shipping container (Code UF) in which the item was shipped or as an aggregate code (Code AC) to group items by style.

**Method for Specifying Case Deliveries in DEX/UCS**

G8302 Quantity - indicate the number of cases

G8303 Unit of Measure - CA (Case)

G8305 Product/Service ID Qualifier - Code UP, e.g.

G8306 Product/Service ID - GTIN of the consumer package inside the case

G8308 Item List Cost - Cost of the case of product

G8309 Pack - Always indicate the number of consumer packages inside the case

G8311 Product/Service ID Qualifier - Code UK, e.g.

G8312 Product/Service ID - GTIN of the case product

<b>G8313</b>	<b>810</b>	<b>Inner Pack</b>	<b>O NO 1/6</b>
The number of eaches per inner container			

This data element is used to provide the number of eaches per inner pack. For example, if there were 2 inner containers within a shipping container and each inner container held 6 consumer units, then the value in this data element would be 6.

**Segment: G22 Pre-Pricing Information****Level:** Detail**Loop:** 0100**Usage:** Optional**Max Use:** 1**Purpose:** To specify pre-pricing information

- Semantic:**
- 1 If G2201 equals "A", then G2202 and G2203 are required.
  - 2 If G2201 equals "Y", then G2202 is required.
  - 3 G2205 is the effective date of the price information.

**Comments:** A If G2201 equals "Z" or G2201 equals "N", then neither G2202 nor G2203 are required.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ G2201	288	<b>Pre-priced Option Code</b> Code specifying pre-pricing option selected A Pre-Priced Prices included and price qualifier applies Items are price marked and the price listed below in G2202 is for the quantity in G2203. N Not Pre-Priced This code permits the supplier to communicate the explicit notice that the item in question is not price marked. Under such circumstances, data elements G2202 and G2203 should not be used. Y Pre-Priced (Prices Included) G2202 must be used and G2203 must not be used. (Where G2203 is needed, G2201 should be A, not Y). Z Pre-Priced (Prices Not Included) This code is used to indicate that the items are indeed pre-price-marked but that the price data is not provided in the transaction set. Under this condition, G2202 and G2203 must clearly not be used.	M ID 1/1
G2202	420	<b>Price New, Suggested Retail</b> The consumer package price or retail unit price associated with the product applicable on or after an effective price date This data is used to provide the price in hundredths of dollars (i.e., in cents) if G2201 is equal to A or Y. Otherwise, it is not used.	O N2 2/7
G2203	289	<b>Multiple Price Quantity</b> Quantity of units for a given price, e.g., 3 for \$10.00 G2203 is used if and only if G2201 is equal to A, and then specifies the number of retail units to which G2202 applies (e.g., if G2202 = 198 and G2203 = 3, the pre-price mark reads 3/\$1.98).	O N0 1/2
G2204	3	<b>Free-form Message</b> Free-form text A free-form message of up to sixty characters providing details concerning pre-pricing can be entered here. However, such information cannot be machine interpreted. Therefore, its use is discouraged.	O AN 1/60
G2205	373	<b>Date</b> Date expressed as CCYYMMDD where CC represents the first two digits of the calendar year The effective date of the pre-price information. This data element is not used in DEX/UCS.	O DT 8/8



**Segment: G72 Allowance or Charge****Level:** Detail**Loop:** 0100**Usage:** Optional**Max Use:** 10**Purpose:** To specify allowances, charges, or services**Syntax:** 1 **R03050809**

At least one of G7203, G7205, G7208 or G7209 is required.

2 **E050809**

Only one of G7205, G7208 or G72 may be present.

3 **P0607**

If either G7206 or G7207 is present, then the other is required.

4 **P0910**

If either G7209 or G7210 is present, then the other is required.

5 **C1103**

If G7211 is present, then G7203 is required.

**Semantic:** 1 G7209 is the allowance or charge percent.**Comments:** A The G73 segment is required when G7201 contains code "499" or "999"; however, the use of these codes is discouraged.**Notes:** The purpose of this segment is to specify allowances or charges that are applied to the list item cost provided for this particular line item in data element G8308. Data segment G72 is the same one that is used in the UCS Transaction Set No. 880 (Invoice), and the same rules and interpretations apply.

The sign convention requires that all charges that increase the amount due the seller be stated as positive quantities or rates (they can be unsigned) and that all allowances that decrease the amount due the seller be stated as negatively signed quantities or rates. Hence, charges are always positive and allowances are always negative numbers.

The allowance or charge rate, amount, or percent is specified in data element G7205, G7208, or G7209, respectively. One and only one of these data elements must be used. The choice of which to use depends on how the allowance or charge is to be expressed.

Refer to Chapter V (Special Conventions) for handling deposit charges associated with resale items and for handling of consignment allowances.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ G7201	340	<b>Allowance or Charge Code</b> Code identifying the type of allowance or charge Refer to Appendix C for a list of valid codes. Code 499 (Other Allowance) or Code 999 (Other Charges) can be used to provide a total allowance or charge equal to the sum of several allowances or charges when they are aggregated into a single G72 segment for the item.	M ID 1/3
➤ G7202	331	<b>Allowance or Charge Method of Handling Code</b> Code indicating method of handling for an allowance or charge 01 Bill Back 02 Off Invoice 06 Charge to be Paid by Customer 15 Information Only	M ID 2/2

		When this code is used, the allowance or charge amounts are not to be added or subtracted from the transaction. The information is being provided for information only.		
<b>G7203</b>	<b>341</b>	<b>Allowance or Charge Number</b>	<b>C AN 1/16</b>	
		The number assigned by a vendor referencing an allowance, promotion, deal or charge		
		This is the number assigned by the DSD supplier to identify the particular allowance, promotion, deal, or charge being applied. It can be optionally used together with data element G7205 or G7208 or G7209.		
<b>G7204</b>	<b>769</b>	<b>Exception Number</b>	<b>O AN 1/16</b>	
		A unique number identifying an exception or modification to an offered or existing promotion		
		This is a unique number that can be assigned by the supplier to identify an exception or modification to an offered or existing promotion.		
<b>G7205</b>	<b>359</b>	<b>Allowance or Charge Rate</b>	<b>C R4 1/15</b>	
		Allowance or Charge Rate per Unit		
		This data element is used if the allowance or charge is specified in terms of a rate, i.e., a dollar amount per unit. It is positive for charges and negative for allowances.		
<b>G7206</b>	<b>339</b>	<b>Allowance or Charge Quantity</b>	<b>C R3 1/10</b>	
		Quantity basis when allowance or charge quantity is different from the purchase order or invoice quantity		
<b>G7207</b>	<b>355</b>	<b>Unit or Basis for Measurement Code</b>	<b>C ID 2/2</b>	
		Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken		
		If G7206 and G7207 are not used, the quantity and unit of measure codes to which this rate applies are those specified in G8302 and G8303 for this item, respectively.		
		G7206 and G7207 must be used together or not at all. Where used, they specify the quantity and unit of measure to which the rate in G7205 is applied. They should only be used where these quantities are different from those expressed in G8302 and G8303.		
		BX Box CA Case CT Carton DZ Dozen EA Each GA Gallon KE Keg KG Kilogram LB Pound PK Package PL Pallet/Unit Load TK Tank UN Unit		
<b>G7208</b>	<b>360</b>	<b>Allowance or Charge Total Amount</b>	<b>C N2 1/15</b>	
		Total dollar amount for the allowance or charge		
		If used, this data element states the actual total amount (in hundredths of dollars) of the allowance (negative amount) or charge (positive amount) for this item.		
<b>G7209</b>	<b>332</b>	<b>Percent, Decimal Format</b>	<b>C R3 1/6</b>	
		Percent given in decimal format (e.g., 0.0 through 100.0 represents 0% through 100%)		
		When used, this data element expresses the allowance (negative amount) or charge (positive amount) in terms of a percent. (10.5% or 0.105 of the dollar basis is expressed as 10.5).		

<b>G7210</b>	<b>828</b>	<b>Dollar Basis For Percent</b>	<b>C R2 1/9</b>
--------------	------------	---------------------------------	-----------------

Dollar basis to be used in the percent calculation of the allowance, charge or tax

**This data element must be used if G7209 is used and states the dollar basis to which the percent allowance or charge is applied in order to calculate its dollar amount.**

<b>G7211</b>	<b>770</b>	<b>Option Number</b>	<b>O AN 1/20</b>
--------------	------------	----------------------	------------------

A unique number identifying available promotion or allowance options when more than one is offered

**This data element can be used to identify the particular promotion or allowance option that has been selected from among several offered by the promotion or allowance specified in G7203.**

**If this data element is used, the associated promotion or allowance must be identified in data element G7203.**

**Segment: G23 Terms of Sale****Level:** Detail**Loop:** 0100**Usage:** Optional**Max Use:** 20**Purpose:** To specify the terms of sale**Syntax: 1 R0809**

At least one of G2308 or G2309 is required.

- Comments: A** The G23 segment may be used for the detail or the total transaction set level. Refer to the transaction set assumptions for details on proper usage.
- B** If G2301 equals "04" (deferred or installment) then either G2313 or G2314 is required and the data in the segment pertains only to the portion of the invoice described in G2313 or G2314. If G2301 equals "11" (elective) then G2304 is required. If G2301 is not equal to "05" (discount not applicable) then (G2305 or G2310) and (G2306 or G2307) is required. If G2301 equals "ZZ" (other) then G2315 is required. Multiple use of this segment when G2301 equals "04" (deferred or installment) always implies an "AND" relationship. When G2301 equals "06" (mixed) or "11" (elective) an "OR" relationship is always implied.
- C** G2310 is a memo figure requiring specific payment performance and therefore should not be negative.
- D** When elective terms are offered in a deferred or installment situation, G2316 (Installment Group Indicator - DE 713) must be used to properly group the terms within each installment.

**Notes:** This segment is used to specify terms of sale that apply specifically to the line item identified in the G83 segment.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES		
➤ <b>G2301</b>	<b>336</b>	<b>Terms Type Code</b> Code identifying type of payment terms <b>01</b> Basic <b>02</b> End of Month (EOM) <b>03</b> Fixed Date <b>04</b> Deferred or Installment <b>05</b> Discount Not Applicable <b>06</b> Mixed <b>07</b> Extended <b>11</b> Elective	<b>M</b>	<b>ID</b>	<b>2/2</b>
➤ <b>G2302</b>	<b>333</b>	<b>Terms Basis Date Code</b> Code identifying the beginning of the terms period	<b>M</b>	<b>ID</b>	<b>1/2</b>
<b>G2303</b>	<b>282</b>	<b>Terms Start Date</b> Date from which payment terms are calculated expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>O</b>	<b>DT</b>	<b>8/8</b>
<b>G2304</b>	<b>283</b>	<b>Terms Due Date Qualifier</b> Code identifying the method to be used for payment in conjunction with due date	<b>O</b>	<b>ID</b>	<b>2/2</b>
<b>G2305</b>	<b>338</b>	<b>Terms Discount Percent</b> Terms discount percentage, expressed as a percent, available to the purchaser if an invoice is paid on or before the Terms Discount Due Date	<b>O</b>	<b>R3</b>	<b>1/6</b>
<b>G2306</b>	<b>370</b>	<b>Terms Discount Due Date</b> Date payment is due if discount is to be earned expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>O</b>	<b>DT</b>	<b>8/8</b>

<b>G2307</b>	<b>351</b>	<b>Terms Discount Days Due</b> Number of days in the terms discount period by which payment is due if terms discount is earned	<b>O</b>	<b>N0</b>	<b>1/3</b>
<b>G2308</b>	<b>446</b>	<b>Terms Net Due Date</b> Date when total invoice amount becomes due expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>C</b>	<b>DT</b>	<b>8/8</b>
<b>G2309</b>	<b>386</b>	<b>Terms Net Days</b> Number of days until total invoice amount is due (discount not applicable)	<b>C</b>	<b>N0</b>	<b>1/3</b>
<b>G2310</b>	<b>362</b>	<b>Terms Discount Amount</b> Total amount of terms discount	<b>O</b>	<b>N2</b>	<b>1/10</b>
<b>G2311</b>	<b>391</b>	<b>Discounted Amount Due</b> Amount of invoice due if paid by terms discount due date (total invoice or installment amount less cash discount)	<b>O</b>	<b>N2</b>	<b>1/10</b>
<b>G2312</b>	<b>390</b>	<b>Amount Subject to Terms Discount</b> Amount upon which the terms discount amount is calculated	<b>O</b>	<b>N2</b>	<b>1/10</b>
<b>G2313</b>	<b>343</b>	<b>Installment Total Invoice Amount Due</b> Deferred or installment portion of the total invoice (including charges, less allowances) before terms discount (if discount is applicable) <b>G2313 is used only at the total transaction set level.</b>	<b>O</b>	<b>N2</b>	<b>1/10</b>
<b>G2314</b>	<b>342</b>	<b>Percent of Invoice Payable</b> Amount of invoice payable expressed in percent <b>G2314 is used only at the total transaction set level.</b>	<b>O</b>	<b>R3</b>	<b>1/5</b>
<b>G2315</b>	<b>3</b>	<b>Free-form Message</b> Free-form text	<b>O</b>	<b>AN</b>	<b>1/60</b>
<b>G2316</b>	<b>713</b>	<b>Installment Group Indicator</b> The installment group indicator is a 2-digit serial number beginning with 01 (i.e., 01, 02, 03 or 04); it is used to group "elective" terms types in an installment payment situation; the same indicator must be used for all segments in the same installment <b>G2316 is used only at the total transaction set level.</b>	<b>O</b>	<b>N0</b>	<b>2/2</b>

**Segment:** **LE** Loop Trailer

**Level:** Detail

**Loop:** \_\_\_\_

**Usage:** Optional

**Max Use:** 1

**Purpose:** To indicate that the loop immediately preceding this segment is complete

**Semantic:** **1** One loop may be nested contained within another loop, provided the inner nested loop terminates before the other loop. When specified by the standards setting body as mandatory, this segment in combination with "LS", must be used. It is not to be used if not specifically set forth for use. The loop identifier in the loop header and trailer must be identical. The value for the identifier is the loop ID of the required loop beginning segment. The loop ID number is given on the transaction set diagram in the appropriate ASC X12 version/release.

**Comments:** **A** See Figures Appendix for an explanation of the use of the LE and LS segments.

**Notes:** This segment specifies the end of the line item detail section of the record. It is used once, after all of the loop iterations have been made.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
LE01	447	<b>Loop Identifier Code</b> The loop ID number given on the transaction set diagram is the value for this data element in segments LS and LE	<b>M AN 1/4</b>
LE01 is set equal to 0100.			

**Segment: G72 Allowance or Charge****Level:** Summary**Loop:** \_\_\_\_**Usage:** Optional**Max Use:** 20**Purpose:** To specify allowances, charges, or services**Syntax:** 1 **R03050809**

At least one of G7203, G7205, G7208 or G7209 is required.

2 **E050809**

Only one of G7205, G7208 or G72 may be present.

3 **P0607**

If either G7206 or G7207 is present, then the other is required.

4 **P0910**

If either G7209 or G7210 is present, then the other is required.

5 **C1103**

If G7211 is present, then G7203 is required.

**Semantic:** 1 G7209 is the allowance or charge percent.**Comments:** A The G73 segment is required when G7201 contains code "499" or "999"; however, the use of these codes is discouraged.

**Notes:** This segment is used to specify allowances or charges that are associated with the entire delivery/return record rather than an individual line entry. The allowance or charge rate, amount, or percent is specified in data element G7205, G7208, or G7209, respectively. One and only one of these data elements must be used.

Refer to Chapter V (Special Conventions) for handling of consignment allowances at the record level.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ G7201	340	<b>Allowance or Charge Code</b> Code identifying the type of allowance or charge Refer to Appendix C for a list of valid codes. Code 499 (Other Allowance) or Code 999 (Other Charges) can be used to provide a total allowance or charge at the record level equal to the sum of several allowances or charges at the record level when they are aggregated into a single G72 segment.	M ID 1/3
➤ G7202	331	<b>Allowance or Charge Method of Handling Code</b> Code indicating method of handling for an allowance or charge 01 Bill Back 02 Off Invoice 06 Charge to be Paid by Customer 15 Information Only When this code is used, the allowance or charge amounts are not to be added or subtracted from the transaction. The information is being provided for information only.	M ID 2/2
G7203	341	<b>Allowance or Charge Number</b> The number assigned by a vendor referencing an allowance, promotion, deal or charge This is the number assigned by the DSD supplier to identify the particular allowance, promotion, deal, or charge being applied.	C AN 1/16

<b>G7204</b>	<b>769</b>	<b>Exception Number</b> A unique number identifying an exception or modification to an offered or existing promotion <b>This is a unique number that can be assigned by the supplier to identify an exception or modification to an offered or existing promotion.</b>	<b>O AN 1/16</b>
<b>G7205</b>	<b>359</b>	<b>Allowance or Charge Rate</b> Allowance or Charge Rate per Unit <b>This data element is used if the allowance or charge is specified in terms of a rate, i.e., a dollar amount per unit. It is positive for charges and negative for allowances.</b> <b>If this data element is used here at the record level, data elements G7206 and G7207 must be used here as well in order to give explicit indication of the total quantity to which the rate applies.</b>	<b>C R4 1/15</b>
<b>G7206</b>	<b>339</b>	<b>Allowance or Charge Quantity</b> Quantity basis when allowance or charge quantity is different from the purchase order or invoice quantity	<b>C R3 1/10</b>
<b>G7207</b>	<b>355</b>	<b>Unit or Basis for Measurement Code</b> Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken <b>G7206 and G7207 must be used together or not at all. If G7205 is used here at the record level, G7206 and G7207 must be used to specify the quantity and unit of measure to which the rate in G7205 is applied.</b> BX Box CA Case CT Carton DZ Dozen EA Each GA Gallon KE Keg KG Kilogram LB Pound PK Package PL Pallet/Unit Load TK Tank UN Unit	<b>C ID 2/2</b>
<b>G7208</b>	<b>360</b>	<b>Allowance or Charge Total Amount</b> Total dollar amount for the allowance or charge <b>If used, this data element states the actual total amount (in hundredths of dollars) of this allowance (negative amount) or charge (positive amount).</b>	<b>C N2 1/15</b>
<b>G7209</b>	<b>332</b>	<b>Percent, Decimal Format</b> Percent given in decimal format (e.g., 0.0 through 100.0 represents 0% through 100%) <b>When used, this data element expresses the allowance (negative amount) or charge (positive amount) in terms of a percent. (10.5% or 0.105 of the dollar basis is expressed as 10.5).</b>	<b>C R3 1/6</b>
<b>G7210</b>	<b>828</b>	<b>Dollar Basis For Percent</b> Dollar basis to be used in the percent calculation of the allowance, charge or tax <b>This data element must be used if G7209 is used and states the dollar basis to which the percent allowance or charge is applied in order to calculate its dollar amount.</b>	<b>C R2 1/9</b>



**G7211 770 Option Number** **O AN 1/20**  
A unique number identifying available promotion or allowance options when more than one is offered

**This data element can be used to identify the particular promotion or allowance option that has been selected from among several offered by the promotion or allowance specified in G7203.**

**If this data element is used, the associated promotion or allowance must be identified in data element G7203.**

**Segment: G23 Terms of Sale****Level:** Summary**Loop:** \_\_\_\_**Usage:** Optional**Max Use:** 20**Purpose:** To specify the terms of sale**Syntax: 1 R0809**

At least one of G2308 or G2309 is required.

- Comments: A** The G23 segment may be used for the detail or the total transaction set level. Refer to the transaction set assumptions for details on proper usage.
- B** If G2301 equals "04" (deferred or installment) then either G2313 or G2314 is required and the data in the segment pertains only to the portion of the invoice described in G2313 or G2314. If G2301 equals "11" (elective) then G2304 is required. If G2301 is not equal to "05" (discount not applicable) then (G2305 or G2310) and (G2306 or G2307) is required. If G2301 equals "ZZ" (other) then G2315 is required. Multiple use of this segment when G2301 equals "04" (deferred or installment) always implies an "AND" relationship. When G2301 equals "06" (mixed) or "11" (elective) an "OR" relationship is always implied.
- C** G2310 is a memo figure requiring specific payment performance and therefore should not be negative.
- D** When elective terms are offered in a deferred or installment situation, G2316 (Installment Group Indicator - DE 713) must be used to properly group the terms within each installment.

**Notes:** This segment is used to specify terms of sale that apply to the delivery or return transaction as a whole.**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES		
➤ <b>G2301</b>	<b>336</b>	<b>Terms Type Code</b> Code identifying type of payment terms <b>01</b> Basic <b>02</b> End of Month (EOM) <b>03</b> Fixed Date <b>04</b> Deferred or Installment <b>05</b> Discount Not Applicable <b>06</b> Mixed <b>07</b> Extended <b>08</b> Basic Discount Offered <b>09</b> Proximo <b>11</b> Elective <b>12</b> 10 Days After End of Month (10 EOM) <b>14</b> Previously agreed upon <b>24</b> Anticipation	<b>M</b>	<b>ID</b>	<b>2/2</b>
➤ <b>G2302</b>	<b>333</b>	<b>Terms Basis Date Code</b> Code identifying the beginning of the terms period	<b>M</b>	<b>ID</b>	<b>1/2</b>
<b>G2303</b>	<b>282</b>	<b>Terms Start Date</b> Date from which payment terms are calculated expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>O</b>	<b>DT</b>	<b>8/8</b>
<b>G2304</b>	<b>283</b>	<b>Terms Due Date Qualifier</b> Code identifying the method to be used for payment in conjunction with due date	<b>O</b>	<b>ID</b>	<b>2/2</b>

<b>G2305</b>	<b>338</b>	<b>Terms Discount Percent</b> Terms discount percentage, expressed as a percent, available to the purchaser if an invoice is paid on or before the Terms Discount Due Date	<b>O R3 1/6</b>
<b>G2306</b>	<b>370</b>	<b>Terms Discount Due Date</b> Date payment is due if discount is to be earned expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>O DT 8/8</b>
<b>G2307</b>	<b>351</b>	<b>Terms Discount Days Due</b> Number of days in the terms discount period by which payment is due if terms discount is earned	<b>O N0 1/3</b>
<b>G2308</b>	<b>446</b>	<b>Terms Net Due Date</b> Date when total invoice amount becomes due expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>C DT 8/8</b>
<b>G2309</b>	<b>386</b>	<b>Terms Net Days</b> Number of days until total invoice amount is due (discount not applicable)	<b>C N0 1/3</b>
<b>G2310</b>	<b>362</b>	<b>Terms Discount Amount</b> Total amount of terms discount	<b>O N2 1/10</b>
<b>G2311</b>	<b>391</b>	<b>Discounted Amount Due</b> Amount of invoice due if paid by terms discount due date (total invoice or installment amount less cash discount)	<b>O N2 1/10</b>
<b>G2312</b>	<b>390</b>	<b>Amount Subject to Terms Discount</b> Amount upon which the terms discount amount is calculated	<b>O N2 1/10</b>
<b>G2313</b>	<b>343</b>	<b>Installment Total Invoice Amount Due</b> Deferred or installment portion of the total invoice (including charges, less allowances) before terms discount (if discount is applicable)	<b>O N2 1/10</b>
<b>G2313 is used only at the total transaction set level.</b>			
<b>G2314</b>	<b>342</b>	<b>Percent of Invoice Payable</b> Amount of invoice payable expressed in percent	<b>O R3 1/5</b>
<b>G2314 is used only at the total transaction set level.</b>			
<b>G2315</b>	<b>3</b>	<b>Free-form Message</b> Free-form text	<b>O AN 1/60</b>
<b>G2316</b>	<b>713</b>	<b>Installment Group Indicator</b> The installment group indicator is a 2-digit serial number beginning with 01 (i.e., 01, 02, 03 or 04); it is used to group "elective" terms types in an installment payment situation; the same indicator must be used for all segments in the same installment	<b>O N0 2/2</b>
<b>G2316 is used only at the total transaction set level.</b>			

**Segment:** **G84** Delivery/Return Record of Totals**Level:** Summary**Loop:** \_\_\_\_**Usage:** Mandatory**Max Use:** 1**Purpose:** To specify summary details of total items in terms of quantity or amount**Syntax:** 1 R0102

At least one of G8401 or G8402 is required.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
G8401	380	<b>Quantity</b> Numeric value of quantity  <b>This quantity is the numerical sum of all G8302 quantities in the base record. Where a mix of units of measure is used (e.g., units and cases or units, feet, and pounds), this sum will have no physical meaning. It merely serves as a numerical check.</b>	C R3 1/15
G8402	361	<b>Total Invoice Amount</b> Amount of invoice (including charges, less allowances) before terms discount (if discount is applicable)  <b>This is the total delivery/return record amount (in hundredths of dollars) for the delivery or return after all deposits, all charges (positive) and all allowances (negative) have been applied. This total must be positive (unless allowances exceed costs). This total is before any payment dating term discounts or interest charges have been applied.</b>	C N2 1/10
G8403	865	<b>Total Deposit Dollar Amount</b> Sum of deposit amounts separately identified  <b>This is the sum of all deposit charges (in hundredths of dollars) that are listed in:</b>  <b>1. The G83 Line Item Detail segments where G8305 is coded "DI" (indicating deposit items not associated with products for resale such as empty bottles). Here the contribution to the total deposit dollar amount is calculated by multiplying the quantity in G8302 by the item list cost in G8308 for each deposit item segment.</b>  <b>2. The G72 data segments at the item level having the G7201 Allowance or Charge Code set equal to "525" (indicating deposit charges that are associated with products for resale). Here, the contribution to the total deposit dollar amount is calculated by multiplying the G7205 dollar rate per unit by the quantity in G7206 if used; otherwise by the quantity in G8302 for the associated line item.</b>  <b>Note that the amounts in G8302, G8308, G7205, and G7206 are expressed in "R" notation, whereas G8403 is expressed in "N2" notation.</b>  <b>This data element should always be positive. Deposit credits for returned items should be handled in a return record, where they show up as a positive amount.</b>	O N2 1/6

**Segment: G86 Signature Identification****Level:** Summary**Loop:** \_\_\_\_**Usage:** Mandatory**Max Use:** 1**Purpose:** To transmit an electronic identity**Semantic:** 1 G8602 is a keyed representation of a signature.

**Notes:** This segment is used to provide a digital signature for verifying the authenticity of the party that generated this base record (and also to verify that the contents of the message itself have not been altered). Beyond this, the standard assigns no particular significance, legal or otherwise, to the signature.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
G8601	867	<b>Signature</b> Electronic identity. Calculation algorithm obtained from the Uniform Code Council	O AN 1/12
<p>G8601 can contain up to 12 hexadecimal numerals, thereby accommodating the hexadecimal encoding of binary bit sets.</p> <p>The digital signature is generated using an algorithm and a secret key chosen by the sender's organization. The sender's organization should maintain a log of the algorithm and key used in order to be able to recalculate and verify the signature at a future date. The electronic signature should be calculated as follows:</p> <p>Use G8201 (Credit/Debit Flag Code), G8202 (Supplier/Delivery Return Number), a private algorithm, and a secret key.</p> <p>Trading partners should retain the electronic signature values.</p> <p>While the message recipient cannot verify the authenticity of a signature directly, such verification could be done by a third party arbitrator in the event of a dispute. To make such potential arbitration effective, the sender's organization should not only maintain a log of the algorithm and secret key used but should also change the algorithm and key (or an algorithm used to generate the key) no more frequently than once a week. By this means, a file of other transactions using the same algorithm and key (or key generator) could be used to verify the authenticity of the log.</p>			
G8602	93	<b>Name</b> Free-form name	O AN 1/60
<p>G8602 can be used to provide a keyed representation of a signature in clear text.</p>			

**Segment: G85** Record Integrity Check

**Level:** Summary

**Loop:** \_\_\_\_

**Usage:** Mandatory

**Max Use:** 1

**Purpose:** To provide a secure method of identifying authenticity of record content

**Notes:** The record integrity check provides a secure means for checking whether the contents of the record, including the signature are unchanged.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
G8501	866	Integrity Check Value	M AN 1/12

Data element providing secure method for identifying authenticity of content. Value calculated by using CRC 16 algorithm

The Integrity Check Value is generated using a CRC algorithm as specified in the Appendix. As a result, the Integrity Check Value must be a fixed length of four characters with no zero suppression.

It is applied to the contents of the entire transaction set up to this segment (i.e., from the beginning of the ST segment up through and including the end of the G86 segment).

**Segment: SE Transaction Set Trailer****Level:** Summary**Loop:** \_\_\_\_**Usage:** Mandatory**Max Use:** 1**Purpose:** To indicate the end of the transaction set and provide the count of the transmitted segments (including the beginning (ST) and ending (SE) segments)**Comments:** A SE is the last segment of each transaction set.**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ SE01	96	<b>Number of Included Segments</b> Total number of segments included in a transaction set including ST and SE segments <b>SE01 contains the total number of segments contained in this particular transaction set, including both the header and trailer segments.</b>	<b>M NO 1/10</b>
➤ SE02	329	<b>Transaction Set Control Number</b> Identifying control number that must be unique within the transaction set functional group assigned by the originator for a transaction set <b>SE02 contains the same transaction set control number that was entered into ST02 of the ST segment (Transaction Set Header) of this record.</b>	<b>M AN 4/9</b>





## UCS

# 895 Delivery/Return Acknowledgment or Adjustment

This X12 Transaction Set contains the format and establishes the data contents of the Delivery/Return Acknowledgment or Adjustment Transaction Set (895) for use within the context of an Electronic Data Interchange (EDI) environment. The transaction set can be used to enable a distributor or Direct Store Delivery (DSD) vendor to communicate adjustments to a DSD delivery or to acknowledge the completion of a delivery. The transaction set contains changes to the Delivery/Return Base Record identified during the check-in procedure. A Delivery/Return Acknowledgment and/or Adjustment Transaction containing no changes is considered to be an acceptance of the preceding Base Record or Adjustment. The transaction set will contain only the detail data which is to be changed.

**The Delivery/Return Acknowledgment and/or Adjustment Record is used to provide supplemental data, make adjustments, and terminate the overall delivery/return record set.**

## Header

PAGE #	POS. #	SEG. ID	NAME	REQ. DES.	MAX USE	LOOP REPEAT
92	0100	ST	Transaction Set Header	M	1	
93	0200	G87	Delivery/Return Adjustment Identification	M	1	
95	0300	G88	Delivery/Return Identification Adjustment	O	1	

## Detail

PAGE #	POS. #	SEG. ID	NAME	REQ. DES.	MAX USE	LOOP REPEAT
96	0100	LS	Loop Header	O	1	
			<b>LOOP ID - 0100</b>			<b>9999</b>
97	0200	G89	Line Item Detail - Adjustment	O	1	
99	0300	G22	Pre-Pricing Information	O	1	
100	0400	G72	Allowance or Charge	O	10	
103	0500	G23	Terms of Sale	O	20	
105	0600	LE	Loop Trailer	O	1	

## Summary

PAGE #	POS. #	SEG. ID	NAME	REQ. DES.	MAX USE	LOOP REPEAT
106	0100	G72	Allowance or Charge	O	20	
109	0200	G23	Terms of Sale	O	20	
111	0300	G84	Delivery/Return Record of Totals	O	1	
112	0400	G86	Signature Identification	M	1	
113	0500	G85	Record Integrity Check	M	1	
114	0600	SE	Transaction Set Trailer	M	1	

### NOTE:

**1/0100** The individual data fields will contain replacement values, not differences. The authentication code in the identification segment will contain the corresponding authentication code from the authentication segment in the Base or Adjustment Transaction immediately preceding it.

**Segment: ST Transaction Set Header**

**Level:** Header

**Loop:** \_\_\_\_

**Usage:** Mandatory

**Max Use:** 1

**Purpose:** To indicate the start of a transaction set and to assign a control number

- Semantic:**
- 1** The transaction set identifier (ST01) is used by the translation routines of the interchange partners to select the appropriate transaction set definition (e.g., 810 selects the Invoice Transaction Set).
  - 2** The implementation convention reference (ST03) is used by the translation routines of the interchange partners to select the appropriate implementation convention to match the transaction set definition. When used, this implementation convention reference takes precedence over the implementation reference specified in the GS08.

**Notes:** This data segment is used to indicate the start of a transaction set and to assign a control number. It is used to start all UCS transaction sets, and here is coded to indicate that this transaction set is a delivery/return acknowledgment and/or adjustment record.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES		
➤ <b>ST01</b>	<b>143</b>	<b>Transaction Set Identifier Code</b> Code uniquely identifying a Transaction Set <b>895</b> Delivery/Return Acknowledgment or Adjustment	<b>M</b>	<b>ID</b>	<b>3/3</b>
➤ <b>ST02</b>	<b>329</b>	<b>Transaction Set Control Number</b> Identifying control number that must be unique within the transaction set functional group assigned by the originator for a transaction set <b>Contains a unique transaction set control number assigned by the sender of this record. (Hence, the base record and all acknowledgment/adjustment records in the set will have different control numbers).</b>	<b>M</b>	<b>AN</b>	<b>4/9</b>
<b>ST03</b>	<b>1705</b>	<b>Implementation Convention Reference</b> Reference assigned to identify Implementation Convention	<b>O</b>	<b>AN</b>	<b>1/35</b>

**Segment: G87 Delivery/Return Adjustment Identification****Level:** Header**Loop:** —**Usage:** Mandatory**Max Use:** 1**Purpose:** To transmit identifying numbers, dates, and other basic data relating to the transaction set**Comments:** **A** G8704 must contain the integrity check value from the G85 (Record Integrity Check) segment in the preceding base or adjustment transaction.**Notes:** This segment is used to provide reference data concerning the acknowledgment/adjustment record. It is different from the data segment (G82) used in the base record for this purpose.**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ <b>G8701</b>	<b>868</b>	<b>Initiator Code</b> Code identifying initiator of the transaction <b>R</b> Receiver <b>Retailer</b> <b>S</b> Supplier	<b>M ID 1/1</b>
➤ <b>G8702</b>	<b>478</b>	<b>Credit/Debit Flag Code</b> Code indicating whether amount is a credit or debit <b>G8702 is used to indicate whether the transaction is a debit or credit. It must have the same value as the G8201 data element in the base record.</b> <b>C</b> Credit <b>D</b> Debit	<b>M ID 1/1</b>
➤ <b>G8703</b>	<b>861</b>	<b>Supplier's Delivery/Return Number</b> Identifying number assigned by the supplier to the transaction <b>G8703 provides the transaction number assigned by the supplier to identify this particular record set. It is mandatory and should have the same value as G8202 in the base record for this set.</b> <b>Multiple adjustments can be uniquely identified by using the combination of the Sender's Communications ID (DXS01) and the Supplier Delivery/Return Number (G8202 and G8703) within a single DXS/DXE envelope. The supplier must assure that the Supplier Delivery/Return Number (G8202 and G8703) is unique within the DXS/DXE envelope.</b>	<b>M AN 1/22</b>
➤ <b>G8704</b>	<b>866</b>	<b>Integrity Check Value</b> Data element providing secure method for identifying authenticity of content. Value calculated by using CRC 16 algorithm <b>G8704 should duplicate the value of the integrity check value contained in data element G8501 of the immediately preceding acknowledgment/adjustment record, or of the base record if this is the first acknowledgment/adjustment record.</b>	<b>M AN 1/12</b>
➤ <b>G8705</b>	<b>869</b>	<b>Adjustment Sequence Number</b> Sequential number for adjustment beginning with 1 and incremented by 1 for each additional adjustment regardless of which party is the originator <b>G8705 is used to sequentially number the acknowledgment/adjustment records from one up to a maximum of nine. Hence, while it is reference data, it is new data.</b>	<b>M NO 1/1</b>

<b>G8706</b>	<b>870</b>	<b>Receiver Delivery/Return Number</b>	<b>O AN 1/22</b>
Identifying number assigned by the customer to the transaction			

**G8706** provides the transaction number assigned by the receiver to identify this particular record set. It is optional in order to permit the supplier to transmit one or more acknowledgment/adjustment records prior to learning from the receiver what this number is. The receiver should assign and transmit this number on his first acknowledgment/adjustment transmission. This same number should then be included in all subsequent acknowledgment/adjustment records belonging to the same record set, irrespective of whether the record is generated by the supplier or receiver.

**Segment: G888 Delivery/Return Identification Adjustment****Level:** Header**Loop:** \_\_\_\_**Usage:** Optional**Max Use:** 1**Purpose:** To transmit adjustments for identification data**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
G8801	872	<b>Physical Delivery or Return Date</b> Actual or intended date of physical delivery or return expressed in format CCYYMMDD where CC represents the first two digits of the calendar year <b>G8801 corresponds to G8207 in the base record and can be used to supply a revised value.</b>	O DT 8/8
G8802	873	<b>Product Ownership Transfer Date</b> Date which is meaningful for both supplier and distributor for various mutually defined purposes (i.e., date of product ownership transfer) expressed in format CCYYMMDD where CC represents the first two digits of the calendar year <b>G8802 corresponds to G8208 in the base record and can be used to supply a revised value.</b>	O DT 8/8
G8803	324	<b>Purchase Order Number</b> Identifying number for Purchase Order assigned by the orderer/purchaser <b>G8803 corresponds to G8209 in the base record and can be used to supply a revised value.</b>	O AN 1/22
G8804	323	<b>Purchase Order Date</b> Date assigned by the purchaser to Purchase Order expressed in format CCYYMMDD where CC represents the first two digits of the calendar year <b>G8804 corresponds to G8210 in the base record and can be used to supply a revised value.</b>	O DT 8/8
G8805	862	<b>Receiver's Location Number</b> Number assigned by the customer that when combined with receiver Duns number uniquely identifies the receiving location <b>G8805 corresponds to G8204 in the base record and can be used to supply a revised value.</b>	O AN 1/6

**Segment:** **LS** Loop Header

**Level:** Detail

**Loop:** \_\_\_\_

**Usage:** Optional

**Max Use:** 1

**Purpose:** To indicate that the next segment begins a loop

**Semantic:** **1** One loop may be nested contained within another loop, provided the inner nested loop terminates before the outer loop. When specified by the standard setting body as mandatory, this segment in combination with "LE", must be used. It is not to be used if not specifically set forth for use. The loop identifier in the loop header and trailer must be identical. The value for the identifier is the loop ID of the required loop segment. The loop ID number is given on the transaction set diagram in the appropriate ASC X12 version/release.

**Comments:** **A** See Figures Appendix for an explanation of the use of the LS and LE segments.

**Notes:** This segment is required (and used only once) if any line-item associated segments (G89 and, possibly, G22, G72, and/or G23) are to be used.

#### Data Element Summary

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
LS01	447	<b>Loop Identifier Code</b> The loop ID number given on the transaction set diagram is the value for this data element in segments LS and LE	<b>M AN 1/4</b>
This reference data element is set equal to 0100.			

**Segment: G89** Line Item Detail - Adjustment**Level:** Detail**Loop:** 0100    **Usage:** Optional    **Max Use:** 9999**Usage:** Mandatory**Max Use:** 1**Purpose:** To transmit line-item detail adjustments

**Notes:** This segment is used not only to provide possible adjustment data for a line item but also to identify the line item in question. Hence, its use is mandatory for each line item being adjusted, even if the adjustment data itself is contained in one of the other related segments below.

G8901 is used to identify the line item affected by the adjustment and is mandatory. All other data elements are optional and each should be used only where new adjusting data is needed.

A special convention is used to remove a line item entirely (including G22, G72, and G23 segments) from the record set as, for example, when the delivery of an unauthorized item is rejected. To remove a line item entirely, its sequence number is designated in G8901, one or more zeros are entered in the G8902 quantity, and then the segment is immediately terminated by a CR/LF control character combination.

Note: if for some reason it proves necessary to change a quantity to zero without deleting the item, the quantity in G8902 can be listed as zero but with a unit of measure (such as "EA") placed immediately thereafter in G8903. Item removal is thereby avoided because the CR/LF terminator does not come immediately after the G8902 data element.

G8911 (Product/Service ID Qualifier) and G8912 (Product/Service ID) will be added in Version 005020 so that changes to G8311 and G8312 can be returned in the 895 transaction set.

## Data Element Summary

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ G8901	204	<b>Direct Store Delivery Sequence Number</b> Direct Store Delivery sequential number of the line item detail or a new line item detail <b>G8901 is used to identify the line item being adjusted. It corresponds to G8301 in the Line Item Detail segment of the base record.</b>  If a new item is to be added to the record, the next available sequence number should be assigned. The line items in the base record are numbered 1, 2, 3, ...N. New items added in acknowledgment/adjustment records should be numbered N+1, N+2, ...  If a new item is added, all of the data element rules from the G83 segment concerning mandatory, optional, paired, ... conditions carry over to the corresponding data elements in this G89 segment.	M N0 1/4
G8902	380	<b>Quantity</b> Numeric value of quantity	O R3 1/15
G8903	355	<b>Unit or Basis for Measurement Code</b> Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken <b>G8902 and G8903 are optional unless a <u>new</u> item is added (in which case they are both mandatory).</b>  BX Box CA Case CT Carton	O ID 2/2

		<b>DZ</b> Dozen			
		<b>EA</b> Each			
		<b>GA</b> Gallon			
		<b>KE</b> Keg			
		<b>KG</b> Kilogram			
		<b>LB</b> Pound			
		<b>PK</b> Package			
		<b>PL</b> Pallet/Unit Load			
		<b>TK</b> Tank			
		<b>UN</b> Unit			
<b>G8904</b>	<b>766</b>	<b>U.P.C./EAN Consumer Package Code</b>	<b>O</b>	<b>AN</b>	<b>12/12</b>
		Code (Universal Product Code - U.P.C.) identifying the retail shelf unit; consists of 2 high order digits identifying the system (U.S. Grocery = 00, 06 or 07, U.S. Drug = 03); the next ten digits are manufacturer ID: 5, Item ID: 5			
		<b>NOT USED BY THE RETAIL INDUSTRY</b>			
		<b>G8905 and G8906 should be used to change values sent in G8305 and G8306.</b>			
<b>G8905</b>	<b>235</b>	<b>Product/Service ID Qualifier</b>	<b>O</b>	<b>ID</b>	<b>2/2</b>
		Code identifying the type/source of the descriptive number used in Product/Service ID (234)			
		<b>See External Code Source 41 in Appendix A for reference document.</b>			
<b>G8906</b>	<b>234</b>	<b>Product/Service ID</b>	<b>O</b>	<b>AN</b>	<b>1/48</b>
		Identifying number for a product or service			
		<b>G8905 and G8906 correspond to data elements G8305 and G8306, respectively. Here, they are all optional, and only those needed to provide new data should be used to adjust an existing item. If a new item is introduced, the rules that apply to these data elements in the base record should be used here.</b>			
<b>G8907</b>	<b>438</b>	<b>U.P.C. Case Code</b>	<b>O</b>	<b>AN</b>	<b>12/12</b>
		Code (Universal Product Code - U.P.C.) including two high order digits identifying the "system" (U.S. Grocery = 00, 06 or 07; U.S. Drug = 03); using the U.S. Grocery system, the next ten digits are: Manufacturer (5) Case Code (5)			
		<b>NOT USED BY THE RETAIL INDUSTRY</b>			
<b>G8908</b>	<b>237</b>	<b>Item List Cost</b>	<b>O</b>	<b>R4</b>	<b>1/9</b>
		Gross unit cost within the appropriate price bracket for a line item			
<b>G8909</b>	<b>356</b>	<b>Pack</b>	<b>O</b>	<b>N0</b>	<b>1/6</b>
		The number of inner containers, or number of eaches if there are no inner containers, per outer container			
<b>G8910</b>	<b>810</b>	<b>Inner Pack</b>	<b>O</b>	<b>N0</b>	<b>1/6</b>
		The number of eaches per inner container			



**Segment: G22 Pre-Pricing Information****Level:** Detail**Loop:** 0100**Usage:** Optional**Max Use:** 1**Purpose:** To specify pre-pricing information**Semantic:** 1 If G2201 equals "A", then G2202 and G2203 are required.  
2 If G2201 equals "Y", then G2202 is required.  
3 G2205 is the effective date of the price information.**Comments:** A If G2201 equals "Z" or G2201 equals "N", then neither G2202 nor G2203 are required.**Notes:** If an adjustment needs to be made in this segment, the entire segment should be furnished and used to entirely replace the previous G22 segment for this item.**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
G2201	288	<b>Pre-priced Option Code</b> Code specifying pre-pricing option selected A Pre-Priced Prices included and price qualifier applies Items are price marked and the price listed below in G2202 is for the quantity in G2203. N Not Pre-Priced This code permits the supplier to communicate the explicit notice that the item in question is not price marked. Under such circumstances, data elements G2202 and G2203 should not be used. Y Pre-Priced (Prices Included) G2202 must be used and G2203 must not be used. (Where G2203 is needed, G2201 should be A, not Y). Z Pre-Priced (Prices Not Included) This code is used to indicate that the items are indeed pre-price-marked but that the price data is not provided in the transaction set. Under this condition, G2202 and G2203 must clearly not be used.	M ID 1/1
G2202	420	<b>Price New, Suggested Retail</b> The consumer package price or retail unit price associated with the product applicable on or after an effective price date This data is used to provide the price in hundredths of dollars (i.e., in cents) if G2201 is equal to A or Y. Otherwise, it is not used.	O N2 2/7
G2203	289	<b>Multiple Price Quantity</b> Quantity of units for a given price, e.g., 3 for \$10.00 G2203 is used if and only if G2201 is equal to A, and then specifies the number of retail units to which G2202 applies (e.g., if G2202 = 198 and G2203 = 3, the pre-price mark reads 3/\$1.98).	O N0 1/2
G2204	3	<b>Free-form Message</b> Free-form text A free-form message of up to sixty characters providing details concerning pre-pricing can be entered here. However, such information cannot be machine interpreted. Therefore, its use is discouraged.	O AN 1/60
G2205	373	<b>Date</b> Date expressed as CCYYMMDD where CC represents the first two digits of the calendar year The effective date of the pre-price information. This data element is not used in DEX/UCS.	O DT 8/8

**Segment: G72 Allowance or Charge****Level:** Detail**Loop:** 0100**Usage:** Optional**Max Use:** 10**Purpose:** To specify allowances, charges, or services**Syntax:** 1 **R03050809**

At least one of G7203, G7205, G7208 or G7209 is required.

2 **E050809**

Only one of G7205, G7208 or G72 may be present.

3 **P0607**

If either G7206 or G7207 is present, then the other is required.

4 **P0910**

If either G7209 or G7210 is present, then the other is required.

5 **C1103**

If G7211 is present, then G7203 is required.

**Semantic:** 1 G7209 is the allowance or charge percent.**Comments:** A The G73 segment is required when G7201 contains code "499" or "999"; however, the use of these codes is discouraged.**Notes:** If an adjustment needs to be made to one or more of the G72 segments for an item, the entire set of G72 segments for that item should be replaced with a complete, new set. (This convention is invoked in order to avoid ambiguity concerning the segment being adjusted).

If desired, the adjusted allowance or charge for an item can be expressed as a total allowance or total charge using a single G72 segment with Data Element G7201 containing Code 499 (Other Allowance) or Code 999 (Other Charges).

The convention for deleting all G72 Allowance or Charge segments for an item is to enter one G72 segment containing the following data elements and corresponding values:

G7201 - Allowance or Charge Code, Value=96 (Grouped Items)

G7202 - Method of Handling Code, Value=12 (Not Processed)

G7203 - Allowance or Charge Number, Value=REMOVE (Literal)

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ G7201	340	<b>Allowance or Charge Code</b> Code identifying the type of allowance or charge Refer to Appendix C for a list of valid codes. Code 499 (Other Allowance) or Code 999 (Other Charges) can be used to provide a total allowance or charge equal to the sum of several allowances or charges when they are aggregated into a single G72 segment for the item.	M ID 1/3
➤ G7202	331	<b>Allowance or Charge Method of Handling Code</b> Code indicating method of handling for an allowance or charge 01 Bill Back 02 Off Invoice 06 Charge to be Paid by Customer Charge included on invoice. 12 Cancel Allowance	M ID 2/2

## 15 Information Only

When this code is used, the allowance or charge amounts are not to be added or subtracted from the transaction. The information is being provided for information only.

**G7203 341 Allowance or Charge Number C AN 1/16**  
The number assigned by a vendor referencing an allowance, promotion, deal or charge

This is the number assigned by the DSD supplier to identify the particular allowance, promotion, deal, or charge being applied. It can be optionally used together with data element G7205 or G7208 or G7209.

**G7204 769 Exception Number O AN 1/16**  
A unique number identifying an exception or modification to an offered or existing promotion

This is a unique number that can be assigned by the supplier to identify an exception or modification to an offered or existing promotion.

**G7205 359 Allowance or Charge Rate C R4 1/15**  
Allowance or Charge Rate per Unit

This data element is used if the allowance or charge is specified in terms of a rate, i.e., a dollar amount per unit. It is positive for charges and negative for allowances.

**G7206 339 Allowance or Charge Quantity C R3 1/10**  
Quantity basis when allowance or charge quantity is different from the purchase order or invoice quantity

**G7207 355 Unit or Basis for Measurement Code C ID 2/2**  
Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken

If G7206 and G7207 are not used, the quantity and unit of measure codes to which this rate applies are those specified in G8302 and G8303 for this item, respectively.

G7206 and G7207 must be used together or not at all. Where used, they specify the quantity and unit of measure to which the rate in G7205 is applied. They should only be used where these quantities are different from those expressed in G8302 and G8303.

BX Box  
CA Case  
CT Carton  
DZ Dozen  
EA Each  
GA Gallon  
KE Keg  
KG Kilogram  
LB Pound  
PK Package  
PL Pallet/Unit Load  
TK Tank  
UN Unit

**G7208 360 Allowance or Charge Total Amount C N2 1/15**  
Total dollar amount for the allowance or charge

If used, this data element states the actual total amount (in hundredths of dollars) of the allowance (negative amount) or charge (positive amount) for this item.

**G7209 332 Percent, Decimal Format C R3 1/6**  
Percent given in decimal format (e.g., 0.0 through 100.0 represents 0% through 100%)

When used, this data element expresses the allowance (negative amount) or charge (positive amount) in terms of a percent. (10.5% or 0.105 of the dollar basis is expressed as 10.5).

<b>G7210</b>	<b>828</b>	<b>Dollar Basis For Percent</b> Dollar basis to be used in the percent calculation of the allowance, charge or tax <b>This data element must be used if G7209 is used and states the dollar basis to which the percent allowance or charge is applied in order to calculate its dollar amount.</b>	<b>C</b>	<b>R2</b>	<b>1/9</b>
<b>G7211</b>	<b>770</b>	<b>Option Number</b> A unique number identifying available promotion or allowance options when more than one is offered <b>This data element can be used to identify the particular promotion or allowance option that has been selected from among several offered by the promotion or allowance specified in G7203.</b> <b>If this data element is used, the associated promotion or allowance must be identified in data element G7203.</b>	<b>O</b>	<b>AN</b>	<b>1/20</b>

**Segment: G23 Terms of Sale****Level:** Detail**Loop:** 0100**Usage:** Optional**Max Use:** 20**Purpose:** To specify the terms of sale**Syntax: 1 R0809**

At least one of G2308 or G2309 is required.

- Comments:**
- A** The G23 segment may be used for the detail or the total transaction set level. Refer to the transaction set assumptions for details on proper usage.
  - B** If G2301 equals "04" (deferred or installment) then either G2313 or G2314 is required and the data in the segment pertains only to the portion of the invoice described in G2313 or G2314. If G2301 equals "11" (elective) then G2304 is required. If G2301 is not equal to "05" (discount not applicable) then (G2305 or G2310) and (G2306 or G2307) is required. If G2301 equals "ZZ" (other) then G2315 is required. Multiple use of this segment when G2301 equals "04" (deferred or installment) always implies an "AND" relationship. When G2301 equals "06" (mixed) or "11" (elective) an "OR" relationship is always implied.
  - C** G2310 is a memo figure requiring specific payment performance and therefore should not be negative.
  - D** When elective terms are offered in a deferred or installment situation, G2316 (Installment Group Indicator - DE 713) must be used to properly group the terms within each installment.

**Notes:** If an adjustment needs to be made to one or more of the G23 segments for an item (up to 20 are permitted), the entire set for that item should be replaced with a complete, new set. (This convention is invoked in order to avoid ambiguity concerning the segment being adjusted).

The G23 segment has yet to be operationally tested for DSD, and no rules have been developed regarding the removal of all G23 segments for an item.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES		
➤ <b>G2301</b>	<b>336</b>	<b>Terms Type Code</b> Code identifying type of payment terms <ul style="list-style-type: none"><li><b>01</b> Basic</li><li><b>02</b> End of Month (EOM)</li><li><b>03</b> Fixed Date</li><li><b>04</b> Deferred or Installment</li><li><b>05</b> Discount Not Applicable</li><li><b>06</b> Mixed</li><li><b>07</b> Extended</li><li><b>11</b> Elective</li></ul>	<b>M</b>	<b>ID</b>	<b>2/2</b>
➤ <b>G2302</b>	<b>333</b>	<b>Terms Basis Date Code</b> Code identifying the beginning of the terms period	<b>M</b>	<b>ID</b>	<b>1/2</b>
<b>G2303</b>	<b>282</b>	<b>Terms Start Date</b> Date from which payment terms are calculated expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>O</b>	<b>DT</b>	<b>8/8</b>
<b>G2304</b>	<b>283</b>	<b>Terms Due Date Qualifier</b> Code identifying the method to be used for payment in conjunction with due date	<b>O</b>	<b>ID</b>	<b>2/2</b>

<b>G2305</b>	<b>338</b>	<b>Terms Discount Percent</b> Terms discount percentage, expressed as a percent, available to the purchaser if an invoice is paid on or before the Terms Discount Due Date	<b>O R3 1/6</b>
<b>G2306</b>	<b>370</b>	<b>Terms Discount Due Date</b> Date payment is due if discount is to be earned expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>O DT 8/8</b>
<b>G2307</b>	<b>351</b>	<b>Terms Discount Days Due</b> Number of days in the terms discount period by which payment is due if terms discount is earned	<b>O N0 1/3</b>
<b>G2308</b>	<b>446</b>	<b>Terms Net Due Date</b> Date when total invoice amount becomes due expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>C DT 8/8</b>
<b>G2309</b>	<b>386</b>	<b>Terms Net Days</b> Number of days until total invoice amount is due (discount not applicable)	<b>C N0 1/3</b>
<b>G2310</b>	<b>362</b>	<b>Terms Discount Amount</b> Total amount of terms discount	<b>O N2 1/10</b>
<b>G2311</b>	<b>391</b>	<b>Discounted Amount Due</b> Amount of invoice due if paid by terms discount due date (total invoice or installment amount less cash discount)	<b>O N2 1/10</b>
<b>G2312</b>	<b>390</b>	<b>Amount Subject to Terms Discount</b> Amount upon which the terms discount amount is calculated	<b>O N2 1/10</b>
<b>G2313</b>	<b>343</b>	<b>Installment Total Invoice Amount Due</b> Deferred or installment portion of the total invoice (including charges, less allowances) before terms discount (if discount is applicable)	<b>O N2 1/10</b>
<b>G2313 is used only at the total transaction set level.</b>			
<b>G2314</b>	<b>342</b>	<b>Percent of Invoice Payable</b> Amount of invoice payable expressed in percent	<b>O R3 1/5</b>
<b>G2314 is used only at the total transaction set level.</b>			
<b>G2315</b>	<b>3</b>	<b>Free-form Message</b> Free-form text	<b>O AN 1/60</b>
<b>G2316</b>	<b>713</b>	<b>Installment Group Indicator</b> The installment group indicator is a 2-digit serial number beginning with 01 (i.e., 01, 02, 03 or 04); it is used to group "elective" terms types in an installment payment situation; the same indicator must be used for all segments in the same installment	<b>O N0 2/2</b>
<b>G2316 is used only at the total transaction set level.</b>			

**Segment:** **LE** Loop Trailer**Level:** Detail**Loop:** \_\_\_\_**Usage:** Optional**Max Use:** 1**Purpose:** To indicate that the loop immediately preceding this segment is complete

**Semantic:** 1 One loop may be nested contained within another loop, provided the inner nested loop terminates before the other loop. When specified by the standards setting body as mandatory, this segment in combination with "LS", must be used. It is not to be used if not specifically set forth for use. The loop identifier in the loop header and trailer must be identical. The value for the identifier is the loop ID of the required loop beginning segment. The loop ID number is given on the transaction set diagram in the appropriate ASC X12 version/release.

**Comments:** A See Figures Appendix for an explanation of the use of the LE and LS segments.

**Notes:** This segment specifies the end of the line item detail section of the record. It is used once, after all of the loop iterations have been made.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
LE01	447	<b>Loop Identifier Code</b> The loop ID number given on the transaction set diagram is the value for this data element in segments LS and LE LE01 is set equal to 0100.	M AN 1/4

**Segment: G72 Allowance or Charge**

**Level:** Summary

**Loop:** \_\_\_\_

**Usage:** Optional

**Max Use:** 20

**Purpose:** To specify allowances, charges, or services

**Syntax:** 1 **R03050809**

At least one of G7203, G7205, G7208 or G7209 is required.

2 **E050809**

Only one of G7205, G7208 or G72 may be present.

3 **P0607**

If either G7206 or G7207 is present, then the other is required.

4 **P0910**

If either G7209 or G7210 is present, then the other is required.

5 **C1103**

If G7211 is present, then G7203 is required.

**Semantic:** 1 G7209 is the allowance or charge percent.

**Comments:** A The G73 segment is required when G7201 contains code "499" or "999"; however, the use of these codes is discouraged.

**Notes:** If an adjustment needs to be made to one or more of the G72 segments at the record level (up to 20 are permitted), the entire set of G72 segments should be replaced with a complete, new set. (This convention is invoked in order to avoid any possible ambiguity concerning the segment being adjusted).

If desired, the adjusted allowance or charge at the record level can be expressed as a total allowance or total charge using a single G72 segment with Data Element G7201 containing Code 499 (Other Allowance) or Code 999 (Other Charges).

The convention for deleting all G72 Allowance or Charge segments for a record is to enter one G72 segment containing the following data elements and corresponding values:

G7201 - Allowance or Charge Code, Value=96 (Grouped Items)  
G7202 - Method of Handling Code, Value=12 (Not Processed)  
G7203 - Allowance or Charge Number, Value=REMOVE (Literal)

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES		
➤ G7201	340	<b>Allowance or Charge Code</b> Code identifying the type of allowance or charge Refer to Appendix C for a list of valid codes. Code 499 (Other Allowance) or Code 999 (Other Charges) can be used to provide a total allowance or charge at the record level equal to the sum of several allowances or charges at the record level when they are aggregated into a single G72 segment.	M	ID	1/3
➤ G7202	331	<b>Allowance or Charge Method of Handling Code</b> Code indicating method of handling for an allowance or charge 01 Bill Back 02 Off Invoice 06 Charge to be Paid by Customer Charge included on invoice. 12 Cancel Allowance	M	ID	2/2



## 15 Information Only

When this code is used, the allowance or charge amounts are not to be added or subtracted from the transaction. The information is being provided for information only.

**G7203 341 Allowance or Charge Number C AN 1/16**

The number assigned by a vendor referencing an allowance, promotion, deal or charge

This is the number assigned by the DSD supplier to identify the particular allowance, promotion, deal, or charge being applied.

**G7204 769 Exception Number O AN 1/16**

A unique number identifying an exception or modification to an offered or existing promotion

This is a unique number that can be assigned by the supplier to identify an exception or modification to an offered or existing promotion.

**G7205 359 Allowance or Charge Rate C R4 1/15**

Allowance or Charge Rate per Unit

This data element is used if the allowance or charge is specified in terms of a rate, i.e., a dollar amount per unit. It is positive for charges and negative for allowances.

If this data element is used here at the record level, data elements G7206 and G7207 must be used here as well in order to give explicit indication of the total quantity to which the rate applies.

**G7206 339 Allowance or Charge Quantity C R3 1/10**

Quantity basis when allowance or charge quantity is different from the purchase order or invoice quantity

**G7207 355 Unit or Basis for Measurement Code C ID 2/2**

Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken

G7206 and G7207 must be used together or not at all. If G7205 is used here at the record level, G7206 and G7207 must be used to specify the quantity and unit of measure to which the rate in G7205 is applied.

**BX** Box

**CA** Case

**CT** Carton

**DZ** Dozen

**EA** Each

**GA** Gallon

**KE** Keg

**KG** Kilogram

**LB** Pound

**PK** Package

**PL** Pallet/Unit Load

**TK** Tank

**UN** Unit

**G7208 360 Allowance or Charge Total Amount C N2 1/15**

Total dollar amount for the allowance or charge

If used, this data element states the actual total amount (in hundredths of dollars) of this allowance (negative amount) or charge (positive amount).

**G7209 332 Percent, Decimal Format C R3 1/6**

Percent given in decimal format (e.g., 0.0 through 100.0 represents 0% through 100%)

When used, this data element expresses the allowance (negative amount) or charge (positive amount) in terms of a percent. (10.5% or 0.105 of the dollar basis is expressed as 10.5).

<b>G7210</b>	<b>828</b>	<b>Dollar Basis For Percent</b> Dollar basis to be used in the percent calculation of the allowance, charge or tax <b>This data element must be used if G7209 is used and states the dollar basis to which the percent allowance or charge is applied in order to calculate its dollar amount.</b>	<b>C</b>	<b>R2</b>	<b>1/9</b>
<b>G7211</b>	<b>770</b>	<b>Option Number</b> A unique number identifying available promotion or allowance options when more than one is offered <b>This data element can be used to identify the particular promotion or allowance option that has been selected from among several offered by the promotion or allowance specified in G7203.</b> <b>If this data element is used, the associated promotion or allowance must be identified in data element G7203.</b>	<b>O</b>	<b>AN</b>	<b>1/20</b>

**Segment: G23 Terms of Sale****Level:** Summary**Loop:** \_\_\_\_**Usage:** Optional**Max Use:** 20**Purpose:** To specify the terms of sale**Syntax: 1 R0809**

At least one of G2308 or G2309 is required.

- Comments:**
- A** The G23 segment may be used for the detail or the total transaction set level. Refer to the transaction set assumptions for details on proper usage.
  - B** If G2301 equals "04" (deferred or installment) then either G2313 or G2314 is required and the data in the segment pertains only to the portion of the invoice described in G2313 or G2314. If G2301 equals "11" (elective) then G2304 is required. If G2301 is not equal to "05" (discount not applicable) then (G2305 or G2310) and (G2306 or G2307) is required. If G2301 equals "ZZ" (other) then G2315 is required. Multiple use of this segment when G2301 equals "04" (deferred or installment) always implies an "AND" relationship. When G2301 equals "06" (mixed) or "11" (elective) an "OR" relationship is always implied.
  - C** G2310 is a memo figure requiring specific payment performance and therefore should not be negative.
  - D** When elective terms are offered in a deferred or installment situation, G2316 (Installment Group Indicator - DE 713) must be used to properly group the terms within each installment.

**Notes:** If an adjustment needs to be made to one or more of the G23 segments at the record level (up to 20 are permitted), the entire set should be replaced with a complete, new set. (This convention is used to avoid any possible ambiguity concerning the segment being adjusted).

The G23 segment has yet to be operationally tested for DSD, and no rules have been developed regarding the removal of all G23 segments at the record level.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES		
➤ <b>G2301</b>	<b>336</b>	<b>Terms Type Code</b> Code identifying type of payment terms <ul style="list-style-type: none"><li><b>01</b> Basic</li><li><b>02</b> End of Month (EOM)</li><li><b>03</b> Fixed Date</li><li><b>04</b> Deferred or Installment</li><li><b>05</b> Discount Not Applicable</li><li><b>06</b> Mixed</li><li><b>07</b> Extended</li><li><b>08</b> Basic Discount Offered</li><li><b>09</b> Proximo</li><li><b>11</b> Elective</li><li><b>12</b> 10 Days After End of Month (10 EOM)</li><li><b>14</b> Previously agreed upon</li><li><b>24</b> Anticipation</li></ul>	<b>M</b>	<b>ID</b>	<b>2/2</b>
➤ <b>G2302</b>	<b>333</b>	<b>Terms Basis Date Code</b> Code identifying the beginning of the terms period	<b>M</b>	<b>ID</b>	<b>1/2</b>

<b>G2303</b>	<b>282</b>	<b>Terms Start Date</b> Date from which payment terms are calculated expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>O DT 8/8</b>
<b>G2304</b>	<b>283</b>	<b>Terms Due Date Qualifier</b> Code identifying the method to be used for payment in conjunction with due date	<b>O ID 2/2</b>
<b>G2305</b>	<b>338</b>	<b>Terms Discount Percent</b> Terms discount percentage, expressed as a percent, available to the purchaser if an invoice is paid on or before the Terms Discount Due Date	<b>O R3 1/6</b>
<b>G2306</b>	<b>370</b>	<b>Terms Discount Due Date</b> Date payment is due if discount is to be earned expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>O DT 8/8</b>
<b>G2307</b>	<b>351</b>	<b>Terms Discount Days Due</b> Number of days in the terms discount period by which payment is due if terms discount is earned	<b>O N0 1/3</b>
<b>G2308</b>	<b>446</b>	<b>Terms Net Due Date</b> Date when total invoice amount becomes due expressed in format CCYYMMDD where CC represents the first two digits of the calendar year	<b>C DT 8/8</b>
<b>G2309</b>	<b>386</b>	<b>Terms Net Days</b> Number of days until total invoice amount is due (discount not applicable)	<b>C N0 1/3</b>
<b>G2310</b>	<b>362</b>	<b>Terms Discount Amount</b> Total amount of terms discount	<b>O N2 1/10</b>
<b>G2311</b>	<b>391</b>	<b>Discounted Amount Due</b> Amount of invoice due if paid by terms discount due date (total invoice or installment amount less cash discount)	<b>O N2 1/10</b>
<b>G2312</b>	<b>390</b>	<b>Amount Subject to Terms Discount</b> Amount upon which the terms discount amount is calculated	<b>O N2 1/10</b>
<b>G2313</b>	<b>343</b>	<b>Installment Total Invoice Amount Due</b> Deferred or installment portion of the total invoice (including charges, less allowances) before terms discount (if discount is applicable) <b>G2313 is used only at the total transaction set level.</b>	<b>O N2 1/10</b>
<b>G2314</b>	<b>342</b>	<b>Percent of Invoice Payable</b> Amount of invoice payable expressed in percent <b>G2314 is used only at the total transaction set level.</b>	<b>O R3 1/5</b>
<b>G2315</b>	<b>3</b>	<b>Free-form Message</b> Free-form text	<b>O AN 1/60</b>
<b>G2316</b>	<b>713</b>	<b>Installment Group Indicator</b> The installment group indicator is a 2-digit serial number beginning with 01 (i.e., 01, 02, 03 or 04); it is used to group "elective" terms types in an installment payment situation; the same indicator must be used for all segments in the same installment <b>G2316 is used only at the total transaction set level.</b>	<b>O N0 2/2</b>

**Segment: G84 Delivery/Return Record of Totals****Level:** Summary**Loop:** \_\_\_\_**Usage:** Optional**Max Use:** 1**Purpose:** To specify summary details of total items in terms of quantity or amount**Syntax:** 1 R0102

At least one of G8401 or G8402 is required.

**Notes:** This segment is the same as that used in the 894 Base Record, except that here use of this segment is optional rather than mandatory. If used, a complete, new G84 segment should be provided to replace the previous one. All of the same syntax rules concerning mandatory, optional, paired, ... data elements apply.

Any totals entered in an 895 Adjustment Record are those that result from the composite, accumulated record set consisting of the 894 Base Record plus the acknowledgment/adjustment records up to and including the present one. (If desired, the sender of this record can ignore price adjustments made by the other party when calculating the totals in G8302 and/or G8403).

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
G8401	380	<b>Quantity</b> Numeric value of quantity  This quantity is the numerical sum of all G8302 quantities in the base record. Where a mix of units of measure is used (e.g., units and cases or units, feet, and pounds), this sum will have no physical meaning. It merely serves as a numerical check.	C R3 1/15
G8402	361	<b>Total Invoice Amount</b> Amount of invoice (including charges, less allowances) before terms discount (if discount is applicable)  This is the total delivery/return record amount (in hundredths of dollars) for the delivery or return after all deposits, all charges (positive) and all allowances (negative) have been applied. This total must be positive (unless allowances exceed costs). This total is before any payment dating term discounts or interest charges have been applied.	C N2 1/10
G8403	865	<b>Total Deposit Dollar Amount</b> Sum of deposit amounts separately identified  This is the sum of all deposit charges (in hundredths of dollars) that are listed in:  1. The G83 Line Item Detail segments where G8305 is coded "DI" (indicating deposit items not associated with products for resale such as empty bottles). Here, the contribution to the total deposit dollar amount is calculated by multiplying the quantity in G8302 by the item list cost in G8308 for each deposit item segment.  2. The G72 data segments at the item level having the G7201 Allowance or Charge Code set equal to "525" (indicating deposit charges that are associated with products for resale). Here, the contribution to the total deposit dollar amount is calculated by multiplying the G7205 dollar rate per unit by the quantity in G7206 if used; otherwise by the quantity in G8302 for the associated line item.  Note that the amounts in G8302, G8308, G7205, and G7206 are all expressed in "R" notation, whereas G8403 is expressed in "N2" notation.  This element should always be positive. Deposit credits for returned items should be handled in a return record, where they show up as a positive amount.	O N2 1/6

**Segment: G86 Signature Identification**

**Level:** Summary

**Loop:** \_\_\_\_

**Usage:** Mandatory

**Max Use:** 1

**Purpose:** To transmit an electronic identity

**Semantic:** 1 G8602 is a keyed representation of a signature.

**Notes:** This segment provides a digital signature which can be used to verify the authenticity of the party which generated this particular 895 Acknowledgment/Adjustment Record. It is generated and used in exactly the same way as in the base record.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
G8601	867	<b>Signature</b> Electronic identity. Calculation algorithm obtained from the Uniform Code Council <b>The electronic signature should be calculated as follows:</b> <b>Use G8702 (Credit/Debit Flag Code), G8703 (Supplier Delivery Return Number), a private algorithm, and a secret key.</b>	O AN 1/12
G8602	93	<b>Name</b> Free-form name	O AN 1/60

**Segment: G85 Record Integrity Check****Level:** Summary**Loop:** \_\_\_\_**Usage:** Mandatory**Max Use:** 1**Purpose:** To provide a secure method of identifying authenticity of record content**Notes:** This segment is used to provide a secure means for checking whether the contents of this acknowledgment/adjustment record are unchanged.**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
G8501	866	<b>Integrity Check Value</b> Data element providing secure method for identifying authenticity of content. Value calculated by using CRC 16 algorithm <b>The Integrity Check Value is generated using a CRC algorithm specified in the Appendix.</b> <b>It is applied to the contents of the entire transaction set up to this segment (i.e., from the beginning of the ST segment up through and including the end of the G86 segment).</b>	<b>M AN 1/12</b>

**Segment: SE Transaction Set Trailer**

**Level:** Summary

**Loop:** \_\_\_\_

**Usage:** Mandatory

**Max Use:** 1

**Purpose:** To indicate the end of the transaction set and provide the count of the transmitted segments (including the beginning (ST) and ending (SE) segments)

**Comments:** A SE is the last segment of each transaction set.

**Notes:** This segment indicates the end of the transaction set and provides the count of the transmitted segments. (It is used to terminate all UCS transaction sets). It is used here in the same way as in the 894 Base Record.

**Data Element Summary**

REF. DES.	DATA ELEMENT	NAME	ATTRIBUTES
➤ SE01	96	<b>Number of Included Segments</b> Total number of segments included in a transaction set including ST and SE segments	M NO 1/10
		SE01 contains the total number of segments contained in this particular transaction set, including both the header and trailer segments.	
➤ SE02	329	<b>Transaction Set Control Number</b> Identifying control number that must be unique within the transaction set functional group assigned by the originator for a transaction set	M AN 4/9
		SE02 contains the same transaction set control number that was entered into ST02 of the ST segment (Transaction Set Header) of this record.	



## SECTION VII

# DIRECT CONNECT INTERFACE STANDARD

The DEX/UCS Communications Standard - Direct Connect Interface is a specification that permits the interchange of data between the computer devices of two parties utilizing a direct electrical connection.

This section of the guide addresses Revision 01 of the Direct Connect Standard Interface.

In the sections below, direct text from the standard itself is printed in italics, whereas supplementary, explanatory material is printed in normal text.

## PREFACE

This Direct Connect Interface specification describes an implementation of a communications standard permitting data interchange between two parties equipped with compatible computer devices.

## CITATION

Cite this specification as follows:

“DEX/UCS Communications Standard - Direct Connect Interface, Revision 01”

This revision supports a single level: Level 01.

## REFERENCE DOCUMENTS

The following documents are referenced in this standard and are required to be on hand for its understanding and application:

1. *American National Standards (ANSI) X3.28-1976*, American National Standard Procedures for the Use of the Communication Control Characters of American National Standard Code for Information Interchange in Specified Data Communication Links
2. UCS Implementation and User Guide for Direct Store Delivery, available from the Uniform Code Council, Inc.

In addition, the reader's attention is directed to the main, message standards section of this UCS Standards Manual, where descriptions are provided of the DXS/DXE control segments and the 894/895 transaction sets. The DXS/DXE header/trailer control segments are used to enclose all DEX/UCS messages and are presented in

Chapter V - Control Segments. The 894 Delivery/Return Base Record and the 895 Delivery/Return Acknowledgment and/or Adjustment Record are the two transaction sets that will be commonly exchanged via DEX/UCS to support DSD transactions. They can be found in Chapter VI - Message Formats (Transaction Sets).

## DIRECT CONNECT SPECIFICATION

### PHYSICAL LEVEL

#### Connector

Access to each party's computer device shall be via a 1/4 inch, 3-circuit, standard female phone jack (see diagram in Figure 2 for applications information).

The connection between the phone jacks on the two devices shall be accomplished using a 3-conductor cable with male phone plugs on each end. The sleeve contacts of these two plugs shall be connected to each other, while the ring of one shall be connected to the tip of the other and vice versa.

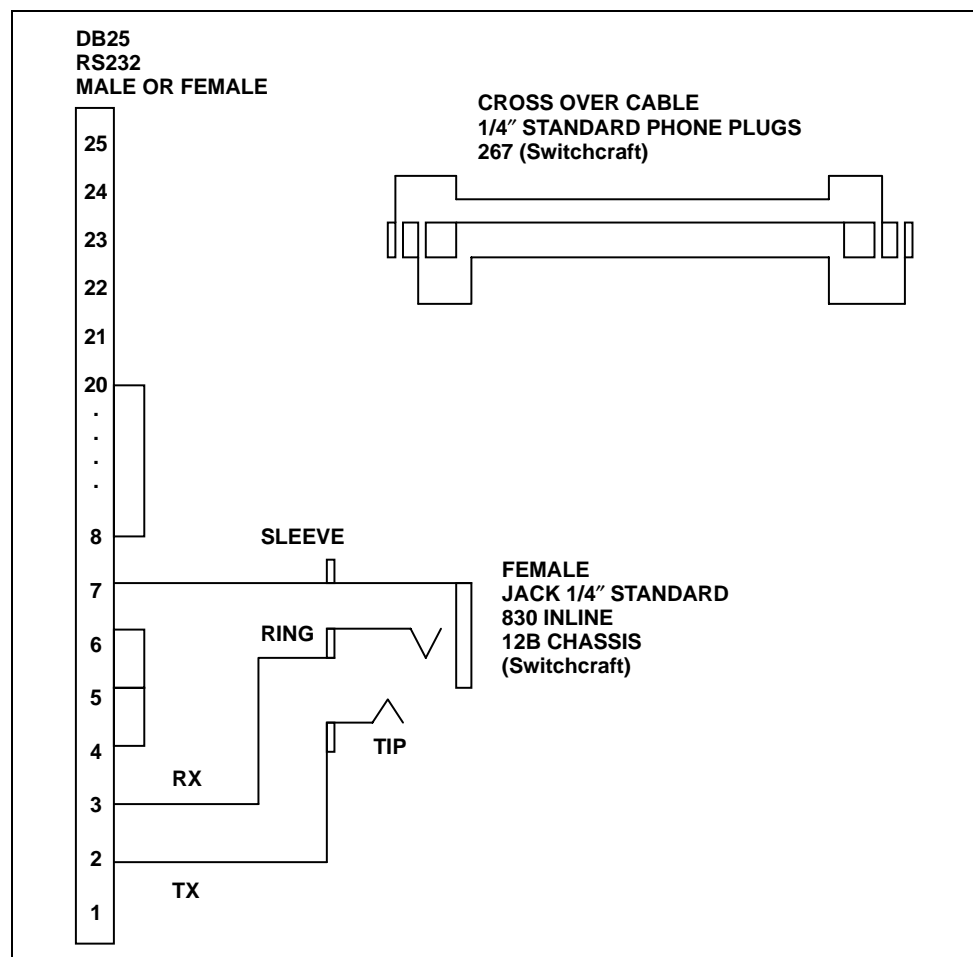


Figure 2. Wiring Application Note: DEX/UCS Phone Jack To Universal RS-232 Adapter  
(For Information Only — Not a Part of This Standard)

The two-jack (i.e., both female) approach was chosen in order to make all parties identical. With it, any party can communicate with any other.

The standard phone plug and jack were chosen because of their simplicity and ruggedness, easy insertion without the need for orientation, and their ability to withstand repeated connect/disconnect cycles. (A consumer grade example of this plug is the full-size stereo headphone plug.)

Users are advised to use high-quality, commercial grade versions of these plugs and jacks, rather than the lower quality grades that are typically found on consumer electronics products. While we can cite no specific quality standard, the plugs and jacks should preferably employ nickel-plated brass conductors and plug barrels, rather than those made of tin-plated steel and plastic, respectively. Plug/jack examples include SPC Technology's Type 302-M.CE (male) and 338.CE (female, chassis mount), and Swithcraft's Part No.s 267 (male) and 830 (female, in line) or 12B (female, chassis mount).

The cord should also be physically attached to the plug in a strong and secure manner so that it can withstand abuse without losing electrical integrity.

The standard itself is silent on the issue of who is responsible for providing the interconnecting cord. Except where special arrangements have been made in advance, thoughtful parties will provide their own cords, to be used in the event that the other party does not.

**Retailer Connection:** In the store-level DSD application, the retailer's cord will normally be used. However, the retailer is advised to provide two things:

1. A female phone jack (socket) connected to the retailer's computer in the prescribed manner and installed in an easily accessed location (e.g., at approximately waist height, unencumbered by poles, furniture, or other objects), **and**
2. A cord connected to the retailer's computer and having at the free end a standard male plug which can be used to plug into the DSD supplier's computer. If desired, this cord can be connected in parallel with the female jack above and hard wired into the retailer's computer, thereby leaving only one loose end. Alternatively, the cord can have plugs at both ends, connected to each other in the prescribed manner, so that one plug can be inserted into the retailer's standard jack specified in (1) above and the other can be connected to the DSD supplier's. Under this arrangement, it might be wise to secure the cord by one means or another to a fixed object so that it cannot be easily taken away and lost.

Under either of these arrangements, the DSD supplier must be able to access the retailer's jack listed in (1) above with his own cord and plug.

**Supplier Connection:** Some DSD suppliers may believe that the standard female jack is unsatisfactory for direct installation in their hand-held computer devices. Under such circumstances, the supplier has a number of options:

1. The supplier can provide an adapter device that attaches to the non-standard connector device on the hand-held and provides the standard female jack at the

other end. With this arrangement, the supplier can connect his device to the retailer's using a standard connector cord, either his own or the retailer's.

2. The supplier can provide a special connector cord with a non-standard connector device on one end for attachment to his own unit, and the standard plug on the other end for connection to the retailer's device. Under this arrangement, the supplier must always use his own special cord. If it fails, the connection cannot be made, as the retailer-provided standard cord will not work.

Thoughtful DSD suppliers who equip their hand-helds with standard sockets or who use non-standard supplier option (1) above will equip their delivery persons with a standard connector cord, to be used in the event that the retailer-provided cord is lost or broken. Normally, this cord can be kept in a secure place on the truck, so that it can be accessed only when needed. DSD Suppliers who choose option (2) above are advised to equip their trucks with a second, spare non-standard cord, to be used if the regular one fails.

### Signals

3 wires only

**Signal ground:** assigned to the "sleeve" lead of jack.

**Transmit data (from device):** assigned to "tip" lead of jack.

**Receive data (to device):** assigned to "ring" lead of jack.

The standard connector cord must connect the ring from one plug to the tip of the other plug, and vice-versa, since one party's transmit is the other party's receive.

### Signal Levels

**Output (from device):** RS-232C compatible bipolar levels.

**Input (to device):** will operate with either RS232C compatible bipolar levels or TTL unipolar levels at 0 and +5 VDC automatically.

### Protection

Shall survive electro-discharge levels as specified in FCC Part 68 regulations for telephone equipment, applied in any combination between tip, ring, and ground.

## DATA LINK LEVEL

### Code

8 bits total not counting start and stop bits (least significant bit first), 7 ASCII information bits with no parity, 8th bit always zero, except that the full 8 bits are used for sending the data block CRC-16 as per ANSI X3.28, Section 4.3.2 (not to be confused with the CRC-16 expressed in hex notation that is used for the Record Integrity Check in transaction sets 894 and 895).

All bytes other than the data block CRC-16 transmitted via DEX/UCS must be standard ASCII bytes. Hence, the block CRC-16 (which we will often refer to simply

as the block CRC or CRC) is the only byte that can have a 1 in the 8th (most significant) bit.

A table of the American National Standard Code for Information Interchange (ASCII) is provided in Appendix E of ANSI X3.28-1976 on page 71.

### Timing

Asynchronous, one start bit and one stop bit.

### Speed

9600 bits/second.

### Flow control

None provided, variable block size, limited to 245 bytes per block, with block defined as the bytes included in the CRC-16 accumulation as per Table 4 of ANSI X3.28 (i.e., the block starting immediately following the 'SOH' or 'STX' control character and continuing through the 'ETB' or 'ETX' but excluding all 'DLE' and 'SYN' control characters, as shown in Figures 2 and 3).\*

**Flow Control:** Flow control was excluded as either approach to it would have imposed difficulties. Flow control via a dedicated wire would have required a fourth conductor and connector pin. Flow control via XON and XOFF control characters would have required full duplex transmission, a difficulty for some computer devices used for route accounting.

**Block Size:** The size limit of 245 bytes per block was chosen to ensure compatibility with some devices and software having buffer limits of 256 bytes.

### Message Transfer Blocking Protocol

Per ANSI X3.28-1976, Message Transfer Subcategory: D1 - "Message-Independent Blocking" (see ANSI X3.28, Section 6.10).

Subcategory D1 provides for blocking that can be performed independent of message content. It further provides for procedures to contend with data bytes that can contain all 256 8-bit combinations. In DEX/UCS, all bytes except the block CRC-16 (which immediately follows the data block) must be 7-bit ASCII characters with the 8th (most significant) bit set equal to zero. Moreover, "data" bytes can never be confused with ASCII transmission control bytes such as 'ENQ,' 'ACK,' or 'DLE.' Hence, there is no danger of erroneously interpreting data bytes as control bytes. Nevertheless, in order to maintain full compatibility with the ANSI standard, all of the rules for D1 blocking are used.

---

\*In this section of the reference guide, apostrophes are used to identify specific ASCII characters, especially control characters. For example, 'DLE' '0' represents the single ASCII DLE control character followed by the ASCII representation of zero. (In contrast, the three-letter sequence of D followed by L followed by E would be represented in the form 'D' 'L' 'E.')

Functional control characters not embraced by apostrophes are generic representations only.

**ASCII Control Characters:** The communication control functions in Subcategory D1 use the ASCII characters with character structure and parity sense in accordance with American National Standard Character Structure and Character Parity Sense for Serial-by-Bit Data Communication in the American National Standard Code for Information Interchange, X3.16-1976, and American National Standard Bit Sequencing of the American National Standard Code for Information Interchange in Serial-by-Bit Data Transmission, X3.15-1976. (See also the table in Appendix E, page 71, of ANSI X3.28-1976.)

**Transmission Initiation:** The transmission of blocks is initiated by the master station after the appropriate session establishment procedure of Subcategory 2.3 (see Section 3 below) in which the master sends an 'ENQ' control character and receives back 'DLE' '0' as an acknowledgment.

**Handshake Header Blocks:** In each of the two handshake transmissions (see Section 3.3 below), the master station sends only a single header block, and therefore precedes this block with a TSOH (consisting of 'DLE' 'SOH'). The block is, in turn, terminated with a TETX (consisting of 'DLE' 'ETX') followed by the CRC for the block.

**Message Blocks:** In the message transmission, no headers are used, and the master station precedes each block with a TSTX (consisting of 'DLE' 'STX'). Each intermediate block is terminated by a TETB (consisting of 'DLE' 'ETB') and the CRC for the block. The final message block is terminated by a TETX (consisting of 'DLE' 'ETX') and the block CRC.

**Block CRC-16:** The CRC-16 (see ANSI X3.28 Section 4.3.2) is a 16-bit number (two 8-bit bytes, with all bits able to assume the value of zero or one) generated by applying a particular polynomial to the contents of the transmission block. (See Section F of the Reference Guide for an explanation of this generator and its use.) Included in its calculation are the contents of the transmission block starting immediately after the TSOH or TSTX, continuing through all of the data bytes, and then including the terminating 'ETB' or 'ETX' control character. However, all 'SYN' and 'DLE' control characters, including the one immediately preceding the terminating 'ETB' or 'ETX' are excluded.

**Block Abort:** If the sending station for some reason wishes to stop the transmission of a block and start over, it can do so by means of a transparent block abort. This is accomplished by means of terminating the incomplete block with the control characters 'DLE' 'ENQ.' The sending station then stops transmission and waits for a reply (with Timer A running — see Section 3.2.1). The receiving station, upon detecting the 'DLE' 'ENQ,' should then discard the portion of the block received, respond with a 'NAK' and remain in the receive condition. The sending station, upon receiving this 'NAK,' should then resume transmission by starting over again with the transmission of the entire block in question.

**Transmission Pause by Sending Station:** While transmitting a message block, the sending station may find it necessary to pause before continuing. For example, time may be required at the end of the block to compute its CRC. In order to prevent time-out by the receiver's Timer B (see next paragraph), the sending station can send during such a pause one or more TSYN (Transparent Synchronous Idle) control characters, with each consisting of the character pair 'DLE' 'SYN.' Since DEX/UCS

transmissions are asynchronous rather than synchronous, these “time-fill” characters need not be sent continuously. Rather, a ‘DLE’ ‘SYN’ pair should be sent whenever the pause since the last character transmitted begins to approach the 100 millisecond time-out limit of Timer B.

**Receive Time-Out:** Timer B (Receive Timer, see Section 3.2.2 of this guide and ANSI X3.28 Section 3.5.2.2) is used by the receiving station to protect against its nonrecognition of a terminating TETB (‘DLE’ ‘ETB’) or TETX (‘DLE’ ‘ETX’) and block CRC. The timer is started upon the receipt of TSOH (‘DLE’ ‘SOH’) or TSTX (‘DLE’ ‘STX’). It is continually reset to zero and kept running as data is received, with any received character causing such reset in order to permit receipt of variable length blocks. It is stopped upon receipt of the TETB or TETX plus block CRC sequence.

When time-out occurs (after a period of 100 milliseconds during which no characters whatsoever are received), the slave station should discard the incomplete block and prepare to receive another transmission. Note that if the remainder of the failed block is then received, the block CRC check will fail, resulting in the return of a ‘NAK’ and retransmission of the entire block by the master station (see next section entitled “Slave Response to a Received Block”). If, on the other hand, no more data from this block is received, the master will receive no acknowledgment, positive or negative, from the slave, resulting in time-out of Timer A (see paragraph below entitled “Response Time-Out). At this point, the master will send an ‘ENQ’ to which the slave will respond by sending the acknowledgment from the last valid received block (‘DLE’ ‘0’ or ‘DLE’ ‘1’). The master will then use this acknowledgment to resume transmission at the proper point.

**Slave Response to a Received Block:** The slave station, upon receiving a block and detecting the TETB or TETX followed by the block CRC, recomputes the CRC using the data received, in order to determine whether the block was received without error and should be accepted. Then, when the slave is prepared to receive more data, it sends one of two replies:

- **Acceptance:** If the transmission block was accepted, it sends an ACKN positive acknowledgment consisting of ‘DLE’ ‘0’ or ‘DLE’ ‘1’. ‘DLE’ ‘0’ and ‘DLE’ ‘1’ are sent alternately for successive blocks. Since ‘DLE’ ‘0’ was sent in response to the original session-initiating ‘ENQ,’ ‘DLE’ ‘1’ is sent in response to the first block. ‘DLE’ ‘0’ is sent in response to the second block, and the alternation is then continued.

Upon detecting the ACKN, the master station first checks to see if it has the expected value of N. If it does, the master concludes that the last block was successfully received and either transmits the next block, if there is one, or initiates termination. If N has the wrong value (receipt of ‘DLE’ ‘0’ instead of ‘DLE’ ‘1’ or vice versa), the master station concludes that the last block was not successfully received and retransmits it, just as if it had received back a ‘NAK.’

- **Rejection:** If the transmission was not accepted (e.g., the block CRC indicated a transmission error), it sends a negative acknowledgment consisting of the ‘NAK’ control character.

Upon detecting 'NAK,' the master station initiates retransmission of the last transmission block up to a total maximum of N (10) times (see paragraph 3.2.5 below), after which the master station exits to a recovery procedure.

The use of 'NAK' does not alter the sequence of alternating acknowledgments. The same affirmative reply ('DLE' '0' or 'DLE' '1') is used for responding to a successful retransmission as would have been used if the original transmission of the unaccepted block had been successful.

**Temporary Interrupt by Slave:** Under some conditions, the slave may not be ready to receive the next block. For example, the slave may require extra time to recompute the block CRC, especially if this is being done in background mode. In order to prevent the master station from timing out during such a pause, the slave can send back a WACK (Wait After Positive Acknowledgment, represented by the DLE control character followed by a semicolon, i.e., 'DLE' ';'). Timer A (see next paragraph) is set by the master at one second, so the slave should make sure that a WACK is sent if the processing time taken after receiving the TETB or TETX (or an 'ENQ') begins to approach this one second limit. Upon receiving the WACK, the sending station will inquire whether the receiving station is still busy by sending an 'ENQ.' If it is, it shall respond to this and each successive 'ENQ' with another WACK. (The sending station does not index the counter N when it transmits an 'ENQ' in response to the valid response of a WACK, so this interrogation/response sequence can repeat as long as the receiving station keeps responding with a WACK.

To keep the inquiry/response traffic manageable, the receiving station can wait until close to the Timer A limit of one second before responding to each 'ENQ.' Once processing is complete and the slave is ready to receive more data, it should respond to the next 'ENQ' with the appropriate response as noted above (i.e., a 'DLE' '0' or 'DLE' '1' positive acknowledgment or a 'NAK' negative acknowledgment).

**Response Time-Out:** Timer A (Response Timer, see Section 3.2.1 of this guide and ANSI X3.28 Section 3.5.2.1) is used by the master station to contend with possible invalid or non-response from the slave. It is set to zero and started after the transmission of an 'ENQ' or the TETB/TETX and block CRC. It is stopped upon receipt of a valid reply (here, 'DLE' '0,' 'DLE' '1,' WACK or 'NAK'). In this DEX/UCS standard, Timer A is set equal to one second.

If response time-out occurs, the master station sends a reply-request consisting of an 'ENQ' control character. Up to a total of N (10) reply-request 'ENQ' attempts resulting from non-responses or invalid responses may be made before exiting to recovery procedures. ('ENQ' attempts resulting from valid WACK responses are not counted.)

Upon receipt of a reply-request 'ENQ,' the slave station sends the appropriate response. During a session where a message block has previously been sent, the receiving station sends a WACK if not yet ready to receive more data. If and when it is ready, it sends or repeats the appropriate reply for the last message block received (i.e., 'DLE' '0,' 'DLE' '1,' or 'NAK'). If it sends a 'NAK,' the sending station responds to it by retransmitting the last block.

If the last block was successfully received, the response consists of sending a 'DLE' '0' or 'DLE' '1' acknowledgment, with the zero or one indicating which one it was.



Once such an acknowledgment is received, transmission resumes at that point. For example, if the master receives back the acknowledgment that it had been expecting before the time-out, it concludes that the block was indeed received and the reason for the time-out was that the original acknowledgment somehow failed. In such a situation, transmission can resume with the next block. On the other hand, if the master receives back the acknowledgment it wasn't expecting (one instead of zero, or vice versa), it concludes that the last block sent was neither received nor acknowledged and, therefore, needs to be retransmitted.

## SESSION LEVEL

### Establishment and Termination

Per ANSI X3.28, Subcategory 2.3 - "Two-Way Alternate, Nonswitched Point-to-Point" (see ANSI X3.28, Section 5.5).

This subcategory is applicable to systems in which two stations are on a non-switched point-to-point link and where both stations may contend for master status and where either may seize it if the other station is not also attempting to seize it.

**Master/Slave Reversal:** An important feature of this establishment and termination subcategory is that it permits the two stations to reverse master and slave roles, so that the station originally initiating the transmission can request the other station to send messages back in the reverse direction. Prior to starting, neither station has master status, and either or both stations may bid for master status.

**Contention for Master Status:** While contention for master status can be a potential problem in other applications of this Subcategory 2.3 establishment and termination procedure, it should not be under DEX/UCS. In this latter context, exchange may take place under either of two modes: attended or unattended. Under attended interchange, transfer takes place between the devices of two persons who are face to face. Hence, these persons can talk with each other and decide who is going to initiate the first transmission. Under unattended interchange, an operator of a device connects with an unattended device which waits passively until the operator initiates the first transmission. Under either mode, once the initial handshake transmission takes place, subsequent transmissions follow using the well-defined rules spelled out below.

**Bid for Master Status:** A station wishing to transmit a message bids for master status by sending an 'ENQ' without a prefix. The station receiving the 'ENQ' assumes slave status and responds as follows:

- If ready to receive, it sends back the positive acknowledgment of 'DLE' '0.'
- If not ready to receive, the receiving station can reject the bid for master status by sending back a 'NAK.' Upon receiving a 'NAK,' the bidding station reinitiates a bid for master status with an 'ENQ' up to ten (M) times (not counting the original), after which it exits to a recovery procedure.
- If temporarily not ready, the receiving station can also send back a WACK ('DLE' ';'), thereby providing a positive response but asking the initiating station to wait a moment. Upon receiving the WACK, the sending station should inquire again whether the receiving station is still busy by sending

another 'ENQ.' So long as the receiving station is still not ready to receive more data, it responds to this and each successive 'ENQ' with another WACK. (The sending station does not index the counter N when it transmits an 'ENQ' in response to the valid response of a WACK, so this interrogation/response sequence can repeat as long as the receiving station keeps responding with a WACK. To keep the inquiry/response traffic manageable, the receiving station can wait until close to the Timer A limit of one second before responding to each 'ENQ.' Also, the sending station can pause a bit before sending the next 'ENQ' — the standard is silent on how long.)

In the event of an invalid, excessively delayed, or non-reply to the 'ENQ,' Timer A (see below) times out and the bidding station reinitiates its bid up to ten (N) times (not counting the original), before exiting to a recovery procedure.

**Message Transmission:** Upon receipt of a positive acknowledgment, the master station initiates message transmission using Message Transfer Subcategory D1 (see Section 2.5 above). As noted in Section 3.3 below, there are three different message transmissions that take place in DEX/UCS: an initial handshake transmission from the initiating party, a second handshake transmission, sent in the reverse direction by the responding station taking on master status, and then the third, main data transfer transmission. This latter transmission can take place in either direction, depending upon whether the original initiating station made a "request to send" or "request to receive" operation request in the first handshake transmission.

**Transmission Termination:** Following transmission of the last block of data and the receipt of an ACKN ('DLE' '0' or 'DLE' '1') from the receiving station, the master station concludes a transmission by transmitting an 'EOT' control character, indicating thereby that it has no more data to transmit. 'EOT' negates the master/slave relationship that existed for this last transmission, permitting either station to bid for master status for the next transmission, if any.

**Transmission Abort (by Sender):** The sending station can prematurely abort a transmission for any reason by this same procedure. That is, following the transmission of a block (including an incomplete block by using a transparent block abort as discussed under Block Abort in Section 2.3) and the receipt of an ACKN or 'NAK,' the sending station sends an 'EOT.'

**Termination Interrupt (by Receiver):** The receiving station can also, for any reason, abort a transmission by means of a termination interrupt procedure. This is accomplished after the receipt of a block by sending back an 'EOT' control character in place of one of the normal responses (e.g., 'DLE' '0,' 'DLE' '1,' 'NAK,' or WACK). Upon receipt of the 'EOT,' the sending station should terminate the transmission and both parties should negate the master/slave relationship. Good design practice would further dictate that each party's system provide an appropriate error and response message to the system operator.

## Timers and Limits

**Timer A (Response Timer):** 1 second (see ANSI X3.28, Section 3.5.2.1).

Timer A is used by the sending station to protect against an invalid or no response from the receiving station. The timer is set to zero and started whenever the sending station sends an 'ENQ,' or completes the transmission of a block by sending a TETB

(‘DLE’ ‘ETB’) or TETX (‘DLE’ ‘ETX’) plus the block CRC. It is stopped upon receipt of a valid response: an ACKN (‘DLE’ ‘0’ or ‘DLE’ ‘1’), ‘NAK,’ or WACK (‘DLE’ ‘;’).

If response time-out occurs after sending an ‘ENQ’ bid for master status, the process is repeated up to a maximum of N (10) times (not counting the original), with Timer A reset to zero and started each time the ‘ENQ’ is sent. If still unsuccessful, the system should exit to recovery procedures. The limit N applies to the total number of reattempts resulting from both non- (time-out) and negative (‘NAK’) responses, but excludes reattempts made in response to receiving a WACK (i.e., an ‘ENQ’ sent in response to a WACK resets Timer A to zero while leaving the count of total attempts unchanged).

If response time-out occurs after sending a data block and terminating block CRC, an ‘ENQ’ is transmitted. As above, the ‘ENQ’ is sent up to a total of N (10) times, counting transmittals following both non- and negative responses but excluding WACKs, before exiting to recovery procedures.

**Timer B (Receive Timer):** 100 msec with timer restart upon data received (see ANSI X3.28, Section 3.5.2.2).

Timer B is used by the receiving station to protect against its nonrecognition of a terminating TETB (‘DLE’ ‘ETB’) or TETX (‘DLE’ ‘ETX’) and block CRC. The timer is started upon the receipt of TSOH (‘DLE’ ‘SOH’) or TSTX (‘DLE’ ‘STX’). It is continually reset to zero and kept running as data is received, with any received character causing such reset in order to permit receipt of variable length blocks. It is stopped upon receipt of the TETB or TETX plus block CRC sequence.

When time-out occurs (after a period of 100 milliseconds during which no characters whatsoever are received), the slave station should discard the incomplete block and prepare to receive another transmission. Note that if the remainder of the failed block is then received, the block CRC check will fail, resulting in the return of a ‘NAK’ and retransmission of the entire block by the master station (see paragraph entitled “Slave Response to a Received Block - Rejection” in Section 2.5 above). If, on the other hand, no more data from this block is received, the master will receive no acknowledgment, positive or negative, from the slave, resulting in time-out of Timer A. At this point, the master will send an ‘ENQ’ to which the slave will respond by sending the acknowledgment from the last valid received block (‘DLE’ ‘0’ or ‘DLE’ ‘1’). The master will then use this acknowledgment to resume transmission at the proper point (see last paragraph of Section 3.2.1 - Timer A, immediately above, for details).

**Timer C (Gross Timer):** Not utilized.

Timer C is intended to facilitate disconnection procedures of a switched communications line if data transmission stops because ‘EOT’ is not recognized or because of remote station or communication facility problems. Since DEX/UCS employs a direct connection directly attended by at least one operator, this timer is not needed.

**Timer D (No-activity Timer):** 2 seconds (see ANSI X3.28, Section 3.5.2.4).

Timer D serves as a “no-activity” time-out for both stations. It is started or reset to zero and restarted upon receipt or transmission of any character. It is stopped upon receipt or transmission of ‘EOT.’

Note that the label of “no-activity” for this timer can be a bit misleading. It should **not** be interpreted to apply to the idle state where a station is standing by, ready to receive a possible ‘ENQ’ bid for master status from an initiating station. Such a stand-by state can last indefinitely, with Timer D and all other timers turned off until something happens. Timer D does not get activated until some character is received or sent.

When time-out occurs, the system should notify the operator (if the station is attended, as will always be true for the DSD supplier’s system) or processor program, or both, and return to the control mode.

**Retry limits (N and M):** *10 Maximum retries resulting from multiple ‘NAK’ responses or multiple invalid or no replies with timer time-out (see ANSI X3.28, Sections 5.5.2 and 6.10.3).*

After ten reattempts (not counting the original) by the bidding or master station to obtain a satisfactory response from the other station, the system should exit to a recovery procedure, notifying the operator or processor program, or both.

**Timer and Response Margins:** In a communications session, various ASCII control characters are sent and returned to control the data exchange sessions. While not specified directly in the formal standard itself, system designers are encouraged to provide suggested margins for response and error so that timing does not introduce problems. These suggestions are presented in Section C.1.e of Section III - The UCS/DSD Standards of this guide.

### **Handshakes prior to data block transfer**

Each exchange of data between parties shall be preceded by two sessions or transmissions (“Transmission” as defined by ANSI X3.28, Appendix D - Glossary) to handshake for revision/level number compatibility, Comm ID, operation requests, and error response codes, as shown in Figure 2. The exchange shall be initiated by a party assuming the master status, who shall send an initial handshake header block and then terminate the first transmission. The other party shall then assume the master status to send a response handshake as a header block, and then terminate this second transmission.

In the first transmission, the initial party shall send a list of all revision/level combinations that its system is capable of processing. The list together with the Comm ID and Operation Request shall not exceed the length of the maximum header block size. (Set at 245 bytes for Revision 01. If different header block lengths are ever defined for different revisions and/or levels, the minimum-length header block among those supported shall be chosen.) If compatible, the responding party shall select and send back a single revision/level number supported by the initial party. The remainder of the interchange shall then take place at this revision and level number. If not compatible, the responding party shall reply with an error response code and terminate the session.

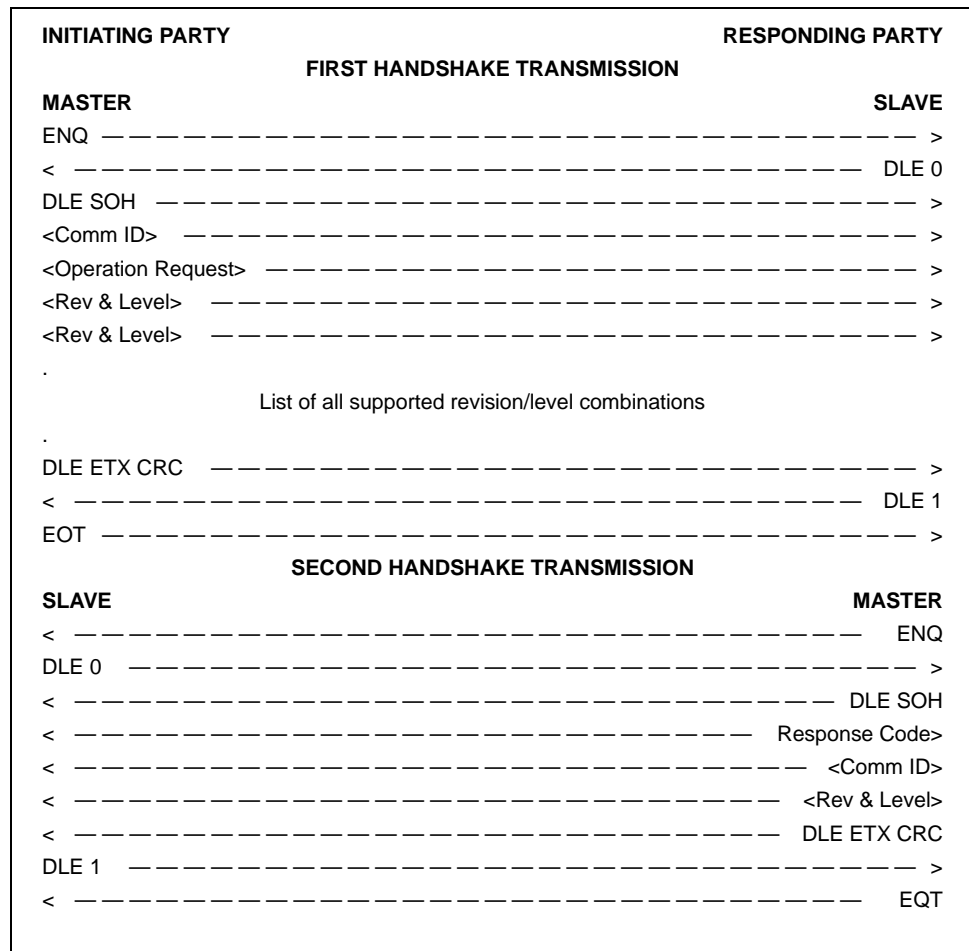
**Single Revision & Level at Present:** At the present Revision 01 of this direct connect interface standard (not to be confused with the version and release of the transaction set standards), there is only this one operational revision in use, and it supports only a single Level 01. Therefore, a system can be designed at present to send as an initiating station in the first handshake transmission only a single

revision/level consisting of "R01L01." Similarly, it can be designed to send back as the responding (now master) station this same "R01L01."

**Provision for Multiple Revisions and Levels:** In time, new revisions may be released and put in use prior to the time when a particular system is updated. Hence, system designers should **even now** make their systems capable of receiving first handshake transmission header blocks containing multiple Revision & Level sets when operating in the response mode. So long as "R01L01" is one of them, the system can answer back with that single choice and proceed.

**No Compatible Revision/Levels:** If no compatible revision/level choice (i.e., R01L01) is found among those received in the first transmission, the responding system should send back in the second transmission a Response Code equal to "02" to indicate that no supported revision number (and level) was received. It should then terminate the transmission by sending the sequence 'DLE' 'ETX' plus the block CRC. In this situation, this termination sequence should not be preceded by the Comm ID or by a revision/level choice.

Data transfer will be accomplished in the third transmission, as shown in Figure 3. If the initial party had sent an "S" (request to send) operation request in the initial handshake header block, it shall assume master status and send data as text blocks. If the initial party had instead sent an "R" (request to receive) operation request in this header block, it shall wait for the other party to assume master status and be prepared to receive data as text blocks.



**Figure 3. Handshake Transmissions**

Where:

<Comm ID>:

ASCII representation of sender's 10-digit UCS Comm ID

<Operation Request>:

"S" = Request to send

"R" = Request to receive

<Rev & Level>:

"RnnLmm" where nn is a two-digit expression of the revision number

and mm is a two-digit expression of the level number

(at Rev 01 only Level 01 is defined, resulting in R01L01)

<Response Code>:

"00" = OK

"01" = Unrecognized Comm ID

"02" = Unsupported Revision Number

"03" = Operation conflict, try again

"04" = No message at this time (used only in response to a request to receive operation request from the initiator)

"05" = Undefined error

"06" - "99" = Not used

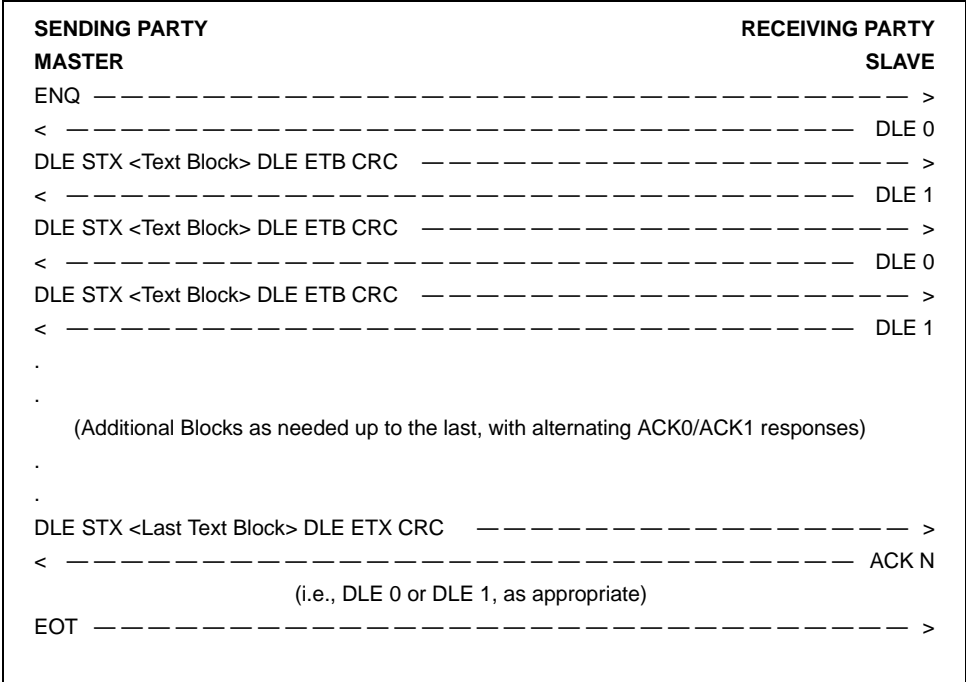


Figure 4. Data Transmission

**Use of Comm IDs:** At the end of the two handshake transmissions, each of the two computer systems will have checked or learned the other's identity through the exchange of Comm IDs. Normally, the two systems will make use of this data as follows:

- **Identification of Responding Party by Initiator when Sending Data:**  
Almost certainly, the initiating system will want to check for the proper identity of the responding system when operating in the request to send mode. Usually the operator of the initiating system will key in some form of identification of the party he is planning to communicate with before sending the first handshake transmission. If the response handshake transmission contains a Comm ID different from the one expected, the initiating system should exit to a recovery procedure and inform its own operator of this specific problem. (Note: Since this error condition is not detected until receipt of the second handshake transmission by the initiating party, no indication of this problem can be provided in the transmissions themselves.)
- **Identification of Responding Party by Initiator when Requesting Data:**  
Whether or not to require the system operator to key in the identity of his intended partner when he initiates a request to receive is a matter of system designer choice. Under some circumstances, the system may already know who the other party is supposed to be (as, for example, when a system seeks to receive an 895 ack/adjust record after previously exchanging an 894 base record that has not yet been closed out). If the initiating system does check and does find that a wrong Comm ID is received, it can exit to a recovery procedure and inform its own operator of this specific problem as in the paragraph immediately above. On the other hand, if the system does not insist on a correct Comm ID, it can use the one received to tag the message received for originator

identification purposes. This latter function can, however, be equally well carried out using the Comm ID in the DXS header data segment contained in the message itself.

- **Identification of Initiating Party by Responder:** The responding party can use the Comm ID received in the first transmission to identify the initiating party. Under many circumstances (as, for example, when the retailer's system is operated in an unattended mode), this will be the only means for identifying the initiator. Where the initiating party sends a request to send, the responding party can use this identification, if desired, to determine whether the sender is authorized and also to label the received message. (Note that the sender's Comm ID is also contained in the DXS header segment of the message itself.) Where the initiating party sends a request to receive, the responding party can use this identification not only to check authorization but also to determine which message, if any, to send back.

For whatever reason, if the responding station determines that the initiator's Comm ID is improper, it can send back in the second handshake transmission a Response Code of "01" (Unrecognized Comm ID). When this Response Code is sent, it can be immediately followed by the terminating sequence 'DLE' 'ETX' plus the block CRC. Alternatively, the Comm ID and revision/level can be sent as well, with the choice left up to the system designer.

**Response Codes:** In addition to the two Response Codes already described ("01" - unrecognized Comm ID, and "02" - unsupported Revision Number), there are four others: one to indicate that everything is OK and three to indicate that there are problems.

If all is satisfactory and the responding system is ready to proceed to the third, data transmission session (either send or receive), it sets the Response Code in the second handshake transmission equal to "00" (OK). In this situation, the full header block, including the Comm ID and revision/level, must always be sent.

The responding system can use the remaining three Response Codes to indicate that it is not ready to proceed with the third, data transmission session, be it send or receive, as follows:

- Response Code "03" can be used to indicate an "operation conflict" and to try again. Whether such reinitiation should be carried out automatically (and how many times) or only by operator action is the system designer's choice.
- Response code "04" is used only in response to a request to receive, and then to indicate that there is no message waiting to be sent. Clearly, the initiating system should be designed to notify the operator accordingly if and when this occurs.
- Response Code "05" indicates some other form of undefined error. Reinitiation following receipt of this code should normally only be done by explicit operator action. Except where reinitiation is automatic, some form of error message should be displayed on the initiating operator's display informing him of the error condition and telling him on what to do.



When any of the above three Response Codes is sent, it can be immediately followed by the terminating sequence 'DLE' 'ETX' plus the block CRC. Alternatively, the Comm ID and revision/level can be sent as well, with the choice left up to the system designer.

**Message Transmission:** As many text blocks as necessary may be sent prior to termination of the transmission without repeating handshakes.

Under DEX/UCS, this session will be composed of the transmission of one or more UCS transaction sets, preceded by a DXS control header segment and concluding with a DXE control trailer segment. Hence the last data block transmitted before the final 'DLE,' 'ETX,' and block CRC will always end with the concluding CR/LF character combination of the DXE trailer.

### **UCS APPLICATION LEVEL**

See the main, message standards section of this *UCS Standards Manual*.



## SECTION VIII

---

# CHANGE SUMMARY

---

This section summarizes the X12 Requirements Group (XRG) Committee approved changes and their effect on the UCS Transaction Sets, Segments, and Data Elements included in 005010UCS. XRG approved changes through January 2004 and corresponding ASC X12 approved changes through October 2003 are reflected.

## ASC X12 Changes

All ASC X12 changes, since the last release, which impact the implementation of the transaction sets printed in 005010UCS are included. Any ASC X12 changes, which did not impact the implementation of the transaction sets printed in 005010UCS, have not been included.

## UCS Changes Summary Highlights

- All references to Smart Card have been removed, as it is no longer part of the standards.
- All references to Cauzin Softstrip have been removed, as it is no longer part of the standard.

## Transaction Sets

### 894 - Delivery/Return Base Record

**G83** Codes BX, CT, KG, PK, PL, and UN have been added to G8303 in the detail area (Position 2/0200).

G8304 usage has been changed from "Used" to "Not Used".

Codes EN, EO, UC, UF, UK, UO, and UP have been deleted from G8305.

Codes AC, EN, EO, UC, UF, UK, UP, UO, and WA, have been added to G8311.

**G72** Code 06 has been added to G7202 in the detail area (Position 2/0400).

Codes BX, CA, CT, DZ, EA, GA, KE, KG, LB, PK, PL, TK, and UN have been added to G7207 in the detail area (Position 2/0400) and summary area (Position 3/0100).

**G23** Codes 08, 09, 12, 14, and 24 have been added to G2301 in the summary area (Position 3/0200).

### 895 - Delivery/Return Acknowledgment Or Adjustment

**G89** Codes BX, CT, KG, PK, PL, and UN have been added to G8903 in the detail area (Position 2/0200).

G8904 usage has been changed from "Used" to "Not Used".

G8907 usage has been changed from "Used" to "Not Used".

**G72** Code 06 has been added to G7202 in the detail area (Position 2/0400) and summary area (Position 3/0100).

Codes BX, CA, CT, DZ, EA, GA, KE, KG, LB, PK, PL, TK, and UN have been added to G7207 in the detail area (Position 2/0400) and summary area (Position 3/0100).

**G23** Codes 08, 09, 12, 14, and 24 have been added to G2301 in the summary area (Position 3/0200).

### **Appendix C - Extended Data Element Information**

**340** Codes 35, 75, 96, 499, 515, 999 have been added.

APPENDIX A

# CODE SOURCE REFERENCE

## 16 D-U-N-S Number

### SIMPLE DATA ELEMENT/CODE REFERENCES

860, 66/1, 66/9, 128/DNS, 128/DUN

### SOURCE

Dun & Bradstreet

### AVAILABLE FROM

U.S. D-U-N-S Number assignment and lookup services are available through EDI, on-line, several types of mainframe and personal computer media, through a 900 Number Service (900-990-3867), and in print.

Dun & Bradstreet Information Services  
Information Quality Department  
D-U-N-S Number Administration  
899 Eaton Avenue  
Bethlehem, PA 18025-0001

### ABSTRACT

The D-U-N-S Number is a non-indicative nine-digit number assigned and maintained by Dun & Bradstreet to identify unique business establishments. D-U-N-S Numbers are assigned to businesses worldwide. The ninth digit of the D-U-N-S Number is a Modulus Ten Check Digit which catches 100% of single digit errors and 98% of single transposition errors. D-U-N-S Numbers provide positive identification of business locations possessing unique, separate, and distinct operations. Through the D-U-N-S Number, Dun & Bradstreet maintains linkage between units of an organization to easily identify corporate family relationships, such as those between headquarters, branches, subsidiaries, and divisions. The D-U-N-S Number is the non-indicative computer "address" of a business for which detailed marketing and credit information is maintained by Dun & Bradstreet.

## 41 EAN.UCC Global Trade Item Number (GTIN), includes Universal Product Code

### SIMPLE DATA ELEMENT/CODE REFERENCES

438, 766, 88/UP, 235/UA, 235/UB, 235/UC, 235/UD, 235/UE, 235/UI, 235/UN, 235/UP, 559/FD

### SOURCE

Uniform Code Council Solutions Center

**AVAILABLE FROM**

Uniform Code Council, Inc.  
7887 Washington Village Drive, Suite 300  
Dayton, OH 45459

**ABSTRACT**

The EAN.UCC Global Trade Item Number (GTIN) is a globally unique number for the identification of products and services. The Universal Product Code (U.P.C.) encodes a 12-digit GTIN.

The identification number may be 8, 12, 13 or 14 digits in length using the EAN/UCC-8, UCC-12, EAN/UCC-13, and EAN/UCC-14 data structures respectively. The EAN/UCC-8 comprises (from left to right) an EAN/UCC-8 Prefix, Company and Item Reference and a Check Digit. The UCC-12 comprises (from left to right) a UCC Company Prefix, an Item Reference, and a Check Digit. The EAN/UCC-13 comprises (from left to right) an EAN.UCC Company Prefix, an item Reference, and a Check Digit. The EAN/UCC-14 comprises (from left to right) an Indicator Digit, an EAN.UCC Company Prefix, an Item Reference, and a Check Digit. Its Application Identifier (AI) is '01'.

Some existing EDI Codes make specific assumptions about the construction of the GTIN, including eliminating certain digits. A specific GTIN may not conform to these construction assumptions. A GTIN must be used in its entirety to ensure uniqueness.

There also exist EDI codes related to a GTIN for coupons, product variants and additional product identification.

## **94 International Organization for Standardization (Date and Time)**

**SIMPLE DATA ELEMENT/CODE REFERENCES**

623

**SOURCE**

ISO 8601

**AVAILABLE FROM**

American National Standards Institute  
25 West 43rd Street, 4th Floor  
New York, NY 10036

**ABSTRACT**

ISO Standards code list for representation of date and time.

## **98 EAN.UCC Serial Shipping Container Code (SSCC)**

**SIMPLE DATA ELEMENT/CODE REFERENCES**

88/GM, 235/UO

**SOURCE**

- a) ANSI/UCC6: Application Standard for Shipping Container Codes
- b) Uniform Code Council Solutions Center

**AVAILABLE FROM**

Uniform Code Council, Inc.  
7887 Washington Village Drive, Suite 300  
Dayton, OH 45459

**ABSTRACT**

The EAN.UCC SSCC is a globally unique number for the identification of logistic units. The identification number is 18 digits in length and comprises (from left to right) an Extension Digit, and EAN.UCC Company Prefix, A Serial Reference, and a Check Digit. The Application Identifier used is “00”.





## APPENDIX B

# CYCLIC REDUNDANCY CHECK (CRC) GENERATION

## CRC USE

The Cyclic Redundancy Check is a number used to check the integrity of the contents of a data block or record. It is generated by processing the contents of the record or block using a specified algorithm. If the contents of the record or block are altered in anyway, the value of the CRC is altered, creating a mismatch between the original CRC and the one calculated from this altered record or block. Hence, it serves much like a check digit but with greater effectiveness.

In UCS, the CRC-16 algorithm is the specific one employed. It detects all errors in bursts up to 16 bits in length and 99.955% of all errors in bursts of greater length.

It is used in UCS for two distinctly different applications:

- **In the Direct Connect Interface Standard:** Here the underlying ANSI X3.28 standard calls for its use to check the accuracy of each data block as it is received. A CRC is generated for each data block as it is transmitted and is then appended to it. It is expressed as a sixteen-bit binary number and then transmitted as two 8-bit bytes, with the special convention that the **less** significant of the two bytes is transmitted **first** and the **more** significant of the two bytes is transmitted **thereafter**. (Since each 8-bit byte is transmitted temporally with its least significant bit first, this means that the entire 16 binary bits of the CRC-16 [excluding start and stop bits] are transmitted temporally in ascending bit sequence, starting with the least significant of the sixteen and ending with the most significant of the sixteen.) Once the CRC-16 is received and checked as part of the communications process, it is discarded.
- **In the 894/895 Delivery/Return Transaction Sets:** Here, the CRC-16 algorithm is used to verify the integrity of the contents of the transaction set. It is applied to the ASCII binary coded representation of the contents of the entire transaction set from the beginning of the ST data segment through the end of the G86 Signature data segment. (Envelope control segments are excluded from the calculation since they lie outside the transaction set itself, since their use depends upon how the transaction set is sent [DEX or NEX, for example] and since these control segments are usually discarded before the transaction set is interpreted and archived. On the other hand, segment delimiters within the transaction set must be included in the calculation and must be represented by the ASCII control

character pair 'CR' and 'LF.') The resulting sixteen-bit number (most significant bit first and least significant bit last) is converted into four, hexadecimal ASCII characters (most significant character first and least significant character last). The four characters are then stored in the transaction set immediately thereafter as data element G8501 (Integrity Check Value) in the G85 Record Integrity Check (RIC) data segment. Only the G85 segment itself and the terminating SE segment that comes after are left out of the calculation. Since G8501 is a part of the transaction set, the CRC can be used at a later date to check the integrity of the stored record.

## CRC ALGORITHM

The CRC-16 algorithm is based on the generating function:

$$G(x) = x^{16} + x^{15} + x^2 + x^0$$

The operation of the algorithm is shown in Figures 1 and 2, where Figure 1 diagrams a shift register hardware implementation and Figure 2 provides a mathematical long division example. In typical implementations of the CRC, the shift register approach is used in hardware devices (e.g., in floppy disk controller ICs), while the long division approach or a table look-up method is normally used in CRC-generation software. All three approaches produce the same result.

In understanding how the algorithm works it is important to note how the message bit stream is handled sequentially. A message block or record consists of a series of ASCII 8-bit bytes, with the eighth, most significant bit always zero. When shown in written form, the normal convention is to display any number, be it binary, decimal, or whatever, with the most significant bit or digit first (to the left) and the least significant one last. On the other hand, ASCII communications protocols call for each message byte to be transmitted with the least significant bit first. For example, the three-byte binary message that would normally be printed in the form 0101 0100, 0110 1000, 0110 0101 (the ASCII characters "The") would be transmitted in the temporal sequence (first bit first) 0010 1010, 0001 0110, 1010 0110. (Here, commas and spaces are used to make reading easier; they have no other significance.) In applying the CRC-16 algorithm, the message is processed bit by bit in the sequence received temporally. Hence, the least significant bit of the first byte is entered first and the most significant bit of the last byte is entered last.

## CRC REPRESENTATION

**In the direct connect interface standard,** the CRC is generated in the form of a 16-bit binary number but then transmitted in the form of two 8-bit bytes. To simplify checking of the CRC, the standard calls for the 16 bits to be transmitted temporally (ignoring the byte start/stop bits) starting with the least significant and ending with the most significant of the 16 bits. To accomplish this end, after the CRC has been split into two 8-bit bytes, the less significant of the two bytes is transmitted first, the reverse of normal transmission convention.

To illustrate, let us again consider our three-byte binary message consisting of the ASCII characters "The." The 16-bit CRC for this message would normally be

printed with the most significant bit first in the form 0011 1011 1010 1110. After splitting it into two bytes, we have 0011 1011 as the more significant byte and 1010 1110 as the less significant byte. When transmitted, the second, less significant byte is sent first. Then, since each byte is transmitted with its least significant bit first, the actual temporal transmission sequence is 0111 0101 1101 1100, the exact reverse order of how it was written at the beginning of this paragraph.

**In the 894/895 transaction sets**, the CRC is arranged as a 16-bit number with most significant bit first and then split into four, 4-bit numbers. These four, 4-bit numbers are then represented as hexadecimal numbers which are, in turn, coded as ASCII characters and entered into data element G8501 in the Record Integrity Check data segment. Here, the binary numbers from zero (0000) through nine (1001) are represented by the ASCII characters “0” through “9” respectively. The binary numbers ten (1010) through fifteen (1111) are, in turn, represented by the ASCII upper case character representations for “A” through “F.”

In our three-character example message “The,” the 16-bit CRC with most significant bit first is again 0011 1011, 1010 1110. In hexadecimal, it is expressed as 3BAE. Hence, in data segment G8501, the integrity check value is expressed in the form of the **ASCII character representations** of these four hexadecimal numbers. (Expressed in binary form, these four characters are 0011 0011, 0100 0010, 0100 0001, 0100 0101.)

### Shift Register Implementation of CRC-16

Message consists of the word “The”

ASCII codes for these three letters (most significant bit of each byte first) are:

0101 0100, 0110 1000, 0110 0101

With each byte’s code reversed to correspond to transmission sequence, the **message** block is transmitted in the temporal sequence:

0010 1010, 0001 0110, 1010 0110

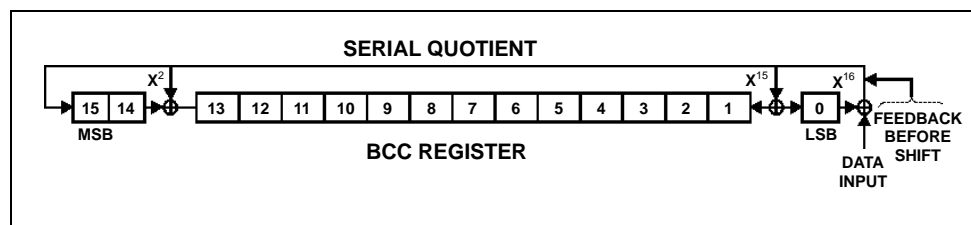


Figure 5.

SHIFT NO.	MSB		LSB	MESSAGE BITS	LSB⊕ MSG BIT
-	0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	0	0
1	0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	0	0
2	0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1	1	1
3	1 0	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1	0	0	1
4	1 1	1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1	1	1	0
5	0 1	1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0	0	0
6	0 0	1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0	1	1	1
7	1 0	1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 1	0	0	1
8	1 1	1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 1	0	0	1
9	1 1	0 1 1 1 1 1 1 0 0 0 0 0 0 0 0 1	0	0	1
10	1 1	0 0 1 1 1 1 1 1 0 0 0 0 0 0 0 1	0	0	1
11	1 1	0 0 0 1 1 1 1 1 1 0 0 0 0 0 0 1	1	1	0
12	0 1	1 0 0 0 1 1 1 1 1 1 0 0 0 0 0 0	0	0	0
13	0 0	1 1 0 0 0 1 1 1 1 1 1 0 0 0 0 0	1	1	1
14	1 0	1 1 1 0 0 0 1 1 1 1 1 1 0 0 0 1	1	1	0
15	0 1	0 1 1 1 0 0 0 1 1 1 1 1 1 0 0 0	0	0	0
16	0 0	1 0 1 1 1 0 0 0 1 1 1 1 1 1 1 1	1	1	0
17	0 0	0 1 0 1 1 1 0 0 0 1 1 1 1 1 1 1	0	0	1
18	1 0	1 0 1 0 1 1 1 0 0 0 1 1 1 0 0 0	1	1	1
19	1 1	1 1 0 1 0 1 1 1 0 0 0 1 1 0 0 0	0	0	0
20	0 1	1 1 1 0 1 0 1 1 1 0 0 0 1 1 0 0	0	0	1
21	1 0	0 1 1 1 0 1 0 1 1 1 0 0 0 0 0 0	1	1	1
22	1 1	1 0 1 1 1 0 1 0 1 1 1 0 0 0 0 1	1	1	0
23	0 1	1 1 0 1 1 1 0 1 0 1 1 1 0 0 0 0	0	0	0
24	0 0	1 1 1 0 1 1 1 0 1 0 1 1 1 0 0 0			

CRC-16 Least Significant Bit

This CRC-16 with most significant bit first is: 0011 1011, 1010 1110

For X3.28 transmission, it is transmitted temporally in the sequence:

Less significant byte: 0111 0101; then, more significant byte: 1101 1100.

In the 894/895 Record Sets it is expressed in hexadecimal representation as the ASCII characters: 3BAE. (Binary representation is: 0011 0011, 0100 0010, 0100 0001, 0100 0101)

## Long Division Implementation of CRC-16

Message consists of the word “The”

ASCII codes for these three letters (most significant bit of each byte first) are:

0101 0100, 0110 1000, 0110 0101

With each byte’s code reversed to correspond to transmission sequence, the **message** block is transmitted in the temporal sequence:

0010 1010, 0001 0110, 1010 0110

Division is as follows:

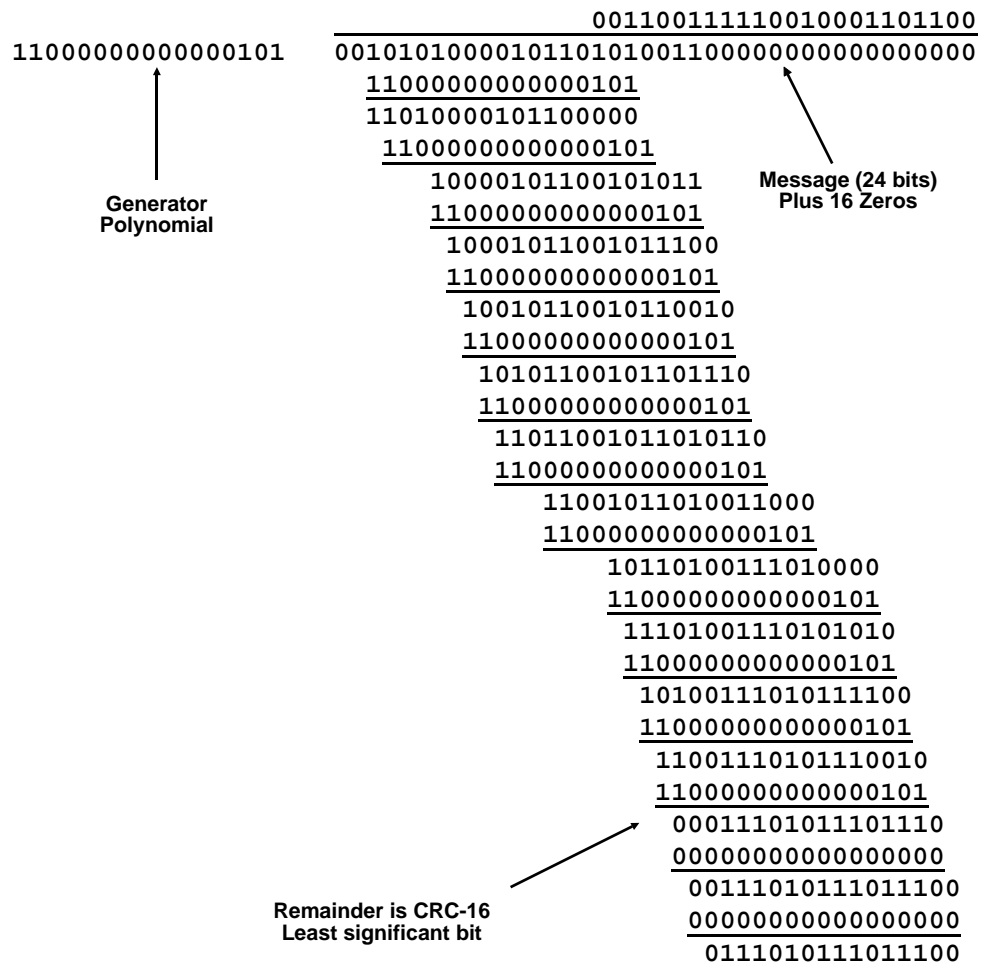


Figure 6.

This CRC-16 with most significant bit first is:

0011 1011, 1010 1110

For X3.28 transmission, it is transmitted temporally in the sequence:

Less significant byte: 0111 0101; then, more significant byte: 1101 1100.

In the 894/895 Record Sets it is expressed in hexadecimal representation as the ASCII characters: 3BAE.

(Binary representation is: 0011 0011, 0100 0010, 0100 0001, 0100 0101)

It should also be noted that the binary codings used to represent these ASCII character representations do not directly match the original binary numbers from which they were derived. For example, the four-bit binary numbers for 0, 1, 2, . . . 9 are 0000, 0001, 0010, . . . 1001, but the 8-bit ASCII byte representations for these same numbers are 0011 0000, 0011 0001, 0011 0010, . . . 0011 1001. Also, the letter representations of the higher numbers are quite different. The binary representations of 10, 11, 12, . . . 15 are 1010, 1011, 1100, . . . 1111, but the 8-bit ASCII byte representations of A, B, C, . . . F are 0100 0001, 0100 0010, 0100 0011, . . . 0100 0110. While this form of representation requires some translation, it permits the resulting hexadecimal numbers, when printed, to be easily interpreted.

## CRC VERIFICATION

The CRC-16 is designed to make checking it simple. To be sure, one can verify it by recalculating it and comparing it with the value transmitted. If the two values are the same, the check passes. The CRC-16 is designed, however, to have a specific property: it is the remainder obtained by dividing the message bit stream by the specified generating function. If the message bit stream is modified by appending its 16-bit CRC remainder to it (least significant bit first), the resulting total bit stream must necessarily have a zero remainder. Hence, to check the integrity of the message, one merely computes the CRC-16 for the message bit stream with its CRC-16 appended to it in binary form. (This is the reason why the less significant of the two bytes of the CRC is transmitted first.) If the resulting CRC-16 is all zeroes the check passes. Otherwise, it fails.

## ILLUSTRATIVE EXAMPLES

Figures 1 and 2 provide a shift register implementation and a long division example of the generation of the CRC-16 for the message consisting of the three-letter word "The" whose ASCII binary representation is 0101 0100, 0110 1000, 0110 0101 (where here, the most significant, eighth bit of each byte is printed first).

Let's look at the shift register example first. Here, the 16 bits of the register are displayed in columns across the page with the least significant bit at the right. The row at the top shows the initial state of the register after it is cleared and before processing starts. Beyond the shift register columns, in the second column from the right, is the message bit stream, with the first bit received at the top and the last at the bottom. Processing is as follows:

- Before each shift of the register, an exclusive or operation is applied to the message bit and the least significant bit in the register. The result is shown in the column at the extreme right.
- The register is then shifted with this bit being inserted into the most significant bit of the register. Additionally, an exclusive or operation is performed on this bit

and the previous value of the fourteenth bit with the result being inserted into the thirteenth bit position. Similarly, an exclusive or operation is performed on this same bit and the previous value of the second bit, with the result being placed in the first, least significant position. All other bits are shifted one position to the right.

- These operations are repeated until all message bits have been processed. The resulting CRC-16 is then contained in the shift register, with the least significant bit at the right.

In the long division example, the mathematical operations are shown in Figure 2. The CRC-16 generator polynomial is used as the divisor. It is derived from the generating function presented on page F-1 by setting  $x = 2$  (for binary numbers):

$$\begin{aligned} G(2) &= 2^{16} + 2^{15} + 2^2 + 2^0 \\ &= 1\ 1000\ 0000\ 0000\ 0101 \end{aligned}$$

The binary representation of the message block forms the dividend, written from left to right as the bit stream is received over time, with sixteen zeroes added at the end. Division is performed with no carries or borrows. (Computations are shown in Figure 2 in conventional notation except that the zero strings subtracted when the quotient bit is zero are not shown except near the end. They are shown there, since the last bits in the quotient all happen to be zero in this example, and the complete representation of these operations makes it easier to see how the process terminates.) In this implementation, the quotient itself is of no interest and is discarded. When processing is complete, however, the remainder contains the CRC-16, with the least significant bit at the left.

## ALGORITHM SOFTWARE PACKAGE

The CRC-16 algorithm is available from the Uniform Code Council as a software package on floppy disk. The disk contains three files:

- A “README” ASCII text file providing operating instructions.
- The CRC-16 algorithm itself, implemented using the table look-up method and written in the language ‘C.’ This program is in uncompiled form, so that it can be incorporated as a subroutine on a wide variety of computers.
- A demonstration program which can be used to generate the CRC-16 for example character sets. The program is compiled for operation on MS-DOS personal computers. Once the program is called, it waits for the operator to type in a sample character string, terminated by a carrier return (excluded from the computation). The program then calculates and displays the CRC-16 for that character string in hexadecimal form. This demonstration program can be useful as a validity check for those writing their own CRC-16 generation programs. By comparing the output of their own program with that of the demonstration “standard” for a number of test examples, they can verify whether their own program is operating properly.





## APPENDIX C

# EXTENDED DATA ELEMENT INFORMATION

Data element 340 - Allowance or Charge Code.

CODE	DEFINITION	NOTE
1	Free Goods	
2	Shrink Allowance	
3	Count and Recount	
4	Fuel Allowance	
5	Allowance Non-Performance	
6	Pallet Charge	
10	Drayage	
	Military drayage allowance	
11	Blast Freezing	
12	Communication Expense	
13	Handling In	
14	Handling Out	
15	Labor	
16	Minimum Charge	
17	Physical Inventory	
18	Pick Rate	
19	Postage	
20	Slow Freezing	
21	Storage	
22	Supplies	
23	Taking Weights	
24	Telephone, Telex, Fax	
25	United States Department of Agriculture (USDA) Inspection	

CODE	DEFINITION	NOTE
26	<b>Unloading</b>	
27	<b>Withdrawal Line Item Rate</b>	
28	<b>Direct Product Handling (DPC)</b>	
29	<b>Price Adjustment Percent (PCT)</b>	
30	<b>Post Damaged Handling (PDC)</b>	
31	<b>Reclamation Center Handling (Chute)</b>	
32	<b>Reclamation Shared Responsibility (SRS)</b>	
33	<b>Maximum Price Percent (MAX)</b>	
34	<b>Minimum Price Percent (MIN)</b>	
35	<b>Conversion Allowance</b>	
40	<b>Slip Sheet Unloading Allowance</b>	
41	<b>Terms Allowance</b>	
42	<b>Central Buy</b>	
	Allowance taken for large quantities bought through headquarters	
43	<b>Display Allowance</b>	
	Allowance for merchandise displayed in traffic areas	
44	<b>Early Buy Allowance</b>	
	Allowance taken for merchandise ordered previous to regularly scheduled order dates	
45	<b>New Discount</b>	
	Allowance taken for a new mutually defined discount	
46	<b>New Warehouse</b>	
	Allowance for first shipment into a new distribution facility	
47	<b>Price and Marketing Allowance</b>	
	Allowance for special promotional activities for a specific product	
48	<b>Special Buy</b>	
	Allowance for a special purchase from supplier	
50	<b>Lump Sum</b>	
	Total allowance amount granted by vendor or broker usually when relationships to a specific item and/or specific rate is not identifiable	

CODE	DEFINITION	NOTE
51	<b>Trade Discount</b>	
52	<b>Quantity Discount</b>	
53	<b>Freight Allowance</b>	
54	<b>Pick-up Allowance</b>	
55	<b>Warehouse Allowance</b>	
	An allowance given to a customer who operates a bona fide warehouse, at which he stocks and from which he distributes products to multiple outlets	
58	<b>Unsaleable Merchandise Allowance</b>	
60	<b>Label Allowance</b>	
61	<b>Handling Allowance</b>	
62	<b>Freshness/Leaker Allowance</b>	
63	<b>Floor Stock Protection</b>	
64	<b>Full Truckload Allowance</b>	
65	<b>New Item Allowance</b>	
	Monies offered by a manufacturer to a chain or wholesale customer to cover costs involved in new items or products. New distribution allowances are specific new item allowances.	
66	<b>Slotting Allowance</b>	
	Monies offered by a manufacturer to a chain or wholesale customer to cover the costs involved in designating a certain section in the customer's warehouse for a new product.	
67	<b>New Distribution Allowance</b>	
	Monies offered by a manufacturer to a chain or wholesale customer to cover costs involved in the initial distribution of a new product among retail units.	
68	<b>Scanner Allowance</b>	
	Allowance which is paid on products that are scanned at the retail level during a specific time frame.	
70	<b>Allowance for Consignment Merchandise</b>	
75	<b>New Store Allowance</b>	
80	<b>Combination Performance and Non-performance</b>	
81	<b>Direct Plant Ship Allowance</b>	
90	<b>Performance Allowance</b>	

CODE	DEFINITION	NOTE
91	Glaze Allowance	
92	In Transit Price Protection	
93	COOP Credit	
94	Cigarette Stamping	
95	Swell	
96	Grouped Items	
97	Cents Off	
100	Advertising Allowance	
101	Voluntary Price Reduction	
105	Pallet Allowance	
	Allowance which is paid on a pallet basis	
106	Show Allowance	
	Allowance for merchandise displayed at a convention	
107	Indirect Customer Allowance	
	Promotional dollars offered to indirect customers	
490	Goods and Services Credit Allowance	
491	Tax Credit Allowance	
499	Other Allowances	
501	Taxes	
503	Special Handling	
504	Freight	
	Freight charge	
505	Insurance	
506	Car Loading	
509	Labeling	
510	Koshering	
511	Warehouse	
512	Palletizing	
514	Surcharge	
515	Stopcharge	
517	Demurrage	
518	Service Charge	

CODE	DEFINITION	NOTE
525	Deposit Charge - Resale Item	
526	Beverage Tax	
527	Environmental Handling Charge	
537	State or Province Tax	
550	Deposit Charge - Non-Resale Item	
560	Equipment Rental Charge	
561	Equipment Service Charge	
562	Inter-warehouse Freight Charge	
565	Inbound Postage	
566	Outbound Postage	
990	Goods and Services Charge	
999	Other Charges	

