



User Guide

QAD JIT Sequencing

Introduction
Setting Up JIT/S
Using JIT/S
Reference

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Section 1

Overview

This section provides an overview of the features and user interface of the JIT Sequencing shop floor control system.

Introduction **3**

Introduction

QAD JIT Sequencing (JIT/S) is a configurable, just-in-time (JIT) application for sequenced manufacture and delivery of items to customers' assembly lines. Using the extensive configurability, suppliers can set up their plants to meet requirements from multiple customers. The application spans activities from the receipt of customer orders to the shipment of goods.

JIT/S processes customer broadcast communications, schedules production, tracks the manufacture of products, and fulfills demand through picking, packing, staging, loading, and shipping of sequenced and non-sequenced shipments. It prints labels and other shipping documents and has configurable views for monitoring key performance indicators in the system.

JIT/S operates as a set of persistently running modules that communicate with messaging. The modules are written in the Progress rule-based development system, Dynamics. The messages can be managed and processed through Sonic or using the JIT/S cache mechanism. All reporting is done using Crystal Reports.

JIT/S relies on integration with a QAD ERP application database for tracking inventory and for recording financial data and generating invoices.

JIT/S does not include automation of the real-time manufacturing devices and machines on the shop floor. JIT/S can manage single orders or sequenced orders only; batch orders—quantity greater than 1—are not supported.

The following topics provide an overview of the QAD JIT Sequencing application.

Communications 4

JIT/S communicates with customers, external systems, and the QAD ERP application by sending and receiving messages through the Message Manager.

Customer Order Management 9

Incoming broadcast communication messages are handled by two major JIT/S processes: order processor and order scheduler.

Production 12

Describes Production Control, Monitors and Factory Dashboard, Replenishment, Shop Floor Tests and Trace Data.

Packaging and Shipping 16

Describes Packaging Setup, Shipping, Production and Shipment Reporting, Printing Labels and Documents.

Verification Tests for the Setup 20

Describes the verification tests used to validate the installation and data setup.

Archiving and Deleting Data 22

Describes the JIT/S workbench and order processor rule that prevent the buildup of very large numbers of records while maintaining data that must be available for customers for long periods of time.

JIT Sequencing Functions 22

Describes the functions available in the JIT/S menus.

User Interface 26

A brief overview of the JIT/S interface.

Communications

JIT/S communicates with customers, external systems, and the QAD ERP application by sending and receiving messages through the Message Manager. See Chapter 5, “Message Manager,” on page 199.

- Order information is received as broadcasts from customers.
- Instructions, acknowledgments, and other production information are exchanged with external systems.
- Base data and sales order information are received from the QAD ERP application while production reporting and shipment information are sent to the QAD ERP application.

Fig. 1.1

JIT/S Integration with QAD Enterprise Edition

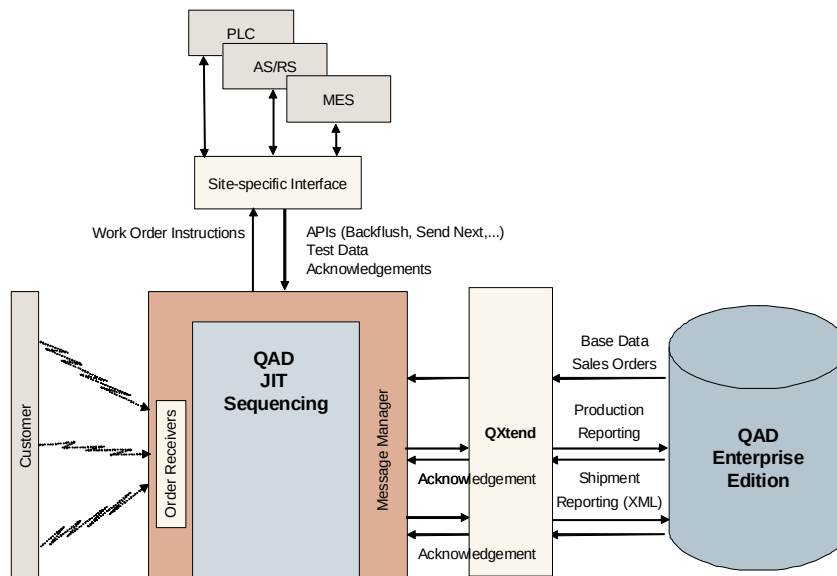
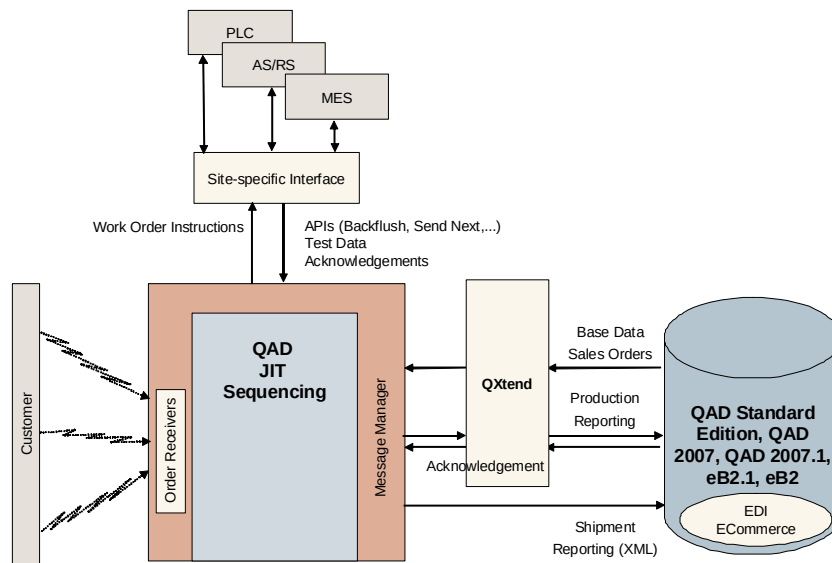


Fig. 1.2
JIT/S Integration with QAD 2008 Standard and Earlier Versions of QAD ERP Applications



Integration is discussed in more detail in these topics:

- Broadcast Communication and Order Receivers
- Integration with the QAD ERP Application
- Communication with External Devices

Broadcast Communication and Order Receivers

Broadcast communications are messages generated at various broadcast points along the customer's production line. These messages carry the order information—vehicle identification and options—that drives sequenced JIT manufacturing and shipments. They indicate the progress of the vehicle through the customer's production line.

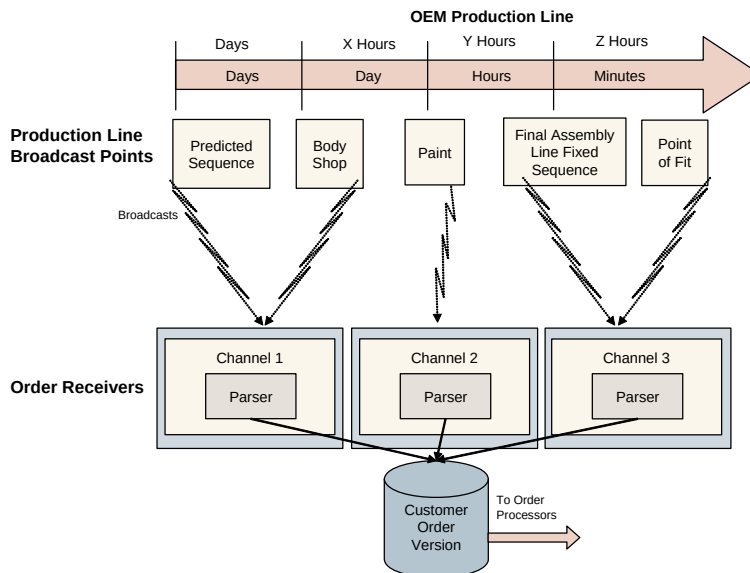
At each broadcast point, the message can include a status change for the order. Which broadcast point to use as a build signal and which to use as a ship signal are based on agreement between the customer and supplier.

The earliest broadcast communications that customers send can include predicted unit sequence messages from weeks to hours ahead of the time a unit is on the production line. Customers can then send early- and late-warning messages from subsequent positions on the production line as the actual build-signal point approaches.

Each of these message types can start a different set of activities:

- Predicted sequence messages can initiate pre-assembly, prepare shopping lists for components, and verify the short-term schedule.
- Early-warning messages can initiate scheduling and production as well as print labels and reports.
- Late-warning messages can initiate the assembly and shipment of sequenced deliveries and record finalized shipments.

Fig. 1.3
Broadcast Communication and Order Receivers



Order receivers are set up in the Message Manager for handling incoming customer order messages. See “Message Processing Overview” on page 200.

Each customer broadcast point sends message files to a specific, user-defined channel. Since each order receiver can parse files of only one type from these multiple broadcast points, you can expect to have at least one order receiver running simultaneously for each file type. Incoming messages are parsed according to Message Manager document definitions.

Over time, customers broadcast multiple messages regarding the same vehicle. An order receiver parses each incoming message and places the resulting document, such as a customer order version (COV), into the document repository. If necessary, the document is transformed into an application format and placed into the application repository. The order receiver gateway process takes the data from the document or application repository and places it in the JIT/S database.

A customer order version added to the JIT/S database can have a process status of temporary, not processed error, recycle, dependency, skipped automatically, or skipped manually. Each broadcast message is kept as a COV linked to the customer order, which represents a specific vehicle.

The order receiver does not validate the content of the broadcast; it validates the structure and loads the data into the JIT/S customer order version table. JIT/S can be configured to check incoming messages for duplicate orders, item numbers, item number combinations, changes in sequence, and finished goods bottlenecks.

Integration with the QAD ERP Application

The QAD ERP application provides the main repository for base data about customers and items. The QAD ERP application also manages sales order information and inventory supply, as well as invoicing for delivered shipments. Through the Message Manager, data is communicated in both directions between the QAD ERP application and JIT/S.

Fig. 1.4
QAD ERP Application and JIT/S Main Integration Points (QAD Enterprise Edition)

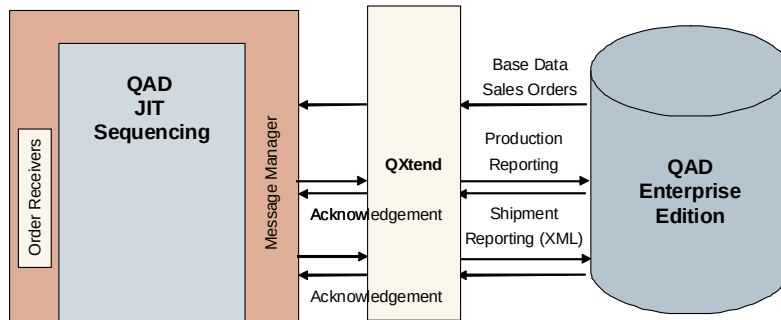
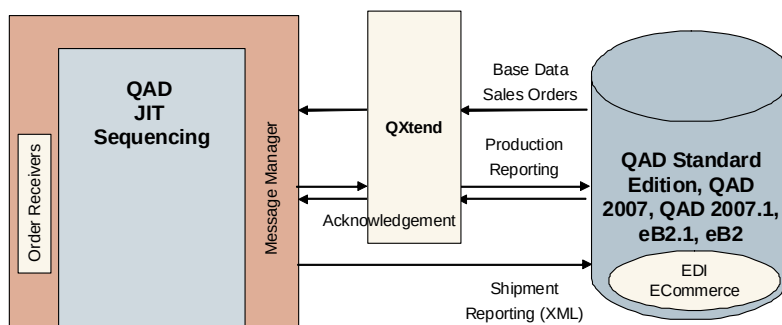


Fig. 1.5
QAD ERP Application and JIT/S Main Integration Points (QAD Standard Edition and Earlier Versions of QAD ERP Applications)



Data from the QAD ERP Application to JIT/S

The QAD ERP application sends information about items, product structures, addresses, and scheduled sales orders to JIT/S as inbound messages to the Message Manager. This data is loaded into JIT/S during initial implementation and updated whenever changes occur in the QAD ERP application database. The updates are managed using QXtend.

Note Updates can be made in JIT/S in critical, time-constrained situations or to add JIT/S-specific values that do not exist in the QAD ERP application. Changes made to data from the QAD ERP application are overwritten the next time data is loaded from the QAD ERP application.

Base data originating in the QAD ERP application includes:

- Items
- Customer items
- Customers
- Carriers
- Customer ship-tos
- Docks
- Product structures
- Sales orders

Table 1.1
QAD ERP Application Tables and Programs Supplying Data to JIT/S

Data Type	Table	Table Description	Updated in the QAD ERP Application
Carrier	ad_mstr ls_mstr	Address Master Address List Master	Carrier Maintenance (2.17.1)
Customer	cm_mstr ad_mstr ls_mstr	Customer Master Address Master Address List Master	Customer Maintenance (2.1.1)
Ship-To	cm_mstr ad_mstr ls_mstr	Customer Master Address Master Address List Master	Customer Ship-To Maintenance (2.1.13)
Dock	cm_mstr ad_mstr ls_mstr	Customer Master Address Master Address List Master	Dock Maintenance (7.3.6)
Item	pt_mstr	Item Master	Item Master Maintenance (1.4.1)
Customer Item	cp_mstr	Customer Item Master	Customer Item Maintenance (1.16)
Product Structure	ps_mstr	Product Structure Master	Product Structure Maintenance (13.5)
Sales Order	so_mstr sod_det	Sales Order Master Sales Order Detail	Scheduled Order Maintenance (7.3.13)

Data from JIT/S to the QAD ERP Application

JIT/S sends two types of information to the QAD ERP application:

Production reporting of items built by the assembly process. This data is sent to QXtend Inbound associated with the QAD ERP application and processed as QDocs using Receipts–Backward Exploded (3.12), Backflush Transaction (18.22.13), and Transfer with Lot/Serial Change (3.4.3). Component items are backflushed based on the product structure maintained in the QAD ERP application. See “Production and Shipment Reporting” on page 18.

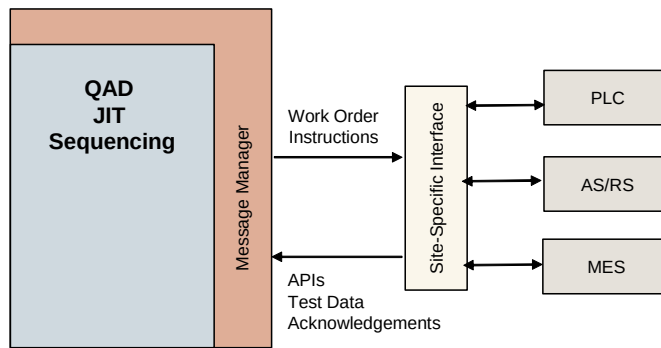
Information about shipments. Shipment reports are sent in XML format and are received by QXtend associated with the QAD ERP application. The shipment report is converted to a confirmed shipper for the associated customer and scheduled sales order, which relieves inventory for the item shipped and initiates invoicing and the appropriate general ledger (GL) updates. See *Installation Guide: QAD JIT Sequencing*.

Communication with External Devices

Many systems that use sequenced delivery also use a manufacturing execution system (MES) to control shop floor equipment including programmable logic controllers (PLCs) and torque controllers. PLCs receive and interpret barcode information. Torque controllers control the amount of pressure that is exerted on a nut, bolt, or screw and record and store related torque measurements and statistics.

When ordered items are not packaged and shipped from the end of the production line, manufacturers can use automated storage and retrieval systems (AS/RS) for temporary storage of finished goods.

Fig. 1.6
Integration Between JIT/S and External Devices



JIT/S can be configured to interact with PLCs through barcodes and send information to and receive information from an installed MES or AS/RS.

The Message Manager handles inbound and outbound messages—ValidateTestData, SendWorkOrder, WorkOrderReleased, and so on—to external devices. See “JIT/S-Provided Messages” on page 264.

JIT/S can send a message to the MES for released work orders. In response to a work order release, the MES can send any of the following messages to JIT/S: work order completion, work order rebuild, work order backflush, work order send (request for a single order) and next work order send (request for all orders after a certain point), package complete, and test results (check test data and validate test data).

JIT/S can also send a message to the automated storage and retrieval system (AS/RS) for released work orders (RQOR), for work orders processed by an order processor, and for scanned work orders. In response, the AS/RS can send back a location update (LOUP), which is a positive acknowledgement, or a missing part (MIPA) message, which is a negative acknowledgement.

Customer Order Management

Incoming broadcast communication messages, after passing through an order receiver, are handled by two major JIT/S processes: order processor and order scheduler.

The behavior of the order processor and order scheduler is governed by user-defined action procedures called rules. A collection of rules that reflect reactions to a particular business event are linked into a rule group. The rule groups are then linked to the processes. This approach is highly flexible since a single rule can be used in multiple rule groups with multiple parameter values. See “Setting Up Rules and Rule Groups” on page 143.

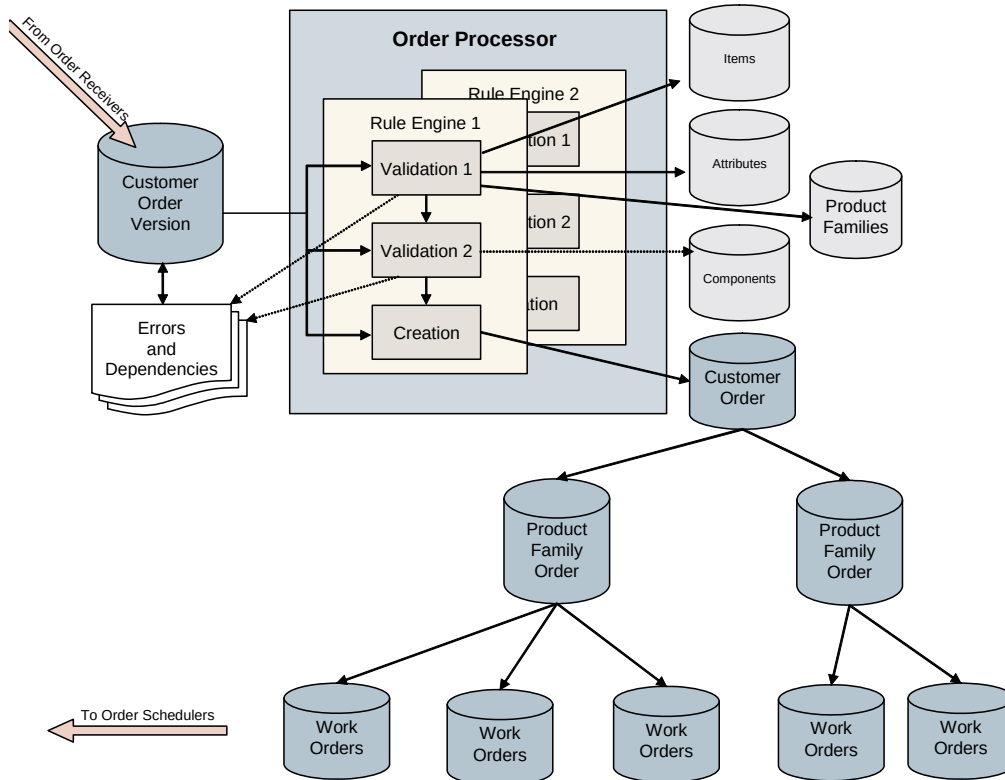
Note The application has standard rules to create work orders and assembly orders in first-in, first-out (FIFO) response to individual product-related broadcasts.

- Order Processor
- Order Scheduler and Assembly Orders

Order Processor

An order processor detects the COVs generated by the order receiver and invokes different rules—depending on the COV status and the broadcast point—to process them.

Fig. 1.7
Order Processors



The order processor—using customer-specific and broadcast point-specific rules—validates the sequence of the orders and such elements as the root assembly units (AU), the vehicle line, the items, and the options against existing scheduled sales orders. It then determines the product families the items belong to and creates the lists—ordered items and their attributes—required to build the items. The order processor validates the vehicle lines, the product families attached to the vehicle lines, and attribute values across product families within vehicle lines.

The order processor then creates or modifies the customer order, the product family orders, and the work orders.

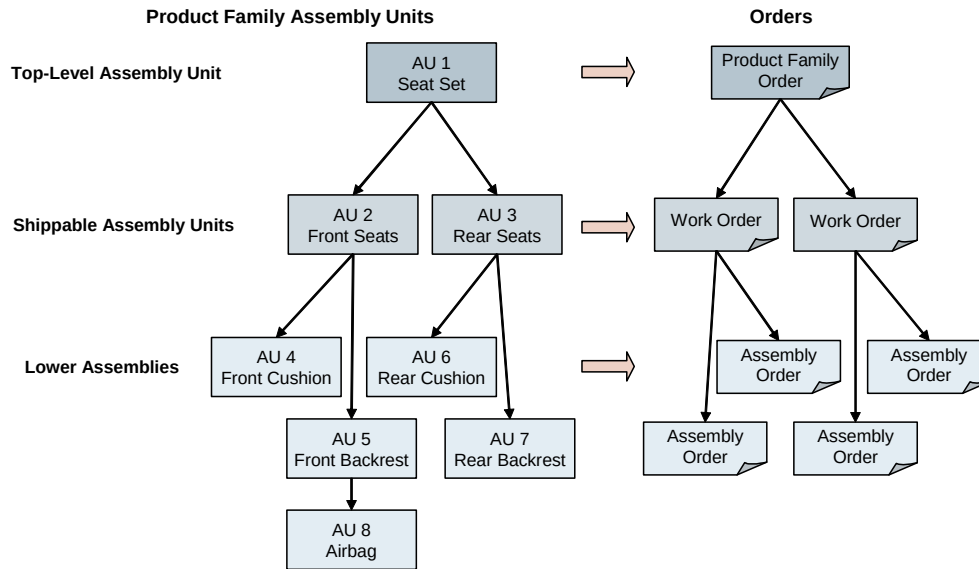
When a broadcast is received from an agreed-upon point, the order scheduler firms the work orders, which means that the order scheduler can begin to schedule them for production.

Customer Orders

The customer order reflects the items required for a unit on the customer’s production line, such as a vehicle. The remaining orders—product family, work, and assembly—reflect the items required for the various assembly units in assembly unit trees. See “Assembly Unit (AU)” on page 437.

Note Assembly orders are created by the order scheduler.

Fig. 1.8
Orders and Assembly Unit Trees



Product Family Orders

Product family orders contain items and options or attributes for a product family. Each product family is represented by one assembly unit tree.

Customers can order one or more product families of items for each unit on their production line. For example, for vehicle manufacturers, product families can include seat sets, door panel sets, or instrument panels.

Each product family of items is represented as a tree of assembly units. The root assembly unit is the product family, such as a seat set. At a lower level in the tree structure are the shippable assembly units, such as front seats and rear seats. The shippable assembly units reflect the customer requirements for how the items should be delivered to their production line; one customer can require that front and rear seats are shipped together (so they are treated as one shippable assembly unit), while another can require separate shipments (multiple shippable assembly units).

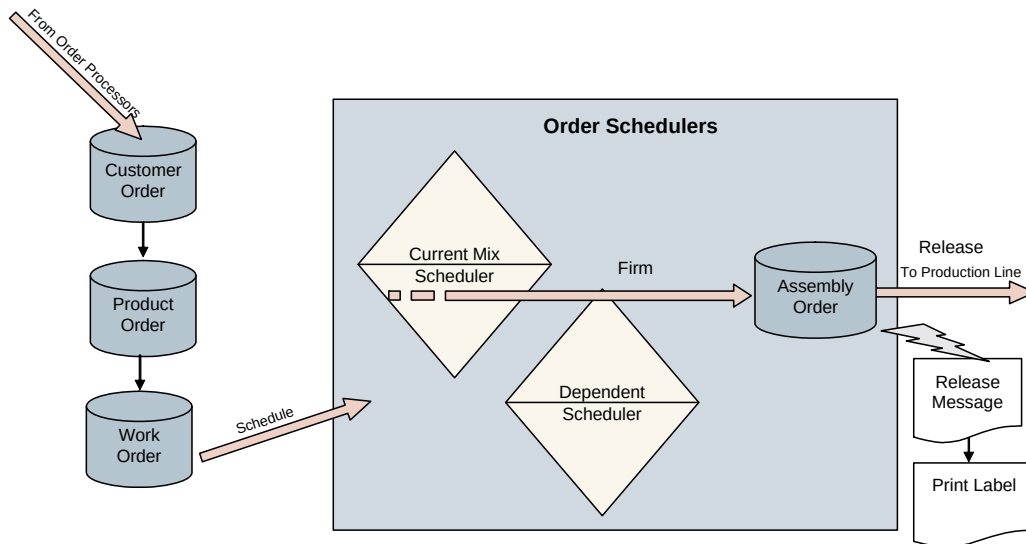
Work Orders

Work orders reflect the items and attributes for shippable assembly units in the assembly unit tree. Each shippable assembly unit has its own production schedule. See the figure in “Customer Orders” on page 10.

Order Scheduler and Assembly Orders

The order scheduler is invoked when the work order is firmed; see “Order Processor” on page 10. Based on firm work orders for shippable assembly units, the order scheduler generates an assembly order for every assembly unit that is below the shippable assembly units in the assembly unit tree. The assembly order is used to collect data from the production process and to initiate label printing.

Fig. 1.9
Order Scheduler



Each order scheduler uses a rule group to schedule firm work orders for a particular shippable assembly unit. Dependent assembly orders are also created for lower-level assemblies. These schedules share a key so that they are released and produced together. This also supports scheduling production lines individually.

Production

Releasing an assembly order makes it available to be built on the production line. The signal for printing labels and the placement of production line scanners and external devices to trace the progress of orders through the production process are user configurable.

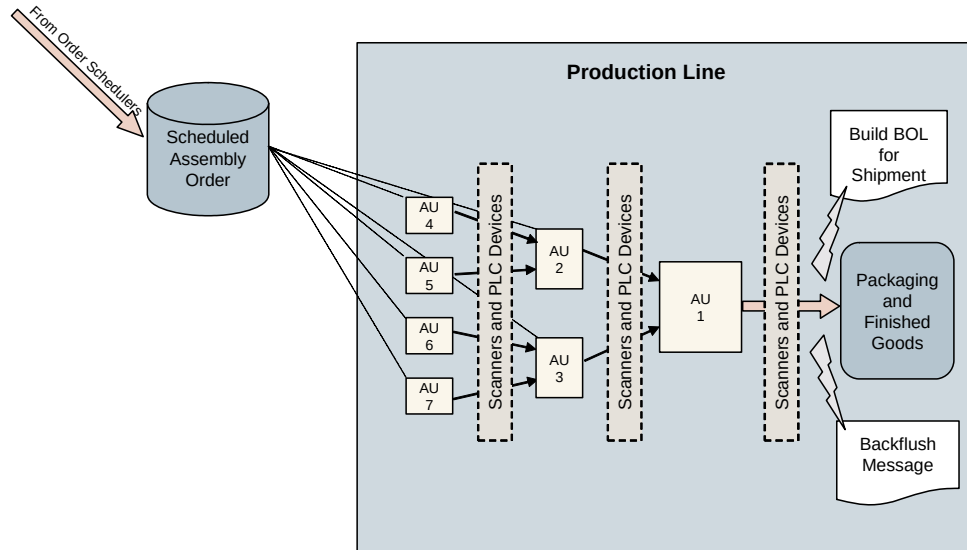
- Production Control
- Monitors and Factory Dashboard
- Replenishment
- Shop Floor Tests and Trace Data

Production Control

Assembly takes place at work cells associated with assembly units. Component items are supplied to production work cells through replenishment activities. When assembly is complete or at specified milestones, component items can be backflushed and appropriate messages can be

generated to initiate packaging and shipment to the customer. Production, production reporting, packaging, and shipment reporting can all be independent. Test results are also collected from external devices.

Fig. 1.10
Production Control



All of the production activities can be monitored and evaluated through real-time configurable monitor screens.

Production control includes a number of related processes, including:

- The label printing process manages the creation of labels and generation of unique serial numbers.
- The scanner process manages the setup and use of scanning devices for reading labels and sending messages from the production line.
- The backflush process generates the production reporting data sent to the ERP application about milestones or finished goods built during production.

If you are using an MES to manage shop floor activities, you can configure JIT/S to send a `workOrderRelease` message to the MES when a work order has been released. This might be required when specialized assembly operations are managed directly through the MES. The `workOrderRelease` message is configured with a rule so that it is sent for only those shippable assembly units that you need to manage this way. See “Interaction with an MES” on page 158.

In this scenario, you can also configure label printing so that it is initiated only after the MES returns a message that the work order is complete.

If assembly is being managed by an MES (by sending the work order released message from JIT/S to the MES), the MES can be configured to send the following production messages to JIT/S:

completeWorkOrder. When this message is received, JIT/S marks the work order as built and generates the `WORDFINI` business event, which can optionally generate packaging or shipping labels.

backflushWorkOrder. When this message is received, JIT/S validates the work order and generates a backflush transaction to be sent to the ERP application.

sendWorkOrder. When this message is received, JIT/S sends information for the specified work order using the `workOrderRelease` message.

sendNextWorkOrder. When this message is received, JIT/S identifies the last work order sent to the MES for the specified shippable AU and sends it information for all work orders that have been released since that work order using the `workOrderRelease` message.

See “Inbound Document Types” on page 267.

Monitors and Factory Dashboard

Throughout all phases of production, JIT/S provides numerous functions that let you monitor activity and order status on the shop floor. Most of these functions are available on the Operations menu; functions include these monitors:

- Number of customer order versions with various statuses
- Scheduled work orders
- Released work orders
- Work orders that have been shipped but not yet received by the customer

Factory Dashboard

Among the most important tools for monitoring the activity on the shop floor are the Factory Dashboard Functions on the Setup|Factory Dashboard menu. These let you identify the key business events that you want to monitor in your system to ensure that activity is within defined thresholds. See “Factory Dashboard” on page 163 for details.

These events are typically known as key performance indicators (KPI) and can include the following:

- Receipt and processing of a customer broadcast
- Scheduling of a work order
- Beginning work on a work order
- Completing a work order
- Finalizing a shipment

You specify which events you want to monitor and how you want to measure the events. Measurements can be based on sequence numbers; date and time; counts; and banks.

A *bank* is a special type of count that measures quantities between two events. These two events typically represent two broadcast points on the production line. For example, you can monitor the number of items you have shipped to an OEM that have not yet been paid for. When shipment occurs, the count is incremented. When a broadcast is received for payment, the count is decremented.

After setting up KPIs, you specify how you want to organize and display the information. You can then view the information about these events using Operations|Factory Dashboard Monitor. See “Factory Dashboard Monitor” on page 313.

Event monitoring is implemented through factory dashboard rules that are included in the rule group executed when a specific event occurs. The factory dashboard rule generates the messages required to update the measurements associated with the event. See “Setting Up Rules and Rule Groups” on page 143.

Monitoring Order Statuses

The system tracks key events by updating status codes as orders move through the production life cycle. Statuses from lower-level records are displayed on higher-level records through the cycle. For example, the work order backflush status can be seen on the associated customer order (CO). Since one CO may have several associated work orders and one work order may have several associated assembly orders, the system uses the following convention.

The highest status is displayed on the parent record. If other lower orders exist with different statuses, the highest status is followed by a pound sign (#) to indicate a partial status: not all associated work orders or assembly orders have this status yet.

Table A.1, “Manufacturing and Reporting Status Codes,” on page 423 shows the key events in the system and how they affect customer order versions, work orders, and assembly orders.

Replenishment

On the shop floor, a replenishment process supplies the production lines with required item components as they are needed. Based on sequenced demand, JIT/S specifies which components should be picked from bulk storage locations and delivered to the appropriate production line consumption points.

This replenishment based on items is managed through shopping lists, which specify a list of required component items. When you create shopping lists, you choose a document format and define settings that manage where the lists are printed. You then associate the shopping lists with the work cells where the items will be consumed.

There is also attribute-based picking for work cells. Items are picked based on their attribute values and whether they are relevant to the assembly unit linked to the work cell.

Note The replenishment process does not involve inventory transactions or directed picking.

Component Demand and Shopping Lists

Order schedulers can generate demand when firming or releasing firm work orders and assembly orders.

JIT/S recognizes the demand and, based on the item and work cell information associated with the orders, channels the demand to active instances of the shopping lists linked to the relevant work cells. For each item and component, the BOM and item start and end dates are validated. After the demand is applied to the shopping lists, those that are full are marked as such. See “Shopping List Configuration” on page 124.

An order that is marked as hot build in the Work Order Workbench receives prioritized handling. For these orders, JIT/S creates a new instance of the appropriate shopping list, adds all of the parts from the hot-build order to that list instance, marks the list as hot build, and prints it.

Each full and hot build list is printed automatically on the printers specified for that list. JIT/S also prints other active shopping lists when they have exceeded their defined time-out period even if they are not full.

Updating Shopping Lists

Active and inactive shopping lists can be reviewed, updated, and reprinted through Operations|Replenishment|Shopping List Workbench. See “Shopping List Workbench” on page 366.

Shop Floor Tests and Trace Data

Tests for functionality and traceability data from the shop floor—torque level, lot/serial numbers, and so on—are defined as named attributes for assembly units and attribute values for items. See “Define Tests” on page 85.

For items, you can assign both the test category (named attribute) and the test code (attribute value) for each relevant test; that is, specify which test to perform on an item and what result is required to pass the test. See “Assign Tests” on page 86.

For assembly units, you can assign test categories as named attributes to specify which tests are applicable to the assembly unit and its linked work cell; that is, specify which tests take place at the linked work cell. This data is stored with the assembly order. See “Test and Trace Data” on page 85.

For shippable assembly units, you can specify that all of the tests for a selected test category have run successfully before packing or backflushing the item. See “Shippable Assembly Units” on page 119.

See “Trace Data” on page 364 for details on viewing the results.

Packaging and Shipping

Packaging can be defined for pre-racked and nonpre-racked orders. Orders can be shipped without packaging but only packaged orders can be shipped through the Shipping Workbench. Shipping can be reported independently of the actual shipment of orders.

- Packaging Setup
- Shipping
- Production and Shipment Reporting
- Printing Labels and Documents

Packaging Setup

JIT/S packaging addresses defining, configuring, and building packages for shipment. JIT/S packages orders based on labels printed when the order is released by the order scheduler or in response to broadcasts from the customer broadcast point that you and the customer agree is the packaging/shipping signal point. The packaging-signal broadcast point and the build-signal broadcast point can be different. See “Packaging” on page 103.

Since how items are packaged is independent of how they are produced, you have great flexibility for accommodating single or multiple items in whatever packaging configuration or combination is required. See “Multiple-Item Packages” on page 104.

Examples include these:

- Packages with items from multiple production lines in your plant go to a single production line at the customer plant and follow a single sequence.
- Packages are partitioned racks holding multiple items built from one or more work orders.

The order processor can be set up to pre-assign work orders to racks and slots, discussed in “Pre-Racking” on page 105. This pre-racking has two effects:

- The preassigned racks and slots are available for printing on the production labels.
- The planned packages can be viewed in Operations|Packaging/Shipping|View/Rebuild Packages before they are built.

Defining and Configuring Packages

Package units, the lowest packaging level, are based on items that are defined as containers. They can be specified as racks, containers, or pallets and the racks can be partitioned into subracks. The size defined for the unit is validated during packaging. See “Package Units” on page 106.

Defined package units are available for inclusion in packaging assembly units, which are assigned to assembly units. An assembly unit can have a different packaging assembly unit for each ship-to. See “Packaging Assembly Units” on page 120.

The configuration for each packaging assembly unit includes a package unit, a ship-to, and validations that apply when packaging the linked assembly unit. The validations include:

Sequences. Validate the sequence of the items being packaged, that is, check that the first sequence in the current package follows the last sequence in the previous package.

Items. Especially when building a package from pre-built items or from separate build and package/ship broadcasts, scan the label serial number or the item number in addition to the production or shipping label. This validates that the item chosen for packaging matches the item expected by the shipping label from the broadcast message.

The content of the second scan serves as the basis of a cross-reference between the item represented by the shipping label and the item chosen for packaging. An alternate cross-reference can be captured with a third scan.

Building Packages

Packages can be built from the end of a production line—based on a production label—or from a pick and pack area, based on a shipping label. JIT/S produces a shipping label when the build-signal and ship-signal broadcast points are different. See “Packaging Workbenches” on page 322.

For items built through JIT/S and packaged from the end of the production line, the application captures the item ID from the scanned production label. For items built outside of JIT/S or packaged from a pick and pack area, the double scanning set up in the packaging assembly unit verifies that the item from the pick and pack area matches the item referenced by the shipping label.

Based on this item identification, the application does the validations specified for the package unit and for the packaging assembly unit, such as correct quantity and sequence. Correct quantity can come from pre-racking or from the size defined for the package unit. Package size can be changed when necessary; see “Package Size Changes” on page 326.

When the package is complete, the application prints the labels for the package and, optionally, saves the production data to create backflush transactions in the ERP application. See “Completing Packages” on page 325.

Packages that are lost or destroyed can be rebuilt. The system:

- Deletes the lost package and cancels the existing labels
- Sets the status for the original orders to Scrapped
- Creates hot build orders to replace the original orders
- Creates a new package record and pre-racks the hot build orders into the new package

In the usual way, the order scheduler schedules the orders, adds them to the production schedule, and creates labels. Any shipment reporting against the original orders in the ERP system can be manually reversed. See “Rebuilding Lost or Destroyed Packages” on page 334.

Shipping

Completed orders can be shipped to the customer through the Shipping Workbench or by generating appropriate shipping documents manually. The shipping process can include:

- Creating bills of lading and packing slips
- Assigning packages to packing slips
- Finalizing shipments and printing shipping documents
- Generating shipment data in the proper format for exporting to the ERP application
- Adding bills of lading to master bills of lading

Shipping activity often varies depending on the requirements of the specific customer ship-to and the requirements of the ship-from site. Configure shipments based on these parameters by defining shipping configuration records.

Validations are implemented as rule groups defined with each shipping configuration. Specify the validations that the system should execute when:

- A package is added to the shipment.
- A shipment is finalized.

In addition, you can set up shipping groups for packages, which inform the system about which finished goods items can be combined on a single packing slip. These shipping groups are associated with shipping configurations for bills of lading that are filled on the Shipping Workbench. Shipping groups of work orders are associated with bills of lading that are not filled on the Shipping Workbench.

Production and Shipment Reporting

JIT/S inventory reporting can accommodate a variety of reporting styles and requirements for what should be reported and when it should be reported:

- Shipping groups determine whether bills of lading (BOL) hold work orders or packages. They are assigned to shipping configurations.
- Shipping configurations determine whether shipping can be reported for BOLs and whether it must be reported separately from the shipping activity.
- Shippable assembly units (SAU) determine whether receipt with backflush or milestone production reporting is used for work orders. If milestone reporting is used, the final operation code is specified on the SAU.
- Assembly units (AU) determine whether production should be reported for an entire work order or, if milestone reporting is used, the operation code for reporting that AU.

Separate Activities and Reporting

Production and shipping can be reported to an ERP application independent of the actual production and shipping activities:

- Use Work Order Status Maintenance to report work orders as built.
- In Work Order Status Maintenance, add work orders to a BOL; then use BOL Processing to report the work order BOLs as shipped. In this case, no packaging is required
- Build and finalize a shipment of packages in the Shipping Workbench; then use BOL Processing to report the package BOLs as shipped, singly or in combination with other BOLs.

Integrated Activities and Reporting

JIT/S can report production to ERP applications both for complete work order receipt with backflushing and for intermediate and final production milestones. The type of reporting is set up by SAU. If milestone reporting is enabled, intermediate milestones can be set up for lower nodes in the AU tree. See “Assembly Units” on page 112 and “Shippable Assembly Units” on page 119.

JIT/S triggers production reporting for full work orders (receipt with backflush), final operations (milestone reporting), or location transfers in several ways:

- Scanning production labels for a single work order
- Building an order on the Assembly Order Workbench
- Receiving a backflush message for one or more orders through an API from an external system
- Based on a scheduling rule, backflushing all work orders released in the current run of the order scheduler
- Based on a package completion rule, backflushing all fully packed work orders
- Based on a shipment finalization rule, backflushing all work orders contained in a shipment

JIT/S initiates intermediate milestone reporting when milestone reporting is set up for an SAU and for associated AUs—location transfers for purchased items and production for manufactured items:

- Scanning work orders
- Building work orders on the AO Workbench

Scanning Setup and Validations

When scanning to report on complete work orders, JIT/S validates that any tests assigned to the items on the work order—of the category specified in the shippable assembly unit—have been passed successfully. See “Shippable Assembly Units” on page 119 and “Shop Floor Tests and Trace Data” on page 16.

After test validation, if the relevant work order has not been previously backflushed, the production reporting process generates work order and item backflush data and marks the work order as backflushed.

Define the rules for gathering the work order and item data in Setup|Processes|Rule Maintenance and Rule Group Maintenance. See “Rule Maintenance” on page 144. Scanners use the scanner rule parameter—AssemblyUnit—to identify an AU for milestone reporting.

Link the defined rules and rule group to the appropriate scanner. Use Operations|Production Utilities|Scanner Startup to start the scanner. See “Setting Up Scanners” on page 158.

Printing Labels and Documents

Labels are a critical part of the process of tracking items and packages in your JIT/S system. See “Labels” on page 177. The system produces three types of labels:

- Production labels are associated with items and are created when work orders and assembly orders are released.
- Package labels identify packages and are generated at package completion.
- Shipping labels are created when shipping is based on a broadcast signal that is not necessarily related to the build of the item.

Most label printing in the system is managed automatically with rules. For example, the last rule of an order scheduler can be to print a label. You can also generate labels manually with functions on the Operations menu.

All of the information for printing labels is maintained in JIT/S. If you use third-party label-design software such as Lofware Label Manager, you can import templates to use as the basis of the label formats maintained in the system.

JIT/S also manages other, more complex printed documents with strict layout requirements that are generated on the shop floor such as bills of lading, build manifests, and shopping lists. This process uses an API to send information to third-party report-generating tools such as Crystal Reports.

Verification Tests for the Setup

Use the verification tests to validate the installation and data setup. The tests are defined as rules and organized into rule groups by test target. You can define additional tests and assign them as rules to the predefined rule groups.

Important The tests should not be running while the plant is in operation; they should be used only during setup and maintenance—preventative, troubleshooting—periods.

- Verification Test Rule Groups

- Verification Test Setup

Verification Test Rule Groups

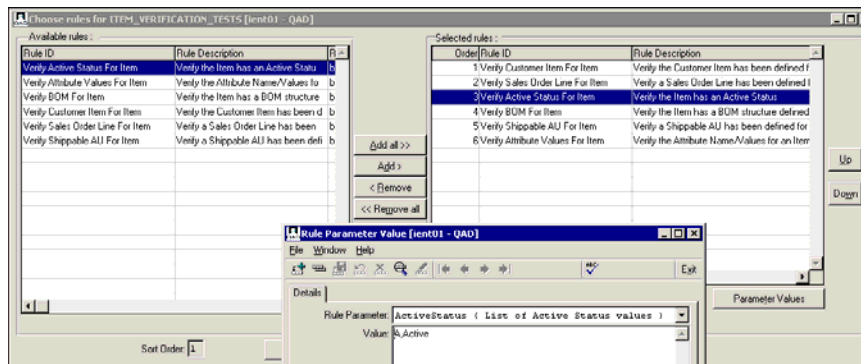
Rule groups and verification test rules exist for the following:

- Product Families
- Item Verification Tests
- Package Verification Tests
- Work Cell Verification Tests
- Assembly Unit Verification Tests
- Label Query Verification Test
- Technical Verification

Verification Test Setup

Some of the verification tests require that parameters be set up for the rules.

Fig. 1.11
Rule Group Maintenance, Rule Parameter Values



Task Steps

- 1 Select a rule group in Setup|Processes|Rule Group Maintenance.
- 2 Choose Options|Rule Assignment to display the rules available/assigned to the rule group.
- 3 Select a rule in the Selected Rules browse; then, click Parameter Values to display the parameters for the selected rule.
- 4 Select a parameter and click Modify Record to update the parameter values.

Table 1.2
Verification Rules That Require Parameter Setup

Rule	Parameter
Verify Active Status for Item	ActiveStatus
Verify Attribute Value for Item	AttributeType
Verify Attribute Names on AU	AttributeType

Archiving and Deleting Data

JIT/S operation generates large amounts of static data and transaction records. Unlimited buildup of these records can impact system performance and eventually absorb all available disk space.

JIT/S has a workbench and an order processor rule that prevent the buildup of very large numbers of records while maintaining data that must be available for customers for long periods of time.

The workbench is a separate JIT/S client application and, in consideration of system resources, should be run only when little or no production activity is taking place. Data that is likely to be archived or deleted includes:

- Internal label information
- Log and message information
- Trace data and test results
- Message Manager transaction data
- Customer order version header and detail information

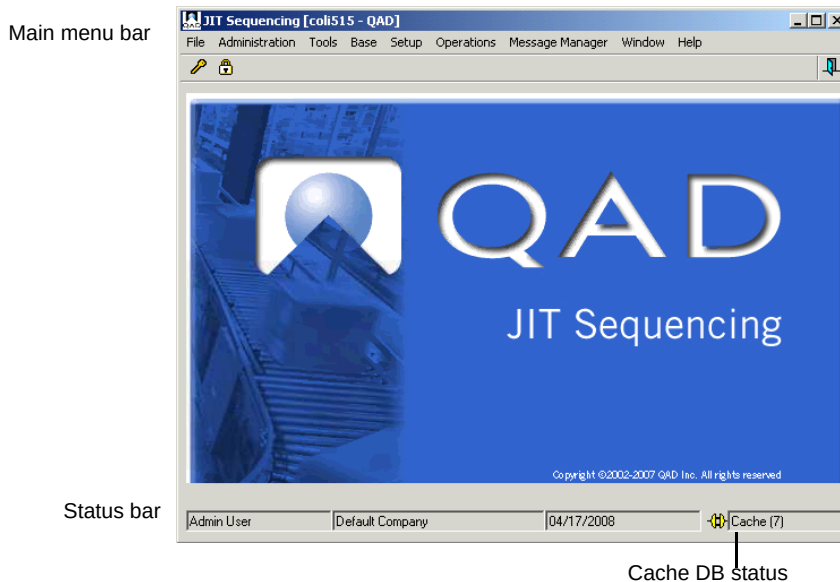
Once transactional data is archived, it is available outside of JIT/S for analysis with dedicated data mining and decision-support tools. There is no provision for returning archived data to JIT/S. See “Archive/Delete Workbench” on page 377.

When it is enabled for an order processor, the rule OPDeletePreviousBPData deletes redundant and outdated COVH, COVD, and Order Information data from previous broadcast points. See “Redundant Broadcast Point Data” on page 138.

JIT Sequencing Functions

All JIT/S functionality is accessed from the main JIT/S window.

Fig. 1.12
JIT/S Main Window



The status line on the bottom of the JIT/S main screen displays status information including the logged-in user name, current company, Web client version, log-in date, and an icon indicating the current status of the cache database. This icon can have three colors:

- Green indicates that the cache database is connected and there are no error messages.
- Orange indicates that the cache database is connected and contains error messages. The number of error messages displays next to the icon.
- Red indicates the cache database is not connected. Users should notify their IT department when they see this icon.

Functions on the Tools menus let you review message logs and customize some JIT/S features. Functions on the Administration, Base, and Setup menus are used during system setup and implementation, and later only on an as-needed basis. Functions focused on the day-to-day execution of the system are under the Operations menu. The tools menu includes functions that can be used both during setup and daily activity:

- Administration
- Tools
- Base
- Setup
- Operations
- Message Manager

Administration

Under the Administration menu, perform the following administrative functions:

- Set up users and security controls for the application.
- Define preferences that affect the user interface.
- Maintain message queues.

Tools

Under the Tools menu, use programs to customize data supplied with the product and to view message and history data:

- View message logs and history for exported transactions and monitored events.
- Add installation-specific information related to application exception messages, including IT troubleshooting guidelines.
- Start Order Scheduler processes.
- Update counters used for identifying documents.
- Create additional class codes that users can select from drop-down lists.
- Verify installation and communication among JIT/S processing and messaging components.
- Update user-defined tools and system control fields.
- View message queue error messages.
- View HFD printing request details.
- Load translated strings to JIT/S for localization.

Base

Under the Base menu, set up data that is static to the application and data that is used by other modules. Static data covers a broad range:

- Addresses and address data such as postal codes and country codes
- Shipping information such as carriers, routes, shipping groups, and shipping configurations
- Work patterns, including shifts and work weeks
- Attributes—options—and their values
- Items and related data (color codes, revision levels, units of measure), vehicle lines, product families, and run Engineering Change utilities.
- Work cells and assembly units
- Packaging
- Product structures
- Storage and Retrieval system and related data

Setup

Under the Setup menu, set up the programs and controls to support order processing, monitoring, and printing:

- Broadcast points and channels
- Rules, rule groups, and processes
- Factory Dashboard events, indicators, and views
- Printers
- Labels, label variables, and the queries to supply values during printing, along with label printing configurations
- Barcode IDs and delimiters
- Document formats for shopping lists, bills of lading, build manifests, and other external documents

Operations

On the Operations menu, you can complete the following tasks:

- Use the Factory Dashboard to monitor activities defined as key performance indicators.
- Review detailed order information (COVH, COVD, PFO, WO, packaging, and labels data)
- Manage assembly orders.
- Manage packaging and shipping.
- Use monitors to review changes to orders as they occur in real time in the system.
- Use a set of workbenches to maintain data and complete related tasks for picking, customer order versions, and work orders.
- Manage print jobs and print or reprint labels.
- Review tracing and test data maintained by the system for various orders.

- Use GUI and CHUI interfaces to replenish shopping lists based on item shopping lists or attribute-based picking lists.
- Generate reports.
- Access utilities for activities such as manually backflushing and starting scanners.
- Maintain item lists and attribute lists.
- Maintain list versions for product family orders and work orders.
- Maintain customer order versions, add customer order versions manually, and review COV errors.
- Maintain sales orders, customer orders, product family orders, work orders, and assembly orders.

Message Manager

Under the Message Manager menu, use the setup functions to implement messages; then use the operational features to maintain the Message Manager repositories and turnaround data.

Setup Functions

- Define the layout and content of documents to be loaded or unloaded from JIT/S.
- Set up the layout and content of applications to reflect how data is stored in the JIT/S database.
- Define the data exchange requirements for a specific trading partner implementation of an application.
- Define outbound destination and processing information.
- Identify each source of inbound messages and each destination for outbound messages. Set up the cross-references between outbound message documents and trading partner sites.
- Create functions for the transformation process. Define the type of data returned by the function as well as the names and types of the function parameters.
- Define data maps for transforming documents in the document repository to application transactions in the application repository.
- Define parameters used in the gateway process to support trading partner-specific processing.
- Define default directories for channels.
- This is not currently available.
- Create IDs for gateway programs to display to users for selection.
- Create the default parameter set that is assigned to new trading partners. It can be maintained in Trading Partner Maintenance.
- Define the format and content of the control records sent from an OEM in inbound message documents.
- Correlate the structure of the data records in inbound messages with a document definition.
- Define Sonic queues.
- Define the parameters for HTTP adapters.
- Specify documents and definitions to be exported and imported.

Operational Features

- Coordinate incoming messages with those that have been sent.
- Track outbound messages.
- Modify or add data to the repository where broadcast data is stored after it is loaded and before transformation and gateway transfer.
- Modify or add data to the repository where inbound data is stored after transformation.
- View document sequence numbers and their corresponding application sequence numbers.
- Define the value of data from incoming documents to be stored and included later during export.
- Track the messages that have been sent and are awaiting acknowledgment; mark messages for reprocessing, and mark acknowledgments manually.
- Track the history of sent messages and resend when required.

User Interface

- Browses and Maintenance Screens
- Menu Bars
- Right-Click Menus
- Record Actions
- Browse Toolbar
- Filtering Records

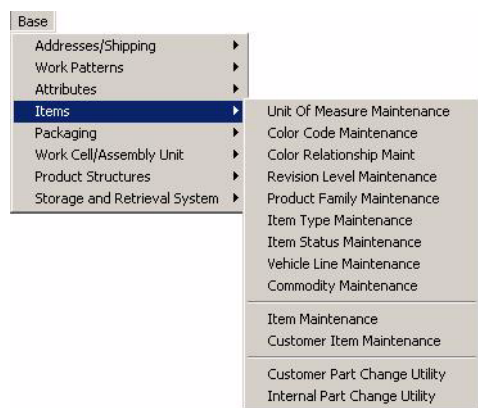
Browses and Maintenance Screens

Access each of the application modules from the menu bar.

File Administration Tools Base Setup Operations Message Manager Window Help

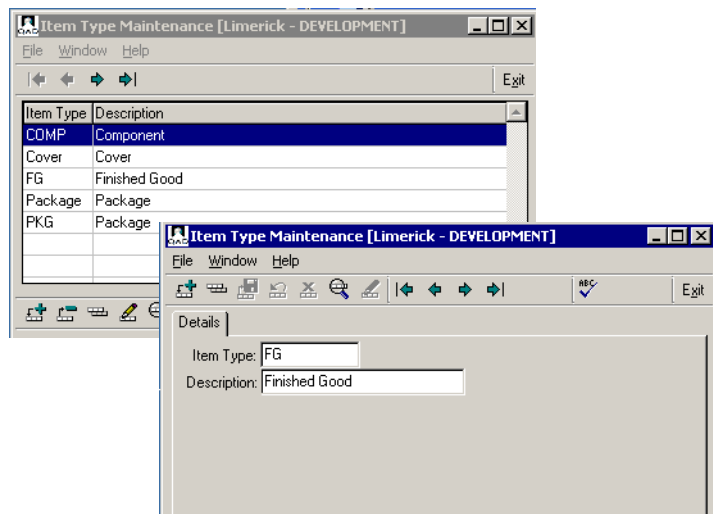
Choosing a setup-related option in a menu displays the existing records for that option; for example, choosing Base|Items|Item Type Maintenance opens the browse and displays the existing item type records. See “Configuring Browses” on page 30 for details about how to customize the way these views display.

Fig. 1.13
Base\Items Menu



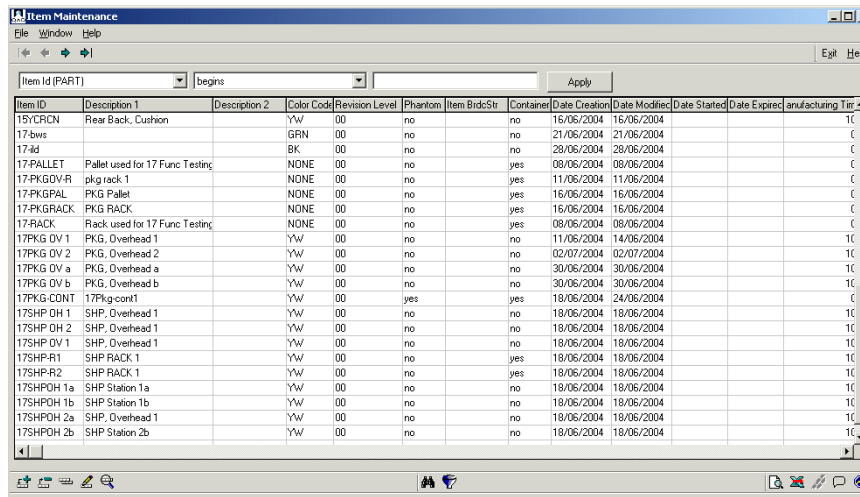
In the Item Type browse, choose File|Add record or click the Add Record button to open the Item Type Maintenance screen. You can also double-click on a record in the browse to open it for editing or viewing. See “Browse Toolbar” on page 32.

Fig. 1.14
Browse and Maintenance Screen



Some browses let you filter the displayed data using various selection criteria. In some cases, you can use operators. The following figure illustrates the filter criteria in the Item Maintenance browse.

Fig. 1.15
Using Browse Filters



Note Which filters you can use varies depending on the format of the field value you are searching.

Table 1.3
Operators for Browse Filters

Operator	Records Returned
begins	Records that start with the value you specify.
equals	Records that exactly match the value you specify.
greater than	Records that start with a value greater than the one you specify.
greater than or equal to	Records that start with the value you specify or any value higher than that value.
is in list	Records that match any item in a comma-separated list or wildcard; for example, 100*,10134,10159. Spaces are considered data.

Menu Bars

Each browse and maintenance screen also has a menu bar. Most windows have the standard menu bar items:

File Window Help

Some windows have an Options menu with additional items that lead to related browses and maintenance screens. Be sure to check carefully since some maintenance screens are available from these menu options only.

File Options Window Help

For tree-building such as product structures, the top level in the tree is created from the Options menu.

See “Menu Listing” on page 424 for a complete listing of all the menu-level functions in JIT/S and the various options.

File Menu

The functions on the File menu are also duplicated with icons on the toolbars. Use the functions on the File menu to:

- Operate on records by adding, deleting, copying, modifying, or viewing.
- Open windows for finding a specific record or filtering records.
- Generate a print preview of listed items in an XML format.
- Export records in the browse to Microsoft Excel.
- View audit history (only enabled on a few functions).
- Add or view comments associated with a record.
- Update status information (not currently implemented).
- Navigate through the browse records.

Window Menu

The Window menu lists all open application windows. You can use the list to activate a Window currently in the background.

The Window menu also has a Multiple Window toggle function.

- When enabled, you can open multiple instances of the same screen.
- When disabled, opening another record reuses the currently open window, rather than opening a new one.

The default window mode is defined in Admin|UI Preferences, but you can change the setting for individual functions as needed. See Multi Window Options in “UI Preferences” on page 62.

For some functions, you should consider disabling multiple windows. For example, some functions such as Process Maintenance let you monitor system activity. In this case, having two windows open may create confusion.

Help Menu

To view information about the version of JIT/S that you are running, use the About JIT/S command on the Help menu.

For information about JIT/S screens and fields, click the Help button found on most screens.

Right-Click Menus

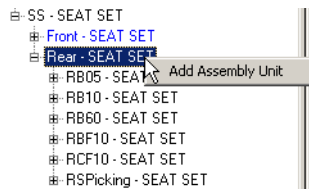
Use right-click menus to create child elements in tree structures such as product structures and to configure and filter browses.

Creating Child Nodes in Tree Structures

The tree-structure maintenance screens such as Base|Product Structures|Product Structure Maintenance and Base|Work Cell/Assembly Unit|Assembly Unit Tree Maintenance use right-click menus.

In the tree-structure pane, right-click a highlighted element to add a child to that element. The fields for defining the child element are displayed in the right pane.

Fig. 1.16
Add Child to Tree Structure



Clearing and Showing Filter Criteria

Some browses have a filter to limit the number of records displayed. You can manage filter settings by right-clicking the Apply button to display the choices.

Fig. 1.17
Browse Filter Right-Click Menu



Choose Show Selection to display an information dialog with the last values used to filter the browse (more than one filter can be in effect).

Choose Clear Selection to remove the effect of the last filter applied.

Choose Clear All to permanently clear all filters from memory.

COV Workbench Errors

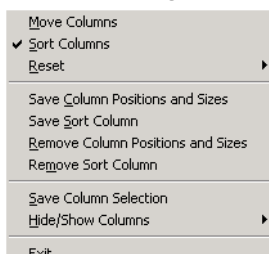
In the Error Code browse of Operations|Monitors/Workbenches|Cust Order Version Workbench, the error resolution choices are available in a right-click menu. The particular choices vary depending on how the error has been defined, but usually include Accept, Reject, and Skip.

Configuring Browses

Right-click in any browse to open the configuration menu for moving and sizing columns, for selecting the column to sort records, and for selecting the columns to display.

Note Some JIT/S browses do not support the Save Column Selection and Hide/Show Columns features.

Fig. 1.18
Records Browse Right-Click Menu



Move Columns

Use this menu choice to enable rearranging the order of the browse columns. Click the column label and drag the column where you want it.

Sort Columns

Click this menu choice to enable data sorting within columns. Click the column label to sort in ascending direction; click again to sort in the descending.

Reset

Use Column Positions and Sizes and Sort Column to reset the display to those last saved.

Use Default Positions and Sizes and Default Sort Column to reset browse settings to the installation defaults, removing any changes you saved previously.

Save Column Positions and Sizes, Save Sort Column

Use these options to save the current column positions and sizes as well as the current sort column setting as the defaults.

Remove Column Positions and Sizes, Remove Sort Column

Use these options to return settings to default values and save them.

Save Column Selection

This menu choice saves the currently displayed columns as the default display for the browse.

Hide/Show Columns

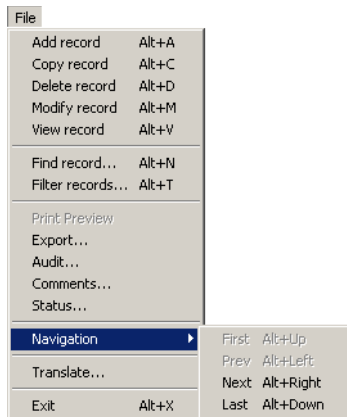
This menu choice displays a list of the columns for the browse. Currently displayed columns have a check. Choose a column name to add or remove the check.

Record Actions

Most record-related actions are available both from the File menu and from the toolbar. You can also use the hotkeys associated with File menu commands to execute actions from the keyboard.

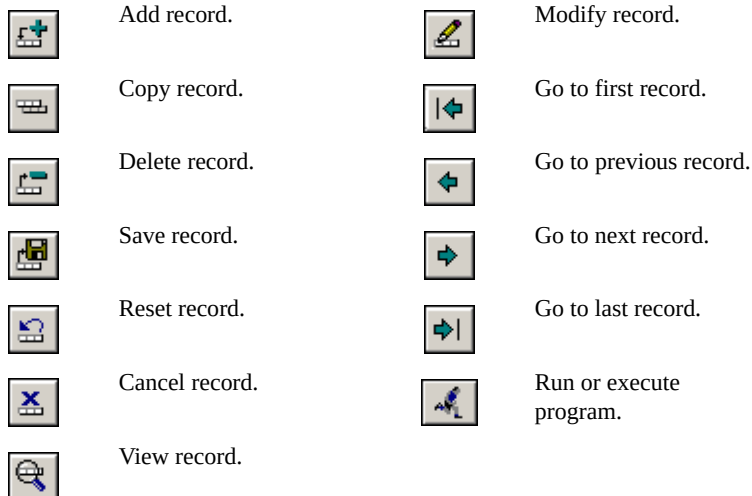
Note In most cases, the default action when you double-click a record is to display the maintenance screen. This is the same as choosing File|Edit.

Fig. 1.19
File Menu



The location of the toolbar depends on the display:

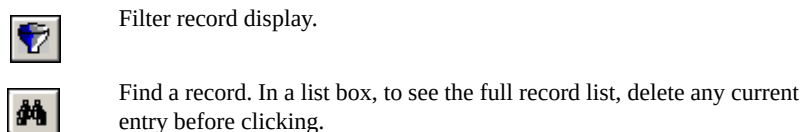
- In most browses, the toolbar is at the bottom of the display.
- In most maintenance screens, the toolbar is at the top of the display.
- In combination maintenance screen-browses such as Assembly Unit Tree Maintenance, the toolbar is above the records in the right-hand pane.



Important The *Go to first record* and *Go to last record* buttons cause the system to read every record that meets the current filter criteria for the browse to determine the first or last record. If a large number of records exists, this may take many minutes to complete.

Browse Toolbar

When these commands are available, they are in the center and right-hand sections of the browse toolbar.



-  Print preview. Generates an XML report and displays it in a browser window.
-  Export records to an Excel spreadsheet.
-  View audit records.
-  Add comments to a record.
-  Status. Not currently used.
-  Refresh.
-  Print.
-  Finalize shipment. This is used in the Shipping Workbench only.

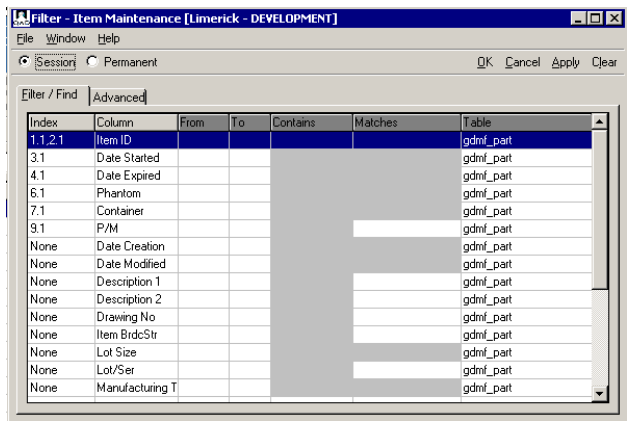
Filtering Records

You can use filtering to narrow the query results that appear in a browse.

Some browses, such as Base|Items|Item Maintenance, display operator-based filters. See Table 1.3 on page 28.

You can also use the Filter icon to specify filtering criteria for one or more fields in the query. The screen in Figure 1.20 displays when you click the Filter icon.

Fig. 1.20
Filtering Records



Each time you filter a browse, you can use the Session and Permanent radio buttons to determine whether the filter applies only to the current session or is still active the next time you log in.

To narrow the query results that appear in the browse, specify filtering criteria on one or more fields in the query as follows:

- Specify From/To Values on a field to display a range of records in which that field contains a value between the specified from and to values. Specify the same value in From Value and To Value to display all records that begin with that value.
- Specify only From Value on a field to display all records in which that field contains a value greater than or equal to the specified value.
- Specify only To Value on a field to display all records in which that field contains a value less than or equal to the specified value.

Click Apply to activate the filter in the browse. Click Clear to clear your current filter settings.

Section 2

Setting Up JIT/S

This section contains details about the functions you use to set up JIT/S in your environment and to integrate it with your QAD ERP application installation.

Administration 37

Gives an overview of the Administration menu, discusses the Security Control Function, and explains how to set and use UI Preferences.

Base Data 65

Explains how to set up base data and includes sections on addresses, shipping, work patterns, attributes, test and trace data, items, packaging, work cells and assembly units, shopping list configuration, and product structures.

Setup 133

Discusses the functions available on the JIT Sequencing Setup Menu with details on communications, processing, process monitoring and tracking, the factory dashboard, printers, labels, documents, and barcodes and 2D symbols.

Message Manager 199

Explains the setup and operations for inbound and outbound message integration, including an introductory section and sections on data load/unload setup, transformation and gateway setup, message manager operations, JIT/S provided messages, message manager setup examples, and document examples.

Tools 277

Explains the functions of the logging/debugging tools, exception management, system process tools, system data tools, and system development tools.

Administration

Use the Administration menu to define users and set up access control restrictions for a variety of application elements such as menus and fields. You can also manage settings that affect the user interface, as well as maintain message queues.

Administration Overview 38

Discusses the Security Control option in the Administration menu with details on security planning, UI preferences, and Message Queue Maintenance.

Security Control 40

Lists the required steps for setting up Security Control with details on the control maintenance tree, system-level settings, action security, data ranges, fields, login companies, security groups, user categories, users, security allocation, security inquiry, and security processing.

UI Preferences 62

Explains how to use the UI Preferences window, with sections on General Options and Multi-Window Options.

Administration Overview

From the Security Control option in the Administration menu, you can manage the following:

- Security setup
- UI preferences
- Message Queues

Important A default user—Admin—is set up with the application. You should change this user's password immediately to prevent unauthorized access.

The Admin user is currently the only user who can close the Assembly Order Workbench and Assembly Order Monitor on the Operations|Assembly menu. These functions are typically left open since they monitor the work for a particular work cell, and the user closing them must provide authentication before the programs shut down.

This is set by the ProdWBUser setting in Tools|Development Tools|System Control. See “System Controls” on page 307.

- Security Planning
- UI Preferences
- Message Queue Maintenance

Security Planning

When you plan your security, review the options on the various menus.

- The Tools and Administration menus are typically used by system administrators and system implementors. Since the security functions on the Administration menu can be disabled by a user with access, it is critical to restrict access to these functions.
- Base and Setup are typically used by system implementors.
- Operation functions are used in the day-to-day operation of the system. However, you should consider restricting access to the functions on the Operations|Lists/Orders menu. These functions let you modify data that is normally processed automatically by the system. This may be needed to correct errors or because of interruption of broadcast receipts. However, it should only be done by users who understand the impact on the system.

The security functions provide a broad range of tools for setting up and applying security at many different levels. You can restrict access to both functions and actions. You can also hide and disable toolbar buttons. This lets you provide read-only access for some users to a function and update access for others. You should consider applying this kind of access to the functions on the Operations|Lists/Orders menu to prevent inexperienced users from changing critical data.

Two security modes are supported by the system: revoke and grant. By default, the revoke model is applied. This means that all users can do everything unless you define additional controls. Determine the model that will be most effective for your implementation. See “Security Model” on page 42.

When the system is installed, security has been defined for a number of fields in Tools|Exception Management|Message Maintenance. This is to let you create administrative message content that cannot be viewed by other users. This feature is discussed in detail in “Setting Up Security for IT Fields” on page 286.

UI Preferences

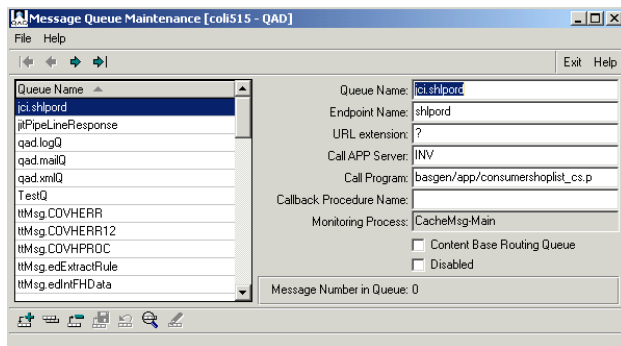
One field on the UI preferences screen may be especially important during system implementation. This is Clear SDF Cache; see “Clear SDF Cache” on page 63. By default, all of the drop-downs and lookups use client caching to improve system performance. If you are adding static data to the system—such as class codes—and want to see this data immediately, you may need to clear the client cache using this option to force the system to update data with new values you have just created.

During normal system use, this is typically not an issue, since all required static data has been set up.

Message Queue Maintenance

Use Administration|Message Queue Maintenance to create, modify, and delete internal message queues stored in the cache database.

Fig. 2.1
Message Queue Maintenance



QueueName. Enter a globally unique ID for the queue.

EndPointName. Enter a globally unique name for accessing the endpoint. Associated with a message queue, an endpoint is the destination where to send messages, mainly in content-based routing.

URL extension. Enter a globally unique endpoint URL extension. Associated with a message queue, a URL extension is mapped to a URL address where the destination resides in content-based routing.

Call APP Server. Enter the APPServer to run the Call Program.

Call Program. Enter the procedure to call when a message is received in the queue.

CallbackProcedureName. Leave this field empty or use the default value.

Monitoring Process. Displays the process listening to this queue.

Content Base Routing (CBR). Specify whether this is a content-based routing (CBR) queue. There are only two CBR queues: queue:ttMsg.inQ and qad.xmlQ. When this is selected, the Call APP Server and Call Program fields are disabled. CBR queues cannot be deleted.

Disabled. Specify whether the queue is disabled. A disabled queue does not receive any messages and is not listened to by the monitoring process.

Message Number in Queue. Displays the number of new, being processed, and failed messages in the queue, exclusive of successfully delivered messages.

Security Control

User and security setup is completed in an integrated Security Control function that provides a tree view for organizing setup activities:

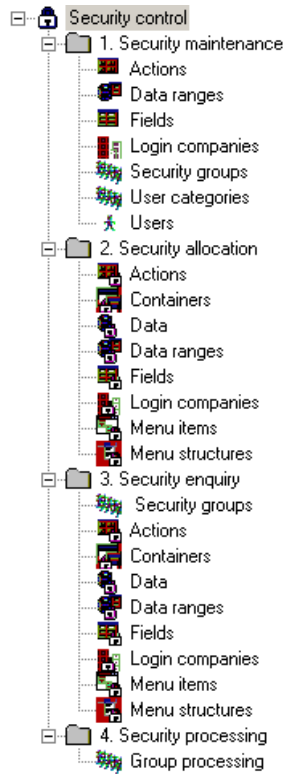
- Control Maintenance Tree
- System-Level Settings
- Action Security
- Data Ranges
- Fields
- Login Companies
- Security Groups
- User Categories
- Users
- Security Allocation
- Security Inquiry
- Security Processing

Control Maintenance Tree

Choose Administration|Security Control to display the control maintenance tree. You define system-level settings related to the application as a whole in the Security Control function.

- You set up codes for the actions, data ranges, and fields that you want to secure with Security Control functions. You also set up users, user categories, security groups, and log-in companies with these functions.
- You define the security rules you want to implement with functions under Security Allocation. You can use one of two models in assigning security:
 - In the grant model, you must explicitly give users access before they can execute a function.
 - In the revoke model, all users have complete access to the system unless controls are defined to prevent access.
- Review security with functions under Security Inquiry.
- Use security utilities under Security Processing.

Fig. 2.2
Security Control Maintenance Tree View



Application security is based on the underlying Progress Dynamics infrastructure. See *Progress Dynamics Administration Guide*.

System-Level Settings

Choose the Security Control node in Administration|Security Control to define application-wide settings and choose the security model you want to implement.

Fig. 2.3
Security Control Maintenance

Security Maintenance

Details

Login filename: ☐ Security enabled

Error log filename: ☒ Translation enabled

Default help filename: ☒ Help writer enabled

Company logo filename: ☒ Build top menus only

System icon filename: ☒ Enable window positioning

Small icon filename: ☒ Minimise siblings

Product logo filename: ☐ Force unique password

SCM tool: ☒ SCM checks on

Password max. retries: ☒ Program access check

Password history life time: ☒ Multi user check

Inactivity timeout:

- ☒ Never
- ☐ Days
- ☐ Hours
- ☐ Minutes

Security Model:

- ☒ Revoke
- ☐ Grant

Field Descriptions

Login Filename. This is the name of the log-in program.

Error Log Filename. The name of the error log file.

Default Help Filename. The name of the default help file for the system.

Company Logo Filename. The file name and relative path of the company logo to display on the Help About window, and other locations in the application user interface.

System Icon Filename. The file name and relative path of the system icon to load for all windows.

Small Icon Filename. The file name and relative path of the small system icon to load for all windows.

Product Logo Filename. The file name and relative path of the product logo to display on the Help About window and other locations in the application user interface.

SCM Tool. The code that indicates the Source Code Manager (SCM) tool you have installed for use with Progress Dynamics. Currently, Progress Dynamics supports only Roundtable (RTB). The default value is RTB.

Password Max Retries. This is the maximum number of times—over time—that a user can enter a password incorrectly before the application disables the user's account.

Password History Lifetime. The number of days to keep and check the password history. The default value is 365 (for one full year).

Security Enabled. When selected, the application performs security checks.

Translation Enabled. When selected, widget label language translation is enabled.

Help Writer Enabled. When selected, assistance with context help writing is enabled.

Build Top Menus Only. When selected, only top-level menus are built initially, and sub-menus are built on menu drop events.

Enable Window Positioning. When selected, the saving of user window positions is enabled.

Minimize Siblings. When selected, the minimizing of all child windows for an object controller or menu controller window is enabled.

Force Unique Password. When selected, every password must be unique. This lets the application locate a user's record with a password only.

SCM Checks On. Selected by default, this option enables Progress Dynamics to coordinate Repository database updates with the SCM. When cleared, the SCM checks are ignored.

Program access check. Indicates that the system should check whether a program is already running for users to prevent them from running it again if they are allowed to have only one copy open at a time.

Multi user check. Indicates that the system should ensure a specific user ID cannot log in more than once.

Security Model. Choose the security model you want to implement.

Revoke: In a revoke security model (the default), users have access to all functions by default, and the administrator revokes access as necessary.

If a user belongs to multiple groups, a user's access must be revoked in every security group to which the user is linked. If the administrator revokes access differently in different groups, the user gets the least restrictive access.

Grant: In a grant security model, users have no access, unless the administrator defines specifically how they have access.

In a grant model, the user gains access if the administrator grants him access in any of the groups to which he is linked. If the administrator grants him access in more than one group, the user gets the least restrictive access.

If only a small part of the application is visible to the user, the grant security model reduces the effort in setting security up for a new user. Instead of having to revoke security rights to most of the options in the application, you only need to grant rights to a small part of the application.

Clear Security Allocations. Lets you delete all existing security allocations for all users, groups, and login companies. Use this option if you want to change the security model. Before you choose this option, you should create a backup of your database.

Action Security

In Security Control, expand the Security Maintenance node and choose Actions to display the Action Security Maintenance window where you can create or edit a security action. A security action is a mechanism for authorizing access to the following:

- **Application functions.** A security action for an application function hides the toolbar button or menu item associated with a particular application function. You cannot disable menu items with action security. To change security for menu items, you must use the Security Allocations window.
- **Folder pages.** A security action for a folder page disables the folder page (tab). The security action for a folder page defaults to the page label.
- **Buttons on visual objects.** A security action for a button disables the button. The security action for a button is based on the button name.

You must also define security structures for security actions. Security structures allow for an action restriction to be specified for a specific object instance, a specific object, a specific product module, or generically for everything. By default, in a revoke security model, an entry is created in the security structure table for the action for global access. You only need to create other security structure records if you want to restrict access to the action more specifically. For example, you might want to grant users access to a function in one program, but not in another. In a grant model, global access is restricted by default, and you grant access to specific actions.

Action security works like field security. In a revoke model, only if a user is restricted access to an action is any action taken. If no security restriction exists for the user or all users, the security groups the user belongs to, the specific login company or all companies, then full access to the action is granted. If a restriction is found, then the action is disabled or hidden depending on the type of action. Specific user and login company restrictions override generic restrictions. The restrictions are not cumulative and the most specific restriction takes effect. If the action is disabled for the user, the relevant button or tab page is disabled, preventing access.

In a grant model, only if a user is granted access to an action is any action taken. If no security allocations exist for the user or all users, the security groups the user belongs to, the specific login company or all companies, then access to the action is restricted.

Note If no actions are allocated to a user and full access is granted, the user is granted access to all actions. You can allocate restrictions for security actions to a user or a company using the Security Allocations window.

Details Tab

In Action Security Maintenance, the Details tab specifies basic action security information.

Fig. 2.4
Action Security Maintenance: Details

Action code	Action description	Disabled	System owned
add	Add operation	NO	YES
Audit	Audit tab label	NO	YES
blank	blank	NO	YES
Cancel	Change status to cancel	NO	YES
Comments	Comments	NO	YES
Copy	Copy operation	NO	YES
Delete	Delete operation	NO	YES

Details | Security Structure

Action code: add

Action description: Add operation

☐ Disabled

☒ System owned

Field Descriptions

Action Code. A unique code to identify the action.

Action Description. A description of the action.

Disabled. When selected, the action is disabled. That is, the action is not checked and full access is granted.

System Owned. When selected, the action is system owned. The user must have the appropriate privileges to modify this action. The framework does not enable this feature automatically. To fully implement this feature, you must provide code in the trigger for the table, or the SDO linked to the table, containing the system owned field.

Security Structure Tab

In Action Security Maintenance, the Security Structure tab displays the security structures for the currently selected action. When the action restriction is not specified for a product module, object, or object instance, <All> displays.

The Security Structure tab lets you edit the fields of the security structure for the selected action.

Fig. 2.5
Action Security Maintenance: Security Structure

The screenshot shows the 'Action Security Maintenance - add' window. The 'Security Structure' tab is active, displaying a table with columns: Product module, Object filename, Attribute code, and Disabled. Below the table are input fields for Product module, Container filename, and Attribute code, each with a lookup button. A 'Disabled' checkbox is also present.

Action code	Action description	Disabled	System owned
add	Add operation	NO	YES
Audit	Audit tab label	NO	YES
blank	blank	NO	YES
Cancel	Change status to cancel	NO	YES
Comments	Comments	NO	YES
Copy	Copy operation	NO	YES
Delete	Delete operation	NO	YES

Product module	Object filename	Attribute code	Disabled
<All>	<All>	<All>	NO
af-cod2	gsmusobjcw	<All>	NO
af-cod2	gsmusfol2w	<All>	NO

Product module: <All> Container filename: <All> Attribute code: <All> ☐ Disabled

Field Descriptions

Product Module Code. The product module in which to make the action restriction. Choose the lookup button to display the available product modules.

Object Filename. The object in which to make the action restriction. Choose the lookup button to display the available objects for the specified product module. You can update this field only after you specify a product module.

Attribute Code. Specify an object instance in which to make the action restriction. Choose the lookup button to display the available object instances. You can update this field only after you specify a product module and an object.

Disabled. When selected, the action restriction is enabled. That is, the action restriction is not checked and full access is granted.

Data Ranges

In Security Control, expand the Security Maintenance node and choose Data ranges to display the Data Range Security Maintenance window where you can define range codes for restricting access to ranges of data. Range codes represent data ranges that require secured access within an application. Progress Dynamics provides support for your programmatic implementation of data range security using the Security Manager API with range codes.

You must also define security structures for range codes. Security structures allow for a range restriction to be specified for a specific object instance, a specific object, a specific product module, or generically for everything.

Note You allocate security restrictions for data ranges to a user or a company from the Security Allocations window.

Details Tab

In Data Range Security Maintenance, the Details tab specifies basic data range security information.

Fig. 2.6
Data Range Security Maintenance: Details

Range code	Range description	Disabled	System owned

Details | Security Structure |

Range code:

Range description:

☐ Disabled

☐ System owned

Range Code. A unique code to identify the data range.

Range Description. A description of the data range.

Disabled. When selected, the data range is disabled. That is, the range code is not checked and full access is granted.

System Owned. When selected, the range code is system owned. The user must have the appropriate privileges to modify this range code. The framework does not enable this feature automatically. To fully implement this feature, you must provide code in the trigger for the table, or the SDO linked to the table, containing the system owned field.

Security Structure Tab

In Data Range Security Maintenance, the Security Structures tab displays the security structures for the currently selected range code. When the data range restriction is not specified for a product module, object, or object instance, <All> displays.

The Security Structure tab lets you edit the fields of the security structure for the selected range code.

Fig. 2.7
Data Range Security Maintenance: Security Structure

Range code	Range description	Disabled	System owned

Product module	Object filename	Attribute code	Disabled

Product module: <All> [lookup]

Container filename: <All> [lookup]

Attribute code: <All> [lookup]

☐ Disabled

Product Module Code. The product module in which to make the data range restriction. Choose the lookup button to display the available product modules.

Object Filename. The object in which to make the data range restriction. Choose the lookup button to display the available objects for the specified product module. You can update this field only after you specify a product module.

Attribute Code. Specify an object instance in which to make the data range restriction. Choose the lookup button to display the available object instances. You can update this field only after you specify a product module and an object.

Disabled. When selected, the data range restriction is enabled. That is, the data range restriction is not checked and full access is granted.

Fields

In Security Control, expand the Security Maintenance node and choose Fields to display the Field Security Maintenance window where you can define security for a field, as well as the required security structures. Field security is generically implemented within Progress Dynamics for fields and widgets that appear in browses and viewers. You can define security for any field that requires secured access within an application.

You must also define security structures for secured fields. Security structures allow for a field restriction to be specified for a specific object instance, a specific object, a specific product module, or generically for everything.

Note You allocate security restrictions for fields to a user or a company from the Security Allocations window.

Details Tab

In Fields Security Maintenance, the Details tab specifies basic field security information.

Fig. 2.8
Fields Security Maintenance: Details

Field name	Field description	Disabled	System owned
buLaunchSuppDocs	button for supporting docs	NO	NO
edEmotInstructions	viewer it instructions	NO	NO
fiEroSupportingDocs	supporting docs in viewer	NO	NO
itInstructions	it instructions	NO	NO
pkau_part_verify	part verification field	NO	NO
supportingDocs	supporting docs	NO	NO

Details | Security Structure

Field name: buLaunchSuppDocs

Field description: button for supporting docs

☐ Disabled

☐ System owned

Field Name. The name of the field (without a database or table name prefix) or widget as it exists within the browse or viewer.

Field Description. A description of the field.

Disabled. When selected, the field is disabled. That is, the field is not checked and full access is granted.

System Owned. When selected, the field is system owned. The user must have the appropriate privileges to modify this field. The framework does not enable this feature automatically. To fully implement this feature, you must provide code in the trigger for the table, or the SDO linked to the table, containing the system owned field.

Security Structure Tab

In Fields Security Maintenance, the Security Structure tab displays the security structures for the currently selected field. When the field restriction is not specified for a product module, object, or object instance, <All> displays.

On the Security Structure tab you can edit the fields of the security structure for the selected field.

Fig. 2.9
Fields Security Maintenance: Security Structure

Field name	Field description	Disabled	System owner
buLaunchSuppDocs	button for supporting docs	NO	NO
edEmotInstructions	viewer it instructions	NO	NO
fiEmoSupportingDocs	supporting docs in viewer	NO	NO
fiInstructions	it instructions	NO	NO
pkau_part_verify	part verification field	NO	NO
supportingDocs	supporting docs	NO	NO

Product module	Object filename	Attribute code	Disabled
<All>	<All>	<All>	NO

Product module: <All>

Container filename: <All>

Attribute code: <All>

☐ Disabled

Product Module Code. The product module in which to make the field restriction. Choose the lookup button to display the available product modules.

Object Filename. The object in which to make the field restriction. Choose the lookup button to display the available objects for the specified product module. You can update this field only after you specify a product module.

Attribute Code. Specify an object instance in which to make the field restriction. Choose the lookup button to display the available object instances. You can update this field only after you specify a product module and an object.

Disabled. When selected, the field restriction is enabled. That is, the field restriction is not checked and full access is granted.

Login Companies

In Security Control, expand the Security Maintenance node and choose Login companies to display the Login Company Maintenance window where you can create or edit a login company. A login company is an organizational entity that you can use to group users or application functionality. A login company might be an actual company or another kind of organization such as a department, a product line, or a role. Progress Dynamics can also restrict user access based on login company.

Choose a browse toolbar button or double-click a browse row to create or edit a login company.

Fig. 2.10
Login Company Maintenance

Login company code	Login company short name	Login company name
Dynamics	Dynamics	Default Company
Limerick	Limerick	Limerick - Autopro Development Team

Details

Login company code: Dynamics
Login company name: Default Company
Login company short name: Dynamics
Login company email:
☐ Login company disabled

Login Company Code. A unique code to identify the login company.

Login Company Name. The full name of the login company. This name is used when displaying the login company name on reports, status bars, and so on.

Login Company Short Name. A short name for the login company used for lookup purposes.

Login Company Email. An e-mail address for the login company used for automatic notification messages, and so on.

Login Company Disabled. When selected, the login company is disabled and all users in this login company are prevented from accessing anything in the application.

Security Groups

In Security Control, expand the Security Maintenance node and choose Security groups to display the Security Group Maintenance window with the available security groups.

Details Tab

View the Details tab in Security Groups Maintenance.

Fig. 2.11
Security Group Maintenance: Details

Group name. The name of the security group.

Group description. A description of the security group.

Disabled. Indicates whether the security group is disabled.

Default security group. Specifies that the group is a default security group, which means it is assigned to all users by default.

Users/Groups Linked to this Group Tab

In Security Groups Maintenance, view group and user group links on this tab.

Fig. 2.12
Security Group Maintenance: Users/Groups Linked to This Group

Login company. A filter that lets you specify to view the linked groups and users for all login companies or for a specific login company.

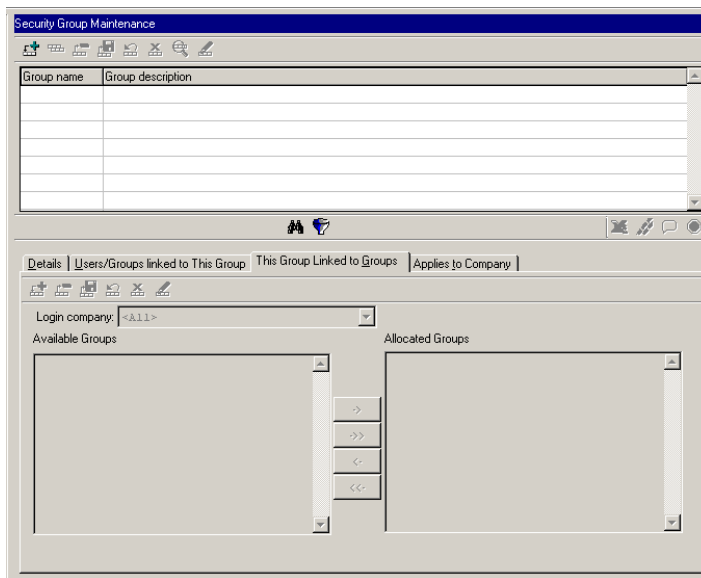
Available Users/Groups. Displays the list of users and groups that you can link to the current group.

Allocated Users/Groups. Displays the list of users and groups that are already linked to the current group.

This Group Linked to Groups Tab

In Security Group Maintenance, view group links on this tab.

Fig. 2.13
Security Group Maintenance: This Group Linked to Groups



Login company. A filter that lets you specify to view the groups to which the current group is linked for all login companies or for a specific login company.

Available Groups. Displays the list of groups to which you can link the current group.

Allocated Groups. Displays the list of groups to which the current group is already linked.

Applies to Company Tab

In Security Group Maintenance, view the login companies that the security settings apply to on this tab.

Fig. 2.14
Security Group Maintenance: Applies to Company

Group name	Group description

Details | Users/Groups linked to This Group | This Group Linked to Groups | **Applies to Company**

☒ Applies to all login companies

Available Login Companies	
Login company code	Login company short name
Dynamics	Dynamics
Limerick	Limerick

> <> <<- >>-

Applies to Login Companies	
Login company code	Login company short name

Applies to all login companies. Specifies that the settings for the current security group apply to all login companies. When you uncheck this option, the following browses appear.

Available Login Companies. Displays the list of login companies to which you can link the current group.

Note This option only appears when you uncheck the Applies to all login companies toggle.

Applies to Login Companies. Displays the list of login companies that you can specify as linked to the current group.

Note This option only appears when you uncheck the Applies to all login companies toggle.

User Categories

In Security Control, expand the Security Maintenance node and choose User categories to display the User Category Maintenance window where you can create or edit a user category. A user category lets you organize users into a grouping for some purpose. For example, the application might respond in one way for expert users and another way for novice users.

Fig. 2.15
User Category Control

User category code	User category description	Disabled
Expert	At guru level	NO
Competent	With productive experience	NO
Guest	Without portfolio	NO
Novice	With little or no experience	NO

Details

User category code:

User category description:

☐ Disabled

User Category Code. A unique code to identify the user category.

User Category Description. A description of the user category.

Disabled. When selected, all users in this category are prevented from accessing the application.

Users

In Security Control, expand the Security Maintenance node and choose Users to display the User Maintenance window where you can create or edit a user profile. Once you have defined the required user categories and login companies, use this window to register users and set various

types of user profile data such as user category, login company, password, language, e-mail address, and security restrictions for a given user. You can also cascade certain profile and security data associated with one user profile to other user profiles that are based on the initial user profile.

Details Tab

In User Maintenance, the Details tab specifies basic user profile information.

Fig. 2.16
User Control: Details

User login name	User category code	Profile use	Based on profile	Development user	Disabled	External user	User full name
admin	Expert	YES		YES	NO		0 Dynamics Admin User
admin2	Novice	YES		YES	NO		0 Dynamics Admin User
aed	Expert	NO		YES	NO		0 Allan Doane
bji	Expert	NO		YES	NO		0 Bengt Johansson
byd	Expert	YES		YES	NO		0 Brad De Vries
cgk	Expert	NO		YES	NO		0 Cherian George

Details | Other Info | User Linked to Groups | Password History | Cascade

User login name: admin ☐ Disabled

User full name: Dynamics Admin User

User category: At guru level (Expert)

☒ Profile user ☒ Development user ☒ Maintain system data

Based on profile:

User creation date: 19/07/1999 Time: 16:18:33

User password: Blank Creation date: 01/04/2005

Confirm password: Blank Creation time: 15:06:21

Password minimum length: 0

☐ Password preexpired ☐ Update password history ☐ Check password history

Default language: EN-US / English - United States

Login company: Dynamics

Field Descriptions

User Login Name. The login name of the user.

Note Selecting this tab enables the Cascade tab.

Disabled. When selected, the user is prevented from accessing the application.

Full Name. The full name of the login user.

User Category. The user category to which the user belongs.

Profile User. When selected, this user's profile can be used as a base for creating other user profiles. Any user whose profile is based on this profile can automatically inherit certain profile and security settings. This inheritance occurs when you initiate a cascade of the data from the profile user's profile by choosing the Cascade button on the Cascade tab.

Development User. When selected, this user can access system development functions.

Maintain System Data. When selected, this user can maintain system control data.

Based on Profile. The user profile on which this user's profile and security settings are based. Choose the lookup button to display a list of available profile users.

User Creation Date and Time. The date and time the user profile was created. This is a read-only field.

User Password. The user's login password. This field does not echo entered characters. Choose the Blank button to clear the password value.

Confirm Password. The user's login password re-entered to confirm the password previously entered in Password. This field does not echo entered characters. Choose the Blank button to clear the confirmation password value.

Password Creation Date and Time. The date and time the current password was created. This is a read-only field.

Password Minimum Length. Enter the minimum required length for user passwords.

Password Pre-Expired. When selected, the user must change their password when they next log into the system.

Update History. When selected, a history of password changes is maintained for the user.

Check Password History. When selected, the history of password changes is checked when the user next logs on to the system.

Default Language. The user's default language which determines their internationalization and localization settings.

Login company. The default login company in which the user belongs. Choose the lookup button to display a list of available login companies.

Other Info Tab

In User Maintenance, the Other Info tab displays password and login information.

Fig. 2.17
User Control: Other Info

User Control: Other Info			
Password expiry date:		Time: 00:00:00	Expiry days: 0
Last login date:	24/03/2004	Time: 20:25:59	
Password fail date:		Time: 00:00:00	Fail count: 0
User email address:			
External userid:	0		

Password Expiry Date and Time. The date and time on which the current password expires. Choose the ellipsis button to select a date.

Expiry Days. The number of days before the current password expires.

Last Login Date and Time. The date and time of the most recent user login. This is a read-only field.

Password Fail Date and Time. The date and time of the most recent user login failure due to an incorrect password. This is a read-only field.

Fail Count. The number of user login failures due to an incorrect password. This is a read-only field.

User Email Address. The user's e-mail address.

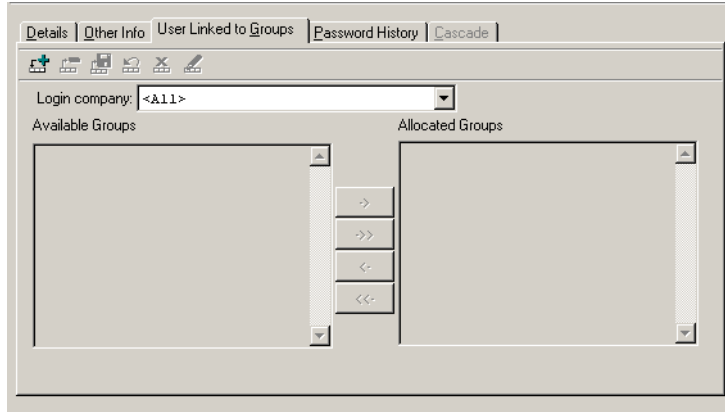
External Userid. An integer representing an external reference to the user.

User Linked to Groups Tab

In User Maintenance, this tab displays user company and group assignments.

Fig. 2.18

User Control: User Linked to Groups



Login company. A filter that lets you specify to view the groups to which the current user is linked, for all login companies or for a specific login company.

Available Groups. Displays the list of groups to which you can link the current user.

Allocated Groups. Displays the list of groups to which the current user is already linked.

Password History Tab

In User Maintenance, the Password History tab is available if the Update History check box is selected.

Fig. 2.19

User Control: Password History

Password change date	Changed time	Changed by
14/06/2000	14:57:48	admin
14/06/2000	14:55:49	
14/06/2000	14:54:54	

Password Change Date and Time. The date and time on which the user's password changed (or was first entered).

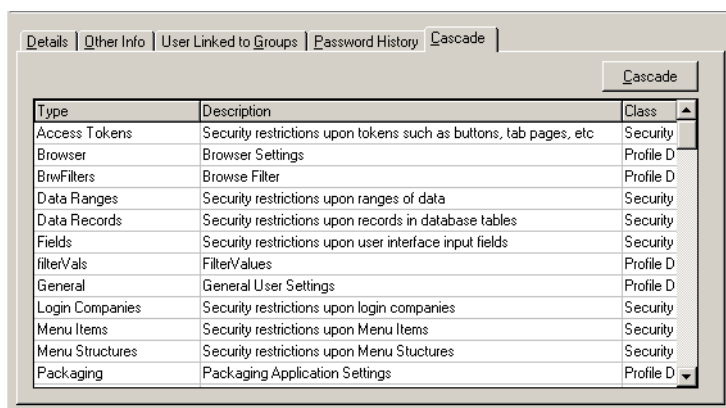
Changed By. The user who changed or first entered the password.

Cascade Tab

In User Maintenance, the Cascade tab is only available for profile users. Settings for the profile user can be cascaded to all users based on that profile.

On the Cascade tab, select the settings to cascade to other users and click Cascade. If a user who inherits cascaded settings is also a profile user, the settings cascade to all users in the cascade tree.

Fig. 2.20
User Control: Cascade



Type. The type of access restriction and profile settings applicable to the user. This can be any of several types available for the specified class.

Description. A description of the access restriction and profile settings applicable to the user.

Class. The class of the setting. The valid classes are:

- **Security**—This includes the types of access restrictions supported by Progress Dynamics.
- **Profile Data**—This includes user preferences saved in the user's profile during an application session, such as window sizes and positions.

Cascade button. Saves the current access restriction and profile settings for the user, and applies the same settings to all users whose profile is based on this user's profile. If a user profile that inherits these settings is also a profile user, all user profiles based on that user's profile inherit the same settings. This process continues for profile users throughout the profile user tree.

Security Allocation

In Security Control, use the Security Allocations window to maintain security restrictions for users or companies.

When you expand the Security Allocations node, the tree view shows the following nodes:

- **Actions:** Codes associated with menu items, toolbar buttons, folder tabs, and other application objects.
- **Containers:** Individual container objects. In a revoke model, if you set security for a container, the menus that launch from that container will automatically be secured. You do not have to secure both the menu and the container, only the container. In a grant model, if you allocate security for a container, the menus that launch from that container will automatically be granted.
- **Data:** Individual records or entire tables.
- **Data ranges:** Ranges of values for a field used to qualify a query.
- **Fields:** Individual database fields.
- **Login companies:** Organizational entities used to specialize the application behavior and appearance.

- Menu items: Individual items or toolbar buttons.
- Menu structures: A group of related menu items, toolbar buttons, or both. (Also referred to as bands).

In a revoke model, you can define restrictions based on an action, a field, or a data range. You can define restrictions for any menu, menu item, or login company. You can also restrict access to specific database tables and records.

In a grant model, you remove restrictions when allocating security to a user. By default, all objects are secured, and you remove security from the objects you want the users to access.

Fig. 2.21
Security Allocation–Actions

Filter. Lets you specify the exact users, groups, and login companies that you want to view in the Details tab folder.

Name. Choose the lookup button to display a list of available users. This field can be blank.

Note If you enter a user name and do not enter a login company, the restrictions apply to the specific user regardless of a login company. If you enter a user name and a login company, the restrictions apply to the user when logged in under the specified login company. If you enter neither a user name nor a login company, the restrictions apply to all users regardless of a login company.

Login Company. Choose the lookup button to display a list of available login companies. This field can be blank.

Note If you enter a login company and do not enter a user name, the restrictions apply to all users who log in under the specified login company. If you enter a login company and a user name, the restrictions apply to the user when logged in under the specified login company. If you enter neither a login company nor a user name, the restrictions apply to all users regardless of a login company.

Rows to Batch. The number of rows to send to the client in each batch. The default value is 100.

Entity (Data node only). The entity mnemonic of the table for which you are defining restrictions. Choose the lookup button to display a list of available entity mnemonic records for application database tables.

Refresh. Retrieves items based on the current user name, login company, and security type settings, and displays them in the browse. Whenever you change any of these settings, choose the Refresh button to repopulate the browse with the appropriate data. Use the Filter tab to narrow the query results that appear in the browse.

Details Tab

In Security Allocation, the Details tab displays a list of available items and a list of items to which security has already been allocated.

Note You need to choose the Refresh button to display these browse lists.

Fig. 2.22
Security Allocation–Actions: Details

The screenshot shows the 'Security Allocation - Actions' window with the 'Details' tab selected. The window is divided into several sections:

- Filter:** Radio buttons for 'Users and Groups', 'Users Only' (selected), and 'Groups Only'. A checkbox for 'All Users' is also present.
- Name:** A text field containing 'admin'.
- Login company:** A dropdown menu showing '<A11>'.
- Rows to batch:** A text field containing '50'.
- Refresh:** A button to refresh the data.
- Allocated to group(s):** An empty text area.
- Available Actions:** A table with two columns: 'Action code' and 'Product module'. It lists various actions like 'add', 'Audit', 'blank', 'Cancel', 'Copy', 'Delete', 'Modify', 'Update Users Based on Profile', and 'View'.
- User specific allocations - Actions:** A table with two columns: 'Action code' and 'Product module'. It is currently empty.
- Object:** A section with radio buttons for 'Revoke access' (selected) and 'Not secured', followed by an 'Apply' button.

Security Inquiry

In Security Control, use the Security Enquiry window to perform queries on the different types of security, so you can check whether objects have been secured, how they have been secured, and why they are or are not secured.

When you expand the Security Inquiry node, the tree view shows the following nodes:

- Actions
- Containers
- Data
- Fields
- Login Companies
- Menu Items

- Menu Structures
- Ranges

Fig. 2.23
Security Inquiry Window

Security Inquiry - Actions

Filter: ☒ Users and Groups ☐ Users Only ☐ Groups Only

☐ All Users and Groups

Name:

Login company: <A11>

Refresh

Allocated to group(s)

Details | Filter

Show: ☒ All ☐ Secured only ☐ Unsecured only

Action code	Product module	Object filename	Instance attribute	Secured	Reason
add	All	All	All	No	No security allocated
add	af-cod2	gsmusobjcw	All	No	No security allocated
add	af-cod2	gsmustol2w	All	No	No security allocated
Audit	All	All	All	No	No security allocated
blank	All	All	All	No	No security allocated
Cancel	All	All	All	No	No security allocated
Copy	All	All	All	No	No security allocated

☐ Access revoked ☒ Not secured

Reason secured/not secured

No security allocated

Use the Details tab to display the list of available items and a list of items to which security has already been allocated.

Note You need to choose the Refresh button to display these browse lists.

Use the Filter tab to narrow the query results that appear in the browse on the Details tab by specifying filtering criteria on one or more fields in the query.

Security Processing

In Security Control, expand the Security Processing node; the tree view displays the following single node:

- Group processing.

This window contains a viewer, with a read-only editor that explains what the tool does. It also contains the following fields:

User. Specifies the name of the user you want on which you want to base the new security group.

New Security Group Name. The name for the new security group.

Process. Choose this button to create the new security group.

If you specified a Profile User, the tool creates a new security group with the name that you specified, then it moves all allocations that are common among the Profile user, and all users based on the Profile User, to the new group. The Profile User and all users based on the Profile User, are then linked to the new security group. All allocations that are not common, are left alone.

If you specified a normal use, then the tool moves all allocations from the user you specified to the new security group, and the user is then linked to the new group.

UI Preferences

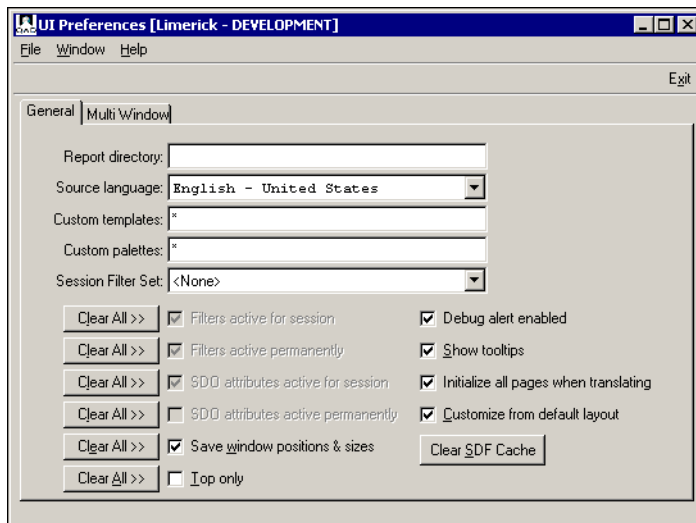
Choose Administration|UI Preferences to display the UI Preferences window.

- General Options
- Multi-Window Options

General Options

In Administration|UI Preferences, set user preferences for Progress Dynamics options.

Fig. 2.24
General UI Preferences



Field Descriptions

Report Directory. The default report directory.

Source Language. The default source language.

Custom Templates. Use this field to enter the name of the master template object to use for a custom template. The default is an asterisk (*) which specifies to include all master template objects. If you blank-out this field, you specify to not use repository templates, but rather the static AppBuilder CST files. This field is directly related to the Custom templates field. If you do not use this field, the custom templates field is also not used.

Custom Palettes. Use this field to enter the name of the master palette object to use for a custom palette. The default is an asterisk (*), which specifies to include all master palette objects. If you blank-out this field, you specify to not use repository files, but rather the static AppBuilder CST (custom) files. This field is directly related to the Custom Palettes field. If you do not use this field, the Custom Palettes field is also not used.

Session Filter Set. Use this combo-box to select a filter set applicable for current the session. The filter set you select determines what data you want to see in the Dynamics user interface. To see all data, including Progress Dynamics Repository data, select the <none> option from the combo-box.

Filters Active for Session. When selected, browse filter settings are discarded at the close of a session. Choose the Clear All button to clear the current filter settings.

Filters Active Permanently. When selected, browse filter settings are retained across sessions. Choose the Clear All button to clear the current filter settings.

SDO Attributes Active for Session. When selected, SDO attribute values are discarded at the close of a session. Choose the Clear All button to clear the current attribute values.

SDO Attributes Active Permanently. When selected, SDO attribute values are retained across sessions. Choose the Clear All button to clear the current attribute values.

Save Window Positions and Sizes. When selected, the position and size of every window you open is saved. Choose the Clear All button to clear the current settings.

Top Only. When selected, the Progress Dynamics Administration window is always displayed on top of all other windows. Choose the Clear All button to clear the current setting.

Debug Alert Enabled. When selected, the Progress DEBUG-ALERT option is enabled for the session. This option lets you access Progress 4GL stack trace information when an error occurs. It also lets you invoke the Progress Debugger.

Show Tooltips. When selected, tooltips are displayed (if defined).

Initialize All Pages When Translating. When selected, ensures the initialization of all pages of a multiple-paged container. Having the pages initialized when you choose File|Translate, before the Translation window starts, ensures that all translatable items are shown in the list of the Translate window.

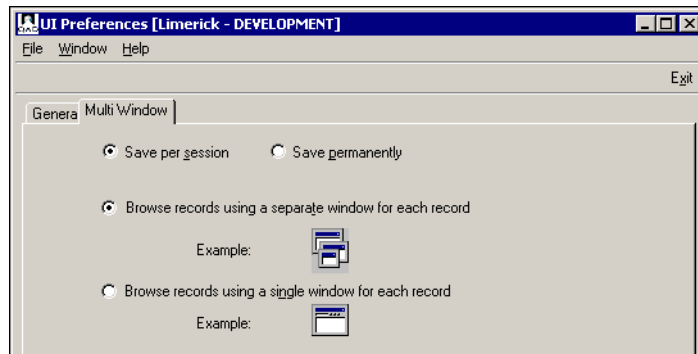
Customize From Default Layout. When selected, specifies to save a new custom layout—that you define using the Custom Layout Selector dialog box—as a set of differences from the default layout. When unchecked, specifies to save a new custom layout as differences from which the custom layout was built. The Custom Layout Selector dialog box will initialize to store newly-defined layouts as changes from the current layout, rather than as changes from the master layout.

Clear SDF Cache. Use this button to clear the SDF (SmartData field) client cache at runtime.

Multi-Window Options

In UI Preferences, use the Multi-Window tab to specify whether browse records are displayed in separate maintenance windows or a single window.

Fig. 2.25
Multi-Window Preferences



Save per Session. Window settings are discarded at the close of a session.

Save Permanently. Window settings are retained across sessions.

Browse records using a separate window for each record. Display browse records in separate maintenance windows.

Browse records using a single window for each record. Display browse records in a single maintenance window.

Base Data

***Setting Up Base Data* 66**

Explains how the Base module is used to set up data.

***Addresses* 66**

Discusses different types of address information, including country codes, postal codes, general addresses, sites, and customers.

***Shipping* 69**

Discusses shipping setup with details on validations, shipping configuration preliminary setup, shipping configurations, and carrier and transport configuration setup.

***Work Patterns* 78**

Explains how to define Shifts and Work Weeks for plant workdays.

***Attributes* 79**

Explains how to use Attribute Maintenance, Attribute Assignment, Copy Attribute Assignment, and Attribute Assignment Review.

***Test and Trace Data* 85**

Discusses how to define tests, assign tests, and assign processing rules.

***Items* 86**

Discusses item numbers, preliminary setup, Item Maintenance, and customer items.

***Packaging* 103**

Explains how JIT/S handles packages with details on multiple-item packages, pre-racking, and package units.

***Work Cells and Assembly Units* 109**

Explains how work cells and assembly units, shippable assembly units, and packaging assembly units are used in a manufacturing environment.

***Shopping List Configuration* 124**

Explains how shopping lists are used and how to manage them with Shopping List Maintenance.

***Product Structures* 125**

Discusses how to use Product Structure Maintenance, Product Structure Copy, Product Structure Component Update, and Product Structure Explosion/Implosion.

***Storage and Retrieval System* 130**

Explains how to set up default data used to support ASRS integration such as area, location, and shelves.

Setting Up Base Data

System administrators use the Base module to set up data that is static to the application and data that is used by other modules.

Information about items as well as most address information in JIT/S is obtained through the integration with the QAD ERP application. The maintenance functions in JIT/S are normally used only to verify data that is imported and add data that is specific to JIT/S. See “Integration with the QAD ERP Application” on page 6.

Note If you use JIT/S programs to make changes to data that originates in the QAD ERP application, your changes may be overwritten the next time data is imported. The base data imported from the QAD ERP application includes customers, ship-to addresses, docks, carriers, items, customer items, and product structures.

Addresses

Information about addresses is brought from the QAD ERP application. The maintenance functions in JIT/S are normally used only to verify data that is imported and to add data that is specific to JIT/S.

Set up countries and postal codes before setting up general addresses. Then set up specific types of addresses (sites, ship-to, docks, carriers) and link them to general addresses.

See *Installation Guide: QAD JIT Sequencing* for details on integration issues specific to address setup.

- Country Codes
- Postal Codes
- General Addresses
- Sites
- Customers

Country Codes

The product provides a country code list. Use Base|Addresses|Shipping|Country Code Maintenance to define the country description, the two- and three-letter ISO acronyms, and the phone prefix. Country is required for Base|Addresses|Shipping|General Address Maintenance and Postal Code Maintenance. In addition, the import of addresses from the QAD ERP application fails if the corresponding country codes are not found. As part of the seed data, most of the usual country codes are already loaded.

Postal Codes

Use Base|Addresses|Shipping|Postal Code Maintenance to enter postal codes for cities in defined countries. During import of address data from the QAD ERP application, postal codes are created if they do not exist. However, country codes must exist in JIT/S.

General Addresses

Address records are linked with ship-to, ship-to dock, customer, site, and carrier records. A record can have one linked address for each of the address types; these are members of the address_type class code: Carrier, Customer, Dock, Ship-To, Site. Class codes are defined in Tools|System Data Tools|Class Code Maintenance.

Choose Base|Addresses/Shipping|General Address Maintenance to enter the address name, address lines, country, postal code, state, phone, fax, Web site, and DUNS number. Countries and postal zip codes must be previously defined.

Fig. 3.1
General Address Maintenance

Selecting the Eliminated option disables the address; that is, any links between the address and a customer, supplier, and so on are broken.

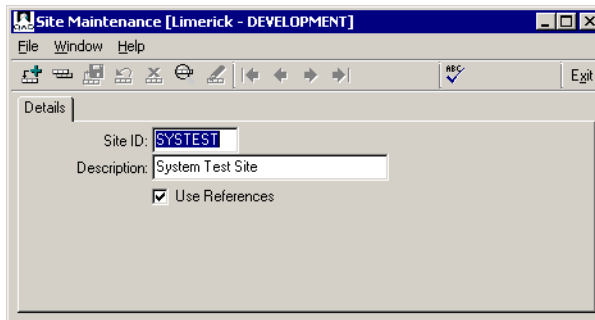
The DUNS number is a unique nine-digit sequence recognized as the universal standard for identifying and keeping track of businesses worldwide. DUNS numbers are issued by Dun & Bradstreet to North American businesses.

Sites

A site is the place where you manufacture items and execute planning and control functions; define it in Base|Addresses/Shipping|Site Maintenance.

Currently, JIT/S supports only a single site. The record is defined upon install. Modify it to reflect the proper QAD ERP application site number. You can modify the values associated with the record, but you cannot create additional records.

Fig. 3.2
Site Maintenance



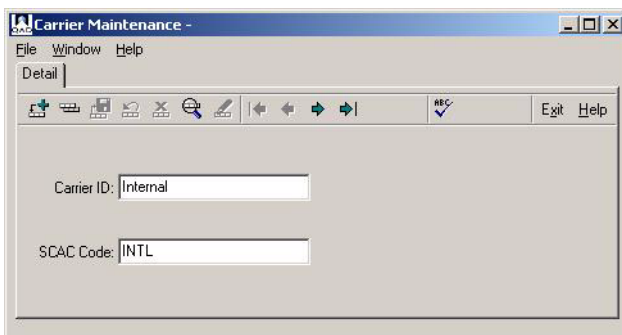
Use References. Select if the application is to use this site as a reference for each inventory transaction associated with the site, such as tracking that a specific airbag went into a specific car.

In the Site Maintenance browse, use Options|Address Assignment to associate addresses with a site ID. A site can have one linked address for each of the address types, which are members of the address_type class code: Carrier, Customer, Dock, Ship-To, Site. Class codes are defined in Tools|System Data Tools|Class Code Maintenance.

Customers

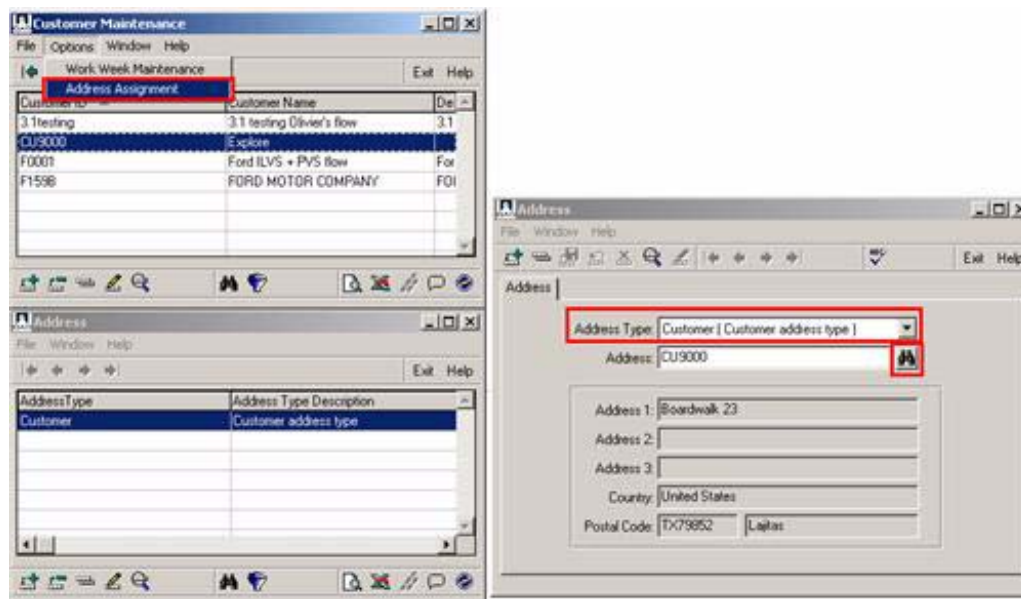
Customer data is usually imported from the QAD ERP application. Use Base|Addresses/Shipping|Customer Maintenance to add, delete or modify customer ID, name, and description. In the maintenance screen, select Order Change Logging to capture automatic and manual order status changes. See “Order Status Maintenance” on page 414. View the log in Tools|Logging/Debug Tools|Logging Database Viewer.

Fig. 3.3
Customer Maintenance



A customer can have one linked address for each address type; these are members of the address_type class code: Carrier, Customer, Dock, Ship-To, Site. Class codes are defined in Tools|System Data Tools|Class Code Maintenance.

Fig. 3.4
Customer Maintenance



Shipping

Shipping is a user-driven process to:

- Define shipping and carrier parameters.
- Create bills of lading and packing slips.
- Validate all aspects of shipments.
- Finalize shipments; print packing slips and bills of lading (BOL).

Shipping activity often varies depending on the production method being used, the requirements of the specific customer ship-to ID, and the requirements of the ship-from site. Configure shipments based on these three parameters by defining shipping configuration records.

Validations are implemented as rule groups; up to three rule groups can be defined with each shipping configuration. Specify the validations that the system should execute when:

- A shipment is created.
- A package is added to the shipment.
- A shipment is finalized.

You can set up shipping groups, which inform the system about which finished goods items can be combined on a single packing slip. Finally, you can define carriers and set up data used to configure shipments.

Shipments are built in Operations|Packaging|Shipping|Shipping Workbench, and finalized shipments are displayed in Operations|Packaging|Shipping|Finalized Shipment Viewer. See “Shipping Workbench” on page 334.

The following sections cover shipping setup:

- Validations

- Shipping Configuration Preliminary Setup
- Shipping Configurations
- Carrier and Transport Configuration Setup

Validations

Rule groups specified in the shipping configuration can perform validations during shipment creation, when adding a package to a shipment, and when finalizing a shipment:

- When creating a shipment, validations run prior to creating a new packing slip. The shipping group and shipping configuration must be valid, the customer for the shipping configuration must match the customer on the BOL, the shipping group must be assigned to the shipping configuration, and the shipment must not be finalized.
- When adding a package to a shipment, validations run prior to adding the package. These validations can verify that each package is shippable and not on another shipment, the customer matches the customer on the BOL, the work orders are complete, and the packages are scanned into the shipment in sequence order.
- When finalizing a shipment, validations run for each packing slip prior to closing the BOL. Based on the associated assembly orders, each package is checked for a continuous set of sequences taking into account any approved sequence gaps. There are also checks that the first sequence on a shipment has no previous shipment that has not been finalized.

To ensure proper and complete shipments, validations can vary by all parameters of the shipping configuration and the finished good being shipped. The create and finalize validations are parameters of the shipping configuration; the package validations are attributes of the package unit. See “Shipping Configurations” on page 73.

Shipping Configuration Preliminary Setup

The shipping configuration defines various shipment parameters including production method, customer, ship-to, ship-from, document templates, validation rules, and shipping groups. The members of shipping groups are packaging assembly units or shippable assembly units.

Complete the tasks in this section; then go to “Shipping Configurations” on page 73.

The following are required for setting up shipping configurations:

- Ship-From Addresses
- Ship-To and Ship-To Dock Addresses
- Shipping Groups
- Rules and rule groups for validations: Setting Up Rules and Rule Groups
- Document templates for BOLs and packing slips: Document Format Maintenance

Ship-From Addresses

Use Base|Addresses|Shipping|Ship-From Maintenance to modify the ship-from address. Only one ship-from is allowed in JIT/S.

Enter a ship-from ID and description. Select the site ID defined in Base|Addresses/Shipping|Site Maintenance; this displays the site description as well. The ID must match the ID in the ERP system, or the shippers will not load.

Fig. 3.5
Ship-From Maintenance

Ship-To and Ship-To Dock Addresses

Ship-to and ship-to dock records are imported from the QAD ERP application. Use Base|Addresses/Shipping|Ship-To Maintenance to modify ship-to records.

Fig. 3.6
Ship-To Maintenance

Ship-To ID. Enter an ID for the ship-to record. The ID must match the ship-to record in the ERP system, or the shippers will not load.

Customer Ship-To ID. Enter the ID the customer uses in broadcast messages to identify themselves. This value provides a cross-reference link between the ID you use for the customer and the ID the customer uses.

Customer ID. Select a customer ID from those defined in Base|Addresses/Shipping|Customer Maintenance.

Supplier Code. Enter the ID that the customer uses to refer to your company as a supplier.

In the Ship-To Maintenance browse, use Options|Address Assignment to associate addresses with a ship-to ID. A ship-to can have one linked address for each of the address types, which are members of the address_type class code: Carrier, Customer, Dock, Ship-To, Site. Class codes are defined in Tools|System Data Tools|Class Code Maintenance.

Use Base|Addresses/Shipping|Ship-To Dock Maintenance to modify ship-to dock records. Ship-to docks provide one or more alternative receiving dock destinations for a customer ship-to.

Fig. 3.7
Ship-To Dock Maintenance

Ship-To ID. Select a ship-to record to associate with the ship-to dock. Ship-to IDs are defined in Base|Addresses/Shipping|Ship-To Maintenance.

Dock ID. Enter an ID for the ship-to dock.

Dealer Number Required on Shipment. Select if a dealer number is required on the shipping record when shipping to any of the addresses associated with this ship-to dock.

In the Ship-To Dock Maintenance browse, use Options|Address Assignment to associate addresses with a ship-to dock ID. A ship-to dock can have one linked address for each of the address types, which are members of the address_type class code: Carrier, Customer, Dock, Ship-To, Site. Class codes are defined in Tools|System Data Tools|Class Code Maintenance.

Note Ship-to docks that were deleted in the QAD ERP application must be manually deleted in JIT/S.

Shipping Groups

Shipping groups are made up of either packaging assembly units (PAU) or shippable assembly units (SAU). The groups are assigned to shipping configurations. Shipping configurations are associated with bills of lading; the shipping group assigned to the shipping configuration specifies what type of content can be added to the bill of lading. Shipping groups also specify which orders or packages can be added to a packing slip.

When shipping a group made up of SAUs, the Pack status for relevant work orders is set to Shipped although the orders were not packaged. See “Shippable Assembly Units” on page 119 and “Packaging Assembly Units” on page 120.

Use Base|Addresses/Shipping|Shipping Group Maintenance to define an ID for a group of one or more packaging or shippable assembly units.

Fig. 3.8
Shipping Group Maintenance

Choose Options|Packaging AU Assignment or Shippable AU Assignment to view and update the members of the shipping group.

Fig. 3.9
Packaging AU Assignment

Shipping Configurations

Shipping configuration records determine the format of the bill of lading, master bill of lading, and packing slips generated for shipments between a ship-to and a ship-from address pair. They also specify the rule group that performs the validation when the shipment is finalized.

Shipping configurations must be defined before importing sales orders. When an order processor is processing an order from a broadcast, it validates that a sales order line with an assigned shipping configuration exists for each item. See “Sales Order Maintenance” on page 396.

Use Base|Addresses|Shipping|Shipping Configuration Maintenance to create and modify shipping configuration parameters that control how finished goods are shipped from the ship-from ID to a specific ship-to ID or ship-to dock ID. Shipping configurations are unique for combinations of Ship-To, Ship-From, Production Method, and Content Type. Some of these default settings can be updated from Operations|Packaging|Shipping|Shipping Workbench.

Use Options|Shipping Groups Assignment to link shipping groups to shipping configuration records. For each configuration/shipping group pair, there can be a packing slip on the bill of lading. See “Shipping Group Assignment” on page 76 and “Shipments and Packing Slips” on page 336.

Shipping Configuration Setup

Once the preliminary setup tasks are complete, set up the shipping configuration records in Base|Addresses/Shipping|Shipping Configuration Maint.

Fig. 3.10
Shipping Configuration Maintenance

The screenshot shows the 'Shipping Configuration Maintenance' window. The fields are as follows:

- ID: BCT3 matrix
- Description: BCT3 Shipping Matrix
- Ship-From ID: SYSTEST
- Ship-To: FORD-01
- Customer: FORD
- Production Method: sequenced (Sequenced Production)
- MBOL Format ID: MBOL
- BOL Format ID: BOL
- Packing Slip Format ID: PackingSlip
- Finalize Validations: Shipping finalization validation
- Printer ID: Label Printer (Test Lab)
- Content Type: packaging au
- Reverse Load: ☐
- Reportable: ☒
- Report Manually: ☐
- Validate Orders: ☒

Field Descriptions

ID. Enter an ID to uniquely identify the shipping configuration record.

Ship-From ID. Select the ship-from record defined in Base|Addresses/Shipping|Ship-From Maintenance.

Ship-To. Select from the ship-to records associated with the customer.

Customer. This field displays the customer ID linked to the ship-to ID in Base|Addresses/Shipping|Ship-To Maintenance.

Production Method. Select a value from the members of the production_method class defined in Tools|System Data Tools|Class Code Maintenance. Currently, the only supported production method is sequenced.

Note During the import of items from the QAD ERP application, a default production method is found by using the salesOrder.production_method setting in QAD ERP Parameter Maintenance—by default, sequenced. See “QAD ERP Parameter Maintenance” on page 139.

MBOL Format ID. Optionally, enter the ID of the document format created in Setup|Labels/Documents|Document Format Maintenance where the format type is MBOL, master bill of lading. If the format is specified, it determines the content and layout of an MBOL printed at shipment finalization. See “Document Format Maintenance” on page 192.

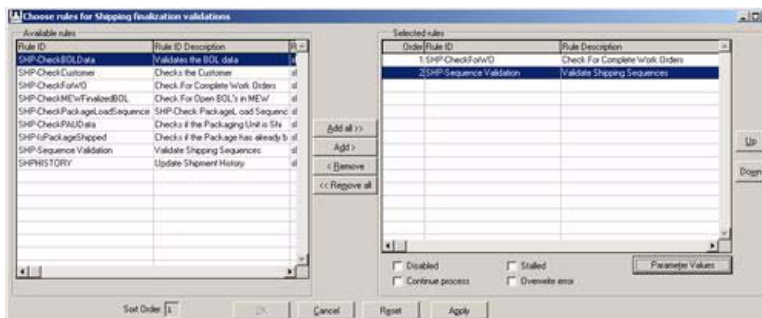
BOL Format ID. Optionally, enter the ID of a document format created in Setup|Labels/Documents|Document Format Maintenance where the format type is BOL. If the format is specified, it determines the content and layout of a BOL printed at shipment finalization.

Packing Slip Format ID. Optionally, enter the ID of a document format created in Setup|Labels/Documents|Document Format Maintenance where the format type is PACKING_SLIP. If the format is specified, it determines the content and layout of a printed packing slips at shipment finalization.

Finalize Validations. Optionally, select an appropriate rule group from the drop-down list. The system uses the rules in this rule group to perform validations when a shipment containing items in the shipping group associated with the configuration record is finalized.

The following is an example of standard finalization rule set checking for Work Order completeness and sequence validation.

Fig. 3.11
Work Order Completeness and Sequence Validation



Printer ID. Enter the ID of a printer defined in Setup|Printers|Printer Maintenance. The paper size associated with the printer must match the paper size associated with the MBOL, BOL, and packing slip formats.

Content Type. This read-only field indicates whether the shipping groups assigned to this configuration have packaging assembly unit or shippable assembly unit members. This field does not populate until after the shipping groups are assigned and the window is refreshed, such as when exiting and reentering.

Reverse Load. Select to have the shipment loaded in reverse sequence order.

Reportable. Select to indicate that BOLs created for this configuration are used only to generate shipping documentation.

Report Manually. Select to indicate that shipments of BOLs created for this configuration are reported manually. This is relevant to only BOLs created in the Shipping Workbench. When clear, JIT/S automatically reports shipments of BOLs created for this configuration. BOLs created by adding orders to a BOL in Work Order Status can be reported only manually. This check box is enabled only when Reportable is selected.

Validate Orders. Select to indicate that orders added to BOLs created for this configuration are validated during shipment finalization to ensure that Pack status is Shipped. This applies only to BOLs created through the Shipping Workbench and is only enabled when Reportable is selected.

The content type for the assigned shipping group must be PackagingAU.

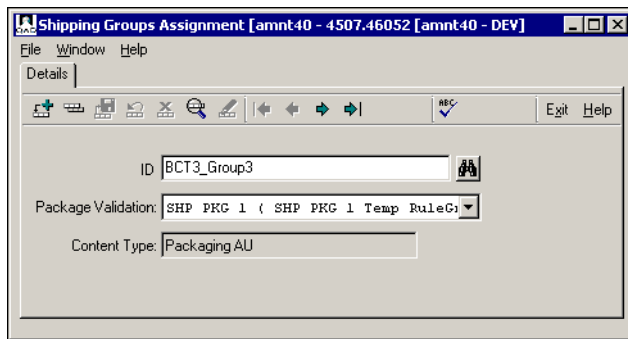
Shipping Group Assignment

In Base|Addresses|Shipping|Shipping Configuration Maint, choose Options|Shipping Groups Assignment to assign shipping groups to shipping configuration records. Each configuration can have multiple shipping groups assigned to it. This allows for multiple packing slips under one BOL. The content type indicates whether the shipping group is made up of packaging assembly units (PAU) or shippable assembly units (SAU).

Assign shipping groups of SAUs to those configurations that are to be used for reporting purposes only.

Assign shipping groups of PAUs to those configurations that are used for building shipments in the Shipping Workbench. Also, specify the rule group that the system uses to perform validations when a package is added to a shipment.

Fig. 3.12
Shipping Groups Assignment



Carrier and Transport Configuration Setup

Carriers are specified by ID when creating a bill of lading in Operations|Packaging|Shipping|Shipping Workbench.

Carrier parameters include ship-from, ship-to, carrier SCAC code, route type, transportation mode, and payment terms.

Carrier data—including Standard Carrier Alpha code (SCAC) IDs and transport modes—is usually imported from the QAD ERP application. In North America, the SCAC ID issued by National Motor Freight Traffic Association is unique to a carrier. It is recognized for use in ANSI X12 and United Nations EDIFACT EDI transaction sets.

Transport configurations hold the detail information for shipping under various circumstances such as different payment terms.

Carrier Maintenance

Carriers are usually imported from the QAD ERP application; use Base|Addresses|Shipping|Carrier Maintenance to modify carrier records.

Specify an ID and SCAC ID for each carrier. There is a one-to-one relationship between carrier and SCAC IDs, but there can be multiple transport configuration records for each carrier/SCAC ID.

Fig. 3.13
Carrier Maintenance

Carrier ID. Enter an ID to use for the carrier. This must match the ID loaded in the ERP system.

SCAC ID. Enter the Standard Carrier Alpha Code for the carrier. This is a unique two-to-four-letter code used to identify transportation companies.

In the Carrier Maintenance browse, use Options|Address Assignment to associate addresses with a carrier ID. A carrier can have one linked address for each of the address types, which are members of the address_type class code: Carrier, Customer, Dock, Ship-To, Site. Class codes are defined in Tools|System Data Tools|Class Code Maintenance.

Note Carriers that were deleted in the QAD ERP application must be manually deleted in JIT/S. Carriers cannot be deleted if they are referenced on any shipment.

Transport Configurations

Use Base|Addresses/Shipping|Transport Configuration Maint to create and modify transport configurations. Route Type, Transportation Mode, and Freight Payment Terms are classes; use Tools|System Data Tools|Class Code Maintenance to define members for these classes.

You can define multiple transport configuration records for each SCAC ID; for example, a carrier—represented by an SCAC ID—can have both primary and secondary route type records.

Note Transport configurations cannot be deleted if they are referenced on any shipment.

Fig. 3.14
Transport Configuration Maintenance

Ship-From ID. Enter the ship-from ID for the site where the carrier receives the goods.

Ship-To ID. Enter the ship-to ID for the site where the carrier delivers the goods.

Carrier SCAC Code. Enter the Standard Carrier Alpha Code for the carrier. It is a unique two-to-four-letter code used to identify transportation companies.

Route Type. Select from the route types defined as members of the Route Type class.

Transportation Mode. Select from the modes defined as members of the Transportation Mode class. Transportation mode represents the method of shipment, such as truck or van.

Freight Payment Terms. Select from the payment terms defined as members of the Freight Payment Terms class. Payment terms can be printed on the shipping documents.

Work Patterns

Note This is legacy feature. It is described here for informational purposes.

Define Shifts and Work Weeks for each work day for your plant.

Shifts

Use Base|Work Patterns|Shift Maintenance to define and modify work shifts.

Specify the hours, sequence, and maximum product capacity for work shifts in Shift Maintenance; then assign shifts to work week days in Base|Work Patterns|Work Week Maintenance.

Fig. 3.15
Shift Maintenance

Shift. Enter an ID for the shift.

Shift Day. Enter a number representing the day of the week that the shift is used, from 1 for Monday to 7 for Sunday.

Shift Sequence. Enter the sequence number for this shift relative to the other shifts assigned to the same shift day.

Start Hour, Stop Hour. Using the 24-hour clock, enter the start and stop hours for the shift. For example, 8 AM to 4 PM is 08:00 to 16:00.

Max Capacity. Enter the maximum number of items that can be produced during the shift.

Work Weeks

Use Base|Work Patterns|Work Week Maintenance to specify the number of work days and shifts in your work week.

Note Shift definitions include the day that they are assigned to and the sequence among the shifts assigned to that day.

Fig. 3.16
Work Week Maintenance

Shifts / day	
Mon	☒ 1
Tue	☒ 1
Wed	☒ 1
Thu	☒ 1
Fri	☒ 1
Sat	☐ 0
Sun	☐ 0

- 1 Select Add Record to activate the Monday-to-Sunday check boxes.
- 2 Select the check boxes for the work week pattern; this activates the Shifts/Day field.
- 3 Enter the number of shifts for each day and choose Save. Define shifts and shift sequence in Base|Work Patterns|Shift Maintenance.

Attributes

Named attributes carry option information about product families, assembly units, work cells, vehicle lines, and items; for example, color is an attribute that can be assigned to an item.

Note Attribute names are assigned to product families, assembly units, vehicle lines, and work cells. Attribute name and value pairs are assigned to items only.

- Attribute Maintenance
- Attribute Assignment
- Copy Attribute Assignments

- Attribute Assignment Review
- Batch Attribute Assignments: Import Attributes

Attribute Maintenance

In Base|Attributes|Attribute Maintenance, define the name and codes for attributes, such as fabricpocketL and fabricpocketR.

Fig. 3.17
Attribute Maintenance

The screenshot shows the 'Attribute Maintenance' window with the title bar 'amnt40 - DEV'. The 'Details' tab is active, displaying the following fields:

- Attribute Name: ASerial
- Description: Airbag Serial Number
- Short Code: AS
- Short Code Length: 2

Note that the Short Code field refers to the length of the short code for the values assigned to this attribute name, and not the short code for the name itself.

Note For product families, be sure to define attribute names that will adequately describe the product family on product orders. See “Product Families” on page 91.

Each named attribute has a defined set of valid values; for example, the attribute color_top might have values such as blue, green, and red.

In the Attribute Maintenance browse, select an attribute, then choose Options|Attribute Value to open the Attribute Value browse and display values for the selected attribute. Click Add Record to define values and specify pictures for the attribute.

Fig. 3.18
Attribute Value

The screenshot shows the 'Attribute Value' window with the title bar 'amnt40 - DEV'. The 'Attribute Value' tab is active, displaying the following fields:

- Attribute Name: Airbag
- Valid Value: No Airbag
- Description: No Airbag
- Primary Picture: Pictogram Heating.bmp
- Secondary Picture:
- Short Code: NA

The Primary and Secondary Pictures display in the Assembly Order Workbench after this setup:

- The attribute name is assigned to the assembly unit.
- Assignment of the attribute to the assembly unit as primary or secondary determines which picture displays.

- Display Attribute Pictures is selected in the workbench defaults for the assembly unit. See “Assembly Unit Workbench Defaults” on page 115.

The default server location for the image files is defined in the `imageDir` parameter in the system configuration file. See *Installation Guide: JIT Sequencing* for details about this file.

In Operations|Assembly Order|Assembly Order Workbench, when an assembly order with the relevant attribute name/value pair opens for the first time, JIT/S copies the picture file from the server to this location on the client:

```
client-root-installation dir\Images\
```

Subsequently, when a picture is needed by the client, it checks first in the client location for the file; if the file is not found there, the client copies it from the server again. To force the client to copy a new version of the picture from the server, delete the version that is on the client.

Attribute Assignment

Use Base|Attributes|Attribute Assignment—or Options|Attribute Assignment in their respective maintenance screens—to assign attribute names to assembly units, product families, vehicle lines, and work cells.

In Base|Items|Item Maintenance, use Options|Attribute Value to assign attribute name and value pairs to an item.

Note You can also assign attributes as a batch using spreadsheets and Tools|System Data Tools|Attribute/Item Import. See “Import Attributes” on page 299.

Select an Assign To, such as assembly unit; choose an instance of the Assign To; then, click Apply Filter to display the available attributes and the attributes that have already been assigned to that instance.

Fig. 3.21
Attribute Assignment, Properties

The screenshot shows a dialog box titled "Assignment Properties". It has the following fields and controls:

- Attribute Name:** A text box containing "17PKGCC".
- Mandatory:** An unchecked checkbox.
- Primary:** A checked checkbox.
- Default value:** A dropdown menu showing "<none>".
- Context:** A list box containing "BroadcastString".
- Buttons:** "OK" and "Cancel" buttons at the bottom.

Mandatory. Select Mandatory if a value for this attribute is required.

For mandatory attributes assigned to product families, the order processor evaluates whether the ordered items associated with the product family have assigned attribute values. For non-mandatory attributes, optionally select a default to use if a value for the attribute is not provided by any of the items associated with the product family. Select this when assigning attributes to the Product Family only.

Primary. Select to indicate that this is a primary attribute; clear to indicate that this is a secondary attribute. This determines display colors for the attribute in the Assembly Order Workbench (AOWB) and whether the attribute is displayed in bold-face type. Select this when assigning attributes to Assembly Units only.

Default Value. If a value for the attribute isn't provided by the order, JIT/S uses this value in processing.

Context. Select one or more contexts for the attribute. Context indicates how the attribute is used; for example, when an attribute with the context DisplayAttributeAsText is assigned to an assembly unit, the AOWB displays the name and value of the attribute when processing orders for that assembly unit.

A class code is defined for each attribute target: AU_context, PF_Context, VL_Context, and WC_Context. The displayed contexts are the valid members of these class codes.

Validate Component. When assigned to an assembly unit, it indicates if an item with this attribute should be scanned and validated at the AOWB associated with the assembly unit.

Display Item. When assigned to an assembly unit, it indicates if an item with this attribute should have its item number displayed on the AOWB associated with the assembly unit.

Record Trace Data. When assigned to an assembly unit, it indicates trace data that should be recorded at the AOWB associated with the assembly unit. Assign the format of the trace data to the item as the attribute value, in the form: prefix, length, suffix; for example, S,4,Z.

Display Attribute as Text. When assigned to an assembly unit, it indicates whether the attribute name and value should be displayed on the AOWB associated with the assembly unit.

Display Attribute as Picture. Displays the attribute picture. See “Attribute Maintenance” on page 80.

Broadcast String. The attribute is part of the broadcast string. The order processor uses attributes assigned to product families with this context to build product order list versions (POLVs). It uses attributes similarly assigned to AUs or SAUs to build work order list versions (WOLVs). Assign to attributes with this context to work cells for attribute-based picking and to vehicle lines for validating attributes within and between associated product families.

Verifiable Test. The attribute is a category of test that will be carried out on the assembly unit; the particular test (test code) is assigned as an attribute value to an item.

During the packaging and shipping processes, the rules from the rule group `Validate_Test_Data` verify that there is a Passed result for each test assigned to assembly units as an attribute with the context `VerifiableTest`.

Non Verifiable Test. The attribute is a category of test that will be carried out on the assembly unit; the particular test (test code) is assigned as an attribute value to an item. The test results are not subject to verification or validation.

Copy Attribute Assignments

In `Base|Attributes|Attribute Assignment`, use `Copy` to copy a set of attribute assignments from one assembly unit, product family, vehicle line, or work cell to another.

In the Attribute Assignment screen, select an assign to and a record to display the attributes assigned to an assembly unit, product family, vehicle line, or work cell. Click `Copy` to open `Copy Attributes`.

Fig. 3.22
Copy Attribute Assignments

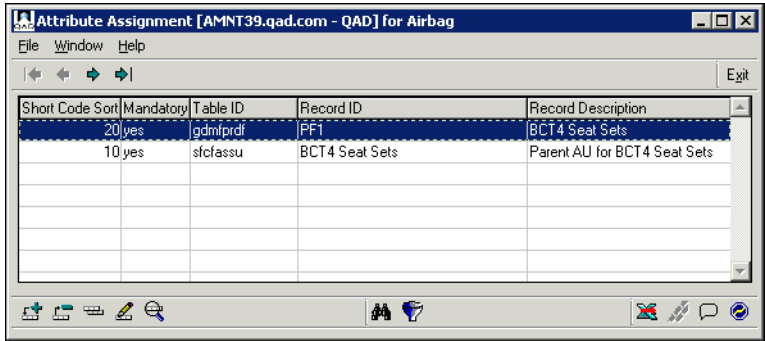
Assembly Unit, Product Family, Vehicle Line, Work Cell. Select the record to receive the copied attribute assignments.

Attribute Assignment Review

Review assignments by attribute name or by attribute value pairs.

To view the work cells, assembly units, vehicle lines, or product families that a defined attribute is linked to, select the attribute in the `Base|Attributes|Attribute Maintenance` browse; then, choose `Options|Attribute Assignment`.

Fig. 3.23
Existing Attribute Assignments



To check where an attribute value is used, in Base|Attributes|Attribute Maintenance, choose Options|Attribute Values. From that browse, select an attribute value; then choose Options|Attribute Value Assignment.

Use Base|Attributes|Attribute Name/Value Browse to review all of the attributes and value pairs that have been set up. Use Options|Attribute Value Assignments to review how a selected value has been assigned. The data in each of these browses can be exported to a spreadsheet.

Test and Trace Data

Functionality tests and traceability data from the shop floor—torque level, lot/serial numbers, and so on—are defined as named attributes for assembly units and as attribute values for items. The resulting data is passed through APIs to JIT/S for processing and validation.

This section covers defining and assigning the tests:

- Define Tests
- Assign Tests
- Assign Processing Rules

For trace and test data operations, see “Trace Data” on page 364.

Define Tests

Use Base|Attributes|Attribute Maintenance to define an attribute for each test category, such as VerifyWire or VerifyAirbag. Use Options|Attribute Value to define the valid values (test codes) for each attribute (test category), such as 50 Ohm test or 75 Ohm test.

Example Group similar tests into a category to use the category as a filter during a selection process. Each test code reflects a different test action.

Test Category	Test Code	Test Action
Verify Wire	200	Verify that the item does not contain wires.
Verify Wire	204	Verify that the item contains 4 wires.
Verify Wire	206	Verify that the item contains 6 wires.

Items with the value 200 for the Verify Wire attribute are tested to verify that they do not contain wires, while those with the values of 204 and 206 are tested to verify that they contain 4 or 6 wires, respectively.

Example Group opposite tests in a category to test successfully for both the presence and absence of an option.

Test Category	Test Code	Comment
Verify Airbag	123	Verify that the item contains an airbag.
Verify Airbag	124	Verify that the item does not contain an airbag.

Items with the value 123 for the Verify Airbag attribute are tested to verify that they *do* contain an airbag, while those with the value 124 are tested to verify that they *do not* contain an airbag. The pair of opposite tests is required so that all items can be tested and pass a test in the category.

Note For categories and codes, click View Audit Records in their respective browses to see a record of user changes.

Assign Tests

Use Options|Attribute Value in Base|Items|Item Maintenance to assign attribute values (specific test codes) to items that are to be tested.

Use Base|Attributes|Attribute Assignment to assign attribute names (test categories) to assembly units. In the Assignment Properties pop-up, set the attribute context to VerifiableTest or NonVerifiableTest. The assembly unit must have an associated packaging assembly unit (PAU) or be below the unit that has the PAU in the assembly unit tree. See “Attribute Assignment” on page 96.

During the packaging and shipping processes, the rules from the rule group Validate_Test_Data verify that there is a Passed result for each test assigned to assembly units as an attribute with the context VerifiableTest.

Assign Processing Rules

On the shop floor, programmable logic controllers (PLC) or other test application systems pass test results and lot trace data to JIT/S. The rules assigned to the VALIDATE_TEST_DATA rule group validate and record the test results or trace data. See “Rule Group Maintenance” on page 145.

Items

This section covers various setup-related topics for items:

- Item Numbers
- Preliminary Setup
- Item Maintenance
- Customer Items

Information about items in JIT/S is obtained through the integration with the QAD ERP application. The item maintenance functions in JIT/S are normally used only to verify data that is imported and to add data that is specific to JIT/S. See *Installation Guide: QAD JIT Sequencing*.

Important A number of codes representing item characteristics are set up in both the QAD ERP application and JIT/S. This includes units of measure, item statuses, item types, and commodity codes. Ensure that the values being imported for these codes from items in the QAD ERP application have also been defined in JIT/S.

Item Numbers

In the automotive industry, many OEMs and tier-one suppliers use product data management systems that require three elements to uniquely identify an item: item ID, revision level, and color ID. For other OEMs and suppliers, an item is uniquely identified by the ID alone. In the QAD ERP application, items are always uniquely identified by ID only.

JIT/S supports these different approaches to identifying items by using independent values for item ID, revision level, and color ID.

Important When JIT/S is installed, the integration components are preconfigured to support the use of item IDs only. If you want to use revision level and color ID, a number of changes must be made to various integration components. You should contact QAD Support Services regarding these kinds of changes.

During system implementation, you specify your item numbering approach in four ways for use by various integration components:

- Define settings in the system configuration file, `config.xml`, that determine how JIT/S item-related maintenance screens validate and display items and how items display on the Assembly Order Workbench.
- Define parameters for the `EDInboundParseItems` rule that the Message Manager uses during import of item-related data from the QAD ERP application.
- Define the Message Manager transformation to use when sending production reporting messages to the QAD ERP application.
- Configure the EDI eCommerce transformation in the QAD ERP application to manage the item-related data it receives in shipment messages.

Since item data is shared between JIT/S and the QAD ERP application, you must decide during implementation what kind of item number scheme you want to use. If you choose to implement an item number scheme that uses three elements in JIT/S, you must set up item numbers in the QAD ERP application to combine those elements. The Message Manager can then separate the QAD ERP application item number into its elements when data is received into JIT/S. Correspondingly, the elements in JIT/S can be concatenated into a single value when information is sent from JIT/S to the QAD ERP application.

Installation Guide: QAD JIT Sequencing contains complete details on setting up the integration components when only item IDs are being used. To implement other naming schemas, contact QAD Support Services.

EDInboundParseItems and config.xml

EDInboundAPI is the Message Manager gateway rule group for processing inbound messages. In this rule group, the `EDInboundParseItems` rule parameters specify the format for item numbers and the default color code and revision level. Use `Setup|Processes|Rule Group Maintenance` to set these parameters for the item numbers.

Format. This parameter defines the format for the item numbers:

- P Only the item ID is used in the item number. This is the default.
- P-C Item ID and color code ID are used.
- P-R Item ID and revision level are used.
- P-C-R Item ID, color code ID, and revision level are used.

DefaultColorCode. This is the default color code for items if it is not specified in the incoming file. The default is –.

DefaultRevisionLevel. This is the default revision level for the items if it is not specified in the incoming file. The default is –.

Set the format and default color and revision levels as well as other item parameters in the `partDisplayConfig` section of the system configuration file, `config.xml`. This information is used by JIT/S to determine how to display item data in maintenance screens and the Assembly Order Workbench.

Table 3.1
Item Format in config.xml

Parameter	Default	Description
useColor	No	No: JIT/S displays the default color value in all color fields and disables the color fields on all maintenance screens as well as the Add, Delete, and Copy functions in Base Items Color Code Maintenance. The Modify function remains enabled. Colors do not display in Assembly Order Workbench. Yes: You can create color codes in Color Code Maintenance. You must specify a color code when creating items in Item Maintenance. Color codes are displayed in Assembly Order Workbench.
colorlength	3	This is the length for fixed-length color elements. This setting is ignored when usedelimiter is Yes.
useRevision	No	No: JIT/S displays the default revision value in all revision fields and disables the revision fields on all maintenance screens as well as the Add, Delete, and Copy functions in Base Items Revision Level Maintenance. The Modify function remains enabled. Revisions do not display in Assembly Order Workbench. Yes: You can create revision codes in Revision Level Maintenance. You must specify a revision level when creating items in Item Maintenance. Revision levels are displayed in Assembly Order Workbench.
revisionlength	2	This is the length for fixed-length revision level elements. This setting is ignored when usedelimiter is Yes.
partidlength	18	This is the default length for fixed-length item ID elements. This setting is ignored when usedelimiter is Yes.

Parameter	Default	Description
usedelimiter	Yes	No: The elements that make up the item number are fixed length. When items are created in Item Maintenance, the system validates lengths of the item elements against the values for partidlength, colorlength, and revisionlength. Yes: The elements that make up the item number are variable length. When items are created in Item Maintenance, the system validates that the sum of all the elements making up the item number is less than or equal to the value of totaldelimitedlength. If only the item ID element is being used, it must be less than or equal to the totaldelimitedlength.
totaldelimitedlength	25	This is the total delimited length of all elements that make up variable-length items. If you are using only variable-length item IDs, this is the maximum item length.
defaultcolor	–	This is the default value for color ID when useColor is No.
defaultrevision	–	This is the default value for revision level ID when useRevision is No.
defaultdelimiter	-	This is the delimiter that is used to separate item elements when displaying them on the Assembly Order Workbench.

Setup Scenarios

The Message Manager is preconfigured to support the following scenario:

- Only the item ID element is used in both JIT/S and the QAD ERP application.
- The item ID is either fixed or variable in length.
- Default values are supplied for color and revision level in JIT/S.

Other scenarios are possible. For example, in JIT/S, you could use only item ID and color or only item ID and revision to identify items. Or your QAD ERP application item numbers could be combined based on item, color, and revision rather than item, revision, and color.

If you need to support a variation of the basic scenario outlined here, configuration and setup changes are required. QAD Support Services can be engaged to perform these customizations. The integration setup documentation assumes you are using the supported scenario.

Setup and JIT/S Maintenance Functions

The settings in `config.xml` that define an item number scheme are validated when you create or update records in Color Code Maintenance, Revision Level Maintenance, and Item Maintenance.

Color Code Maintenance

When you use Color Code Maintenance—see “Color Codes” on page 91—the system ensures that:

- For a fixed-length item number scheme, the color code length matches the color length specified in the system configuration file.

- If the scheme is not using color code, users cannot add, delete, or copy records. Modify remains enabled.
- If the default color record is modified, the color code ID matches the default color setting in the system configuration file.

Revision Level Maintenance

When you use Revision Level Maintenance—see “Revision Levels” on page 91—the system ensures that:

- For a fixed-length scheme, the revision level length matches the revision length specified in the system configuration file.
- If the scheme is not using revision level, users cannot add, delete, or copy records. Modify remains enabled.
- If the default revision level record is modified, the revision level ID matches the default revision setting in the system configuration file.

Item Maintenance

When a new item is manually created—see “Item Maintenance” on page 94—the system takes these actions:

- Disables the color code and revision level fields if these elements are not used in the item number scheme and displays the appropriate default values defined in the system configuration file.
- For a delimited scheme, ensures that the value of the sum of the individual element sizes and the delimiter length does not exceed the setting for total delimited length in the system configuration file.
- For a fixed-length scheme, validates that the item ID length matches the length specified for the item ID in the system configuration file.
- If you are using only the item ID and it is defined as variable, the system validates that it is not longer than the total delimited length specified in the system configuration file.

Preliminary Setup

Before defining items, you must set up various codes that are used in the definition of items, including:

- Units of Measure
- Color Codes
- Color Relationships
- Revision Levels
- Product Families
- Item Types
- Item Statuses
- Vehicle Line Maintenance
- Commodities

Units of Measure

A default list of units of measure is installed. This list can be used, deleted, or modified as needed. In Base|Items|Unit of Measure Maintenance, define the units of measure needed for all items. Enter a code for the unit of measure, such as kg, and a description. Assign each item a unit of measure in Base|Items|Item Maintenance.

Note Ensure that the unit of measure values associated with items being imported from the QAD ERP application exist in JIT/S as well. Always ensure that any manually set up IDs match those in your ERP system.

Color Codes

Use Base|Items|Color Code Maintenance to define and modify color codes and their descriptions.

Color code is one of three possible elements—item ID, revision level ID, and color ID—of item numbers imported into or exported from JIT/S. In JIT/S, these are independent elements. Settings in the system configuration file determine how color and revision level are validated in maintenance functions. See “Item Numbers” on page 87.

As required, assign items a color code in Base|Items|Item Maintenance. The color code assigned to a finished goods item can have an attached list of the commodities associated with the finished good, such as metal or plastics, and the colors assigned to them.

In Color Code Maintenance, select a color; then choose Options|Color Matrix to display the linked commodities and the colors assigned to them. Use New Record to link additional commodity/color code combinations to the finished goods color code.

Color Relationships

Set up color relationships for finished goods (FG) and their components in Base|Items|Color Relationship Maint. Select a color code ID for the FG field and for the Component field, then save the record.

Revision Levels

Use Base|Items|Revision Level Maintenance to manually define or modify revision levels and their descriptions. Update item revision levels in Base|Items|Item Maintenance.

Revision level is one of three possible elements—item ID, revision level ID, color ID—of item numbers imported into or exported from JIT/S. In JIT/S, these are independent elements. Settings in the system configuration file determine how color and revision level are validated in maintenance functions. See “Item Numbers” on page 87.

Product Families

For sequenced order environments, product families (PF) combine multiple item numbers to form a final item; for example, a complete seat set. PFs are set up to reflect the specific production or packaging requirements of the plant or the customer.

For batch order environments, PFs typically hold only one item number.

Product Family Maintenance

In Base|Items|Product Family Maintenance, enter a name and description for the PF, then select other values:

- Select Order Change Logging to capture automatic and manual order status changes; see “Order Status Maintenance” on page 414. View the log in Tools|Logging/Debug Tools|Logging Database Viewer.
- Select Create POLV/WOLV to create a new version of an existing list when the attributes on the order remain the same but the parts list changes and to create a new list version ID only when the attributes change. This is the default.

Clear the check box to create a new list version ID each time that either the attributes or the parts list changes.

Product Families, Assembly Units, and Items

Assign each item a PF in Base|Items|Item Maintenance. Define an assembly unit (AU) tree for each PF in Base|Work Cell/Assembly Unit|Assembly Unit Tree Maint; see “Work Cells and Assembly Units” on page 109.

Grouping items into PFs combines the list of attribute name/value pairs attached to each item into a general attribute list—product family order list version (POLV)—that holds all of the information at the PF level. Attributes assigned to any AU node of an AU tree must also be assigned to the PF linked to the AU tree.

Use Options|Data Verification Tests to check that the data for PFs is set up correctly. This test is a rule defined as a member of the rule group PGF_VERIFICATION_TESTS. Optionally, define additional tests and assign them as rules to the rule group.

Rule Name	Description
Verify Attribute Names on AU	Verify that the attributes assigned to an AU node of an AU tree are also assigned to the product family linked to that AU tree.

Select one or more tests in the left browse; then, click Launch Tests. The results display in the browse on the right. See “Verification Tests for the Setup” on page 20.

Important The tests should not be running while the plant is in operation; they should be used only during setup and maintenance—preventative, troubleshooting—periods.

Product Family Orders

In response to demand from customers, an order processor creates a product family order for each PF on a customer order. See “Vehicle Line Maintenance” on page 93 for information on validations based on attribute assignments and across-PF attribute value checking.

When a customer order is canceled and the status is not beyond the value for the pointOfNoReturn parameter for the OPCancelOrder rule, packaging options—rerack, empty scan—for the orders are determined by the remaining parameters:

- The order processor sets the Empty Scan Required field on the PF order when the PF is one of the values in the EmptySlotPGFs parameter and process status for the order is set to one of the values for the parameter EmptySlotOrderStatus.

At the Packaging Workbench, a scan of an empty slot code is required for these orders. Clearing the Empty Scan Required field on the PF order if the orders are pre-racked, leads to an error during packaging. If the orders are not pre-racked, the Empty Scan Required field can be cleared without triggering a sequence validation error when packaging.

- When the PF is one of the values in the RerackPGFs parameter and the process status for the order is set to one of the values for the parameter RerackOrderStatus, the package for the order must be reracked and the Empty Scan Required field on the PF order is cleared.

Item Types

Define item type names and descriptions in Base|Items|Item Type Maintenance. Assign each item an item type in Base|Items|Item Maintenance.

- FINGOOD is finished goods.
- COMP is component or lower-level assembly item.
- RAW is raw materials.

Note Ensure that the item type codes associated with items being imported from the QAD ERP application exist in JIT/S as well. Always ensure that any manually set up IDs match those in your ERP system.

Item Statuses

In Base|Items|Item Status Maintenance, enter the item status names and descriptions. Assign each item an item status in Base|Items|Item Maintenance.

- A is active.
- I is inactive.
- O is obsolete.
- P is prototype.

Note Ensure that the item status values associated with items being imported from the QAD ERP application exist in JIT/S as well. Always ensure that any manually set up IDs match those in your ERP system.

Vehicle Line Maintenance

Use Base|Items|Vehicle Line Maintenance to define vehicle line IDs and descriptions. Vehicle lines are the basis for validations on the COVH and, when assigned to items, can be used in user-defined reports.

Vehicle Lines on the COVH

When creating a customer order, the order processor rule, OPValidateVehicleLine, verifies that the vehicle line on a COVH has been defined in JIT/S. When a vehicle line is not specified on the COVH and OPValidateVehicleLine has the defaultVehicleLine parameter, the order processor uses the value for that parameter as the vehicle line on the customer order.

Use Options|Attribute Assignment to assign attributes to vehicle lines. The Mandatory setting in the Assignment Properties pop-up screen determines how vehicle line attributes are used by the order processor. See “Attribute Assignment” on page 81.

The order processor rule OPValidateAttributes uses those assigned attributes for two validations:

- Are the product families required for the vehicle line present: The value for the vehicleLines parameter is a comma-separated list. The rule validates that for each mandatory attribute assigned to a vehicle line on the parameter list, a product family with the same attribute exists. The attribute for each product family should be unique to the product family.

Example The value for vehicleLines is: Ford, Mercury, Lincoln. The Ford vehicle line has Carpet and Electrical assigned as mandatory attributes. Based on the vehicleLines parameter and assigned attributes, OPValidateAttributes validates that there is a product family with each of those attributes on the order for the vehicle line.

- Are the attribute values the same across product families for a vehicle line: The validateAcrossPF parameter validates that for each non-mandatory attribute assigned to the vehicle line, each product family with that attribute assigned has the same value for the attribute.

Example The attribute Color is assigned as a non-mandatory attribute to the vehicle line. Of the three product families for the vehicle line, two—seats and carpets—have the attribute Color. Based on the validateAcrossPF parameter and the assigned attributes, OPValidateAttributes validates that seats and carpets have the same value for Color.

Reports on Items

To use vehicle line in user-defined reports on items and a particular car model, such as purchased items and finished goods, assign a vehicle line to each item in Base|Items|Item Maintenance. This use of vehicle line is independent of the use of vehicle line by the order processor for COVH validations.

Commodities

In Base|Items|Commodity Maintenance, enter the commodity code and description for all commodities—headrests, foam, metal, covers, and so on—needed for your items. Assign commodity codes in Base|Items|Item Maintenance.

Note Ensure that the commodity values associated with items being imported from the QAD ERP application exist in JIT/S as well. Always ensure that any manually set up IDs match those in your ERP system.

Item Maintenance

Although the goal is to have all item data imported from the QAD ERP application, it is possible to manually create records. Settings in the system configuration file determine whether the item numbers include color ID and revision elements, or are item IDs alone. If color and revision elements are included, the system configuration file also specifies whether the elements—item ID, revision level, and color ID—are fixed length or if they are variable in length and delimiter-separated. See “Item Numbers” on page 87.

- Attribute Assignment

- Shippable AU Assignment
- Item Verification Tests

Use Base|Items|Item Maintenance to modify items. Select a record; then click Modify Record to open it for update.

Fig. 3.24
Item Maintenance

Field Descriptions

Color Code, Revision Level. These fields are enabled when useColor and useRevision are set to Yes in config.xml, which is defined during installation. If these elements are set to No in config.xml, the fields are disabled and the item number elements are assigned the default values—defaultcolor, defaultrevision—defined in config.xml. See “Item Numbers” on page 87.

Item Lot Size. This is the number of items per lot; it is the default size for batch production.

Purchase/Manufacture Code. The Purchase/Manufacture Code is used by the backflush and scrapping functions. If these codes are incorrect, the functions may not work properly. Enter the purchase/manufacture code for this item:

- P Purchased items
- M Manufactured items
- R Routable manufactured items
- C Configurable to a customer order
- F Product family

Net Weight. Enter the net weight per unit for this item. This is used for freight charge calculations.

Net Weight Unit. Enter the unit of weight for the item, such as kg. Add new net weight units in Base|Items|Unit of Measure Maintenance.

Container. Select to indicate that this item is a container and eligible to be further defined as a package unit in Base|Packaging|Package Unit Maintenance. See “Package Units” on page 106.

Default Customer Item ID. Enter the corresponding customer item number. This field is used during the automatic creation of sales order detail records. Automatic creation of sales order details applies to situations where the plant has only one customer.

Percent Manufactured. Enter the percentage of the item manufactured in-house. When this is not 100%, the remainder is purchased. This percentage is used to reconcile the total costs of a finished good. It also affects the production schedule.

Date Creation. Enter the system date for the day the item was added.

Date Modified. Enter the last modification date of this item.

Date Started. Enter the date the item was activated for use. No transactions are possible before this date. Not in use.

Date Expired. Enter the expiration date of this item. No transactions are possible after this date and the item is not visible on the product family order workbench. Not in use.

Note ABC Class, Broadcast String, Drawing Number, Item Manufacturing Time, Lot/Serial Control, and Phantom are not currently used.

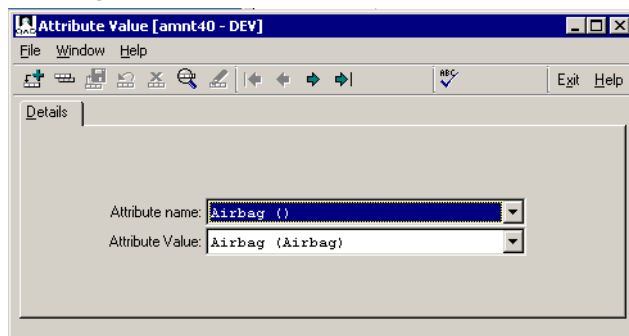
Attribute Assignment

In Base|Items|Item Maintenance, select an item record, then choose Options|Attribute Value to link an attribute name and value pairs to the item.

Note You can also assign attributes as a batch using spreadsheets and Tools|System Data Tools|Attribute/Item Import. See “Import Attributes” on page 299.

Example Use this screen to link test categories (attribute names) and test codes (attribute values) to items for collecting test data. See “Shop Floor Tests and Trace Data” on page 16.

Fig. 3.25
Attribute Assignment



Attribute Name. Select an attribute name to assign to the selected item.

Attribute Value. Select the attribute value. Only those attribute values defined for the selected attribute name in Base|Attributes|Attribute Maintenance are available.

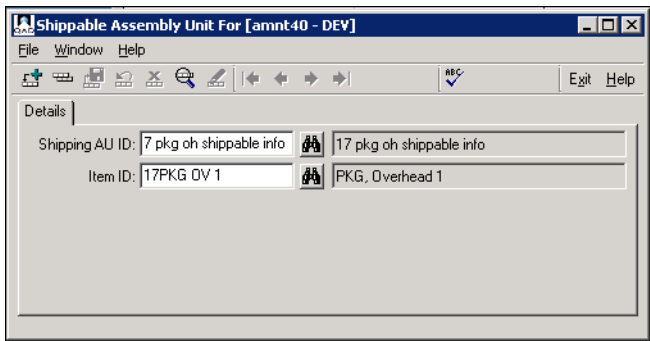
Shippable AU Assignment

In Base|Items|Item Maintenance, select an item record, then choose Options|Shippable AU to link a shippable assembly unit to the item. Multiple Shippable AUs can be added to each item if required.

Define shippable AUs in Base|Work Cell/Assembly Unit|Assembly Unit Tree Maint. See “Shippable Assembly Units” on page 119.

Note You can also assign shippable AUs to items as a batch using spreadsheets and Tools|System Data Tools|Attribute/Item Import. See “Import Attributes” on page 299.

Fig. 3.26
Shippable AU Assignment



Item Verification Tests

In Base|Items|Item Maintenance, use Options|Data Verification Tests to access the tests for items. These tests are rules defined as members of the rule group ITEM_VERIFICATION_TESTS. The rules listed in Table 3.2 are predefined; you can define additional tests and assign them as rules to the rule group. See “Verification Tests for the Setup” on page 20.

Table 3.2
Predefined Rules for Item Verification

Rule Name	Description
Verify Active Status for Item	Verify that the item status is Active.
Verify Attribute Values for Item	Verify that attribute name/value pairs are assigned to the item.
Verify BOM for Item	Verify that a BOM structure is defined for the item.
Verify Customer Item for Item	Verify the item is linked to a customer item.
Verify Sales Order Line for Item	Verify that there is a sales order line for the item.
Verify Shippable AU for the Item	Verify that a shippable AU is defined for the item.

Select one or more tests in the left browse; then, click Launch Tests. The results display in the browse on the right.

Important The tests should not be running while the plant is in operation; they should be used only during setup and maintenance—preventative, troubleshooting—periods.

Customer Items

Although the goal is to have all customer items imported from the QAD ERP application, it is possible to manually create records; use Base|Items|Customer Item Maintenance to maintain customer item information. This is the information that the customer uses to identify and describe an item when ordering it from you as the supplier. Any value imported for the Customer Item field on a sales order detail is validated against values defined here.

The imported item numbers can be an item ID only or include three elements: item ID, revision level, and color code. See “Item Numbers” on page 87.

Fig. 3.27
Customer Item Maintenance

Field Descriptions

Customer Item ID. Enter the number that the customer uses for the item. Be sure to include any spaces, dashes, and so on, that the customer uses. This field can only be edited on a new record.

Customer Item Display. Enter the item number that will be used on reports and labels.

Customer Item Revision. Enter the revision level for the customer Item.

Item ID. Enter the internal item ID that uniquely identifies the internal item related to this customer item.

Customer ID. Enter the customer ID or select it from the browse. This field can only be edited on a new record.

Last Changed By. The system displays the user ID of the user who most recently made a change to the customer item record.

Last Change Date. The system displays the date of the most recent change to the customer item record.

ECN (Engineering Change) Utilities

Engineering changes are coordinated with the customer and can be controlled (the exact sequence dictated by a customer between multi-suppliers) or running (exhausting the old level prior to change to the new one). Engineering changes can also be required against the internal item number

assigned to a customer item number, even though the customer item number does not change. ECN utilities in JIT/S control these changes by allowing for the update of open orders at various statuses and controlling the item levels on new incoming records.

- Open orders in JIT/S past the cut over point, must be updated to the new item level
- Revert any open orders in JIT/S back to the previous level until you are ready to cut over to the new level when the customer starts sending the new level too early
- Received new orders in JIT/S with updated item level when customer is still sending an old one

Internal Part Change Utility

Changing an internal item number against a static customer item number breaks several item links. The Internal Part Change Utility re-maps those links to the new item updating:

- POLV ID's
- WOLV ID's
- Sales Order Detail Lines
- ItemAttributeList

Customer Part Change Utility

Run this process when the Customer Item Number change is needed within the JIT/S system. You can set up this item as the Customer Item in Customer Item Maintenance or the Item setup in Item Maintenance if the Customer Item Maintenance is unused. You can set the Customer Part Change Utility to active to review all incoming orders for several days until the customer stops sending the old level.

Note This process manually manipulates orders that have been processed in the system. It allows for changes to orders that are beyond the point of no return, pre-racked, released, and even packed. Work Orders that have been released are also updated. If already exported to a third party application or PLC, the item numbers no longer match the exported data. This requires manual input when running the script, so the human error factor must be considered.

The steps that should be taken ahead of physical change are:

- Setup new item in Item Maintenance
- SAU(s) assigned to new item
- Attributes assigned to new item
- Setup product structures for new item if used
- Setup new Customer Item in Customer Item Maintenance if used
- Add new Sales Order Detail Lines. Make sure to update all sales orders where applicable.

Note This can only be done ahead of time if the internal item changes as well. If the internal item remains the same and only the Customer Item changes, you should update the Sales Order Detail Lines just before running the utility. Be sure to save the setup before pressing the Update Existing Orders button.

Fig. 3.28
Customer Part Change Utility

Field Descriptions

Active. Checking this option makes the customer part change records active. When any orders are processed by the order processor they will be checked for the Old Cust Part No. If found, they are updated with the New Cust Part No. The order processor must check orders against all ACTIVE setups. Therefore, the longer the list, the longer the processing time.

Event Type. Determines the event used to set the cut over point and the trigger for the Order Processor

BeginCustCONumber: This is a unique number in the Customer Order Version workbench that can be used to determine the cut over point. This is a good option to use when receiving an 866 for incoming orders.

BeginCOV: Each order coming into JIT/S is assigned a COV number. This number is found in the Customer Order Version workbench. This is a good option to use when receiving live broadcasts.

BeginDate: ORDER DATE, if the Order Date field in the customer order version header records is not populated, this option should not be used.

BeginSequence: Would use the sequence number field in the customer order version header record to trigger the updates. Be careful using this option if the customer rolls the sequence numbers.

Old Cust Part No. Enter the old customer item that is being replaced

New Cust Part No. Enter the new customer item that is now active

The screen used to setup the criteria is known as a JACK table. It allows for many possible forms of criteria. Only a few of these options are needed. The JACK table was used in this design to allow for future requirements and growth.

Cha1 – Cha5

Cha1. This field is used to enter the beginning Cust CO Number or the COV Number when either of these options is selected in EVENT TYPE.

Cha2 – Cha5. Currently not used

Dec1 – Dec5

Dec1 – Dec5. Currently not used

Int1 – Int5

Int1. This field is used to enter the beginning Sequence number when sequence is selected in EVENT TYPE

Int2. Int5 are currently not used

Dat1 – Dat5

Dat1. This field is used to enter the beginning Order Date when date is selected in EVENT TYPE.

Dat2- Dat5. Currently not used

Tim1 – Tim5

Tim1 – Tim5. Currently not used

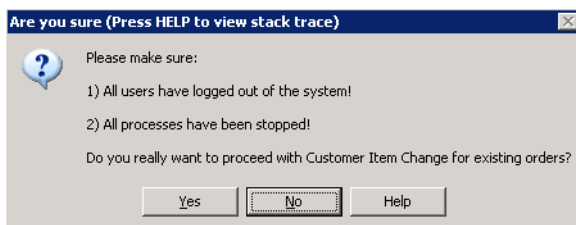
Log1 – Log5

Log1 – Log5. Currently not used

Prior to Status

Setting this status determines when NOT to update an existing order. For example if the event type was set to sequence and sequence 1235 was entered into Int1, all orders starting with sequence 1235 would be updated. When you add a prior to status of Packed, all sequences starting at 1235 that have not been packed (meaning the package has been scanned and the package status is PLANNED) will be updated. However, those sequences that have been packed will not be updated. This provides more control over which open orders are updated.

Select Update Existing Orders to update all open orders for this setup that fit the criteria selected. The following Warning appears.



Select Yes, only when criteria 1 and 2 have been met. This can take several minutes, depending on the amount of orders in the system and whether this item is a high runner. A window will appear with a message stating that the change is complete and where the audit / update log is located.

Internal Part Change Utility

Run this process when the Internal Item that is setup against the Customer Item, in Customer Item Maintenance, changes. However the Customer Item itself remains the same.

Note This process manually manipulates orders that have been processed in the system. This process allows for changes to orders that have passed the point of no return and are pre-rack, released, and even packed. The labels for orders that are updated no longer match the internal item number. Work Orders that have been released are also be updated. If already exported to a third party application or PLC, the item numbers no longer match the exported data. This process requires manual input when running the script. Therefore, human error must be considered.

Steps that should be taken ahead of physical change are:

- New item setup in Item Maintenance
- SAU(s) assigned to new item
- Attributes assigned to new item
- Setup product structures for new item if used

Fig. 3.29
Internal Part Change Utility

The screenshot shows a Windows-style dialog box titled "Internal Item Change Utility". It contains the following fields and controls:

- Old Item ID:** A text input field.
- New Item ID:** A text input field.
- Customer BP:** A text input field.
- Begin COV:** A text input field.
- Prior To Status:** A dropdown menu with a downward arrow.
- Start:** A large rectangular button at the bottom of the dialog.

Field Descriptions

Old Item ID. Old internal item number

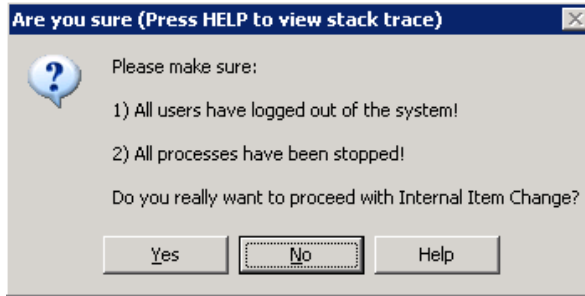
New Item ID. New internal item number

Customer BP. Broadcast Point for this item change

Begin COV. First (COV) Customer Order Version number to update

Prior to Status. Shipped is the only option, since with an internal item change, all open orders must be updated.

Select Start to update all open orders for this setup that fit the criteria selected,. The following Warning appears.



Select Yes, only when criteria 1 and 2 have been met. This can take several minutes, depending on the number of orders in the system and whether this item is a high runner. A window will appear with a message stating that the change is complete and where the audit / update log is located.

Packaging

JIT/S packages orders based on labels printed when the order is released by the order scheduler or in response to broadcasts from the customer broadcast point that you and the customer agree is the packaging/shipping signal point. This packaging/shipping broadcast point and the build-signal broadcast point can be different.

When the items to be packaged are built in JIT/S, an order processor—in response to the build signal—creates the appropriate customer order, product family order, and work orders. Releasing an order manually or through an order scheduler triggers the creation of labels that are linked by their restrictions to the relevant assembly unit.

When the items to be packaged are not built in JIT/S, an order processor creates the orders but not the production labels; then in response to the ship signal, the order processor creates a shipping label.

Use these production or shipping labels, package units, and packaging assembly units (PAU) when building and maintaining packages in Operations|Packaging/Shipping|Packaging Workbench and View/Rebuild Packages. This setup section covers:

- Multiple-Item Packages
- Pre-Racking by an order processor
- Package Units: items defined to hold built items; they have an assigned type—container, pallet, rack—and size

PAUs are covered in the context of maintaining assembly units. They identify what goes into a single package and are defined for an assembly unit tree node. They specify the package unit, the ship-to address, and the validation rules for building the package. See “Packaging Assembly Units” on page 120.

Packaging activities are covered under Operations: “Packaging Workbenches” on page 322 and “View/Rebuild Packages” on page 330.

Multiple-Item Packages

There are two types of multiple-item packages:

- Packages with items from multiple production lines in your plant that go to a single production line at the customer plant and follow a single sequence.
- Packages that are partitioned racks holding multiple items built against one or more work orders.

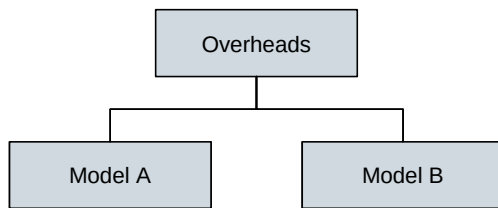
Multiple Lines in a Single Sequence

Use a multiple-item package to deliver items from multiple production lines according to a single sequence from the customer. In this case, rather than defining a separate PAU for each shippable assembly unit (SAU), define a single PAU for an assembly unit tree node that is above the multiple SAUs.

Example The following figure shows an assembly unit tree for two types of overheads:

- Model A and Model B are shippable assembly units.
- They are built on different production lines in response to separate work orders.
- They need to be packaged together for delivery to a single customer production line.

Fig. 3.30
Multiple-Component Assembly Unit Tree



Define one PAU—package unit, ship-to, validation rules—for the Overheads node rather than separate PAUs for the Model A and Model B nodes. The packaging application validates that the user packs instances of Model A and Model B into this single package according to a sequence from the customer.

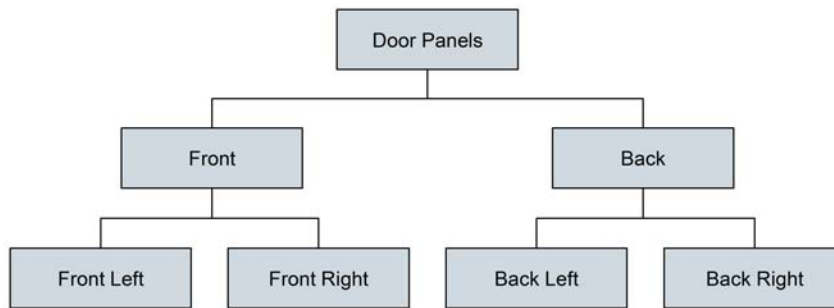
Multiple-Item Racks

Use a rack and subracks to deliver multiple items—door panels, head liners, instrument panels—in a single partitioned package.

Example The figure below shows an assembly unit tree for four types of door panels:

- Front Left, Front Right, Back Left, and Back Right are door panels.
- They are built in response to one or more work orders.
- The front panels and the back panels need to be packaged together.

Fig. 3.31
Partitioned Packaging Assembly Unit



Define a package unit of type rack with two subracks. Define one PAU—rack package unit, ship-to, validation rules—for the Front node and one for the Back node. In each of the PAUs, assign the left and right panels to the appropriate subracks. For the Front and Back racks, the packaging application then validates that the user packs the left and right panels into their subracks according to their respective sequence numbers.

Pre-Racking

Pre-racking assigns package racks and slots to work orders based on the customer sequence received from a chosen broadcast point. See “Packing Sequence” on page 320.

Pre-racking has two effects:

- The preassigned racks and slots are available for printing on the production labels.
- The planned packages can be viewed in Operations|Packaging/Shipping|View/Rebuild Packages.

Packaging Rule

Based on a packaging rule, an order processor associated with a broadcast point assigns packaging racks and slots to work orders. By default, the pre-racking packaging rule is not assigned to an order processor.

The packaging rule takes a list of product families as an input parameter. If a rule group containing the packaging rule is assigned to an order processor but there is no list of product families, the order processor pre-racks work orders for all product families processed through the broadcast point.

Pre-racking is set up in the rule groups for order processors. For the order processor assigned to the broadcast point that determines the packaging/shipping sequence:

- Assign a pre-racking rule to the order processor rule group.
- Assign the comma-separated list of product families as a parameter value to the rule. See “Rule Assignments and Parameters” on page 146.

If pre-racking is not used for an item, assign an alternative rule to the relevant order processor rule group.

Note For sequenced orders, regardless of whether pre-racking is used, the order processor must have a rule for setting packing sequence.

Package Status

A package that has been pre-racked by the order processor has the value of Planned for the class code package_status. The class code package_fill_status has these values:

In Progress	The package is currently being filled and can accept more items.
Complete	The package is full.
Short Ship	The package is marked complete but has fewer items than Total Size defined for the package unit.

At any time, for a specific packaging assembly unit, only one package can exist where package_status is Planned and package_fill_status is In Progress. Pre-racking assigns work orders to this package until the package is full; it then changes the package_fill_status to Complete.

When no package exists where package_status is Planned and package_fill_status is In Progress, pre-racking creates one.

Package Units

There are three types of package units in JIT/S: racks, containers, and pallets. The selected package type determines which fields are available in the maintenance screen; for example, the fields on the Rack Details tab are only available and relevant when the package type is rack.

Each package unit is an item that is first defined in Base|Items|Item Maintenance with the Container check box selected.

Use Base|Packaging|Package Unit Maintenance to define and maintain package units; then use choices from the Options menu to define and maintain any subracks and verification tests.

- Define Rack Details
- Create Subracks
- Maintain Existing Subracks
- Package Verification Tests

Fig. 3.32
Package Unit Maintenance

The screenshot shows the 'Package Unit Maintenance' window for 'Limerick - DEVELOPMENT'. The 'Rack Details' tab is selected. The form contains the following fields and values:

- Package Type:** Rack / Rack
- Item ID:** FRACK
- Short Name:** Front Rack
- Description:** BCT3 Front Rack
- Total Size:** 6
- Shippable:** ☒
- Returnable:** ☒
- Free Form Text:** Drivers and Passengers

Field Descriptions

Package Type. The package types—Container, Pallet, Rack—are members of the package_type class defined in Tools\System Data Tools\Class Code Maintenance.

Item ID. Each package unit is an item. Enter an item ID for an item defined with the Container check box selected in Base\Items\Item Maintenance.

Total Size. Enter the total number of items that can be packaged in this unit. For racks with subracks, the total size is the sum of the sizes of the subracks and must be evenly divisible by the number of subracks.

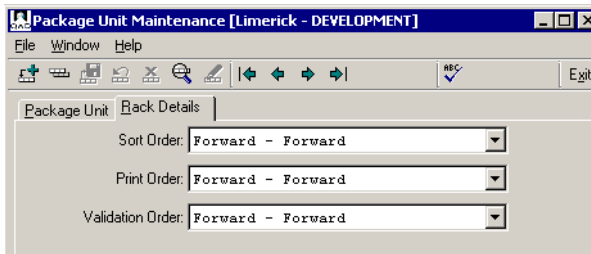
Shippable. Select if this package unit does not get packed into another package unit for shipment.

Returnable. Select if this package unit is returned by the customer for reuse; that is, it is not expendable.

Define Rack Details

When the package type is rack, use the Rack Details tab in Base\Packaging\Package Unit Maintenance to define additional information.

Fig. 3.33
Rack Details



Field Descriptions

Sort Order. Enter either Forward or Reverse. Sort order determines the order that items are packed into the rack.

Example For a rack with four slots, forward sorting puts order number 10 in slot one, order number 20 in slot two, order number 30 in slot three, and order number 40 in slot four. For the same rack, reverse sorting puts order number 10 in slot four, order number 20 in slot three, and so on.

Print Order. Enter either Forward or Reverse. Print order can be used in label queries to determine the label printing order for a rack.

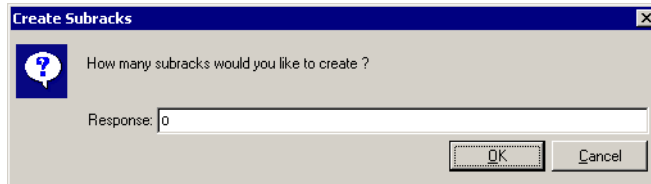
Validation Order. Enter either Forward or Reverse. Validation order determines the order for scanning the rack slots. Forward starts with the first slot; Reverse starts with the last slot.

Create Subracks

In Base\Packaging\Package Unit Maintenance, use Options\Subrack Maintenance to define and maintain subracks for the selected rack.

If the selected rack does not have defined subracks, the Create Subracks screen displays for specifying the number of subracks to create for that rack.

Fig. 3.34
Number of Subracks



The 'Create Subracks' dialog box has a title bar with a close button. Inside, there is a question mark icon and the text 'How many subracks would you like to create?'. Below this is a text field labeled 'Response:' containing the number '0'. At the bottom right are 'OK' and 'Cancel' buttons.

Enter the number of subracks and click OK to display the subrack maintenance browse with the newly defined subracks. The initial size of each subrack is the size of the parent rack divided by the number of subracks.

Note The total size of the parent rack must be evenly divisible by the number of subracks.

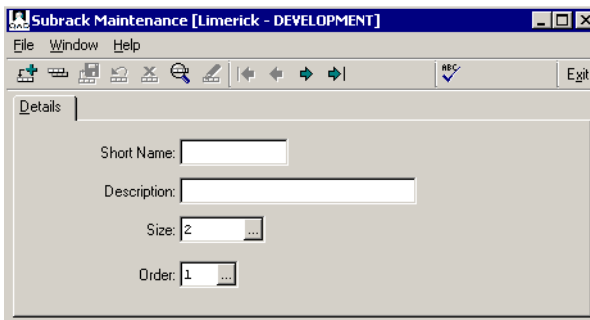
Maintain Existing Subracks

In Base|Packaging|Package Unit Maintenance, select a rack with defined subracks; then choose Options|Subrack Maintenance to display the subracks for the selected rack.

Subracks can be added to or deleted from rack package units until the package unit is assigned to a packaging assembly unit. See “Create Subracks” on page 107.

Select a subrack in the browse; then use Edit Record to display a subrack for updating.

Fig. 3.35
Subrack Maintenance



The 'Subrack Maintenance' window has a title bar 'Subrack Maintenance [Limerick - DEVELOPMENT]'. It includes a menu bar (File, Window, Help) and a toolbar with icons for adding, deleting, and navigating records. The main area is titled 'Details' and contains four input fields: 'Short Name:', 'Description:', 'Size: 2', and 'Order: 1'. Each field has a small button to its right for opening a selection list.

Field Descriptions

Size. Enter the number of items to pack in this subrack. Changes to the size of any of the subracks update the size of the other subracks and the parent rack when necessary.

Scan Order. Enter the sequential order for scanning this subrack relative to the other subracks in the rack. This defines the order in which the items are scanned in the subrack. For example, if you have a subrack where Left is order 1 and Right is order 2, the Left item is scanned before the Right item during the packaging scan process.

Package Verification Tests

Use Base|Packaging|Package Unit Maintenance, Options|Data Verification Tests to access the tests for packages. These tests are rules defined as members of the rule group PACKAGING_VERIFICATION_TESTS. The rules listed in Table 3.3 are predefined; as needed, define additional tests and assign them as rules to the rule group. See “Verification Tests for the Setup” on page 20.

Table 3.3
Package Verification Tests

Rule Name	Description
Verify PAU for Packaging Unit	Verify that the package unit is assigned to a packaging AU.
Verify PAU for Pkg Unit Partitions	Verify that the package unit partitions are assigned to a packaging AU.

Select one or more tests in the left browse; then, click Launch Tests. The results display in the browse on the right.

Important The tests should not be running while the plant is in operation; they should be used only during setup and maintenance—preventative, troubleshooting—periods.

Work Cells and Assembly Units

In a manufacturing plant, the work cells reflect the work stations, substations, and production lines of the shop floor. The assembly units reflect the finished goods, shippable units, and lower-level assemblies that are built.

Groups of assembly units are organized hierarchically into an assembly unit tree; each tree is associated with a particular product family; see “Product Families” on page 91. The finished goods assembly unit can have multiple shippable units, while each shippable unit can have multiple assemblies in multiple layers. See “Assembly Units” on page 112.

Each assembly unit is associated with one work cell and the hierarchy among the assembly units can be reflected in the types—station, substation, production line—of the associated work cells. The work cell types have no inherent hierarchy of their own.

Both work cells and assembly units can have assigned attributes. For example, test categories indicating which types of tests apply to an assembly unit are assigned as attributes. See “Attribute Assignment” on page 81.

Work Cells

Work cells are the places on the shop floor where users perform the various operations in building a product. A work cell can represent a production work station for a specific assembly, a substation, a production line, or a group of any of these.

Although the work cell structure itself is flat, you can create hierarchy by assigning different types of work cells to the root and nodes of an assembly unit tree. For example, you might assign a work cell of type Production Line to the root assembly unit of a tree and work cells of type Substation to lower-level assembly unit nodes. See “Root Assembly Unit” on page 112 and “Added Assembly Units” on page 114.

By tracing associations, it is possible to determine which work cell should be used to produce a particular customer item:

- Each item number—and its associated customer item number—is associated with a shippable assembly unit; see “Shippable AU Assignment” on page 97.
- Each assembly unit is associated with a work cell.

Default labels are also assigned to production lines (work cell type is Production Line) through the association of the work cell with an assembly unit that has an assigned label printing configuration. See “Label Restrictions” on page 118.

- Work Cell Setup
- Assign Printers to Work Cells
- Assign Users to Work Cells
- Work Cell Verification Tests
- Attribute Assignment

Work Cell Setup

Use Base|Work Cell/Assembly Unit|Work Cell Maintenance to create and modify work cells. Select a record from the browse; then click Modify Record to open it for update.

Fig. 3.36
Work Cell Maintenance

The screenshot shows a window titled "Work Cell Maintenance [Limerick - DEVELOPMENT]". It has a menu bar with "File", "Window", and "Help". Below the menu bar is a toolbar with various icons, including a plus sign, a printer, a magnifying glass, and navigation arrows. To the right of the toolbar are buttons labeled "REC" and "Exit". The main area of the window is labeled "Details" and contains three input fields: "Workcell ID:" with the value "15_WC_01", "Description:" with the value "1.5 RT Workcell 01", and "Work Cell Type:" with a dropdown menu showing "Workcell".

Field Descriptions

Work Cell ID. Enter the ID for the work cell.

Description. Enter a complete description for the work to be done at the work cell.

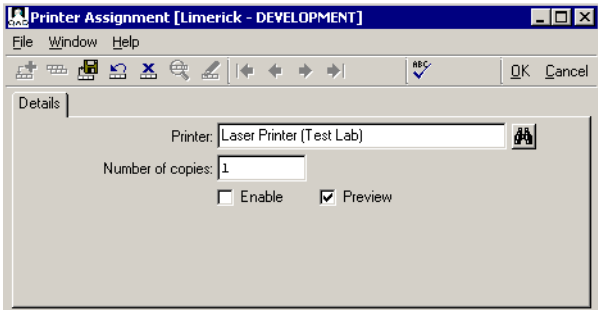
Work Cell Type. Select a type for the work cell: Work Cell, Substation, Production Line. Work cell types are members of class code Workcell_Type defined in Tools|System Data Tools|Class Code Maintenance.

When associating work cells with assembly units, the work cell type should reflect the existing hierarchy in the assembly unit tree. For example, assign work cells of type Substation to assembly units for lower-level assemblies.

Assign Printers to Work Cells

Printers assigned to work cells print the labels and documents generated by activity at the work cells. In Base|Work Cell/Assembly Unit|Work Cell Maintenance, choose Options|Printer Assignment.

Fig. 3.37
Printer Assignment



Field Descriptions

- Printer.* Specify the ID of a printer defined in Setup|Printers|Printer Maintenance.
- Number of copies.* Enter the number of copies of the picking report to print.
- Enable.* Select this option to enable printing of picking reports on this printer.
- Preview.* Select this option to indicate that the picking report is to display on a video monitor before printing.

Assign Users to Work Cells

Each user can be assigned to only one work cell. From the Options menu in Base|Work Cell/Assembly Unit|Work Cell Maintenance, choose User Assignment. Highlight a name and use the arrows to move the name to the selected user list.

Work Cell Verification Tests

Use Base|Work Cell/Assembly Unit|Work Cell Maintenance, Options|Data Verification Tests to access the test for work cells. The test is a rule defined as a member of the WORKCELL_VERIFICATION_TESTS rule group. See “Verification Tests for the Setup” on page 20.

One rule is predefined; you can define additional tests and assign them as rules to the rule group.

Rule Name	Description
Verify AU for Workcell	Verify that the work cell is assigned to an AU.

Select the tests to run in the left browse; then, click Launch. The test name, result, and notes on the test display in the right browse.

Important The tests should not be running while the plant is in operation; they should be used only during setup and maintenance—preventative, troubleshooting—periods.

Assembly Units

Assembly units are organized in trees, hierarchical structures that reflect how the finished product units are built for a product family. The members of the tree are the AUs and the work cells linked to them.

Note Be sure to create AUs also for any specific action such as scanning or labeling.

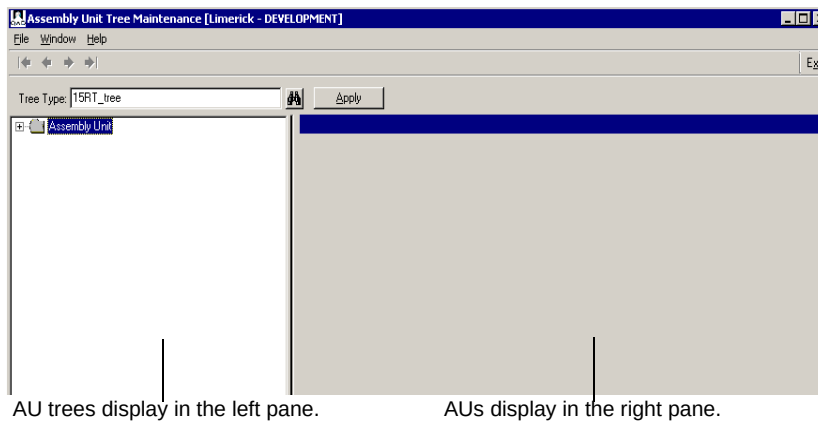
Use these tasks to set up an AU tree for a product family:

- Create a Root Assembly Unit.
- Build the tree with Added Assembly Units at various levels.
- Define Assembly Order Workbench Button Profiles.
- Define Assembly Order Workbench Color Profiles.
- Define AU Assembly Unit Workbench Defaults.
- Specify the name and location for Work Instructions files.
- Link test categories to AUs for data collection with Attribute Assignment.
- Set up Label Restrictions: associate label printing configurations with the AU.
- Run Assembly Unit Verification Tests for the AU setup.
- Define Shippable Assembly Units and specify production reporting methods.
- Define Packaging Assembly Units.

Root Assembly Unit

In Base|Work Cell/Assembly Unit/Assembly Unit Tree Maint, select a tree type and click Apply to display any existing AU trees of that type in the left pane. Tree types are members of the `au_tree_type` class defined in Tools|System Data Tools|Class Code Maintenance.

Fig. 3.38
Assembly Unit Tree Maintenance



To create a root assembly unit, select the top-level assembly unit in the left pane, right-click, and select Add Assembly Unit. This displays the fields in the right pane for defining the root assembly unit.

Warning Create one, and only one, root assembly unit and tree (AU tree) for each product family. Multiple AU trees for a single product family cause problems in order processors that can prevent the appropriate creation of work orders.

Fig. 3.39
Root Assembly Unit

Field Descriptions

Assembly Unit. Enter a name for the root assembly unit node.

Shippable. This read-only check box is selected when a shippable assembly unit is associated with this AU.

Product Family. Select from the product families defined in Base|Items|Product Family Maintenance. This product family applies to all child nodes in this AU tree. See “Product Families” on page 91.

Report Work Order on Build. Select to report production for manufactured items and location transfers for purchased items for the entire work order when this AU is built. This applies to both milestone and non-milestone reporting. For milestone reporting, JIT/S uses the operation code from the SAU.

Report Transfer From, To. Enter the locations that purchased items are transferred from and to when production is reported for this AU as a milestone operation.

Operation Code. Enter the intermediate milestone operation code to use when reporting production for manufactured items for this AU. Define operation codes as valid members of the class OperationCodes; see “Class Members Maintenance” on page 302.

Scrap Transfer From, To. Enter the location that purchased items are transferred from and to when they are scrapped at this AU. If no values are entered, JIT/S uses the values specified for the relevant SAU.

Work Cell ID. Select the work cell that the assembly unit is associated with.

Once the root assembly unit is saved, use the Options menu to set up the remaining information that applies to the root unit.

Note When you change the AU node selected in the left pane, any option windows related to that node are closed.

Added Assembly Units

Once the root assembly unit is defined, use that same Configuration tab in the right pane to add the other unit nodes to the tree:

- To add units one level down from a unit, highlight a unit in the tree. Right-click and choose Add Assembly Unit.
- To add units at the same level as any unit, highlight the unit to display the record in the right pane, then click Add Record in the tab menu bar.

Complete the Configuration tab and click Add Record to add the node to the tree.

Assembly Order Workbench Button Profiles

Use Base|Work Cell|Assembly Unit|AOWB Button Profile Maintenance to define and update collections of button names and actions for the Assembly Order Workbench (AOWB). You can define up to 54 buttons.

The default buttons are Next, Previous, Exit, Build, Refresh, Find, AutoPrint, Label, and Work Instructions. Only the sequence can be updated for these buttons. The Next and Previous buttons are always displayed.

Select an existing profile; then click Modify Record to update the ID and description for the selected profile.

To create a new profile: after selecting a profile in the browse, click Copy Record to open the maintenance screen.

Use Options|Details to specify the rule group to execute for the button as well as the display sequence.

Fig. 3.40
AOWB Button Profile Detail

The screenshot shows a software window titled "Button Profile Detail Maintenance [amnt40 - DEV]". The window has a standard menu bar with "File", "Window", and "Help". Below the menu bar is a toolbar with several icons, including a plus sign, a magnifying glass, and a checkmark. The main content area contains the following fields:

- Label:** A text box containing the word "Build".
- Rule Group:** A dropdown menu.
- Frozen:** A checkbox that is currently unchecked.
- Display Sequence:** A text box containing the number "1".

Label. Enter the label to be displayed on the button.

Rule Group. Enter the name of the rule group to be executed when the button is clicked. In the AOWB, the rule group is executed for the current assembly order.

Frozen. Select to indicate that the button should always be available even when users scroll through the available buttons. Up to six buttons can be frozen; if more are frozen, only the first six are displayed.

Display Sequence. Enter the sequence for this button relative to the other defined buttons.

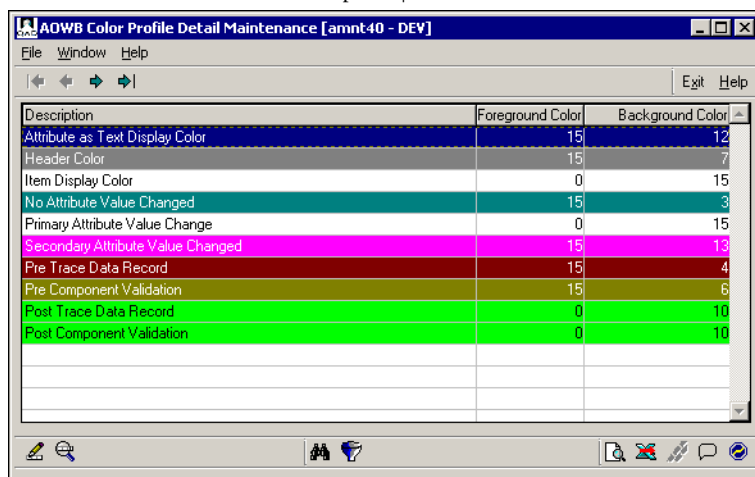
In Base Work Cell/Assembly Unit/Assembly Unit Tree Maintenance, assign button profiles to AOWBs in Options/Workbench Defaults. In the Workbench, scroll through the buttons defined for the profile assigned to that workbench.

Assembly Order Workbench Color Profiles

Use Base/Work Cell/Assembly Unit/AOWB Color Profile Maintenance to define profiles; that is, sets of foreground and background colors for events such as the value for a primary attribute changing from one order to the next. The events are members of the `auwb_color_event` class code as defined in Tools/System Data Tools/Class Code Maintenance.

Define a name and description for a profile in the maintenance screen; then, use Options/Details to define the foreground and background colors for the specific events.

Fig. 3.41
AOWB Color Profile Maintenance: Options/Details



Description	Foreground Color	Background Color
Attribute as Text Display Color	15	12
Header Color	15	7
Item Display Color	0	15
No Attribute Value Changed	15	3
Primary Attribute Value Change	0	15
Secondary Attribute Value Changed	15	13
Pre Trace Data Record	15	4
Pre Component Validation	15	6
Post Trace Data Record	0	10
Post Component Validation	0	10

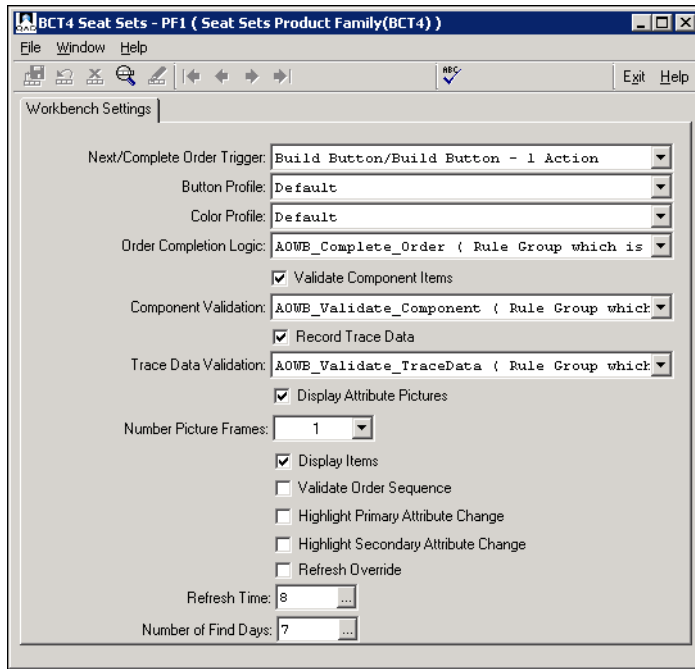
Assembly Unit Workbench Defaults

In Assembly Unit Tree Maintenance, use Options/Workbench Defaults to set defaults for the work order and assembly order workbenches.

Operations/Monitors/Workbenches/Work Order Workbench uses the defaults set for shippable assembly units.

Operations/Assembly/Assembly Order Monitor and Assembly Order Workbench use the defaults for the selected AU.

Fig. 3.42
AU Workbench Defaults



Field Descriptions

Next/Complete Order Trigger. Select the action for the next/complete order:

Build Button/Build Button	Clicking Build completes the current order and displays the next order.
Build Button/Order Scan	Clicking Build completes the current order; scanning the next order displays it.
Build Scan/Build Scan	Scanning the Build barcode completes the current order and displays the next order.
Build Scan/Order Scan	Scanning the Build barcode completes the current order; scanning the next order displays it.
Order Scan/Order Scan	Scanning the next order completes the current order and displays the next order.

Button Profile. Select a button profile from those defined in Base|Work Cell/Assembly Unit|AOWB Button Profile Maintenance.

Color Profile. Select a color profile from those defined in Base|Work Cell/Assembly Unit|AOWB Color Profile Maintenance.

Order Completion Logic. Select the rule group to run at the Complete Order Trigger.

Validate Component Items. Select to scan and validate component items for the current order on the workbench.

Component Validation. Select the rule group to run to validate component items.

Record Trace Data. Select to scan trace data for the current order on the workbench.

Trace Data Validation. Select the rule group to run to identify and validate the data that is scanned. The default rule group is ValidateTraceData. The rule ValidateUniqueData can be used to indicate which trace data values should be checked for uniqueness.

Display Attribute Pictures. Select to display pictures associated with attribute values.

Number Picture Frames. Select 1 to use one picture frame where up to four pictures with transparent backgrounds can be displayed. Select 4 to use four picture frames, each displaying one picture.

Display Items. Select to display item numbers for the assembly unit.

Validate Order Sequence. Select to validate that the next order scanned is to be validated as the next expected order.

Highlight Primary Attribute Change. Select to highlight changes in primary attributes from one order to the next.

Highlight Secondary Attribute Change. Select to highlight changes in secondary attributes from one order to the next.

Refresh Override. Select for the refresh time to be updated from within the Assembly Order Monitor.

Refresh Time. Enter the default refresh time in seconds for the Assembly Order Monitor.

Number of Find Days. Enter the number of days into the past that data should be retrieved for the FIND functionality on the AO Workbench.

Work Instructions

In Base|Work Cell|Assembly Unit|Assembly Unit Tree Maintenance, use Options|Work Instruction Maintenance to define the ID, description, and file name for work instructions for the selected assembly unit. The default server location for the work instruction files is stored in the workInstructionsDir setting in the system configuration file, config.xml, and is defined during installation.

In Operations|Assembly Order|Assembly Order Workbench, click Work Instructions to display the work instructions assigned to the current assembly unit. Clicking Work Instructions for the first time copies the work instructions file from the server to this location on the client:

```
client-root-installation dir\WorkInstructions\
```

Subsequently, when a work instruction is needed by the client, it checks first in the client location for the file; if the file is not found there, the client copies it from the server again. To force the client to copy a new version of the work instructions from the server, delete the version that is on the client.

Attribute Assignment

In Assembly Unit Tree Maintenance, use Options|Attribute Assignment to assign attributes to the selected AU. For example, assign test categories to AUs. See “Attribute Assignment” on page 81.

Test categories for functionality and traceability data from the shop floor—torque level, lot/serial numbers, and so on—are defined as named attributes for AUs. Test category/test code pairs are assigned to items as attribute name/attribute value pairs. See “Shop Floor Tests and Trace Data” on page 16.

If you assign a default value to an attribute, that value is used if it is not replaced by one from the a customer broadcast message.

Label Restrictions

In Assembly Unit Tree Maintenance, use Options|Label Restriction to create restrictions for label printing configurations. This displays the same screen that displays when you choose Printing Restriction from Setup|Labels/Documents|Label Configuration Maintenance. See “Label Printing Restriction” on page 191.

When an assembly unit is associated with a label printing configuration, the labels defined by the configuration are produced only when that assembly unit is identified as part of the business event that triggers the label production. A label is printed if no restrictions are defined for it or if a defined restriction matches any of the conditions associated with the print-triggering event.

For those assembly units that are associated with a work cell of type Production Line, associating the assembly unit with a label printing configuration effectively defines a default label printing configuration for the production line.

Assembly Unit Verification Tests

With an AU is displayed in the right pane, use Options|Data Verification Tests to launch and view results for tests of the AU data. See “Verification Tests for the Setup” on page 20.

Select the tests to run in the left browse; then, click Launch Tests. The name, result, and notes for each test display in the right browse.

These tests are rules defined as members of the rule group AUTREE_VERIFICATION_TESTS. The rules in Table 3.4 are predefined; as needed, define additional tests and assign them as rules to the rule group.

Table 3.4
Predefined Rules for AU Tree Verification Tests

Rule Name	Description
Verify Workcell for AU	Verify that a work cell is assigned to the AU.
Verify Packaging AU	Verify that the AU is a packaging AU.
Verify Shippable AU	Verify that the AU is a shippable AU.
Verify Item on AU	Verify the items on the SAU nodes
Verify Attribute Names on AU	Verify that valid attributes are assigned to the AU.
Verify Milestone Operation on AU	Verify that the AU is a milestone operation.

Important The tests should not be running while the plant is in operation; they should be used only during setup and maintenance—preventative, troubleshooting—periods.

Shippable Assembly Units

Order processors create work orders for only shippable assembly units (SAU).

In Assembly Unit Tree Maintenance, use Options|Shippable AU Maintenance to define an SAU based on the selected AU. In the tree structure, AUs with associated SAU records are shown in blue.

SAUs include the AU, a ship-to, and any item verification tests. For an AU, there can be a different SAU for each ship-to.

Production reporting methods—receipt with backflush, milestone reporting, location transfers for purchased items—are also defined by SAU.

Fig. 3.43
Shippable AU Maintenance

Field Descriptions

Shippable AU ID. Enter an identifier for this SAU.

Item Verification Test. Select VerifiableTests if the application must validate, before packing or backflushing the item, that tests have run successfully. The tests are included in the default system data.

Ship-To ID. Enter the ship-to ID for the SAU. Define ship-to IDs in Base|Addresses/Shipping|Ship-To Maintenance.

Leading Shippable AU. Optionally, indicate that the current SAU is a *led* SAU by identifying another SAU, with the same ship-to, as a *leading* SAU. This field is disabled if the current SAU has previously been identified as a leading SAU.

Actions taken on work orders for leading SAUs in Operations|Order Status Maintenance and Shipment Reporting are also applied to work orders—for the same customer order—for any associated led SAUs.

- Setting the Pack status to Shipped.
- Setting Production status to Built.
- Reporting an order as Built.
- Adding a leading order to a bill of lading (BOL) to report as shipped, adds all led orders to BOLs according to their shipping configurations.

Report Transfer From, To. Enter the location that purchased items are transferred from and to when production is reported for the entire work order.

Default Scrap Reason Code. Enter the default reason code to use when scrapping orders for this assembly unit. Define scrap reasons as valid members of the class ScrapReasonCodes; see “Class Members Maintenance” on page 302.

Report Production at Milestones. Select to use milestone production reporting for this SAU.

Scrap Transfer From, To. Enter the default locations that purchased items are transferred from and to when they are scrapped.

Production Line. Enter the production line to use for milestone reporting. Define lines as valid members of the class ProductionLines; see “Class Members Maintenance” on page 302.

Final Operation Code. Enter the code that is used when reporting production for the entire work order when milestone reporting is being used. Define operations as valid members of the class OperationCodes

Packaging Assembly Units

In Assembly Unit Tree Maintenance, use Options|Packaging to define packaging assembly units (PAU). PAUs specify how manufactured units are packaged for shipment:

- PAU Definitions
- Assigned Packaging Browsers
- Package Details
- Subrack Assignments
- Multiple-Level Packages

PAU Definitions

PAUs include the package unit, ship-to, and validations. There are three approaches to defining packaging assembly units:

Single-Item Packages. Define the PAU for a single item.

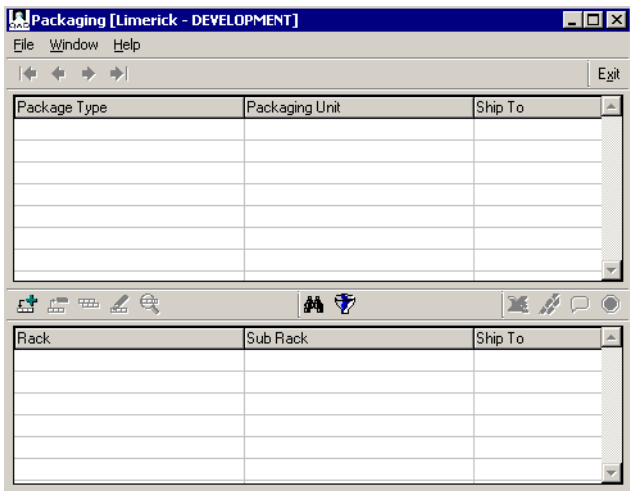
Single-Sequence Multiple-Lines. Define the PAU for the node in the AU tree that is above the multiple shippable units that are shipped in a single package according to a single sequence from the customer. See “Multiple Lines in a Single Sequence” on page 104.

Multiple-Item Racks. Define the PAU for the node in the AU tree that is above the multiple items. The package unit selected for the PAU must have a package type of rack and a subrack defined for each of the items. Each of the items is assigned to a subrack of the rack. See “Multiple-Item Racks” on page 104.

Assigned Packaging Browsers

Select an AU record; choose Options|Packaging to display the current packaging for the selected node. Rack, container, and pallet records are shown in the upper browse. If the selected node is assigned to a subrack, the subrack information displays in the lower browse.

Fig. 3.44
Packaging Browsers

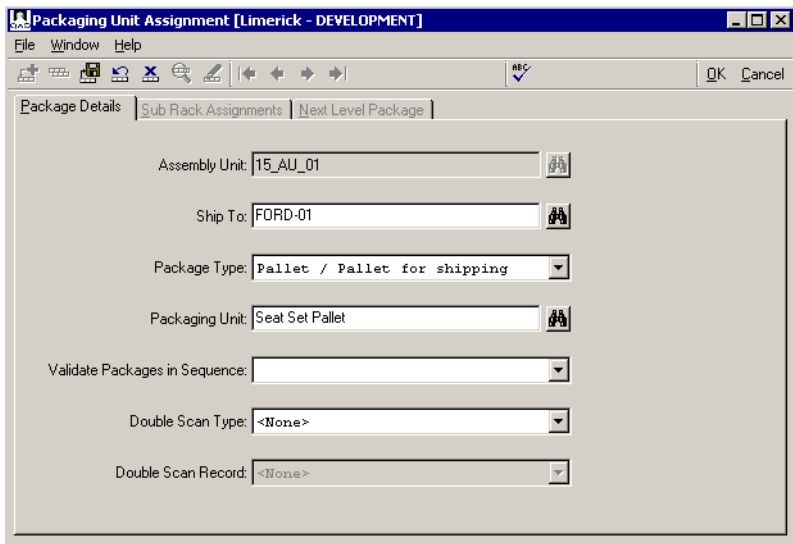


Package Details

In the Packaging browse, select a PAU record and click Edit Record or click New Record to open Packaging Unit Assignment to the Package Details tab.

After adding or updating, save the record before going on to the other tabs.

Fig. 3.45
Packaging Unit Assignment



Field Descriptions

Assembly Unit. This is the current assembly unit.

Ship-To. Enter a ship-to for the PAU. The ship-to must match the ship-to for any item included in the package.

Package Type. Enter a package type for the PAU. Package types are members of the class code `package_type` defined in Tools|System Data Tools|Class Code Maintenance. Choices are container, pallet, or rack.

Packaging Unit. Enter a package unit for the PAU. Define package units in Base|Packaging|Package Unit Maintenance.

Validate Packages in Sequence. Specify whether to validate that the first sequence of the current package follows the last sequence of the previous package for this assembly unit.

Double Scan Type. Specify what, if anything, should be scanned in addition to the production or shipping label. This is used especially when building a package from pre-built items or from separate build and package/ship broadcasts. It verifies that the item chosen for packaging matches the item expected by the shipping label from the broadcast message.

Scan types are members of the `double_scan_type` class code defined in Tools|System Data Tools|Class Code Maintenance. Choose:

Serial	For a label serial number when the item is build in JIT/S
Item	When the item is built elsewhere

Double Scan Record. If you select a double-scan type in the previous field, the content of the second scan goes into the double scan record and serves as the basis of a cross-reference between the item represented by the shipping label and the item chosen for packaging. Third scan choices are:

Record Double Scan	The record is the content of the second scan.
Serial	This requires a third scan if the double-scan type is Item.
Item	This requires a third scan if the double-scan type is Serial

A third scan is an alternate cross-reference.

Subrack Assignments

Link items to subracks for multiple-sequence, multiple-component packaging. See “Multiple-Item Racks” on page 104.

To access the Subrack Assignment tab, the Package Details tab must be in the View Record mode and the package unit must have subracks defined in Packaging Maintenance:

- If Packaging Assembly Unit Maintenance is open and the Package Details tab active, click View Record; then select the Subrack Assignment tab.
- If Packaging Assembly Unit Maintenance browse is displayed, double-click a record with the package type of rack to open Packaging Assembly Unit Maintenance with the Package Details tab in the view mode. Select the Subrack Assignment tab.

The Subrack Assignment tab opens in the browse. All available subracks will be listed. Select a record, then use the look up option to select the appropriate Assembly Unit to assign to this subrack. Repeat this action until all subracks have been assigned to Assembly Units.

Fig. 3.46
Subrack Assignment

Note Although subrack setup is done at the packaging assembly unit level, the subracks do not display at this level. They are displayed when looking at the packaging option for the assembly units that the subracks were assigned to.

Multiple-Level Packages

Use the Next Level Package tab to define multiple-level packaging; that is, a packaging hierarchy.

To access the Next Level Package tab, the Package Details tab must be in the active mode. In Packaging Assembly Unit Maintenance, select a record; click Edit Record, then select the Next Level Package tab.

Fig. 3.47
Next Level Package

Field Descriptions

Package Type. Enter the package type for the next package unit that the current package unit is packed into.

Packaging Unit. Enter a package unit that the current package unit is packed into.

Note When adding a Next Level Package, the packaging unit being added should not be flagged as Shippable in packaging Maintenance, and the Next Level Package should be flagged as Shippable.

Shopping List Configuration

Shopping lists are used in replenishment, the shop floor activity that supplies the production line with components. In response to sequenced demand, a shopping list of components is picked from a storage location and delivered to the consumption point on the production line. Shopping lists can print automatically when they are full or when they exceed their defined time limit. See “Replenishment” on page 15 and “Shopping List Workbench” on page 366.

Note The replenishment process does not create inventory transactions or include picking functionality.

Warning To avoid erroneous multiple picking, multiple shopping lists linked to a work cell must have mutually exclusive lists of parts. This is not validated by the application.

Use Base|Work Cell|Assembly Unit|Shopping List Maintenance to define and modify replenishment shopping lists. The execution of the replenishment process fills instances of defined shopping lists in response to demand from released orders.

Use the browses to specify the items to include in each shopping list and the printers where the list should be sent.

Fig. 3.48
Shopping List Maintenance

The screenshot shows the 'Shopping List Maintenance' window with the following sections:

- Shopping List:** LFB
- Description:** License Place Brackets
- Work Cell ID:** MSIG_LPB_WC
- Buffer Size:** 20
- Cart Slots:** 5
- History List to Display:** 100
- Format ID:** ShoppingList
- Timeout:** 5
- Copies:** 3
- ☒ Automatic Printing Disabled
- ☒ Allow Multiple Picks
- Rule Group:** ValidatePicking
- Available Printers:**

Printer ID	Description
Laser Printer (Test Lab)	Laser Printer (T
Label Printer	Intermec Label I
Laser Printer (Schiphol-Rijk)	Laser printer in I
Decostar Printer Server	Decostar Printer
iktest	test
Label Printer - backup	Intermec Label I
- Selected Printers:**

Printer ID	Description
Laser Printer icp04	Test Lab Laser
- Available Items:**

Item ID	Color Code	Revision	Description
SSFRHFA	RED	00	Seat Sets, Fr
TSSFH0	Blue	00	Seat Sets, Fr
TSSFLEET	Blue	00	Seat Sets, Nc
salh	RED	00	Seat Sets, Fr
SSFRHFA	RED	00	Seat Sets, Fr
SSHA	RED	00	Seat Sets, Fr
FRCOVRED	RED	00	Front Red Co
NOD-PALLET	RED	00	Bumper Rack
LUMBAR	NONE	00	Lumber
FRACK	NONE	00	Front Rack
PASSSENSOR	NONE	00	Pass Sensor
RRACK	NONE	00	Rear Rack
- Selected Items:**

Item ID	Color Code	Revision	Description
1007594	NONE	00	MSIG 01 W2
1007605	NONE	00	MSIG 01 W2
1055946	NONE	00	MSIG 01 W2

At the bottom, there is a 'FilterBy: Item ID' dropdown, 'Apply' and 'Reset' buttons, and a 'Current Picking Operator' field.

Field Descriptions

Shopping List. Enter an ID for this shopping list configuration.

Work Cell ID. Enter the work cell ID that this shopping list configuration and its instances are linked to.

Buffer Size. Enter the number of sequences that shopping lists with this configuration can be created for.

Cart Slots. Enter the number of sequences to pick for each shopping list.

Note In Operations|Replenishment|Shopping List Workbench, the number of active shopping lists displayed is Buffer Size/Cart Slots.

History List to Display. Enter the number of inactive shopping lists to display on the History tab in Operations|Replenishment|Shopping List Workbench.

Format ID. Select a document format ID from those defined in Setup|Labels/Documents|Document Format Maintenance. The document format must be SHOPPING_LIST. The format determines the content and layout of printed shopping lists. See “Document Format Maintenance” on page 192.

Time-Out. Enter the number of minutes that a shopping list should remain active before the replenishment process sends it to be printed.

Copies. Enter the number of shopping lists to print at each assigned printer.

Automatic Printing Disabled. Select to disable the automatic printing of shopping list instances that are filled or beyond their defined time-out period.

Allow Multiple Picks. Select to allow multiple users who are using Operations|Replenishment|Shopping List Picking to pick from the same shopping list configuration simultaneously.

Rule Group. Select a rule group to validate items picked for this list when using Operations|Replenishment|Shopping List Picking.

Product Structures

A product structure or bill of material (BOM) is a list of assemblies and items needed to manufacture products—finished goods. In addition to the item list, it shows how the product is fabricated and assembled.

Information about product structures in JIT/S is obtained through the integration with the QAD ERP application. The product structure maintenance functions in JIT/S are normally used to verify data that is imported and to add data that is specific to JIT/S.

- Use Base|Product Structures|Product Structure Maintenance to define and maintain the finished goods and tree structures.
- Use Base|Product Structures|Product Structure Copy to copy a product structure from one item to another and set a date when the new structure takes effect.
- Use Base|Product Structures|Product Structure Component Update to add, delete, and replace components in a product structure.
- To view a product structure, use Base|Product Structures|Product Structure Explosion/Implosion.

Product Structure Maintenance

Set up the finished good and tree structure for each product.

Finished Goods Setup

The top level for the product structure is a finished good. Create finished goods items for product structures in Product Structure Maintenance. Choose Create Finished Goods from the Options menu.

Fig. 3.49
Create Finished Goods

Field Descriptions

New FG Any item defined in the application can be set up as a finished good.

Qty Per. This field is not used for finished goods.

Start Date, End Date. Enter the first and last days when this finished good is in effect. The dates are inclusive and cannot overlap.

Note During import of items from the QAD ERP application, a default start date is found by using the value of the billOfMaterial.boms_start_date. By default, this is set to 01/01/1950. See “QAD ERP Parameter Maintenance” on page 139.

Product Structure Tree Setup

Once the finished good is set up as the top level of the product structure, add the other items to the structure.

Fig. 3.50
Product Structures Filter

Task Steps

- 1 Display finished goods items in the browse.
 - a Enter a full or partial item ID or description in Item ID or one of the Description fields.
 - b Choose the appropriate operation from the list box.
 - c Click Apply Filter to display the list of items that fit the filter criteria.
 - 2 Highlight a finished goods item from the browse; then click Select to display it in the left pane.
 - 3 Use one of these methods to add a new component item to the finished good:
 - Highlight the finished goods name, right-click, and choose Add Product Structure.
- Or
- Highlight an existing component to display it in the viewer, then click Add to clear the Product Structure Details fields for adding a new component to the finished good displayed in Parent Details.

Fig. 3.51
Product Structure Maintenance

- 4 Enter the item ID for the component item.
- 5 Enter the first and last days that this parent/component relationship is in effect. The dates are inclusive and cannot overlap.
- 6 Enter the quantity of the component item required to make one unit of the parent item.
- 7 Click Save.

Product Structure Copy

Use Base|Product Structures|Product Structure Copy to copy the product structure from one item to another.

Important Product structures can be copied only between finished goods items that are manufactured. If the source item Purchase/Manufacture field is set to P (purchased), the copy will fail with an error.

Fig. 3.52
Product Structure Copy

The screenshot shows a software dialog box titled "Product Structure Copy [Limerick - DEVELOPMENT]". It has two main sections. The first section, "Choose Item For Existing Product Structure", contains a text field for "Item ID" with the value "ssfrh" and a small icon to its right. The second section, "Choose Item For Copy", contains a text field for "Item ID" with the value "SSFHA", a "Start Date" field with a calendar icon, and a "Copy" button at the bottom right.

Field Descriptions

Existing Item ID. Enter the ID for the item with the product structure that you want to copy. Purchase/Manufacture Code must be set to M in Base|Items|Item Maintenance.

Target Item ID. Enter the ID for the item to receive the product structure. This item cannot have an existing product structure.

Start Date. This is the first day that the target item and newly attached product structure are in effect.

Click Copy to complete the copy operation.

Product Structure Component Update

A change made in Base|Product Structures|PS Component Update affects that component in all product structures. Changes are done at the same level and for the same quantities as the original component.

Fig. 3.53
Product Structure Component Update

Product Structure Component Update [amnt40 - DEV]

File Window Help

Item 1

Item ID: SeatCover

Color Code: No Color

Revision Level: Revision Level 00

Apply

Item 2

Item ID:

Color Code:

Revision Level:

UM:

Start Date: End Date:

Quantity Per:

when 0 copy from existing item

Commit Undo

Actions:

- ☒ Add Item 2
- ☐ Add New Item 2
- ☐ Delete Existing Item 1
- ☐ Replace Existing Item 1 by Item 2
- ☐ Set end Effective Date Item 1
- ☐ Eliminate Item 2 where Item 1 exists

Item ID	Color Code	Revision Level	Start Date	End Date	Quantity Per	Parent

Field Descriptions

Add Item 2. Add a new item with an effective date. The existing item is valid until the start effective date of new item. The new item is valid from the start effective date.

Add New Item 2. Add a new component item with or without a start effective date. Both the existing item and the new item are valid all of the time in the product structure.

Delete Existing Item 1. Delete an existing component item with a start effective date. This deletes an existing item even in the past and product structure history is no longer available.

Replace Existing Item 1 by Item 2. Replace one component with a different component; the start and end effective dates must be blank. The new component deletes the history of the existing component; the existing component can no longer be tracked.

Set End Effective Date Item 1. Add or change the end effective date for an item.

Eliminate Item 2 where Item 1 exists. The system looks for the existing item—Item 1—and deletes the second item—Item 2—if they are on the same level. Item 1 remains in effect.

Product Structure Explosion/Implosion

Use Base|Product Structures|PS Explosion/Implosion to view all of the components in a finished good or all of the finished goods that include a particular component.

Fig. 3.54
Product Structure Explosion/
Implosion

Product Structure Explosion/Implosion [Limerick - DEVELOPMENT]

Item ID: SFBRH3 Add Item: SFBRH3 Color Code: BK Revision Level: 00

Color Code: BK Black color for BCT 3

Revision Level: Rev 00 Remove

☐ Finished Good -> Components Start Date: 29/06/2004 ☐ Show Attributes

☐ Component -> Finished Goods

Level 0	Level 1	Level 2	Type	Description	Quantity	Standard Cost	Level	Color ID	Color Description	Revision
SFBRH3			D	Seat Set, Split, Luxury	1.00	0.00	0	BK	Black color for BCT 3	00
=====	BDFINAL		D	Driver, Luxury	1.00	0.00	1	BK	Black color for BCT 3	00
=====	BFFINAL		D	Passenger, Luxury	1.00	0.00	1	BK	Black color for BCT 3	00
=====	BFRCL		D	Rear Back, Luxury	1.00	0.00	1	BK	Black color for BCT 3	00
=====	BFRBHR364		D	Rear Back, Head 3, Sport	1.00	0.00	1	BK	Black color for BCT 3	00
	=====	HEADREST	D	HeadRest	3.00	0.00	2	NONE	No Color	00

Display item names in Item ID. Select an item and then click Add to move it to the items browse. Set the other parameters for the view; then click Refresh to view the information for the item selected in the browse.

Storage and Retrieval System

Information about the Storage and Retrieval system is manually entered in JIT/S.

- Use Base|Storage and Retrieval System|Location Maintenance to define and maintain the general location.
- Use Base|Storage and Retrieval System|Area Maintenance to define and maintain the various areas among a site and location.
- Use Base|Storage and Retrieval System|Shelf Maintenance to define and maintain the content of a shelf for a specific Area.

Location Maintenance

Use Base|Storage and Retrieval System|Location Maintenance to set up locations where multiple SRS can be located. A site can manage multiple locations. Locations can have multiple areas (physical SRS).

Fig. 3.55
Location Maintenance

Location

Location Head ID: FG Number of unknown containers: 0

Description: Val Code: ☐ Permanent

Site ID: 1100 Default Site ☐ Consignment

Capacity: 0 ☐ FIFO

Commodity Code: 0 ☐ Nettable

Capacity Unit: ☐ Ref Location

Single Item: 0 ☐ Warehouse

Compatible Item Type: Location Type:

Number of Containers: 0

Preferred Location:

Remarks:

Status: Normal

Area Maintenance

Use Base|Storage and Retrieval System|Area Maintenance to define and maintain areas. An area represents a physical SRS.

Fig. 3.56
Area Maintenance

The screenshot shows the 'Area Folder' window with the following fields and values:

Area ID:	SRS1
Description:	Toaster
Status:	Active
Location:	FG
Date Start:	28/09/2010
Time Start:	00:00:00
Date Stop:	/ /
Time Stop:	00:00:00

Shelf Maintenance

Use Base|Storage and Retrieval System|Shelves Maintenance to define and maintain shelves; or, from the Area Maintenance screen, select the appropriate area record and use the Option|Shelf Maintenance menu. The Shelf setup is optional. You can perform shelf creation through a specific part from the SRS integration through the SRRU message. For further information about SRS integration, refer to the standard PLC-SRS integration document. This message is used to renew JIT/S' mirrored SRS content by requesting a complete upload of all or some locations from the SRS. The SRS responds with a SRUL message containing all of the requested locations. The SRRU message is sent using a dedicated screen to avoid corruption of the SRS mirror in JIT/S.

To manually create shelf records, you must create possible and preferred locations in advance.

Fig. 3.57
Shelf Maintenance

The screenshot shows the 'Shelf Maintenance Folder' window with the following fields and values:

Shelf ID:	0
Description:	SHELF id 1
Entity Memorico:	
No Id available:	
Shelf Pos X:	
Shelf Pos Y:	
Shelf Pos Z:	
Shelf Max Qty:	0.00
Shelf Occupied Qty:	0.00
Shelf Available Qty:	0.00
Shelf Date Last Item In:	
Time:	00:00:00
Shelf Date First Item In:	
Time:	00:00:00
Shelf Location:	FG
Shelf Preferred Location:	default
Shelf Area:	SRS1
Capacity:	0
Capacity UOM:	02
Compatible Item Type:	
Commodity Code:	0
Number of Containers:	0
Remarks:	
Single Item:	0
Number of unknown containers:	0
Validation Code:	BTPNWPG8
Shelf Location Type:	
Shelf Status:	Normal
Shelf Reservation Status:	

Setup

This section covers the functions available on the JIT Sequencing Setup menu.

Communications 134

Explains the types of communications in JIT/S and how to use Channel Maintenance, Broadcast Point Maintenance, and QAD ERP Parameter Maintenance.

Processes 141

Discusses default system processes, setting up rules and rule groups, user response maintenance, and setting up continuous processes, cache management processes, order processors, order schedulers, event listener processes, and scanners.

Process Monitoring and Tracing 159

Discusses basic process logging, exception handling, and process tracing.

Factory Dashboard 163

Explains how to design KPIs and manage data, as well as how to set up and manage severity levels, use Monitored Event Maintenance, Dashboard Indicator Maintenance, and Dashboard View Maintenance.

Printers 174

Discusses how to use Printer Type Maintenance, Printer Size Maintenance, print labels and templates, and use Printer Maintenance.

Labels 177

Explains how labels are used in JIT/S, with details on Label Group Maintenance, Label Format Maintenance, label data variables, label data queries, and label queues and printing configuration.

Documents 192

Explains how to use Document Format Maintenance, and addresses document printing setup and document runtime processing.

Barcodes and 2D Symbols 196

Explains how to use Barcode Data ID Maintenance and Delimiter Maintenance.

Communications

JIT/S has both incoming and outgoing communications:

- Incoming communication includes broadcast messages received from customers, master data from the QAD ERP application, and messages from external devices.
- Outgoing communication sends information from JIT/S to external devices and other applications such as the QAD ERP application.

Note See “Message Manager” on page 199 for information on inbound and outbound communication definition and management.

The two types of broadcast messages from the customer—orders and checkpoints—are the source of data for the shop floor execution system.

- Orders carry detailed information at the unit order level; for example, orders and item lists for a specific day, order changes, or order deletions.
- Checkpoints indicate that a unit has reached a certain point in the manufacturing process; for example, entering the paint booth.

Set up channels and broadcast points for processing broadcast communication messages.

- Each channel has a message receiver process. For broadcast communications, the message receiver process is an order receiver process that checks for appropriate files in the channel inbox and has a parsing program that creates customer order version header (COVH), customer order version detail (COVD), and order information (ORDi) records for the file.
- The order processor detects the COVs generated by the order receiver and invokes different rules—depending on the COV status and the broadcast point—to process them.
- The order scheduler creates firm work orders for each shippable assembly unit.

Use the other functions on the Communications menu to monitor the data that will be sent to the QAD ERP application and to set up parameter values needed by integration functions.

- Channel Maintenance
- Broadcast Point Maintenance
- QAD ERP Parameter Maintenance

Channel Maintenance

Channels define the handling protocols and configuration for incoming messages—transaction sets. Set up channels to receive information from a specific customer. Configuration includes mailbox directory setup and specifying the parser—the order receiver, inbound Message Manager process. The parsing program is a custom program based on the type of messages being received.

Channels are associated with an order receiver process as a process parameter. Message Manager includes details on setting up inbound messaging and channels. See “Setup Work Flow” on page 205.

You can set up default values for various channel directories in “Default Directory Maintenance” on page 206.

Note The value of *rootdir* in the system configuration file (*config.xml*) affects how the directories specified in this program are found. If a value exists for *rootdir*, directories are considered relative to that root. Otherwise, you can specify fully qualified path names.

Use Setup|Communications|Channel Maintenance to define channels.

Fig. 4.1
Channel Maintenance

The screenshot shows the 'Channel Maintenance' window for 'colis15 - QAD'. The 'Details' tab is active. The fields are as follows:

- Channel Name: BCT1_channelA
- Description: Channel used for BCT1
- Channel Type: INBOX (Inbox directory Channel)
- Inbox Directory: /qad/projects/automotive/jits/tst/channels/bct1/inbox (Find button)
- Outbox Directory: /qad/projects/automotive/jits/tst/channels/bct1/outbox (Find button)
- Trash Directory: /qad/projects/automotive/jits/tst/channels/bct1/trash (Find button)
- History Directory: /qad/projects/automotive/jits/tst/channels/bct1/history (Find button)
- Dump Directory: /qad/projects/automotive/jits/tst/channels/bct1/dump (Find button)
- Filename Mask: *.* (Find button)
- Ts Parser Program: edigen/app/processcontrolplipp.p
- Parse Procedure: processdocument
- Code Page: (empty)
- Subsystem Name: JITS-Fixed (Browse button)
- Trading Partner ID: Fiat (Browse button)
- Document Type: BCST (Browse button)
- Sonic Queue ID: (empty) (Browse button)
- Timeout: 0
- Files Per Batch: 0
- Ack Rule Group: (empty) (Browse button)
- Parser Parameters: (empty text area)

Field Descriptions

Channel Type. Channel types are members of the *channel_type* class set up in Tools|System Data Tools|Class Code Maintenance.

Inbox Directory. This directory defines where files containing broadcast messages to be processed by this channel are located.

Outbox Directory. This directory defines where files containing outbound responses for incoming broadcast messages are placed. This directory is not currently being used, but will be used when broadcast acknowledgement is implemented. It can also be used as a destination for outbound files for external devices.

Trash Directory. The application moves files with errors to this directory.

History Directory. The application moves successfully processed files to this directory.

Note It is advisable to have a company procedure for periodically copying history files to some other medium—tape, CD, and so on—and then removing them from the system.

Dump Directory. The directory was used by the Message Manager process for preprocessing incoming files, such as breaking them into smaller sections before parsing and loading them. The current Message Manager program does not use this field.

File Name Mask. This specifies the type of file that the Message Manager should parse when multiple file types are possible through a channel. For example, if the mask is *.seq, the Message Manager parses all files with the .seq extension.

TS Parser Program and Procedure. This is the transaction set parser program for this channel and the specific subprogram to use. A custom program is required for each type of broadcast message such as a DELJIT message.

Code Page. Specify the code page of inbound messages for the channel so that inbound messages are converted from the source code page to the utf-8 code page when loaded into JIT/S.

Subsystem Name. Optionally enter the ID of the default subsystem associated with messages received on this channel. Set up subsystems in Setup|Message Manager|Subsystem Maintenance. See “Subsystem Maintenance” on page 212.

Trading Partner ID. Optionally enter a default trading partner ID for the parser program to use for documents received on this channel. If blank, the parser must locate the trading partner ID in the incoming document. Set up trading partners in Setup|Message Manager|Trading Partner Maintenance. See “Trading Partner Maintenance” on page 242.

Document Type. Optionally enter a default document type for the parser program to use for documents received on this channel. If blank, the parser must locate the document type in the incoming document.

Sonic Queue ID. Select a Sonic queue to associate with this channel. When a queue is specified, the Message Manager looks for messages on that queue rather than for files in the inbox directory. Set up queues in Setup|Message Manager|Sonic Queue Maintenance.

Timeout. Not currently used.

Files Per Batch. This specifies the number of files that the Message Manager processes per batch. Only when the entire batch is processed does the Message Manager check for more incoming files. Setting Batch to 0 has the same effect as setting Batch to 1.

Parser Parameters. Specify whether to parse as comma-separated list or XML. The parser parameters are not used by the Message Manager supplied with the system.

Broadcast Point Maintenance

Consult with the customer to determine which broadcast point will receive build signals and which will receive ship signals. Maintain other broadcast points as interim tracking points.

Broadcast Point Setup

Use Setup|Communications|Broadcast Point Maintenance to set up customer broadcast points and cross-reference them to your internal broadcast point reference. Assign each broadcast point a defined channel.

A one-to-one relationship exists between a customer broadcast point and the internal broadcast point name that you use to reference it:

- Broadcast point is the code that identifies a point on the customer’s production line from the application point of view.

- Customer broadcast point is the code the customer uses in their broadcast messages to refer to this broadcast point.

Fig. 4.2
Broadcast Point Maintenance

Field Descriptions

Broadcast Point. Enter an internal code for the application to use when referencing a point on the customer's production line. This internal broadcast point code is associated with a channel in Setup|Communications|Channel Maintenance. Each order processor also references a broadcast point.

Customer BP. Specify the code the customer uses to reference the broadcast point on their production line. This code is included within the broadcast messages and displayed in the customer orders created by the order receiver inbound Message Manager process.

Channel. Specify the channel associated with these broadcast points, previously defined in Channel Maintenance.

Keep Orders. Select to stop orders that come in through this broadcast point from being deleted. Use this field to manage the cleanup of checkpoint data.

When the rule OPDeletePreviousBPData is enabled for an order processor, it checks all broadcast points that the current order previously came in on; if Keep Orders is not selected on these broadcast points, it deletes the associated customer order version data.

Example There is an early warning point, a build point, three checkpoints, and a shipping point.

EW1 - BP - CP1 - CP2 - CP3 - SP

To delete the early warning and checkpoint data after an order has reached the shipping point:

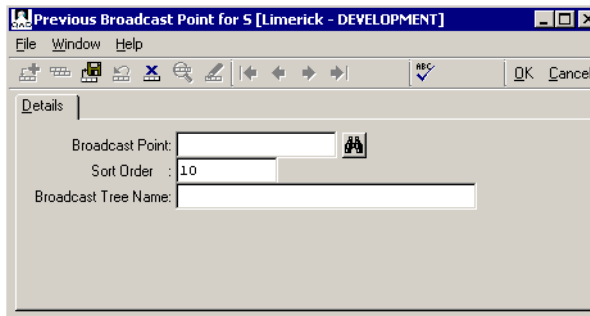
- Clear Keep Orders for the EW1, CP1, CP2, and CP3 broadcast points.
- Select Keep Orders for the BP and SP broadcast points.
- Add the OPDeletePreviousBPData rule to the order processor rule group on the SP broadcast point. It clears the COV data on the EW1, CP1, CP2, and CP3 broadcast points as soon as the order is processed successfully on the SP broadcast point.

Previous Points Setup

In the Broadcast Point Maintenance browse, use Options|Previous Points to identify the broadcast point that proceeds the current one; this is used in previous point verifications; for example, if Point A comes in with item numbers and Point B does not, the application is required to get Point A before B. The combination of the broadcast points and the previous points defines the broadcast tree.

Use Options|Order Processor Browse to view the order processor that executes when a broadcast is received on a particular broadcast point. You can use this browse to verify that setup is correct.

Fig. 4.3
Previous Points Maintenance



Redundant Broadcast Point Data

When the same data is gathered for an order—COV—at multiple broadcast points, data from early broadcast points can become redundant and outdated.

To delete that data, set up OPPostProcess as the post-processing rule group in the order processor for the later broadcast point. This rule group includes the OPDeletePreviousBPData rule, which has the parameter deleteOldData. Set the value for this parameter to Yes in Rule Group Maintenance.

Task Steps

- 1 In Setup|Processes, select the order processor; then choose Options|Process Rule.
- 2 Select the rule; then click Modify Record.
- 3 Set Post Rule Group to OPPostProcess.

Fig. 4.4
Process Maintenance: Process Rule

Process Rule on 17_1_OP_C1 [amnt40 - DEV]

File Window Help

Details

Process Rule ID: create

Description: Create

Class Code: action_request

Member: 3

Pre Rule Group:

Rule Group: OP-17-C

Post Rule Group: **OPPostProcess**

Process ID: 17_1_OP_C1

- 4 Go to Setup|Processes|Rule Group Maintenance and Select OPPostProcess.
- 5 Choose Options|Rule Assignment to display the OPPostProcess rule group with the OPDeletePreviousBPData assigned.

Fig. 4.5
Process Maintenance: Rule Group

Choose rules for OPPostProcess [amnt40 - DEV]

Available rules:

Rule ID	Rule Description
BCT1.OPCancelOrder	Cancel Customers Order
OP0647updatePSK	Updating PSKey
OPAutoRecycleErrors	OP Automatically recycles errors
OPCancelOrder	Cancel Customers Order
OPCheckSeq	OP Check sequence number
OPCheckTrans	OP Check Transmission Number
OPCreateOrders	Creates CO,PO,w/O
OPDeletePreviousBPData	Deletes data for previous broadcast
OPHighPoint	Check processed on higher point
OPIsOrderOK	OP is Order OK
OPLowerPoint	Check processed on lower point
OPMoveOrderToHP	Update CO,PO,w/O
OPPreProcessInventions	Pre processing rule for Inventions
OPPushBackOrders	Pre Backs the orders control the th
OPPrintW/ShippingLabel	OP Print w/O Shipping Label
OPRejectErrorsOnLowerPoint	Reject Errors On LowerPoint

Selected rules:

Order	Rule ID	Rule Description
1	OPDeletePreviousBPData	Deletes data for previous broadcast points

Add all >> Add > < Remove << Remove all

Up Down

Disabled Continue process Stalled Overwrite error Parameter Values

Sort Order: 1 OK Cancel Repeat Apply

- 6 Select OPDeletePreviousBPData in the Selected Rules browse; then click Parameter Values.
- 7 Select deleteOldData; then click Modify Record.
- 8 Set the rule parameter to Yes; then click Save Record.

JIT/S deletes the COVH, COVD, and Order Information data from previous broadcast points when the current COVH has been processed, rejected, or skipped successfully and the Keep Orders field is cleared when defining those broadcast points.

Deleting records does not affect factory health counters. The synchronize activity on the Factory Health Monitor is based on counting records. When records are deleted, any factory health counters attached to them are no longer available for synchronization.

QAD ERP Parameter Maintenance

Use Setup|Communications|QAD ERP Parameter Maintenance to set up these parameters:

- The parameters used when processing incoming information from the QAD ERP application. The parameters have the class code APIDefaults.

- The parameters used when generating QDocs to send to the QAD ERP application. The parameters have the class code QXtendConfig.

Table 4.1
Parameters for the QAD ERP Application Integration

Parameter	Value	Class Code	Description
part.product_family_obj		APIDefaults	The product family code to assign to new items created using QDocs.
salesOrder.production_method	Sequenced	APIDefaults	The code for the default production method that is used when locating shipping configuration records during import of sales order QDocs.
billOfMaterial.boms_start_date	01/01/1950	APIDefaults	The default start date to use when a structure record is being added.
billOfMaterial.bom_type_obj		APIDefaults	The default BOM type code assigned to all new BOMs records created using this API.
domain		QXtendConfig	The QAD ERP application domain that JIT/S communicates with.
username		QXtendConfig	The QAD ERP application log-in username.
password		QXtendConfig	The QAD ERP application log-in password.
dateFormat	yyyy-mm-dd, yyyy-dd-mm, mm-dd-yyyy, dd-mm-yyyy	QXtendConfig	The date format to use when a QDoc is created. The default is yyyy-mm-dd.
partAssignmentOption	0, 1, 2, 3	QXtendConfig	Defines the format for ASN item numbers. 0: item number = item number in the QAD ERP application 1: item number = item ID in JIT/S 2. item number = item ID in JIT/S + delimiter + revision level + delimiter + color code ID 3: item number = item ID in JIT/S + revision level + color code ID The default is 1.
partItemLength		QXtendConfig	The length of the item ID.
partRevisionLength		QXtendConfig	The length of the revision level.
partColorLength		QXtendConfig	The length of the color code ID.
partDelimiter		QXtendConfig	The delimiter to use when partAssignmentOption is 2.
asnLength		QXtendConfig	The length of the advanced ship notice (ASN) number.
asnHdrStartingPos		QXtendConfig	The starting position of the advanced ship notice (ASN) header.
asnStartingPosition		QXtendConfig	The starting position of the advanced ship notice (ASN) number.
packSlipNbrStartPos		QXtendConfig	The starting position of the pack slip number.

You can set up parameters one at a time or use the import feature to import a set of parameters from a file. If necessary, you can export parameters to be imported into another database. This can streamline setup if you are implementing JIT/S at multiple sites.

Fig. 4.6
QAD ERP Parameter Maintenance

Field Descriptions

Class. Indicate the parameter group this parameter is associated with. Choose a member of the parameter_group class defined in Tools\System Data Tools\Class Code Maintenance.

Key1-5. Enter one to five keys for the parameter. Key1 is the parameter name. To deactivate a parameter without deleting it, enter text such as *inactive* in one of the Key fields. This unexpected text is not accepted by the process and the parameter is ignored.

Value1-5. Enter one to five values for the parameter.

Description. Enter a description of the parameter.

Processes

Your shop-floor system is managed through a set of interrelated event-driven and continuous processes. Some are included in JIT/S while others are user-defined.

Set up order processor and order scheduler processes based on the parameters and rules that conform to your business requirements. The order receiver requirements are discussed in Chapter 5, “Message Manager,” on page 199.

Rules are code fragments representing action procedures and reactions to events. They are flexible, scalable, and reusable, and they take parameters. Based on setting rule parameters, each implementation can customize the behavior of the system without extensive code changes.

The rules, with an assigned sort order, are combined and linked to a rule group as a work flow. The rule groups—work flows—are then linked to processes. User responses can be linked to the rule actions, so that when errors occur, users can determine how the application should proceed.

Rule groups that correspond to business events have the same name as the associated event. These groups are predefined with the system. For example, the rule group WORDRLSD corresponds to the business event WORDRLSD, which indicates a work order has been released in preparation for the start of production. When a business event occurs, the system looks for the rules associated with its corresponding rule group and executes them in the order specified.

Note See your QAD Support representative for the latest information on the rules included in default JIT/S system data.

- Default System Processes
- Setting Up Rules and Rule Groups
- User Response Maintenance
- Setting Up Continuous Processes
- Setting Up Order Processors
- Setting Up Order Schedulers
- Setting Up Event Listener Processes
- Setting Up Scanners

Default System Processes

Table 4.2 lists the default processes provided with the system. These processes are required by the activities listed in the Description column.

Table 4.2
JIT/S-Provided Processes

Process ID	Description	Program Name Program Procedure
CacheExtMsg-Processor	Cache Processor for Message Manage	basgen/app /csmhqueueprocessorplipp.p messageProcessor
CacheMsg-Clean	Clears out all successfully transferred cached messages	basgen/app/csmhcleanmessageplipp.p cleanMessage
CacheMsg-ForMMInbound	Cache Message Processor ONLY for MM separation inbound	basgen/app /csmhqueueprocessorplipp.p messageProcessor
CacheMsg-Processor	Cache Message Processor for all nessary queues (labels, WO release, ...)	basgen/app /csmhqueueprocessorplipp.p messageProcessor
DashIndExp	Periodically exports factory dashboard data. Only needed if you use the Factory Dashboard.	ftyhlt/app/ factoryHealthExportPlipp.p exportData
MessageReceiver_FILE	Message Receiver for processing inbound files.	edigen/obj/edprcctrlcaller.p OrderReceiver
MessageReceiver_HTTP	Message Receiver for processing inbound HTTP messages.	edigen/obj/edprcctrlcaller.p OrderReceiver
MessageReceiver_SONIC	Message Receiver for processing inbound Sonic messages.	edigen/obj/edprcctrlcaller.p OrderReceiver

Process ID	Description	Program Name Program Procedure
Message_Reprocess_Inbound	Process that checks for inbound integration messages for reprocessing.	edigen/obj/edprctrllcaller.p OrderReceiver
Message_Reprocess_Outbound	Checks for outbound integration messages for reprocessing.	edigen/obj/edprctrllcaller.p OrderReceiver
Message_Timeout	Checks for outbound messages that have timed out.	edigen/obj/ edchktransquetimeout.p checkTransQueTimeout
MonEvtHstPur	Periodically purges the monitored event history viewer. Only needed if you use the Factory Dashboard.	ftyhlt/app/monitoredEvent HistoryPurgePlipp.p purgeMonitoredEventHistory
ShopListWDog	Monitors shopping lists for timeout/errors.	gsford/app/ shoppingListWatchdogPlipp.p checkShoppingLists
SONICCACHE	Clears out cached messages after Sonic has been down. This is faster than letting Sonic manage the process directly.	basgen/app/SONICCACHE.p attemptSend
TVProcess	Process used by the technical verification test	basgen/app/tvprocessplipp.p tvProcess

Setting Up Rules and Rule Groups

Note See your QAD Support representative for the latest information on the rules included in the default JIT/S system data.

Rules are associated with processes that you can configure in Process Maintenance and Scanner Maintenance. But they are also used with processes owned by the application such as shipping, packaging, data collection, and business events. Rules let you configure these system-owned processes to adapt them to your business requirements.

You can specify rules for packaging and shipping in Base|Addresses|Shipping|Shipping Configuration Maintenance. These rules perform validations during shipment creation, when adding a package to a shipment, and when finalizing a shipment. See “Shipping Configurations” on page 73.

Rules have assigned rule types and rule group types that are members of classes defined in Tools|System Data Tools|Class Code Maintenance. Rules can be linked only to rule groups that have the same rule group type; for example, if the rule group type assigned to a rule is Order Processor, that rule can be linked only to rule groups with the Order Processor rule group type. The rule group type determines what kind of process a rule affects. Rule type identifies the function of the rule within the rule group.

Rule setup covers rule types, rule group types, programs and procedures, parameters, and user responses to procedure errors:

- Rule Maintenance
- Rule Group Maintenance
- Rule Assignments and Parameters
- Rule Group Printing

- User Response Maintenance

Rule Maintenance

Use Setup|Processes|Rule Maintenance to name rules and link them to rule types, rule group types, and predefined procedures.

Fig. 4.7
Rule Maintenance

The screenshot shows the 'Rule Maintenance' window with the following fields and values:

Field	Value
Rule Name	backflushScanner
Description	scanner rule for backflush
Rule group type	Scanner (Rules and groups for s)
Rule type	ScanProcessing (Processing rule)
Program Name	basord\obj\scannerrulegroupplpp.p
Procedure	validateLabel
Run On Client	☐
Comment	Validates incoming labels and checks against the various tables and generates the backflush message if validation is successful.

Field Descriptions

Rule Group Type. Choose the type of rule group that this rule is used in; for example, validation rules or processing rules. Rule groups are defined as members of the class rule_group_type in Tools|System Data Tools|Class Code Maintenance.

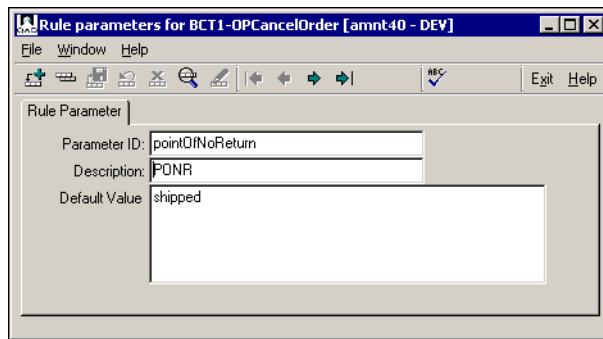
Rule Type. Choose the function of the rule within the rule group. Rule types are defined as members of the class rule_type in Tools|System Data Tools|Class Code Maintenance.

Program Name. Enter the name of the program containing the procedure that reflects the rule.

Procedure. Enter the name of the procedure that has the functionality for the rule.

Once a rule is defined, in the Rule Maintenance browse, choose Options|Rule Parameters to set up the behavior of the rule through the rule parameters and their default values.

Fig. 4.8
Rule Parameters



Rule Group Maintenance

Rule groups are sets of parameterized rules grouped to form a work flow. Rule groups reflect business events. The linking of rules to rule groups gives the rule group flexibility and scalability. Since rule groups have parameters and values, you must create a copy of a rule to use it in another process.

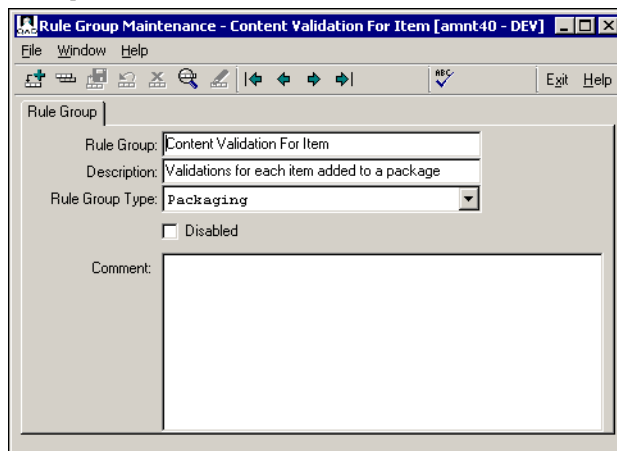
Setting up rule groups includes assigning a rule group type, choosing linked rules for the group, and defining parameters for the rules.

Use Setup|Processes|Rule Group Maintenance to define a rule group ID and assign a rule group type.

Note Ensure that there are no leading spaces in the rule group ID; such spaces interfere with processing.

The check boxes determine when and how the processes, such as order processors, execute the programs linked to the rules in the specified rule group.

Fig. 4.9
Rule Group Maintenance



Field Descriptions

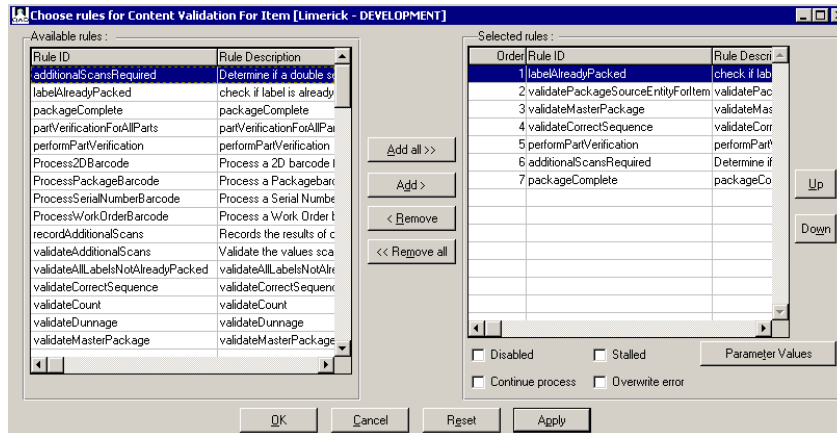
Rule Group Type. Rule groups are defined as members of the class `rule_group_type` in Tools|System Data Tools|Class Code Maintenance.

Rule Assignments and Parameters

In Rule Group Maintenance, choose Options|Rule Assignment to specify which of the available rules to select for the rule group. Only the rules that are assigned to the same rule group type in Setup|Processes|Rule Maintenance are available for assigning to the rule group. Use the Up and Down buttons to organize the rules in the appropriate order for execution.

In the Selected Rules browse, click Parameter Values to maintain parameters for the selected rule. Default parameters and values are defined in Rule Maintenance.

Fig. 4.10
Assigning Rules to Rule Groups



Note Stalled and Overwrite Error are not currently used.

Rule Group Printing

In Rule Group Maintenance, choose Options|Print Rule Group to export information about the rules that are currently assigned to the selected rule group to a spreadsheet application. You can then print the rule information from the spreadsheet.

User Response Maintenance

Use Setup|Processes|User Response Maintenance to define possible user responses—such as accept, reject, or skip—to errors generated by procedures linked to rules. The responses update the error record.

Currently, user responses are implemented only by order processor. You can view errors generated by the order processor and specify responses in the Customer Order Version Workbench on the menu Operations|Monitors/Workbenches.

Note The system comes with three defined responses: Skip, Reject, Accept. While you can add additional responses, the system will not use them unless you modify the code to accept the new values.

Skip. Do not process the record but update the last good and bad sequence numbers so that subsequent orders will not be seen as sequence gaps.

Reject. Do not process the record and do not update the last good and bad sequence numbers. If you are doing sequence checking, then the next order will probably have a sequence error as well.

Accept. Process the current record again as if it were new. You would probably have changed something on the order before using this response.

Fig. 4.11
User Response Definition

The screenshot shows the 'User Response Maintenance [Limerick - DEVELOPMENT]' window. The 'Details' tab is active. The 'Response ID' is 'Accept'. The 'Description' is 'Accept current error'. There are two 'Icon' fields, 'Icon1' and 'Icon2', each with a 'Find' button next to it. The window has a menu bar with 'File', 'Window', and 'Help', and a toolbar with various icons and an 'Exit' button.

In the browse, highlight a response and choose Options|Response Usage to link that response to specific errors in specific procedures.

Fig. 4.12
Response Usage for Accept

The screenshot shows the 'Response Usage for Accept [Limerick - DEVELOPMENT]' window. The 'Detail' tab is active. The 'Response Usage ID' is '14'. The 'Error' is 'JOP' with a small icon next to it. The 'Program Name' is empty. The 'Procedure' is empty. The 'Needed Level' is '1'. There are two checkboxes, 'Disabled' and 'Stall', both of which are unchecked. The window has a menu bar with 'File', 'Window', and 'Help', and a toolbar with various icons and an 'Exit' button.

Field Descriptions

Response Usage ID. Enter an ID for the link between the error and the user response.

Error. Choose an error to link to the user response. These errors are maintained in Tools|Exception Management|Message Maintenance. See “Message Maintenance” on page 284.

Program Name. Enter the name of the program where the error might occur.

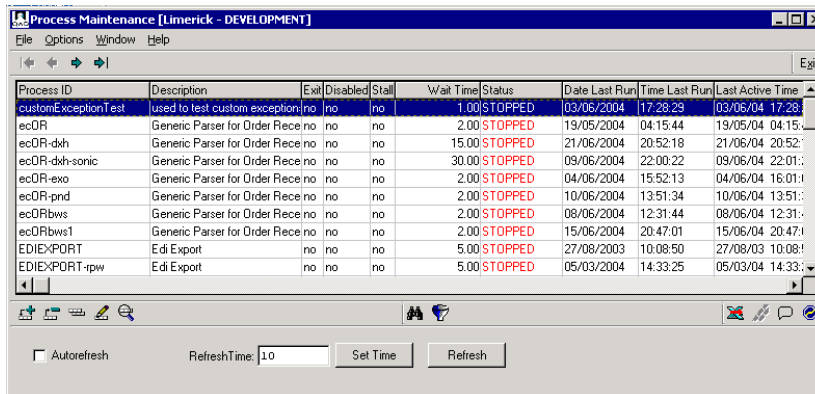
Procedure. Enter the name of the procedure within the named program where the error might occur.

Setting Up Continuous Processes

Continuous processes include such core components of the application as order processors and order schedulers. For event-driven processes, see “Setting Up Event Listener Processes” on page 158. For order receiver processes, see “Message Manager” on page 199.

Use Setup|Processes|Process Maintenance to display the existing processes. In the browse, you can view and monitor process activity as it is occurring in the system. The Status, Stall, Date Last Run, Time Last Run, and Last Active Time columns reflect whether each process is active and running. You can set a refresh time and use the Autorefresh check box to automatically update displayed information. Or you can click the Refresh button to refresh the data manually.

Fig. 4.13
Process Maintenance Browse



Process ID	Description	Exit	Disabled	Stall	Wait Time	Status	Date Last Run	Time Last Run	Last Active Time
customExceptionTest	used to test custom exceptions	no	no	no	1.00	STOPPED	03/06/2004	17:28:29	03/06/04 17:28:29
ecOR	Generic Parser for Order Rece	no	no	no	2.00	STOPPED	19/05/2004	04:15:44	19/05/04 04:15:44
ecOR-dkh	Generic Parser for Order Rece	no	no	no	15.00	STOPPED	21/06/2004	20:52:18	21/06/04 20:52:18
ecOR-dkh-sonic	Generic Parser for Order Rece	no	no	no	30.00	STOPPED	09/06/2004	22:00:22	09/06/04 22:01:22
ecOR-exo	Generic Parser for Order Rece	no	no	no	2.00	STOPPED	04/06/2004	15:52:13	04/06/04 16:01:13
ecOR-pnd	Generic Parser for Order Rece	no	no	no	2.00	STOPPED	10/06/2004	13:51:34	10/06/04 13:51:34
ecORbws	Generic Parser for Order Rece	no	no	no	2.00	STOPPED	08/06/2004	12:31:44	08/06/04 12:31:44
ecORbws1	Generic Parser for Order Rece	no	no	no	2.00	STOPPED	15/06/2004	20:47:01	15/06/04 20:47:01
EDIEXPORT	Edi Export	no	no	no	5.00	STOPPED	27/08/2003	10:08:50	27/08/03 10:08:50
EDIEXPORT-pw	Edi Export	no	no	no	5.00	STOPPED	05/03/2004	14:33:25	05/03/04 14:33:25

Autorefresh ☐ RefreshTime: 10 Set Time Refresh

Choose File|New Record to define processes, configure the behavior of the processes, and associate programs to execute the processes. Complete the process definition with choices from the Options menu in the browse:

- Process Maintenance
- Process Parameters
- Process Rules
- Process Management
- Processing Order
- Autokill and Autorefresh
- Process Status and History
- Process Detail Viewer
- Process Import/Export

Process Maintenance

In Setup|Processes|Process Maintenance, select a process in the browse and click Modify Record.

Fig. 4.14
Process Maintenance

Process ID:	15_test_P01	Date Force Stop:	/ /	Force Stop Time:	00:00:00
Description:	Order Processor 17 Func BP:17A	Date Last Stall:		Last Stall Time:	00:00:00
Process Type:	OP (Order Processor)	Last Start Date:	16/06/2004	Last Start Time:	13:39:00
Program Name:	gsford\src\OPEnginePLipp.p	Date Last Stop:	17/06/2004	Last Stop Time:	10:39:00
Program Procedure:	orderProcessor	Date Last Run:	17/06/2004	Last Run Time:	10:39:00
Appserver:	JIT	Process User:			
Status:	STOPPED				
Wait Time:	5.00				
Error Factor:	1.00				
Autokill:	1.00				
		☐ Disabled			
		☐ Local Execution			

Field Descriptions

Process ID. Enter the code you want to use to identify this process. Process IDs cannot contain blanks. The only valid characters are alphanumeric, hyphen (-), and underscore (_).

Process Type. Process types are members of the class process_type defined in Tools\System Data Tools\Class Code Maintenance. The types are for reference only.

Program Name. Enter the name of the program containing the program procedure for the process.

Program Procedure. Enter the name of the program procedure that executes the functionality for the process.

Wait Time. When the process is running, it waits—sleeps—this many seconds before each execution of the program procedure.

Error Factor. Enter a multiplier for the application to use when evaluating whether there may be a problem in a running program procedure. The default is 1.

If the elapsed time since the Last Start Date and Time is greater than Error Factor * Wait Time, the process is highlighted in red in Setup\Processes\Process Maintenance.

To avoid false errors, increase the error factor and wait time or have the program process update the date and time during processing rather than only when it runs the program procedure.

This field can be set while the process is running.

Autokill. Enter the number of minutes that a process is to display in red before the application kills it. A process displays in red when elapsed time since Last Start Date and Time is greater than Error Factor * Wait Time. For processes with the status of Startup, when Autokill is invoked, the application kills the process after Autokill minutes.

Autokill is invoked when the browse display is refreshed. The screen refreshes on request when you click the Autorefresh button or periodically when the Autorefresh check box is selected in the browse.

Autokill restarts processes that had the status Running.

The default is one minute and the field can be set while the process is running.

Process User. Select a user from the drop-down list to be associated with the Progress Dynamics session initiated by this process. The user is needed to manage the generation of exception messages during process execution. Define users in Administration|Security Control See “Users” on page 54.

Disabled. This field disables the process; that is, it is impossible to launch the process. This field is currently not implemented.

Local Execution. This field sets the local session type for the new Prowin session.

Process Parameters

In the Process Maintenance browse, choose Options|Process Parameter, to define parameters to use in the selected process; for example, channel, debug, trace, or log. These parameters are not taken into account by the process launcher but must be retrieved by the launched process itself using the process object as an input parameter. See “Order Processor Tracing” on page 162.

Process Rules

In the Process Maintenance browse, choose Options|Process Rule, define a process rule, and associate rule groups and class codes with it. Define rule groups in Setup|Processes|Rule Group Maintenance. Define class codes in Tools|System Data Tools|Class Code Maintenance.

See “Rule Group Maintenance” on page 145 to update rule parameters and rule group membership for the rule groups assigned to process rules. Any changes to the rules or the rule group affect all processes using the rule group.

Fig. 4.15
Process Rules and Class Codes

Process Rule on 15_test_P01 [Limerick - DEVELOPMENT]

File Window Help

Details

Process Rule ID: 15-op-1

Description:

Class Code: action_request

Member: 3

Pre Rule Group:

Rule Group: 15_rule_grp_01

Post Rule Group:

Process ID: 15_test_P01

Field Descriptions

Process Rule ID. Enter an ID for this process rule. A process can have multiple process rules.

Class Code. Choose one of the classes defined in Tools|System Data Tools|Class Code Maintenance.

Member. Choose one of the valid members of Class Code. These are specified in Tools|System Data Tools|Class Code Maintenance|Options|Valid Members.

Pre Rule Group. Enter the name of a rule group that does pre-processing for this process rule.

Rule Group. Enter the name of a rule group that does processing for this process rule.

Post Rule Group. Enter the name of a rule group that does post-processing for this process rule.

Process Management

In the Process Maintenance browse, use Options|Launch Process, Stall/Unstall Process, and Stop Process to govern the running of your processes.

- For an explanation of the processing loop, see “Processing Order” on page 151.
- To stop a process that is not responding to Options|Stop Process, see “Autokill and Autorefresh” on page 152.
- For system-maintained process data, see “Process Status and History” on page 152.

Use Options|Launch Process to launch the selected process. This initializes a new session and launches the program on the application server. The status in the overview changes from stopped to startup and then to running. By default, processes run continuously.

Warning Processes launched through Process Maintenance can be shut down without warning. If, for any reason, a user logs on to the JIT/S server machine and then logs off, all processes started by all users through Process Maintenance are terminated. To avoid this situation, use Lock Computer to suspend sessions on the JIT/S server rather than logging off.

Use Options|Stall/Unstall Process to stall a process session temporarily before it runs the program or to release it and resume normal processing. The Stall column in the overview shows whether the process is currently stalled.

When Stall is selected, the process delays running the program procedure the number of seconds specified for stallTime in the system configuration file (`config.xml`), then checks the stallTime setting again. The process continues checking the stallTime setting until it is no longer selected; it then runs the program procedure and continues with normal processing.

Options|Stop Process sets the exit field for the selected process. When the current run of the program procedure completes, the system stops the process and terminates the session where the process was running.

If for some reason Stop Process does not stop the process, use Setup|Processes|Process Maintenance to set Error Factor and Autokill. If the status is Running but the program procedure has not run in Error Factor * Wait Time seconds, the process is displayed in red. When the number of minutes specified in Autokill has passed, if the program procedure has still not run, the process is killed. If the Exit field is not set, the process is restarted.

Processing Order

A running process follows this loop:

- Check whether the process is stalled by Options|Stall/Unstall Process in Process Maintenance.
 - If the process is stalled, wait the number of seconds specified for stall time in `config.xml`.
 - If the process is not stalled, go on.
- Run the program procedure as specified in Process Maintenance.

- Check whether the process is set to exit by Options|Stop Process.
- Pause the number of seconds specified for Wait Time in Process Maintenance before starting the loop again.

Autokill and Autorefresh

Processes are highlighted in red when the elapsed time since the Last Start Date and Time is greater than the error factor multiplied by the wait time—as defined in Process Maintenance. A process can remain highlighted in red for the length of time specified for autokill in Process Maintenance.

In the Process Maintenance browse, autokill applies to only those processes that are highlighted in red. It is invoked by the AutoRefresh check box—minimum time is 10 seconds. When AutoRefresh is not selected, clicking Refresh in the browse invokes autokill.

Process Status and History

In the Process Maintenance browse, use Process Status and Process History to access system-maintained data about the processes.

Options|Process Status displays information about the running process; for example, the process ID for a launched process.

Options|Process History displays start and stop times for the selected process.

Process Detail Viewer

Use Setup|Processes|Process Detail Viewer to review all of the information related to a process in one place. Use this program to ensure consistency between the various aspects of a process set up in related programs before you begin implementing a live system.

Choose a process and then click Refresh. All of the associated data displays: process parameters, rule group, rules, and rule parameters.

Fig. 4.16
Process Detail Viewer

The screenshot shows the 'Process Detail Viewer' window for 'Limerick - DEVELOPMENT'. It contains several sections:

- Process Information:** Process ID: BCT3_OS_2, Description: OrderScheduler for BCT3 Front Passenger, Wait Time: STOPPED. There are checkboxes for Exit, Stalled, and Disabled, and a Refresh button.
- Process Parameters:** A table with columns 'Parameter Name' and 'Description'. It lists ShippableAU, LabelType, and Log.
- Process Rule Group:** A table with columns 'Process Rule ID', 'Description', 'TYPE', 'Rule Group', and 'Description'. It shows a rule group named 'Scheduler' with type 'MAIN' and rule group 'OS-BC-FIFO Scheduler'.
- Rules:** A table with columns 'Rule Name' and 'Description'. It lists rules like OSCreateWCOSSequence, OSFitScheduleWOS, OSFitFirmWOS, OSCreateWCOS, OSFitReleaseWOS, and OSSExitFlag.
- Rule Parameters:** A table with columns 'Parameter ID', 'Initial Value', and 'Value'. It shows parameters like AUList and SeqLimit with a value of 9999.

Process Import/Export

Use Process Import/Export to:

- Save process data including parameters and rule groups into an XML process file.
- Load process data from an XML process file into the database.

Fig. 4.17
Process Import/Export

The screenshot shows the 'Process Import/Export' dialog box. It has a menu bar with 'File', 'Navigation', 'Window', and 'Help'. Below the menu bar are navigation arrows and 'Exit' and 'Help' buttons. The dialog has two radio buttons: 'Import' and 'Export', with 'Export' selected. There are two text input fields: 'Process ID:' and 'Process XML:'. Below these is a checkbox labeled 'Overwrite Data'. At the bottom is an 'Import/Export' button.

To import a process:

- 1 Select the Import radio button.
- 2 Optionally, enter the ID of the process you want to import. If the field is blank, the standard default process ID in the XML process file will be used.
- 3 In the Process XML field, enter the full path and file name of the XML process file you want to import process data from.
- 4 If the process data you want to import already exists in the database, select Overwrite Data to overwrite existing data; otherwise, an error will occur.

- 5 Click the Import/Export button to start the import.

To export a process:

- 1 Select the Export radio button.
- 2 Click the Lookup button and select the process you want to export or enter the process ID in the Process ID field.
- 3 In the Process XML field, enter the full path where you want to save the XML process file. The XML process file name is automatically generated by the system using the following format:
`proc_<process id>_YYYY-MM-DD_HHMMSS.XML`
- 4 Click the Import/Export button to start the export.

Setting Up Cache Message Processes

The following processes handle internal communication messages. They must be started before launching any JIT/S functions and must be stopped before JIT/S AppServers shut down or restart.

Process ID	Description
CacheMsg-Processor	Listens to all the queues in JIT/S.
CleanSuccessMsg	Clears out all successfully transferred cached messages.

Set up cached message processes in Setup|Processes|Process Maintenance using these values:

Process parameters control how the cached message processes operate.

Table 4.3
Cached Message Process Parameters

Parameter	Values	Description
MaxSleepTime	Number of seconds	Optionally specify the maximum sleep time, in seconds, when there are no incoming messages. This value defaults to the process wait time.
MinSleepTime	Number of seconds	Optionally specify the minimum sleep time, in seconds, when there are no incoming messages. When this value is 0, there is no sleep time.
QueueList	One to ten queue names	Specify up to ten queue names the process listens to delimited by " ". A message queue can only be listened to by one running process at a time. Therefore, no two running processes should have the same queue name in their QueueList parameters. This is a required parameter.
TimeOut	Number of seconds	Specify the maximum wait time, in seconds, before the incoming message processing status is set to Error.
Debug	True or False	Specify whether or not to write detailed log information to the log file to facilitate debugging. True: Write detailed process log information to the log file. False: Write only normal process log information to the log file.
SrvAgentByQ	True or False	Specify how the queues in the QueueList will use AppServer agent. True: The processor will create one AppServer agent for each queue in the QueueList. False: All the queues with the same AppServer will share one AppServer agent.

Setting Up Order Processors

Use Setup|Processes|Process Maintenance to set up an order processor for each broadcast point where messages are received. Use these values:

Process Type: OP
 Program Name: gsford\prc\OPEnginePlipp.p
 Program Procedure: orderProcessor
 AppServer: JIT

Process parameters, such as these, control how an order processor operates.

Table 4.4
Order Processor Parameters

Parameter	Values	Description
BroadcastPoint	Table ID gdcfbrdp and broadcast point ID	Determines the broadcast point that the order processor monitors. This is your internal ID for the customer's broadcast point.
Debug	True/False	When true, the processor adds additional detail about each order it processes or skips to the log files in the log directory specified in the process section of the system configuration file.
Log	True/False	Determines whether the process logs messages in the logging databases. You can view these messages with Tools Logging/Debug Tools Logging Database Viewer.
OPErrrorEmailList	Comma-delimited e-mail address list	Use this parameter to send e-mails to a delimited list of recipients when the processor encounters an error.
StopOnError	True/False	When True, the process stops after encountering an error and waits for the record to be flagged for recycling before continuing. When False, the processor will indicate the error, then continue.
Trace	0, 1, 4, 7, 10	Determines if business logic tracing is enabled and written to a log. See "Order Processor Tracing" on page 162 for details.

The following are examples of using rules and rule parameters to define processing for order processors:

- Item Number Processing
- Validating Broadcast Points
- Validating Sequences
- E-Mail Error Notification

Note See your QAD Support representative for the latest information on the rules included in the default JIT/S system data.

Item Number Processing

The configuration for item numbers is defined in the partDisplayConfig section of config.xml. The item number can include multiple elements—item ID, color code ID, and revision level—or only the item ID element. See "Item Numbers" on page 87.

If the item number is defined by more than one field in the broadcast, the order receiver transforms it into a single, unique item number string.

The OPValidateParts rule for the order processor does the following validations:

- If the item number includes multiple elements:
 - A customer item record must exist where the customer item ID matches the item number string constructed from the elements in the broadcast.
 - A sales order line must exist for the customer and ship-to that specifies the internal item and the customer item.
- If the item number includes only the item ID:
 - An internal item ID must exist that matches the item number from the broadcast.
 - A sales order line must exist for the customer that specifies the internal item; the customer item on the sales order must be blank.

Validating Broadcast Points

Before processing an order, the order processor first determines if the customer order already exists and is at a higher broadcast point. This rule (OPHigherPoint) has one parameter: HigherPointAction. This parameter determines the action to take. It can have the following values:

Error. Raise an error condition if broadcast is found on a higher point.

Skip. Skip processing this COV if the CO is found on a higher point.

The value you choose for the HigherPointAction parameter depends on the specific relationship you have with the OEM sending the broadcast. This lets you tailor the behavior of the system based on your business needs.

Validating Sequences

In a sequenced manufacturing system, validating sequence numbers is a critical activity. The OPCheckSeq rule has the following parameters:

MinVal	The minimum sequence value allowed.
MaxVal	The maximum sequence value allowed.
Add Wrap	When the sequence is restarted. This can be either NewDay or NewWorkWeek.
SkipList	A comma-separated list of broadcast point IDs for which the sequence does not need to be checked.
IncrVal	The sequence increase value.

Using these parameters, you can determine the behavior of the system based on information specific to the OEM originating the broadcast.

E-Mail Error Notification

When an order processor encounters an error, it can continue after indicating that there is an error or it can stop—process parameter StopOnError is True.

To have an e-mail sent when an error occurs, use the process parameter OPErrEmailList and enter a comma-separated list of e-mail addresses in the Value 1 field. The subject and content of the e-mail describes the error.

Setting Up Order Schedulers

Set up order schedulers in Setup|Processes|Process Maintenance using these values:

Process Type: OS
 Program Name: gsford\prc\OSEnginePLipp.p
 Program Procedure: orderScheduler
 AppServer: JITS

Process parameters control how the order scheduler operates.

Table 4.5
Order Scheduler Parameters

Parameter	Values	Description
LabelType		Determines the type of label to be printed based on the label printing configuration when orders are released. Label types are members of the label_type class code.
Debug	True/False	When true, the processor adds additional detail about each order it processes or skips to the log files in the log directory specified in the process section of the system configuration file.
Log	True/False	Determines whether the process logs messages in the logging databases. You can view these messages with Tools Logging/Debug Tools Logging Database Viewer.
ShippableAU	Table ID sfcash and a shippable assembly unit ID	Determines the shippable assembly unit for which this order scheduler creates firm assembly orders.
Trace	0, 1, 4, 7, 10	Determines if tracing is enabled and written to a log. See “Process Tracing” on page 160 for details.

Use rules and rule parameters to define processing for order schedulers; for example, for Multiple Shippable Assembly Units or Interaction with an MES.

Multiple Shippable Assembly Units

In Process Maintenance, define an order scheduler process that schedules orders for multiple shippable assembly units (SAUs) on a single production line:

- Determine the rules that you want to use for order scheduling.
- For each SAU, add an instance of each rule—with the ShippableAU parameter set to that SAU—to your order scheduler rule group.
- Assign the rule group for the multiple SAUs to your order scheduler process.
- Specify the maximum number of orders to count for various actions:
 - To read: max_batch
 - To schedule: max_schedule
 - To firm: max_firm
 - To release: max_release

When scheduling multiple SAUs for a single production line, use these parameters in the SAU-specific rules to set the mix of orders across the SAUs.

- Use the CountHotBuilds process parameter in your order scheduler process to specify whether to include hot-build orders in the counts for max_schedule, max_firm, and max_release. If hot-build orders are not included in the count, they are released separately and first.
- Use the ReverseRelease parameter in the OSFifoReleaseWOs rule to specify whether a batch of orders should be released in forward or reverse order. If the CountHotBuilds parameter is included in the rule and set to Yes, the hot-build orders are included in the group and reversed.
- Use the AllowPartialRelease parameter in the OSFifoReleaseWOs rule to specify whether fewer than the max_release number of orders can be released. If the CountHotBuilds parameter is included in the rule and set to Yes, the hot-build orders are included in the group; if CountHotBuilds is No, the hot-build orders are released before the count starts for the group.

Interaction with an MES

If you are using a manufacturing execution system (MES) to manage shop floor activities, you can configure JIT/S to send a workOrderRelease message to the MES when a work order has been released.

Use Setup|Processes|Rule Group Maintenance to configure the WORDRLSD_PLC rule that is a member of the WORDRLSD rule group. The rules in the WORDRLSD rule group are executed whenever the Order Scheduler generates a WORDRLSD business event.

The WORDRLSD_PLC rule has one parameter:

startProduction. Yes indicates that production has started on the work order. When Yes, the production status of the work order is set to W and the WORDSTAR business event is created.

Setting Up Event Listener Processes

Use Setup|Communications|Event Listener Maintenance to set up event listeners or consumers for event-driven processes or engines. In this context, a *consumer* is an event listener that initiates an action when a monitored event occurs. In the header, assign a rule group.

From the Options menu, choose Event Listener Detail to define the callback procedures and clients for the consumer; choose Event Listener Parameter to define the parameters and their values for the consumer.

None of the processes that are set up with the current version of JIT/S are event listeners. This function can be used for custom processes or future enhancements.

Setting Up Scanners

Use Setup|Processes|Scanner Maintenance to set up scanners for the work cells. Before opening the scanner setup screen, see “Rule Maintenance” on page 144 and “Rule Group Maintenance” on page 145 to define procedural rules for the scanners. The rule group type must be Scanner.

Fig. 4.18
Scanner Maintenance

Field Descriptions

Rule Group. Select a rule group from those defined for the rule group type Scanner.

Start-up Rule. This is the first rule the application runs to detect what is being scanned. Based on what is being scanned, the application then starts the next appropriate rule.

Publish. Choose one of the members of class code Scanner_Publish to determine when to publish the result of the scans.

Always	Publish the results of all scans.
Good	Publish the results of successful scans.
Bad	Publish the results of only problematic scans.
Never	Never publish the results.

Work Cell. Select the work cell where the scanner is located.

UI Program Name. Enter the name of the program to use to collect data from a scanner.

Process Monitoring and Tracing

JIT/S has a number of logs for exception handling. In addition, logs can be created for monitoring the activity of any process. For order processor processes (type OP), an additional level of tracing is possible that includes details about the business logic execution. Tracing is enabled for processes individually.

- Basic Process Logging
- Exception Handling
- Process Tracing

Basic Process Logging

When a process starts, the process engine that manages and supports all system processes creates two files in the `logdir` specified in the `process` section of `config.xml`.

- `processID_output.log`. Unhandled Progress errors are written to this log. During normal system operation, these errors should not occur, but they might occur during a development or customization cycle.
- `processID.log`. Process-specific business logging is written to this file, where `processid` is the ID for the process being monitored.

For order receiver and order scheduler processes, if the `Debug` parameter is set to `true` in `Process Maintenance`, additional detail is written to the `processID.log`. This includes, for example, which orders were processed and which were ignored.

Two additional log files can be created for any process when the `businessEvent` and `businessEventDetails` settings are `Yes` in the `debug` section of `config.xml`. These logs are updated whenever a process generates a business event. When detailed logging is enabled, each rule executed as part of a business event is also logged.

Note For order processor processes, business logging is enabled through the `TRACE` parameter. See “Order Processor Tracing” on page 162.

Exception Handling

The system validates setup and writes errors and warnings for the following processes:

- Order Processor
- Order Scheduler
- Label Engine
- Process Engine

This logging is always enabled; it is not controlled by process parameters. It captures exceptions such as an invalid value for a required parameter, an invalid program specified for a process, or an invalid query for a label.

JIT/S writes errors and warnings to files in the process-specific subdirectories in the `logdir` directory that is defined in the `logging` section of `config.xml`.

Table 4.6
Process Subdirectories for Exception Logs

Process	Subdirectory	File Name
Order Processor	OP	<code>processID.log</code>
Order Scheduler	OS	<code>processID.log</code>
Label Engine	Label_Engine	<code>exception.log</code>
Process Engine	Process_Engine	<code>processID.log</code>

Process Tracing

You can trace process activity using the process `TRACE` parameter and, optionally, indicate a level for tracing detail. This is normally needed only during system implementation.

Note The TRACE parameter provides some Tracing for All Processes; however, it currently provides additional business-level information from only Order Processor Tracing.

Tracing for All Processes

When process tracing is enabled through the TRACE parameter in Process Maintenance, the system captures information related to process activity in a log named *processID-Trace.log*, where *processid* is the ID for the process being monitored. Files are placed in the *logdir* directory that is defined in the *logging* section of *config.xml*.

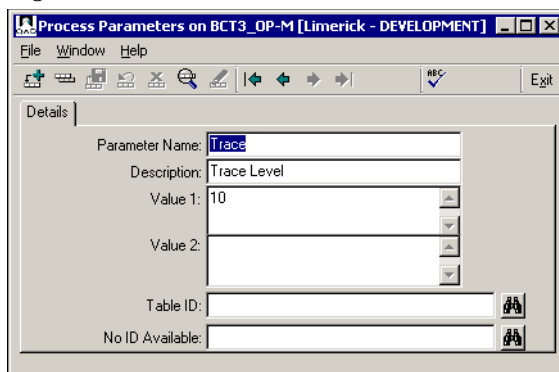
The trace log entries can be imported into Excel for analysis. The trace level is included just before each program name. The order of the data is as follows: Date, Time, Trace Statement, Trace Level, Procedure, Line Number.

Note Trace files can grow quite large quickly; it is recommended that you enable trace only when you are tracking a specific issue.

When tracing a process, be sure to set Local Execution to Yes in Process Maintenance to ensure that the process procedure runs solely within the session rather than being executed on the appserver. This is also required for messages and tracing information to be written correctly to the log files.

Use Process Maintenance, Options|Process Parameter to enable tracing. Add the parameter TRACE to the process selected in the process browse and set Value 1 to the tracing level you want to use (See Table 4.7).

Fig. 4.19
Setting Trace Level in Processor Parameters



Each tracing level includes reporting for all lower levels; for example, when the tracing level is 7, tracing also returns the data for level 4.

Table 4.7
Generic Process Tracing Levels

Level	Description	Content Examples
1	Not currently used	
4	High-level actions (default level)	- Any reason the process is stopping, such as stopped by a user, it has reached the date force stop and time, or an exception has been raised by the process program. - Errors reported by the process. - When a process goes into stalled status.

Level	Description	Content Examples
7	Medium-level actions	- Each time the process engine wakes up, it reports what program is being run. - After running the program, it reports whether the program indicated it should continue running or stop.
10	Detailed	- Each time a process checks to see if it is still stalled. - The operating system PID for the process.

Order Processor Tracing

Additional business process tracing is available for order processor processes. These processes are identified by the program name `OPEnginePLipp.p.` and the program procedure `orderProcessor`.

When tracing is enabled for an order processor process, JIT/S writes the additional business process information to `processID-Trace.log` according to the level specified. The output described for generic processing in Table 4.7 is also included; the business logic tracing is in addition to the standard trace.

Note For order processor processes, the Debug and Log parameters cannot be used. All business logic tracing is captured by the TRACE parameter.

You set up business tracing for OP processes in the same way as generic tracing by using the TRACE parameter in Process Maintenance. However, for business process tracing, the tracing levels produce different output.

Table 4.8
OP Process Tracing Levels

Level	Description	Content Examples
0	No tracing. Default.	
1	Performance. Traces a single statement at the start and end of each COVH that is processed.	Execution time for a complete activity
4	High-level actions. Traces the main events that occur during processing.	- Any reason the process is stopping, such as stopped by a user, it has reached the date force stop and time, or an exception has been raised by the process program - When a process goes into stalled status
7	Medium-level actions. Traces details.	- Each rule run - Rule parameter values - Result of each rule
10	Detailed. Traces all other information that might be useful.	- Contents of the temp tables between each rule - Contents of any other temp tables used during processing - Start and end of each subprocedure or block of code - Value of any significant internal variables at significant points in the process

Factory Dashboard

The functions on the Setup|Factory Dashboard menu let you identify the key business events that you want to monitor in your system to ensure that activity is within defined thresholds. These events are typically known as key performance indicators (KPI).

You specify which events you want to monitor and how you want to measure the events. You also specify how you want to organize and display the information. You can then view the information about these events using Operations|Factory Dashboard Monitor. See “Factory Dashboard Monitor” on page 313.

Monitoring of events is implemented through factory dashboard rules that are included in the rule group executed when a specific event occurs. The factory dashboard rule generates the messages required to update the measurements associated with the event.

- Designing KPIs
- Managing Data
- Severity Levels
- Monitored Event Maintenance
- Dashboard Indicator Maintenance
- Dashboard View Maintenance

Designing KPIs

In a just-in-time environment, you are constantly monitoring the sequence of events reported by your customer in broadcast messages to ensure that your deliveries are on time and sequenced correctly.

The setup functions associated with the Factory Dashboard are designed to help you answer questions such as the following:

- How many items have I shipped to my customer that have not yet been installed in a vehicle at their plant?
- How many shipments occurred during work shift 1?
- How much time has elapsed since we received a broadcast?
- Have any sequence gaps occurred in broadcast messages?

You build KPIs based on five key monitored events:

- Receipt and processing of a customer broadcast
- Scheduling of a work order
- Beginning work on a work order
- Completing a work order
- Finalizing a shipment

You can create four types of measurements related to these events:

- Sequence numbers are received in the broadcasts from the customer and indicate the order in which items need to be delivered to the customer assembly line. In many cases, the gap between sequence numbers is fixed, such as by an increment of 1 or 10. You can monitor differences between sequence numbers to raise alarms when sequences are out of order or unusual gaps occur.
- Date and time can be monitored based on differences or elapsed time. For example, you can design a KPI that registers an alarm when the elapsed time since a broadcast receipt exceeds a defined threshold. This may indicate a problem with the broadcast communication system. You can also monitor the difference between two time points so you can determine, for example, how much time there is between each shipment.
- Count values can be monitored based on a beginning and ending time. These can then be reset to a specific value on a daily basis. For example, you might want to count the number of work orders completed each hour, and then reset that value to 0 at the beginning of each day. You can also use a count to calculate a runrate, which is the number of shipments per hour.
- You can also monitor counts between two events. This is known as a bank. A bank is often used to measure quantities between two broadcast points. For example, you can monitor the number of items you have shipped to an OEM that have not yet been paid for. When shipment occurs, the count is incremented. When a broadcast is received for payment, the count is decremented.

You can also specify a deviation to use with the calculation. This can be useful when the specific event you want to monitor is not included, but another event has a known relationship to it.

Example You want to monitor the sequence number of the vehicle on the OEM assembly line at the point of fit. They do not have a broadcast point assigned at the point of fit. Their next broadcast occurs at the pay point. However, you know that the point of fit is always 75 cars before the pay point. You can use a deviation against the pay point to monitor the sequence at the point of fit.

Managing Data

When you set up dashboard indicators, you can choose to enable logging. When logging is enabled, a record is kept in the database of the old and new values and the data and time when the value was updated. You can view this data using Tools|Logging/Debug Tools|Monitored Event History Viewer. See “Monitored Event History View” on page 282.

Purging this data is managed by a background process. You can configure the number of days you want to retain data in Setup|Processes|Process Maintenance.

The program that you specify in Process Maintenance is `MonitoredEventHistoryPurgePlipp.p`. This process has one decimal parameter (`dataRetentionDays`) that determines the number of days that data is retained. If this parameter is not set or it is specified incorrectly, a 30-day retention period is assumed.

You can also choose to have data exported, either periodically or only when data is updated. The export is managed by two settings in the system configuration file, `config.xml`:

- `exportMode` can be `sonic` or `file`. `Sonic` places the data in a Sonic queue (`indicatorData`) for processing. `File` causes the data to be written to a file in QDoc format and placed in the directory specified by `exportDir`.

- `exportDir` specifies the location where the exported file is saved when `exportMode` is file.

Other applications can access the data for viewing in integrated tools.

You can configure this process in Setup|Processes|Process Maintenance to specify how frequently data is exported. The program that you specify in Process Maintenance is `FactoryHealthExportPlipp.p`. This process runs in the background and waits the time specified in Wait time before looking again for data to export.

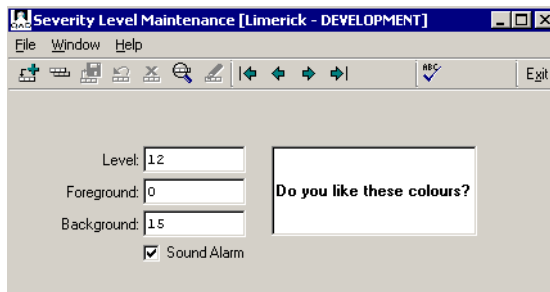
Severity Levels

Use Setup|Factory Dashboard|Severity Level Maintenance to set up the display characteristics—foreground and background colors—for severity levels.

You then assign severity levels to the threshold associated with an indicator in Dashboard Indicator Maintenance; see “Level” on page 173. These colors display in Operations|Factory Dashboard Monitor based on the thresholds of the various data values.

You can also indicate whether you want a visible and audible alarm when a threshold reaches a particular severity level.

Fig. 4.20
Severity Level Maintenance



Field Descriptions

Level. Enter an integer value for this severity level, up to 9,999,999.

Foreground and Background. Specify a value for the foreground and background colors. The foreground color is used for text values and the background color for the cell shading in the Factory Dashboard display.

The underlying Progress infrastructure defines 16 reserved colors. Your system administrator can add additional colors (up to 255, in sequence) in the Progress session initialization file. Otherwise, you should specify one of the colors listed in Table 4.9.

Table 4.9
Default Progress Colors

Color Number	Windows RGB Value	Actual Color
0	0, 0, 0	Black
1	0, 0, 128	Dark blue
2	0, 128, 0	Dark green
3	0, 128, 128	Blue green
4	128, 0, 0	Red

Color Number	Windows RGB Value	Actual Color
5	128, 0, 128	Purple
6	128, 128, 0	Olive
7	128, 128, 128	Gray
8	192, 192, 192	Light gray
9	0, 0, 255	Blue
10	0, 255, 0	Green
11	0, 255, 255	Turquoise
12	255, 0, 0	Red
13	255, 0, 255	Pink
14	255, 255, 0	Yellow
15	255, 255, 255	White

Sound Alarm. Select this option if you want users to be notified when the threshold with this severity level is reached. In this case, a message displays in the Factory Dashboard, and an audible beep occurs until the message is dismissed by clicking OK.

Monitored Event Maintenance

Use Setup|Factory Dashboard|Monitored Event Maintenance to specify the key business events you want to monitor and under which conditions (filter criteria) you want the monitoring to occur.

Note The business events that are valid members of the class code `Business_Events` are used in the Factory Dashboard as monitored events. They are independent of the events and business events defined and used in the Message Manager.

Fig. 4.21
Monitored Event Maintenance

Field Descriptions

ID. Enter the name of this business event.

Description. Enter a brief description of the event to indicate its intended use.

Business Event. Select a predefined event from the drop-down list. Business events are members of the `Business_Events` class code defined in Class Code Maintenance. They represent key points in the assembly process where activity is monitored.

Member Name Data Synchronization Program	Description
COVHPROC FH_COVHPROC_DataSynch.p	Customer broadcast processed
INMSGERR FH_INMSGERR_DataSynch.p	Inbound message processed with error
INMSGPASS FH_INMSGPASS_DataSynch.p	Inbound message processed correctly
INMSGTYERR FH_INMSGRTYERR_DataSynch.p	Inbound message retry processed with error
INMSGTYPASS FH_INMSGRTYPASS_DataSynch.p	Inbound message retry processed correctly
OUTMSGACK FH_OUTMSGACK_DataSynch.p	Outbound message received and accepted
OUTMSGERR FH_OUTMSGERR_DataSynch.p	Outbound message processed with error
OUTMSGNACK FH_OUTMSGNACK_DataSynch.p	Outbound message received but rejected
OUTMSGPASS FH_OUTMSGPASS_DataSynch.p	Outbound message processed successfully
OUTMSGRSPTOUT FH_OUTMSGRSPTOUT_DataSynch.p	Outbound message response timeout
OUTMSGRTYACK FH_OUTMSGRTYACK_DataSynch.p	Outbound message retry received and accepted
OUTMSGRTYERR FH_OUTMSGRTYERR_DataSynch.p	Outbound message retry processed with error
OUTMSGRTYNACK FH_OUTMSGRTYNACK_DataSynch.p	Outbound message retry received but rejected
OUTMSGRTYPASS FH_OUTMSGRTYPASS_DataSynch.p	Outbound message retry processed successfully
WORDFINI FH_WORDFINI_DataSynch.p	Production finished
WORDRLSD FH_WORDRLSD_DataSynch.p	Production scheduled
WORDSHIP FH_WORDSHIP_DataSynch.p	Shipment finalized
WORDSTAR FH_WORDSTAR_DataSynch.p	Production started

Sync Program. Enter the name of a Progress program to automatically update the indicators associated with this business event. This can be useful, for example, when a new bank is created between two points and you want to set its initial value based on information currently in the database. The system-supplied synchronization programs are listed in the previous table.

You can invoke the synchronization from the Factory Dashboard Monitor.

Note Synchronization cannot be used with indicators of type Count or indicators with a calculation type of Minimum or Maximum; see “Indicator Type” on page 170.

The system builds a default name for this program based on the following convention:

`FH_ + BusinessEventID + _DataSynch.p`

For example, for an event associated with the business event COVHPROC, the program defaults to:

`FH_COVHPROC_DataSynch.p`

Event Filters

You can monitor all events of a certain type or choose to apply predefined filter criteria. You can also apply multiple filters to pinpoint very specific events to monitor.

Each business event has predefined filter criteria that can be used to focus on specific events you want to monitor. For example, you may want to monitor the broadcast receipt only when it is from a specific customer.

In Setup|Factory Dashboard|Monitored Event Maintenance, choose Options|Filter Maintenance to specify filter criteria for a selected event. Specifying filter criteria is optional. If not specified, all events are monitored.

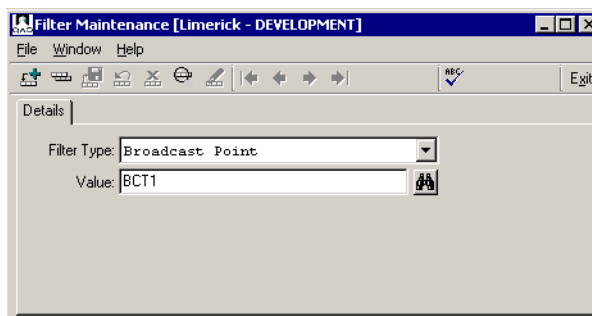
For each event, four types of filters can be specified. You can specify multiple criteria of one type or different types if you want. When you specify multiple criteria of one type, this is treated as a logical OR. Multiple criteria of different types are treated as logical AND.

Example You specify the following criteria for monitoring shipments:

- Items in product family Seats
- Shipped-to customer A
- Shipped-to customer B

The system finds events that match product family Seats AND (customer A OR customer B).

Fig. 4.22
Filter Maintenance



Field Descriptions

Filter Type. Choose a predefined filter type from the drop-down list. Filter types are members of the Filter_Criteria class code defined in Class Code Maintenance.

Class Name	Description	Sort Order
EDMFTPDC	Trading Partner Document	70
EDMFTRDP	Trading Partner	60
GDCFBRDP	Broadcast Point	10
GDMFCUST	Customer	20
GDMFPRDF	Product Family	30
SFCFASSH	Shippable Assembly Unit	40
SHMFSTO	Ship To	50

Valid filter types depend on the business event you are updating.

- For customer broadcast processed, you can choose broadcast point, product family, shippable assembly unit, and ship-to.
- For other events, you can choose customer, product family, shippable assembly unit, and ship-to.

Value. Enter a value for the filter you have selected. For example, if the filter is ship-to, enter the ship-to address to be monitored for this event.

You can choose a value from the lookup. The records that display vary depending on your choice of filter type.

Synchronizing Data

The Factory Dashboard setup supports the ability to synchronize data. It is useful when new indicators are created to initialize their values appropriately. For example, when you create a new bank, you can set its value based on data already being tracked in your JIT/S database.

Indicator type and the events associated with the indicator determine how an indicator is synchronized. You cannot synchronize events of type Count or those with a calculation type of Minimum or Maximum.

You specify the program that completes the synchronization during setup. This function can then be invoked from the Factory Dashboard Monitor.

Dashboard Indicator Maintenance

Use Setup|Factory Dashboard|Dashboard Indicator Maintenance to set up the key performance indicators you want to monitor in the Factory Dashboard. Settings for the indicator determine how the value is calculated and updated by the system.

Note The Indicator Type determines which fields are displayed.

Fig. 4.23
Dashboard Indicator Maintenance

Field Descriptions

ID. Enter the name identifying this indicator.

Description. Enter a brief description of the indicator indicating how it is used in the system.

Indicator Type. Indicator type determines how the value of the indicator can be calculated. It also affects the fields that display for input in this screen. Indicator types are members of the Indicator_Type class code defined in Tools\System Data Tools\Class Code Maintenance.

Choose one of the available types from the drop-down list:

Sequence Number. This type can be calculated using Replace, Difference, Maximum, and Minimum.

Timestamp. This type can be calculated using Replace, Difference, and Elapsed Time.

Bank. No calculation type is associated with a bank. You must specify start and end events and an increment amount. When the start event occurs, the bank is incremented by the increment value. When the end event occurs, the bank is decremented by the same amount.

Production Count. This type can be calculated using Decrement and Increment. You must specify an increment amount, start and end time range, and reset value.

Calculation Type. Choose the code that determines how the value of this indicator is calculated.

Note This field does not display when indicator type is Bank.

Calculation types are members of the class code Calculation Type defined in Tools\System Data Tools\Class Code Maintenance. Choices are:

Replace	Replace the existing value with the new value.
Decrement	Decrement the existing value by a specified amount.

Difference	Determine the new value by taking the difference between the new data received in the current message and the data received in the previous message.
Elapsed Time	Determine the value by taking the difference between the time associated with the monitored event and the current time. This is updated each time that the Factory Dashboard Monitor is refreshed.
Increment	Increase the existing value by a specified amount.
Maximum	Choose the greater of the old and new values; replace the existing value with a new value only when the new value is greater than the existing value.
Minimum	Choose the lesser of the old and new values; replace the existing value with the new value only when the new value is less than the existing value.

Start Event. Choose the event defined in Monitored Event Maintenance that triggers the update of this indicator. For indicators of type Bank, this event increments the bank value.

End Event. For indicators of type Bank only, specify the event that indicates the end of the bank. This is typically a broadcast point. The bank value is decremented when this point is reached.

Derivation Offset. Specify a simple positive or negative numeric offset to use when deriving a value from the raw data.

Derivation Program. Specify the path and name of a Progress program that calculates a derived value. The program must be in the PROPATH.

Note When both Derivation Offset and Program are specified, they are used in combination. If only an offset is specified, this is added to the indicator value. If a program is specified, it is run and the result of the program is added to the indicator value. If both are specified, both values are added to the indicator.

Example Offset Program is `calcProgram.p`, which returns a value of 10.22. Offset value is 2. 12.22 is added to the indicator value.

Logging. Select this field to log the data for the indicator. With logging enabled, a record is kept in the database of the old and new values and the date and time when the value was updated. You can view this information using Monitored Event History View on the Tools|Logging/Debug Tools menu.

Export. Select this field if you want the data for the indicator exported for use by an external system. A background process exports data at predetermined intervals, defined in Setup|Processes|Process Maintenance. See “Managing Data” on page 164.

Export On Update. Select this field if the data for the indicator should be exported only when it is updated. When the monitored event occurs, a background process writes the new data.

The following field displays only when you are defining an indicator of type Production Count or Bank:

Increment Amount. Specify the amount that each event increments or decrements the production count indicator. (Increment and decrement are the only calculation types that can be associated with a production count.)

The following fields display only when you are defining an indicator of type Production Count:

Start and End Time. Specify the beginning and end of the daily time range when the indicator can be updated. If the time of the start event is outside this time range, the indicator is not updated.

When a reset value is defined, the start time determines when the indicator value is reset.

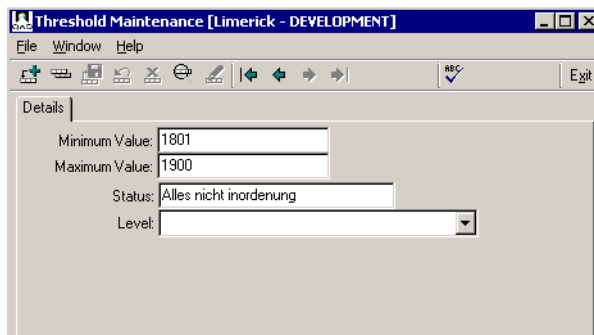
Reset Value. Specify the value that the indicator should be reset to each day. Production count indicators are typically reset to 0 (zero).

Threshold Maintenance

In Dashboard Indicator Maintenance Maintenance, choose Options|Threshold Maintenance to set up thresholds and severity levels for the selected indicator that you want to monitor in the Factory Dashboard.

You must define at least one threshold record for an indicator before the indicator will display in the dashboard. You can define multiple threshold ranges to reflect different statuses associated with an indicator. The ranges cannot overlap to ensure that a data point always falls within one range only.

Fig. 4.24
Threshold Maintenance



Field Descriptions

Minimum Value. Specify the minimum value for the threshold range. Leave blank for an open-ended range. The minimum value must be less than or equal to the maximum.

When multiple threshold values are associated with an indicator, they cannot overlap. Open-ended ranges are available only for measurements that are not based on time.

Note For elapsed-time calculations, set Minimum Value to 00:01:00 and Maximum Value to 23:59:59 to have the largest window for capturing measurable events.

Note When Indicator type is Timestamp, the minimum and maximum values are times of day in the 24-hour format.

Maximum Value. Specify the maximum value for the threshold range. Leave blank for an open-ended range. The maximum value must be greater than or equal to the minimum.

Status. Enter a text-based status.

Level. Choose a severity level from the drop-down list, previously defined in Severity Level Maintenance. The severity level determines the background and foreground colors for visual display. See “Severity Levels” on page 165.

Manual Adjustment

In Dashboard Indicator Maintenance, choose Options|Manual Adjustment to specify a new value for an indicator manually. This can be used to correct values that become out of sync with real data.

Fig. 4.25
Manual Adjustment

The screenshot shows a dialog box titled "Manual Adjustment [amnt40 - DEV]". It contains the following fields and controls:

- Indicator ID:** BCT 3 - Prod Count
- Indicator Description:** BCT 3 - Prod Count
- Current Value:** 0
- New Value:** 0.00 (with a spinner control to the right)
- Adjustment Note:** A large empty text area.
- Buttons:** OK and Cancel at the bottom.

The system displays the ID of the indicator being edited, as well as its description and its current value.

Field Descriptions

New Value. Specify the new value for this indicator.

Note The format varies depending on the type of indicator you are adjusting.

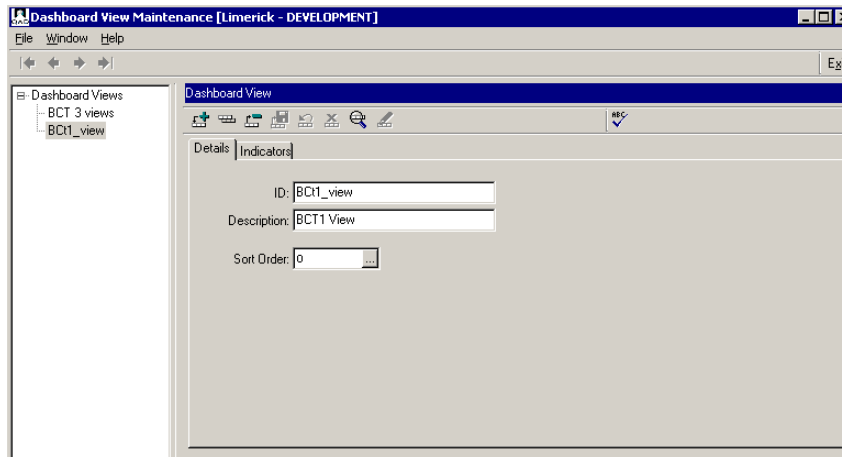
Adjustment Note. Enter a comment regarding why this adjustment is needed in the free-form text box.

Dashboard View Maintenance

Use Setup|Factory Dashboard|Dashboard View Maintenance to organize indicators in a hierarchical tree structure. Indicators can be associated with one or many views and views can be arranged in a hierarchical structure. Views have a sort order so they can be moved within the structure. In addition, each indicator within the view also has a sort order.

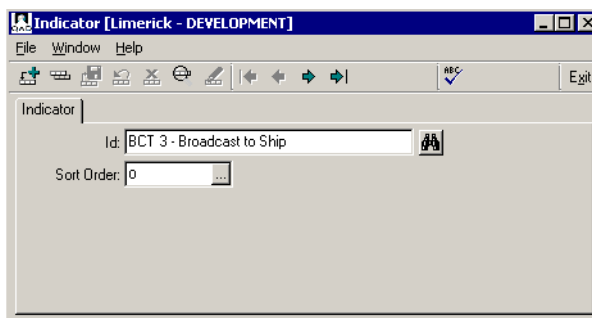
Like other tree views in JIT/S, you can add a new view by right-clicking a parent node and choosing the Add Dashboard View Node command.

Fig. 4.26
Dashboard View Maintenance



First, specify a view name and description and the order you want it to display in. Then click the Indicator tab to choose one or more indicators to associate with this view.

Fig. 4.27
Dashboard View Maintenance, Indicator



You can also specify the order of the indicator using the Sort Order field.

Printers

Printer setup covers defining printer types, paper size, and printers. Information about printers and paper size is then referenced when you set up labels and documents.

You can send document print jobs directly to a print queue. For labels, you can use a print queue or a print server, through a shared directory interface. To use the shared directory interface, select Print Server and specify the print server program in Printer Maintenance, and store the name of the shared directory in the Base section in `config.xml`:

```
<printServerDir>D:\PrintServer\</printServerDir>
```

The print control program specified in Printer Maintenance determines the printing method.

- Printer Type Maintenance
- Paper Size Maintenance
- Label Templates and Printing
- Printer Maintenance

Printer Type Maintenance

In Setup|Printers|Printer Type Maintenance, set up printer types such as line printer or laser printer; then define your printers in Setup|Printers|Printer Maintenance. Associate printer types with label formats to ensure correct printing.

Paper Size Maintenance

Use Setup|Printers|Paper Size Maintenance to define paper sizes that can be linked to specific printers and formats. Specify an ID and description for each paper size.

Label Templates and Printing

Most label printing in the system is managed automatically with rules sending labels to a printer or a queue. For example, the last rule of an order processor can be to print a label.

Generate labels manually through various workbenches and these screens:

- See “Print Job Maintenance” on page 359 to print labels manually from a queue.
- See “On-Demand Label Print” on page 361 to generate a label manually.

All of the information for printing labels is maintained in JIT/S. Several tool sets can be used to develop the required print templates. These include text editors, Seagull Scientific’s Bartender, and Intermec’s LabelShop. For any of these solutions, each field designation in a JIT/S label template must start and end with a tilde (~), as in ~so_nbr~.

When JIT/S loads all types of label templates, it creates data variables for everything between pairs of tildes. See “Label Format Maintenance” on page 178; use the Maintain Variables option to view the variables.

Many companies choose to use third-party label-design software such as Software Label Manager to design highly configurable label formats. These templates can then be imported into JIT/S to use as the basis of the label formats maintained in the system.

JIT/S provides support for templates developed with Software 7.3 in the following file formats: .xml, .pas, and .csv. You can also continue to use the .dat and .dwn formats created in earlier versions of Software (Software no longer supports these). Specify the appropriate template parser program in Label Format Maintenance. See “Template Parser Program” on page 179.

The directory where labels are placed before printing is specified in a system configuration file—`config.xml`—that is updated during implementation.

Printer Maintenance

After setting up printer types and paper sizes, define your printers in Setup|Printers|Printer Maintenance. From the browse, you can also access Printer Type Maintenance on the Options menu.

Fig. 4.28
Printer Maintenance

Field Descriptions

Printer Type. Specify a printer type defined in Printer Type Maintenance.

Device Name. Enter the printer device name as it is defined on the server.

Model Name. Enter the specific description that the printer manufacturer uses to identify this model.

IP Address. Enter the address that identifies this device when it is accessed across the Internet or other network.

Automatic Printing. Select this field to enable automatic printing of production labels at this printer. The system checks the value of this setting before sending print commands. If automatic printing is disabled, the label is not generated.

The setting of Automatic Printing can be modified from the Work Order Workbench and the Assembly Order Workbench.

Print Control Program. Identify the program that queues the file to the printer or sends it to the print server. The supplied files are:

basgen\prc\print_file.p. Use this program to send labels directly to the printer.

basgen\app\printsharedirectory.p. Use this program to print through a print server using a shared directory interface.

Alternatively, you can supply your own custom print program, if needed.

Paper Size. Enter a size defined in Paper Size Maintenance that describes the labels currently in this printer. When this printer is selected, the system validates that the paper size associated with the label format matches the paper size of the printer.

Print Server. Select to use a print server to print labels.

Server Routine. If you are using a print server, enter the name of the print server routine.

When using the Software print server for setting the print server commands, such as SENDFORMAT, specify the following program: `basgen\app\printserver\software.p`.

Labels

Labels are a critical part of the process of tracking items and packages in JIT/S:

- Production labels are associated with items and are created when work orders and assembly orders are released.
- Package labels identify packages and are generated at package completion.
- Shipping labels are created when shipping is based on a broadcast signal that is not necessarily related to the build of the item.

This section covers label setup; for labeling operations, see “Label Operations” on page 359. Setting up labels involves multiple steps and varies in complexity depending on your printing needs.

- Review Label Templates and Printing.
- Define label groups—in Label Group Maintenance—that determine how many labels are printed and whether labels can be manually reprinted.
- Create label formats—in Label Format Maintenance—that determine how the labels print and what programs and queries should be used to populate the data in the label. Label formats can be imported from third-party label software. During the import, variables for the label data are created and stored. If you do not import formats, you must create these variables manually.
- Create label data variable detail records—in Label Data Variable Detail Maintenance—to extract data values from queries and populate the variable fields on labels.

If necessary, associate different queries with specific variables—in Label Data Variable Maintenance—in a label format. This is only needed under special conditions if a single query does not work.

- Write queries—in Label Data Queries—to locate information in the database that needs to be printed on labels. Typically, all the data for a specific group of labels can be located with a single query.
- Create label queues—in Label Queue Maintenance—and then define printing configurations—in Label Printing Configuration—that link a label format to a label type and define the printers and queue where the labels are generated.

Label Group Maintenance

Use Setup|Labels/Documents|Label Group Maintenance to create, update, and delete group definitions used to group label formats and store parameter settings for related labels. Labels are typically grouped by function such as item labels or package labels.

Fig. 4.29
Label Group Maintenance

Field Descriptions

ID. Specify the name you want to use to identify this label group.

Description. Enter a brief description of the group to indicate its usage.

Labels Per Run. Specify the maximum number of labels required when labels in this group are printed.

Reprint. The setting of this field determines whether labels in this group can be reprinted using Operations\Labels\Label Reprint. When using label groups, you must select the Reprint field to use Label Reprinting.

Label Format Maintenance

In Setup\Labels\Documents\Label Format Maintenance, create format IDs and associate IDs with printer types, print programs, and queries that fill the templates with data. You can generate label formats based on imported templates. If you do, you must specify a program to parse the template. During the import, the system does the following:

- It stores template files in the database.
- It makes a list of all the variables that are in the template and stores them in the database.
- It creates variable headers if they do not currently exist.

To complete label format definition, choose any of the following on the Options menu:

- Use Label Format Detail to specify static data that can be passed to a label-specific custom print program. The custom program takes the static value specified for a key and inserts it in the specified line of the label when it is printed.
- Use Printer Type Maintenance to display the same program accessed from Setup\Printers\Printer Type Maintenance.
- Use Import Template to import new templates created with third-party template software, override existing template definitions with imported values, or delete templates that are no longer needed. For import, you must specify the template file location. You can also choose to have the system create variables based on the template, if they do not already exist.

Note Deleting a template does not delete the variables associated with it.

- Use Maintain Variables to view the variables included in the format that will be replaced with data before printing. If you are using variable-specific queries, use Maintain Variables to specify the join between the label query and the variable query.

Fig. 4.30
Label Format Maintenance

Field Descriptions

Format ID. Specify the name that identifies this label format.

Description. Enter a brief description of this format to help identify its use in the system.

Printer Type. Specify the printer type defined in Printer Type Maintenance that identifies the type of printer used with labels of this format.

Template File. Specify the name of the file containing the template to be imported. You must specify the full path if the file is not located within the PROPATH. See “Label Templates and Printing” on page 175.

This field is required when you create label formats with third-party software and import them for use.

Print Definition. Specify whether and when to transmit the template. Printers that have memory can store the template and do not need to have it sent each time. Next Time sends the format template the next time and then switches the field to Never.

Label Build Program. Specify the name of a predefined program that obtains the values needed to update variables in the label template with actual data. This program executes the query specified for Query ID (basgen\app\print_routine.p).

Template Parser Program. If you specify a template file for import, specify a program to parse this file. The parser program identifies variables that must be updated in the template.

If you are using Software Label Manager as your label-design software, specify the following programs:

- basgen\prc\parsedatdwn.p for older versions of Software
- basgen\app\parsetemplatefile.p for .pas, .xml, or .csv templates from the 7.3 Software release

Query ID. Select the ID of the query created with Label Data Query Maintenance to use to populate the data variables printed on this label. The program specified for Label Build Program executes this query.

Label Group. Select a label group defined in Label Group Maintenance, if used.

Label Usage. Specify a member of the label_use class code defined in Tools|System Data Tools|Class Code Maintenance. It can have one of three values:

- **std_label** indicates a standard label format. For this label usage you can select optional additional start and end label formats.
- **start_label** indicates the format to use for the first label printed. When this usage is selected, the Start and End Label fields cannot be updated.
- **end_label** indicates the format to use for the last label printed. When this usage is selected, the Start and End Label fields cannot be updated.

Paper Size. Select the paper size to use when printing this format. Define sizes in Paper Size Maintenance.

Label Data Variables

Label Data Variable Maintenance

Use Setup|Labels/Documents|Label Data Variable Maintenance to define variables to be used as placeholders in a label template.

Note If you import templates, the import process creates the variables for you. You can then review them with this program and make any required updates.

You can optionally associate a query ID with a variable to determine how the system generates actual data values. However, typically, queries are associated with the label format, not individual variables.

After defining the variables, review or define variable details that determine the format and layout of the variable.

Important Since the detail record specifies how the variable data from the query is to be placed on the label, each variable must have at least one detail record.

Note You cannot change the format associated with a variable in this program, but you can override certain details for a particular usage of the variable.

Fig. 4.31
Label Data Variable Maintenance

Field Descriptions

Variable ID. Specify the name you want to use to identify this variable.

Description. Enter a brief description of this variable.

Query. Select a query previously defined in Label Data Queries.

From the browse, choose Options|Link Variable Details to select a variable detail record from those defined and maintained in Label Data Variable Detail Maintenance on the Setup|Labels/Documents menu.

Fig. 4.32

Label Data Variable Maintenance, Link Variable Details

Choose the variable detail record that you want to link in the first field. The system displays all of the default information about this detail record including its format and sort order. You can override these two values by specifying a different format or sort order in the bottom two fields. This override applies to this usage of the detail record only.

You can also override variable details in Label Data Queries.

Label Data Variable Detail Maintenance

Use Setup|Labels/Documents|Label Data Variable Detail Maintenance to specify the data type and format for placing variable data retrieved by a label query onto a label.

A data variable can have multiple detail records; for example, to place a work order number on a label with the prefix WO, create two variable detail records for an imported or defined work order variable:

Variable Type	Sort Order	Data
Fixed	10	WO
Data Retrieval	20	womf_worder.word_id

Important Since the detail record specifies how the variable data from the query is to be placed on the label, each variable must have at least one detail record.

Fig. 4.33
Label Data Variable Detail Maintenance

Field Descriptions

Variable Detail ID. Specify the name used to identify this detail record.

Description. Specify a brief description of this detail record to indicate its use.

Variable Type. Choose a member of the tagd_type class previously defined in Class Code Maintenance.

- Data retrieval indicates the data is populated by a query. In this case, the Data field contains the name of a table and field from which to read the data, such as gdmf_part.part_id.
- Fixed indicates a fixed value specified in the Data field such as a prefix.
- Function indicates a value calculated with a function specified in the Data field. The valid values are Date and User.

Sort Order. Specify a sequence number to determine the order in which label details are concatenated.

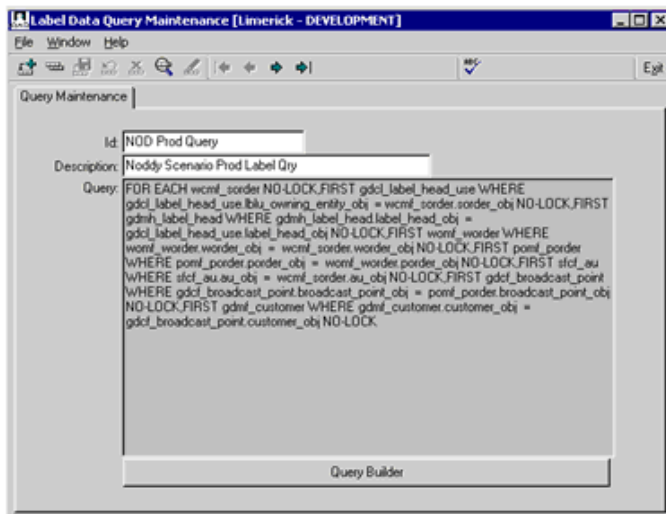
Data. Enter the data required by the variable type:

- For data retrieval variables, enter the table name and field name, separated with a period.
- For fixed variables, enter the fixed data.
- For function variables, enter the defined function.

Format. Enter the data format such as HH:MM:SS for time values, MM/DD/YYYY for date values, or X(12) for character values.

You can also use the Format section to call internal functions such as SUBSTRING (from, length) and getAttributeValue (attributeName, attribute value field to fetch). This last function can only be used when the defined data field is part_obj. You can also use the Format section to call internal functions such as custom functions created under the printfunctions folder from the custom directory using the layout: function(functionName,parameter1, parameter2) as shown in the following example.

Fig. 4.34
Label Data Variable Detail Maintenance Using Custom Function



Label Data Queries

Dynamic queries populate the data printed on a label. The variables associated with the query determine the data that is retrieved. After defining a query, use verification testing to ensure that it is valid.

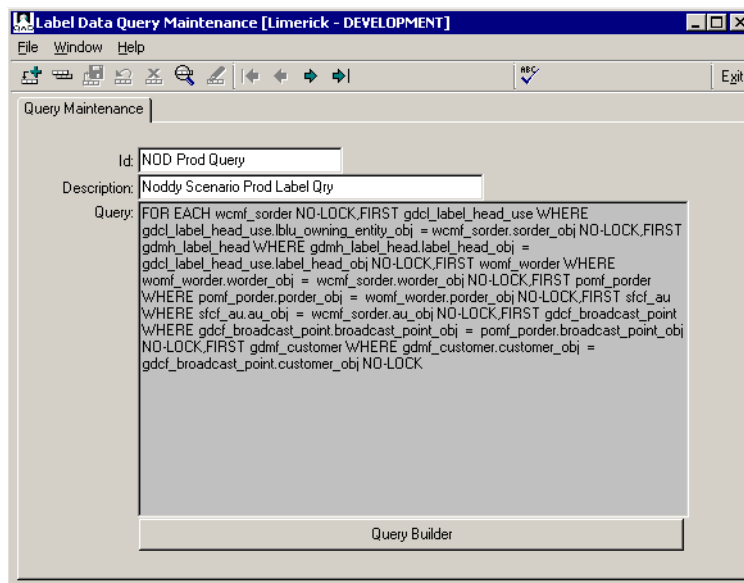
- Label Data Query Maintenance
- Label Data Query Builder
- Label Data Variables
- Label Query Verification Test

Label Data Query Maintenance

Use Label Data Query Maintenance on the Setup|Labels/Documents menu to specify both the name you want to use to identify the query and a brief description of its use.

You do not specify the query directly in this screen. Click the button below the Query field to launch the Label Data Query Builder.

Fig. 4.35
Label Data Query Maintenance



Label Data Query Builder

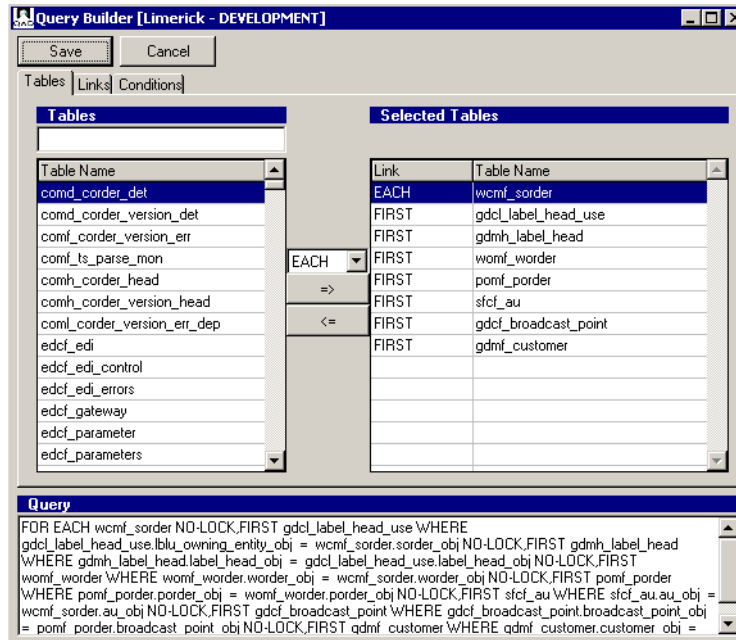
In Label Data Query Maintenance, click Query Builder to display the query builder dialog.

Use the three tabs to build queries based on identified database tables, links between the tables and table fields, and conditions.

Tables Tab

In the Tables tab, add a table or select or modify the tables for the query.

Fig. 4.36
Query Builder, Tables Tab



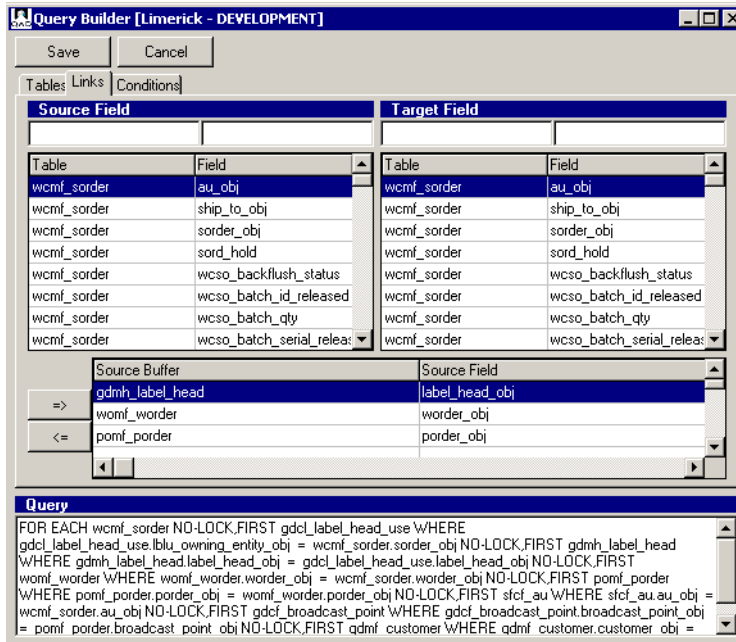
- 1 Choose the type of relationship in the drop-down list: EACH, FIRST, or LAST.
- 2 Highlight a table name on the left and click the right arrows to move the table from left list to the right.

The Progress command syntax based on the table and command selected displays in the Query field.

Links Tab

In the Links tab, choose the specific fields to be linked.

Fig. 4.37
Query Builder, Links Tab



- 1 Use the data entry fields above the lists to find a specific record. For example, if you type an S in the second entry field under Source Field, the Field list below scrolls to the first field that starts with the letter S.
- 2 Use the right arrow to add the source and target fields to the query statement. Highlight a statement and use the left arrow to remove it.

Conditions Tab

Specify conditions for the query.

Fig. 4.38
Query Builder, Conditions Tab

The screenshot shows the 'Query Builder [Limerick - DEVELOPMENT]' window with the 'Conditions' tab selected. The 'Fields' list on the left contains the following entries:

Table	Field
wcmf_sorder	au_obj
wcmf_sorder	ship_to_obj
wcmf_sorder	sorder_obj
wcmf_sorder	sord_hold
wcmf_sorder	wcso_backflush_status
wcmf_sorder	wcso_batch_id_released
wcmf_sorder	wcso_batch_qty
wcmf_sorder	wcso_batch_serial_released

The 'Value' field is empty, with a note: 'Use PROGRESS functions or quoted constants to define additional conditions'. The 'Operator' section shows buttons for '<', '<=', '=', '>', '>=', and '<>'. The 'Conditions' table at the bottom is empty. The 'Query' text area at the bottom contains the following SQL query:

```
FOR EACH wcmf_sorder NO-LOCK,FIRST gdcf_label_head_use WHERE
gdcf_label_head_use.lblu_owning_entity_obj = wcmf_sorder.sorder_obj NO-LOCK,FIRST gdmh_label_head
WHERE gdmh_label_head.label_head_obj = gdcf_label_head_use.label_head_obj NO-LOCK,FIRST
womf_worder WHERE womf_worder.worder_obj = wcmf_sorder.worder_obj NO-LOCK,FIRST pomf_porder
WHERE pomf_porder.porder_obj = womf_worder.porder_obj NO-LOCK,FIRST scf_au WHERE scf_au.au_obj =
wcmf_sorder.au_obj NO-LOCK,FIRST gdcf_broadcast_point WHERE gdcf_broadcast_point.broadcast_point_obj =
pomf_porder.broadcast_point_obj NO-LOCK,FIRST qdmf_customer WHERE qdmf_customer.customer_obj =
```

Task Steps

- 1 Select a table and field in the list on the left
- 2 Type the condition value on the right in the Value text field.
- 3 Click the button that represents the operator you want to use. In this example, the selected field must be less than or equal to (<=) a reference field value.

Label Data Variables

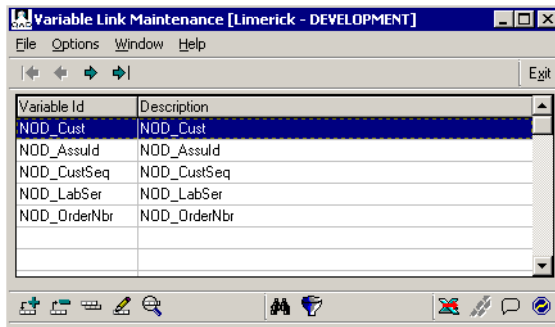
After defining a query ID in Label Data Query Maintenance, choose Options|Link Variables to view a listing of all of the label data variables currently using this query.

Link Variables

Click Add or Modify to link other variables to this query.

Note You can also specify the query associated with a variable in Label Data Variable Maintenance.

Fig. 4.39
Variable Link Maintenance



Variable Detail Overrides

On the Options menu, choose Override Detail Variables to modify the variable details from their default values. This does not change the defaults, but overrides them for this particular variable and query.

Choosing this option displays a browse of all of the variable detail records associated with the header that have been overridden. You can modify, add, or delete records.

Fig. 4.40
Query Variable Detail Override Maintenance

The screenshot shows the 'Query Variable Detail Override Maintenance [Limerick - DEVELOPME...]' window. It contains several sections for editing variable details and overrides.

Linked Variable Details

Variable Detail ID:

Description:

Variable Type:

Data:

Variable Defaults

Format:

Sort Order:

Header Variable Overrides

Format:

Sort Order:

Query Variable Overrides

Format:

Sort Order:

Task Steps

- 1 Choose the variable detail record that you want to modify in the first field.
The system displays all of the default information about this detail record in the Variable Details and Header Variable Overrides groups.
- 2 Specify a new format or sort order in the last two fields to be used with this detail record.

Label Query Verification Test

In Label Data Query Maintenance, use Options|Data Verification Tests to access the test for labels. The test is a rule defined as a member of the rule group LABEL_VERIFICATION_TESTS. As needed, define additional tests and assign them as rules to the rule group. See “Verification Tests for the Setup” on page 20.

Rule Name	Description
Verify Label Query	Verify that the label query and all its variables are valid and compile.

Select one or more tests in the left browse; then, click Launch Tests. The results display in the browse on the right.

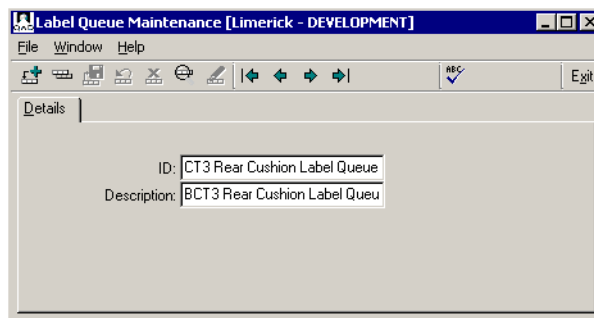
Important The tests should not be running while the plant is in operation; they should be used only during setup and maintenance—preventative, troubleshooting—periods.

Label Queues and Printing Configuration

Label Queue Maintenance

Use Setup|Labels/Documents|Label Queue Maintenance to define label queue IDs and specify a description.

Fig. 4.41
Label Queue Maintenance



Label Printing Configuration

In Setup|Labels/Documents|Label Printing Configuration, define label set names and assign them to the label_type class. Label types are typically processed similarly.

You can assign label printing configurations to assembly units in Assembly Unit Tree Maintenance. When a label type is associated with an assembly unit, those labels can be produced only when that assembly unit is identified as part of the business event that triggers the production of the labels. This is the same as using Options|Label Restriction to define the conditions that must be true before labels are printed. See “Label Restrictions” on page 118.

Use the following choices on the Options menu:

- Choose Label Configuration Detail to specify individual labels, formats, and destination printers.
- Choose Label Printing Restriction to specify rules that determine when labels print.

Fig. 4.42
Label Printing Configuration

Field Descriptions

Label Name. Enter the name for a group of labels; for example, Rear Production.

Description. Enter a description for the group of labels.

Label Type. Choose a member of the label_type class code defined in Tools\System Data Tools\Class Code Maintenance.

Label Configuration Detail

In Label Printing Configuration, choose Options\Label Configuration Detail to define individual labels for the group and associate each label with a label format. See “Label Format Maintenance” on page 178.

Fig. 4.43
Label Configuration Detail

Field Descriptions

Label Detail Name. Enter the name for a label in this printing configuration.

Description. Enter a description for this label configuration detail.

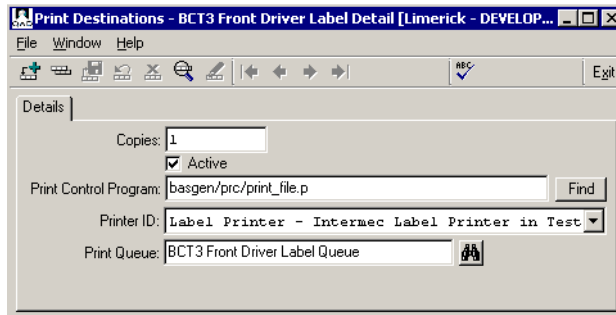
Active. Select to make the label active.

Format ID. Enter the ID of the appropriate format from those defined in Setup\Labels/Documents\Label Format Maintenance.

Tracking. This must be selected to save and print labels. If this is not selected, you cannot use print queue or reprint functions for this label.

From the Label Configuration Detail browse, choose Options|Print Destinations to associate multiple printer destinations with a label.

Fig. 4.44
Label Print Destinations



Field Descriptions

Copies. Select the number of copies to print. To use the Copies function, the label template must include the Duplicate parameter.

Active. Specifies whether this printer destination is active for this label.

Print Control Program. Enter a program name here to override the control program specified for the printer in Setup|Printers|Printer Maintenance. If left blank, the program specified in Printer Maintenance is used.

Printer ID. Printer IDs are defined in Setup|Printers|Printer Maintenance.

Printer Queue. When this field is blank, labels are printed directly after creation. If you specify a queue defined in Label Queue Maintenance, the labels will be generated and routed to the print queue for management.

Label Printing Restriction

In Label Printing Configuration, choose Options|Label Restriction to control which events trigger the label print. If no restrictions exist, the label is printed whenever the printing procedure is called by one of the print rules.

When a restriction is specified, the labels in the label set are printed only when the restricting table and record are identified as part of the business event that triggers the label production. You can set up multiple restrictions per printing configuration.

Note This function can also be accessed from Base|Work Cells/Assembly Units|Assembly Unit Tree Maintenance. When accessed for an assembly unit, the restriction applies to business events related to that assembly unit only. See “Label Restrictions” on page 118.

Fig. 4.45
Label Restriction

Label Name. This field is defaulted.

Label Description. This field is defaulted.

Table ID. Select the table for the appropriate restriction

Record ID. Select the record to be restricted

Documents

JIT/S manages complex printed documents that are generated on the shop floor such as bills of lading, build manifests, and shopping lists. This process uses an API to send information to Crystal Reports, an automated, query-driven reporting tool.

Crystal Reports, reads the required data directly from the JIT/S database using an ODBC connection and then formats and prints the results. It also transforms data into barcodes or two-dimensional symbols as needed.

In special cases when the data cannot be retrieved directly by an SQL query, data can be passed as parameters to the report-generating tool. When the report-generating tool is invoked, the system sends it information about the template to use, the number of copies to print, a list of designated printers to use, and any parameter name and value pairs.

- Document Format Maintenance
- Document Printing Setup
- Document Runtime Processing

Document Format Maintenance

Use Setup|Labels/Documents|Document Format Maintenance to create, edit, and delete document format definitions and optionally specify parameter values to be used during report generation. These formats are used to determine the layout and content of documents generated by other processors in JIT/S:

- Shipping activities use the formats for bills of lading, master bills of lading, and packing slips that accompany shipments to the customer.
- Shopping List Workbench uses a designated format for printing shopping lists, which are the lists of items needed at a work cell.

- The order scheduler and Work Order Workbench use formats for printing build manifests. Build manifests combine barcodes and data for multiple associated records involved in producing an item. They may include test data and results or include work order data and related assembly orders. In some cases, the build manifest is attached to a shippable unit and must be delivered with it in the same way a packing slip is sent.

Document formats are similar to label formats, but more complex. To manage this additional complexity, the system is designed to interact with a report-generation tool. The only tool supported in this release is Crystal Reports.

With Crystal Reports, you typically write queries against the JIT/S database to obtain the data you need and then design the templates to format the data for printing. In some scenarios, you may need to preprocess data values to derive the information you actually want to print. To accommodate this need, you can associate custom functions with a document format. The system executes these functions before it notifies Crystal Reports that a document is ready for printing.

You can write as many functions as you need and reference them when you set up document formats.

Fig. 4.46
Document Format Maintenance

Field Descriptions

Format ID. Specify the code that identifies a specific format definition.

Description. Enter a brief description of the format to identify its use.

Template File. Enter the path and name of the file containing the report template to be used when formatting documents with this format ID.

Program. Enter the directory location and name of the program that contains the custom functions you have defined for preprocessing data before making it available to Crystal Reports. The program must be in the PROPATH of users executing the system. You specify the specific function within this program by choosing Options|Format Parameter.

Number of Copies. Specify the default number of copies that should be printed for documents with this format. The effect of this field varies depending on the format type:

- For BOLs, MBOLs, and packing slips, number of copies defaults to the printer dialog when printing is invoked.

- For shopping lists, the number of copies associated with the format is used unless a different value is specified in Base|Work Cell/Assembly Unit|Shopping List Maintenance. See “Shopping List Configuration” on page 124.
- For build manifests, the number of copies is used as defined when the order scheduler releases an order. When a print request is invoked from the Work Order Workbench, it supplies the default for the printer dialog that displays.

Orientation. Used to specify the printing orientation of the document (portrait or landscape).

Status. Specify the status of the definition: active, inactive, or obsolete. Set up status values for class code FORMAT_STATUS in Class Code Maintenance. If you specify obsolete, the system verifies that no document currently references this format.

Paper Size. Select the size of paper to use when printing this document format. Define sizes in Paper Size Maintenance.

Format Type. Select a value from the members of the HFD_DOCUMENT class defined in Tools|System Data Tools|Class Code Maintenance. Your choices are BOL, Build_Manifest, Packing_Slip, Shopping_List, MBOL, and Packing_List.

Callback Program. Specify the name of a program to be run to communicate the result of the print request to JIT/S. When the print request is successful, the callback program is invoked and returns information to JIT/S. For example, when a packing slip is successfully printed, the print date and time can be returned and recorded in the packing slip record. Callback programs are found in the shpshp\app directory.

Choose Options|Format Parameter to define parameters to be sent to the report-generating tool at runtime for supplying data required in the report.

Fig. 4.47
Format Parameter

The screenshot shows a Windows-style dialog box titled "Format Parameter [Limerick - DEVELOPMENT]". It has a menu bar with "File", "Window", and "Help". Below the menu is a toolbar with icons for file operations and navigation. The main area contains the following fields:

- ID:** A text box containing the value "packSlipObj".
- Function Name:** A text box containing the value "getPackSlipObj".
- Mandatory:** A checkbox that is checked.
- Default Value:** An empty text box.

Field Descriptions

ID. Enter a code to identify this parameter.

Function Name. Specify the specific function within the program specified previously that supplies the value of this field. You must specify a function when Mandatory is selected. Otherwise, you can supply a default value in the Default Value field.

Mandatory. Select this field if a value for this parameter must be supplied at run time or if it is optional.

Default Value. When parameters are not mandatory, you can specify a default value.

Document Printing Setup

QAD provides the Crystal Reports templates shown in the Table 4.10. They are located in `JIT$InstallDir\jpssrc\template\crystal`.

Table 4.10
Crystal Report Templates

Document	Template File
Build manifests	buildManifest.rpt
Shopping lists	shoppingList.rpt
Bills of lading	bol.rpt
Packing slips	packingSlip.rpt
Packing Lists	packingList.rpt
Master Bills of Lading	mbol.rpt

Task Steps

- 1 Create a backup copy of each template.
- 2 Access the templates from Crystal Reports, copying them to the Crystal Reports host if Crystal Reports is installed on a separate server from JIT/S.
- 3 Make any required changes to the templates in Crystal Reports.
- 4 Assign the templates to the documents in JIT/S Setup|Labels/Documents|Document Format Maintenance. See “Document Format Maintenance” on page 192.

Document Runtime Processing

Processing print requests occurs in three main areas:

Shipping. Print requests can be generated manually or automatically by the shipment finalization process. When you request printing, a print dialog displays. The number of copies to print defaults from the document format definition specified in Document Format Maintenance. The document formats to use for BOLs and packing slips are defined in Shipping Configuration Maintenance. See “Shipping Configurations” on page 73. The shipment finalization process opens the print dialog automatically only when document formats have been specified in the shipping configuration.

Shopping List. When a shopping list is printed, the default printer and number of copies are obtained from details defined in Shopping List Configuration, if available. Otherwise, the values associated with the format are used. See “Shopping List Workbench” on page 366.

Build Manifest. The build manifest can be printed in two ways:

- Automatically by a rule when the WORDRLSD business event occurs. In this case, the rule must have the following three parameters defined: format ID, printer ID, and number of copies. The number of copies is optional and defaults from the format ID if not specified. At print time, the system validates that the format ID is of type BUILD_MANIFEST and that the printer is valid.

- Manually from the Work Order Workbench. In this case, a dialog displays where the operator can select a format ID and printer and modify the number of copies, which defaults from the format. See “Work Order Workbench” on page 353.

Barcodes and 2D Symbols

Various packing and shipping activities require scanning labels to populate barcode/symbol fields in maintenance screens. The application parses the scanned barcodes and symbols for item numbers, label numbers, work order numbers, and package unit item IDs (dunnage).

Use the maintenance screens to define data identifier codes and a data separators for interpreting the scanned codes.

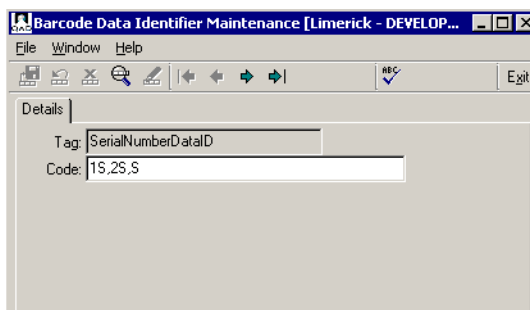
- Barcode Data Identifier Maintenance
- Delimiter Maintenance

Barcode Data Identifier Maintenance

Use Setup|Labels/Documents|Barcode Data ID Maintenance to define codes for the application-provided data types. For each code, enter a comma-separated list of one or more codes.

The data ID is not part of the barcode number; it identifies the class of data.

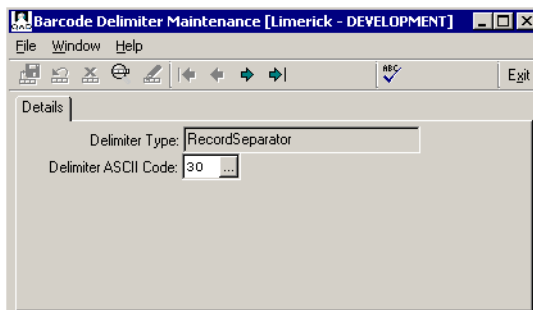
Fig. 4.48
Barcode Data ID Maintenance



Delimiter Maintenance

For two-dimensional symbols, use Setup|Labels/Documents|Barcode Delimiter Maintenance to define the ASCII character separator that separates records and fields within records.

Fig. 4.49
Barcode Delimiter Maintenance



Message Manager

This section describes the setup and operations for inbound and outbound message integration with other systems or applications.

Message Manager Introduction 200

Gives a processing overview, and lists and describes message manager function screens, COVH gateway tables and variables, and tokens.

Data Load/Unload Setup 205

Explains how to use Default Directory Maintenance, HTTP Adapter Maintenance, addresses Sonic queues, explains how to use Inbound Process Maintenance, Subsystem Maintenance, Document Definition Maintenance, Document/Subsystem Cross-Reference, and Transmission Group Maintenance.

Transformation and Gateway Setup 225

Explains how to use Gateway Maintenance, Application Definition Maintenance, Implementation Definition Maintenance, Function Maintenance, Transformation Maintenance, setting up parameters, Trading Partner Maintenance, Business Event Maintenance, and Import/Export Utilities.

Message Manager Operations 251

Discusses the functions of the Message Manager menu, including Inbound Workbench, Outbound Workbench, Document Repository Maintenance, Application Repository Maintenance, Document/Application Cross-Reference, Turnaround Data Maintenance, Transmission Queue Maintenance, and Archive Queue Maintenance.

JIT/S-Provided Messages 264

Lists and describes the messages included as default JIT/S system data on outbound events, outbound and inbound document types.

Message Manager Setup Examples 268

Gives inbound and outbound message examples.

Document Examples 273

Gives sample outbound and inbound document definitions.

Message Manager Introduction

JIT/S exchanges messages with QAD ERP, other ERP systems, manufacturing execution systems (MES), programmable logic controllers (PLC), and automated storage and retrieval systems (AS/RS) using files, HTTP, and Sonic.

Inbound and outbound messages are handled by the Message Manager. Three message receivers are included as default data, one for each pathway: file, Sonic, and HTTP.

- Message Processing Overview
- Message Manager Function Screens
- COVH Gateway Tables and Variables
- Tokens
- Setup Work Flow

Message Processing Overview

The Message Manager has three processes: load/unload, transform, and gateway. The transform process is not always required.

- **Load/Unload:** For inbound messages, the process validates messages for correct format. If the message is not of the correct format, the process moves it to the trash directory associated with the inbound channel. If the message is of the correct format, the process parses the message according to a document definition and loads the resulting document into the document repository.

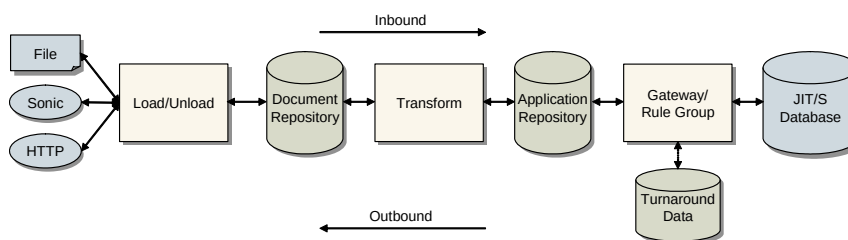
For outbound messages, the process unloads the data from the document repository and outputs it as a file, to HTTP or to Sonic.

- **Transformation:** For inbound messages, the process maps the data from a document to an implementation and stores the resulting data in the application repository.

For outbound messages, the process maps the data from an implementation to a document and stores the resulting data in the document repository. Transformation can call user- or system-defined functions.

- **Gateway:** For inbound messages, the process transfers data from one of the repositories to the JIT/S database. When mapping is not required for a particular combination of trading partner, document, and direction, the gateway process accesses the document directly from the document repository.

Fig. 5.1
Message Processing



Inbound Processing

- A user-defined JIT/S process monitors a specified channel for messages from a file, HTTP, or Sonic, validates messages, and calls the TS Parser Program on the Channel.

The channel definition includes the inbox directory, the parser program for the document type expected, and, optionally, default values for subsystem, trading partner, and trading partner document type. If trading partner and trading partner document type are not defined, the parser must locate them in the message.

- The process controller calls the parser program.

Based on the incoming document type and a matching user-defined document definition, the load program loads data into the document repository and creates error messages if required.

- The process controller then checks the corresponding trading partner document to decide if a transformation is to be done or if the data is going straight to the gateway.

If a transformation is specified then the transformation program transforms data from the format in the document repository to the format for the application repository and loads it into that repository. Error messages are created if necessary.

- If a transformation is performed then the gateway used is the one specified on the implementation definition.

The gateway program can load the data directly or you can specify the QAD gateway program, `edigen\obj\edRulesGateway.p`, which allows you to run the gateway rule group.

Outbound Processing

- JIT/S processing triggers an event, the generation of a message of a particular type.

Example The order scheduler releasing an order triggers a WORDRLSD event, a work order released message.

- The Message Manager determines which document types are associated with the message type.

Example The workOrderReleased and RQOR document types are associated with the WORDRLSD event/message type.

- JIT/S determines the destination for the outbound documents.

Example For the workOrderReleased and RQOR documents, JIT/S determines the values for the fields specified in Identity Field and Site Identity Field; then, compares those values with the values for Application Address and Application Site in each trading partner site/address cross-reference that has the associated trading partner documents workOrderReleased and RQOR.

Matching values identify the destination/trading partner for the document.

- JIT/S extracts the data from the database, transforms the application data to the specified document definition, unloads the document, and displays it in the appropriate transmission queue.

Example The workOrderReleased and RQOR trading partner documents specify the gateway, transformation, transmission group, acknowledgment requirements, and other processing for each of these document types for this particular trading partner/destination.

The document definitions for workOrderRelease and RQOR specify the record, field, and element structure of the unloaded documents.

Message Manager Function Screens

Message Manager functions are centrally grouped under the Message Manager menu. Use the setup functions to implement messages; then use the operational features to review the incoming and outgoing data.

Some fields in programs that are currently used are not yet fully implemented.

Table 5.1
Message Manager Setup Menu

Menu Item	Purpose
Document Definition Maintenance	Define the layout and content of documents to be loaded or unloaded from JIT/S.
Application Definition Maintenance	Set up the layout and content of applications to reflect how data is stored in the JIT/S database.
Implementation Definition	Define the data exchange requirements for a specific trading-partner implementation of an application.
Transmission Group Maintenance	Define outbound destination and processing information.
Trading Partner Maintenance	Identify each source of inbound messages and each destination for outbound messages. Set up the cross-references between outbound message documents and trading partner sites.
Function Maintenance	Create functions for the transformation process. Define the type of data returned by the function as well as the names and types of the function parameters.
Transformation Maintenance	Define data maps for transforming documents in the document repository to application transactions in the application repository.
Parameter Definitions	Define parameters used in the gateway process to support trading partner-specific processing.
Default Directory Maintenance	Define default directories for channels.
Error Message Maintenance	This is not currently available.
Gateway Maintenance	Create IDs for gateway programs to display to users for selection.
Default Parameter Maintenance	Create the default parameter set that is assigned to new trading partners. It can be maintained in Trading Partner Maintenance.
Subsystem Maintenance	Define the format and content of the control records sent from an OEM in inbound message documents.
Document/Subsystem Cross-Reference	Correlate the structure of the data records in inbound messages with a document definition.
Sonic Queue Setup	Define Sonic queues.
HTTP Adapter Maintenance	Define the parameters for HTTP adapters.
Import/Export Utilities Setup Export and Setup Import	Specify documents and definitions to be exported and imported.

This table lists the items on the Operations|Messages menu with a brief description of its purpose.

Table 5.2
Message Manager Operations Menu

Menu Item	Purpose
Inbound Workbench	Coordinate incoming messages with those that have been sent.
Outbound Workbench	Track outbound messages.
Document Repository Maintenance	Modify or add data to the repository where broadcast data is stored after it is loaded and before transformation and gateway transfer.
Application Repository Maintenance	Modify or add data to the repository where inbound data is stored after transformation.
Document/Application Cross-Reference	View document sequence numbers and their corresponding application sequence numbers.
Turnaround Data Maintenance	Define the value of data from incoming documents to be stored and included later during export.
Transmission Queue Maintenance	Track the messages that have been sent and are awaiting acknowledgment; mark messages for reprocessing, and mark acknowledgments manually.
Archive Queue Maintenance	Track the history of sent messages and replay when required.

COVH Gateway Tables and Variables

For incoming order broadcast messages, customer order version header (COVH) gateway tables and variables are specified in document definitions when the data requires no transformation; when transformation is required, the tables are specified in the implementation definition.

The gateway program, `edigen\obj\edcovhgateway.p`, can be used to transfer the data from these temp-tables into JIT/S.

Table 5.3
QAD-Supplied Gateway Tables

Table Name	Purpose
tt_covh	Supplies the data for the customer order version header record.
tt_covd	Supplies the data for the customer order version detail records.
tt_ordi	Supplies additional information about an order.

In addition to the fields defined for the COVH, COVD, and order information tables, there are several other gateway field variables.

Table 5.4
Gateway Variables

Variable Name	Values	Purpose
covh_purposeCode	Create: A, 0001, ?, "", or 3 Amend: M or 1 Cancel: C or 2 Replace: R or 5	Relative to a customer order, specifies what action the order receiver should take
covh_JulianDateTime	Integer date	Accommodates multiple date formats
covd_class_member	part, option	Specifies the class identifier

Tokens

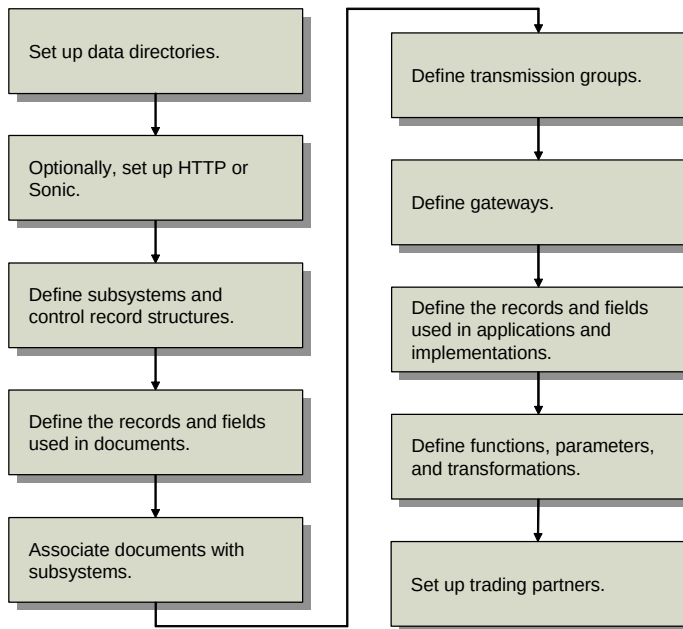
Tokens can access data values independent of the record, field, or element name. When defined in Subsystem Maintenance and Document Definition Maintenance, tokens are variables that let you supply specific values such as the trading partner identifier or the document identifier during processing.

Table 5.5
Tokens

Token Name	Requirements, Typical Use
tp-id	Trading Partner ID, used if the trading partner is specified in the incoming control records.
tp-document-id	Trading Partner Document ID, used if the trading partner document is specified in the incoming control records.
tp-document-nbr	Primary reference number.
tp-message-nbr	Sequence number for something; for example, messages.
tp-func-grp-nbr	Sequence number for OEM company divisions.
tp-interchange-nbr	Transmission number set by the subsystem.
tp-address	External address of a business partner.
tp-site	Internal or business partner representation of your address.
APP_IDENT	For inbound responses, it is cross-referenced against the value of the key information field in the transmission queue.

Setup Work Flow

Fig. 5.2
Setup Work Flow



Data Load/Unload Setup

Use the following to set up message loading/unloading:

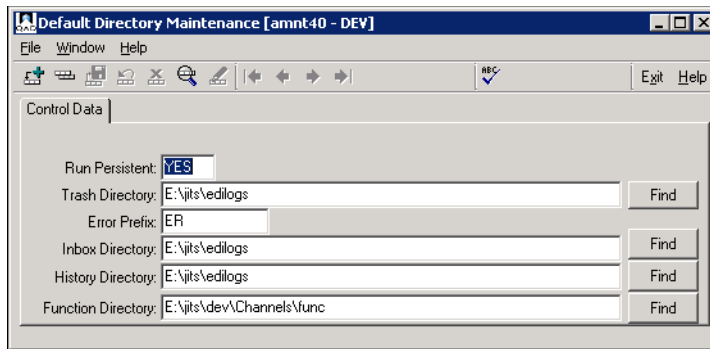
- Default Directory Maintenance
- HTTP Adapter Maintenance
- Sonic Queue
- Inbound Process Maintenance
- Subsystem Maintenance
- Default Directory Maintenance
- Document/Subsystem Cross-Reference
- Transmission Group Maintenance

Default Directory Maintenance

Use Setup|Message Manager|Default Directory Maintenance to define trash, inbox, and history directories. These are the inbound default directories; see “Channel Maintenance” on page 134. Set up outbound destination directories in “Transmission Group Maintenance” on page 224.

Fig. 5.3

Default Directory Maintenance



Field Descriptions

Note All directory fields are required and are validated by the system.

Use Persistent Setup. When this field is set to Yes, the setup data is persisted on the AppServers and any setup change requires that the AppServers be restarted to pick up the change. There is a significant performance gain in having it set to Yes.

Set to No during setup so that changes are picked up immediately without restarting the AppServers.

Trash Directory. Enter the directory where message files that fail during loading are stored. This is the default for the Trash Directory field in Channel Maintenance.

Error Prefix. Enter a three-character prefix to be added to the names of files containing documents that encounter errors during loading. The system places these files in the trash directory specified in Channel Maintenance. Reporting and reprocessing functions use this prefix to identify target files.

Inbox Directory. Enter the directory where the Message Manager looks for new incoming message files. This is the default for the Inbox Directory field in Channel Maintenance.

History Directory. Enter the default directory where the Message Manager places the message files when processing completes. This is the default for the History directory in Channel Maintenance.

Function Directory. Enter the directory where the code for user-defined functions created with Function Maintenance and used during transformation processing is stored.

HTTP Adapter Maintenance

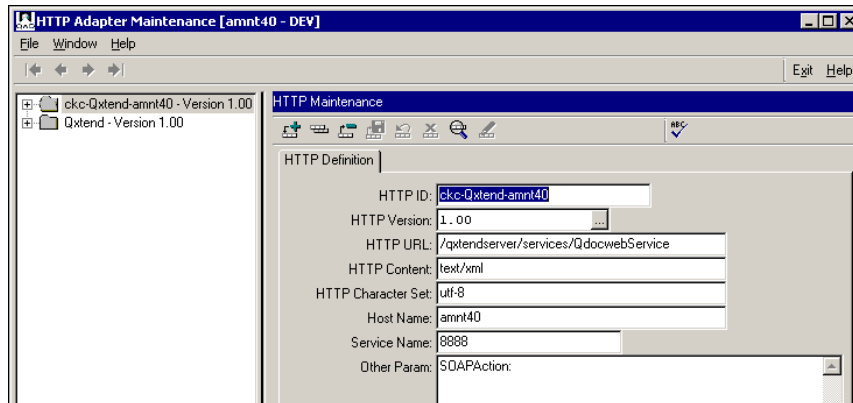
Use Setup|Message Manager|HTTP Adapter Maintenance to define the information that the Message Manager needs to send messages in XML format to a Web server, where they are available to external applications.

Associate HTTP IDs with trading partners (destinations):

- Assign HTTP records to transmission groups.
- Assign transmission groups to trading partner documents that are then cross-referenced with specific trading partner site/addresses.

Note The HTTPS protocol is not included.

Fig. 5.4
HTTP Adapter Maintenance



Field Descriptions

HTTP ID. Enter an alphanumeric code identifying this HTTP connection record. Use this code in Transmission Group Maintenance to associate XML files with the server that receives them.

HTTP Version. Enter the HTTP version number associated with the parameters in this record. Indicates which version of HTTP is expected by the server.

HTTP URL. Enter the URL address on the specified host where the XML data is made available for the external application.

HTTP Content. Enter the type of content included in the files that are posted using this parameter record. Typically this is text/xml. This informs the Web server what type of values to expect.

HTTP Character Set. Enter the character set associated with the files that are posted using this parameter record; for example, UTF-8. This informs the Web server what character set to expect.

Host Name. Enter the host name or host IP address of the Web server to connect to for posting data.

Service Name. Enter the port number on the specified host that your system uses for connecting.

Other Parameters. Enter values other than the default HTTP header information that must be sent along with the protocol header, such as SOAPAction information.

Right-click on an HTTP ID in the tree and choose Add HTTP Parameter to display the HTTP Parameters screen.

Fig. 5.5
HTTP Parameters

HTTP Maintenance

HTTP Parameters

Sequence: 2

Parameter Code: 1

Parameter Data: a

Token:

Field Descriptions

Sequence. Enter the sequence for the parameter in the concatenated URL string. Parameter name/value pairs convey information to the Web Server.

Parameter Code. Enter the name of a parameter to be appended to the URL string. If the parameter name is case-sensitive, be sure to use the correct case. This is used with either Parameter Data or Token.

Note Either Parameter Data or Token can be used, but not both.

Parameter Data. Enter the exact value for Parameter Code. Use this to pass values such as log-in ID or password with the URL string when this information is not available within the data being sent to the HTTP server.

Token. Enter a token representing the value for Parameter Code.

FileName	The name of the file that was created
JITsSeq	The JIT/S sequence that generated the file
ProcSess	The process session number
ErrFile	The name of the error file in the error/gateway directory
DocName	The name of the JIT/S document definition
DocVers	The version of the JIT/S document definition
JITs-site	The ID code for the JIT/S site
JITs-Address	The ID code for the JIT/S address
ScriptName	The name of the script to run after the processing program
TransGrp	The name of the transmission group from JIT/S

Sonic Queue

Sonic Queue Maintenance

Use Setup|Message Manager|Sonic Queue Maintenance to define the information that the Message Manager needs to send messages to and accept messages from a Sonic queue.

For inbound messages, associate Sonic queues with trading partners and trading partner documents by assigning all three to channels in “Channel Maintenance” on page 134. Once the Message Manager has loaded a message as a document into the document repository, it stores the message in the history directory defined for the current channel.

For outbound messages, associate Sonic queues with trading partners and trading partner documents:

- Assign Sonic queues to transmission groups.
- Assign transmission groups to trading partner documents that are then cross-referenced with specific trading partner site/addresses.

Fig. 5.6
Sonic Queue Maintenance

Field Descriptions

Name. Enter the name for the Sonic queue.

Description. Enter a description for the Sonic queue.

Server Host. Enter the name of the host where the service is running.

Server Service. Enter the port where the host is listening.

User and Password. Specify the name and password of the user to be passed to the program accessing the queue.

Broker Host. Specify the name of the host where the Sonic broker is running.

Broker Service. Enter the port where the broker is running.

Client ID. Enter the client ID for the connection.

Durable. Select if this is to be a durable connection.

Direction. Select the direction for message flow.

Type. Select the queue management type:

- Publish/Subscribe** An application publishes (sends) messages; another application subscribes to and receives messages. A message can go to multiple receivers.
- Point-to-Point** An application sends a message to a queue; another application receives that message from the queue. A message goes to only one receiver.

Queue. Specify the queue where the Message Manager should find messages to process.

Wait. Specify the number of seconds that the connection continues to monitor the queue without receiving a message.

Consumer Program. Enter the name of the program that runs persistently and contains the consumer procedure.

Consumer Procedure. Enter the name of the procedure within the consumer program that handles the incoming message in the queue.

Error Program. Enter the name of the persistently running program that contains the error procedure.

Error Procedure. Enter the name of the procedure in the error program that handles the error messages.

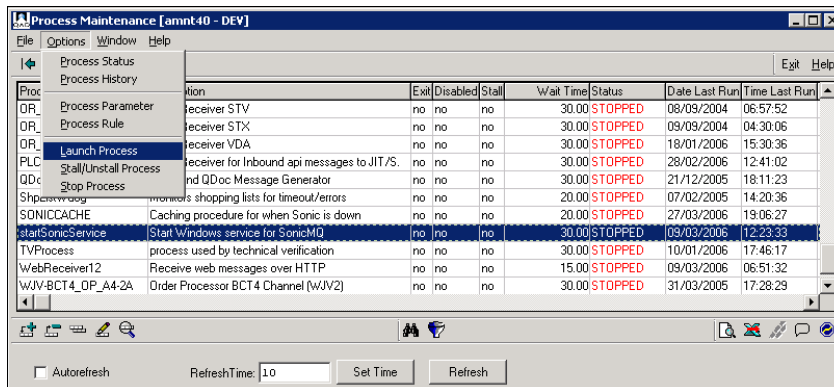
Subscription. Enter the name of the subscription for the user and client ID with a durable connection.

Subscription Filter. Enter text for filtering data gathered from the queue.

Sonic Service Startup

Use Options|Launch Process in Setup|Processes|Process Maintenance to start or restart the Sonic service.

Fig. 5.7
Sonic Process Launch



Inbound Process Maintenance

Define a process for each channel that the Message Manager uses for processing inbound messages. See “Setting Up Continuous Processes” on page 147 for general information on defining processes.

Set up the processes in Setup|Processes|Process Maintenance.

Fig. 5.8
Message Manager Process

In Options|Process Parameter, define parameters to use in the process; for example, channel, debug, trace, or log. These parameters are not taken into account by the process launcher but must be retrieved by the launched process itself using the process object as an input parameter.

Define an order receiver process for each channel where you expect incoming information. Use the `edigen\obj\edprcctr\caller.p` program and the OrderReceiver procedure.

Table 5.6
Inbound Process Parameters

Parameter	Values	Description
Channel	Table ID (gdcfchnl) and channel ID	Determines the channel that the Message Manager monitors.
Log	True/False	Determines whether the process logs messages in the logging databases. You can view these messages with Tools Logging/Debug Toos Logging Database Viewer.
fileType	New Error Reprocess	Determines which files the Message Manager processes: New: Process files in the channel inbox directory. Error: Process files in the channel trash directory. Reprocess: Process records in the repositories that have Reprocess set to Yes. The second value is document status code indicating the minimum status for reprocessing.

Parameter	Values	Description
StopGateway	True/False	Determines whether an inbound process executes a gateway. True: Load message but do not process through the gateway. False: Load and process the messages.
Trace	0, 1, 4, 7, 10	Determines if tracing is enabled and written to a log. See “Process Tracing” on page 160 for details.
WebReceiver	True/False	Specifies whether or not this process is receiving from a Web receiver.
WebHTTPId	Table ID (edmfhttp) and HTTP ID	If the WebReceiver parameter is set, this parameter determines the HTTP that the Message Manager monitors.
TimeDelay	Integer value	The number of seconds between consecutively running the timeout rule group for the same message in the transmission queue.
TP-ID	Table ID (edmftrdp) and trading partner ID	The trading partner for whom you want to monitor messages for timeouts
TP-DOC-ID	Table ID (edmftpdc) and trading partner document ID	If the TP-ID is specified, this parameter narrows what the process is monitoring to a specific trading partner document.

Subsystem Maintenance

Use Setup|Message Manager|Subsystem Maintenance to describe the format and content of the control records exchanged between the Message Manager and each communication subsystem.

For each subsystem, you can define the following:

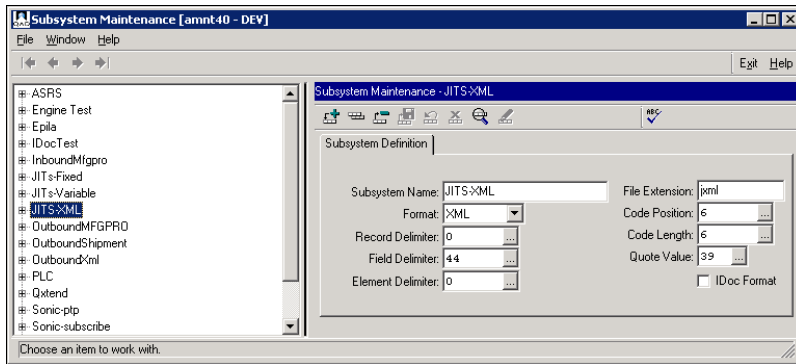
- Subsystem Records
- Subsystem Fields
- Subsystem Field Elements

In the tree structure, the records, fields, and elements are identified by both their sequence and name; for example, 1-FirstRecord or 3-MsgField. At each level, use right-click menus to display maintenance screens for adding lower-level nodes to the tree.

Important The values you enter must correspond to those used in the message.

Click Add Record to begin defining a subsystem.

Fig. 5.9
Subsystem Maintenance



Field Descriptions

Subsystem Name. Enter up to 50 characters to identify a subsystem that exchanges data with JIT/S. Use any name that makes the subsystem easy to identify.

Format. Choose the format for the entire structure of files used by this subsystem. Values are fixed, variable, or XML.

Record Delimiter. If you specify variable-length records for this subsystem, enter the ASCII code for the character the subsystem uses to separate records

Field Delimiter. If you specify variable-length fields for this subsystem, enter the ASCII code for the character the subsystem uses to separate fields.

Element Delimiter. If you specify variable-length field elements for this subsystem, enter the ASCII code for the character the subsystem uses to separate field elements.

File Extension. For subsystems using files, enter the three-character file extension that the subsystem uses to identify its files. Each subsystem can have only one associated file extension.

Code Position. Enter the number of the character position where the record control code begins. Enter zero to indicate that the record code is in the last position in the document. This is not required when using XML.

Code Length. For fixed-length records, enter the number of characters the subsystem uses to indicate the type of record it uses. This value must be between 1 and 20. For XML or variable-length records, the Message Manager uses code length to validate the length of the record code.

Quote Value. Enter the ASCII code for the quote character used by the subsystem. If no quote character is used, enter zero.

Some systems dump data using quotation marks as the element delimiter. The Message Manager uses the quote value to remove quotation marks from the data.

IDoc Format. Select to indicate that the documents received by this subsystem are in IDoc format.

No: The document has a record indicator for each line.

Yes: The first record in the document defines the records received, including the length of each record, number of iterations for each record, and the total number of characters in the record.

IDoc format is typically received from integration with products such as SAP. This format requires special processing before a document can be loaded by the Message Manager.

Skip CR/LF. Indicates that the outgoing document does not contain carriage returns or line feeds.

SAX Parsing. Indicates to use the SAX parser technique instead of the DOM way (OpenEdge) to parse XML files. The SAX parser is much faster and should always be used unless the system has issues with it. This feature was provided to permit backwards compatibility.

Import blanks. Selecting this option causes the system to not trim the spaces in field values.

Subsystem Records

In Subsystem Maintenance, right-click a subsystem and choose Add Subsystem Record to display the screen for adding details about specific records.

Fig. 5.10
Subsystem Maintenance: Records

Field Descriptions

Inbound. Select to indicate that this subsystem definition is for inbound messages. Clear for outbound messages.

Record Sequence. Specify the sequence number for this record among the control records for the subsystem.

Record ID. Enter an ID for the record. The ID must be unique in the subsystem.

Required. Select to indicate that this record is required for processing; clear to indicate that it is not required. When the Message Manager cannot find required records to load/unload, it generates an error message and does not process the associated message.

Record Code. Enter the alphanumeric code that the subsystem uses to define this type of record.

This value in the incoming file is the record identifier. When the load process encounters a record identifier while parsing an incoming file, it checks whether a subsystem record exists with the same record code identifier.

Token. Enter a token name. The Message Manager uses token variables to access data values such as the trading partner ID or the document ID regardless of the name of the record, field, or element where they are stored. You can specify multiple tokens separated by commas. See “Tokens” on page 204 for a list of valid values.

Output Record Code. Select this option to export the record code value for each document record at the same time into the output file/message based on the code position value determining its position in the output line.

Subsystem Fields

In Subsystem Maintenance, right-click a subsystem record in the tree structure and choose Add Subsystem Fields to display the screen for adding details about specific fields in the selected record.

Fig. 5.11
Subsystem Maintenance: Fields

Field Descriptions

Field Sequence. Specify the sequence number of this field within the record. If the format is fixed, the field appears in this sequence; if the format is variable, the field appears in this element. Field sequence is not used in XML formats.

Field Name. Enter an ID for the field. The ID must be unique in the record.

Important For XML files, the field ID must exactly match the field ID in the incoming file. It is not case sensitive.

Field Min. Enter the minimum length of the field. The Message Manager validates that required or optional data is greater than or equal to the minimum required value for the field. Zero is a valid value for optional fields.

Field Max. Enter the maximum length of the field.

- If the field lengths are variable and separated by the specified delimiter, the Message Manager validates that the field length is between the Min and Max values.
- If the field lengths are fixed, the Message Manager uses this value to calculate where each field ends.

Required. Select to indicate that this field is required during processing; clear to indicate that it is not. When the Message Manager finds a required field that has zero characters, it generates an error message and does not process the associated record.

Token. Enter a token name. The Message Manager uses token variables to access data values such as the trading partner ID or the document type regardless of the name of the record, field, or element where they are stored. You can specify multiple tokens separated by commas. See “Tokens” on page 204 for a list of valid values.

Default Value. If the system cannot find a value for this field in the incoming data, the default value specified here is assigned.

Subsystem Field Elements

In Subsystem Maintenance, right-click a subsystem field in the tree structure and choose Add Subsystem Elements to display the screen for adding details about specific elements in the selected field.

Fig. 5.12
Subsystem Maintenance: Elements

The fields in this screen are exactly the same as those for defining Subsystem Fields, but they apply to subelements within the fields. Not all fields require this additional level of division, but it can be useful for processing; for example, for differentiating the elements within a date or time stamp.

Document Definition Maintenance

Use Setup|Message Manager|Document Definition Maintenance to define the layout and content for documents sent to and from JIT/S. The Message Manager uses this information to process and parse incoming messages and to validate sizes, records, and looping structures.

The Message Manager uses an implementation definition, a document definition, and a transformation definition to meet the data structure and format requirements of JIT/S and an external subsystem when transforming and transferring data.

For inbound transformations, the document definition is the template for a source document; for outbound transformations, it is the template for the target document. Define templates for inbound target and outbound source transactions in Setup|Message Manager|Application Definition Maintenance.

Note A document definition can be deleted only when it is not referenced by any other setup data.

“Document Examples” on page 273 shows the layout and values you can use for document definitions. For the inbound document, the template maps each data element in the incoming message to a field in the temporary table that the Message Manager uses to load and process the data.

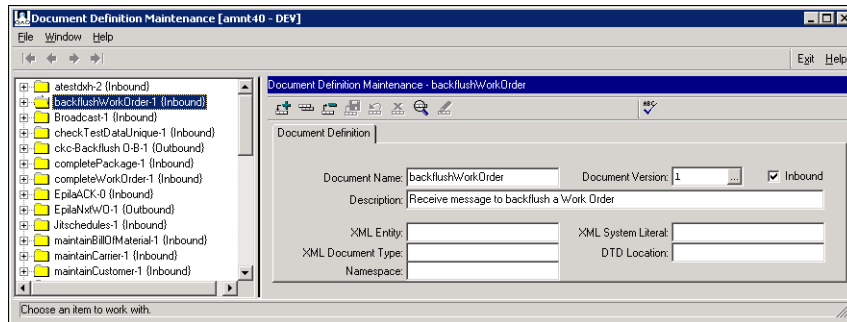
For each document definition, you can define the following:

- Document Records
- Document Fields
- Document Field Elements

In the tree structure, the records, fields, and elements are identified by both their sequence and name; for example, 1-FirstRecord or 3-MsgField. At each level, use right-click menus to display maintenance screens for adding lower-level nodes to the tree.

Click Add Record to set up a new document definition.

Fig. 5.13
Document Definition Maintenance



Field Descriptions

Document Name. Enter an ID for this document definition.

Document Version. Enter a version number for the document definition. You can use version number to differentiate among multiple documents with the same name.

Inbound. Select if the direction for this document definition is inbound relative to the JIT/S database. Documents imported into JIT/S are inbound, while those exported to a communication subsystem are outbound. You can use direction to differentiate among multiple documents with the same name.

Description. Optionally enter a text description of the document definition. This description is for reference only.

The following fields are used only with XML documents.

XML Entity. Enter the URL containing the namespace definition that controls the XML structure associated with documents created using this definition; for example, <http://www.w3.org/2000/xmlns/>.

An XML namespace is a collection of names—identified by a specific uniform reference locator (URL)—that are used in XML documents as element types and attribute names.

XML Document Type. Enter the document-level XML identifier for the document to be created using this definition. The resulting XML document includes this identifier in the first line.

Namespace. Enter the namespace to use when creating the XML document.

XML System Literal. Specify whether the document type definition (DTD) used to validate the content of exported XML files is on a public server or within a system domain. Valid values are:

PUBLIC: The DTD is on a public server.

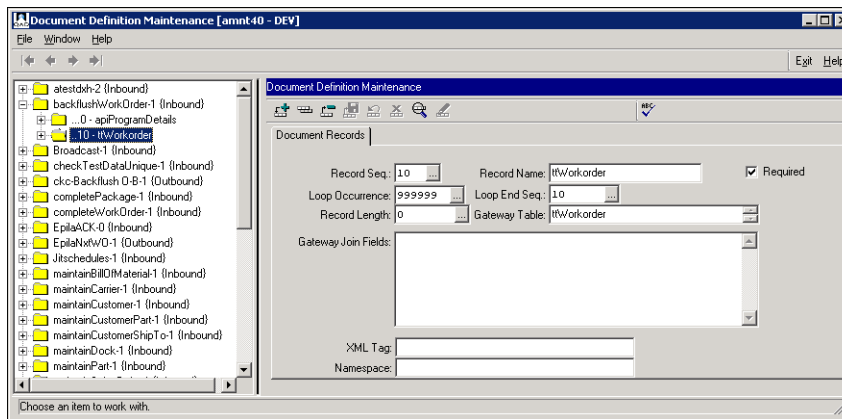
SYSTEM: The DTD is within the local system domain.

DTD Location. Enter the path to the location where the DTD used to validate the content of XML files is stored.

Document Records

In Document Definition Maintenance, right-click a document ID in the tree structure and choose Add Document Record to display the screen for adding details about specific records.

Fig. 5.14
Document Definition Maintenance: Records



Field Descriptions

Record Seq. Enter the sequence number for this record in the document definition. The Message Manager uses this value in conjunction with Loop End Sequence to specify iterations through a record. The first sequence number must be one regardless of the scheme used for subsequent numbers.

Valid	Invalid
1, 2, 3, 4, 5	2, 3, 4, 5
1, 10, 20, 22, 30	10, 20, 22, 30

Record Name. Enter an ID for the record; each record ID must be unique in a document definition. The transformation process uses the record ID as a variable, independent of the sequence number.

Important For XML files, the record ID must exactly match the record ID in the incoming file. It is not case sensitive.

Field Required. Select to indicate that this record is required during processing or clear the field to indicate that it is not. When the Message Manager cannot find a required record, it generates an error message and does not process the associated document.

Export Empty. This option only applies to outbound XML documents. Select this option to indicate that empty fields in the outbound XML document should be exported when the outbound message is sent. If the field is cleared, the Message Manager ignores all empty fields in the outbound document.

Loop Occurrence. Enter the number of times the load/unload process allows a record to iterate before it generates an error. The Message Manager uses this value to validate the file content. If the process iterates more than the number of times specified, the Message Manager generates an error message and does not load/unload the associated document.

Loop End Seq. Processing loops start on the current record. Enter one of the defined record sequence numbers to indicate where the loop ends.

For example, enter a Loop End Seq value of 2 on the record with the sequence number 2 to indicate that the entire loop sequence takes place on that single record. Or, enter an end sequence of 4 on record number 3 to indicate a loop that starts at record 3 and ends at record 4. To specify a loop structure that includes all records, enter zero or a number higher than the last record sequence defined.

Record Length. For records with a required length, enter a value that the Message Manager uses to validate the length of the record. If the record is longer than this value, the Message Manager generates an error message on loading/unloading.

Gateway Table. Specify the name of the temporary table used by the gateway for storing data from this record before inbound processing. You can specify multiple tables separated by commas. This field is relevant only when no data transformation is required. See Table 5.3, “QAD-Supplied Gateway Tables,” on page 203.

Gateway Join Fields. Enter a comma-separated list of fields to use to join records for dynamic queries and data sets during export. Use the format `table.field` and list the parent table and field first.

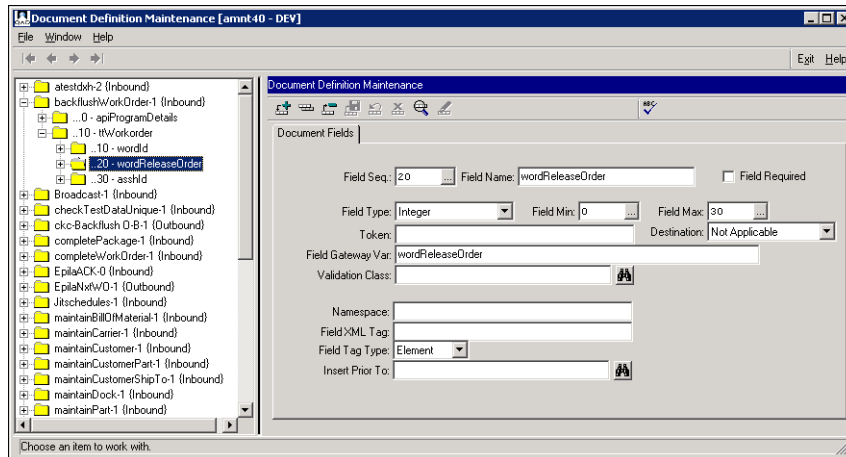
XML Tag. Enter the XML name if this record is being exported to an XML file.

Namespace. Enter the namespace to use when creating the XML document.

Document Fields

In Document Definition Maintenance, right-click a record in the tree structure and choose Add Document Field to display the screen for adding details about specific fields in the selected record.

Fig. 5.15
Document Definition Maintenance: Fields



Field Descriptions

Field Seq. Enter the sequence number for this field in the selected record. If the format is fixed, the field appears in this sequence; if the format is variable, the field appears in this element. Field sequence is not used in XML formats.

Field Name. Enter an ID for the field; each ID must be unique in the record.

Important For XML files, the field ID must exactly match the field ID in the incoming file. It is not case sensitive.

Field Required. Select to indicate that this field is required during the load/unload process or clear it to indicate that it is not. When the Message Manager finds a required field that has zero characters, it generates an error message and does not process the associated record.

Field Type. Choose a code representing the type of data stored in this field. Valid entries are:

- Alphanumeric (trims all blank spaces on either side of the field)
- Date
- Integer
- Logical
- Real (decimal)
- String (only trims the right side of the incoming field)

Field Min. Enter the minimum length of the field. The Message Manager validates that required or optional data is equal to or greater than the minimum value for the field.

Field Max. Enter the maximum number of characters to include in this field.

- If the field lengths are variable and separated by the delimiter specified in Subsystem Maintenance, the Message Manager validates that the field length is between the Min and Max values.

- If the field lengths are fixed, the Message Manager uses this value to calculate where each field starts and ends.

Token. Enter a token name. The Message Manager uses token variables to access data values such as the trading partner ID or the document type regardless of the name of the record, field, or element where they are stored. You can specify multiple tokens separated by commas. See “Tokens” on page 204 for a list of valid values.

Destination. Valid values are Gateway Variable, Turnaround, and Not Applicable.

Field Gateway Var. Specify the name of the variable in the gateway program that is associated with this field. The field must exist in one of the tables specified for Gateway Table in the record definition. This is frequently the name of the field in the target table where the gateway inserts the data. This field is relevant only when there is no transformation. See Table 5.4, “Gateway Variables,” on page 204.

Validation Class. Optionally enter the class code defined in Tools|System Data Tools|Class Code Maintenance that determines valid values for the gateway variable. If a class code is specified, the value of the gateway variable must be one of the members of this class or an error is generated by the Message Manager during processing and the file is not loaded. See “Class Codes” on page 301.

Namespace. Enter the namespace to use when creating the XML document.

Field XML Tag. Enter the XML name if the value in this field is being exported to an XML file.

Field Tag Type. Select Element if the value is another element under the current element. Enter Attribute if the value is an attribute of the current record.

Important The use of the term attribute in this context is particular to XML statements; it is not related to the general use of the term in JIT/S.

Insert Prior To. Enter the name of a field that is to follow this field.

Document Field Elements

In Document Definition Maintenance, right-click a field in the tree structure and choose Add Document Element to display the screen for adding details about specific elements within a field in the selected record.

Fig. 5.16
Document Definition Maintenance: Elements

Document Definition Maintenance

Document Elements

Element Seq.: 0 Element Name: ☒ Element Required

Element Type: Element Min.: 0 Element Max.: 0

Element Tokens: Destination: Not Applicable

Element Gateway Var.:

Validation Class:

Element <XML Tag:

Element Tag Type: Element

Namespace:

The fields in this screen are exactly the same as those for defining document fields, but they apply to subelements within the fields. Not all fields require this additional level of differentiation, but it can be useful for processing such things as different elements within a date or time stamp.

Document/Subsystem Cross-Reference

Use Setup|Message Manager| Document/Subsystem Cross-Reference to correlate the structure of the data records in the file received from the subsystem with a document defined in Document Definition Maintenance. This lets the Message Manager place data properly in the document repository before beginning transformation processing.

The Message Manager can use one document definition to parse the same message type from different trading partners and different subsystems.

Control records are defined in Subsystem Maintenance.

Document Cross-Reference Tab

For each subsystem, document, and document definition combination, you can create one generic cross-reference—without a trading partner association—to use when specific trading partner requirements do not exist.

Define additional cross-references for those combinations of subsystem, document type, and document definition that do have trading partner- specific requirements.

Fig. 5.17

Document/ Subsystem Cross-Reference

Field Descriptions

Subsystem. Select the name of a subsystem defined in Subsystem Maintenance.

Document Type. Enter the type of document to be exchanged between JIT/S and this subsystem. Order broadcasts are not part of any published EDI standard; you can identify them with a string of your choice such as Broadcast. This is ordinarily the value represented by the tp-document-id token.

Inbound. Select this field if the direction for this document type is inbound rather than outbound. Documents imported into JIT/S are inbound, while those exported are outbound.

Trading Partner. Select the identifier for the trading partner to which this document/subsystem cross-reference applies. Leave blank if it applies to all trading partners. See “Trading Partner Maintenance” on page 242.

Document ID. Select the name of the document definition set up in Document Definition Maintenance to be associated with this relationship.

Cross-Reference Records

Establish a link between the document type and the record sequences and data control codes within the incoming document. Data control codes are those values that define what the record is and its purpose.

Fig. 5.18
Document/ Subsystem Cross-Reference, Records Tab

Record Seq.	External Record Code	Record Name
1	BCST	Order
2	Part	Part Records

Record Name:

External Record Code:

Break Level:

☐ Include in Smaller Transactions

Field Descriptions

Record Name. Select a record from those defined for the document definition. The load process parses message records that have the value entered for External Record Code against this record as it is defined in Document Definition Maintenance.

External Record Code. Enter the code the subsystem uses to identify this type of data record in the message.

When the load process encounters a record with this code in the message, it parses it according to the definition for the record specified in Record ID.

Break Level. Enter the break level associated with this record.

Break level lets you define documents in which the same record identifier can be used more than once. For example, you can use Comment in both the header and in the detail. When the system processes data during transformation and encounters a duplicate record name, it looks for the record with a higher Break Level value than the previous instance.

Include in Smaller Transaction. Select this field if you want the data in this record to be treated as a separate transaction line. This lets you process multiple transactions separately even when they are not separated by control data records.

Omit Code when Exporting. Select this option to indicate that the record code is not exported. You must use it in combination with the Export Record Code flag from the subsystem definition.

Add Dummy Record. This indicates that the incoming file does not have fixed strings to identify the type of records. That is, the external record code cannot match any value in each record of the file. It is therefore necessary to enter a dummy one. The system will read the file based on the document loop occurrence value from the document definition to associate this dummy record code with the document record itself. Even if the record code setup here is not meaningful, it must be unique within the setup of that Xref Subsystem/document (unique dummy record code value per document record).

Transmission Group Maintenance

Use Setup|Message Manager|Transmission Group Maintenance to specify the outbound processing for documents for a particular destination. A transmission group can then be associated with multiple trading partners to facilitate exporting batches of documents to a single destination.

Fig. 5.19

Transmission Group Maintenance

Field Descriptions

Name. Enter the ID for the transmission group.

Control Nbr. Displays the system-assigned control number for transmissions involving this group. This number is combined with the value in File Prefix and the file extension specified in Subsystem Maintenance to create a unique transmission file name.

Use Counter. Selecting this option automatically creates and uses a specific counter for this transmission group instead of the generic control number. A counter is only used for a specific transmission group, while a control number is used by all of the other transmission groups.

Destination Directory. Enter the directory where outbound files associated with this group are written.

File Prefix. Enter a prefix to be added to the control number and the extension assigned in Subsystem Maintenance to create a unique file name.

Processing Script. Optionally enter a file name of a custom script to be run after a group of documents is created. For example, this could be a script that invokes an e-mail program to transmit the exported file to the trading partner.

Processing Program. Enter the path name to an executable program file to be run when a file is exported to this transmission group. For example, this might be an e-mail program that transmits the file to a trading partner.

Default Subsystem. Select a subsystem to associate with this transmission group from those defined in Subsystem Maintenance. The subsystem provides the file extension for constructing the unique file names for this transmission group.

It is also used to select an appropriate Subsystem/Document Cross-Reference for mapping internal document record IDs to the external record codes that appear in exported messages.

HTTP ID. Enter the HTTP adapter ID from those defined in Setup|Message Manager|HTTP Adapter Maintenance.

Sonic Queue ID. Enter the Sonic Queue ID from those defined in Setup|Message Manager|Sonic Queue Maintenance.

Code Page. Specify the code page of outbound messages for the transmission group so that outbound messages are converted to the target code page when sent from JIT/S.

Transformation and Gateway Setup

Use the following to set up the Message Manager transformation and gateway processes:

- Gateway Maintenance
- Application Definition Maintenance
- Implementation Definition Maintenance
- Function Maintenance
- Transformation Maintenance
- Setting Up Parameters
- Trading Partner Maintenance
- Business Event Maintenance

Gateway Maintenance

Gateway programs transfer data between the repositories and the application database. Inbound data is transferred directly from the document repository or, if transformation is required, from the application repository. Outbound data is transferred directly to the application repository; a transformation is always required to transfer the data from the application repository to the document repository.

Use Setup|Message Manager|Gateway Maintenance to link IDs to gateway programs. Associating identifiers with program names eliminates the need for users to know the exact program names when they are selecting a gateway.

For example, specify Broadcast as the identifier for the gateway program that manages incoming broadcast messages.

Fig. 5.20
Gateway Maintenance

The screenshot shows a window titled "Gateway Maintenance [amnt40 - DEV]". It has a menu bar with "File", "Window", and "Help". Below the menu bar is a toolbar with various icons. The main area contains several labeled text input fields:

- Name: CheckTestDataUnique
- Description: Inbound CheckTestDataUnique
- Processing Program: edigen/obj/edcovhgateway.i
- Processing Procedure: (empty)
- Reporting Program: edigen/obj/edcovhgateway.p
- Reporting Procedure: (empty)
- Rule Group: MF_CHECK_UNIQUENESS

At the bottom right of the window, there is a small icon of a person.

Field Descriptions

Name. Enter the name that you want to display for selection in fields where users specify a gateway program name.

Description. Enter a description to further clarify the purpose of the gateway.

Processing Program. Enter the name of the gateway program.

Processing Procedure. Enter the name of the procedure within the processing program for transferring the data.

Reporting Program. Optionally enter the name of a program that is invoked to process any report output of the processing program.

Reporting Procedure. Enter the name of the procedure within the reporting program that processes report data.

Rule Group. Select the rule group for the gateway to run.

Application Definition Maintenance

Use Setup|Message Manager|Application Definition Maintenance to define the layout and content for target transactions created by the inbound transformation process and for source transactions for outbound processing.

Define templates for source and target documents in Setup|Message Manager|Document Definition Maintenance.

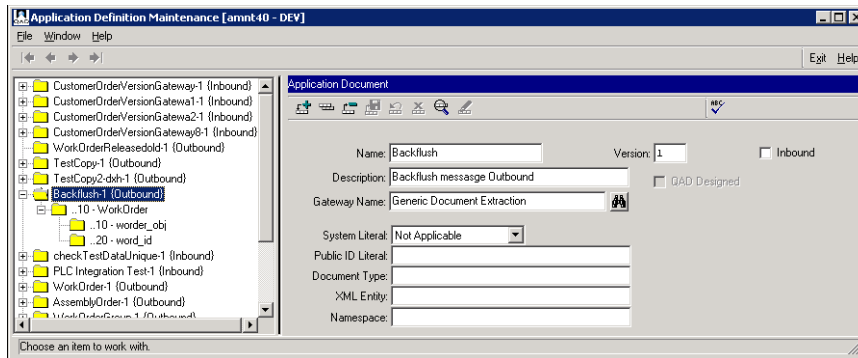
For each application definition, you can specify the following:

- Application Definition Records
- Application Definition Fields
- Application Definition Field Elements

In the tree structure, the records, fields, and elements are identified by both their sequence and name; for example, 1-FirstRecord or 3-MsgField. At each level, use right-click menus to display maintenance screens for adding lower-level nodes to the tree.

Click Add Record to set up a new application definition.

Fig. 5.21
Application Definition Maintenance



Field Descriptions

Name. Enter an ID for this application definition.

Version. Enter a version number for the application definition. Use version numbers to differentiate among multiple applications with the same name.

Inbound. Select to indicate that this is a definition for a transaction inbound to JIT/S. Use this to differentiate between inbound and outbound application transactions with the same name.

QAD Designed. This is selected when the document definition is included in the default system data.

Gateway Name. Select a gateway name from those defined in Gateway Maintenance.

XML System Literal. Specify whether the DTD used to validate the content of exported XML files is on a public server or within a system domain. Valid values are:

PUBLIC: The DTD is on a public server.

SYSTEM: The DTD is within the local system domain.

Public ID Literal. Enter the value of the URL where the document type definition (DTD) is located if the system literal is PUBLIC.

Document Type. Enter the document-level XML identifier for the document to be created using this definition. The resulting XML document includes this identifier in the first line.

XML Entity. Enter the URL containing the namespace definition that controls the XML structure associated with the documents created using this definition; for example, <http://www.w3.org/2000/xmlns>.

Namespace. Enter the namespace to use when creating the XML document.

Application Definition Records

In Application Definition Maintenance, right-click an application name in the tree structure and choose Add Application Record to display the screen for adding details about specific records.

Fig. 5.22
Application Definition: Records

The screenshot shows the 'Application Record' dialog box. It contains the following fields and values:

- Record Seq: 10
- Record Name: WorkOrder
- Required: ☐
- Loop Occurrence: 1
- Loop End Seq: 10
- XML Tag: (empty)
- Gateway Table: womf_worder
- Gateway Join Fields: (empty)

Field Descriptions

Record Seq. Enter the sequence number for this record in the application definition.

Record Name. Enter the record name; it must be unique in the application definition. The transformation process uses the record name as a variable, independent of the sequence number.

Required. Select to indicate that this record is required during transformation or clear the field to indicate that it is not. When the Message Manager cannot find a required record, it generates an error message and does not process the associated document.

Loop Occurrence. Enter the number of times the transformation process should loop through the record.

Loop End Seq. Processing loops start on the current record. Enter one of the defined record sequence numbers to indicate where the loop ends.

For example, enter a Loop End Seq value of 2 on the record with the sequence number 2 to indicate that the entire loop sequence takes place on that single record. Or, enter an end sequence of 4 on record number 3 to indicate a loop that starts at record 3 and ends at record 4. To specify a loop structure that includes all records, enter zero or a number higher than the last record sequence defined.

XML Tag. Enter the XML name if this record is being exported to an XML file.

Gateway Table. Enter a comma-separated list of tables. For inbound messages these correspond to the temp tables that are passed to the gateway.

For outbound messages these are the tables that are used in the outbound query.

Gateway Join Fields. Enter a comma-separated list of joins to use to join the tables listed in Gateway Table.

```
table2.field2=table1.field1
```

Application Definition Fields

In Application Definition Maintenance, right-click a record in the tree structure and choose Add Application Field to display the screen for adding fields to the application definition.

Fig. 5.23
Application Definition: Fields

The screenshot shows the 'Application Field' dialog box. The fields are as follows:

- Field Sequence: 10
- Field Name: worder_obj
- Field Required: ☒
- Field Type: Real
- Field Min: 0
- Field Max: 30
- Field Gateway Var: worder_obj
- Namespace:
- Field XML Tag:
- Field Tag Type: Element
- Insert Prior To:
- Match To Variable: worder_obj
- Add for Sub Query: ☐

Field Descriptions

Field Sequence. Enter the sequence number for the field within the record.

Field Name. Enter a name for the field; each name must be unique in the record.

Field Required. Select if this field is required during document transformation.

Field Type. Choose a code representing the type of data stored in this field. Valid entries are:

- Alphanumeric (trims all blank spaces on either side of the field)
- Date
- Integer
- Logical
- Real (decimal)
- String (only trims the right side of the incoming field)

Field Min. Enter the minimum length of the field. The Message Manager validates that required or optional data is equal to or greater than the minimum value for the field.

Field Max. Enter the maximum length of the field.

- If the field lengths are variable and separated by a delimiter defined in Subsystem Maintenance, the Message Manager validates that the data length is between the minimum and maximum values.
- If the field lengths are fixed, the Message Manager uses this value to calculate where each field starts and ends.

Field Gateway Var. Enter a gateway variable name. This refers to a field in one of the gateway tables specified for the application record.

Namespace. Enter the namespace to use when creating the XML document.

Field XML Tag. Enter the XML name if the value in this field is being exported to an XML file.

Field Tag Type. Select Element if the value is another element under the current element. Enter Attribute if the value is an attribute of the current record.

Important The use of the term attribute in this context is particular to XML statements; it is not related to the general use of the term in JIT/S.

Insert Prior To. Enter the name of a field that is to follow this field.

Match to Variable. Entering a variable in this field indicates that the records to include in the query are those where the field matches the value of the variable.

Add to Subquery. Select to make the field available for subsequent matches to variables.

Application Definition Field Elements

In Application Definition Maintenance, right-click a field in the tree structure and choose Add Application Element to display the screen for adding field elements to the application definition.

Fig. 5.24
Application Definition: Elements

The fields in this screen are exactly the same as those for defining application fields, but they apply to subelements within the fields. Not all fields require this additional level of differentiation, but it can be useful for processing, for example, different elements within a date or time stamp.

Implementation Definition Maintenance

Use Setup|Message Manager|Implementation Definition to modify an application definition to reflect the requirements of a specific trading partner.

The Message Manager uses an implementation, a document definition, and a transformation definition to meet the data structure and format requirements of JIT/S and an external subsystem when transforming and transferring data.

For each implementation, you can define the following:

- The application definition that is the basis for the implementation; see “Application Definition Maintenance” on page 226.
- Implementation Definition Records
- Implementation Definition Fields

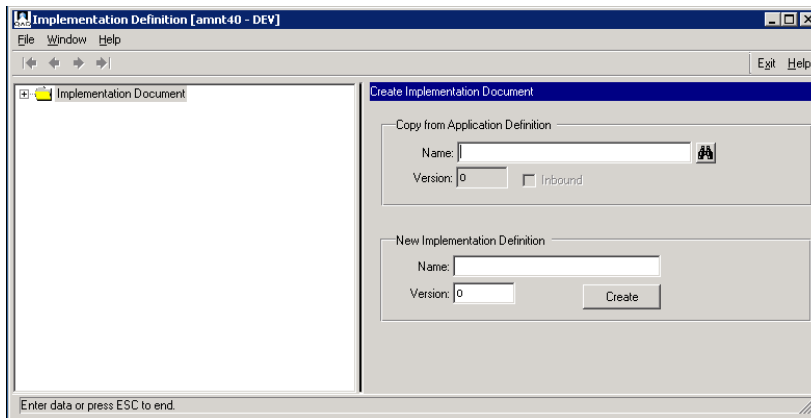
- Implementation Definition Field Elements

In the tree structure, each implementation is identified by the defined implementation name, the version, and whether it is for inbound processing; for example: Implementation XYZ-2 (yes).

To create a new implementation document definition in the tree structure, select the application that is the basis for the implementation and enter the implementation ID and version; then click Create.

Note Many record and field values default from the source application.

Fig. 5.25
Implementation Definition: Create from Application



Field Descriptions

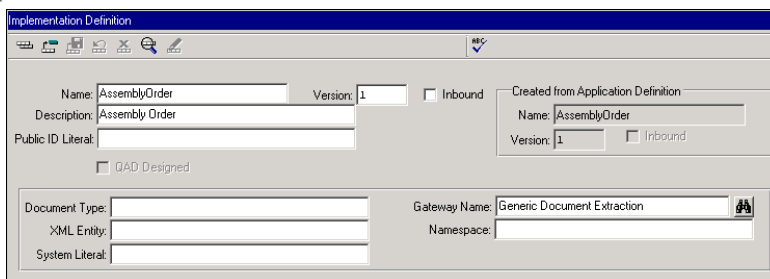
Name. Select an application definition ID from those defined in Application Definition Maintenance.

Name. Enter an ID for the implementation.

Version. Enter a version number for the implementation; then click Create to add the implementation to the tree structure.

Click an implementation document ID in the tree structure to display the screen for completing the definition.

Fig. 5.26
Implementation Document Definition



Field Descriptions

Name. Enter the ID for the implementation document.

Version. Enter the version number for the implementation.

Inbound. Select for inbound implementations; clear for outbound implementations.

Description. Enter a description for the implementation document.

Public ID Literal. Enter the value of the URL where the document type definition (DTD) is located if the system literal is PUBLIC.

Document Type. Enter the document-level XML identifier for the document to be created using this definition. The resulting XML document includes this identifier in the first line.

XML Entity. Enter the URL containing the namespace definition that controls the XML structure associated with the documents created using this definition; for example, <http://www.w3.org/2000/xmlns>.

XML System Literal. Specify whether the DTD used to validate the content of exported XML files is on a public server or within a system domain. Valid values are:

PUBLIC: The DTD is on a public server.

SYSTEM: The DTD is within the local system domain.

Gateway Name. Select a gateway from those defined in Gateway Maintenance.

Namespace. Enter the namespace to use when creating the XML document.

Implementation Definition Records

In Implementation Definition Maintenance, right-click an implementation document ID in the tree structure and choose Add Implementation Record to display the screen for adding records to the implementation definition.

Note The Sort List, Sort Order List, and Misc Join Info fields are displayed for only outbound implementations.

Fig. 5.27
Implementation Records

The screenshot shows the 'Implementation Record' form with the following data:

- Record Seq: 10
- Record Name: Assembly Order
- Required: ☒
- Loop Occurrence: 999999
- Loop End Seq: 30
- XML Tag:
- Gateway Table: wcml_sorder, woml_worder, sfcl_au_ship, woml_worder_list_version, gdmh_part_list
- Gateway Join Fields: , woml_worder.worder_obj = wcml_sorder.worder_obj, sfcl_au_ship.au_ship_obj = woml_worder.au_ship_obj, woml_worder_list_version.worder_list_version_obj =
- Sort List:
- Sort Order List:
- Misc Join Info:

Field Descriptions

Record Seq. Enter the sequence number for this record in the implementation.

Record Name. Enter the record ID; it must be unique in the implementation. The transformation process uses the record ID as a record variable independent of the sequence number.

Required. Select to make this a record that is required during transformation.

Loop Occurrence. Enter the number of times the transformation process should loop through the record.

Loop End Seq. Processing loops start on the current record. Enter one of the defined record sequence numbers to indicate where the loop ends.

For example, enter a Loop End Seq value of 2 on the record with the sequence number 2 to indicate that the entire loop sequence takes place on that single record. Or, enter an end sequence of 4 on record number 3 to indicate a loop that starts at record 3 and ends at record 4. To specify a loop structure that includes all records, enter zero or a number higher than the last record sequence defined.

XML Tag. If the gateway process is creating an XML document, the XML tag replaces the implementation ID.

Gateway Tables. Enter a comma-separated list of tables to create during the gateway processing.

Gateway Join Fields. Enter a comma-separated list of fields to use to join records for dynamic queries and data sets during export. Use the format `table.field` and list the parent table and field first.

Sort List. Enter a comma-separated list of database fields for sorting the query on the record.

Sort Order List. Enter a comma-separated list with an item or blank for each item in Gateway Tables. The items in this list, ASCENDING or DESCENDING, specify how the matching gateway table should be sorted. ASCENDING, the default, is used for blank items.

Join Information. Enter a comma-separated list of miscellaneous, usually static, join information. The join information must specify which table from the gateway table list has the information; for example, this line indicates that only manufactured items should be extracted and the data is in the second gateway table.

```
,gdmf_part.part_pm_code='M',, .
```

Implementation Definition Fields

In Implementation Definition Maintenance, right-click a record name in the tree structure and choose Add Implementation Field to display the screen for adding fields to the implementation definition.

Fig. 5.28
Implementation Fields

Field Descriptions

Field Sequence. Enter the sequence number for the field within the record.

Field Name. Enter an ID for the field.

Required. Select if this field is required during document transformation.

Field Type. Enter the type of data that the field holds:

- Alphanumeric (trims all blank spaces on either side of the field)
- Date
- Integer
- Logical
- Real (decimal)
- String (only trims the right side of the incoming field)

Field Min. Enter the minimum length of the field. The Message Manager validates that required or optional data is equal to or greater than the minimum value for the field.

Field Max. Enter the maximum length of the field.

- If the field lengths are variable and separated by a delimiter defined in Subsystem Maintenance, the Message Manager validates that the data length is between the minimum and maximum values.
- If the field lengths are fixed, the Message Manager uses this value to calculate where each field starts and ends.

Field Destination. Enter the type of variable associated with this field. Valid values are:

- Gateway Variable. This variable type is used by the gateway during the transfer process.
- Turnaround. This variable type represents imported data that is stored in the turnaround data table, indexed, and later associated with an export document.

Field Gateway Variable. Enter a gateway variable name. These are the fields in the gateway tables specified for the implementation document record.

Cross-Ref Class. Select a class ID to have the incoming field value replaced by the first valid member of the class. Select a class member to have the incoming field value replaced by that value. Class code IDs and class members are defined in Class Code Maintenance.

Match to Variable. Entering a variable in this field indicates that the records to include in the query are those where the field matches the value of the variable.

Add to Subquery. Select to make the field available for subsequent matches to variables.

Field Mask Default. To display custom fields on the report generated during import, use this field to specify the field length and label to display, separated by a slash (/). For example, if you enter 4/Max, the report displays the output defined in this implementation record in a four-character field, with a label of Max.

Note Select Field Display for these values to have an effect.

Field Help. Use this field to identify the data that is needed for this implementation field. This help displays at the bottom of the screen for export updates.

Field Validate. Select to validate the data in this field against the members of the class specified in Cross-Ref Class.

Validate Class. Select the class code that determines valid values for the field. If a class code is specified, the value of the field must be one of the members of this class or an error is generated by the Message Manager.

Field Conditions. Enter the types of conditions to validate the field.

Field Display. Select to display data on the import report based on the field length and label specified in Field Mask Default.

Field Edit. Select to enable editing of the data in this field for export updates.

Field Display Children. Select to display information on lower levels that has been entered at higher levels.

Field XML Tag. Enter the XML name if the value in this field is being exported to an XML file.

Field Tag Type. Select Element if the value is another element under the current element. Enter Attribute if the value is an attribute of the current record.

Important The use of the term attribute in this context is particular to XML statements; it is not related to the general use of the term in JIT/S.

Namespace. Enter the namespace to use when creating the XML document.

Insert Prior To. Enter the name of a field that is to follow this field.

Implementation Definition Field Elements

In Implementation Definition Maintenance, right-click a field name in the tree structure and choose Add Implementation Element to display the screen for adding elements to the implementation field definition.

Fig. 5.29
Implementation Elements

The screenshot shows the 'Implementation Element' dialog box. It has a title bar with a blue background and a toolbar with icons for adding, deleting, and saving. The main area contains several input fields and checkboxes. The 'Element Sequence' is set to 0. The 'Element Name' field is empty. The 'Element Type' is a dropdown menu. The 'Element Min' and 'Element Max' are both set to 0. The 'Element Destination' is a dropdown menu. The 'Xref Class' is a text field. The 'Element Mask Default' and 'Element Help' are text fields. The 'Element Validate' checkbox is unchecked. The 'Validate Class' is a text field. The 'Element Conditions' is a text field. The 'Element XML Tag' is a text field. The 'Element Tag Type' is a dropdown menu set to 'Element'. The 'Element Required', 'Element Display', 'Element Edit', and 'Element Display Children' checkboxes are all checked.

The fields in this screen are exactly the same as those for defining implementation fields, but they apply to subelements within the fields. Not all fields require this additional level of differentiation, but it can be useful for processing such things as different elements within a date or time stamp.

Function Maintenance

Use Setup|Message Manager|Function Maintenance to define functions that can then be used in transformation instructions.

Complete the Function Maintenance and Function Parameters tabs; then click Process to Disk to save the function to a file. This creates a program shell that can be completed using a file editor outside of JIT/S.

Fig. 5.30
Function Maintenance

The screenshot shows the 'Function Maintenance' dialog box. It has a title bar with a blue background and a toolbar with icons for adding, deleting, and saving. The main area contains several input fields and a button. The 'Name' field is set to 'Concatenate'. The 'Description' field is set to 'Concatenate two strings'. The 'Return Type' is a dropdown menu set to 'Alphanumeric'. The 'Save to File' button is visible. The 'QAD Designed' checkbox is checked.

Field Descriptions

Name. Enter a name for the user-defined function. This name must meet the naming standards for the operating system.

Description. Enter a description of what the function does.

Return Type. Select the type of value returned as output when this function is performed: Alphanumeric, Real, Integer, Logical, Date. String is not allowed.

Process to Disk. Click to save the function in a file.

Click the Function Parameters tab to define parameters.

Fig. 5.31
Function Parameters

Param Seq	Param Type	Param Name
1	AN	aP
2	AN	aQ
3	D	aQ

Param Sequence: ...

Param Type:

Param Name:

Field Descriptions

Parameter Sequence. Enter a sequence for the parameter.

Parameter Type. Select the type of value represented by the parameter: Alphanumeric, Real, Integer, Logical, Date.

Parameter Name. Enter the name of the parameter that will be created in the program.

Resequencing. Click to interactively resequence the parameters; it is done automatically when the window is shut. Gaps are not allowed in the parameter sequence.

Transformation Maintenance

Use Setup|Message Manager|Transformation Maintenance to define data maps for transforming inbound documents in the document repository to application transactions in the application repository and outbound application transactions in the application repository to documents in the document repository.

The transformation maps are based on these inputs:

- Source data formatted according to a document defined in Document Definition Maintenance.
- A trading partner-specific implementation of an application as defined in Implementation Definition Maintenance.

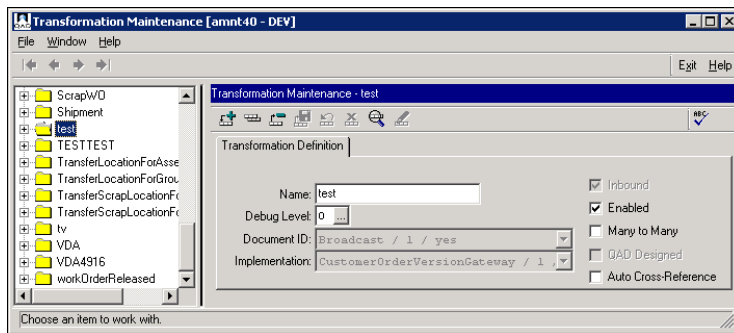
For each transformation, you can define the following:

- Transformation Events
- Transformation Instructions

In the tree structure, the instructions are identified by both sequence and type; for example, 1-Read or 30-Loop. At each level in the tree, use right-click menus to display maintenance screens for adding lower-level nodes.

Click Add Record to set up a new transformation definition.

Fig. 5.32
Transformation Maintenance



Field Descriptions

Name. Enter an ID for this transformation definition.

Debug Level. Enter a value between 0 and 9 to indicate the level of detail to report in the activity file—`mmddyyyy.dbg`—created when this transformation is run. Lower levels provide less detail. Setting this to 9 during testing gives you a complete record of what happens during processing. Transformation activity appends data to the file throughout the day it is created.

Warning Leaving this field set to a high value can produce very large files that create disk space problems.

Document ID. Enter the ID for the document or application transaction that is the source document for this transformation. Define the documents in Document Definition Maintenance.

Implementation ID. Enter the ID for the implementation that defines the target document definition or application transaction for this transformation.

Inbound. Select if this transformation is inbound to JIT/S.

Enabled. Select if this transformation is operational. If you clear this field for testing, the transformation goes through the entire process but does not store the data in the destination repository.

Many-to-Many. Select to have the transformation process map from multiple source documents to one or more target documents. Clear to let the transformation process determine the many-to-many or many-to-one relationships.

QAD Designed. This is selected when the transformation is provided in the default system data.

Auto Cross-Reference. Select for the transformation process to cross-reference the incoming trading partner address and site with those represented by token assignments for address and site in Trading Partner Maintenance.

Transformation Events

In Transformation Maintenance, right-click a transformation ID in the tree structure and choose Add Transformation Event to display the screen for specifying events.

Fig. 5.33
Transformation Events

Field Descriptions

Event. Select the type of event: Loop-Entry, Record-Entry, Loop-Exit, Record-Exit.

Record Name. Select the record ID that the event applies to from the records defined for the document specified for this transformation. See “Document Definition Maintenance” on page 216.

Transformation Instructions

In Transformation Maintenance, right-click an event in the tree structure and choose Add Transformation Instruction to display the screen for adding details about the source and target data.

Note Entries in the Type and Qualifier fields determine which subsequent fields are displayed.

Fig. 5.34
Transformation Instructions

Field Descriptions

Sequence. Enter the sequence for this action relative to the other actions linked to the current event. The transformation process will perform actions in this order when it encounters the specified record in the repository.

Target Qualifier. Select the type of data for the target of the current action: Input Data, Output Data, Variable.

Target. Specify the record or variable that is the target of the action specified in Type.

Type. Specify the type of action to perform on the target. Valid action types are:

- **Equate:** Set the target equal to the source.
- **Read:** Read the target record fields into memory. This can be used only with an input record.
- **Clear:** Remove the target record fields from memory.
- **Write:** Write the target record to the repository.
- **Loop:** Loop through the records that have already been read by the transformation but have not yet been cleared.
- **EndLoop:** End a loop. Does not require a source or target.
- **If:** Conditional logic based on the source and source qualifier. The If statement must return a value of True or Yes. It allows the use of Else and Endif and does not require a source or target.
- **Endif:** End of an If statement. Endif does not require a source or target.
- **Else:** Logical branch between If and Endif statements. Else does not require a source or target.
- **Repeat:** Repeats a section of code the number of times defined by the value of Source.

Source Qualifier. Select the form of data to be specified as the source. Valid values for the Source field are determined by this setting: input data, output data, variable, constant, function, or sort. Sort is only used when the type is Loop; it allows you to define the sorting index.

Source. Enter the inbound record, variable, constant, or function that is the source for the action specified in Type.

Add, Remove, Up, Down. These buttons are available when the source qualifier is Sort. Use them to move values within the sort list.

Setting Up Parameters

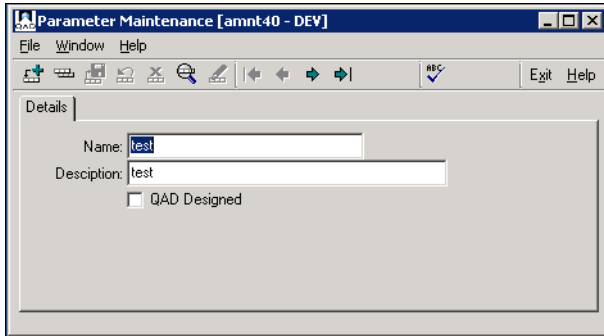
The Message Manager gateways can use parameters when transferring data between the application repository and the JIT/S database. Some QAD-defined parameters are included in the default system data.

- Parameter Maintenance
- Default Parameter Maintenance

Parameter Maintenance

Use Setup|Message Manager|Parameter Maintenance to define parameters.

Fig. 5.35
Parameter Maintenance



Field Descriptions

Name. Enter a name for the parameter.

Description. Enter a description for the parameter.

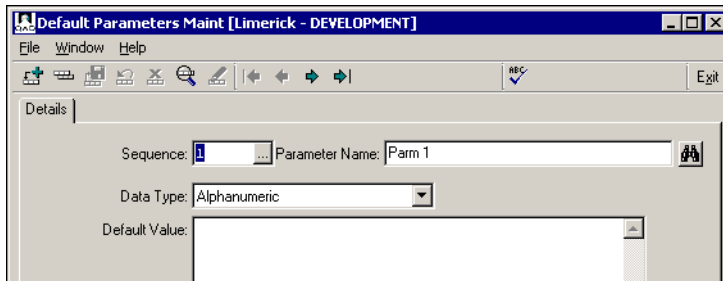
QAD Designed. This is selected when the parameter is provided as default system data by QAD. These parameters cannot be deleted by users.

Default Parameter Maintenance

Use Setup|Message Manager|Default Parameter Maintenance to specify a default set of parameters from those defined in Parameter Maintenance.

Each time you define a new trading partner, JIT/S assigns the parameters that are current members of the default parameter set to that trading partner. Changes to the default parameter set do not affect existing trading partners; the changes affect only subsequently defined trading partners. Update the parameters assigned to trading partners in Trading Partner Maintenance. See “Trading Partner Default Parameters” on page 248.

Fig. 5.36
Default Parameter Maintenance



Field Descriptions

Sequence. Enter the display order for the specified parameter. Sequence numbers can be used only once.

Parameter Name. Enter a name for the parameter. Parameter name and data type combinations must be unique.

Data Type, Default Value. Default value is optional.

Data Type	Valid Default Values
Alphanumeric	Not validated
String	Not validated
Logical	Yes, No, True, False
Integer	Valid integer
Date	Valid date format
Real	Numeric value

Entered values are validated according to this table.

Trading Partner Maintenance

Use Setup|Message Manager|Trading Partner Maintenance to identify the sources of inbound messages and destinations of outbound messages.

After creating a trading partner record, you can maintain three types of information related to trading partners:

- Documents
- Site/Address Cross-References
- Trading Partner Default Parameters

In the Trading Partner frame, click Add Record to display the screen for defining a new trading partner.

Fig. 5.37
Trading Partner Maintenance

Field Descriptions

Trading Partner ID. Enter an ID for this trading partner. This ID must match the name for the field or record defined in Subsystem Maintenance where Token is set to tp_id. This is the code the trading partner uses to identify itself in the incoming messages.

Name. Enter the name of this trading partner. This is for reference only.

Timeout. This is the number of seconds of inactivity before the Timeout rule group is run. Timeouts are checked by the Timeout process.

Sequenced. Select to have sequence control at the trading partner/destination level.

ACK Required. Select to indicate that an acknowledgment is required to documents outbound to this trading partner/destination.

Allow Resend. Select to mark documents for this trading partner/destination eligible for reprocessing.

Active. Select to indicate that messages should be processed for this trading partner/destination.

Timeout Rule Group. Select the rule group to run when the value of Timeout is exceeded. Timeouts are checked by the Timeout process.

Error Rule Group. Select a rule group to run when an error occurs in the processing of an inbound or outbound message.

E-mail Error List. Enter a comma-separated list of e-mail addresses to receive the error.

Click Save Record to add the new trading partner to the tree structure with three subnodes: Documents, Cross References, and Default Parameters.

Documents

In Trading Partner Maintenance, expand the tree structure under any trading partner; then right-click Documents and choose Add Trading Partner Document to display the screen for adding details about specific documents associated with this trading partner.

Use the Cross-References node to link these documents to specific site/addresses defined for the trading partner. See “Document Cross-References” on page 247.

Note Not implemented in this release: Right-click a document record and choose Add Ack/Nack Error.

Fig. 5.38
Trading Partner Maintenance: Documents

Trading Partner Documents

Type: ☒ Inbound

Token List:

Transformation:

Gateway:

Document in Response:

Transmission Group:

Timeout:

Timeout Rule Group:

NACK Deactivation Count:

Deactivation Rule Group:

Resend Deactivation Count:

Resend Rule Group:

☐ Sequenced

☐ ACK Required

☒ Allow Resend

☒ Save Repository Data

☐ Inbound Response

☒ Active

☐ Export Empty Fields

Field Descriptions

Type. Enter the identifier for a document type received from this trading partner. This ID must match the name for the field in the incoming message where Token is set to `tp_document_id`. This is the code the trading partner uses to identify the document type in the control record portion of broadcast messages.

Note Order broadcasts often do not include a document type. In this case, the Message Manager uses the default trading partner document associated with the channel where messages are being received. See the field Default Trading Partner Document in “Channel Maintenance” on page 134.

Inbound. Select if this record applies to inbound records. Use this field to distinguish between two trading partner records with the same document type by making one inbound and the other outbound.

Token List. Enter a comma-separated list of tokens. The values for these tokens are specified on the TP cross-reference record to differentiate among TP cross-references. See “Tokens” on page 204.

Transformation. If data transformation is required, enter the ID of the transformation map for converting the data for this combination of trading partner, document type, and direction. Define transformation maps in Transformation Maintenance.

For inbound, if a transformation is not specified, the process loads the record directly into the document repository and attempts to run the gateway. A transformation is mandatory for outbound.

Gateway. Choose the name of a gateway to process the order data. Set up gateway names in Gateway Maintenance.

Document in Response. Enter the outbound document that this inbound document is responding to.

Transmission Group. Enter the name of the transmission group associated with this trading partner for this document type. This group must be defined in Transmission Group Maintenance; it specifies where the XML documents are saved.

Timeout. Enter the number of seconds that the outbound message can remain in the transmission queue before timing out. Timeouts are checked by the Timeout process.

Timeout Rule Group. Enter the rule group that the Timeout process runs as soon as a timeout is detected.

NACK Deactivation Count. Enter the maximum number of NACKs this document can have before it is deactivated.

Deactivation Rule Group. Enter the rule group that runs when the value of NACK Deactivation Count is reached.

Resend Deactivation Count. Enter the maximum number of resends that this document can have before it is deactivated.

Resend Rule Group. Enter the rule group that runs when the value of Resend Deactivation Count is reached.

Sequenced. Select if this message is to be sequenced by document. The message will not be sent until the previous message of this document type has been successfully sent and acknowledged if ACK Required is also selected.

ACK Required. Select if the message is to remain in the Transmission queue until an acknowledgement is received.

Allow Resend. Select to indicate that this document is available for resending from the Outbound workbench.

Save Repository Data. Select to save the data for this document in either repository. If there is an error for a message, the data is always saved. This data can also be archived. Clear this field to avoid building up large amounts of data in the repositories.

Inbound Response. Select if this inbound document is a response to the outbound document specified in Document in Response.

Active. Select to indicate that messages should be processed for this document. For inbound messages, if the field is cleared, the document is loaded into the Document repository but no further action is taken. For outbound documents, if the field is cleared, the data is not extracted from the database.

Export Empty Fields. This option only applies to outbound XML documents. Select to indicate that empty fields in the outbound XML document should be exported when the outbound message is sent. If the field is cleared, Message Manager ignores all empty fields in the outbound document.

Site/Address Cross-References

In Trading Partner Maintenance, use cross-references to link trading partner and JIT/S identifiers for sites/addresses; then link documents and parameters to specific site/addresses.

Expand the tree structure under any trading partner; then right-click Cross References and choose Add Sites/Address to display the screen for adding a site/address record. The external site, external address, application site, and application address values are concatenated to form the entry in the tree structure.

Fig. 5.39
Trading Partner Cross-Reference Maintenance

Field Descriptions

External Site. Enter the ID the trading partner uses for a site.

External Address. Enter the trading partner address.

Application Site. For inbound messages, enter the JIT/S ID, as defined in Site Maintenance, for the external site. See “Sites” on page 67.

For outbound messages, when the value for the field specified in Site Identity Field on the business event matches the value in this field, the message is to go to this destination/trading partner. See “Business Event Maintenance” on page 248.

Application Address. Enter the address linked to application site in Site Maintenance.

For outbound business event messages, when the value for the field specified in Identity Field on the business event matches the value in this field, the message is to go to this destination/trading partner. If the value in this field is an asterisk (*), the message goes to this destination/trading partner regardless of the value for the field specified in Identity Field on the business event.

Implementation Name. Select an implementation name from those defined in Implementation Definition Maintenance.

Token Value List. Enter a comma-separated list of token values. These values are used in conjunction with the tokens listed in a trading partner document to differentiate among multiple site/address cross-references.

Export. Select to indicate that the cross-reference is applicable only for outbound data.

Parameter Cross-References

Note Parameter cross-references are not currently available.

Expand the tree structure under any site/address, then right-click Parameters and choose Add Parameter to display the screen shown in Figure 5.40 for maintaining site-specific parameters.

The default parameters are defined in Default Parameter Maintenance.

Fig. 5.40
Trading Partner Site-Specific Parameters

Field Descriptions

Sequence. Enter the sequence for the parameter. A sequence number can be used only once for each site/address.

Parameter Name. Select a parameter from those defined in Parameter Maintenance. A parameter name and data type combination can be used only once for each site/address.

Data Type, Default Value. Default value is optional.

Data Type	Valid Default Values
Alphanumeric	Not validated
String	Not validated
Logical	Yes, No, True, False
Integer	Valid integer
Date	Valid date format
Real	Numeric value

Entered values are validated according to this table.

Document Cross-References

Expand the tree structure under any site/address, then right-click Documents and choose Add Document Cross-Reference to display the screen shown in Figure 5.41 for identifying site-specific documents.

This cross-reference of destination/trading partner with document/business event message is the mechanism for identifying the destination for business event messages. The trading partner documents specify the processing for business event messages of the same name.

Fig. 5.41
Trading Partner Site-Specific Documents

Document ID. Select one of the documents defined for this trading partner. See “Documents” on page 243.

Trading Partner Default Parameters

Note Trading partner default parameters are not currently available.

The gateways use the default parameters when processing documents from a trading partner.

When you define a new trading partner, JIT/S assigns the current default parameter set defined in Default Parameter Maintenance. Use this screen to refine the default set of parameters for each trading partner.

Expand the tree structure under any trading partner, then right-click Default Parameters and choose Add Default Parameter to display the screen shown in Figure 5.42.

Fig. 5.42
Trading Partner Default Parameters

Field Descriptions

Sequence. Enter the sequence number for this parameter.

Parameter Name. Select a parameter from those defined in Parameter Maintenance.

Data Type, Default Value. Default value is optional.

Data Type	Valid Default Values
Alphanumeric	Not validated
String	Not validated
Logical	Yes, No, True, False
Integer	Valid integer
Date	Valid date format
Real	Numeric value

Entered values are validated according to this table.

Business Event Maintenance

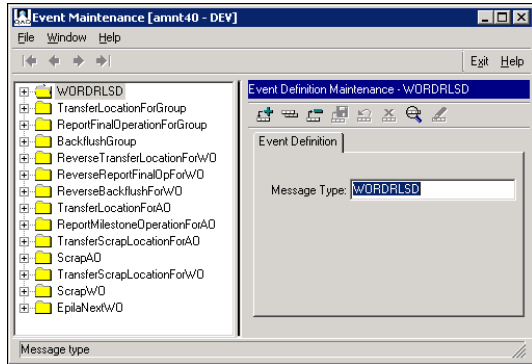
Use Setup|Message Manager|Event Maintenance to define business events/document types to associate with the JIT/S-supplied events. Events are types of outbound messages. Business events/document types are specific configurations of the message types that specify data to be extracted from the JIT/S database. See “Outbound Message Example” on page 272.

Business events are cross-referenced to trading partners/destinations through trading partner documents. For a document type, the business event identifies the data and the trading partner document specifies how the data is to be processed for a particular trading partner/destination.

Depending on setup, JIT/S processing—such as completing a work order and setting its Production status to Built—triggers events such as BackflushGroup. In processing the event, JIT/S determines which business events/messages need to be generated, what data needs to be extracted from the JIT/S database, as well as the processing and destinations for the data.

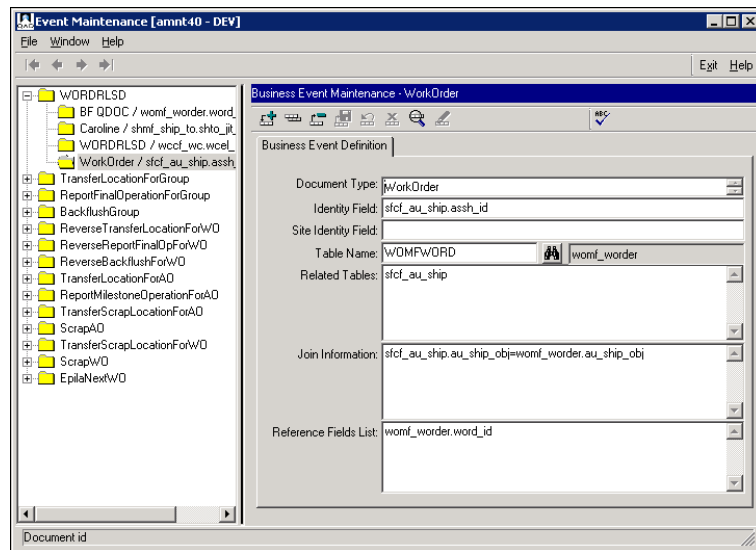
Note The business events defined and used in the Message Manager are independent of the business events that are valid members of the class code Business_Events and tracked in the Factory Dashboard as monitored events.

Fig. 5.43
Event Maintenance



For each event, define messages/document types that specify the data to be extracted from the JIT/S database.

Fig. 5.44
Business Events Maintenance



Document Type. Enter the name of a document defined for a trading partner in Setup|Message Manager|Trading Partner Maintenance. This cross-reference connects the business event message to the destination/trading partner.

Identity Field. Enter the table and field name that holds the key value that must be matched with the value in the Application Address field on a trading partner cross-reference Site/Address screen. When these values match, the message is to go to that destination/trading partner. The message also goes to that destination/trading partner if an asterisk (*) is specified in the Application Address field. See “Application Address” on page 246.

Site Identity Field. This field holds the key value that can be matched with the value in the Application Site field on a trading partner cross-reference Site/Address screen. When these values match, the message is to go to that destination/trading partner. The message also goes to that destination/trading partner if an asterisk (*) is specified in the Application Site field. This field is in addition to the Identity Field.

Table Name. Enter the table ID for the object in the extraction process.

Related Tables. Enter the tables that are part of the join information from Table Name to Identity Field.

Join Information . Enter the join information from the Table Name to the location for Identity Field.

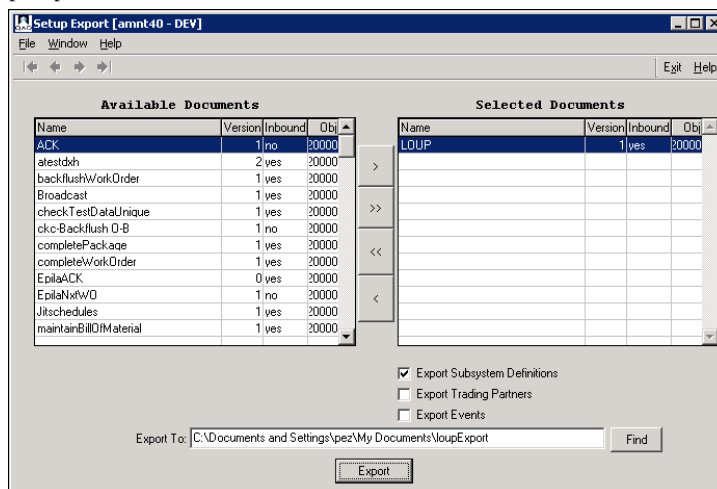
Reference Fields List. Enter a comma-separated list of fields—from the tables in Related Tables—to create a unique reference number for the outbound message. It can be viewed in the Key Info field of the Transmission Queue record.

If this field is left blank, the Key Info defaults to the message number on the application repository record.

Import/Export Utilities

Use Setup|Message Manager|Import or Export Utilities to load or save a messaging setup from one environment for import into a different environment. For example, save all or part of a test setup and then import it into a production environment.

Fig. 5.45
Setup Export

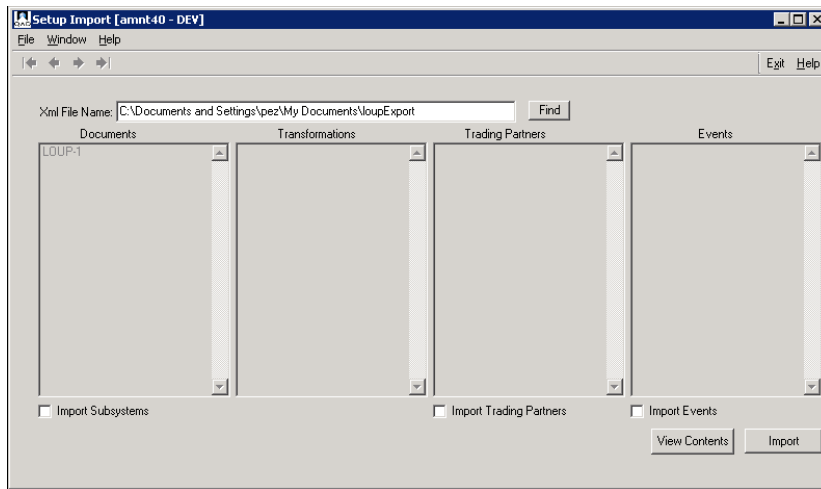


Task Steps

- 1 In Setup Export, select the Trading Partner to which the documents to be exported belong.
- 2 Use the CTRL or Shift keys to select the document types to export.
- 3 Select Site as Source to store the site ID.
- 4 Select Dump on Server to dump the file on the server instead of the local machine from the export screen (recommended).
- 5 Select Verification Messages to display warning messages.
- 6 Enter the Dump Directory and click Dump.

Note When you import trading partners, any repository data that references those trading partners will have the references cleared.

Fig. 5.46
Setup Import



Task Steps

- 1 In Setup Import, enter the folder of the XML file to import; Use File on Server.
- 2 Select the file to import and set up the elements to import. By default all elements found in the file are imported.
- 3 Use Rename Using Source ID to include source ID in the imported element names.
- 4 Click Import.

Note If there is more than one subsystem/document cross-reference for the same combination of subsystem and document, only the first one is imported.

Message Manager Operations

Use these functions from the Operations|Message Manager menu:

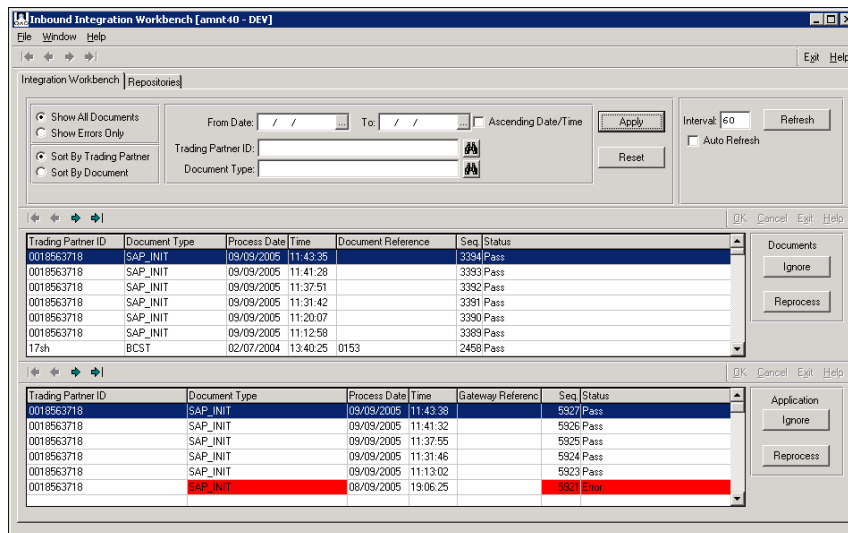
- Inbound Workbench

- Outbound Workbench
- Document Repository Maintenance
- Application Repository Maintenance
- Document/Application Cross-Reference
- Turnaround Data Maintenance
- Transmission Queue Maintenance
- Archive Queue Maintenance

Inbound Workbench

Use Operations|Message Manager|Inbound Workbench to monitor all messages coming into JIT/S.

Fig. 5.47
Message Manager Inbound Workbench



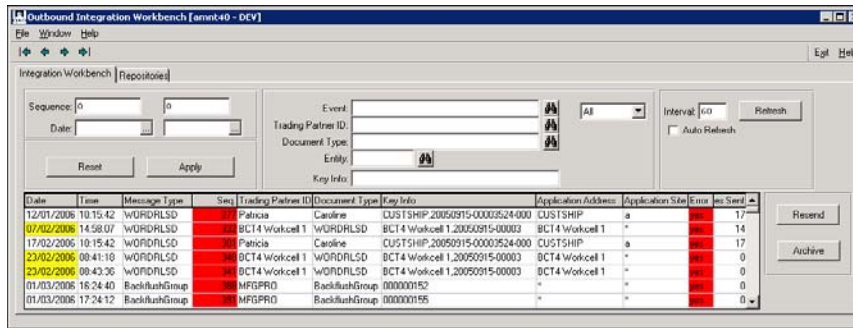
Clicking Ignore removes the selected message from the display only. Clicking Reprocess marks the message as available to the Reprocess process.

Outbound Workbench

Use Operations|Message Manager|Outbound Workbench to monitor all of the messages in the Transmission queue. Messages moved from the Transmission queue to the Archive queue are also removed from the workbench.

Clicking Resend resends the repository data.

Fig. 5.48
Message Manager Outbound Workbench



Document Repository Maintenance

Use Operations|Message Manager|Document Repository Maint to review broadcast data loaded into the repository. You can also modify or add data to the repository in order to reprocess a failed message. For example, you might use this program to add a value to a missing required field that is preventing the order receipt from completing.

Note This function is on the Operations menu since it is not related to setup, but can be used on an ongoing basis to troubleshoot or review data.

The repository stores inbound and outbound messages—documents:

- Load processes inbound messages and creates documents according to the document definitions. These documents have not been transformed; they may or may not have been transferred into JIT/S.
- Unload processes outbound messages.

The repository stores all documents that pass through it during processing, whether or not they complete all the subsequent steps. These documents remain in the repository until they are archived and deleted.

The maintenance screen has four tabs:

- Document Status Tab
- Session Details Tab
- Repository Data Tab
- Repository Detail Tab

Document Status Tab

In Document Repository Maintenance, when you select a document to review or maintain in the Document Status tab, the system displays trading partner data and reference information about it. The value for TP Document combines the trading partner ID, the document name, and the direction—yes for inbound.

Fig. 5.49
Document Repository Maintenance: Document Status Tab

Document Repository Maintenance [amnt40 - DEV]

File Window Help

Document Status Session Details Repository Data Repository Detail

Sequence: 49306 Status: 43 ☐ Reprocess

Transmission Group: PLC

TP Document: PLC / workOrderReleased / no

Document Reference:

File Name: d:\users\jfk\0000000148.jfk.xml

Application Identifier: 20060413-00010734-00000000

The system assigns a status code to each document at each step of the process.

Table 5.7
Document Processing Status Codes

Code	Direction	Status
11	Inbound	Load process failed. Possible reasons: the Message Manager could not determine the subsystem to use, the trading partner/document cross-reference is not set up, or the document is not in the expected format.
12	Inbound	Message data loaded successfully into the document repository.
13	Inbound	Transform process failed. Could indicate problem with the application or implementation definition.
14	Inbound	Transform process succeeded.
21	Inbound	Indicates that the document was passed directly from the document repository to the gateway; this applies to documents that do not require transformation.
22	Inbound	Indicates that the document was passed directly from the document repository to the gateway and the gateway process failed.
23	Inbound	Indicates that the document was passed directly from the document repository to the gateway and the gateway processed the document successfully.
41	Outbound	Data successfully transformed from application repository to document repository.
42	Outbound	Document unload failed.
43	Outbound	Document unload completed successfully.

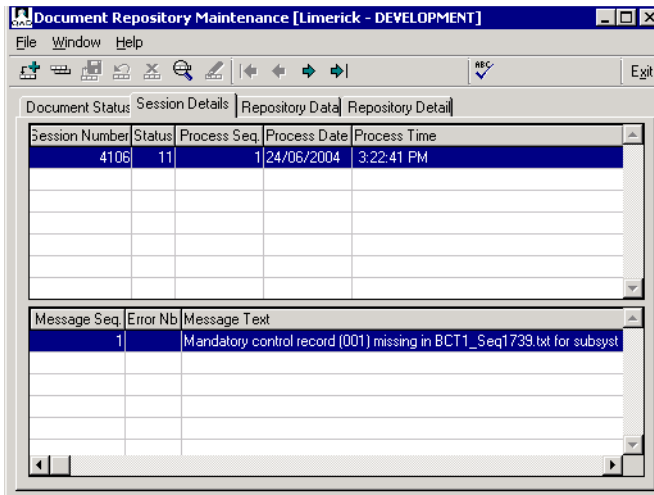
Use the Reprocess field to resubmit a document for processing after correcting an error. When the Message Manager is run with the parameter fileType set to Reprocess, it finds all of the documents with reprocess set to Yes and reloads them. See Table 5.6, “Inbound Process Parameters,” on page 211.

Session Details Tab

In Document Repository Maintenance, click the Session Details tab to view the status of the load process. When you click the different status records, the bottom browse shows any messages that occurred during the process. You can double-click a message to view more details about it.

Fig. 5.50

Document Repository Maintenance: Session Details Tab



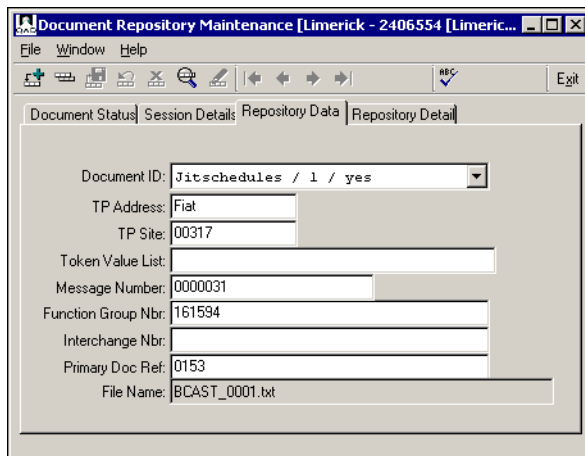
Repository Data Tab

In Document Repository Maintenance, click the Repository Data tab to view message information loaded in the repository. The Document field displays the name, version, and direction—yes for inbound—for the document.

Note Repository data exists only if the document processing status code is 12 or higher, indicating that the message was successfully loaded. Status codes are covered for the Document Status Tab above.

Fig. 5.51

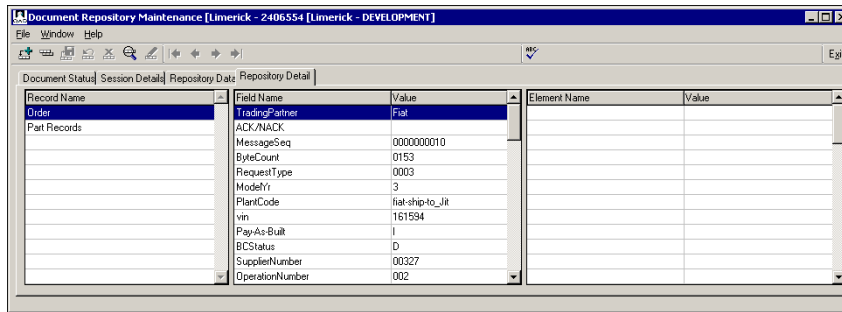
Document Repository Maintenance: Repository Data Tab



Repository Detail Tab

In Document Repository Maintenance, click the Repository Detail tab to view information about the field and element values associated with the document records. You can edit data in the value column directly in the browse. This is useful if you need to change a value before reprocessing.

Fig. 5.52
Document Repository Maintenance: Repository Detail Tab



Application Repository Maintenance

The inbound transformation process maps data from successfully loaded documents in the document repository into application transactions and loads the resulting transactions into the application repository.

The outbound transformation process maps the data from application transactions into documents in the document repository from where they can be unloaded.

Define application definitions in Application Definition Maintenance.

Use Operations|Message Manager|Application Repository Maintenance to review application transactions in the repository. You can also modify or add data to the transactions for reprocessing failed transformations. For example, you can add a value for a required field that is empty.

Note Application Repository Maintenance is on the Operations menu since it can be used on an ongoing basis to troubleshoot or review data.

The maintenance screen has four tabs:

- Transaction Status Tab
- Session Details Tab
- Repository Data Tab
- Repository Detail Tab

Transaction Status Tab

For the application transaction selected in Application Repository Maintenance, the Document Status tab displays the application-assigned sequence number and the site/address cross-reference information.

Because of the possible one-to-many relationships between incoming documents and application transactions, the sequence numbers assigned to transactions do not stay the same throughout processing.

Fig. 5.53
Application Repository Maintenance: Transaction Status

The screenshot shows a software window titled "Application Repository Maintenance [amnt40 - DEV]". It has a menu bar with "File", "Window", and "Help". Below the menu is a toolbar with various icons. The main area has four tabs: "Transaction Status", "Session Details", "Repository Data", and "Repository Detail". The "Transaction Status" tab is active. It contains the following fields and controls:

- Sequence: A text box containing "76071" and a dropdown arrow.
- Status: A text box containing "34" and a dropdown arrow.
- Reprocess: A checkbox.
- Application Site: A text box with an asterisk (*) on the left.
- Application Address: A text box with an asterisk (*) on the left.
- Document Site: A text box with an asterisk (*) on the left.
- Document Address: A text box with an asterisk (*) on the left.
- Gateway Reference: A text box containing "20060413-00010734-00000000".
- Application Identifier: A large text box with a vertical scrollbar.

The system assigns a status code to each transaction at each step of the process.

Table 5.8
Application Processing Status Codes

Code	Direction	Status
21	Inbound	Transformation of data from document repository to application repository completed successfully.
22	Inbound	Gateway process failed.
23	Inbound	Gateway process succeeded.
30	Outbound	The export process was initiated but the gateway did not run.
31	Outbound	An error occurred in the gateway processing.
32	Outbound	The gateway exported successfully.
33	Outbound	Transformation of the document failed.
34	Outbound	Transformation of the document succeeded; the document resulting from the transformation of the application resides in the document repository.

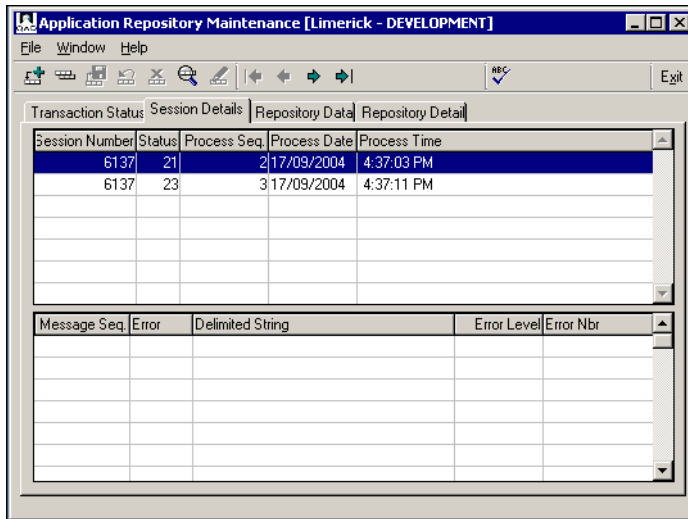
Select the Reprocess field to mark the transaction for reprocessing after correcting an error. When the Message Manager is run with the parameter fileType set to Reprocess, it finds and processes all of the transactions with reprocess set to Yes. See Table 5.6, "Inbound Process Parameters," on page 211.

Session Details Tab

In Application Repository Maintenance, click the Session Details tab to view processing session information for the selected transaction. JIT/S assigns session numbers for the Message Manager.

The upper browse shows the various statuses that the transaction achieved during the session. Select a status line to display any errors that occurred at that processing stage in the lower browse.

Fig. 5.54
Application Repository Maintenance: Session Details



Session Number	Status	Process Seq	Process Date	Process Time
6137	21	2	17/09/2004	4:37:03 PM
6137	23	3	17/09/2004	4:37:11 PM

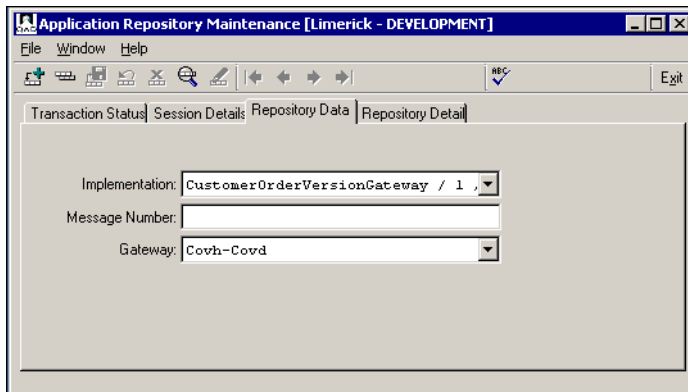
Message Seq	Error	Delimited String	Error Level	Error Nbr

Repository Data Tab

In Application Repository Maintenance, click the Repository Data tab to view information about a transaction. Inbound repository data exists only if the status—as shown on the Session Details tab—is 14 or higher, indicating that the transaction was successfully transformed.

This tab displays the implementation that the Message Manager used in the transformation and the gateway it used to move the data into the JIT/S database.

Fig. 5.55
Application Repository Maintenance: Repository Data



Implementation: CustomerOrderVersionGateway / 1

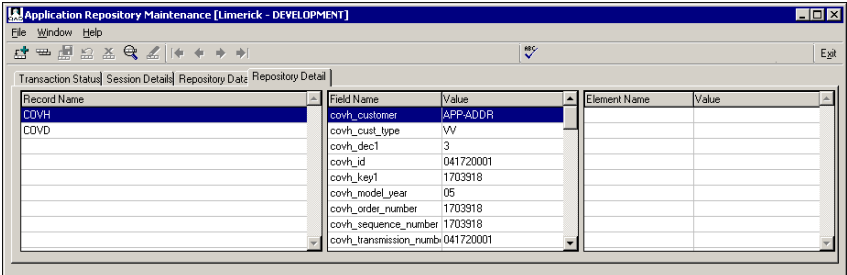
Message Number:

Gateway: Covh-Covd

Repository Detail Tab

In Application Repository Maintenance, click the Repository Detail tab to view the field and element data for each transaction record. You can edit data in the Value column to correct problems before reprocessing.

Fig. 5.56
Application Repository Maintenance: Repository Detail

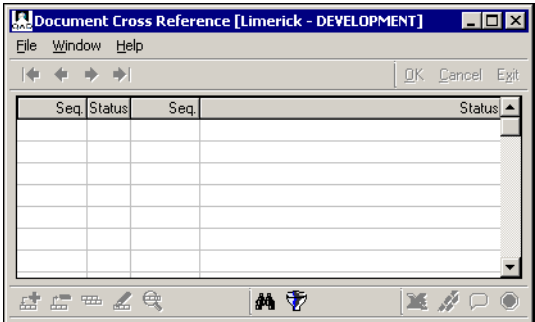


Document/Application Cross-Reference

The transformation process transforms data from documents in the document repository into transactions in the application repository as one-to-many, many-to-one, and many-to-many. Outbound processing performs the inverse.

Use Document/Application Cross-Reference to view documents by sequence number and the sequence numbers of their corresponding application transactions.

Fig. 5.57
Document/ Application Cross-Reference



Turnaround Data Maintenance

Use Operations|Message Manager| Turnaround Data Maintenance to modify turnaround data.

Turnaround data consists of inbound data items that are required for related outbound documents. During outbound processing, the Message Manager relates the turnaround data to the outbound document.

Fig. 5.58
Turnaround Data Maintenance

Field Descriptions

Table Name. Enter the name of the table associated with this turnaround data item.

Index Name. Enter the name of the field associated with this turnaround data item.

Index Value. Enter the value of the variable associated with this turnaround data. For example, if the turnaround data is related to a sales order, this could be the sales order number.

Data Item ID. Enter the name of the turnaround variable.

Data Item Value. Enter the value of the turnaround data.

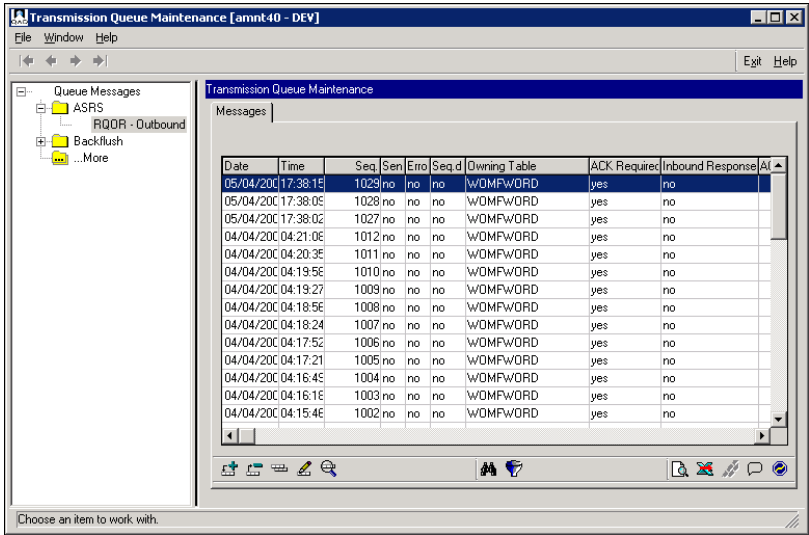
Transmission Queue Maintenance

Use Operations|Message Manager|Transmission Queue Maintenance to track documents that have been exported and are awaiting acknowledgments. When a document is matched with a received acknowledgment document, it moves to the Archive queue.

When a sequenced document moves to the Archive queue, the next document in the sequence is unloaded.

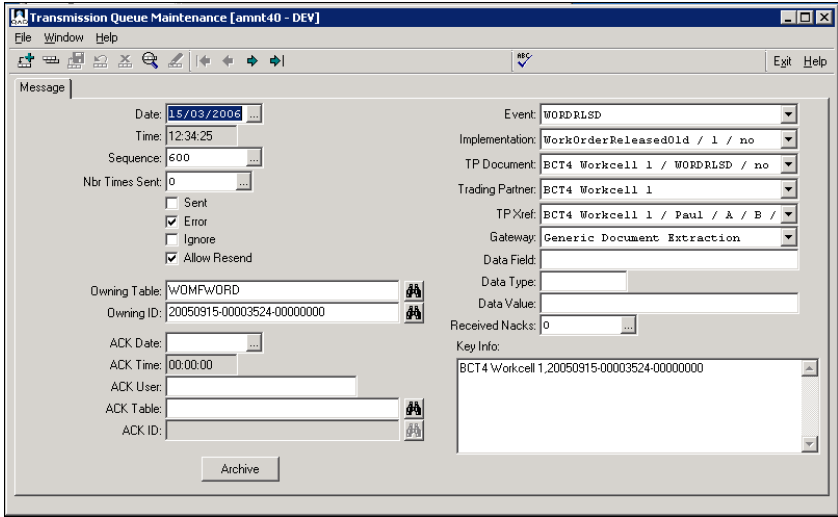
Select a business event (document type) in the tree to display the unloaded documents of that type in the browse.

Fig. 5.59
Transmission Queue: Unloaded Documents



Select an unloaded document and click Update Record to display the document in the viewer.

Fig. 5.60
Transmission Queue: Document Viewer



Field Descriptions

- Date.** This is the date that the transmission was queued or created.
- Time.** This is the time, as an integer, that the message was created. The integer format ensures that the messages are created in the same sequence that they were generated.
- Sequence.** The sequence number for either the destination/trading partner or the message/trading partner document, whichever is appropriate for this message.
- Nbr Times Sent.** This is the number of times that the document has been sent.
- Sent.** Selected to indicate that the document has been sent successfully.

Error. Selected to indicate that the document did not complete the unload process successfully.

Ignore. When selected, the document is not visible in the workbenches.

Allow Resend. Selected to indicate that the document can be resent.

Owning Table. This is the table for the object that was passed to the event that initiated the message and document.

Owning ID. This is the ID for the object that was passed to the event that initiated the message.

ACK Date. The acknowledgment document was received on this date.

ACK Time. The acknowledgment document was received at this time.

ACK User. This is the name of the user who sent the acknowledgment.

ACK Table. This is the table for the repository where the acknowledgment is currently.

ACK ID. This is the object for the repository where the acknowledgment is currently.

Event. This is the message type that was triggered to produce the document.

Implementation. This implementation is used in the transformation of an application to this document.

TP Document. This is the message that is the origin of the document.

Trading Partner. The destination/trading partner provides a link back to the message that is the origin of the document.

TP Xref. This is the trading partner site/address cross-reference that links the message to the trading partner.

Gateway. This is the gateway that processed the data extracted from the JIT/S database into an application.

Data Field, Data Type, Data Value. When JIT/S is triggering an outbound event, there are two ways to identify the record in the table specified in the business event (document type) definition:

- Send the object value for the record in the table.
- If the record is not identified by an object, send the data field ID, data type, and data value for a field in the table.

Received NACKs. The number of NACKs that have been received for this outbound document.

Key Info. This is the key identifier for the outbound message. It is set to the value of the Reference Field in the business event/document type definition if this is specified. Otherwise it is set to the message number on the Application Repository record. ACKs and NACKs are matched with outbound documents based on the value in this field.

Archive Queue Maintenance

Use Operations|Message Manager|Archive Queue Maintenance to review a history of message that have been sent. If appropriate data is not found in the application repository use the Resend button to send the data again from the database.

Fig. 5.61
Archive Queue Maintenance

The screenshot shows the 'Archive Queue Maintenance' window for 'amnt40 - DEV'. It contains several input fields and dropdown menus for message metadata. The 'Key Info' section on the right displays a specific workcell ID.

Field	Value
Date	07/12/2005
Time	21:42:05
Sequence	2
Times Sent	0
Event	WORDRLED
Implementation	WorkOrderRelease / 1 / no
TP Document	CUST / BCST / yes
Trading Partner	CUST
TPXref	Backflush / Backflush / a / c / b / P
Gateway	Covh-Covd
Owning Entity	COMHCDRH
Owning ID	20050915-00001326-00000000
Ack Date	
Ack Time	00:00:00
Ack User	
Ack Entity	
Ack ID	
Key Info	BCT4 Workcell 1.20050915-00003524-00000000

Field Descriptions

Date. This is the date that the transmission was queued or created.

Time. This is the time, as an integer, that the message was created. The integer format ensures that the messages are created in the same sequence that they were generated.

Sequence. The sequence number for either the destination/trading partner or the message/trading partner document, whichever is appropriate for this message.

Times Sent. This is the number of times that the document has been sent.

Sent. Selected to indicate that the document has been sent successfully.

Error. Selected to indicate that the document did not complete the unload process successfully.

Ignore. When selected, the document is not visible in the workbenches.

Allow Resend. Selected to indicated that the document can be resent.

Owning Table. This is the table for the object that was passed to the event that initiated the message and document.

Owning ID. This is the ID for the object that was passed to the event that initiated the message.

ACK Date. The acknowledgment document was received on this date.

ACK Time. The acknowledgment document was received at this time.

ACK User. This is the name of the user who sent the acknowledgment.

ACK Table. This is the table for the repository where the acknowledgment is currently.

ACK ID. This is the object for the repository where the acknowledgment is currently.

Event. This is the message type that was triggered to produce the document.

Implementation. This implementation is used in the transformation of an application to this document.

TP Document. This is the message that is the origin of the document.

Trading Partner. The destination/trading partner provides a link back to the message that is the origin of the document.

TP Xref. This is the trading partner site/address cross-reference that links the message to the trading partner.

Gateway. This is the gateway that processed the data extracted from the JIT/S database into an application.

Data Field, Data Type, Data Value. When JIT/S is triggering an outbound event, there are two ways to identify the record in the table specified in the business event (document type) definition:

- Send the object value for the record in the table.
- If the record is not identified by an object, such as a backflush group number, send the data field ID, data type, and data value for a field in the table.

Received NACKs. The number of NACKs that have been received for this outbound document.

Key Info. Enter a value that can be used to search for this message in other workbenches.

JIT/S-Provided Messages

Outbound Events

These events and business events are included as default JIT/S system data.

Table 5.9
JIT/S Events

Event	Notes
BackflushGroup	Performs a receipt with backflush for all manufactured items in a specified group of work orders that are associated with a shippable assembly unit that does not have milestone reporting enabled. This can be triggered by rules for scanners, order processors, packaging, shipping, by the AO Workbench, and by options in Work Order Status Maintenance.
maintainShipment	Can be triggered by the Shipping Workbench or the Set Status to Shipped option in Work Order Status Maintenance.
ReportFinalOperationForGroup	Performs a milestone backflush for all manufactured items in the specified group of work orders that are associated with a shippable assembly unit that has milestone reporting enabled. Triggered by a scanner rule, building from the AO Workbench, or the Set Status to Built option in Work Order Status Maintenance.

Event	Notes
ReportMilestoneOperationForAO	At the operation specified on an assembly unit, perform a milestone backflush for all manufactured items on the work order of an assembly order. Triggered by building from the Assembly Order Workbench.
RQOR	JIT/S triggers this event in two places: • In the order processor rule OPSendRQOR. The rule can be added to any order processor rule group. • At any scanner using the rule group SendRQORScannerRuleGroup.
ReverseBackflushForWO	Perform a negative receipt with backflush for all manufactured items on the work order associated with a shippable assembly unit that does not have milestone reporting enabled. Triggered by Options Set Status to Unproduced in Work Order Status Maintenance.
ReverseReportFinalOpForWO	Perform a negative milestone backflush for all manufactured items on the work orders associated with a shippable assembly unit that has milestone reporting enabled. Triggered by Options Set Status to Unproduced in Work Order Status Maintenance.
ReverseTransferLocationForWO	Perform a negative location transfer for all of the purchased items on the specified work order. Triggered by Options Set Status to Unproduced in Work Order Status Maintenance.
ScrapAO	Perform a milestone backflush for all manufactured items on the work order of the specified assembly order. Triggered by the Swap/Scrap Work Orders option from the Work Order Workbench.
ScrapWO	Perform a milestone backflush for all manufactured items on the specified work order. Triggered by the Swap/Scrap Work Orders option from the Work Order Workbench.
TransferLocationForAO	Perform a location transfer for all of the purchased items on the work order of a specified assembly order. Triggered by building from the Assembly Order Workbench.
TransferLocationForGroup	Performs a location transfer for all of the purchased items in the specified group of work orders. This can be triggered by rules for scanners, order processors, packaging, shipping, by the AO Workbench, and by options in Work Order Status Maintenance.

Event	Notes
TransferScrapLocationForAO	Perform a location transfer for all purchased items on the work order of the specified assembly order. Triggered by the Swap/Scrap Work Orders option from the Work Order Workbench.
TransferScrapLocationForWO	Perform a location transfer for all the purchased items on the specified work order. Triggered by the Swap/Scrap Work Orders option from the Work Order Workbench.
WORDRLSD	JIT/S triggers this event in the WORDRLSD_PLC rule under the WORDRLSD rule group. This rule group is run by the order scheduler every time it releases a work order.

Outbound Document Types

Information for outbound document types is defined in several places:

- Document Definition Maintenance specifies the structure—records, fields, elements—of a document type that is loaded/unloaded from JIT/S.
- Trading Partner Document specifies the handling—transformation, gateway, transmission group, and so on—of a document type for a particular TP/destination.
- Events Maintenance|Business Events Maintenance specifies cross-reference information—tables and fields—for a particular document type associated with a particular message type (event). A document type can have different cross-reference information for different message types.

Table 5.10
JIT/S Outbound Document Types

Document Types	Notes
workOrderReleased	This contains all of the information that a PLC system may require about a work order. It is created when the WORDRLSD event is triggered.
RQOR	The request order tells automated storage and retrieval system (AS/RS) to pick a certain order from storage; it contains the work order list version information and the customer order information for the work order. It is created when the WORDRLSD event is triggered or the RQOR event is triggered.
maintainShipment	This message goes to an ERP system. It is created when the maintainShipment event is triggered.
receiptsBackwardExploded	This message goes to an ERP system. The default message is a standard QDoc that can be processed by QXtend Inbound into QAD ERP.
transferInventory	This message goes to an ERP system. The default message is a standard QDoc that can be processed by QXtend Inbound into QAD ERP.
recordBackflush	This message goes to an ERP system. The default message is a standard QDoc that can be processed by QXtend Inbound into QAD ERP.

Inbound Document Types

There are also inbound documents loading master data from the ERP system.

Table 5.11
JIT/S Inbound Document Types

Document Types	Notes
BackflushWorkOrder	This message is initiated by an external system and indicates that a work order should be backflushed.
CheckTestDataUnique	This message is initiated by an external system. It creates test/trace data in JIT/S and validates that the values have not previously been recorded against a different work order.
CompletePackage	This is a message from a PLC indicating what the contents of a package were; it marks the pre-racked package as complete and available for shipping.
CompleteWorkOrder	This message is initiated by an external system. It indicates to JIT/S that the specified work order should be completed.
LOUP	LOUP (location update) is a positive response from an external system indicating that a requested order has been successfully retrieved.
maintainBillOfMaterial maintainCarrier maintainCustomer maintainCustomerPart maintainCustomerShipTo maintainDock maintainPart maintainSalesOrder	These messages are initiated by an external ERP system to deliver the named types of master data to JIT/S.
MIPA	MIPA (missing part) is a response from an external system to JIT/S indicating that the external system was unable to fulfill an RQOR request made to it by JIT/S.
RebuildOrder	This is a message from an external system indicating that an order is unacceptable in terms of quality and needs to be rebuilt.
SendWorkOrder	This message is initiated by an external system. It triggers the WORDRLSD Message Manager event for the specified work order.
SendNextWorkOrders	This message is initiated by an external system. It triggers the WORDRLSD Message Manager event for each released work order after the specified work order.
ValidateTestData	This message is initiated by an external system. It creates test/trace data in JIT/S.

Message Manager Setup Examples

The examples follow the steps, in general, from “Setup Work Flow” on page 257.

Inbound Message Example

This section outlines the steps you would take to set up an order receiver process. This is only an example, but it illustrates the values that you might use for a real application, as well as steps that must be completed.

Task Steps

- 1 Set up an error prefix and default trash, inbox, and history directories in Setup|Message Manager|Default Directory Maintenance.
- 2 Set up values for the channel that the Message Manager uses.
 - a Choose Setup|Communication|Channel Maintenance.
 - b Enter the values related to the Message Manager from the following table. You can enter any user-defined values for other channel settings such as the various directories:

TS Parser Program:	edigen\app\processcontrolplipp.p
Parse Procedure:	processdocument
Default Subsystem:	ansi x12
Default Trading Partner:	<Trading partner created in step 12>
Default TP Document:	866/yes
- 3 Set up the broadcast points and previous broadcast points that will be sending messages to the Message Manager in Setup|Communications|Broadcast Point Maintenance. Specify the channel you created in step 2.
- 4 Set up a subsystem that defines the file type and control records of received messages.
 - a Choose Setup|Message Manager|Subsystem Maintenance and click New Record in the Subsystem Maintenance screen.
 - b Define a new subsystem with the following values:

Subsystem Name:	ansi x12
File Extension:	x12
Format:	Variable
Code Position:	1
Record Delimiter:	28
Code Length:	3
Field Delimiter:	126
Quote Value:	39
Element Delimiter:	0

Note The values you specify for the control code position, code length, delimiters, and quote values may vary from this example based on the OEM sending the broadcasts.

- c Right-click the subsystem name in the tree and choose Add Subsystem Record to define records for the subsystem.
 - d Right-click a subsystem record and choose Add Subsystem Fields to define fields for each subsystem record.
 - e Right-click a subsystem field and choose Add Subsystem Elements to define elements for subsystem fields as required.
- 5 Set up a document—a definition for parsing broadcast messages. Define the records, fields, and elements that you want to store in the target database.
 - a Choose Setup|Message Manager|Document Definition Maint.
 - b Add a new document definition using these sample values:

Document ID: ANSI X12 866

Version: 1

Inbound: Select

Description: ANSI X12 866
 - c Right-click the document definition name in the tree and choose Add Document Record to define records for the document definition.
 - d Right-click a document definition record in the tree and choose Add Document Field to define fields for each record.
 - e Right-click a field record in the tree and choose Add Document Elements to define elements for each field as required.
- 6 Set up a cross-reference between the subsystem and the document definition.
 - a Choose Setup|Message Manager|Document/Subsystem Cross Reference.
 - b In the Document Cross-Reference tab, define a new record with the following values:

Subsystem: ansi x12

Document Type: 866

Inbound: <select>

Trading Partner: <trading partner defined in step 12>

Document ID: ANSI X12 866
 - c In the Cross-Reference Records tab, set up links between the defined document records and the record sequences and data control codes from the subsystem document type.
- 7 Use Setup|Message Manager|Gateway Maintenance to review the program and procedure assigned to the QAD-supplied gateway and to add a user-specific rule group.
- 8 Set up an application—a definition of the target application transactions for the transformation process.
 - a Choose Setup|Message Manager|Application Definition Maintenance.
 - b Add a new application definition using these sample values:

Application Name: CustomerOrderVersionGateway
 Version: 1
 Inbound: Select
 Description: Customer order version header, detail,
 and order information
 Gateway Name: Covh-Covd

- c Right-click the application name in the tree and choose Add Application Record to define records for the application.
 - d Right-click a record name in the tree and choose Add Application Field to define fields for each record.
 - e Right-click a field name in the tree and choose Add Application Elements to define elements for each field as required.
- 9** Set up a trading partner-specific implementation of an application definition.
- a Choose Setup|Message Manager|Implementation Definition.
 - b Select the application definition that is the basis for the implementation:

Application Name: CustomerOrderVersionGateway
 Implementation Name: CustomerOrderVersionGateway
 Version: 1
 - c Select the implementation name in the tree and complete the definition:

Version: 1
 Inbound: <select>
 Description: Customer order header, detail, and order information
 Gateway: Covh-Covd
 - d Right-click the implementation name in the tree and choose Add Implementation Record to define records for the implementation; these can vary for each implementation of an application.
 - e Right-click an implementation record in the tree and choose Add Implementation Field to define fields for each record.
 - f Right-click a field record in the tree and choose Add Implementation Elements to define elements for each field as required.
- 10** Set up a transformation definition—the data map for transforming documents to application transactions.
- a Choose Setup|Message Manager|Transformation Maintenance.
 - b Add a new transformation definition using these values:

Name: Test866
 Debug Level: 0
 Document ID: ANSI X12 866
 Implementation: CustomerOrderVersionGateway

Inbound: <select>
Enabled: <select>

- c Right-click the transformation name in the tree and choose Add Transformation Event to define events for the transformation.
 - d Right-click an event name in the tree and choose Add Transformation Instruction to define instructions for each event.
- 11 Define parameters and a default set of parameters to be assigned to trading partners.
 - a Choose Setup|Message Manager|Parameter Maintenance.
 - b Add a new parameter using these values:

Name: Parm1
Description: Parameter 1 for TP1
 - c Define additional parameters as required.
 - d Choose Setup|Message Manager|Default Parameter Maintenance.
 - e Define the default parameter set using these values:

Sequence: 1
Parameter Name: Parm1
Data Type: Alphanumeric
 - f Add additional parameters to the default set as needed.
- 12 Set up a record for the trading partner.
 - a Choose Setup|Message Manager|Trading Partner Maintenance and click New Record.
 - b Enter a trading partner ID and name. Leave the other fields blank and save the record.
 - c Click the ID you just created to expand the choices. Right-click Documents and choose Add Trading Partner Document.
 - d Enter the following values:

Document Type: 866
Inbound: <select>
Token List: tp-address, tp-id, tp-document-nbr
Transformation: Test866
Gateway: Covh-Covd
- 13 Set up a Message Manager process for each file type that you are going to receive.
 - a Choose Setup|Processes|Process Maintenance.
 - b Define a new record with the following values:

Process ID: OR_X12
Description: Order Receiver—X12
Process Type: OR

Program Name: edigen\obj\edprcctrlcaller.p

Program Procedure: OrderReceiver

- c** Set up process parameters by choosing Options|Process Parameter and entering the following values.

Parameter Name	Description	Value 1	Table ID	Record
Channel	Channel		GDFCHNL	ChannelSTF
Debug	Debugging enabled	True		
UseSonic	Use Sonic queue	False		
StopGateway	Load the message but do not run the gateway	True		
Partition	Appserver partition	JIT	GDCFPRCP	
Filetype	File types	New		
Log	Logging enabled	True		

Outbound Message Example

Send this message to a work cell when a work order is released if ship-to is CUSTSHIP on the work order.

The work order master file (WOMF_WORDER) references the ship-to object (ship_to_obj). In ship_to_obj, the shto_jit_id field holds the ship-to value for the work order.

Task Steps

- 1 Define event or add business event to existing event.

In the business event:

Document Type: shmf_ship_to
 ID Field: shmf_ship_to.shto_jit.id
 Entity: WOMF_WORDER
 Related Tables: shmf_ship_to
 Reference Field: shmf_ship_to.shto_jit.id,
 WOMF_WORDER.worder.id
 Join Info: WOMF_WORDER.ship_to_obj|
 shmf_ship_to.ship_to_obj

- 2 Create a document for a trading partner.

Type: Enter a new document type
 Token List:
 Transformation: WorkOrderRelease
 Gateway: Generic document extraction (not required)
 Transmission Group: TestOEM
 Save Repository Data: Enabled

- 3 Create a site/address cross-reference. This links the document to a specific site/address defined for the trading partner.

This holds the piece of information that needs to be matched for the business event to be executed.

Application Site	CUSTSHIP
Implementation Name	WorkOrderRelease

- 4 Update implementation definition.

- a Add a field to the existing record in the implementation.

Field Name:	ship_to_obj
Field Gateway Variable:	ship_to_obj (be sure to enter only the field name here, not the table name)
Add to sub-query:	Enable

- b Add a record to WorkOrderRelease.

Seq:	20 because it is the second record
Name:	Customer
Loop Occurrence:	999
Loop End Sequence:	20 (ends with itself)
Gateway Table:	shmf_ship_to (if there is more than one, information required in Join Fields)
Misc Join:	Something else to match

- c Add a field to the new record.

Field Name:	ship_to_obj
Field Destination:	Gateway variable
Field Gateway Variable:	ship_to_obj
Name:	shto_jit_id
Field Gateway Var:	shto_jit_id

Document Examples

See “XML Documents” on page 432 for field mappings for the backwardExplodeReceipts and billOfLading documents.

Sample Outbound Document Definition

These tables list the fields for an outbound transferInventory message. There are three records: transferInventory, inventoryTransfer, and inventoryDetail.

In the transferInventory record, none of the fields are required and all are string with a maximum size of 100.

Table 5.12
transferInventory Record Fields

	Field Name	Gateway Variable
10	scopeTransaction	
20	suppressResponseDetail	
30	version	
40	xml:lang	
50	xmlns	
60	xmlns:enc	
70	xmlns:qcom	
80	xmlns:xsi	

In the `inventoryTransfer` record, none of the fields are required and all are strings with a maximum size of 35.

Table 5.13
inventoryTransfer Record Fields

	Field Name	Gateway Variable
10	operation	operation
20	part	part
30	lotSerialQty	lotSerialQty
40	effDate	effDate

In the `inventoryDetail` record, none of the fields are required and all are strings with a maximum size of 35.

Table 5.14
inventoryDetail Record Fields

	Field Name	Gateway Variable
10	operation	operation
20	logSerialQty	lotSerialQty
30	effDate	effDate
40	nbr	nbr
50	soJob	soJob
60	rmks	rmks
70	siteFrom	siteFrom
80	locFrom	locFrom
90	lotserFrom	lotserFrom
100	lotrefFrom	lotrefFrom
110	siteTo	siteTo
120	locTo	locTo
130	lotserTo	lotserTo
140	lotrefTo	lotrefTo
150	yn	yn

Sample Inbound Document Definition

The following tables provide details for a sample document definition for a customer broadcast. It includes two records: order header record and item detail record.

Table 5.15 lists the fields related to the order record, which is associated with two gateway tables: tt_covh and tt_ordi. The field information includes the sequence order, field name, whether the field is required, the field type (alpha means alphanumeric), the maximum value, the token, and gateway variables.

Note In all cases except for TradingPartner, the minimum length is 0 (zero). TradingPartner minimum is 1.

Table 5.15
Order Record Fields

	Field Name	Req	Type	Max	Token	Gateway Variable
1	TradingPartner	Yes	Alpha	4	tp-id,tp-address	orid_value
2	ACK/NACK	No	Alpha	3		
3	MessageSeq	No	Int	10	tp-document-nbr	covh_order_number covh_transmission_ number
4	ByteCount	No	Alpha	4	tp-document-nbr	
5	RequestType	No	Alpha	4		covh_purposeCode
6	ModelYr	No	Alpha	1		covh_Model_Year
7	PlantCode	No	Alpha	16	tp-site	covh_customer covd_shipto_info
8	vin	No	Alpha	6	tp-func-grp-nbr	covh_vin_number
9	Pay-As-Built	No	Alpha	2		
10	BCStatus	No	Alpha	2		covh_cust_type
11	SupplierNumber	No	Alpha	7	tp-site	
12	OperationNumber	No	Alpha	3		
13	UON	No	Alpha	12		
14	BCSeqNumber	No	Alpha	7	tp-message-nbr	covh_sequence_number
15	BCDate/Time	No	Alpha	11		covh_JulianDateTime
16	Recovery/Flag	Yes	Alpha	1		
17	PartInfo1	No	Alpha	20		covd_item
18	PartUsage1	No	Alpha	2		covd_item_qty

Table 5.16 lists the fields related to the item record, which is associated with gateway table tt_covd. The field information includes the sequence order, field name, whether the field is required, the field type (alpha means alphanumeric), the minimum value, the maximum value, the token, and gateway variables.

Table 5.16
Item Record Fields

	Name	Req	Type	Min	Max	Token	Gateway Variable
1	PartName	No	Alphanumeric	0	20		covd_item
2	Quantity	No	Alphanumeric	0	2		covd_item_qty

	Name	Req	Type	Min	Max	Token	Gateway Variable
3	ModelYr	No	Alphanumeric	0	1		
4	PlantCode	No	Alphanumeric	0	20		covd_shipto_info

Tools

This section describes various tools that can be used to help administer your JIT Sequencing environment.

Logging/Debug Tools 278

Explains how to use the Logging Database Viewer, Sonic Cache Viewer, Message Queue Viewer, Order/Package Change Logs, and Monitored Event History Viewer.

Exception Management 282

Discusses the different exception management tools, including messages and how they are distributed, message management, setting up security for IT fields, and the message log viewer.

System Process Tools 287

Explains how to use the OS Launcher and HFD Print Process.

System Data Tools 289

Discusses the System Data Tools menu options, including counter controlled documents, import attributes, class codes, state overviews, technical verification, and load translation terms.

Development Tools 306

Explains how to update user-defined fields and use System Controls.

Logging/Debug Tools

JIT/S has a number of different ways that messages can be logged.

- Exception messages created with Tools|Exception Management|Message Maintenance are logged on a per-message basis when logging is enabled. This log is stored in a table (gst_error_log) in the icfdb database, which is one of the five databases in the JIT/S database set.

You can view these messages with Tools|Exception Management|Message Log Viewer.

- Debug messages generated by order scheduler and order receiver processes can be directed to the logging database, another member of the JIT/S database set. To generate these messages, enabled must be set to True in the logging section of the system configuration file (config.xml). In addition, the Log parameter must be set to True for the specific process. View these messages with Tools|Logging/Debug Tools|Logging Database Viewer.
- Other log files created by system processes are placed in directories specified in the system configuration file. These files can be viewed with any text editor. See “Process Monitoring and Tracing” on page 159 for details on log files.

There are general and specific log viewers:

- Logging Database Viewer
- Sonic Cache Viewer
- Message Queue Viewer
- Monitored Event History View

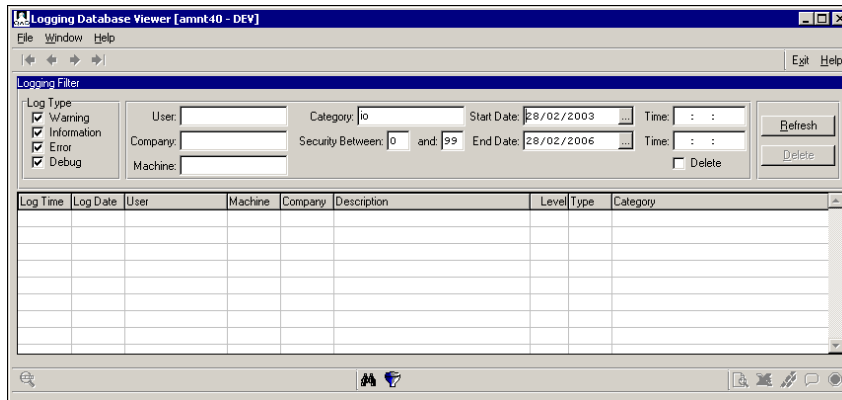
Logging Database Viewer

Use Tools|Logging/Debug Tools|Logging Database Viewer to view messages logged to the logging database. Many order scheduler and order receiver processes can write information messages, as well as errors and warnings to the logging database when the process parameter Log is set to True. These messages can be helpful, especially during implementation, in diagnosing the behavior of the system.

Note These messages can also be written to an operating system file.

For example, in debug mode, the order scheduler can write messages indicating which orders are processed and which ignored. These display in the order of execution, letting you see the logic the processor was following.

Fig. 6.1
Logging Database Viewer



Field Descriptions

Use the filters to control the messages you want to view. You can filter by the type of message, the user associated with the message, the server machine where the process was running that generated the message. Enter a date and time range to limit the display.

Category. Messages are grouped by category based on the program originating them.

JOR: Order Receiver messages

JOS: Order Scheduler messages

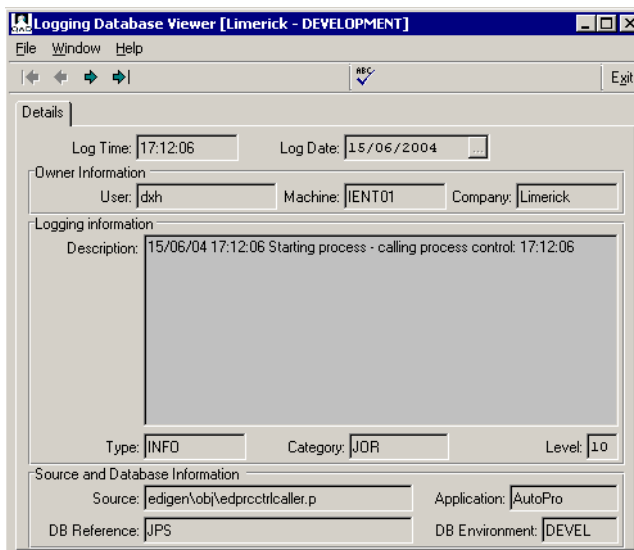
JBF: Backflush engine messages

PROCESS: General process engine message such as those about stopping and starting processes

PRINTLABEL: Printing engine messages

Click the View icon to review additional message detail.

Fig. 6.2
Logging Database Viewer



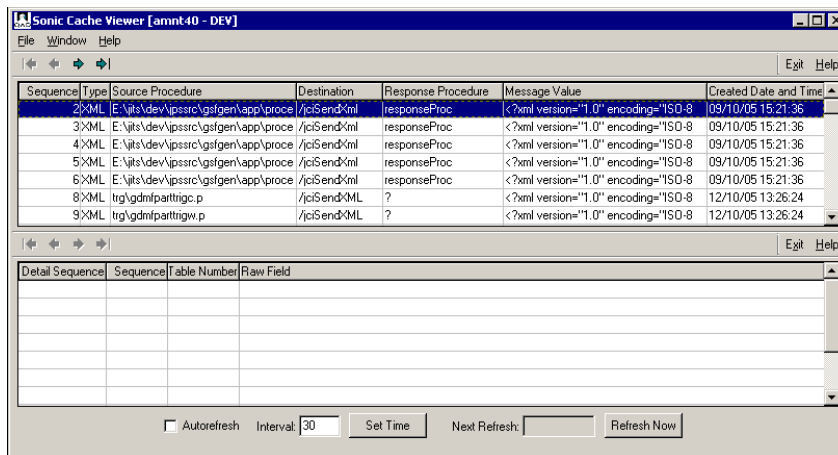
Sonic Cache Viewer

Use Tools|Logging/Debug Tools|Sonic Cache Viewer to verify that Sonic is correctly processing messages. Sonic is the message-oriented middleware (MOM) application that manages communication between various processes that are part of JIT/S.

During normal processing, no data should display in this viewer.

If any messages have been cached and display in the viewer, this indicates a problem in the communication with Sonic. In this case, Sonic is typically down and must be restarted. When Sonic is started, any messages that have been cached and display in the viewer will be sent to the appropriate Sonic queues and processed.

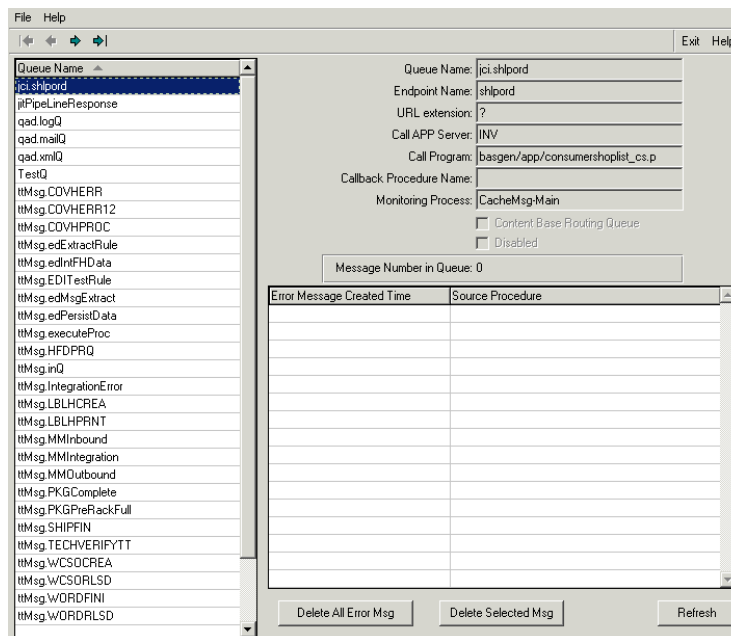
Fig. 6.3
Sonic Cache Viewer



Message Queue Viewer

Use Tools|Logging/Debug Tools/Message Queue Viewer to view internal message queue information and error messages.

Fig. 6.4
Message Queue Viewer



Click a queue in the list on the left of the screen to view its details. On the right of the screen, queue setting information is displayed on the top, and error messages associated with failed messages, if any, are displayed below in order of time created. Queue settings information here is read-only. Queues are maintained by the administrator in Administration|Message Queue Maintenance.

To delete all error messages, click the Delete All Error Msg button.

To delete selected error messages, select the error messages you want to delete and click the Delete Selected Msg button.

To refresh the error message list, click the Refresh button.

You can set the level of log information details written into the QueueManage-trace.log log folder by adding the QueueManage, *LogDetailLevel*, no string to the following section in config.xml:

```
<debug> - -> <ComponentManager>
```

Where *LogDetailLevel* can be set from 1 to 10 for different detail levels of log information. Setting this value to 1 only gives you the queue setting modifier username.

Order/Package Change Logs

Use Tools|Logging/Debug Tools|Order/Package Change Logs to view and track status changes for orders and packages.

Fig. 6.5
Order/Package Change Logs

Monitored Event History View

Use Tools|Logging/Debug Tools|Monitored Event History View to review the history for events defined in Setup|Factory Dashboard|Monitored Event Maintenance.

Only events with Logging enabled are written to the history log. When logging is enabled, a record is kept in the database of the old and new values and the data and time when the value was updated.

Purging of this data is managed by a background process. You can configure the number of days you want to retain data in Setup|Processes|Process Maintenance.

The program that you specify in Process Maintenance is `MonitoredEventHistoryPurgePlipp.p`. This process has one decimal parameter (`dataRetentionDays`) that determines the number of days that data is retained. If this parameter is not set or it is specified incorrectly, JIT/S assumes a 30-day retention period.

Select a record; then click View Record to display record details.

Fig. 6.6
Monitored Event History View

Date	Time(h:mm)	Indicator ID	Indicator Description	Event ID	Value	Status	Level	Last Data	Indicator Type	Calculation Type	Adjustment Note
28/06/2004	18:42:07	Shipment Final	Shipment Finalized Ind(Synchronic)	176.6522			0	153.176.6522	Timestamp	Replace	
28/06/2004	18:24:14	Shipment Final	Shipment Finalized Ind(Synchronic)	176.6522			0	153.176.6522	Timestamp	Replace	
28/06/2004	18:14:15	Shipment Final	Shipment Finalized Ind(Synchronic)	176.6522			0	153.176.6522	Timestamp	Replace	
28/06/2004	18:07:40	Shipment Final	Shipment Finalized Ind(Synchronic)	176.6522			0	153.176.6522	Timestamp	Replace	
28/06/2004	18:03:47	Shipment Final	Shipment Finalized Ind(Synchronic)	176.6522			0	153.176.6522	Timestamp	Replace	
28/06/2004	17:58:52	Shipment Final	Shipment Finalized Ind(Synchronic)	176.6522			0	153.176.6522	Timestamp	Replace	
28/06/2004	17:54:55	Shipment Final	Shipment Finalized Ind(Synchronic)	176.6522			0	153.176.6522	Timestamp	Replace	
25/06/2004	13:14:59	W/O Start Ind	W/O Start Indicator Time BCT1 W/or	183.5521			0	153.183.5521	Timestamp	Replace	
25/06/2004	13:14:59	W/O Start Ind	W/O Start Indicator Seq BCT1 W/or	1,000.00			0	4.00	Seq_Num	Maximum	

Exception Management

During the operation of JIT/S, the system may encounter and report various errors and warning conditions. The messages displayed are predefined in the system. You can use the exception management tools to add your own messages referenced in custom code or augment the QAD-supplied messages with information tailored for your specific environment.

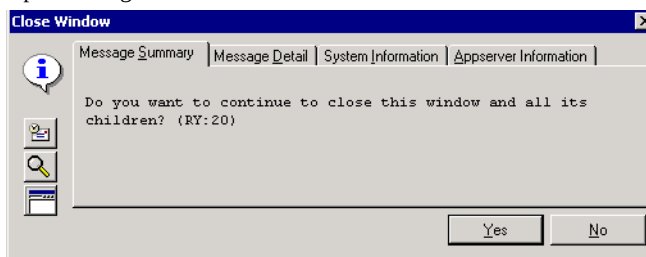
- Messages
- Distributing Messages
- Message Maintenance
- Setting Up Security for IT Fields
- Message Log Viewer

Messages

The Messages window displays information on multiple tabs.

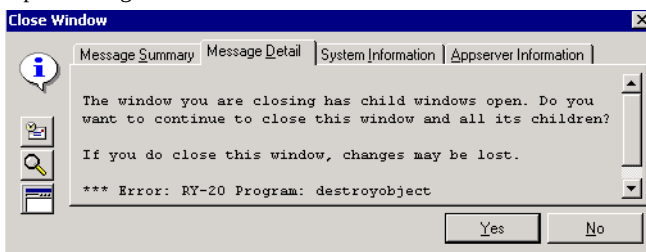
- Message Summary is a short form of the error message.

Fig. 6.7
Example Message



- Message Detail is a long form of the message. Any additional user help defined in Message Maintenance displays here.

Fig. 6.8
Example Message Detail



- System Information includes details about the user, the operating platform, and the programs currently executing.
- AppServer Information displays when the application is running on an AppServer. Otherwise, this tab is blank.

Distributing Messages

In many large companies, one IT department supports product installations at multiple dispersed divisions. If you add support instructions for messages, you may want to use the same text in other databases. You can use standard utilities supplied with Progress Dynamics to export message data and import it into another database.

The system can store message history that you can view later. You can also delete records in the history log whenever you choose. The purge option lets you remove all messages older than a specified date and time.

Messages are grouped by module and function. If you add your own messages for custom code, you should choose a module name that starts with X to indicate a user-defined group. QAD-supplied message groups will never start with the letter X. This ensures that your messages are not overwritten during installation of subsequent releases of the product.

Message Maintenance

Use Tools|Exception Management|Message Maintenance to create your own messages and add information to QAD-supplied exception messages. Messages that you create with this program are automatically marked as custom.

Click Add Record to create a new exception message.

Select a record; then click Modify Record to open it for update. For QAD-supplied messages, you can only modify the user resolution details, IT instructions, supporting documentation, and whether it updates the history log.

Fig. 6.9
Message Maintenance

The screenshot shows the 'Message Maintenance' window. The title bar reads 'Message Maintenance [Limerick - DEVELOPMENT]'. The menu bar includes 'File', 'Window', and 'Help'. Below the menu bar is a toolbar with various icons and an 'Exit' button. The main form area contains the following fields and controls:

- Message number:** A text box containing '1'.
- Message group:** A text box containing 'AF'.
- Message type:** A dropdown menu showing 'Information'.
- Language:** A dropdown menu showing 'EN-US / English - United States'.
- Message summary description:** A text box containing 'The &1 must be specified. &2'.
- User Resolution Details:** A large text area containing 'The &1 must be specified. &2'.
- IT Instructions:** A large text area.
- Supporting Documentation:** A text box.
- Checkboxes:** 'Custom' (unchecked), 'Update message log' (checked), and 'Source language' (checked).
- Buttons:** 'View Documents' (bottom right).

Field Descriptions

Message Number. For a new message you create, specify the ID in this field.

Message Group. Indicate the group this message belongs to. Message groups are used to classify and sort messages, typically by the module they are associated with.

Some messages and their associated groups originate from the underlying Progress Dynamics framework used to build JIT/S. Most originate from particular JIT/S modules. The following table indicates the relationship between message group and JIT/S modules.

Message Group	JIT/S Module
BAS	Base
ED	Order Receiver (EDI)
FH	Factory Health
GS	General System
JGN	Attributes
JIT	Labeling
JOP	Order Processor
JOR	Order Receiver
JOS	Order Scheduler
JSC	Scanning Application
OSE	Operating System Errors
PKG	Packaging
RY	Repository

Custom messages that you create should be added to a group that starts with X to prevent overlap with QAD-supplied groups.

Message Type. Indicate the type of message by choosing one of the following:

- Message. A message with no distinct type.
- Information. Information to help the user.
- Error (default). An application event that prevents processing.
- Warning. The system continues but the user needs to understand special conditions.
- Question. The user must respond for the system to continue.

Update Message Log. Select this field if you want to update the error log whenever this message occurs. The system captures the data for later viewing with the Message Log Viewer, including the message code, message group, message type, date and time of message event, message text, program that was executing, and log-in ID of the user executing the program.

Source Language. Indicate the default source language for this message in this group. This field is important for translation: it indicates the original language of the message when it has been translated into another language as displayed in the Language field.

Language. The language of the message text. If untranslated, this is the same as Source Language.

User Resolution Details. Enter any additional text to help the user understand the message and resolve the issue that caused it. This text displays on the Message Detail tab of the message dialog.

IT Instructions. Enter any additional text that your IT department can use when answering questions about this message or troubleshooting its cause. You can use security to ensure that only members of your IT department see this information.

Supporting Documentation. Specify a URL where additional documentation is located that your IT personnel can use when this message occurs.

View Documents. Click to view the supporting documentation. When the supporting documentation is accessed through a URL link, the default system browser is launched.

Setting Up Security for IT Fields

The IT instructions and supporting documentation should be visible only to your support personnel. Use security features to ensure that this is the case. Grant access to these fields:

- buLaunchSuppDocs
- edErrolInstructions
- fiErroSupportingDocs
- itInstructions
- supporting Docs

Review the field security defined for the fields. See “Fields” on page 47. By default, the required fields have been set up so that security can be defined for them. Restrict access to all users; then, grant access to only those users who require it.

Task Steps:

- 1 Open Administration|Security Control.
- 2 Expand the Security control node in the tree view.
- 3 Expand 1. Security maintenance below Security control.
- 4 Select Fields to view fields with defined security.
- 5 Expand 2. Security allocation below Security control.
- 6 Select Fields to allocate users who can access the secured fields.
- 7 Select the All Users and Groups check box and click Refresh.
- 8 Move all of the fields previously listed from the Available Fields list to the Restricted Fields list.
- 9 Finally, assign access to the users and/or groups that you want to be able to view and update these fields.

Message Log Viewer

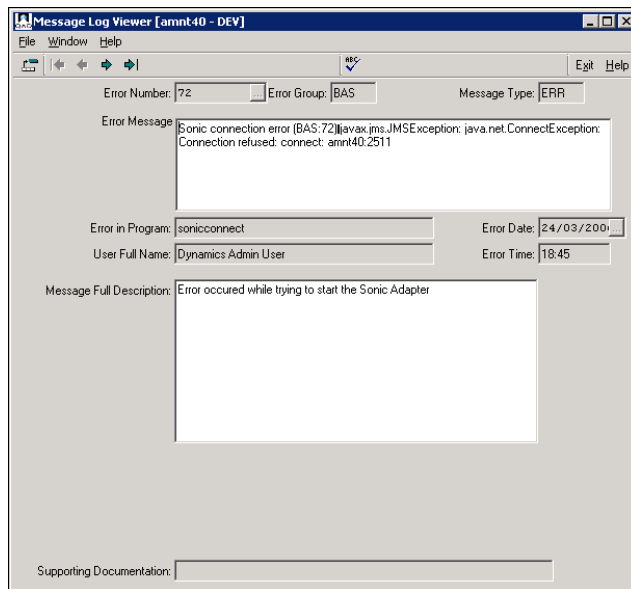
Use Tools|Exception Management|Message Log Viewer to display the message log. A log entry is created whenever a message occurs that has Update Message Log enabled. You can delete records from the viewer when they are no longer needed.

This view is initially sorted by message number and group. You may want to sort this view by date so you can see the most recently created messages first. Use the right-click menu to reorder the columns and to save this as the default view when you next log in. See “Configuring Browsers” on page 30.

Use Options|Message Purge to clear out messages when an on-line record is no longer needed. You specify a date and time; all messages created before this date and time are deleted when you execute the purge. The default purge date and time are taken from the currently selected message.

Select a record; then click View Record to display the selected record.

Fig. 6.10
Message Log Viewer



System Process Tools

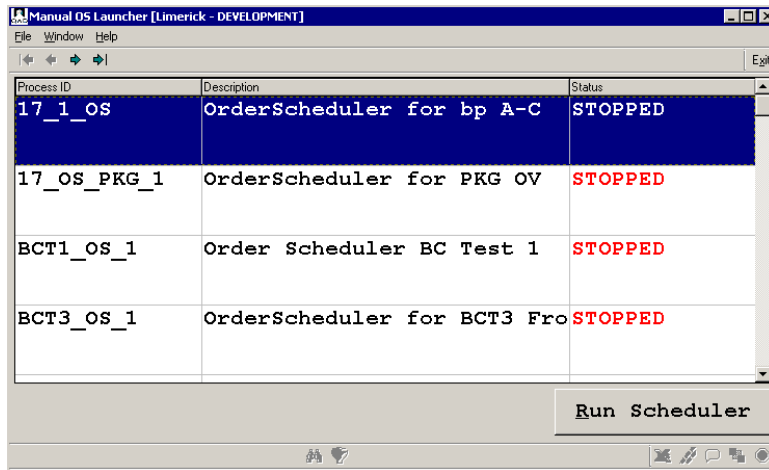
OS Launcher

Use Tools|System Process Tools|Manual OS Launcher to launch an order scheduler manually. Define the order scheduler process for each shippable assembly unit in Setup|Processes|Process Maintenance.

This tool lets you launch an order scheduler without having to run it as a continuous process. The screen displays all the processes of type Order Scheduler. You highlight the process you want to run and click Run Scheduler.

You can use this when you want to run production on an on-demand basis. Set up your order scheduler to release one order at a time and run it only when you are ready for the next order. This gives you complete control of the production activity and may be useful especially during implementation and testing.

Fig. 6.11
Manual OS Launcher



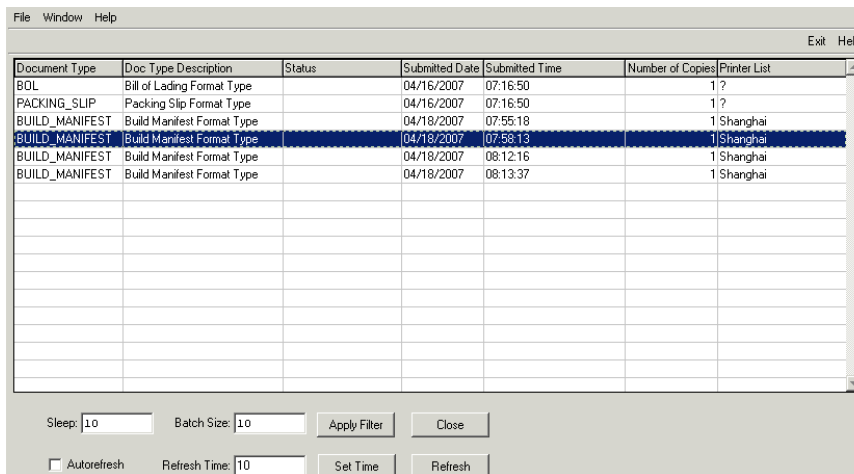
Note You cannot edit the parameters or rules associated with the order scheduler from this screen. See “Setting Up Order Schedulers” on page 157.

HFD Print Process

Use Tools|System Process Tools to view HFD printing request details in the HFD Print Queue Manager screen (document type, number of copies, printer list, and status). The list of printing requests can be auto-refreshed at a specified interval. You set how many requests in a batch the system sends to a printer and how long it pauses between batches.

Note The HFD print process is used if the JIT/S server is UNIX-based. If a Windows server is used, this process is not needed. However, you must open this menu option once during the setup process to kick off any document printing from JIT/S.

Fig. 6.12
HFD Print Queue Manager



Sleep. Specify how long the system pauses, in milliseconds, between two batches of requests it sends to a printer. Click Apply Filter to apply this setting.

Batch Size. Specify the how many requests in a batch the system sends to a printer. Click Apply Filter to apply this setting.

Autorefresh. Specify whether you want the system to automatically refresh the HFD print queue list. If yes, specify how often to refresh the list in the Refresh Time field.

Refresh Time. Specify the time interval, in milliseconds, between auto-refreshes of the HFD print queue list. Click Set Time to apply this setting.

System Data Tools

The System Data Tools menu contains options for the following:

- Counter-Controlled Documents
- Import Attributes
- Class Codes
- State Overview
- Technical Verification
- Load Translation Terms

Counter-Controlled Documents

JIT/S uses a number generator—counter—to automatically number key documents; the counter determines the format and content of the document number.

- Application status sequence number
- Assembly order number
- Bill of lading number
- Customer order detail number
- Customer order header number
- Document session sequence number
- Document status sequence number
- Label serial number
- Master bill of lading number
- Packing slip number
- Picking list number
- Product order detail number
- Package number
- Reported build group
- Reported shipment group
- Shopping list number
- Work order number
- Work order batch number

Note Only label numbers must be unique across the entire system; they are serial, since duplicates cannot exist. This is enforced by JIT/S.

At installation, a default counter is defined for each type of document. You can make adjustments during implementation.

- Counter Function Maintenance: Maintain functions for associating with counters in Counter Maintenance.
- Counter Maintenance: Define new counters, modify default counter attributes, and optionally reference functions that supply required values as part of the generated counter values.
- Counter Configuration: Link counters to specific document instances based on document-specific parameter values. For example, you can generate different number sequences based on the value of the ship-to parameter associated with a bill of lading.
- Counter Field Activation: Specify the database table and field for storing sequence numbers for custom document types.

Counter Function Maintenance

Use Tools|System Data Tools|Counter Function Maintenance to add, edit, and delete functions that can be referenced as part of the mask associated with a counter or used to update its end value. After defining functions, link them to counters in Counter Maintenance.

Note Some functions are supplied with the system. These are marked as QAD owned and cannot be modified or deleted. System functions are listed in “Using Functions in Masks” on page 292.

Fig. 6.13
Counter Function Maintenance

Counter Function Maintenance [Limerick - DEVELOPMENT]

File Window Help

Function ID: Package Code

Description: Insert Package Code

☒ QAD Owned

Program: basgen\prc\uniqueid\functions\plipp

Program Function: PackageCode

Comments: Returns packaging unit short name for the packaging unit record after applying the supplied mask. The mask uses asterisk and the letter "P" as special character. An asterisk in the mask means ignore the character in that position while the letter "P" means include the character in that position. Any other character is included as is. For eg: If the short name is "HVPK12", a mask code of "P***KP" would return VK2

Last Modified Date: 07/04/2004

Time: 11:13

User: admin

Field Descriptions

Function ID. Enter the ID for this function.

Description. Enter a brief description of this function to identify its use.

QAD Owned. This field cannot be modified. It is selected automatically for functions supplied with the system. For new records that you create, it is automatically unselected.

Program. Enter the directory location and name of the program that contains the function you are defining. The program must be in the PROPATH of users executing the system.

Program Function. Specify the name of the function within the program that you want to reference.

Comments. Use the free-form text area to enter an optional description of the function with additional information about how to use it or apply it to counters.

Counter Maintenance

Use Tools|System Data Tools|Counter Maintenance to add counters and to modify how a particular counter behaves and determines its next value.

Use JIT/S-supplied functions to generate values that become part of the number sequence or create your own functions and reference them in counters if you have special requirements.

Counters are then used to identify documents in the system such as package labels, bills of lading, and packing slips.

- Counter Masks
- Using Functions in Masks
- Updating Counter Records
- Associating a Function with a Counter

Counter Masks

Counter values are stored in the database as base 10 and the increment value is always a whole number. However, the actual format of the number is determined by the value of the counter mask. A *mask* is a pattern that determines how values are formatted and replaced at run time.

Three types of values are supported in a mask:

- Convert to base X, where X is 10, 16, 26, or 36.
- Insert a constant value.
- Insert a value generated by a function.

Table 6.1
Mask Characters and Their Effects on Identifier Formats

Mask Characters	Type	Description
9	Convert to Base X	Numeric (base 10)
X	Convert to Base X	Alphabetic (base 26), using English alphabet
Z	Convert to Base X	Alphanumeric (base 36), using English alphabet
H	Convert to Base X	Hexadecimal (base 16), values of 0-9, A,B, C, D, E, F

Mask Characters	Type	Description
< >	Constant Insert	The value between the angle brackets (< >) is inserted in the formatted value without change. For example, <PS->999 would result in PS-###.
@@	System Data	The value between the two symbols (@@) identifies the sort order specified for an associated function. The result of the function is inserted between the @ symbols. For example, to reference the first function associated with a counter, you enter @10@.

Using Functions in Masks

The following functions are supplied with the system:

- The Package Code function returns the packaging unit short name (maximum 15 characters) specified in “Package Units” on page 106.
- The Vendor Code function returns the supplier code (maximum 35 characters) associated with the ship-to record in “Ship-To and Ship-To Dock Addresses” on page 71.
- The Julian Date function generates the system date in YYDDD format (two-digit year, followed by three-digit day of year).
- The International Date function generates the system date in YYYYMMDD format (four-digit year, two-digit month, and two-digit day).

To use these functions, you associate them with a counter. You then specify parameters for the function. The QAD-supplied functions use special characters as part of the parameter text to determine the specific value returned by the function. Each function requires a different letter:

- Package Code is P.
- Vendor Code is V.
- Julian Year is J.

Each instance of the special letter (P, V, or J) in the parameter text is replaced by one character of the value returned by the function.

You use asterisks to indicate that the character in that position should be ignored. Any other character in the parameter text is included without change.

Example A counter references the Package Code function using the parameter text *P***KP. When the system processes a package with the short name ARMG12, the value returned is RK2.

This value is derived as follows:

- The first asterisk causes the character A to be ignored.
- The first P is replaced by the second character, which is R.
- The next three asterisks cause M, G, and 1 to be ignored.
- The K is used literally.
- The last P is replaced by the sixth character of the short name (2).

Updating Counter Records

Select a record; then click Modify Record to open it for update.

Fig. 6.14
Counter Maintenance

The screenshot shows a window titled "Counter Maintenance [Limerick - DEVELOPMENT]". It has a menu bar with "File", "Window", and "Help". Below the menu bar is a toolbar with various icons. The main area contains the following fields:

- Counter Name: BCT3GenRack
- Description: Ford General Rack Package Numbers
- Mask: <BCT3->999999<-Gen-FORD>
- Minimum Value: 1
- Formatted Min Value: BCT3-000001-Gen-FORD
- Maximum Value: 999999
- Formatted Max Value: BCT3-999999-Gen-FORD
- Increment: 1
- Next Value: 17
- Formatted Next Value: BCT3-000017-Gen-FORD
- Last Formatted Value: BCT3-000016-Gen-FORD

At the bottom, there is a checkbox labeled "System Owned" which is currently unchecked.

Field Descriptions

Counter Name. Enter a unique name that reflects what is being counted.

Description. Enter a brief description of the counter to help users identify its purpose.

Mask. Enter the characters that identify the format of the ID generated by the system based on this counter. See Table 6.1, "Mask Characters and Their Effects on Identifier Formats," on page 291 for a list of valid characters. When you save a record, the system validates the following:

- The characters you specify in the mask are valid.
- For constants and system data, a matching closing character exists for the opening character.
- For system data, the value between the two @ symbols is a valid sort order for an associated function.
- The mask is consistent with the maximum value specified.

Minimum Value. Enter the minimum value (in base 10) for the counter.

Formatted Min Value. The system displays the minimum value formatted based on the specified mask. This field cannot be updated.

Maximum Value. Enter the maximum value (in base 10) for the counter.

Formatted Max Value. The system displays the maximum value formatted based on the specified mask. This field cannot be updated.

Increment. Enter the size of the increment for each change in the counter value.

Next Value. Specify the next value the system should use when this counter is used for generating a sequence number. Next value must be greater than the minimum value and less than the maximum value.

Formatted Next Value. The system displays the next value to be applied to a document using this counter, formatted based on the specified mask. This field cannot be updated.

Last Formatted Value. The system displays the last value applied to a document using this counter, formatted based on the specified mask. This field cannot be updated.

System Owned. This field is selected when the counter is one that is created by the system. These counters cannot be modified.

Note This is true regardless of the settings and permissions associated with the user.

Associating a Function with a Counter

Choose Options|Associate Function to associate functions with a counter. You reference these functions by sort order to include system data in the counter mask. You can also specify functions to be run when the final value of a counter has been determined to update this end value based on user-specified parameters.

Fig. 6.15
Associate Function

Field Descriptions

Sort Order. Enter a numeric value identifying the order the system should look for functions when resolving the mask. The system supplies a default value based on the next available base 10 number (10, 20, 30, and so forth). This is the value you place between the @ symbols when you want to reference the function in the counter mask.

Function ID. Choose a system-supplied function or one previously defined with Counter Function Maintenance.

Description. The system displays the description associated with the function.

Parameter Text. Optionally enter any values that you want the system to pass to the function to modify its behavior for this specific sequence.

For the three QAD-supplied functions, enter any combination of special characters (P, V, or J), asterisks, or literal characters. See “Using Functions in Masks” on page 292.

Run On Final Value. Select this field if you want this function to be run after processing of the entire mask is complete.

Use this option for functions that you have written. The QAD-supplied functions cannot be used in this way.

After you select a function, the system displays the location of the program containing the function as defined in Counter Maintenance.

Counter Configuration

Use Tools|System Data Tools|Counter Configuration to add, edit, and delete the records that determine which counter is used for generating an identifier for a counter-controlled document, based on the parameters associated with the document.

For each document type, the top level is the generic record that is applied to all instances of this document type when a more specific record is not found. You can create as many sublevels as there are parameters associated with a document type.

- Document Types and Parameters
- Counter Configuration Nodes
- Numbering Examples

Table 6.2
Document Types and Parameters

Document Type	Parameters
Label serial numbers	• Customer • Ship-to • Product family • Label format • Label printing configuration
Packing slip numbers	• Customer • Ship-to
Bill of lading numbers	• Customer • Ship-to
Unassigned bill of lading numbers	This is a temporary number that cannot be configured.
Package numbers	• Customer • Ship-to • Package unit ID
Shopping list numbers	Work cell

Counter Configuration Nodes

The data is organized in a hierarchical tree. Initially, the top-level records in the tree view are the counter-controlled documents supplied with JIT/S. More records exist only if you have created them in Counter Field Activation to support custom code.

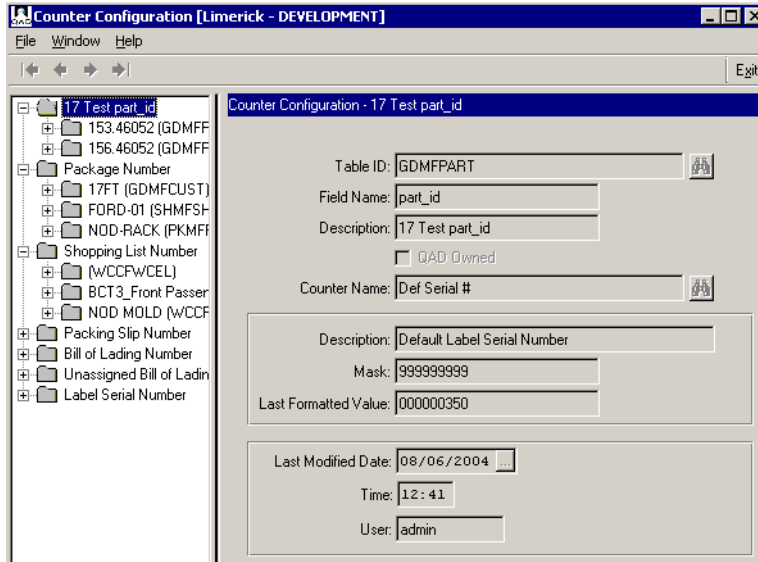
The Counter Configuration tree has two types of nodes: root nodes and subnodes.

Root nodes display all documents defined in Counter Field Activation. The node name is the value of the Description field. When you select a root node, the information defined in Counter Field Activation displays in read-only mode as displayed in the figure below.

Note You cannot add a root node to the tree using Counter Configuration.

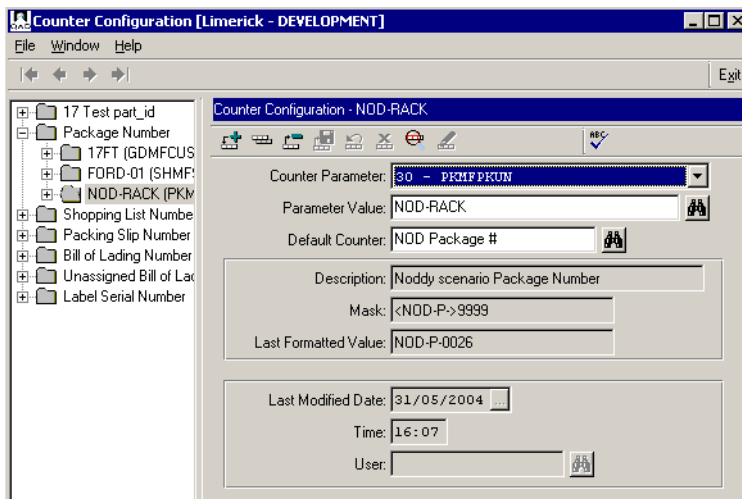
Subnodes display all of the specific instances of this document type that are currently configured. You can add new subnodes or edit existing ones. You can create multiple levels of subnodes based on the sort hierarchy specified for the parameters associated with a document. The subnode name is the parameter value you specify.

Fig. 6.16
Counter Configuration, Top-Level Nodes



Selecting a subnode or adding a new subnode displays the screen for selecting the parameter and parameter value associated with the top-level node and specifying the counter to use.

Fig. 6.17
Counter Configuration, Subnode Level



Field Descriptions

Right-click a root node to add a configured counter beneath it. Then specify values for the following fields:

Counter Parameter. Choose from one of the predefined parameters associated with this document type in Counter Field Activation. Which parameters you can select depends on which type of document you are configuring. It also depends on where in the hierarchy you are adding a record. The system only displays parameters with a higher sort order than the parent node.

Note If the node currently selected references the parameter with the highest sort order for a document, no additional levels can be added.

Parameter Value. Specify the value that the parameter chosen in the previous field must have for the system to use the associated counter. For example, if you want the bill of lading number to be different based on the ship-to address, choose the ship-to table as the parameter and the specific ship-to address as the value. This value is used as the subnode name.

Default Counter. Specify the counter, previously defined in Counter Maintenance, that you want to use for generating numbers for this parameter value. The system displays the description, mask, and last formatted value associated with the counter you choose so that you can verify that it is the one you want.

Numbering Examples

Example One of your customers has special document numbering requirements for different types of packages. You define a record for the one customer that requires special processing. The system then applies the generic record to your other customers.

You can use three parameters to configure package numbers: customer (sort order 10), ship-to (sort order 20), and package name (sort order 30). This lets you create more detailed configurations if needed.

Example The customer with special requirements has five ship-to addresses. One of the ship-to addresses has additional numbering requirements for packages different from the customer. You define a record for the one ship-to address below that customer. The system then applies the customer-level record to the other four ship-to addresses.

The third level of detail is the package unit short name (sort order 30). This lets you configure separate number schemes when a particular package is used.

Example The ship-to with special requirements needs packages numbered differently when a certain packaging unit is used. You create a third-level record to configure the numbering based on the package unit name. This is then applied only when the specific package is shipped to the specific ship-to address. Packing documents for other package units shipped to that ship-to address use the generic ship-to record.

You can combine these three levels in any way that meets your requirements. You do not need to set up numbers for an intermediate level to use a lower level. However, you must follow the sort order of the parameters. For example, you can set up records at level 10 and 30 without using level 20, but you cannot follow level 20 with level 10.

Counter Field Activation

Use Tools|System Data Tools|Counter Field Activation to add, edit, and delete counter-controlled document records and associated parameter details.

Important QAD-supplied records cannot be modified or deleted. Only records that you add can be modified.

This function defines the field within a specific table where a counter is used and assigns the default counter. Detail records specify the parameters associated with the counter that can be used to configure it for specific parameter values. These parameters must be predefined in the code you write.

Fig. 6.18
Counter Field Activation

The screenshot shows the 'Counter Field Activation' window. The title bar reads 'Counter Field Activation [Limerick - DEVELOPMENT]'. The menu bar includes 'File', 'Window', and 'Help'. The toolbar contains icons for adding, deleting, and saving records, along with navigation arrows and an 'Exit' button. The form fields are as follows:

- Table ID: GDMFPART
- Field Name: part_id
- Description: 17 Test part_id
- ☐ QAD Owned
- Counter Name: Def Serial #
- Description: Default Label Serial Number
- Mask: 99999999
- Last Formatted Value: 000000350
- Last Modified Date: 08/06/2004
- Time: 12:41
- User: admin

Field Descriptions

Table ID. Choose the mnemonic from the lookup that identifies the table in the database where data about the document you want to control is stored. For example, the package document data is stored in the table with the ID PKMFPCCKG.

Field Name. Enter the name of the field within the selected table where the counter value will be stored. Valid field names depend on the table selected in the previous field. When you change the table name, this field is cleared.

Description. Enter a brief description of the counter-controlled document to identify its purpose. This description displays as the description of this document type in Counter Configuration, so you should ensure that users understand what it represents.

QAD Owned. This field is system controlled. It is automatically selected for the data supplied with the application. These records cannot be modified or deleted.

For new records that you create, this field is always unselected.

Counter Name. Enter the default counter that you want to associate with this field. Define counters in Counter Maintenance. The default counter is used by the system unless you set up additional records in Counter Configuration.

Choose Options|Details to define the parameters related to this counter and the order in which the system should look for values for the parameters.

These parameters should reflect the parameters supplied by your custom code and determine how the counter can be configured in Counter Configuration. For example, if the parameters are ship-to and customer, you cannot set up a different counter value based on site.

Fig. 6.19
Counter Field Activation Detail

Field Descriptions

Sort Order. Specify a number indicating the order for searching this table. When a new record is created, a default value is set based on the next available base 10 number (10, 20, 30, and so forth). The system validates that the number you specify is unique.

Table ID. Choose the mnemonic from the lookup that represents the table to be searched for parameter values.

Import Attributes

Named attributes carry option information about product families, assembly units, work cells, and items; for example, color is an attribute that can be assigned to an item. Two classes are defined for attributes in Tools|System Data Tools|Class Code Maintenance: Attribute Name and Attribute Value.

For items, you can define attribute names, values, and assignments in two ways:

- Interactively through the menu interface; see “Attributes” on page 79
- As a batch using spreadsheets and Tools|System Data Tools|Attribute/Item Import

Note Items must be set up in Base|Items|Item Maintenance before using this method.

You can also use Attribute/Item Import to automatically associate an item with its shippable assembly unit (SAU). You do this by adding an additional column to the spreadsheet. The SAUs must already be defined in the system. You can link an item to more than one SAU by specifying a comma-delimited list.

Task Steps

The Excel file for importing attributes has two spreadsheets:

- 1 Create sheet 1 with the item numbers and the attributes linked to each item number. The attribute values must be equal to the attribute value short codes and not the attribute names or attribute value IDs.

If you want to associate the items with SAUs, use the last column with the header Shippable Assembly Unit ID Used. This can be a comma-delimited list to link the item to more than one SAU.

Note The color and revision columns must be completed. If color and revision codes are not used with items, you must list the default values (such as -). The first item number cannot be above line 4. Any items listed above line 4 in the spreadsheet are not loaded.

Fig. 6.20
Attributes Sheet 1

	A	B	C	D	E	F	G	H	I	J	K
				Headrest	Traveller	FrontAirbag	RearAirbag	AirbagTrace	SeatCoverTrace	PretentionTrace	Shippable Assembly Unit ID Used
1	Item Number	Color	Revision	1	2	3-4	5-6	7	8-9	0-1	10
2											
3											
4	SSFLEET	RED	000	-	-	--	--		CT	PT	V023
5	SSFHO	RED	000	F	-	--	--		CT	PT	V023,V024
6	SSFHA	RED	000	F	-	FA	--	AT	CT	PT	V023
7	SSFRH	RED	000	B	-	--	--		CT	PT	V023
8	SSFRHFA	RED	000	B	-	FA	--	AT	CT	PT	V023

- 2 Create sheet 2 with the names and all possible values for the attributes. The short code column is loaded against the attribute value, not the attribute name.

Fig. 6.21
Attributes Sheet 2

	A	B	C	D	E
1	attribute name	possible value	description	short code	default
2	Headrest	Front	Front Headrest only	F	
3	Headrest	Both	Both Front & Rear Headrests	B	
4	Headrest	None	No Headrests	-	
5	Traveller	Yes	Travel Option Present	T	
6	Traveller	No	No Travel Option	-	
7	FrontAirbag	Yes	Front Airbag present	FA	
8	FrontAirbag	No	No Front Airbag	--	
9	RearAirbag	Yes	Rear Airbag present	RA	
10	RearAirbag	No	No Rear Airbag	--	
11	AirbagTrace	Serial	Airbag Serial Trace Data	AT	
12	SeatCoverTrace	Serial	Seat Cover Serial Trace Data	CT	

- 3 Choose Tools|System Data Tools|Attribute/Item Import. This screen has buttons that let you complete the following functions.

Button	Action
Load	Loads the data from the spreadsheet into the browse.
Delete All Old	Deletes what is currently in the browse and marked as OLD. Use this option with care; you can delete attributes currently loaded against items as well as attribute assignments.
Firm All	Confirms the records that you are going to add or change.
Transfer Data	Adds the records in the view to the database.

Button	Action
Clear	Clears the records in the view.
Abort	Stops the loading of data from the spreadsheet to the browse.

Fig. 6.22
Attribute/Item Import

- 4 Enter the name of the spreadsheet file in Excel File.
- 5 Click 1. Import Attribute Values to load the attribute names and all possible values.
- 6 Click Load to load the data from the spreadsheet into the browse.
- 7 Review the data, then click Firm All to confirm that these are records that you want to add to the database.
- 8 Click Transfer Data to add the attribute names and values to the database.
- 9 Click 2. Import Item Attributes to load the items and their assigned attribute values.
- 10 Repeat steps 6 through 8 for sheet 2.

Class Codes

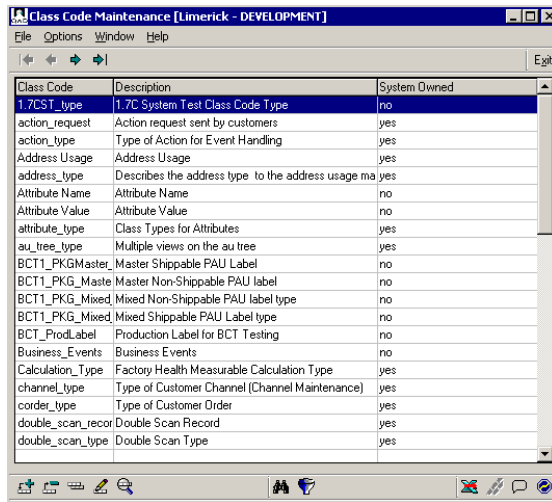
A class is a named group; the members of the group can be types of data or ways of processing data; for example, Attribute Value or Production_method. Class codes are used throughout the system to manage JIT/S processing. Specific values are set up during system installation. You can add additional members, but you cannot delete system-owned records.

- Counter Maintenance
- Class Members Maintenance

Class Code Maintenance

Use Tools|System Data Tools|Class Code Maintenance to create and modify classes.

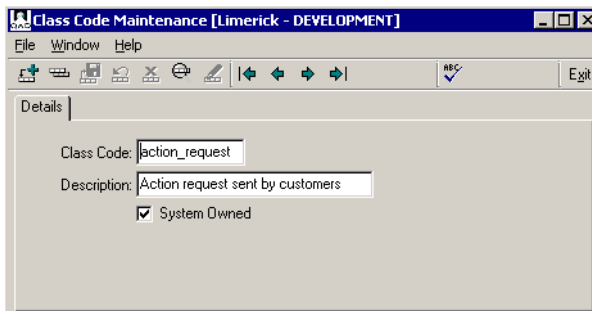
Fig. 6.23
Class Code Browse



Class Code	Description	System Owned
1.7CST_type	1.7C System Test Class Code Type	no
action_request	Action request sent by customers	yes
action_type	Type of Action for Event Handling	yes
Address Usage	Address Usage	yes
address_type	Describes the address type to the address usage ma	yes
Attribute Name	Attribute Name	no
Attribute Value	Attribute Value	no
attribute_type	Class Types for Attributes	yes
au_tree_type	Multiple views on the au tree	yes
BCT1_PKGMaster	Master Shippable PAU Label	no
BCT1_PKG_Maste	Master Non-Shippable PAU label	no
BCT1_PKG_Mixed	Mixed Non-Shippable PAU label type	no
BCT1_PKG_Mixed	Mixed Shippable PAU Label type	no
BCT_ProdLabel	Production Label for BCT Testing	no
Business_Events	Business Events	no
Calculation_Type	Factory Health Measurable Calculation Type	yes
channel_type	Type of Customer Channel (Channel Maintenance)	yes
order_type	Type of Customer Order	yes
double_scan_recor	Double Scan Record	yes
double_scan_type	Double Scan Type	yes

To define a new class, click Add Record. To update an existing class, select the class; then click Modify Record.

Fig. 6.24
Class Code Maintenance



Class Code:

Description:

☒ System Owned

Field Descriptions

Class Code. Specify the name for this class.

Description. Enter a brief description of the class code, indicating its purpose in the system.

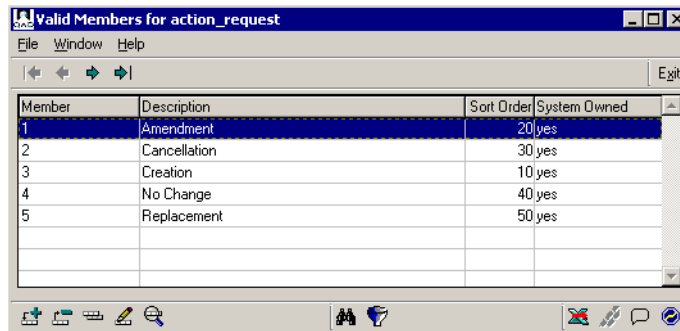
System Owned. Records supplied by QAD and loaded during system installation are marked as system owned. These records cannot be deleted.

Use Options|Valid Members to define valid class members for the class codes.

Class Members Maintenance

To view the members of a class, select the class in Tools|System Data Tools|Class Code Maintenance; then choose Options|Valid Members.

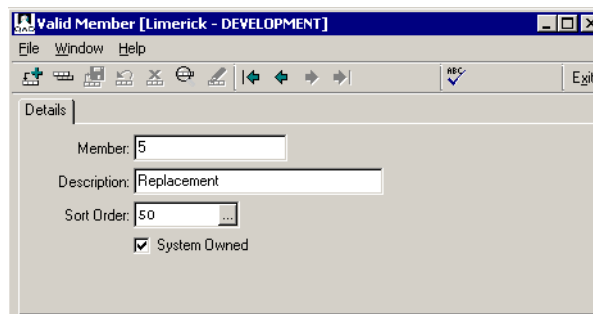
Fig. 6.25
Class Code Members



Member	Description	Sort Order	System Owned
1	Amendment	20	yes
2	Cancellation	30	yes
3	Creation	10	yes
4	No Change	40	yes
5	Replacement	50	yes

Select a record; then click Modify Record to open it for update. Click Add Record to define a new member for the class.

Fig. 6.26
Valid Member



Valid Member [Limerick - DEVELOPMENT]

File Window Help

Details

Member: 5

Description: Replacement

Sort Order: 50

☒ System Owned

Field Descriptions

Member. Enter the value for one of the members of this class.

Sort Order. The sort order determines the order in which the values display in lookups when chosen by users.

State Overview

Order state is the unique combination of statuses that are set for an order at any moment. When a new status is set for an order, the state transition engine evaluates whether the state change is valid; that is, it is valid for an order with the original state (set of statuses) to be set to the new state. If it is not valid, the engine returns an error.

Use Tools|System Data Tools|State Overview to review the state IDs and descriptions.

Fig. 6.27
State Overview

Id	Description
0.00	Unscheduled
0.00001	Cancelled
0.00011	Closed
0.01	On Hold
0.01001	Cancelled
0.01011	Closed
10.00	Scheduled
10.00001	Cancelled
10.00011	Closed
10.01	On Hold
10.01001	Cancelled

The state IDs are the sum of the values attached to the various order statuses.

Table 6.3
Order State ID

Status	Value
Process: Unscheduled	00
Process: Scheduled	10
Process: Firmed	20
Process: Released	30
Production: Unproduced	0000
Production: Work in Progress	1000
Production: Built	2000
Pack: Unpacked	000000
Pack: Packed	100000
Pack: Shipped	200000
Canceled	.00001
Closed	.0001
In Repair	.001
On Hold	.01
Scrapped	.1

Example If a work order has a process status of R, a production status of B, a pack status of P, and it is currently In Repair, its state ID is the sum of the values for each of those statuses.

$$30 + 2000 + 100000 + .001 = 102030.00100$$

The state IDs can be used in writing queries; for a query that finds all work orders that have not been released, check for work orders with a state ID that is less than 2000.

Technical Verification

Use Tools|System Data Tools|Technical Verification to access verification tests for JIT/S processing, services, and Sonic communication. These tests are rules defined as members of the rule group TECHNICAL_VERIFICATION_TESTS. See “Verification Tests for the Setup” on page 20.

Some rules are predefined; you can define additional tests and assign them as rules to the rule group.

Table 6.4
Predefined Rules for Technical Verification

Rule Name	Description
Check Devices	Check whether hardware devices such as printers can be found.
Check Directories and Programs	Check whether directories and programs can be found.
Check Parameters	Check the process and rule parameters for appropriate values.
Verify Process Engine	Verify that the process engine is set up using a test process supplied with the system.
Verify Temp Table Sonic Message	Verify a temp-table message to Sonic.
Verify XML Sonic Message	Verify an XML message to Sonic.

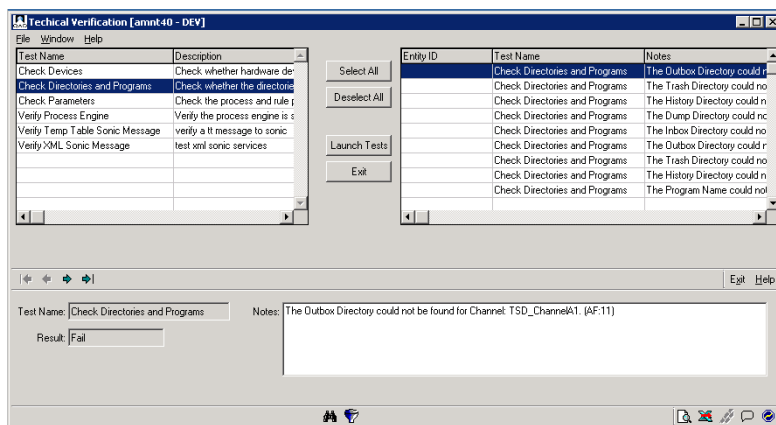
When testing Sonic, JIT/S uses the rule TECHVERIFYTT_rule from the dummy rule group TECHVERIFYTT as a business event.

The following directories and program are verified; programs must be found in the PROPATH to pass the validation:

- Channel Maintenance: Inbox Directory, Outbox Directory, Trash Directory, History Directory, Dump Directory, TS Parser Program
- Rule Maintenance: Program Name,
- Label Format Maintenance: Template File, Label Build Program, Template Parser Program
- Document Format Maintenance: Template File, Program

Select one or more tests in the left browse; then, click Launch Tests. The results display in the browse on the right.

Fig. 6.28
Technical Verification



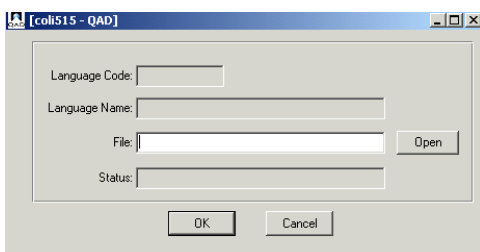
Important The tests should not be running while the plant is in operation; they should be used only during setup and maintenance—preventive, troubleshooting—periods.

Load Translation Terms

Use Tools|System Data Tools|Load Translation Terms to load translated strings into JIT/S to localize the system into other languages.

To load translated strings, click Open to browse and select the .dat file containing the translated strings to load into JIT/S; then click OK.

Fig. 6.29
Load Translation Terms



Development Tools

The functions on this menu are typically used only if you develop custom programs.

- Update User-Defined Fields
- System Controls

Update User-Defined Fields

Most JIT/S tables include fields that can be updated by users and referenced in custom code. These fields do not display in the normal maintenance screens. Use Tools|Development Tools|Update User-Defined Fields to specify values for these fields as needed.

Task Steps

- 1 In the first screen, choose a table name and then click Refresh to see all of the records in the table.
- 2 Double click a record to display the user-defined fields associated with the record.
- 3 In the fields screen click Modify Record to enable for fields for data entry.

Fig. 6.30

Update User Defined Fields

Table & Record Info:			
Table Name:	gdccl_counter_ctrl_det		
Record:	508731.01052		
User Defined Fields:			
Cha1:	Dec1: 0.000000	Obj1: 0.000000000	☐ Log1
Cha2:	Dec2: 0.000000	Obj2: 0.000000000	☐ Log2
Cha3:	Dec3: 0.000000	Obj3: 0.000000000	☐ Log3
Cha4:	Dec4: 0.000000	Obj4: 0.000000000	☐ Log4
Cha5:	Dec5: 0.000000	Obj5: 0.000000000	☐ Log5

System Controls

Use Tools|Development Tools|System Controls to set up any kind of data to be referenced by your custom programs. You can use any of the logical, character, date, or decimal fields associated with the table.

Some settings are also provided with the system and three of them are currently being used. You may need to change these values to accommodate your installation requirements:

ProdWBUser stores the ID of the user who can close Operations|Assembly|Assembly Order Workbench. These functions are typically left open since they monitor the work for a particular work cell, and the user closing them must provide authentication before the programs shut down. By default, this is set to the Admin user.

Two scanner programs are also set up here. The values determine the window that displays when you use Operations|Production Utilities|Scanner Startup to start scanners. This is set to:

```
ae0647\uib\scanningresultTraceStatw.w
```


Section 3

Using JIT/S

This section provides details about the functions on the Operations menu in JIT/S.

Operations **311**

Discusses the Factory Dashboard Monitor, the Detailed Order Viewer, how to manage assembly orders, packing and shipping, monitors, workbenches and order swapping, label operations, trace data, replenishment, reports, production utilities, Archive/Delete Workbench, and Archive Batch File.

Lists and Orders **383**

Addresses different types of lists and orders, including customer order versions, item and attribute lists, order list versions, orders, and Order Status Maintenance.

Operations

The following topics describes functions on the Operations menu that are used in the day-to-day operation of JIT Sequencing. The maintenance of lists, versions, and orders is described in Chapter 8, “Lists and Orders,” on page 383.

Factory Dashboard Monitor 313

Explains how to use the Factory Dashboard Monitor.

Detailed Order Viewer 314

Explains how to use the Detailed Order Viewer.

Assembly Orders 315

Explains how to use the Assembly Order Workbench and Assembly Order Monitor.

Packaging and Shipping 319

Describes packing sequences, Shipping Sequence Viewer, Packaging Workbench, Package Size Workbench, packaging and packing sequence errors, View/Rebuild Packages, Shipping Workbench, finalize shipments, print documents, view, Build/Ship Labels Cross-Reference, BOL and MBOL shipment reporting, packaging/shipping and canceled orders, and the packaging/shipping character interface.

Monitors 345

Discusses different monitors, including the Customer Order Version Monitor, WO Scheduling Monitor, Released WO Status Monitor, and In-Transit Order Monitor.

Workbenches and Order Swapping 348

Describes the customer order version workbench, work order workbench, work order swapping and scrapping, and ASRS Overview.

Label Operations 359

Explains how to use Print Job Maintenance, On-Demand Label Print, Label Reprint, Label Inquiry, and label statuses.

Trace Data 364

Explains how the system uses trace data and how it can be managed by the user.

Replenishment 365

Explains how to use Shopping List Workbench, review active and inactive shopping lists, update item lists, shopping list picking, and work cell picking workbench.

Reports 371

Describes the JIT/S report, WO List Version Detail report, Ordered Items report, Order Aging report, and Open Orders report.

***Production Utilities* 375**

Discusses the Scanner Startup and Build Ahead/Net/Safety Quantity production utilities.

***Archive/Delete Workbench* 377**

Explains how to use Archive/Delete Workbench.

***Archive Batch File* 381**

Explains how to use archive batch files.

Factory Dashboard Monitor

Use Operations|Factory Dashboard Monitor to track the communication and processing activities that are defined as key performance indicators for the shop floor in Setup|Factory Dashboard|Dashboard Indicator Maintenance and Dashboard View Maintenance. See “Factory Dashboard” on page 163 for setup information.

The indicators represent logical points in the assembly process where there is a measurable value of interest; for example, a broadcast is received from a particular customer broadcast point, or production is started on a work order for a particular shippable assembly unit.

Fig. 7.1
Factory Dashboard Monitor

ID	Description	Value	Status	Level	Last Changed Date	Last
BCT 3 - Broadcast to Sh	BCT 3 - Broadcast to Ship	201			7/23/06/2004	09:32
BCT 3 - Last Sequence	BCT 3 - Last Sequence Number	9036			7/22/06/2004	21:32
BCT 3 - Last Ship Sequ	BCT 3 - Last Ship Sequence Time	23/06/0	Before Lunch		7/23/06/2004	09:32
BCT 3 - Prod Count	BCT 3 - Prod Count	0			7/23/06/2004	09:32
BCT 3 - Highest Driver S	BCT 3 - Highest Driver Sequence	8008			7/18/06/2004	12:31
BCT 3 - Highest Passen	BCT 3 - Highest passenger Sequence	8006			7/18/06/2004	12:31
BCT 3 - Highest Rear C	BCT 3 - Highest Rear Cushion Seq	8006			7/18/06/2004	12:31
BCT 3 - Highest Rear B	BCT 3 - Highest Rear Back Sequence	8006			7/18/06/2004	12:31

Field Descriptions

ID and Description. Define the IDs and descriptions for key performance indicators in Setup|Factory Dashboard|Dashboard Indicator Maintenance.

Value. Values for each ID are calculated by the system based on the calculation type and other data defined in Setup|Factory Dashboard|Dashboard Indicator Maintenance.

Status. Statuses are determined by the system based on the thresholds defined for an indicator.

Level. Levels are determined by the system based on the thresholds defined for an indicator. The level determines the color displayed and whether the system displays a message. The message alerts you that an indicator has reached a defined level.

Last Changed Date/Time. The system displays the last date and time that the value of this indicator was updated.

Use the check box and buttons to perform the following functions:

Autorefresh. Select to have the browse data refreshed every Interval seconds.

Set Time. Enter the interval time in seconds for Autorefresh. The smallest allowed refresh interval is 3 seconds.

Refresh Now. Click Refresh Now to update the monitor display at any time.

Synchronize. Use synchronize to initialize the values of new indicators based on data in your database. For example, when you create a new bank, you can set its value based on data already being tracked in your JIT/S database. You might also need to use this function if data displayed no longer reflects an accurate picture of your operations.

An indicator is synchronized based on its type and the events associated with it. You cannot synchronize events of type Count or those with a calculation type of Minimum or Maximum.

You specify the program that completes the synchronization during setup.

Detailed Order Viewer

Use Operations|Detailed Order Viewer to display all of the information associated with a customer order (CO), such as VIN, all related subordinate order numbers, all related label IDs grouped by product, when the order was built, and when it was shipped. Records are not locked when displayed in the viewer.

Use the filter fields at the top of the screen to locate the CO of interest. To use a scanner to populate the filter fields, place the cursor in the destination field for the scanned data.

If the entry in Work Order ID is for a Build-Ahead work order (WO) that has no associated CO, JIT/S displays all of the WO information. Searching by sequence number can return multiple COs if the sequence is set up to wrap and does wrap within the specified date range.

Fig. 7.2
Detailed Order Viewer

CO Number	BP	Customer CO Number	Seq/VIN	Create Date	Create Time	CO Description
20060218-00000948-00000000	N/D	N/D / 7400	7400/6152	18/02/2006	11:01:08	System Generated
20060229-000003762-00000000	N/D	8300	8300/6152	28/02/2006	20:45:13	System Generated
20060301-000003770-00000000	N/D	8360	8360/6152	01/03/2006	11:38:28	System Generated
20060301-000003772-00000000	N/D	8400	8400/6152	01/03/2006	12:21:23	System Generated
20060301-000003769-00000000	N/D	8350	8350/6152	01/03/2006	11:32:06	System Generated
20060229-000003764-00000000	N/D	8320	8320/6152	28/02/2006	20:46:13	System Generated
20060229-000003763-00000000	N/D	8310	8310/6152	28/02/2006	20:46:01	System Generated

Use the choices in the Options menu to display lower-level information for the CO selected in the browser. The COVH Data and PFO Data screens have additional Options menu choices:

- CO Detail
- COVH Data
 - COV Detail
 - ORDI Information
- PFO Data
 - Item Data
 - Attribute Data
 - WO Data
 - Labels
 - Test Results

- Item Data
- Attribute Data
- AO Data: Labels, Package Details, Packing Slip/BOL Details
- Package Details. Pre-racked packages known as Planned packages are not displayed.
- Packing Slip/BOL Details
- Package Details
- Packing Slip/BOL Details
- Package Details
- Packing Slip/BOL Details

CO information that has been archived is no longer available for display. This is a viewer only; there is no updating or reprinting capability although the data can be exported to an Excel spreadsheet.

Assembly Orders

The Assembly Order Workbench, for use on the shop floor, manages production for assembly orders for a specific work cell. The Assembly Order Monitor tracks the production status for assembly orders at a specific work cell.

- Assembly Order Workbench
- Assembly Order Monitor

Assembly Order Workbench

Use the Assembly Order Workbench to view production data for queued assembly orders for an assembly unit. The workbench and its command buttons are designed for use as a touch screen in a shop floor environment.

Choose Operations|Assembly Order|Assembly Order Workbench to display a list of work cells/assembly units. Do either of the following to display the workbench with the current order to be completed:

- Select a work cell/assembly unit from the list; then click OK.
- Scan the barcode of the current assembly unit. The system displays and validates the scanned ID in the Scan field. If the ID is valid, the workbench will display.

The workbench is typically started and left running. When you click Exit to leave the workbench, the log-in screen displays. You must enter your user ID and password to verify that you have permission to shut down the workbench.

The AO Workbench security group specifies which users have permission to close the workbench; the Override AO WB security group specifies which users have permission to override errors. See “Security Control” on page 40.

Note In the event of a system failure, when the workbench reloads, it displays the order that was being worked on before the failure.

Workbench Appearance

Use Options|Assembly Unit Workbench Defaults in Base|Work Cell|Assembly Unit|Assembly Unit Tree Maintenance to specify the appearance, displayed information, and operation of the workbench. See “Assembly Unit Workbench Defaults” on page 115.

Fig. 7.3
Assembly Order Workbench

Attribute Name	Value
Airbag	Airbag
Airbag	Airbag
Electrical	NotElectric
Electrical	NotElectric
Style	Leather

Sequence	Order number	Attributes	Release	Batch	Package	ID
7110	0000007110	P Airbag (NotElectr	599	575		200511
7120	0000007120	P Airbag (NotElectr	599	575		200511

Sequence: 7060 Built

Order: 0000007060 Status: W

Release: 600 Batch: 577

Label Info: 000017759, 000017754, 001 ID: 20051118-00012923-00000000

Packaging Info:

Broadcast String: L7ANE

7070	0000007070	P Airbag (NotElectr	601	577		20051111
7080	0000007080	P Airbag (NotElectr	602	577		20051111
6720	0000006720	P Airbag (NotElectr	603	592		20051201

2160	0001222-08092600-00000000	30P	59			

Buttons: Build, Refresh, Find, Work Instructions, Auto Print, Label, Exit

Left Browse

The browse on the left displays the following data according to the color profile specified for the assembly unit in WorkBench Defaults.

- Attribute names and values for items on the order are displayed when an attribute, with the context DisplayAttributeAsText, is assigned to the assembly unit (AU) and the attribute name/value is assigned to an item.
Designated primary attributes display in bold text; secondary attributes display in regular text. See “Attribute Assignment” on page 96.
- Item numbers are displayed according to their item-color-revision definition in config.xml when an attribute name/value is assigned to an item and the same attribute, with the context DisplayItems, is assigned to an AU.
- Component items that must be validated by scanning before completing the order are displayed when an attribute name/value is assigned to one or more items and the same attribute, with the context ValidateComponent, is assigned to an AU.
- Trace data that requires scanning before completing the order is displayed when an attribute name/value is assigned to an item and the same attribute, with the context RecordTraceData, is assigned to an AU.

Order Browse

The order browse on the right is divided: the top section has the last built orders, the center section shows the order detail for the current order, and the lower section shows the next expected orders. A separate browse shows any existing COVH errors.

Packaging Info, shown in the center section, has the format: package number: slot number (package status). The Package column in the top browse shows the final eight characters of the package number and the slot number. Package information only displays if the order is for an assembly unit with packaging assigned. Meaning that a PAU has been assigned in the AU tree at the assembly unit or shippable assembly unit level. When subracking is used the package information will be displayed at the subrack assembly unit level.

Buttons

The buttons available on the workbench are organized into defined profiles that are associated with assembly units as workbench defaults. Use Next (→) and Previous (←) to cycle through any user-defined buttons.

Button Descriptions

Build. The operation of this button is defined in Base|Work Cell/Assembly Unit|AOWB Button Profile Maintenance. See “Assembly Order Workbench Button Profiles” on page 114.

Refresh. Click this button to update the data being viewed with any changes in the system. Set the default refresh interval for each assembly unit in “Assembly Unit Workbench Defaults” on page 115.

Work Instructions. Displays the work instructions assigned to the assembly unit in Options|Work Instructions in Assembly Unit Tree Maintenance. See “Work Instructions” on page 117.

Auto Print. Click to view and update the automatic print setting of printers in the system. This setting is initially defined in Setup|Printers|Printer Maintenance and determines whether the system can print to the printer as part of a background process. When this is set to No, labels defined to print to this printer are not automatically printed. You must click Label to initiate the printing.

Label. Prints a production label.

Find. Displays the following buttons:

Next	Show the next order.
Prev	Show the previous order
CO	Filter the list of customer order numbers and find a specific order. Type the filter value into the text field or click Keyboard to display a keyboard screen and key buttons sized for a touch screen. When the orders display, select the order of interest and choose Apply.
VIN	Filter the list of vehicle identification numbers and find a specific number. Type the filter value into the text field or click Keyboard to display a keyboard screen with key buttons sized for a touch screen. When the numbers display, select the VIN of interest and choose Apply.
Seq	Filter the list of sequences and find a specific sequence.
Leave	Return to the first set of buttons.

Skip. When the status for the displayed order is On Hold or In Repair, this button is available for skipping orders during the build process without triggering build sequence errors.

Pictures

Pictures are assigned to attribute values. When the attribute with that value is assigned—with context `DisplayAttributeAsPicture`—to an assembly unit, and the attribute name/value is assigned to an item, the picture displays on the workbench. See “Attribute Maintenance” on page 80.

Scanning Item Validations and Trace Data

Scanning to validate components and to record trace data are enabled in Workbench Defaults for an assembly unit. The relevant rule groups are specified there as well.

When an item has an attribute value for an attribute that is assigned to an assembly unit with the context `ValidateComponent`, scan the item before completing the order. The workbench marks the component as validated and records the scan as a test with the value of passed.

For trace data, assign the attribute to the assembly unit and assign the format of the trace data—prefix, length, suffix—to the items as the value for the attribute. Scan the item before completing the order. If the trace data must be unique, use the rule `ValidateUniqueData` to test for uniqueness.

Completing an Order and Displaying the Next

As specified in Workbench Defaults, you can indicate that an order is complete by clicking the Build button, scanning a Build barcode, or scanning the next order. The Build button is always available.

On executing the completion rule group and logic specified in Workbench Defaults, JIT/S sets the order status to Built and updates the appropriate time and date fields.

If the workbench defaults are set up to require that the next order is displayed only after it is scanned, the workbench is cleared; otherwise, the next order is displayed.

If the workbench is set up in Workbench Defaults to display the next order in response to a scan, there is additional validation before the order displays:

- If the order scanned is the expected next order, it is displayed.
- If the order is not the expected next order, an error is displayed. If you override the error, JIT/S logs the action and updates the next expected sequence to be the one following this scanned order.

If the order scanned is already built, the workbench displays the order and highlights the status. If the order scanned is already packed or built, there is an error and the workbench does not display the order.

Once the order is displayed, its status is set to Work in Process.

Assembly Order Monitor

Use Operations|Assembly|Assembly Order Monitor to track production flow for a particular work cell. It shows the last orders that have been built in the top browse, the next orders to be built in the bottom browse, and the order currently being built in the center. The to-be-built orders display in larger, bold type so that they can be more easily viewed from a distance.

When you choose Assembly Order Monitor from the menu, a list of work cells displays. Select a work cell from the list; then click OK to display the viewer.

This program is typically started and left running. When you click Exit to terminate the program, the login screen displays.

Note Packaging Info, shown in the center section, has the following format: package number: slot number (package status). Package information only displays if the order is for an assembly unit with packaging assigned. This is the level that the PAU is assigned in the AU Tree. When subbracking is used, the package information is displayed at the subrack assembly unit level.

Fig. 7.4
Assembly Order Monitor

The screenshot shows the Assembly Order Monitor window for Work Cell 'BCT4 SeatSets WCI' / 'BCT4 SeatSets WCI'. The window has a menu bar (File, Options, Window, Help) and a toolbar with navigation icons. The main display is divided into several sections:

Release	Batch	Sequence	Qty	ID	S	Order number	Package	Attributes
19	607	2290	0	20050428-00008612	B	0000002290		No Airbag Leather
20	609	2320	0	20050428-00008710	B	2320		No Airbag Leather
21	610	2340	0	20050428-00008798	B	2340		No Airbag Leather
22	610	2330	0	20050428-00008790	B	2330		No Airbag Leather
23	609	2310	0	20050428-00008779	B	2310		No Airbag Leather

Release Nbr: 24 Batch: 609 Sequence: 2300
 ID: 20050428-00008768-00000000
 Order Nbr: 2300 Qty: 0
 Status: R
 Broadcast string: NAL
 Packaging Info:

Attribute Name	Valid Value	Attribute Name	Valid Value
Airbag	No Airbag		
Style	Leather		

25	613	2380	0	20050428-00008835	R	2380		No Airbag Leather
26	613	2350	0	20050428-00008842	R	2350		No Airbag Leather
27	613	2360	0	20050428-00008849	R	2360		No Airbag Leather
28	613	2370	0	20050428-00008856	R	2370		No Airbag Leather

At the bottom of the window are three buttons: Exit, Refresh, and Find.

Packaging and Shipping

JIT/S packages and/or ships items in response to broadcasts from the broadcast point that you and the customer agree is the packaging/shipping signal point. The packaging/shipping-signal broadcast point and the build-signal broadcast point can be different.

When the items to package are to be built in JIT/S, an order processor (in response to the build signal) creates the appropriate customer order, product family order, and work orders. Releasing an order manually or through an order scheduler triggers the creation of labels that are linked by their restrictions to the relevant assembly unit.

When the items to be packaged are not built in JIT/S, an order processor creates the orders but not the production labels; then, in response to the packaging/shipping signal, the order processor creates a shipping label.

Completed items can be shipped to the customer by generating appropriate shipping documents manually or letting the completion of assembly initiate the shipments. This section covers:

- Packing Sequence
- Packaging Workbenches
- Alternative Packaging Workbench
- Short-Racking Packages
- Short-Shipping Packages
- Packaging and Packing Sequence Errors
- Packing Sequence Errors
- Unpacking Packages
- Resetting Packing Sequence
- View/Rebuild Packages
- Shipping Workbench
- Packaging/Shipping and Canceled Orders
- Packaging/Shipping Character Interface

See setup information for packaging and shipping in “Packaging” on page 103.

Packing Sequence

Packing sequence is maintained at the product family order (PFO) level. Sequence issues can be created by, for example, the supplier accepting out-of-sequence orders or by the customer rebroadcasting a range of orders.

- For nonpre-racked packages, sequence issues are addressed in Operations|Lists/Orders|Product Family Order Maint. See “Product Family Order Maintenance” on page 403.
- For pre-racked packages, when there is a sequence issue with a package that has not been shipped, all packages holding orders from that PFO must be unpacked, resequenced, and repacked. See “Unpacking Packages” on page 328, “Resetting Packing Sequence” on page 329, and “Packaging Workbenches” on page 322.

JIT/S supports two sequence numbering schemes for order insertions:

Scheme 1	Scheme 2
45	20
46	30
46.5	35
46.75	37
47	40
48	50
48.5	55

The packing sequence for an order insertion is calculated as:

$$\text{lower sequence} + (\text{higher sequence} - \text{lower sequence})/2$$

For example, if the newest inserted sequence in scheme 2 is 37, the packing sequence is calculated as:

$$35 + (40 - 35)/2 = 37.5$$

Note When you insert an order into the very first package in the system, that package and all of its related data are deleted, even when you are not pre-racking. You must then create a second package for the new unit that is inserted. In this situation, sequence validation fails since a previous package with a sequence number to validate against does not exist. To avoid errors, you should leave sequence validation off until the third package.

When a package is scrapped, all related data, package contents, content labels, and label header usage records are deleted from the system. Any package labels associated with the package are canceled. A record is logged to order/package logging if logging is enabled for the customer or product family.

Pre-Racked Package Order Insertions

The parameter, InsertAction, for the pre-racking rule, OPPreRackOrders, determines the order processor response to the sequence insertion for pre-racked packages.

Value	Effect
NewRack	Create a new planned package and put the insertion order into that package.
Re-Rack	The order processor identifies the package and slot for the insertion order. If the package has not been built and the slot is empty, the order processor assigns the insertion order to the appropriate slot. If the package has been built, the order processor deletes the existing package, assigns the insertion order to the appropriate slot, and generates new labels.

Nonpre-Racked Package Order Insertions

For those product families that do not have pre-racked packages—as identified by the list of product families passed by the ProductFamily parameter to the OPValidatePackageStatus rule—the order processor identifies the package for the insertion order. If the fill status for the package is Complete or In Process, the order processor deletes that package and all of its related data. The package must be rebuilt before it can pass validations on the Shipping Workbench.

Shipping Sequence Viewer

Use Operations|Packaging|Shipping|Shipping Sequence Viewer to view the shipping sequence of customer orders to support these tasks:

- Picking from inventory with a transfer to a staging location
- Independent shipping and production sequences

You can filter the record display by product family, shippable assembly unit, and ship-to. The viewer displays the records organized by the customer packing sequence. Only orders that have not been shipped are included in the display.

The bottom browse displays sequences that have errors.

Fig. 7.5
Shipping Sequence Viewer

Seq. Number	Packing Seq	Package Info	WOLV ID	Version	Cancelled	Items	WOLV De	Label ID
6100	44.00		00000104	00000001	no	CARPETW	w	
6110	45.00		00000104	00000001	no	CARPETW	w	
6115	45.50		00000104	00000001	no	CARPETW	w	
6117	45.75		00000104	00000001	no	CARPETW	w	
6120	46.00		00000104	00000001	no	CARPETW	w	
6140	47.00		00000104	00000001	no	CARPETW	w	

Sequence Number	COV Number	Error Type	Error Code	Error Info

Packaging Workbenches

Use Operations|Packaging/Shipping|Packaging Workbench to build packages from the end of a production line or from a pick and pack area. Use Operations|Packaging/Shipping|Alternative Packaging Workbench to repack missing orders and to build special packages.

Building Packages from the Production Line

For items built through JIT/S and packaged from the end of the production line, scan a production label to populate the Barcode field in Packaging Workbench. Based on the packaging assembly unit (PAU), the application fills in the Package Unit field. See “Packaging Assembly Units” on page 120.

Fig. 7.6
Packaging Workbench

If the status for an order is On Hold, it cannot be packaged through the workbench. If the status for an order is In Repair, you can optionally choose to continue. If you choose to continue, the order is packed as usual but retains the In Repair status. If you choose not to continue, the workbench proceeds as if the label had not been scanned.

The application carries out barcode validations and the validations called for in the PAU before adding the item to the package. The PAU validations ensure that the item is packed in the correct package and in the correct sequence.

Barcode Validations

The following are the barcode validations from rules in the Double Scan Validation rule group:

- An item record with the same elements that are found in the barcode must exist. See “Item Numbers” on page 87.
- For item numbers that have item ID, revision level, and color code, elements must be in the order specified in the `BARCODE_ORDER` parameter of the `validateDelimitedAdditionalScans` or `validateFixedAdditionalScans` rules.
- For item numbers where the item ID, revision level, and color ID elements are not separated by a delimiter, the overall length of the barcode must be equal to the sum of the values for the `colorlength`, `revisionlength`, and `partidlength` elements in `config.xml`.
- For item numbers where the item ID, revision level, and color ID elements are separated by a delimiter, the delimiter must match the value for the `PART_DELIMITER` parameter for the `validateDelimitedAdditionalScans` rule. Also, the overall length of the barcode must be less than or equal to the value of `totaldelimitedlength` in `config.xml`.

Field Descriptions

Barcode. This field holds up to 4000 characters.

Expected Count. After you scan the first item, the system displays the pre-rack size of the package or the default number of items.

To short-ship a package, manually enter the number of units that you expect to load in this package. See “Short-Shipping Packages” on page 327.

When the package is completed and this value is less than the Total Size defined for the package unit in Base|Packaging/Shipping|Package Unit Maintenance, the value for the attribute `package_fill_status` is Short Ship rather than Complete.

Current Count. The application displays the number of items scanned for this package.

Scan Packaging. Selecting this field indicates that you are going to scan one or more package units for a barcode with the dunnage prefix. Each scanned dunnage barcode increments the dunnage count. On exiting Packaging Workbench, this setting is saved and reinstated when the same user ID restarts Packaging Workbench.

Dunnage Count. The application displays the number of package unit item IDs that have been scanned.

Mixed. Selecting this field indicates that items scanned for this package can have different item numbers. Leave this unselected to validate that all items in the package have the same item number—a master package. On exiting Packaging Workbench, this setting is saved and reinstated when the same user ID restarts Packaging Workbench.

Label Serial No. The application displays the scanned item data in this field.

Complete. If pre-racking is not used or the expected count is entered manually, click Complete when the appropriate number of items have been scanned.

When pre-racking is done in an order processor, the application saves the record when Current Count matches Expected Count.

Clear. Click to clear all items from the package without saving any data to the database.

Remove. Click to remove the currently selected item from the package. This is only available for non-sequenced packages.

Building Packages from Pick and Pack Area

For items built outside of JIT/S or packaged from a pick and pack area, double scanning can be set up in the PAU for verifying that the item from the pick and pack area matches the item referenced by the shipping label.

Scan the shipping label first; then scan the original production label as specified by the pop-up dialog:

- Label number if the item is built in JIT/S
- Item number if the item is built elsewhere

The application also fills the Expected Count field: for pre-racking the count comes from the planned package defined during pre-racking by the order processor; otherwise, the count comes from the scanned package size. To create a short-ship package, update the expected count. See “Short-Shipping Packages” on page 327.

Before adding an item to a package, the application validates that the tests assigned to the item have been passed successfully. The test category is specified in the shippable assembly unit.

See “Assign Tests” on page 86 and “Shippable Assembly Units” on page 119.

Completing Packages

When a package is completed either by an order processor or through the Complete button on Packaging Workbench, the system executes the rules in the PKGComplete rule group.

The rule `postProductionForPackage` ensures that production has been posted for the work orders associated with all of the items in the package. The production data is used to create backflush transactions in the ERP application.

The rule `printPackageLabels` initiates the print application to produce a label of the appropriate type—mixed/shippable, mixed/nonshippable, master/shippable, master/nonshippable. The print application checks whether there is a label configuration for that type with restrictions that match the product family, assembly unit, and ship-to for the package.

Alternative Packaging Workbench

Use Operations|Packaging/Shipping|Alternative Packaging Workbench to create special single-instance packages, to package orders with a negative packing sequence, and to insert orders labeled as missing into their original packages.

Specify in the system configuration file (`config.xml`) whether special packages use standard or nonstandard ID numbering. Configure the nonstandard numbering counter based on some combination of packaging unit, customer, and ship-to in “Counter Maintenance” on page 291. Activate this counter in Counter Field Activation for field Special in table PKMFPCCKG.

Missing Orders

When the scanned missing order is from an unshipped package, JIT/S displays this message:

```
Scan the original package to add order <number> to it or select Create Special Package.
```

Scanning the package label adds the order to the package, optionally regenerates the package labels, and closes the package.

Selecting Create Special Package creates the package, adds the order to it, and always generates new package labels; the label type is `MasterShippablePackageLabel` and the packaging assembly unit is the same as the original package for this missing order. JIT/S prints the labels as if the package had been completed in the Packaging Workbench.

New package labels have status set to Created while those they replace have status set to Canceled.

Orders Requiring Special Packages

Special packages can be created only for orders that have been marked as missing or orders with a negative packing sequence. See “Resetting Packing Sequence” on page 329.

The special package holds only the one order. Selecting Regenerate Production Labels sets the status for the existing labels to Canceled and generates new labels with status set to Created.

When a scanned order is missing from a shipped package, JIT/S displays the message:

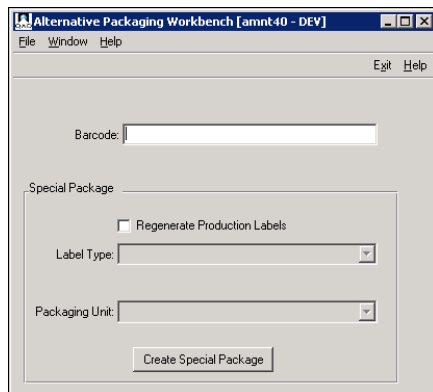
Package <number> has a status of Shipped, create a special package for the order.

When the scanned order has a negative packing sequence, JIT/S displays the message:

The Product Order has a negative packing sequence, you must add the order to a special package.

In either case, select Regenerate Production Labels if the order labels have package or slot information that needs to be updated; select a label type, then select a packaging unit and click Create Special Package to complete the package. As in the Packaging Workbench, completing the package prints the package labels.

Fig. 7.7
Alternative Packaging Workbench



Package Size Changes

Package size can be adjusted in View/Rebuild Packages and in the Packaging Workbench.

Short-Racking Packages

A short-rack package might be needed at the end of a shift or business day when all of the orders for a usual order scheduler batch have not been received and the orders that have been received need to be released for production, packing, and shipping.

Pre-racked packages can be resized before the orders are released by an order scheduler. Use Operations|Packaging/Shipping|View/Rebuild Packages to select the package with the relevant orders; the status is Planned (pre-racked) and the fill status is In Progress. Click Short-Rack Package to update package_fill_status to Short Ship. The package can now be packed and completed with the reduced number of orders.

If an order is later inserted into the package, the package_fill_status changes back to In Process.

Changing the package size does not change the batch size that the order scheduler uses to release the orders for production. To release a smaller batch size of pre-racked or nonpre-racked orders for production, change the rule parameter max_release in the order scheduler; see “Setting Up Order Schedulers” on page 157.

Changing package size in the Packaging Workbench is referred to as short-shipping.

Short-Shipping Packages

Use the Expected Count field in Operations|Packaging/Shipping|Packaging Workbenches to define short-ship packages:

- 1 Change the value in Expected Count.
- 2 Scan the items to include in the short-ship package.
- 3 When Current Count matches Expected Count, click Complete; respond Yes to the short-ship verification.

JIT/S then creates a new package based on the completed package and moves the unfilled contents from the original package to the new package. For pre-racked packages, the package number for the new package has the format: Completed Package Number–Deviation Number. The deviation number increments by one for each additional short-ship package based on the original package. The status for the new package is Planned and the fill status is Short-Shipped. For nonpre-racked packages, the package number for the new package is the next expected number.

JIT/S then cancels the existing package label, creates new production labels for the items in the new package, and, depending on a parameter setting for the createNewProductionLabels rule, sets the status on the existing production labels to Canceled or Replaced.

Packaging and Packing Sequence Errors

While building a package through either the Packaging Workbench or a hand-held scanner, packaging validation errors can occur when:

- Orders are out of sequence
- Status is set to In Repair
- Trace data is missing.

Responses to packaging errors are logged, including which orders actually went into the package.

Packing sequence errors can be addressed for both pre-racked and nonpre-racked orders.

Override Packaging Errors

When the order is In Repair or trace data is missing, the error message offers the option to override the error. When you choose to override the error, JIT/S displays a barcode field where you can then scan or manually enter the override code. The code is a user-defined value for the OverrideErrors parameter in two rules—validateOrderStatus, PerformPartVerification—in the Content Validation For Item rule group.

Accept Packaging Errors

After accepting a packing error, you have these options:

- When pre-racking is not used, continue adding items until the package is full. This changes the composition of subsequent packages as well as the current package.
- Stop building the package until the issue is resolved: the missing order is available, the trace data is recorded, or the In Repair status is removed.

- Scan a barcode into that spot in the package. Use the missing order barcode when the sequence error is unexpected; the order is marked as a missing order. Use the empty slot barcode when the order is canceled. The barcodes are defined in Setup|Labels/Documents|Barcode Data Identifier Maintenance.

Subsequently in the Packaging Workbench, when you scan orders labeled as missing, the application reports that the order was supposed to be in a particular, now-closed package and whether the package has been shipped. The application then directs you to Operations|Packaging/Shipping|Alternative Packaging Workbench.

Packing Sequence Errors

Packing sequence is maintained at the product family order (PFO) level. Sequence errors can result when suppliers accept out-of-sequence orders or when customers rebroadcast a range of orders.

Use Operations|Lists/Orders|Product Family Order Maintenance to address sequence issues in nonpre-racked packages.

For sequence issues with a pre-racked package that has not been shipped, all of the completed packages holding orders from that PFO must be unpacked, resequenced, and rebuilt. See “Unpacking Packages” and “Resetting Packing Sequence” on page 329.

Once the packing sequence has been updated; use the Packaging Workbenches for packing or repacking the packages.

Unpacking Packages

Both pre-racked and nonpre-racked packages can be unpacked. The reasons to unpack a package include:

- The contents of a completed, pre-racked package are out of packing sequence so the package needs to be reorganized.
- There is a problem with an order in the package; for example, an order needs to be swapped out or a damaged item must be removed, repaired, and replaced.

In View/Rebuild Packages, select a package that has not been shipped where the fill status is Complete; then click Unpack to:

- Change the fill status to Rebuild.
- Remove the current order records from the package.
- Create new pre-racked order records—whether or not the original package was pre-racked—and assign them to the package.
- Invalidate the current packaging labels.

Since a Complete package is a physical reality, the physical package must be unpacked as well. Repacking the package in the Packaging Workbenches and indicating that it is complete signals the printing of new package labels.

Resetting Packing Sequence

Use Operations|Packaging|Shipping|Update Packing Sequence to address sequencing problems for the following:

- Pre-racked orders that have not yet been packed
- Pre-racked orders from packages that have been unpacked
- Orders from non-racked packages that have been unpacked

All orders from unpacked packages are considered pre-racked whether they were originally pre-racked or not.

Note Use “Product Family Order Maintenance” on page 403 to address sequence problems for nonpre-racked orders that have not yet been packed.

Important Be sure to pause the order processor while using this screen to avoid conflicting package assignments.

Pre-racked orders and empty slots are displayed by product family and ship-to in the Pre-Racked Orders browse. Use the buttons to move any of them up and down in the browse list, changing their packing order within and between packages. Orders with status set to On Hold, Canceled, Closed, or Shipped cannot have their packing sequence changed and are not displayed in the browse.

Since sequence updating is done by product family, it will take multiple iterations to update the packing sequence for all of the product orders on a customer order.

Fig. 7.8
Update Packing Sequence

Moving orders or empty slots to the Available Orders browse removes them from the packing sequence; JIT/S assigns them negative packing sequence numbers to avoid interference with sequence validations.

If an order removed from the Pre-Racked Orders browse is not replaced by an order or by an empty slot, the remaining orders are reordered in the packages/slots to fill the gap; for example, every later order will move up one place in the packages.

If an order is inserted into the packing sequence in the Pre-Racked Orders browse without removing an order or empty slot from the affected package, the order with the highest packing sequence in the package is displaced from the package.

If the order is displaced from the last package, it is added to a newly created pre-racked package; if it is not the last package, all orders after the insertion point are moved down one place in the packages. The last order in the last package will be displaced—assuming that the last package is full—and JIT/S creates a new package to hold this order. The next order pre-racked by the order processor is then added to this package and so on.

Clicking Re-rack confirms the changes. It does not update the backflush status of an order so there is no danger of backflushing an order multiple times.

The changes are logged for each affected order.

View/Rebuild Packages

Use Operations|Packaging|Shipping|View/Rebuild Packages to view the structure and status of existing packages and to rebuild shipped packages that are lost or destroyed.

- Viewing Packages
- Rebuilding Lost or Destroyed Packages

Viewing Packages

You can filter the package view as well as view items and parent packages.

- Filtering the Package View
- Package Tab
- View Parent Package
- View Item in Package

Filtering the Package View

Use the fields across the top of the screen to filter the list of packages displayed. Enter one or more values; then click Apply.

Fig. 7.9
View/Rebuild Packages: Filter

Filter Field Descriptions

Package Unit. Enter the name of a package unit defined in Base|Packaging|Package Unit Maintenance. This limits the display to packages associated with the selected package unit.

Ship-To. Limits the display to packages associated with the selected ship-to.

Assembly Unit. Limits the display to packages whose PAU is associated with the selected assembly unit.

Label Serial Number. Limits the display to the specific package or to the parent package containing the package carrying the label with the specified label number.

Package Number, To. Limits the display to packages with numbers within the specified range.

Last Modified, To. Limits the display to packages with last-modified timestamps within the specified range.

Fill Status. Limits the display to packages with the selected fill status. Valid values for the class code package_fill_status are defined in Tools|System Data Tools|Class Code Maintenance.

In Progress	Package is in the process of being filled.
Complete	Package is filled with the number of units specified in the definition of the package unit.
Short Ship	Package is filled but with fewer than the number of units specified in the definition of the package unit.

Status. Limits the display to packages with the selected status code. Valid values for the class code package_status are defined in Tools|System Data Tools|Class Code Maintenance.

Planned	The package is planned through pre-racking but does not yet physically exist.
Insertion	Planned package due to an insertion which creates a new rack.
Confirmed	The package has been created by scanning items into it but has not been shipped.
Shipped	The package has been shipped.
Rebuild	This package is planned due to a rebuild but does not yet physically exist.

Package Tab

Select a package to display information about it in the view area. You can view packages built in Operations|Packaging/Shipping|Packaging Workbench or packages planned through pre-racking in an order processor.

Fig. 7.10
View/Rebuild Packages

Field and Button Descriptions

Package Unit Name. This is the name of the package unit associated with the selected package.

Shippable. If this is selected, it indicates that the packaging unit associated with the package is shippable.

Mixed. If this is selected, it indicates that the Mixed check box was selected when the package was created in Operations|Packaging/Shipping|Packaging Workbench.

Ship-To ID. This is the ship-to ID associated with the package.

Package Number. This is the unique ID number for this package.

Status. This is the value of the package_status class code for this package. See “Status” on page 331.

Fill Status. This is the value of the package_fill_status class code for this package. See “Fill Status” on page 331.

Label Serial Number. This is the unique ID number for this package label.

Dunnage Count. This is the number of package unit item IDs that have been scanned into the current package.

Assembly Unit. This is the assembly unit associated with the package.

Scrap Reason Code. Select the reason for scrapping the selected packaged. This is required for rebuilding.

Rebuild Package. Click to rebuild the selected package and any related packages. See “Rebuilding Lost or Destroyed Packages” on page 334 for details.

Short Rack Package. Click to update package_fill_status to Short Ship. The package can now be packed and completed with a reduced number of orders. See “Short-Racking Packages” on page 326.

Unpack Package. For a package with a Complete fill status that has not been shipped, click Unpack to:

- Change the fill status to Rebuild.
- Remove the current order records from the package .
- Create new pre-racked order records—whether or not the original package was pre-racked—and assign them to the package.
- Invalidate the current packaging labels.

Since a Complete package is a physical reality, the physical package must be unpacked as well.

View Parent Package

Select the Parent Package tab to review parent package information:

Package Unit. This is the name of the package unit associated with the parent package.

Package Number. This is the unique ID number of the package.

Label Serial Number. This is the unique ID number of the label on the parent package.

View Item in Package

Select an item in the packages tree to display information in the Item View.

Fig. 7.11
Package Item Information

The screenshot shows the 'View/Rebuild Packages [Limerick - DEVELOPMENT]' application window. The window has a menu bar (File, Window, Help) and a toolbar with navigation icons and an 'Exit' button. The main area is divided into two panes. The left pane, titled 'Packages', shows a tree view of packages. The right pane, titled 'Item View', displays detailed information for the selected item.

Package Information Fields:

- Packaging Unit: [Text Field]
- Package Number: [Text Field]
- Ship To: [Text Field]
- Last Modified: [Text Field] Time: [Text Field]
- Assembly Unit: [Text Field]
- Fill Status: [Text Field]
- Label Serial Number: [Text Field]
- Status: [Text Field]
- To: [Text Field]
- To: [Text Field]
- Apply [Button]

Item View Fields:

- Work Order ID: [Text Field]
- Assembly Order ID: [Text Field]
- Assembly Unit: [Text Field]
- Label Serial Number: [Text Field]
- Sub-track: [Text Field]
- Slot Number: [Text Field]

Packages List (Left Pane):

- Seat Set Pallet : 000000001
- Seat Set Pallet : 000000002
- Seat Set Pallet : 000000003
- Seat Set Pallet : 000000004
- Seat Set Pallet : 000000005
- Seat Set Pallet : 000000006
- Seat Set Pallet : 000000007
- Seat Set Pallet : 000000008
- Seat Set Pallet : 000000009
- Seat Set Pallet : 000000010
- Seat Set Pallet : 000000011
- Seat Set Pallet : 000000012
- Seat Set Pallet : 000000013
- Seat Set Pallet : 000000014
- Seat Set Pallet : 000000015
- Seat Set Pallet : 000000016

Rebuilding Lost or Destroyed Packages

If a package with package_status of Shipped is lost or destroyed, use View/Rebuild Packages to rebuild the package. In rebuilding packages, JIT/S does the following:

- Determines the orders that are in the selected package and any related packages.
- Scraps all of these work orders and creates hot build orders to replace them. This cancels the existing production labels for the work orders and all of their assembly orders.

The hot build orders have these statuses: Unprocessed, Unproduced, Unpacked, and Unbackflushed. The order scheduler schedules them normally, their production labels are created, and they can proceed through the normal production, packaging, and shipping steps.

- Sets the status for all affected packages to Rebuild; they retain the same package numbers.
- Disassociates the original work orders from their packages and pre-racks the hot build orders into the positions of the orders that they are replacing.

Rebuilding affects not only the selected package but all packages related through shared work orders.

Example You have work orders for six seat sets with front seats packed three to a rack and rear seats packed six to a rack. This creates three packages:

Pkg1 WO1Front, WO2Front, WO3Front

Pkg2 WO4Front, WO5Front, WO6Front

Pkg3 WO1Rear, WO2Rear, WO3Rear, WO4Rear, WO5Rear, WO6Rear

If Pkg1 must be rebuilt, Pkg3 must be rebuilt because it also contains part of WO1. Continuing the logic, if Pkg3 must be rebuilt, any packages containing parts of WO1 through WO6 must be rebuilt. Since the three packages are related through their shared work orders, JIT/S rebuilds all three.

Shipping Workbench

Use Operations|Packaging/Shipping|Shipping Workbench to:

- Create Bills of Lading and Shipments
- Build Shipments and Packing Slips
- Finalize Shipments, Print Documents, View

The Shipping Workbench has browses and viewers for BOLs, packing lists, and packages.

Bills of Lading and Shipments

In Shipping Workbench, the browse displays all unassigned and unfinalized BOL records.

Click New Record to create a new shipment record. Click Filter to define a filter for reducing the number of displayed records.

Fig. 7.12
Shipping Workbench

The screenshot shows the 'Shipping Workbench [Limerick - DEVELOPMENT]' application window. It features a menu bar (File, Window, Help) and a toolbar. The main interface is divided into several sections:

- Top Left Table:** A table with columns BOL ID, Status, ETD Date, and ETD Time. It lists several BOL records, with '17-BOL-A0017' selected.
- Top Right Form:** Fields for BOL ID (17-BOL-A0017), Status (L), BOL Format ID (BOL), Gross Weight (0.00), Trailer ID, Freight Payment (Collect ()), Driver Name, Carrier ID (Carrier 1), ETD Date (29/06/2004), ETD Time (00:00:00), BOL Date (29/06/2004), BOL Time (12:14:00), Finalize Date, Finalize Time (00:00:00), Print Date, and Print Time (00:00:00).
- Bottom Left Table:** A table with columns Packing Slip ID, # Packages, Shipping Group ID, and Shipping Conf. It shows 'NOD-PS-0017' with 1 package, NOD_Group shipping group, and NOD_matrix configuration.
- Bottom Right Form:** Fields for Packing Slip ID (NOD-PS-0017), Shipping Group (NOD_Group), Shipping Configuration ID (NOD_matrix), Gross Weight (0.00), Nbr of Packages (1), Dunnage Weight (0.00), Address ID, Docks, Wt Adjust (0.00), Dealer Number, Net Weight (0.00), Create Date (29/06/2004), Create Time (12:14:00), Print Date, and Print Time (00:00:00).
- Bottom Section:** A 'Package Number' list showing 'NOD-P-0026' and a 'Scan Label ID' field with a checkbox to 'Select to remove a Package'.

Field Descriptions

BOL ID. When you create a new record, the application displays an Unassigned BOL number. After the first package label is scanned, the BOL ID is assigned based on the relevant customer.

Status. This is the BOL status: Empty, Loading, Finalized. The status is Empty until the first package is scanned.

BOL Format ID. Scanning a package label displays the BOL Format ID defined for the relevant shipping configuration. To update, enter the ID of a document format created in Setup\Labels\Documents\Document Format Maintenance where the format type is BOL.

Gross Weight. As each package label is scanned for the shipment, the application updates this field based on associated assembly orders.

Trailer ID. Enter the vehicle ID for the transport. This field is manually entered and must be completed before finalizing the BOL.

Freight Payment. Enter a freight payment method. The options are members of the Freight Payment Terms class code defined in Tools\System Data Tools\Class Code Maintenance. Freight payment is defined in Base\Addresses/Shipping\Transport Configuration Maintenance for the carrier but can be overridden here. See “Transport Configurations” on page 77.

Driver Name. Enter the transport driver’s name. This field is manually entered and must be completed before finalizing the BOL.

Carrier ID. Select a carrier ID that has a transport configuration record that suits the needs of the shipment. Carrier IDs are defined in Base|Addresses|Shipping|Carrier Maintenance. Through the SCAC ID on the carrier record, carrier IDs are linked in a one-to-many relationship to transport configurations defined in Base|Addresses|Shipping|Transport Configuration Maintenance.

Carrier defaults from the shipping configuration when the first package is added to the shipment if only one carrier is associated with the combination of ship-to and ship-from address.

ETD Date, Time. Enter the expected date and time of delivery to the customer.

Create Date, Time. These values are updated when a packing slip is added to the BOL.

Shipments and Packing Slips

In Shipping Workbench, put the cursor in the Scan Label ID field in the Packages section of the workbench; then scan a package label. This yields the packaging assembly unit for the package; from this, JIT/S identifies the shipping group and shipping configuration for the package.

- If a packing slip exists for this configuration/group pair on this shipment, JIT/S runs the package validations and adds the package to the packing slip.
- If a packing slip does not exist for this configuration/group pair, JIT/S creates the packing slip before running the validations and adding the package to the packing slip.

Packages with orders having the status On Hold or In Repair cannot be scanned into a shipment. If this or any of the validations fails, JIT/S aborts the transaction. See “Packing Sequence” on page 320.

Adding a package to a packing slip displays the package number in the package browse.

Fig. 7.13
Shipping Workbench: Packages and Packing Slips

Field Descriptions

Packing Slip ID. This read-only field displays the ID generated for the packing slip by the application.

Shipping Group. This read-only field displays the shipping group linked to the packing slip.

Shipping Configuration ID. This read-only field displays the shipping configuration linked to the shipping group.

Gross Weight. This read-only field shows the sum of net weight, dunnage weight, and the weight adjustment.

Nbr of Packages. This read-only field shows the number of packages on the packing slip.

Dunnage Weight. This read-only field shows the sum of the weight of the packaging units on the packing slip.

Docks. Select to display ship-to dock addresses in the Address ID browse.

Address ID. Select an address ID from those linked directly to the ship-to on the shipping configuration or those linked to any ship-to dock that is associated with the ship-to on the shipping configuration. The Docks check box determines which addresses are displayed.

Net Weight. This read-only field shows the sum of the weight of the packages on the packing slip.

Dealer Number. Enter the number for a dealer that the package should be sent to by the customer; for example, when the customer requests a single special item for a dealer. This field is required when the selected address ID is for a ship-to dock record that has the Dealer Number check box selected in Base|Addresses/Shipping|Ship-To Dock Maintenance.

Wt Adjust. Enter a numeric value to adjust the gross weight.

Date, Time. These read-only date and time fields apply to the selected packing slip.

Scan Label ID. Put the cursor in this field to capture a scanned or manually entered package label ID. Click Enter to complete a manual entry. If Remove Package is selected, this removes the package linked to the label ID from the packing slip. If Remove Package is not selected, this adds the package linked to the label ID to the packing slip.

Remove Package. Select to remove the package represented by the label ID in Scan Label ID from the packing slip.

Finalize Shipments, Print Documents, View

In the Shipping Workbench, when all of the required packages have been added to the appropriate packing slips for a shipment, close the shipment by clicking the Finalize push pin icon in the tool bar above the packing slip browse.

The shipping finalize validations validate that no packages in a shipment have status set to Invalid.

Note When using the CHUI Shipping Workbench, if the GUI Shipping Workbench is open and displaying the BOL that you are scanning packages into, the BOL must be refreshed to display the scanned-in packages before you can finalize it. You can refresh the GUI Shipping Workbench by clicking the Refresh icon in the toolbar above the packing slip browse.

This changes the status to Finalized, displays the Print Documents Dialog (if document formats are specified on the shipping configuration associated with the BOLs), and enables the printing icons for manually printing the BOL and packing slips. Use Operations|Packaging/Shipping|Finalized Shipment Viewer to review finalized shipments.

For finalized shipments in the workbench or in the viewer, click Print to display Print Documents; then select the documents to print, enter the number of copies, select the printer, and click OK.

Note Only documents that have formats specified in the shipping configuration are available for printing. See “Shipping Configurations” on page 73.

Fig. 7.14
Print BOL and Packing Slips

Document Type	Document Id	Print Date	Print Time	Description
Shipment	BOL-000000033		0	
Packing	PS-000000058		0	

No of Copies: Printer:

Build and Ship Labels Cross-Reference

Use Operations|Packaging/Shipping|Build/Ship Labels Cross-Reference to associate production and shipping sequences.

When orders are packaged and shipped from the end of the production line, typically the sequence on the shipping label is the same as that on the production label. And since the sequence is the same, the WOLV and version are the same as well.

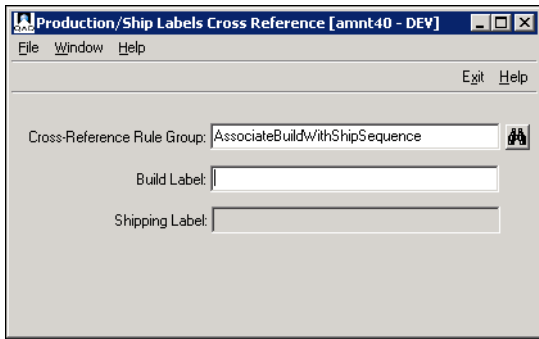
Alternatively, when orders are produced elsewhere or produced in JIT/S and held in a temporary storage facility, it is not as likely that the sequence is the same on the two labels. So when an order is retrieved from the storage facility, the WOLV or WOLV and version on its production label must be validated against that on the shipping label.

Use the AssociateBuildWithShipSequence rule group to set up a scanner for cross checking production and shipping sequences. There is one rule defined for the rule group: SHP-BuildInfoShipSequence. Use Setup|Processes|Rule Maintenance to specify values for the three rule parameters:

- **BuildLabelType:** If the production labels to be scanned are JIT/S production labels, specify the label type for the production labels. If a label type is not specified, scanned labels are considered to be non-JIT/S production labels.
- **ShipLabelType:** Specify the label type for the shipping labels to be scanned.
- **OverrideErrors:** Specify the string for overriding the *Same WOLV but different version* error

Label types are valid values for the label_type class code defined in Tools|System Data Tools|Class Code Maintenance. The build and ship types must be different.

Fig. 7.15
Build/Ship Labels Cross-Reference



When retrieving an order from storage for shipment, scan the production label; if no error is reported, scan the shipping label.

- For non-JIT/S production labels, the system records the production label and associates it with the ship order/sequence for traceability.
- For JIT/S production labels, JIT/S swaps the work order on the production label with the work order on the shipping label. This associates the built work order with the customer order on the shipping label that it is fulfilling.

When the production label and shipping label are validated, JIT/S associates the trace data captured against the build order with the shipping sequence/order.

- If the scanned labels do not match, you can override the error if the WOLV ID matches but the version is different.
- If the scanned production label or shipping label is not valid, JIT/S stops the scanning operation until you quit or scan a valid label.

BOL and MBOL Shipment Reporting

Use Operations|Packaging/Shipping|BOL Processing and MBOL Processing to maintain BOLs and MBOLs respectively.

Use the filter criteria at the top of the browse to determine the BOL records displayed:

- No criteria: All reported BOLs are displayed first by reported date and ID, followed by unreported BOLs by ID.
- Specifying a BOL displays only that record.
- Specifying Reported BOLs displays those BOLs by reported date and ID.
- Specifying Unreported BOLs displays only those BOLs by ID.

Reportability is determined by the shipping configuration associated with each BOL; see “Shipping Configuration Setup” on page 74.

Use choices from the Options menus to process selected BOLs:

- Create an MBOL and add the selected BOLs to it.
- Print the BOLs according to their specified formats.
- Report the BOLs as shipped to an ERP application. This creates an MBOL and assigns the selected BOLs to it, generates a report as shipped group number, and updates the reported date and time fields. Reporting is independent of actual shipping activity.

- Show the work orders assigned to the first selected BOL.

Fig. 7.16
BOL Processing

Field Descriptions

BOL Format ID. Enter a defined format ID. See “Document Format Maintenance” on page 192.

Trailer ID. Enter a vehicle ID for the transport. This is optional and not verified.

Driver Name. Enter the transport driver’s name. This is optional and not verified.

ETD Date, Time. Enter the estimated date and time of delivery. This is optional and not verified.

Freight Payment. Enter a freight payment method. The options are members of the Freight Payment Terms class code defined in Tools\System Data Tools\Class Code Maintenance. Freight payment is defined in Base\Addresses/Shipping/Transport Configuration Maintenance for the carrier but can be overridden here. See “Transport Configurations” on page 77.

Carrier ID. Enter a carrier ID that has a transport configuration record that suits the needs of the shipment. Carrier IDs are defined in Base\Addresses/Shipping/Carrier Maintenance. Through the SCAC ID on the carrier record, carrier IDs are linked in a one-to-many relationship to transport configurations defined in Base\Addresses/Shipping/Transport Configuration Maintenance.

Carrier defaults from the shipping configuration when the first package is added to the BOL if only one carrier is associated with the combination of ship-to and ship-from address.

The MBOL Processing browse displays MBOLs according to the filter criteria at the top of the browse:

- No criteria: All reported MBOLs are displayed first by reported date and ID, followed by unreported BOLs by ID.
- Specifying a MBOL displays only that record.
- Specifying Reported MBOLs displays those MBOLs by reported date and ID.
- Specifying Unreported MBOLs displays only those MBOLs by ID.

Use choices from the Options menu to process selected MBOLs:

- Report MBOLs as shipped to an ERP application. This reports each of the BOLs on the MBOLs as shipped. It is independent of the actual shipping activity.
- Unreport MBOLs as shipped reverses the shipment report for the selected MBOLs whether the reporting was automatic from the Shipping Workbench or manual from this Options menu.

Important JIT/S does not report this to the ERP application automatically; the ERP must be updated manually.

- Print the MBOLs according to their specified formats.
- Show the BOLs assigned to the selected MBOLs.

Fig. 7.17
MBOL Processing

MBOL Format ID. Enter a defined format ID. See “Document Format Maintenance” on page 192.

Packaging/Shipping and Canceled Orders

When a customer cancels a vehicle order, the packaging and shipping changes are determined by the current work order status and whether the order was pre-racked by the order processor.

- JIT/S cancels the customer order, product family order, and any related work orders that are not released.
 - Released work orders are converted to build-ahead work orders.
 - If the items from the work order have been packaged, the package must be opened and the canceled items removed.
 - JIT/S deletes the package and its associated data, creates a new package with status set to rebuild, copies the package information and the contents, and creates empty slots in the package. You can then repack the package.
- JIT/S considers the spaces in racks that held the canceled items are occupied by empty slots. Racks with empty slots can be completed because the expected count and current count match. The empty slot is associated with the packing sequence on the product order so that packaging validation rules work correctly.
- If the package is a rack where the slots have been assigned, the removed item is replaced with an empty slot. For non-segmented packages such as pallets, the removed item is replaced with an empty sequence.

If a work order has been shipped or is considered beyond the point-of-no-return, a cancellation error is generated and the package is not changed. The point-of-no-return status is specified by the pointOfNoReturn parameter value in the rule, OPCancelOrder. The valid values for the parameter are: scheduled, firmed, released, packed, and shipped. The default is shipped.

Note When a package is scrapped, all related data, package contents, content labels, and label header usage records are deleted from the system. Any package labels associated with the package are canceled. A record is logged to order/package logging if logging is enabled for the customer or product family.

Packaging/Shipping Character Interface

Use the character interfaces (CHUI) for the Packaging Workbench and the Shipping Workbench to build packages and shipments with a mobile, handheld scanner.

For packaging, scan production labels to signal adding the built item to a package. For shipping, scan package labels to signal loading the package onto the truck and adding it to the bill of lading (BOL) for the shipment. The scanned information is sent to JIT/S for validation and recording.

- Character Interface Log-In
- Character Packaging Workbench
- Character Shipping Workbench

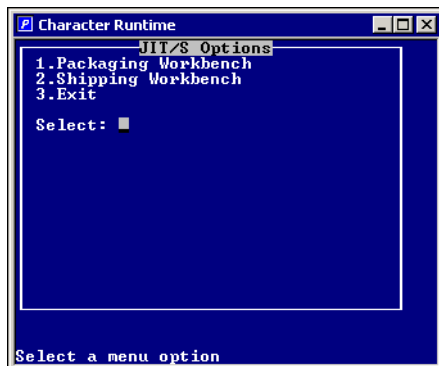
See *Installation Guide: QAD JIT Sequencing* for details on installing and configuring the character UI.

Character Interface Log-In

There is no screen-level security for the CHUI.

- 1 Start the scanner.
- 2 Initialize the connection to the JIT/S server.
- 3 Enter a user ID and password. When JIT/S validates the user ID and password, the scanner displays the menu:

Fig. 7.18
CHUI Interface Menu



- 4 Choose the workbench to open.

Character Packaging Workbench

Use the CHUI Packaging Workbench for the following:

- To add an item to a package by scanning the item's work order number or the label number from the item's work order build label
- To add a lower-level package to a container package by scanning the package label

When you scan the first item into a package, JIT/S enters the pre-rack size of the package or the default number of items for the package in the Expected Count field. See "Package Units" on page 106.

When you have scanned items such that Current Count matches Expected Count, JIT/S sets the package parameter `package_fill_status` to Complete and saves the package record.

To create a short-ship package, scan the required number of items into the package, change Expected Count to this number, then press Complete. This sets `package_fill_status` to Short Ship and saves the package record.

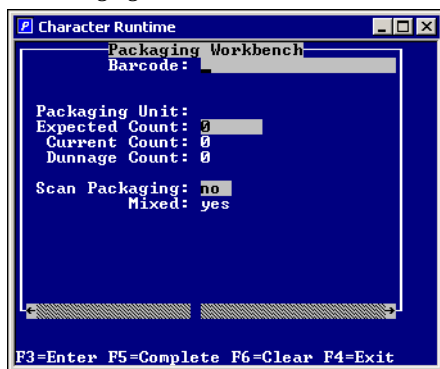
Press Clear to clear all items from the package without saving any data to the database.

To use the character Packaging Workbench, follow these steps:

- 1 Log in to the character interface. See "Character Interface Log-In" on page 342.
- 2 From the character interface main menu, choose Packaging Workbench.
- 3 Scan the item label; then, press Enter.

If a double scan type is specified for the item through its assembly unit in Base|Work Cell/Assembly Unit|Assembly Unit Tree Maint, Options|Packaging, you are prompted for the second scan.

Fig. 7.19
CHUI Packaging Workbench



Field Descriptions

Barcode. This field holds up to 4000 characters.

Expected Count. After you scan the first item, the system displays the pre-rack size of the package or the default number of items.

To short-ship a package, manually enter the number of units that you expect to load in this package. See "Short-Shipping Packages" on page 327.

Current Count. The application displays the number of items scanned for this package.

Dunnage Count. The application displays the number of package unit item IDs that have been scanned.

Scan Packaging. Selecting this field indicates that you are going to scan one or more package units for a barcode with the dunnage prefix. Each scanned dunnage barcode increments the dunnage count. On exiting Packaging Workbench, this setting is saved and reinstated when the same user ID restarts Packaging Workbench.

Mixed. Selecting this field indicates that items scanned for this package can have different item numbers. Leave this unselected to validate that all items in the package have the same item number—a master package. On exiting Packaging Workbench, this setting is saved and reinstated when the same user ID restarts Packaging Workbench.

Character Shipping Workbench

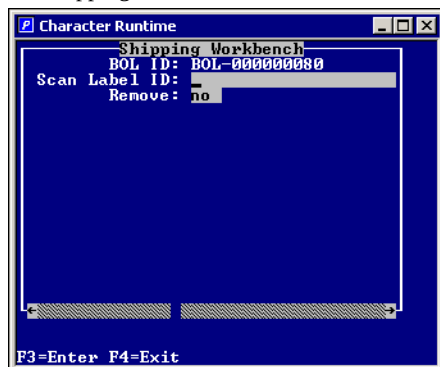
The character Shipping Workbench can be used only to scan package labels for adding packages to or removing packages from a shipment BOL that is already defined through the GUI interface. The procedure sends the label ID and the BOL ID to the server to be validated and added to the shipment. As in the GUI interface, JIT/S allocates the package to a packing slip based on the combination of shipping group and shipping configuration.

Use the JIT/S GUI Shipping Workbench for these other shipment-related tasks:

- Define or edit bills of lading. Bills of Lading and Shipments
- Edit packing slip details.
- Finalize shipments.

- 1 To use the character Shipping Workbench, log in to the character interface and choose Shipping Workbench from the CHUI menu options.

Fig. 7.20
CHUI Shipping Workbench



- 2 Enter the BOL number for the shipment; then press Enter to move to Scan Label ID.
- 3 Scan the package label.

- 4 Specify the action for the scanned package: Use the space bar to toggle between settings.
 - a To add the package to a shipment, set Remove Package to No.
 - b To remove the package from a shipment, set Remove Package to Yes.
- 5 Press Enter to have the label validated and the appropriate action taken for the package. JIT/S clears Scan Label ID in preparation for scanning another package into the current shipment.
- 6 To enter a new BOL number, press End in Scan Label ID.
- 7 Press End in BOL ID to return to the main menu.

Note When using the CHUI Shipping Workbench, if the GUI Shipping Workbench is open and displaying the BOL that you are scanning packages into, the BOL must be refreshed to display the scanned-in packages before you can finalize it. You can refresh the GUI Shipping Workbench by clicking the Refresh icon in the toolbar above the packing slip browse.

Monitors

Access four monitors from Operations|Monitors/Workbenches: COV, work order scheduling, released status, and in-transit work orders. Use them to view changes to records as they occur in real time in the system.

- Customer Order Version Monitor
- WO Scheduling Monitor
- Released WO Status Monitor
- In-Transit Order Monitor

Customer Order Version Monitor

Use Operations|Monitors/Workbenches|Cust Order Version Monitor to count customer order versions (COV) with various status values: new, recycle, error, dependency, and processed.

Enter a customer broadcast point ID—defined in Setup|Communications|Broadcast Point Maintenance—and date in the list boxes. Select each count you want to monitor; then click Refresh.

Fig. 7.21
Customer Order Version Monitor

You can choose to monitor COVs by status:

New. These are incoming COV records that are not processed.

Recycle. These are COVs that are recycled for reprocessing after an error has been corrected.

Error. This is the number of erroneous COV header records.

Dependency. This is the number of dependency errors. Dependency errors occur when the final processing of a COV depends on correcting an error condition in an earlier COV.

Processed. This is the number of processed orders that receive a status of P (processed). Orders that are skipped or rejected are not reflected in this count.

Configure the way the monitor works using these settings:

Loop/Start. When this option is selected, the monitor loops continuously with a pause of Pause Time minutes between runs.

Pause Time. This is the number of minutes between runs when the monitor is looping continuously.

Cust BP. Select the customer BP to monitor. When blank, the counts for all broadcast points are included in the count.

Received Date. Select the beginning received date to monitor. When blank, all received dates are included in the count.

WO Scheduling Monitor

Use Operations|Monitors/Workbenches|WO Scheduling Monitor to track the schedule status, by shippable assembly unit, for work orders from all broadcast points that are not yet in production.

For the specified shippable assembly unit and each selected status, the monitor returns the following:

- **CURRENT:** The number of orders currently in that status.
- **DELTA:** The number of changes to that status from the last refresh of the monitor.
- **PER SECOND:** The number of orders, per second, in that status.

Fig. 7.22
WO Scheduling Monitor

Brd. point	Current/Unscheduled	Current/Scheduled	Current/Firmed	Current/Released	Current/Hold	Delta/Unscheduled	Delta/Scheduled	Delta/Firmed	Delta/Released
Total	0	0	0	0	0	0	0	0	0
Build Ahead	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0
A	0	0	0	0	0	0	0	0	0
A1	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	0
2A	0	0	0	0	0	0	0	0	0
2B	0	0	0	0	0	0	0	0	0
2C	0	0	0	0	0	0	0	0	0
2D	0	0	0	0	0	0	0	0	0
2S	0	0	0	0	0	0	0	0	0
A4	0	0	0	0	0	0	0	0	0
B4	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
DT	0	0	0	0	0	0	0	0	0
C4	0	0	0	0	0	0	0	0	0
D4	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0
M1	0	0	0	0	0	0	0	0	0
N	0	0	0	0	0	0	0	0	0

Loop/Start. When this option is selected, the monitor restarts after a pause of Pause Time minutes.

Pause Time. This is the number of minutes between runs when the monitor is automatically restarting.

Order Scheduling Status check boxes. Use the check boxes to specify which order statuses to track:

- Unscheduled** Unscheduled is the default status when the order processor creates a work order.
- Scheduled** When the order scheduler rearranges the sequence of an order, the status is Scheduled.
- Firmed** When the order scheduler deploys the order to the work cell, the status is Firmed for production.
- Released** When the order scheduler releases the order for label printing, the status is Released for production. This is the highest status of an order.
- Hold** The order is on hold.

Released WO Status Monitor

Use Operations|Monitors/Workbenches|Released WO Status Monitor to track the production status by shippable assembly unit for work orders from all broadcast points.

For the specified shippable assembly unit and each selected status, the monitor returns the following:

- **CURRENT:** The number of orders currently in that status.
- **DELTA:** The number of changes to that status from the last refresh of the monitor.
- **PER SECOND:** The number of orders, per second, in that status.

Fig. 7.23
Released Work Order Status Monitor

Brd. point	Current Unproduced	Current Hold	Current WIP	Current Build	Delta Unproduced	Delta Hold	Delta WIP	Delta Build	Per sec Unproduced	Per sec Hold	Per sec WIP	Per sec Build
Total	0	0	0	0	0	0	0	0	0	0	0	0
Build ahead	0	0	0	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	0
A	0	0	0	0	0	0	0	0	0	0	0	0
A1	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	0	0	0	0
2A	0	0	0	0	0	0	0	0	0	0	0	0
2B	0	0	0	0	0	0	0	0	0	0	0	0
2C	0	0	0	0	0	0	0	0	0	0	0	0
2D	0	0	0	0	0	0	0	0	0	0	0	0
2S	0	0	0	0	0	0	0	0	0	0	0	0
A4	0	0	0	0	0	0	0	0	0	0	0	0

Loop/Start. When this option is selected, the monitor restarts after a pause of Pause Time minutes.

Pause Time. This is the number of minutes between runs when the monitor is automatically restarting.

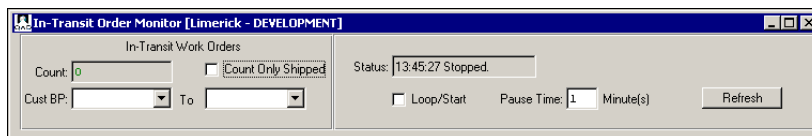
Order Production Status check boxes. Use the check boxes to specify which order statuses to track:

Unproduced	Production has not started on the work order.
Work in Process	The work order is currently being produced.
Hold	The work order is on hold.
Built	The work order has been completed in production.

In-Transit Order Monitor

Use Operations|Monitors/Workbenches|In-Transit Order Monitor to track work orders with shippable assembly units that are in-transit to the destination customer site. These orders have been shipped on a bill of lading but have not yet arrived at the customer site.

Fig. 7.24
In-Transit Order Monitor



Choose a from and to broadcast point in the two drop-down lists on the left. The system displays the number of orders in-transit between these points.

Cust BP. Enter the customer broadcast point that sends the ship signal for the shippable assembly units of interest.

To. Enter the customer broadcast point that sends the point-of-fit signal for the same shippable assembly units.

Count Only Shipped. Select to limit the count to shippable assembly units that have been shipped.

Workbenches and Order Swapping

Access two workbenches from Operations|Monitors/Workbenches: customer order version and work order. Workbenches provide a single access point for all functions and data that affect an operational area. Use the workbenches for defining related sets of records.

- Customer Order Version Workbench
- Work Order Workbench
- Work Order Swapping and Scrapping

Customer Order Version Workbench

Use the Operations|Monitors/Workbenches|Cust Order Version Workbench to review and maintain the processing of customer order versions (COVs) based on broadcast messages:

- *Filters:* Use filters to display records by the customer's order ID, the customer's broadcast points, or a range of sequence numbers.

- COV Record Browsers: Filter the records by up to three of the fields in the main browse.
- Errors and Dependencies: Review and respond to errors generated by an order processor. Review dependencies that occur when the final processing of a COV depends on correcting an error condition in an earlier COV.
- Orders and List Versions: Review PFO and WO list versions.
- Modify or view customer order version detail by double-clicking on an order in the Customer Order Versions browse. This displays Customer Order Version Maintenance.
- Order Sequence Insertions: Review order insertions.

Options Menu Choices

You can also select from the following choices on the workbench Options menu:

- Use Customer Order Version Monitor to count COVs with various status values.
- Use CO Version Details to display the customer order line (detail) records for the currently selected COV.
- Use View PFO List Versions to review the item and attribute lists for a product family (PF).
- Use View WO List Versions to review the item and attribute lists for a work order (WO).
- Use Manual COV Entry to create a COV manually when you need to create a COV for building items ahead or when the online broadcast communication lines are not available.
- Use Copy Customer Order Version to create a new COV record based on the currently selected record; for example, to correct an error.
- Use Delete Cust Order Version to delete a new COV that is corrupted or has errors. The COV status must be N (New) to delete it.

Filters

You can filter COV records in multiple ways. Any of these methods determines which records display in the main Customer Order Version browse.

- Use Locate to display records matching the entered customer CO number and customer broadcast point.
- Use Select to display the records defined by the sequence to and from fields.
- Use the field filters to limit the display by one to three field values.

Fig. 7.25
Customer Order Version Workbench

COV Number	Cust CO Number	Sequence Number	AR	Customer	Cust BP	COV Status	Numb
20060327-00002800-00000000	wy-11180	11180	(3) Creation	NODDY CORP	N	P	
20060327-00002700-00000000	wy-11180	11180	(3) Creation	NODDY CORP	N	P	
20060327-00002600-00000000	wy-11170	11170	(3) Creation	NODDY CORP	N	P	
20060327-00002500-00000000	wy-11160	11160	(3) Creation	NODDY CORP	N	P	
20060327-00002400-00000000	wy-11150	11150	(3) Creation	NODDY CORP	N	P	

Field Descriptions

COV Number. This ID is unique for the COV record.

Cust CO Number. This is the number that the customer uses for the order.

Version. This field identifies the version for the current Customer CO Number. When a Customer CO Number is received more than once for a BP, the version number increments.

AR Description. The latest action request and subscription for the COV displays. Action request is a class code defined in Tools|System Data Tools|Class Code Maintenance. Valid members of the class are defined in Options|Valid Members and include amendment, cancellation, creation, no change, replacement.

Customer. This ID identifies the customer that sent the order.

Cust BP. This is the customer's ID for a broadcast point. It is defined and linked to an internal broadcast point in Setup|Communications|Broadcast Point Maintenance.

COV Status. This field displays the process status of the COV. This can be one of the following:

N	New, not processed	R	Recycle
P	Processed	T	Temporary
D	Dependency	X	Manually Skipped Error
E	Error	XA	Auto Skipped Error

Sequence Number. This field displays the sequence number of the order at the transmitted broadcast point. See "Order Sequence Insertions" on page 352.

VIN Number. This is the vehicle identification number for the unit on the COV.

Transmission. This field identifies the transmission set in which the broadcast message that created the COV record was transmitted.

Items and # Errors. These fields displays the number of items and the number of errors generated for the COV when it was last processed by the order processor.

Received Date, Time. These are the date and time that the COV was received by the order receiver.

CO Type. This field displays a code identifying the type of customer order. Customer order type is SEQ for sequenced JIT orders.

Ordered Date, Time. These are the date and time that the COV was generated by the customer.

Due Date, Time. These are the date and time that the ordered goods are due at the customer site.

Current Brdp. This field displays the internal broadcast point associated with the COV message. Broadcast points are defined in Setup|Communications|Broadcast Point Maintenance.

Batch Qty. When customer order type is SEQ, batch quantity is 1; otherwise, the batch quantity of the batch order displays.

Key 1. This field is used by the order processor to store plant-specific information.

Customer Ship-To. This field displays the particular ship-to address associated with the customer for this COV.

COV Record Browsers

The main browse, Customer Order Versions, shows all of the COV records that match the specified filter and selection criteria.

The COV by Customer BP browse shows the COV records, from any customer broadcast point, that are associated with the highlighted COV record in the main browse.

In the main browse, use the four command buttons to manage how the system processes a COV:

Recycle	The relevant order processor processes this record again.
Recycle All	All order processors process this record again.
Move First	This record is first in the queue to be processed by the relevant order processor. Move First re-assigns a new COV Number to the order. The new number follows the last processed order with a status of P, X, S. The COV Number assigned increments the last two digits on the middle section by one (for example, 01, 02, 03, and so on). Only 99 orders can be moved between two existing COV Numbers.
Move First on All	This record is first in the queue to be processed by all order processors.

Errors and Dependencies

Information displays in these lists only when the selected COV has a process status of E (error) or D (dependency). When errors exist, right-click in the error browse to display a list of possible responses to the error. This list varies depending on the specific error, but may include options such as Skip, Reject, Accept, Ignore. Error responses are defined in Setup|Processes|User Response Maintenance.

Skip. Do not process the record but update the last good and bad sequence numbers so that subsequent orders will not be seen as sequence gaps.

Reject. Do not process the record and do not update the last good and bad sequence numbers. If you are doing sequence checking, then the next order will probably have a sequence error as well.

Accept. Process the current record again as if it were new. You would probably have changed something on the order before using this response.

Orders and List Versions

If the process status of the COV is P (processed), the product family orders and work orders—and their list versions—associated with the COV display in their respective browses. Double click on a PFO or WO to open that record in its appropriate maintenance screen.

Order Sequence Check

The standard order sequence check rule in JIT/s is used to check for sequence jump between two orders. The order processor has an integrated auto correct sequence module to try to automatically fix such issues. When a sequence jump occurs, it is possible that the expected sequence is loaded after (a user can load the missing sequence at any time) so that the Order Processor must check if the missing expected sequence was loaded. The order processor falls into the IN-ERROR state, but does not stop functioning. That way, an appropriate user can note that something is wrong. The current order is set to error with the sequence gap error message. Based on the action request parameter list value (Add, Amendment), the order processor tries to find the appropriate order to process. Once found, it places it next in the sequence to be processed and processes it. If the earlier order that was in error is the next in sequence for processing, its status changes to Unprocessed and it is processed normally without requiring any user action. Finally, the order processor status is set to RUNNING.

If an appropriate order to cover the sequence gap is not found, the order processor remains in the IN-ERROR status and will require user actions. If the user cannot manually load the missing sequence, the user must recycle the record previously in error in the COVH Wb using the appropriate response (Reject, Accept, Skip).

Order Sequence Insertions

An insertion occurs when a sequence number received at a broadcast point is less than the last processed sequence for the same broadcast point. When an order processor determines that a customer order version header (COVH) reflects a sequence insertion, it changes the action request to Insert. The order processor takes into account the last bad sequence and marks the inserted sequence as a dependency when appropriate.

JIT/S supports two sequence numbering schemes for insertions:

Scheme 1	Scheme 2
45	20
46	30
46.5	35
46.75	37
47	40
48	50
48.5	55

Whether an insertion is accepted depends on the status of the next-higher sequence. If the order with the next-higher sequence has a status that is not beyond the point-of-no-return status, the order processor accepts the insertion. The point-of-no-return status is specified by the `pointOfNoReturn` parameter value in the order processor rule, `OPValidateInsertion`. The valid values for the parameter are: scheduled, firmed, released, packed, and shipped. The default is shipped.

When an insertion is not accepted, the COVH workbench shows an error for the entire order.

Work Order Workbench

Use Operations|Monitors/Workbenches|Work Order Workbench to display the work order (WO) schedule for each assembly unit (AU).

Use the list boxes and check boxes to filter the existing WOs and specify which ones to display.

Use the buttons to modify the status of selected work orders.

- Use Release to release the selected orders for production. Orders must already be scheduled to be released in this manner.
- Use Hot Build to prioritize the sequence in which orders are scheduled. When you select a work order and click Hot Build, it is scheduled first. Each time that the order scheduler runs, it schedules the orders marked as hot build first regardless of the method or key that it is using to schedule orders. The browse displays the work orders marked as hot build first followed by the remaining orders in descending order of release.

Note Hot build is only effective for unscheduled orders.

- Use Auto Print to view and update the automatic print setting of printers assigned to the work cell for the selected WO. (Click Modify Record to make the Auto Print check box editable.) This setting is initially defined in Setup|Printers|Printer Maintenance and determines whether the system can print to the printer as part of a background process. When Auto Print is set to No, labels defined to print to this printer are not automatically printed.
- Use Build Manifest to specify the format, printer, and number of copies of the manifest to print for the selected work order. Define format IDs in Setup|Labels/Documents|Document Format Maintenance; set the format type to BUILD_MANIFEST.

In Base|Work Cells/Assembly Units|Assembly Unit Tree Maintenance, use Options|Assembly Unit Workbench Defaults to set the defaults for refresh time for Autorefresh and the number of racks displayed for each SAU. You can also specify whether these settings can be updated—Set Time button—in the workbench.

Use the right-click menu in the browse to specify the columns to display and other browse controls.

Note Package Info has the following format: package number: slot number (package status).

The browse at the bottom of the screen displays the relevant COV errors. Use Options|Cust Order Version Workbench to update COVs.

Fig. 7.26
Work Order Workbench

Work Order ID	Description	WOLV ID	Customer ID	Ship-To	PTO ID	Manual Order	Lot Build	Netted Out	Build Ahead
20060310-00010225-00000000	System Generated	00000729	Cust	CUSTSHIP	20060310-00007547-00000000	no	NO	no	no
20060310-00010294-00000000	System Generated	00000715	Cust	CUSTSHIP	20060310-00007546-00000000	no	NO	no	no
20060310-00010293-00000000	System Generated	00000726	Cust	CUSTSHIP	20060310-00007545-00000000	no	NO	no	no
20060310-00010292-00000000	System Generated	00000729	Cust	CUSTSHIP	20060310-00007544-00000000	no	NO	no	no
20060310-00010291-00000000	System Generated	00000715	Cust	CUSTSHIP	20060310-00007543-00000000	no	NO	no	no
20060310-00010290-00000000	System Generated	00000726	Cust	CUSTSHIP	20060310-00007542-00000000	no	NO	no	no
20060310-00010289-00000000	System Generated	00000729	Cust	CUSTSHIP	20060310-00007541-00000000	no	NO	no	no
20060310-00010288-00000000	System Generated	00000715	Cust	CUSTSHIP	20060310-00007540-00000000	no	NO	no	no
20060310-00010287-00000000	System Generated	00000726	Cust	CUSTSHIP	20060310-00007539-00000000	no	NO	no	no
20060310-00010286-00000000	System Generated	00000729	Cust	CUSTSHIP	20060310-00007538-00000000	no	NO	no	no
20060310-00010285-00000000	System Generated	00000715	Cust	CUSTSHIP	20060310-00007537-00000000	no	NO	no	no
20060310-00010284-00000000	System Generated	00000726	Cust	CUSTSHIP	20060310-00007536-00000000	no	NO	no	no
20060310-00010283-00000000	System Generated	00000729	Cust	CUSTSHIP	20060310-00007535-00000000	no	NO	no	no
20060310-00010282-00000000	System Generated	00000715	Cust	CUSTSHIP	20060310-00007534-00000000	no	NO	no	no
20060310-00010281-00000000	System Generated	00000726	Cust	CUSTSHIP	20060310-00007533-00000000	no	NO	no	no
20060310-00010280-00000000	System Generated	00000729	Cust	CUSTSHIP	20060310-00007532-00000000	no	NO	no	no
20060310-00010279-00000000	System Generated	00000715	Cust	CUSTSHIP	20060310-00007531-00000000	no	NO	no	no
20060310-00010278-00000000	System Generated	00000726	Cust	CUSTSHIP	20060310-00007530-00000000	no	NO	no	no
20060310-00010277-00000000	System Generated	00000729	Cust	CUSTSHIP	20060310-00007529-00000000	no	NO	no	no
20060310-00010276-00000000	System Generated	00000715	Cust	CUSTSHIP	20060310-00007528-00000000	no	NO	no	no
20060310-00010275-00000000	System Generated	00000726	Cust	CUSTSHIP	20060310-00007527-00000000	no	NO	no	no
20060310-00010274-00000000	System Generated	00000729	Cust	CUSTSHIP	20060310-00007526-00000000	no	NO	no	no
20060310-00010273-00000000	System Generated	00000715	Cust	CUSTSHIP	20060310-00007525-00000000	no	NO	no	no
20060310-00010272-00000000	System Generated	00000726	Cust	CUSTSHIP	20060310-00007524-00000000	no	NO	no	no

Sequence Number	COV Number	Error Type	Error Code	Error Info
2169 2005 222-00092500-00000000	WOP	58	SAME BFO/P (error): CO with Customer Order Number = N00-2160 found on 1	
2005 210 14420000-00001100	ADP	81	No items available. This order has 0 items. *** Error: ZOP/B1 Table: s	
2005 210 14420000-00001100	ADP	81	Sequence Error on COV with Order Number - Retrieved 1 Last Order 2 E.x	

Enter values in any of the following filter fields and then click Apply to refresh the displayed work orders.

Filter Field Descriptions

Ship-To. Enter the appropriate ship-to ID for the customer.

Product Family. Enter a product family name to see the work orders for those product family orders.

Shippable AU ID. Select a shippable assembly unit from the drop-down list. These are defined for a selected AU in Base|Work Cell/Assembly Unit|Assembly Unit Tree Maint, Options|Shippable AU Maintenance.

WOLV ID. Enter a WOLV ID to see all of the work orders with that WOLV assigned.

Date Filter Type. Select the type of date to use in the filter: Backflush, Canceled, Closed, Created, Planned, Production Start, Production End, Released, Reported as Shipped, Scrapped, Shipped, Updated.

Process Status. Enter the system-assigned process status of the work orders to display. This can be any of the following:

- U Unscheduled is the default status when the order processor creates a work order.
- N Not schedulable; for example, there is a dependency error.
- S When the order scheduler rearranges the sequence of an order, the status is Scheduled.
- F When the order scheduler deploys the order to the work cell, the status is Firmed for production.
- R When the order scheduler releases the order for label printing, the status is Released for production. This is the highest process status.

Production Status. Enter the system-assigned production status code of the work orders to display. This can be any of the following:

- U Unproduced: Production has not started on the work order.
- W WIP: The work order is currently being produced.
- B Built: The work order has been completed in production. This is the final production status.

Backflush Status. Enter the system-assigned backflush status of the work orders to display. This can be any of the following:

- U Unbackflushed.
- B Backflushed: The items for the work order and all associated assembly orders have been backflushed.

Pack Status. Enter the system-assigned packaging status of the work orders to display. This can be any of the following:

- U Unpacked: Packing has not started.
- P Packed: Packing is confirmed through a scan message.
- S Shipped: The BOL is finalized. Packages on an open BOL will not have shipped pack status.

Netted Out, Build Ahead, Hot Build, Hold, Canceled, Closed, In Repair, Scrapped. Select any of these fields if you want to include work orders that have that field selected or are set to that status.

Work Order Swapping and Scrapping

Occasionally, such as when an order is changed at a very late stage or a serious flaw is detected in an item, an order must be fulfilled with the output of another order.

To address these situations, select a work order to be swapped out in Operations|Monitors/Workbenches/Work Order Workbench, then choose Swap/Scrap Work Order from the Options menu to display the Swap/Scrap Work Orders screen. JIT/S displays an error if the selected order status is set to Not Released, Packed, Shipped, or Closed.

In the Swap/Scrap Work Orders screen, you can specify the source for a replacement order, the method for locating a donor order, the new status for the swapped-out order, and whether to replace labels for the swapped-out or donor order.

Trace data and test results remain with the work order that the data was collected against. All the swapping details are logged.

When scrapping a swapped-out order where the associated shippable assembly unit (SAU) is set up for milestone production reporting, the operation code and locations are used from the SAU if they are not available from the assembly unit where the order is scrapped. JIT/S sends a location transfer for each purchased item and milestone backflush for the quantity of each manufactured item on the work order.

When scrapping a swapped-out work order where the associated SAU is set up for backflush production reporting, JIT/S does not send scrap messages to the ERP application so the inventory must be adjusted manually in response to the scrap transaction.

Fig. 7.27
Swap/Scrap Work Orders

Work Order ID	WOLV ID	Version	Sequence Number	Batch ID	Sched	Build Ahead	Process Status	Production Status	Backflush Status	Pas

Field Descriptions

Hot Build. Select to create a hot build order to replace the swapped-out order.

Donor. Select to replace the swapped-out order with a donor order.

None – Scrap Only. If the selected swap-out order is a Build Ahead order, the Swap/Scrap Work Orders screen opens with None – Scrap Only selected. This is the only allowed action for a Build Ahead and only Build Ahead orders can be swapped out without replacement.

WOLV ID + Version. Select to display donor orders with the same WOLV ID and version.

WOLV ID. Select to display donor orders with the same WOLV ID.

Scrapped. Select to set the status for the swapped-out order to scrapped.

In Repair. Select to set the status for the swapped-out order to In Repair.

On Hold. Select to set the status for the swapped-out order to On Hold.

No Change. Select to retain the current status of the swapped-out order.

Reason Code. Enter the reason code to assign to this swapped out work order. Define scrap reasons as valid members of the class ScrapReasonCodes; see “Class Members Maintenance” on page 302. Set the default scrap reason on the shippable assembly unit; see “Shippable Assembly Units” on page 119.

Assembly Unit. Optionally enter the assembly unit where the work order is being scrapped. This is enabled only when the shippable assembly unit for the work order is set up for milestone reporting. See “Shippable Assembly Units” on page 119.

Donor Order. Select to regenerate labels for the donor order. Select the label type from the drop-down box.

Swapped-out Order. Select to regenerate labels for the swapped-out order. Select the label type from the drop-down box.

Order Swapping Task Steps

Replacing a Swapped-Out Order with a Donor Order

- 1 Select an order other than a Build Ahead order in the Work Order Workbench.
- 2 Select Options|Swap/Scrap Work Orders.
- 3 Select Donor as the replacement option.
- 4 Specify the search criteria for the donor order: WOLV ID + Version or WOLD ID.
- 5 Select the new status for the swapped-out order.
- 6 Click Find Donor to display the orders—by status—that match the search criteria. Orders display in this order in the browse: Build Ahead, WIP, Released, In Repair, On Hold, Packed.
If the status for the desired donor order is set to Packed:
 - a Use Operations|Packaging/Shipping|View/Rebuild Packages to unpack the package holding that order.
 - b Return to Swap/Scrap Work Orders and click Find Donor again.
- 7 Select one of the displayed orders and click Swap to complete the swap orders transaction.
 - If the donor order is pre-racked, the pre-racking information is also swapped between the orders.
 - If the donor order is a Build Ahead order, the swapped-out order becomes a Build Ahead order and the donor order is netted out.
 - If the donor order is a hot build order, it becomes associated with the CO and PFO for the swapped-out order. The hot build status is set for the swapped-out order and it becomes associated with the CO and PFO for the donor order.
- 8 If the donor order had been packed, use Operation|Packaging/Shipping|Packaging Workbench to repack the package that it came from.

Replacing a Swapped-Out Order with a New Hot Build Order

- 1 Select an order other than a Build Ahead order in the Work Order Workbench.
- 2 Select Options|Swap/Scrap Work Orders.
- 3 Select Hot Build to create a hot build order as the replacement order.
- 4 Select the new status for the swapped-out order.
- 5 Click Swap to complete the swap orders transaction.

The hot build order becomes associated with the customer order and the swapped-out order is set to Build Ahead.

Scraping an Order

- 1 Select an order in the Work Order Workbench.
- 2 Select Options|Swap/Scrap Work Orders.

If the selected order is a Build Ahead order, the Swap/Scrap Work Orders screen opens with None – Scrap Only selected in the Replacement Option. This is the only allowed action for a Build Ahead and only Build Ahead orders can be swapped out without replacement.

- 3 Enter a Scrap Details Reason Code.
- 4 Click Swap.

ASRS Overview

Use Operations|Monitors/Workbenches|ASRS Overview view the content of the automated storage and retrieval system (AS/RS).

Fig. 7.28
ASRS Overview

WOLV ID	Description	Shelf status	Area status	First Item In	Last Item In	Max Qty	Ave
0000000025		0CCP	ACTV		05-06-2008 06:02:01	0.00	
0000000025		0CCP	ACTV		05-15-2008 01:27:11	0.00	
0000000025		0CCP	ACTV		05-06-2008 06:02:01	0.00	

Filter Field Descriptions

Area Status. Specify the area status.

ACTIVE: Only show shelves of active cranes.

INACTIVE: Only show shelves of inactive cranes.

ALL: Show all shelves regardless of their statuses.

Shelf Status. Specify shelf status.

OCCP: Occupied

FREE: No pallet in shelf

ALDL: Allocated for retrieval

ALUL: Allocated for storing

EMPT: Empty pallet in shelf

STAP: Staple of empty pallets

ERRO: Shelf in error condition

Under the Shelf tab, view the content of a specific subset of shelves based on the filter criteria.

Under the Work Order List Version tab, view a summary of WOLV-IDs for the entire or filtered location.

Under the Bottleneck tab, view a requirement summary of WOLV-IDs between two broadcast points.

In the Shelf, Work Order List Version, or the Bottleneck view, you can use the Export icon at the lower right corner of the screen to export the displayed data into an MS Excel file.

Label Operations

This section covers the various label printing operations:

- Viewing, updating, and manually printing labels from a queue
- Populating a selected label format with manually entered data and printing the label with On-Demand Label Print
- Selecting and reprinting labels with Label Reprint that were lost or damaged
- Retrieving information about a label and optionally launching its related production program with Label Inquiry

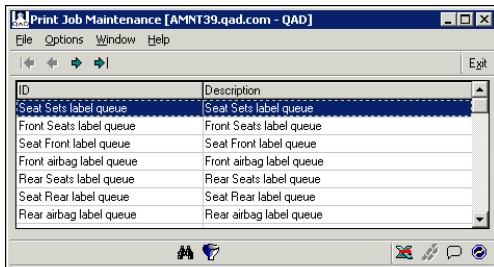
When errors occur during label operations, they are captured in `JITSInstallDir\log\Label_Engine\Exception.log`.

Print Job Maintenance

Use Operations|Labels|Print Job Maintenance to view and update print jobs submitted to a queue and to directly print labels from a queue.

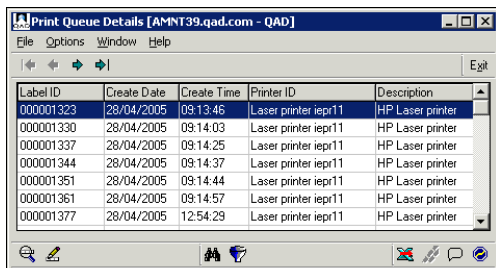
When you select Print Job Maintenance from the menu, a browse displays all of the print queues defined in Setup|Labels/Documents|Label Queue Maintenance.

Fig. 7.29
Print Job Maintenance



Select a queue and choose Options|Print Queue Details to display a browse listing all of the jobs currently in the queue.

Fig. 7.30
Print Queue Details Browse

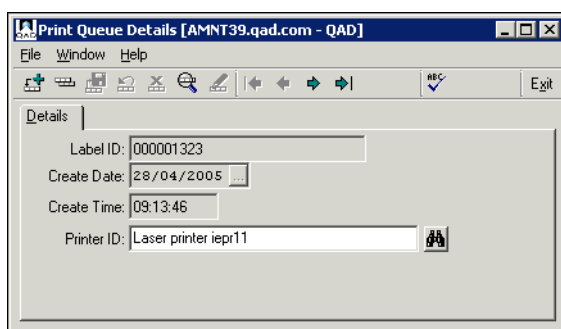


Select one or more labels for applying the Options menu choices:

- Choose Print Label to print selected jobs.
- Choose Cancel Label to remove jobs from the queue so that they will not print.

Select a record; then click Modify Record to open it for updating. The only field you can change for a submitted label print job is the destination printer.

Fig. 7.31
Print Queue Details



Printer ID. Enter the ID of the printer you want to use for printing this label. The system verifies that the paper size associated with the label format is the same as the size associated with the printer.

On-Demand Label Print

Use Operations|Labels|On-Demand Label Print to populate a selected label format with manually entered data and print this label after selecting a printer destination.

When you select this option on the menu, a browse displays all available label formats. Double-click a format to display a window for specifying data values for the variables associated with the label.

Fig. 7.32

On-Demand Label Print: Variable Maintenance

ID	Description	Data	Result
*QUANT	*QUANT	1	
BCT4_Packa	BCT4_PackageNumber	pkmf_packa	
BCT4_PkgLa	BCT4_PkgLabelSerial	gdmh_label	
BCT4_Shipp	BCT4_Shippable	pkmf_packa	
BCT4_ShipT	BCT4_ShipTo	shmf_ship_	

You can enter the data values directly in the Result column. Then choose Options|Select Printer to select the output device to use for the labels.

Fig. 7.33

On-Demand Label Print: Select Printer

Printer ID	Description
Intermec label printer	Intermec label printer

The system displays all available printers that have a paper size that matches the size associated with the label format. The paper size is associated with the printer in Setup|Printers|Printer Maintenance and with the format in Setup|Labels/Documents|Label Format Maintenance.

Select the printer you want to use and then choose Options|Print Label.

Label Reprint

Use Operations|Labels|Label Reprint to view, select, preview, and reprint labels that were lost or damaged. Selecting this option displays a list of printed and reprinted label records.

Fig. 7.34
Label Reprint

Table ID	Label Name	Label Detail Name	Label ID	Status	Copies	Created date & time	User full name	File Name
PKMFPCCKG	BCT1 Mixed Shippable PAU	BCT1 Mixed Shippable AU	000011915	Reprinted	1	28/09/2005 18:48:29		200509:
PKMFPCCKG	BCT1 Mixed Shippable PAU	BCT1 Mixed Shippable AU	000011916	Reprinted	1	28/09/2005 18:48:52		200509:
PKMFPCCKG	BCT1 Mixed Shippable PAU	BCT1 Mixed Shippable AU	000011917	Reprinted	1	28/09/2005 18:49:20		200509:
PKMFPCCKG	BCT1 Mixed Shippable PAU	BCT1 Mixed Shippable AU	000011918	Created	1	28/09/2005 18:49:37		200509:
PKMFPCCKG	BCT1 Mixed Shippable PAU	BCT1 Mixed Shippable AU	000011919	Created	1	28/09/2005 18:50:24		200509:
PKMFPCCKG	BCT1 Mixed Shippable PAU	BCT1 Mixed Shippable AU	000011920	Reprinted	1	28/09/2005 18:50:46		200509:

Use the various filters to limit the displayed records by:

From/To Date and Time. Enter a range of dates and times for selecting labels based on when they were last printed or reprinted.

Table ID. Select the table containing the key data printed on this label.

Label Configuration ID. Choose a label configuration record ID to display only labels that are associated with this printing configuration. These are defined in Setup|Labels/Documents|Label Printing Config.

Label Config Detail ID. This field is enabled only if the label configuration you have selected has label control detail records defined. Choose the ID of the detail record you want to use for selecting records to display. The detail records have values for format, printer, printer control program, and print queue.

Label Group. Choose a label group for selecting labels to display. Label groups are defined in Setup|Labels/Documents|Label Group Maintenance.

Printer. Choose a printer defined in Setup|Printers|Printer Maintenance for selecting labels to display. You can redirect the labels to another printer using the commands on the Options menu.

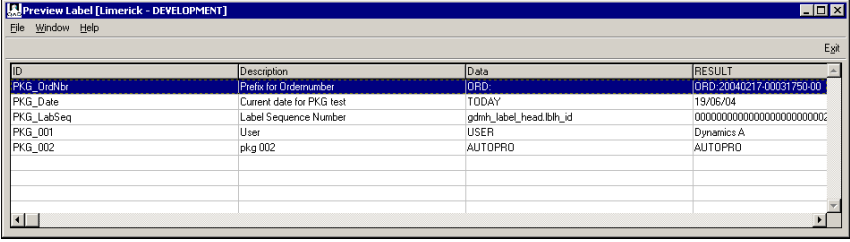
Use the choices on the Options menu for these tasks:

- Choose Label Detail to display any print control records defined for the label. These control records are used to define values that can be used by custom print programs.
- Choose Preview Label to display a list of the variables defined for the label format and the actual data that will be printed in their place.
- Choose Print Label to display a dialog where you can modify some label parameters and choose a different printer if needed.

Preview Label

When you choose Options|Preview Label, the screen in the figure below displays.

Fig. 7.35
Preview Label



ID	Description	Data	RESULT
PKG_DistNbr	Prefix for Ordernumber	ORD	ORD:20040217:00031750:00
PKG_Date	Current date for PKG test	TODAY	19/05/04
PKG_LabSeq	Label Sequence Number	gdrnh_label_head.blh_id	00000000000000000000000000000000
PKG_001	User	USER	Dynamics A
PKG_002	pkg 002	AUTOPRO	AUTOPRO

Review the data to ensure the results are what you expect before reprinting.

Print Label

When you choose Options|Print Label, the screen in the figure below displays.

Fig. 7.36
Reprint Labels

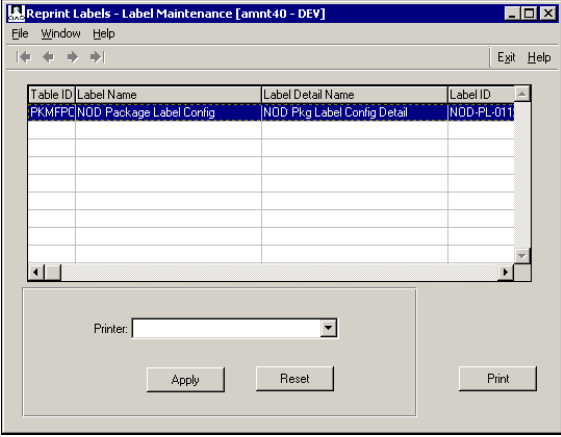


Table ID	Label Name	Label Detail Name	Label ID
PKMFPCNOD	Package Label Config	NOD Pkg Label Config Detail	NOD-PL-011

Printer:

Apply Reset Print

When a label format is defined in Setup|Labels/Documents|Label Format Maintenance, an optional start and end label can be defined. These are used when the initial and final label in a group requires special setup or processing. If the format of the label you are printing includes start and end labels, you can choose to print them when you reprint this label.

You can also select a different printer as needed. The system verifies that the paper size associated with the label format is the same as the size associated with the printer.

Label Inquiry

Use Operations|Labels|Label Inquiry to retrieve information about a label and optionally launch its related production program.

This function might be used, for example, for a misplaced label. You can scan the label and click Fetch Info. The system then retrieves and displays the label format and description.

Fig. 7.37
Label Inquiry

If you need further information, you can launch the program that is associated with the activity that generated the label by clicking Launch Utility.

By default, the following programs display depending on the type of label that is scanned:

- For a production label, Assembly Order Maintenance displays.
- For a package label, View/Rebuild Package displays.
- For a work order label, Work Order Maintenance displays.

Label Status

Label status is set during JIT/S processing, such as in the Alternative Packaging Workbench.

Labels can have the following statuses:

- Created: The label has been created successfully.
- Printed: The label was printed successfully.
- Cancelled: A JIT/S process cancelled the label.
- Replaced: The label was replaced by another label through a JIT/S process.
- Error: The label has encountered an error - possibly due to an improperly formatted label query.
- Reprinted: The label has been reprinted. See “Label Reprint” on page 362.

Trace Data

Traceability data from the shop floor and tests for functionality—torque level, lot/serial numbers, and so on—are defined as named attributes for assembly units and attribute values for items. The resulting data is passed through APIs to JIT/S for processing and validation; valid data can be reviewed in Trace Data Viewer along with double-scan records from the packaging functions.

See “Test and Trace Data” on page 85 for information on defining and assigning tests to items and assembly units.

On the shop floor, programmable logic controllers (PLC) or other test application systems pass test results and lot trace data to JIT/S for import. The rules assigned to the VALIDATE_TEST_DATA rule group validate and record the test results or lot trace data. See “Rule Group Maintenance” on page 145.

If errors occur during processing, the rule determines if the results are logged and/or stored in the database when the rule fails. The process returns an error message if any of the rules reported an error.

Use Operations|Trace Data|Trace Data Viewer to view history data maintained in the system for any type of order. You designate the order type based on the table where data is stored (Owning Entity). This is a multipurpose viewer that provides access to multiple types of data, including trace data, verifiable tests, non-verifiable tests, and double-scan records.

Fig. 7.38
Trace Data Viewer

Seq. Number	Order Number	Vin Number	Status	Reason	Test Category	Test	Line	Created Date	Created Time	Operator	Sta
7630/7680	7470	1			LabelSerialScan	000022022		1/06/03/2006	18:10:56	BC	
9030 0000009030	7470	1			LabelSerialScan	000022013		1/06/03/2006	18:10:18	BC	
9030 0000009030	7470	1			LabelSerialScan	000022006		1/06/03/2006	18:08:53	BC	
9010 0000009010	7470	1			LabelSerialScan	000022001		1/06/03/2006	18:08:27	BC	
9010 0000009010	7470	0			BCT4 Front Seats	BadADWBSscan		2/06/03/2006	18:08:17	BC	
9010 0000009010	7470	0			BCT4 Front Seats	BadADWBSscan		1/06/03/2006	18:08:00	BC	
6960 0000006960	6810	1			LabelSerialScan	000021995		1/06/03/2006	18:07:43	BC	
0		1			LabelSerialScan	000021857		2/06/03/2006	17:55:52	BC	
0		1			LabelSerialScan	000021857		1/06/03/2006	17:55:38	BC	
8150 0000008150	6810	1			LabelSerialScan	000021752		1/06/03/2006	17:47:46	BC	
8750 0000008750	8750	1			LabelSerialScan	000021734		1/06/03/2006	17:47:10	BC	
1060 0000001060	1060	1			LabelSerialScan	000021719		1/06/03/2006	17:45:20	BC	
1030 0000001030	1030	1			LabelSerialScan	000021715		1/06/03/2006	17:45:02	BC	
0		0			BCT4 Front Seats	BadADWBSscan		3/06/03/2006	17:35:51	BC	
0		0			BCT4 Front Seats	BadADWBSscan		2/06/03/2006	17:35:44	BC	
0		0			BCT4 Front Seats	BadADWBSscan		1/06/03/2006	17:35:40	BC	
0		0			BCT4 Front Seats	BadADWBSscan		6/23/02/2006	17:53:21	BC	
0		0			BCT4 Front Seats	BadADWBSscan		5/23/02/2006	17:53:16	BC	
0		0			BCT4 Front Seats	BadADWBSscan		4/23/02/2006	17:52:43	BC	

The Trace Data Viewer includes the following fields:

Status. Displays the status of the test. 1 = Passed, 0 = Failed.

Test Category. Displays the Attribute Name assigned to this test data. A blank test category indicates that the record is from a required double-scan during the packaging functions.

Test. Displays the Attribute Value for the test data or the type of double-scan data collected.

Engineering Data. This column contains the actual value received or scanned in JIT/S for the record. It could be a torque value for a verifiable test, a serial number for a trace data requirement, or an item number for a packaging double-scan.

Replenishment

Operations|Replenishment has menu choices for item-based picking from item shopping lists and attribute-based picking for work cells.

- Shopping List Workbench
- Review Active and Inactive Shopping Lists
- Update Items Lists

- Shopping List Picking
- Work Cell Picking Workbench

Shopping List Workbench

Use Operations|Replenishment|Shopping List Workbench to review and update lists. Use the Print button as needed to print shopping lists.

Shopping lists are used in replenishment, the shop floor activity that supplies the production line with components. In response to sequenced demand, the replenishment process picks components from a storage location and delivers them to the consumption point on the production line. Shopping lists can print automatically when they are full or when they exceed their defined time limit.

The workbench has three shopping list-related browses, a shopping list properties view area, and a shopping list entries maintenance area. The browse at the top right of the screen displays the relevant COVH errors. Use Options|Cust Order Version Workbench to update COVs.

The configuration browse displays the shopping list configurations defined in Base|Work Cell/Assembly Unit|Shopping List Maintenance. The shopping list browse displays shopping list instances, and the shopping list details browse displays items.

Note For scrolling, the keyboard arrow keys apply to the browse that currently has focus.

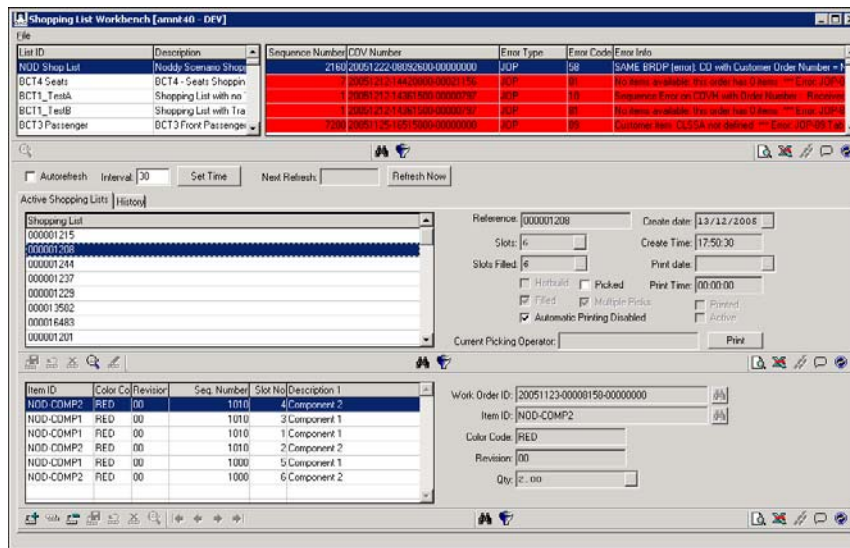
Review Active and Inactive Shopping Lists

Selecting a shopping list configuration from the configuration browse displays the instances of that configuration in the shopping list browse. Active lists display on the Active Shopping Lists tab; inactive lists display on the History tab.

The number of active lists displayed is Buffer Size/Cart Slots from Shopping List Maintenance. The number of inactive lists displayed is determined by the value for History List to Display in Shopping List Maintenance. Inactive lists that have not been printed have a yellow background.

Note If an error is logged against a shopping list, the list displays on red. An inactive shopping list that was printed without being filled displays on yellow.

Fig. 7.39
Shopping List Workbench



Selecting an active or inactive shopping list in the shopping list browse displays the items and components for that list in the shopping list details browse and enables the Print button and Automatic Printing Disabled.

The properties view displays the following data for the selected shopping list:

Shopping List ID. The unique ID for the list instance.

Slots. The number of slots on the cart.

Slots Filled. The number of slots filled.

Hot Build. If this is selected, the shopping list was created as a hot build list for a work order that is marked as hot build.

Filled, Printed, Active. Any of these that are selected are true.

Automatic Printing Disabled. Select to disable automatic printing of shopping list instances filled or beyond their defined time-out period.

Create Date, Create Time. This is the date, time that the list was started.

Print Date, Print Time. This is the date, time that the list was printed.

Picked. For hand-picked lists, select this field to indicate that the list is picked. The system selects Picked when a list is completely picked through scanning in Shopping List Picking.

If, for any reason, you cannot complete picking a shopping list and need to move on to the next one, manually select Picked to mark the list as complete. Alternatively, if for some reason you need to repick a list, manually deselect Picked to make a list eligible for picking again.

Current Picking Operator. The system displays the login ID for the user who is using Shopping List Picking to pick the selected list. This field is enabled for only that user; for all others, it is a read-only field.

If picking for the list is interrupted before it is complete, only the current picking operator can clear this field, making the list again available for picking.

Update Items Lists

Selecting an active or inactive shopping list in the shopping list browse displays items and components for that list in the shopping list details browse. The shopping list entries editor displays data for selected item in the details browse. Select Add Record to open these fields for data entry:

Work Order ID. Select the work order that the shopping list is being built against.

Item ID. Select the item from the browse to add to the shopping list. Define item IDs in Base|Items|Item Maintenance.

Color Code. Enter the color code for the selected item. Define color codes in Base|Items|Color Code Maintenance.

Revision. Enter the revision level for the selected item. Define revision levels in Base|Items|Revision Level Maintenance.

Qty. Enter quantity of the selected item required for this shopping list.

Shopping List Picking

Shopping list picking supports the pull replenishment process between the bulk storage locations and the line-side storage locations. You can pick the items for a shopping list with a scanner or by hand from a printed copy of the list.

For hand picking, when you print a shopping list from Shopping List Workbench, the system moves the list to History. When all items for the shopping list are picked, you can, optionally, select Picked in Shopping List Workbench to indicate that the list is complete.

For scanner picking, when all items for the shopping list are picked, the system marks the list as picked and moves it to History in Shopping List Workbench. Multiple users can pick from the same shopping list configuration if Allow Multiple Picks is selected in Base|Work Cell/Assembly Unit|Shopping List Maintenance.

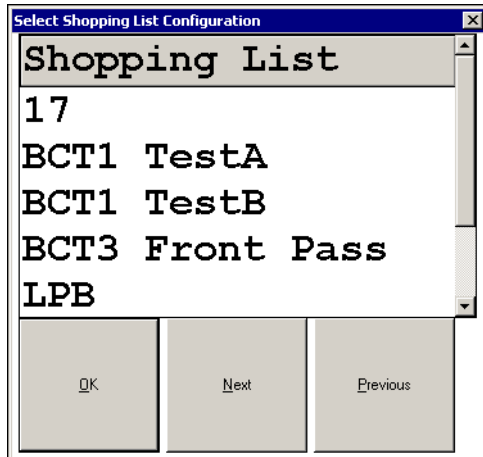
When scanner picking, before the application accepts a scanned item as picked, it runs validations from the rule group selected in Shopping List Maintenance; for example, rules for barcode validation that are members of the validatePicking rule group:

- An item record must exist that matches the elements—item ID, revision level, and color ID—in the barcode.
- For item numbers with multiple elements, the elements must be in the order specified in the BARCODE_ORDER parameter for the validateDelimitedBarcode or validateFixedBarcode rule.
- For item numbers where the multiple elements are separated by a delimiter, the delimiter must match the value for the PART_DELIMITER parameter for the validateDelimitedBarcode rule. Also, the overall length of the barcode must be less than or equal to the value of totaldelimitedlength in config.xml.
- For item numbers where the multiple elements are not separated by a delimiter, the overall length of the barcode must be equal to the sum of the values of partidlength, colorlength, and revisionlength in config.xml.

Use Operations|Replenishment|Shopping List Picking to record the picking of the items on a shopping list with a hand-held scanner.

- 1 Enter your user ID and password.

Fig. 7.40
Select Shopping List Configuration



- 2 Select a shopping list ID in the Shopping List Configuration window that is not being picked by another user; then, press OK. JIT/S displays the oldest, unpicked shopping list for that configuration; that is, the next shopping list to be picked, based on the build sequence for released work orders.

Note If Allow Multiple Picks is selected in Shopping List Maintenance, multiple users can pick for a shopping list configuration simultaneously.

- 3 Scan the item label for the first item on the shopping list. When you have scanned the appropriate quantity for the line, the display indicates that the item has been picked.
- 4 Scan each of the remaining item labels in the order shown in the Seq. Number column. JIT/S validates that the picked item was the next item to be picked.

Fig. 7.42
Work Cell Picking Workbench

Released	Serial Rel.	Sequence	Description
591		22202	Airbag :Airbag Style :
591		32010	Airbag :No Airbag Style :
591		42200	Airbag :No Airbag Style :
591		52201	Airbag :Airbag Style :
591		62203	Airbag :Airbag Style :
595		12206	Airbag :Airbag Style :
595		22204	Airbag :Airbag Style :
595		32205	Airbag :Airbag Style :
595		42207	Airbag :Airbag Style :
596		16100	Airbag :No Airbag Style :
596		26110	Airbag :No Airbag Style :
596		36120	Airbag :No Airbag Style :
596		46140	Airbag :No Airbag Style :
605		42240	Airbag :No Airbag Style :

Page Up

Page Down

Get next batch

Run Scheduler

Reprint list

Display 15

BCT4 Sea

This screen is designed to be used on the shop floor with a touch-screen terminal. Use the command buttons as follows:

- Use Page Up and Page Down to navigate through the displayed records.
- Use Run Scheduler to start the order scheduler process from the workbench. This is the same as starting it in Setup|Processes|Process Maintenance.
- Use Get Next Batch to retrieve the next batch of sequences to display on the screen. This is also the signal to print the picking list.
- Use Reprint List to reprint picking reports. This generates a report and loads for display.
- Use Display Rows to specify the number of rows to display for each batch.

Printing Picking Lists

Both Get Next Batch and Reprint List trigger the printing of a picklist. How this list is formatted for print depends on a setting in the system configuration file (`config.xml`). The picking list `exportMode` setting can be Crystal, indicating that the print request is managed by Crystal Reports, or Excel, indicating that an Excel template is used.

When `exportMode` is Crystal, two other settings in `config.xml` are used to manage the printing:

- `xmlDsn` is the name of an XML data source file that determines the formatting instructions to use.
- `xmlFile` is the name of the file containing the picking list data to be formatted and printed. By default this is:

```
JITSInstallDir\PickingList\pickingList.xml
```

Reports

Access reports from Operations|Reports:

- JIT Sequence Report
- WO List Version Detail Report

- Ordered Items Report
- Order Aging Report
- Open Orders Report

JIT Sequence Report

Use Operations|Reports|JIT Sequence to generate a report of sequenced work orders between two broadcast points.

Fig. 7.43
JIT Sequence Report

Starting Cust BP Point. Enter the customer broadcast point where you want the report to start.

Item Cust BP Point. Enter the last broadcast point to identify the range of sequences to report.

Customer CO Number. Enter the customer order number.

Date Received From, To. Enter a range of dates/times for selecting broadcasts to report.

Sequence From, To. Enter a range of sequence numbers to report.

WO List Version Detail Report

Use Operations|Reports|WO List Version Detail to display a list of all work orders with an unpacked and unshipped status.

Fig. 7.44
WO List Version Detail

Work Order ID	Description	Batch Serial Sched	Batch Qty	Release Order	Process Status	Produ
20040629-00000215-00000000	System Generated	0	1	0 U	U	
20040629-00000214-00000000	System Generated	0	1	0 U	U	
20040629-00000213-00000000	System Generated	0	1	0 U	U	
20040629-00000212-00000000	System Generated	0	1	0 U	U	
20040629-00000211-00000000	System Generated	0	1	0 U	U	

Ordered Items Report

Use Operations|Reports|Ordered Items to display items ordered by a customer and sequence range at a particular broadcast point. The filter criteria can also include product family, shippable assembly unit, and Canceled or On Hold orders. There are options for the data to display: customer item, internal item, or work order list version.

The report can be generated while the processes such as order receiver and order processor are running; it does not lock records and it does not access archived records.

Fig. 7.45
Ordered Items Report

The screenshot shows the 'Ordered Items Report' window with the following details:

- Selection Criteria:**
 - Customer ID: NODDY CORP
 - Broadcast Point: NOD
 - Ship-To ID:
 - Product Family:
 - Shippable AU ID:
 - Start Sequence: 8575, Start Sequence Date: 02/03/2006
 - End Sequence: 8700, End Sequence Date: 03/03/2006
 - ☐ Include Canceled Orders, ☐ Include On Hold Orders
- Data To Display:**
 - ☐ Customer Item
 - ☐ Internal Item
 - ☒ WOLV ID and Version
 - ☒ WOLV Attributes
- Table:**

Customer ID	Product Family	Shippable AU ID	WOLV ID	Version	Description	Qty	Attribute Name	Valid Value
NODDY CORP	NOD BUMPER	NOD Bumper Shippable AU	00000782	00000001	W-NA	5	SPN	1
NODDY CORP	NOD BUMPER	NOD Bumper Shippable AU	00000740	00000002	W-NA	8	NUDCOLOR	White
NODDY CORP	NOD BUMPER	NOD Bumper Shippable AU	00000751	00000001	P-NA	2	NUDCOLOR	White
							SPN	A
							NUDCOLOR	Pink

Order Aging Report

Use Operations|Reports|Order Aging to display orders that have been received at one broadcast point but not received at a specified subsequent broadcast point within a specified time limit. This gives a measure of how long orders have been in the system and which ones may require investigation. Select Canceled Orders to include canceled orders in the report.

The report can be generated while the processes such as order receiver and order processor are running; it does not lock records and it does not access archived records.

Fig. 7.46
Order Aging Report

Broadcast Point	Interval(Hours)	Count	Customer CO Number	Age(Hours)	Sequence Number	Received Date	Product Family	Shippable AU ID	WOLV ID
C4	10	5	000006770	3250	6790	18/10/05	PF2	BCT4 Carpet Shippable Info	00000726
							PF1	BCT4 Seat Sets Shippable Info	00000725
							PF3	BCT4 Facias Shippable Info	00000715
			0000007170	2416	7180	22/11/05	PF1	BCT4 Seat Sets Shippable Info	00000729
							PF3	BCT4 Facias Shippable Info	00000715
			0000007180	2415	7190	22/11/05	PF2	BCT4 Carpet Shippable Info	00000726
							PF1	BCT4 Seat Sets Shippable Info	00000729
			0000007190	2415	7200	22/11/05	PF2	BCT4 Carpet Shippable Info	00000726
							PF3	BCT4 Facias Shippable Info	00000715
							PF1	BCT4 Seat Sets Shippable Info	00000729
							PF2	BCT4 Carpet Shippable Info	00000726
							PF3	BCT4 Facias Shippable Info	00000715
			Cust 9000	303.1	9000	18/02/06	PF2	BCT4 Carpet Shippable Info	00000726
							PF3	BCT4 Facias Shippable Info	00000715
							PF1	BCT4 Seat Sets Shippable Info	00000729

BP1. Enter a lower broadcast point to start at.

BP2. This must be a higher broadcast point than BP1.

Order Age. The order age can be displayed by days or hours. You can add Multiple Intervals for each. Data is displayed according to the interval selection. For example, if you have five orders that are four days old and three orders that are nine days old, you can set Day intervals of 5 and 10. The five orders will show under the 5 day interval and the three orders will show under the 10 day interval.

Open Orders Report

Use Operations|Reports|Open Orders to display orders that match the filter criteria and have not had status set to Shipped or Closed. Data can be displayed by product family, shippable assembly unit, or work order list version.

The report can be generated while the processes such as order receiver and order processor are running; it does not lock records and it does not access archived records.

When data is displayed using the Shippable AU and WOLV ID version options, orders for some SAUs and WOLVs can be displayed although they have been shipped. SAU and WOLV records for those PF Orders are displayed with a Packed Status of S#, meaning that the PFO was partially shipped.

Fig. 7.47
Open Orders

Product Family	Customer CO Number	Sequence Number	Created Date	Created Time	VIN Number	Process Status	Production Status	Backflush Status	Pack Status	Cust BP
1000	BCT1005610	5620	02/03/2006	12:24:38	5000	R	U	U	U	D
1000	bct1005600	5600	13/02/2006	11:51:09	5000	R	U	U	U	D
1000	BCT11005430	5430	24/01/2006	19:19:10	5000	R	U	U	U	D
1000	BCT11005420	5420	24/01/2006	19:17:08	5000	R	B	B	P	D
1000	BCT11005410	5410	24/01/2006	19:13:01	5000	R	U	U	U	D
1000	BCT1005400	5400	17/01/2006	11:49:26	5000	R	B	B	P	D

Production Utilities

The production utilities include:

- Scanner Startup
- Build-Ahead/Net/Safety Quantity

Scanner Startup

Use Operations|Production Utilities|Scanner Startup to start a scanning process set up with Setup|Processes|Scanner Maintenance. For setup information, see “Setting Up Scanners” on page 158.

Fig. 7.48
Scanner Startup

Scanner Name	Description
Backflush Scanner	
15RT-Scanner	

Highlight the scanner you want to start and click Choose. The window that displays depends on the value associated with the scanner in Tools|Development Tools|System Controls.

Fig. 7.49
Scanner Screen

Date scanned	Time	Scan good	Scan Value	Sequence	Status	Scanner Name	Description	Username
21/03/2006	11:06:30	yes	000022620		Released	Backflush Scanner		admin
21/03/2006	11:05:57	no	000022625		Released	Backflush Scanner		admin
21/03/2006	11:04:45	no	000022630		Released	Backflush Scanner		admin
20/03/2006	20:49:35	yes	000022662		Released	Backflush Scanner		admin
20/03/2006	20:48:06	yes	000022680		Released	Backflush Scanner		admin
20/03/2006	20:38:44	yes	000022685		Released	Backflush Scanner		admin
20/03/2006	20:11:41	yes	000022680		Released	Backflush Scanner		admin
20/03/2006	20:05:24	yes	000022685		Released	Backflush Scanner		admin

Always use the Exit button to close the scanner screen. Not clicking the Exit button can result in the scanner retaining a lock. Based on scanner function, a user ID and password may be required to exit.

Build-Ahead/Net/Safety Quantity

For WO list versions, use Operations|Production Utilities|Build-Ahead/Net/Safety Qty to review current build-ahead and nettable quantities and to update safety stock quantities.

Note In response to a customer order cancellation or an amendment to an existing released order, the order processor changes scheduled and released orders to build-ahead orders. Use Operations|Lists/Orders|Work Order Maintenance to manually specify whether a work order can be used for built-ahead or nettable items.

Select Build-Ahead Work Orders from the Options menu to view build-ahead work order records.

Use the Description field and Refresh button to filter the WO list versions display.

Fig. 7.50
Build-Ahead/
Net/Safety Qty Records

W/DLV ID	Description	Qty Current Mix	Build-Ahead Qty	Nettable Qty	Safety Stock	Qty Received Cum	Qty Build Cum	Qty Shipped Cum
00000713	LNA	0	2.00	0.00	3.00	0	0	0
00000714		0	6.00	2.00	40.00	0	0	0
00000715	YFNS	0	9.00	2.00	40.00	0	0	0
00000716	-F...	0	1.00	0.00	0.00	0	0	0
00000717	--LYANYC	0	0.00	0.00	0.00	0	0	0
00000718	102NYC	0	0.00	0.00	0.00	0	0	0
00000719	NYC	0	0.00	0.00	0.00	0	0	0

The Qty Current Mix, Qty Received Cum, Qty Build Cum, and Qty Shipped Cum are not currently used.

System Build-Ahead Quantity. This is the number of build-ahead orders currently in the system for the selected WO list version. It is the total of system- and user-created build-ahead orders. This quantity is incremented when an order for the WO list version is marked as build-ahead and decremented when an order is netted out.

Nettable Quantity. This is the number of nettable build-ahead orders currently in the system for the selected WO list version. This quantity is incremented when an order for the WO list version is marked as nettable and decremented when an order is netted out.

Safety Stock. Enter the number of orders for this WO list version that should be build-ahead but not nettable.

To specify a safety stock quantity for a WO list version, select the record and click Modify Record.

Fig. 7.51
Build-Ahead/Net/Safety Qty

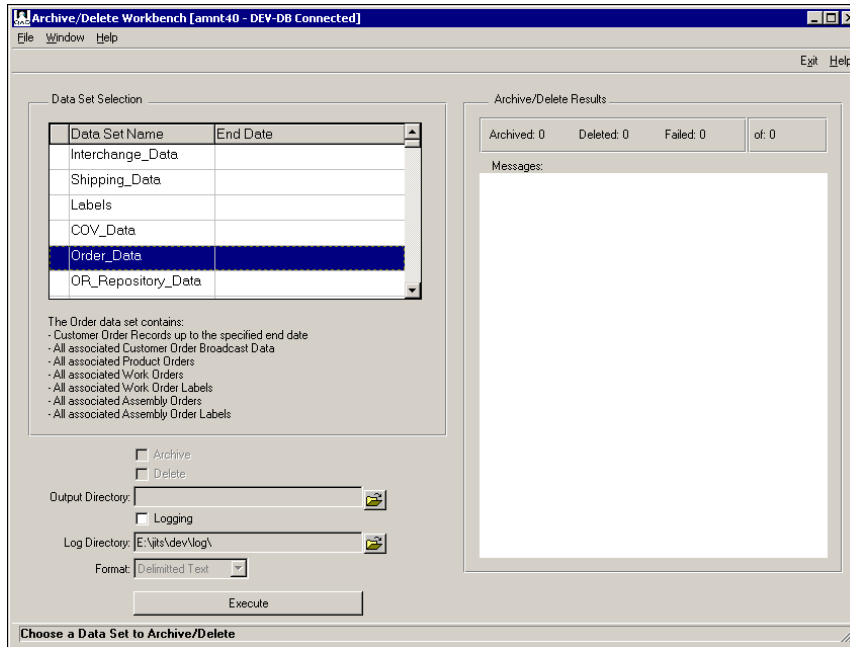
Archive/Delete Workbench

Use the Archive/Delete Workbench—accessed through a separate JIT/S client, *GUI client for JITSARCH*—to archive or delete records in JIT/S, such as log files, internal and external label files, trace data, test results, customer order information, and transaction information. There is no provision to return archived data to JIT/S.

Because of significant impact on system resources, this workbench should be used only during production down time or when there is very little activity. There are also contention issues; for example, a log file cannot be deleted while JIT/S is writing to it.

Note See “Redundant Broadcast Point Data” on page 138 for information on deleting redundant COV data.

Fig. 7.52
Archive/Delete Workbench



Field Descriptions

Archive. Select to store the selected datasets in the specified file format on the specified output directory. This enables the Output Directory and Format fields.

Delete. Select to delete the selected data sets. This is independent of archiving.

Output Directory. Enter the target directory for the archive files.

Logging. Select to log the archive and delete processing. This uses significant resources and can affect performance.

Important If this is selected, the resulting file can be quite large and should be cleared frequently.

Log Directory. Enter the target directory for the log files.

Format. Select the format for the archive files: delimited text or XML. When the delimited text format is used, you can open and review the archived files for historical data using Excel. To do so, change the file extension to csv.

Task Steps

- 1 Run the JIT/S Archiving runtime client to display the Archive/Delete Workbench.
- 2 Select data sets. Place the cursor in the cell to the left of the desired data set. Select to enable the check box; select again to mark the data set for processing.
- 3 Enter the End Date to specify the most recent date to process records for. All of the End Date fields are populated by the first End Date entered. Update the field for any data set with a different end date.

- 4 Select the action: Archive, Delete, or both.
- 5 Optionally, select Logging, then select the directory for the log files.
- 6 For archiving, select the file format: Delimited Text or XML.
- 7 Click Execute to begin processing.

Data Sets

The following are the data sets available for archiving and deleting from JIT/S, including the record selection criteria and data validations.

Interchange Data Set. Processing archives, deletes, or archives and deletes records from the Interchange table for the Interchange data set. Record selection is based on the export date for the record. There are no data validations.

Shipping Data Set. Processing archives, deletes, or archives and deletes these records for the Shipping data set:

- Reported master bills of lading (MBOL) up to the specified end date
- All associated records:
 - Bills of lading (BOL)
 - Packages
 - Labels
 - Shipment history
- Finalized, non-reportable bills of lading up to the specified end date

Processing also archives label detail records and deletes the shipping work table, SHSL_PACKING_SLIP_WORDER.

Record selection for MBOLs is based on the reported date. For BOLs that are not reportable, that is, are not associated with an MBOL, record selection is based on the BOL finalize date. These validation criteria must be met to archive packaging and shipping data:

- MBOL can be archived only when all of the BOLs under it can be archived.
- BOLs can be archived when these conditions are met:
 - BOL is finalized.
 - All packing slips on the BOL can be archived.
 - There are no interchange records for the BOL.
- Packing slips can be archived when these conditions are met:
 - The package has been shipped.
 - Status is set to Closed for all orders on the BOL.
 - All packages on the BOL can be archived.
- A package can be archived when all of its contents can be archived; that is, the contained packages can be archived or status for the orders is set to Closed.

Labels Data Set. Processing archives, deletes, or archives and deletes label records up to the specified end date. Processing also deletes associated label detail records.

Record selection is based on the Create date for the label header records. Label information is included in the Shipping data set also. There is no data validation.

Customer Order Version Data Set. Processing archives, deletes, or archives and deletes customer order broadcast records—COVH, COVD, Order Information—up to the specified end date.

Before archiving or deleting a COVH, the status for the corresponding CO is validated as Closed.

Record selection is based on the date the status for the COVH is set to Processed. COVHs with any other Process status are ignored. To archive COVH data, the status for the CO corresponding to the COVH must be set to Closed.

Customer Orders Data Set. Processing archives, deletes, or archives and deletes these records for the Customer Order (CO) data set:

- Customer order records up to the specified end date
- All associated records:
 - Customer order broadcast data
 - Product orders
 - Work orders
 - Work order labels
 - Assembly orders
 - Assembly order labels

Record selection is based on the date the status for the CO is set to Closed. These validation criteria must be met to archive CO data:

- All of the product orders (PFO) attached to the CO can be archived.
- PFOs can be archived when these conditions are met:
 - All of the work orders (WO) attached to the PFO can be archived.
 - Status for the PFO is set to Closed.
- WOs can be archived when these conditions are met:
 - None of the assembly orders (AO) attached to the WO are assigned to a package.
 - Status for the WO is set to Closed.
- AOs can be archived when these conditions are met:
 - The parent WO can be archived.
 - The AO is not on a picking list.

Order Receiver Transactions Data Set. Processing archives, deletes, or archives and deletes order receiver transaction records from the application and document repositories.

Record selection is based on processed date for the document session. There is no data validation.

Logs and Exceptions Data Sets. Processing deletes logging and exception management records up to the specified end date. Record selection is based on the creation date. There are no data validations.

Change Logs Data Set. Processing archives, deletes, or archives and deletes order and package change log dates up to the specified end date.

Trace Data Set. Processing archives, deletes, or archives and deletes trace data and test results for the Trace data set. Record selection is based on the create date for the trace data. There is no data validation.

WOLVs and POLVs Data Sets. These data sets can only be archived. Processing archives these records for the WOLVs and POLVs data sets:

- Work order list version records up to the specified end date and all associated item and attribute records
- Product order list version records up to the specified end date and all associated item and attribute records

There are no data validations.

Archive Batch File

Apart from using the Archive/Delete Workbench, you can also use an archive batch file to archive or delete records in JIT/S, such as log files, internal and external label files, trace data, test results, customer order information, and transaction information. There is no provision to return archived data to JIT/S.

Because of significant impact on system resources, this archive batch file should be scheduled to run only during production down time or when there is very little activity. There are also contention issues; for example, a log file cannot be deleted while JIT/S is writing to it.

To archive or delete records in JIT/S using the archive batch file:

- 1 Copy `archivebatch.p` to the `jpssrc/archive/app` directory.
- 2 Copy `archive_config.xml` to `JITSInstallDir/config`.
- 3 Open `archive_config.xml` in a text editor. Read the comment section of the file beginning with Notice for configuration instructions. Note the following constraints and limitations:
 - The specified directory must exist and can be written to.
 - Currently, the maximum run time can not be controlled.
 - Date format must be mm/dd/yyyy.
- 4 Create a `jits_batch_archive.pf` file under `JITSInstallDir/pf` by copying from the `jits_archive.pf` file in the same directory.
- 5 Open `jits_batch_archive.pf`. Comment out or remove the lines beginning with `-baseADE` and `-icfparam` and add all the database connection strings that can be found in `JITSInstallDir/config/jits_dbbound.xml`.

Use the following as an example (see bold text for changes).

```
-inp 18000 # max-statement-len
-mmax 65534 # max-r-code-memory
-tok 3072 # max-tokens
-zn
# -baseADE ""
-rereadnolock # reset .pl dir
-h 10 # max-number-dbs
```

```

-s 255
-TB 31 # speed sort
-TM 32 # merge number
-l 1000 # local buffer size
-D 500 # directory size
-Bt 512 # buffer size for temp-tables
-nb 150 # nested blocks
-yy 1920
-d mdy
-T E:\temp
-db jps -N TCP -H coli44 -S prodjits_jps
-db logging -N TCP -H coli44 -S prodjits_logging
-db cache -N TCP -H coli44 -S prodjits_cache
-db icfdb -N TCP -H coli44 -S prodjits_icfdb
-db temp-db -N TCP -H coli44 -S prodjits_temp-db

```

- 6 Create a `jits_batch_archive.ini` file under *JITSInstallDir*/ini by copying from the `jits_archive.pf` file in the same directory.
- 7 Create a `jits_batch_archive.ini` file under *JITSInstallDir*/ini by copying from the `jits_archive.ini` file in the same directory.
- 8 Create a `jits_batch_archiveclient.bat` (`jits_batch_archiveclient.sh` on Linux) file under *JITSInstallDir*/bin by copying from the `archiveclientjits.bat` (`archiveclientjits.sh` on Linux) file in the same directory.

Modify the `jits_batch_archiveclient.bat` file. Use the following as an example (see bold text for changes).

```

@echo off
REM Script to start JIT/S multi-user client on the server
REM GUI Client for JITS or GUI Client for JITSAB
REM mod: 1-Feb-07 amu: for devjits on bigfoot
REM tokens:
REM &DLC = Progress Directory
REM &JITSCIENT-DB-CONNECT = command line to connect to each db in dbset
REM &CONFIG_FILE = archive batch process configuration file
SET JITSROOT=E:\jits\2.0\dev
SET DLC=D:\dlc101a
SET PATH=%PATH%;%DLC%\bin
SET PROMSGS=%DLC%\promsgs
SET PROTERMCAP=%DLC%\protermcap
SET PROPATH=%JITSROOT%\patch,%JITSROOT%\custom,.,%JITSROOT%
SET CONFIG_FILE=% JITSROOT %\config\ archive_config.xml
SET ARCHIVE_PROCEDURE=%JITSROOT%\jpssrc\archiv\app\archivebatch.p
REM
REM Start JIT/S archive
REM
echo %CONFIG_FILE% | %DLC%\bin\prowin32 -b -p %ARCHIVE_PROCEDURE% -pf
%JITSROOT%\pf\jits_batch_archive.pf -iname %JITSROOT%\ini\jits_batch_archive.ini

```

- 9 Schedule the execution of the batch file using Scheduled Tasks on Windows or Cronjob on Linux. You can view `error.log` in the *JITSInstallDir*/bin directory for processing error information.

Lists and Orders

The order receiver creates customer order versions based on broadcast messages from customers. The order processor first creates item and attribute lists from the customer order versions, then order list versions from the item and attribute lists. The order processor also creates customer, product family, and work orders based on the customer order versions. The order scheduler firms work orders and creates assembly orders.

This section describes the edit functions related to various types of lists and orders; they are available on the Operations menu.

Customer Order Versions 384

Describes different customer order versions, including Manual COV Entry, COV Maintenance, and Customer Order Version Error Maintenance.

Item and Attribute Lists 390

Explains how to use Item List Maintenance and Attribute List Maintenance.

Order List Versions 392

Explains how to use Product Family Order List Version Maintenance and Work Order List Version Maintenance.

Orders 395

Explains how to use Sales Order Maintenance, Customer Order Maintenance, Product Family Order Maintenance, Work Order Maintenance, Assembly Order Maintenance, and build-ahead/nettable orders and safety stock.

Order Status Maintenance 414

Discusses manual and automatic updates, customer and product orders, and Work Order Status Maintenance.

Customer Order Versions

The order receiver evaluates incoming broadcast messages from the customer and, if the message is valid, creates customer order version header and detail records (COVH, COVD). The order receiver creates the records even if no change has occurred since the last broadcast for a particular order.

The COV header includes all of the order information for a vehicle. The COV detail stores all of the details about specific items related to the COV.

To review and maintain COVs, see “Customer Order Version Monitor” on page 345 and “Customer Order Version Workbench” on page 348.

- Manual COV Entry
- Cust Order Version Maint
- COV Error Maintenance

Manual COV Entry

Normally, COVs are generated in the database by the order receiver. You can use Operations|Lists/Orders|Manual COV Entry to create a COV manually when you need to create a COV for building items ahead or when the online broadcast communication lines are not available.

- 1 Set up default processing values in the fields in the lower right for the COVs you plan to create.

Fig. 8.1
Manual Customer Order Version Entry

Field Descriptions

Cust BP. Specify the customer broadcast point defined in Setup|Communications|Broadcast Point Maintenance. The customer broadcast point identifies the point on their production line where the broadcast message was sent.

CO Number. Enter the customer order number.

Sales Order. Enter the number of the customer sales order that you are creating this COV for.

PFO List ID. This field works with the Create Detail Records field. When Create Detail Records is Yes, the system creates COVD records based on the PFO list version you specify in this field. Otherwise, you must create details manually.

Create Detail Records. Select this field to generate COVD records based on the list version specified in the PFO List ID field.

Build Ahead. Select this field if this COV is being created to produce build-ahead quantities not directly associated with customer demand. This lets you identify and group COVs for this purpose.

Nettable. Select for the order processor to consider this order as a source of supply available to satisfy the next incoming order for the same WOLV.

- 2 After entering defaults, choose Add Record to manually create a COV record based on the defaults.

Fig. 8.2
Manual Customer Order Entry

The screenshot shows the 'Manual Customer Order Entry' window. It includes fields for Customer Ship-To, Customer Broadcast, Cust CO Number, Sequence Number, VIN Number, Batch Quantity, Action Request (set to 3 (Creation)), CO Type (set to SEQ (Sequence Order for JIT)), and Description. On the right, there are date and time fields for Sent Date, Received Date, Ordered Date, and Due Date, all set to 22/03/2006 at 17:43:32. There are also fields for Shift, Model Year, Vehicle Line ID, and Key1. At the bottom right, there are checkboxes for Build Ahead, Nettable, and Manual Order (which is checked). Two large text areas labeled Info 1 and Info 2 are at the bottom.

Field Descriptions

Customer Ship-To. Select a customer ship-to ID. Customer ship-to ID is cross-referenced to customer ID and ship-to ID in Base|Addresses|Shipping|Ship-To Maintenance.

Customer Broadcast. Specify the customer broadcast point defined in Setup|Communications|Broadcast Point Maintenance. The customer broadcast point is the customer's ID for the point on their production line where the broadcast message was sent. See "Broadcast Point Maintenance" on page 136.

Customer CO Number. Enter the customer's customer order number.

Sequence Number. Enter a number that represents the order in line with the Customer Broadcast Point previously selected.

VIN Number. Enter the vehicle identification number for the vehicle covered by the customer order.

Batch Quantity. When customer order type is SEQ, batch quantity is 1.

Action Request. Select the reason for the broadcast message that is the basis for the COV. Action request is a class code defined in Tools|System Data Tools|Class Code Maintenance; valid members include amendment, cancellation, creation, no change, replacement. For a new record, action_request defaults to creation.

CO Type. Customer order type is a class code defined in Tools|System Data Tools|Class Code Maintenance. Currently, the only valid member is SEQ, for sequenced order.

Shift. Optionally specify the customer shift associated with this COV. Define work shifts in Base|Work Patterns|Shift Maintenance.

Model Year. Enter the model year for the unit represented by the customer order.

Vehicle Line ID. Enter the ID for the vehicle line that this order applies to. Define vehicle lines in Base|Items|Vehicle Line Maintenance.

Key 1. This field is used by the order processor to store plant-specific information.

Info 1-2. Use these fields for any additional customer-specific information you want to store and later print on labels.

- 3 To create COV detail records, first save the COV order, then choose Options|CO Version Detail if you have not chosen the Create Detail Records option in the default setup. This displays the same screen as shown in “CO Version Details” on page 389. The fields and descriptions are the same for both versions of the screen.
- 4 Use the command buttons to transmit, delete, or save records. You can also copy an existing COV to create another and modify details as needed.

Button Descriptions

Transmit. Click to transmit manually created COV records to the order processor.

Delete Selected Group. Use this command to remove selected records from the Manual COV Entry screen before they are sent to the order receiver. You might need to do this if data-entry errors occur.

Exit and Keep. Use this command to save the records in the database without transmitting them to the order receiver. You can then return to this function and complete the data-entry process at another time.

Copy Customer Order. Use this command to create a new order based on an existing one. A dialog displays for you to specify the existing customer order and sequence number to use as the source of the copy.

Cust Order Version Maint

Use Operations|Lists/Orders|Customer Order Version Maint to maintain COVs generated by the order receiver. Normally, you should not need to update fields in the COV unless an error was generated.

In the browse, use the list boxes to specify a Customer ID and Broadcast Point for filtering the records. Then click Apply/Refresh to see the effect of your selection.

Fig. 8.3
Customer Order Version Maintenance Browse

Cust. B/C Point	Cust CO Number	Version Number	Sequence Number	# Items	Process Status	Error Flag	# Errors	Received Date	Received Time	Batch Quantity
S4	CUST-9560	57	9560 3	3	P	no	0	01/03/2006	17:02:29	(
A4	15360	57	15360 3	3	P	no	0	01/03/2006	16:45:02	(
S4	CUST-9560	57	9560 1	1	P	no	0	01/03/2006	13:45:19	(
S4	Cust-9540	57	9540 3	3	P	no	0	01/03/2006	11:57:38	(
N	9840	1	9840 1	1	P	no	0	01/03/2006	05:56:46	(

- Choose Options|Co Version Detail to display the customer order line (detail) records for the currently selected order. More details are listed at the bottom of this section.
- Choose Options|COV Error Maintenance to display the COV records that have an error status. The list is generated and updated by an order processor. Specify a response to an error before recycling the COV.
- Choose Options|Delete Selected COV to physically remove the selected COV from the database. You can only delete COV records with a status of N.
- Choose Options|Recycle Selected Record to resubmit a COV with errors or dependencies.
- Choose Options|Recycle All Records to resubmit all COV records with errors or dependencies.

CO Version Records

In the Customer Order Version Maintenance browse, select a record; then click Modify Record to open it for updating.

Fig. 8.4
Customer Order Version Maintenance

Details

COV Number: 20060310-00005800-00000000

Description:

CO Type: SEQ

Cust BP: S4

Cust CO Number: C-9560

Version Number: 57

TS Filename: E:\jits\dev\Channels\BCT4\Inbox\BCT4-Seq7470=PI54-With

Model Year: 3

Sequence Number: 9560

Batch Quantity: 0

Process Status: P

Recycle Counter: 6

Shift:

Key1: 3

CO Info 1:

CO Info 2:

Ordered Date:

Ordered Time: 00:00:00

Sent Date:

Sent Time: 00:00:00

Received Date: 10/03/2006

Received Time: 17:03:50

Due Date:

Due Time: 00:00:00

Transmission: 7470

VIN Number: 7470

Vehicle Line ID: Toyota

Action Request: (9) Insertion

Customer Ship-To: CUSTSHIP

☐ Error Status ☐ Build Ahead

Field Descriptions

COV Number. This is the ID for the COV.

CO Type. Customer order type is a class code defined in Tools|System Data Tools|Class Code Maintenance. Currently, the only valid member is SEQ, for sequenced order.

Cust BP. This identifies the point on the customer production line where the broadcast message was sent. See Setup|Communications|Broadcast Point Maintenance.

Customer CO Number. This is the order number used by the customer.

Version Number. Increment the version each time that you make a change to the COV.

TS Filename. This is the transaction set file name. Transaction sets identify groups of broadcast messages.

Model Year. This is the model year for the vehicle represented by the customer order.

Sequence Number. For customer orders received by the order receiver, the sequence number is part of the broadcast message and indicates the order in which a specific vehicle passed a specific broadcast point on the customer's production line.

Transmission Number. This is an optional field for identifying specific transactions grouped in a transaction set.

Batch Quantity. When customer order type is SEQ, batch quantity is 1.

Process Status. The system displays the status for this COV. See "Status Codes" on page 420. Valid values are:

N	New, not processed
P	Processed
D	Dependency
E	Error
R	Recycle
T	Temporary
X	Skipped
XA	Skipped Auto Response

You can monitor COVs by status with the Customer Order Version Monitor.

Error Status. This error status is selected by the order processor when the process status is one of those indicating an error condition such as Error or Dependency. After you correct the error, submit the order for recycling by the Order Processor.

Build-Ahead. Select this error status when you create a COV manually in order to build units ahead when no actual demand exists. The order processor copies this setting to the work orders for this COV. Use to filter records on Operations|Monitors/Workbenches|Work Order Workbench.

Recycle Counter. This is the number of times this COV has been recycled by the order processor after being in an error status.

Shift. Optionally specify the customer shift associated with this COV. Define work shifts in Base|Work Patterns|Shift Maintenance.

VIN Number. Enter the vehicle identification number for the vehicle covered by the COV.

Vehicle Line ID. Enter the ID for the vehicle line on this customer order. Define vehicle lines in Base|Items|Vehicle Line Maintenance.

Action Request. Select the reason for the broadcast message that is the basis for the COV. Action request is a class code defined in Tools|System Data Tools|Class Code Maintenance; valid members of the class are defined in Options|Valid Members: amendment, cancellation, creation, no change, replacement.

Customer Ship To. This is the ship-to address for the COV; it defaults to all orders derived from the COV. It can be changed on derived orders as needed. Define ship-to records in Base|Addresses/Shipping|Ship-To Maintenance.

CO Version Details

In the Customer Order Version Maintenance browse, select a record; then choose Options|CO Version Detail to display the customer order line (detail) records. Select a detail record; then click Modify Record to open it for updating.

Fig. 8.5
Customer Order Version Detail

Field Descriptions

Line Number. Displays the number of this line.

Customer Item. Displays the item number received from the customer on the broadcast message for this line.

Attribute List. Displays the values for the attributes linked to the item in Base|Items|Item Maintenance, Options|Attribute Value.

Item Description. Displays the description of the item.

Item Group. Displays the item group received on the broadcast message for this line. Item group is used to subclassify item types. For example, when item type is option code, the item group represents the specific option.

Item Quantity. Displays the item quantity received on the broadcast message for this line.

Item/Option Type. Item/Option type is a class code defined in Tools|System Data Tools|Options|Class Code Maintenance; valid members of the class are defined in Options|Valid Members.

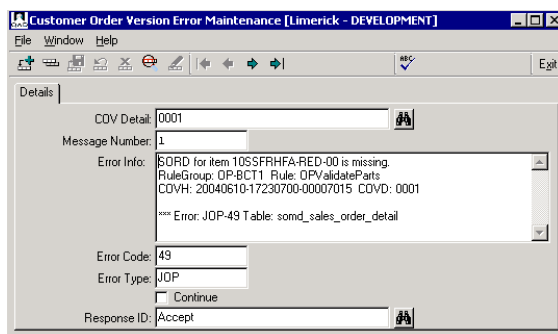
Action Request. Select the reason for the broadcast message that is the basis for the COV. Action request is a class code defined in Tools|System Data Tools|Class Code Maintenance; valid members of the class are defined in Options|Valid Members: amendment, cancellation, creation, no change, replacement.

COV Error Maintenance

Use Operations|Lists/Orders|COV Error Maintenance to display all of the COV records in the system where Processing status is Error. To address an error, use Operations|Monitors/Workbenches|Cust Order Version Workbench to modify the order, specify a user response, and resubmit the order for processing by clicking the Recycle button.

If you have customized the code, you can also use this function to add new errors or modify the error information.

Fig. 8.6
Customer Order Version Error Maintenance



The system displays the error message number with detailed message content, error code, and type. This data is generated and updated by the order processor and should not be manually changed.

- Messages are defined in Tools|Exception Management|Message Maintenance.
- Responses are defined in Setup|Communications|User Response Maintenance.

Item and Attribute Lists

The order processor generates two types of lists based on the customer order version. See “Customer Order Versions” on page 384.

- Item List Maintenance: List of ordered items—at the finished goods level—from the customer broadcast.
- Attribute List Maintenance: List of attributes associated with the finished goods.

The order processor then organizes these lists into product family order list versions (POLV) and work order list versions (WOLV). See “Order List Versions” on page 392.

Important During normal operation, these lists do not need to be modified. Maintenance functions are provided for emergency use only. Even an experienced user should be very careful when changing data in these lists.

Item List Maintenance

Use Operations|Lists/Orders|Item List Maintenance to maintain item lists generated by the order processor, if necessary.

Fig. 8.7
Item List Maintenance

Field Descriptions

Item List ID. Enter the ID for the item list.

Description. The description of Auto Added is inserted by the order processor to indicate that this list was generated automatically.

Product Family. Select the product family from the browse. Define product families in Base|Items|Product Family Maintenance.

Invalid. This field is not currently used.

From the Item List Maintenance browse, choose Options|Item List Detail to specify item numbers for the list, the quantity of each item for the list, and whether the item should be backflushed.

Note To skip an item during the backflush, you must check the Skip Backflush box for this item in each Item List containing this item number.

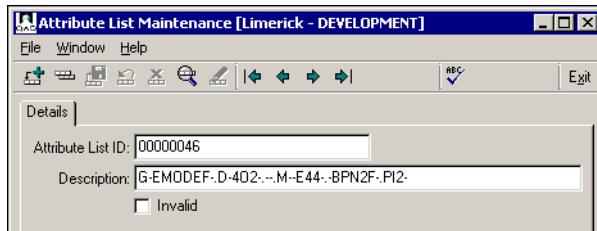
Fig. 8.8
Item List Maintenance, Detail

Attribute List Maintenance

Use Operations|Lists/Orders|Attribute List Maintenance to maintain attribute lists generated by the order processor, if necessary.

Fig. 8.9

Attribute List Maintenance



Field Descriptions

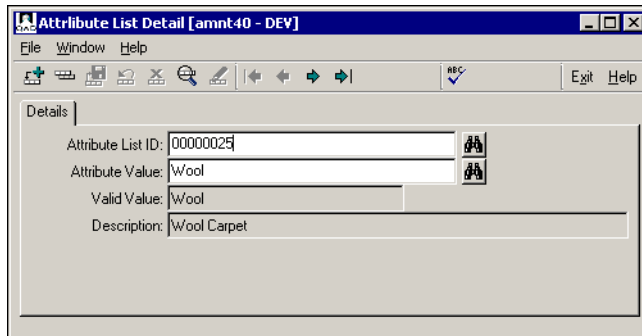
Attribute List ID. Enter the ID for the attribute list.

Description. The system displays the list of attribute short codes generated automatically by the order processor. This list can be updated by using the Recalculate Attribute Short Code described in “Product Family Order List Version Maintenance” on page 393 and “Work Order List Version Maintenance” on page 394.

From the Attribute List Maintenance browse, choose Options|Attribute List Detail to specify attribute values for the list.

Fig. 8.10

Attribute List Maintenance, Detail



Order List Versions

Based on the item and attribute lists it creates from the customer order version (see “Item and Attribute Lists” on page 390), the order processor creates and modifies product family orders (PFO) and list versions (POLV) based on a customer order version (COV); it then creates and modifies work orders (WO) and list versions (WOLV) based on the PFOs. The order processor reuses existing list versions when appropriate. The PFO and WO list versions can also be created manually.

- Product Family Order List Version Maintenance
- Work Order List Version Maintenance

Product Family Order List Version Maintenance

A POLV includes the item and attribute lists for a product family.

Use Operations|Lists/Orders|PFO List Version Maintenance to create PFO list versions or maintain those generated by the order processor from the COV.

You can also select from the following choices on the browse Options menu:

- Use Options|Attribute List Details to view and modify attributes associated with the PFO list version.
- Use Options|Item List Detail to view and modify the items associated with the PFO list version.
- Use Options|Recalculate Attr Short Code to update the attribute short code string field for the PFO list version after changing the list in Options|Attribute List Detail or Operations|Lists/Orders|Attribute List Maintenance.

Fig. 8.11
PFO List Version Maintenance

Attribute Name	Attribute Value	Short Code
Style	Leather	L
Airbag	No Airbag	NA

Field Descriptions

PFO List ID. Enter the name of the list version for a PFO.

Attribute Short Code String. In the browse, use Options|Recalculate Attr Short Code to update this concatenated list of abbreviations for the attributes of the PFO list version.

Item List. Enter the ID for the list of items required for the PF. Maintain item lists in Operations|Lists/Orders|Item List Maintenance.

Attribute List. Enter the ID for the list of attributes required for the PF. Maintain attribute lists in Operations|Lists/Orders|Attribute List Maintenance.

Version. Increment the version each time that you make changes to the PFO list version.

Revision Obsolete. This field is selected when the version of the PFO list version specified in Version is obsolete based on order processor rules.

Running Change. This field is selected when the version of the PFO list version specified in Version is obsolete because of an engineering change order. This feature is not currently implemented.

Work Order List Version Maintenance

A WO list version includes the item and attribute lists for a shippable assembly unit.

Use Operations|Lists/Orders|WO List Version Maintenance to create WO list versions or maintain those generated by the order processor from a product family order.

You can also select from the following choices on the browse Options menu:

- Use Options|Attribute List Details to view and modify attributes associated with the work order list version.
- Use Options|Item List Detail to view and modify the items associated with the work order list version.
- Use Options|Recalculate Attr Short Code to update the attribute short code string field for the work order list version.

Fig. 8.12
WO List Version Maintenance

WO List Version Maintenance [tent01 - QAD]

File Window Help

WO List Version ID: 00000269 Version: 00000001

Attribute Short Code String: 643LBL

Qty Current Mix: 0 Qty Build Cum: 0 Safety Stock: 0.00

Qty Received Cum: 0 Qty Shipped Cum: 0 Build-Ahead Qty: 0.00

☐ Revision Obsolete
☐ Running Change

Item List ID: 00000038 Description: Auto Added

Attribute List ID: 00000048 Description: 643LBL

PFO List ID: Description:

Shippable AU: Rear Back Description: Rear Back - Description

Component List ID: Description:

Attribute Name	Attribute Value	Short Code
3Split	60/40	64
3HeadRests	3	3
3Type	Lux	L
3Style	Black L	BL

Field Descriptions

WO List Version ID. Enter an ID for the WO list version.

Version. Increment the version each time that you make a change to the WO list version.

Attribute Short Code String. In the browse, use Options|Recalculate Attr Short Code to update this concatenated list of abbreviations for the attributes of the WO list version. This field is not currently used.

Qty Current Mix. The system displays the current active number of work orders with the specified ID and version. This field is updated based on order processor rules.

Qty Build Cum. The system displays the number of assembly units built with this list version ID. This number is incremented by the backflush process. This field is not currently used.

Safety Stock. Enter the quantity of assembly units with this list version ID to be maintained in inventory as protection against fluctuations in supply and demand. Create safety stock through build-ahead orders that are not nettable.

Qty Received Cum. The system displays the total number of orders referencing this list version ID that have been received from the customer. The number is incremented by the order processor. This field is not currently used.

Qty Shipped Cum. The system displays the number of assembly units that have been shipped with this list version ID. The number is incremented by the shipping process. This field is not currently used.

Build-Ahead Qty. The system displays the number of assembly units that have been built ahead with this list version ID.

Revision Obsolete. This field is selected when the version of the WO list version specified in Version is obsolete based on order processor rules.

Running Change. This field is selected when the version of the WO list version specified in Version is obsolete because of an engineering change order. This feature is not currently implemented.

Item List ID. Enter the ID for an item list. See “Item List Maintenance” on page 391 for application- and manually-created item lists.

Attribute List ID. Enter the ID for an attribute list. See “Attribute List Maintenance” on page 392 for application- and manually-created attribute lists.

PFO List Version ID. Enter the ID for a PFO list version. See “Product Family Order List Version Maintenance” on page 393 for application and manually created PFO list versions.

Shippable AU. Enter the ID of a shippable assembly unit defined in Base|Work Cell/Assembly Unit|Assembly Unit Tree Maintenance.

Orders

The order processor—using customer-specific and broadcast point-specific rules—validates Customer Order Versions (COV) against existing sales orders and creates customer, product family, and work orders:

- Each customer order (CO) covers one complete unit such as a vehicle.
- A CO can have multiple product family orders (PFO), one for each product family on the order; for example, seat sets and instrument panels.
- A product family order can have multiple work orders (WO), one for each shippable assembly unit in the PF; for example, front seats and rear seats.

Based on WOs, the order scheduler creates assembly orders (AO). A work order can have multiple AOs, one for each lower-level assembly in the shippable assembly unit; for example, front seat cushion, front seat back, rear seat cushion, and rear seat back. See Figure 1.8, “Orders and Assembly Unit Trees,” on page 11.

Build-ahead orders are also created under several circumstances. Build-ahead orders are not necessarily nettable; some are created to rebuild safety stock.

- Sales Order Maintenance
- Customer Order Maintenance
- Product Family Order Maintenance

- Work Order Maintenance
- Assembly Order Maintenance
- Build-Ahead/Nettable Orders and Safety Stock

Sales Order Maintenance

Scheduled sales orders are typically created and maintained in the QAD ERP application and imported into JIT/S using integration features documented in *Installation Guide: QAD JIT Sequencing*. During data integration, the system locates and adds a shipping configuration ID to the sales order header. The shipping configuration must have the ship-to defined for the sales order and the ship-from defined for the JIT/S instance. See “Shipping Configurations” on page 73.

The maintenance functions in JIT/S are normally used only to verify data that is imported and add data that is specific to JIT/S.

Important If you use JIT/S programs to make changes to data that originates in the QAD ERP application, your changes may be overwritten the next time data is imported.

Only if needed, use Operations|Lists/Orders|Sales Order Maintenance to create and modify sales orders.

Choose Options|SO Details to review details about the various lines on the order. See “Sales Order Details” on page 398.

Sales Order Header

Select a record in the Sales Order Maintenance browse; then click Modify Record to open it for update.

Fig. 8.13
Sales Order Maintenance

The screenshot shows the 'Sales Order Maintenance [Limerick - DEVELOPMENT]' window. The 'Details' tab is active, displaying the 'From' and 'To' sections. The 'From' section includes 'Site ID: SYSTEST' and 'Name: System Test Site'. The 'To' section includes 'Customer ID: 17FT' and 'Name: 17Test customer'. Below these is the 'Bill To' section, also with 'Customer ID: 17FT' and 'Name: 17Test customer'. The 'General' section contains various fields: 'Number: 17-b2', 'Reference: PO-17b2 BWS', 'Cust Cont Location ID', 'Empty Cont Location ID', 'AR Account', 'CR Terms', 'Currency', 'FOB Point', 'Shipping Config ID: BCT1_Matrix', 'Taxable' checkbox, 'Tax Class', 'Tax Date', 'Tax Percent: 0', 'Trans Days: 0', 'Rest of month and week logic' checkbox, and 'Customer Calendar Logic' checkbox. The window has a standard menu bar (File, Window, Help) and a toolbar with various icons.

Field Descriptions

Site ID. Enter the ID for your site—the location from which the finished goods are shipped—as defined in Base|Addresses|Shipping|Site Maintenance.

Note Currently, only one site record can be defined.

Customer ID. Enter the ID that identifies the customer placing the order. If different, also enter the ID of the customer who receives the invoice associated with this order.

Number. Enter the order number for this sales order. This number should match the order number in the ERP system.

Rest of Month and Week Logic. Select this field to activate rest-of-month scheduling for customer scheduled quantities. When selected, the system moves any forecasted requirements for days after the last bucket of the month into the first bucket of the next month. This field is not currently used.

Customer Calendar Logic. Select this field if you want the system to take the customer calendar—such as defined holidays—into account when scheduling shipments. This field is not currently used.

Reference. Use this field to specify any implementation-specific reference value.

Sched. This field is set by the integration and indicates that the sales order is a scheduled sales order in the QAD ERP application.

Customer Container Location ID. Specify the default location for containers used to pack items for shipment to this customer. This field is not currently used.

Empty Container Location ID. If empty containers need to be transferred to the customer container location, specify the location where the empty containers are stored. This field is not currently used.

AR Account. Enter the general ledger (GL) account code used to track invoices, DR/CR memos, finance charges, and payments processed for this order. This field is not currently used.

Credit Terms. Identify the normal credit terms extended to this customer during payment processing. Credit terms identify the due date and any discount for early payment. This field is not currently used.

Currency. Enter the currency code for this order. Currency defaults from the bill-to address. This field is not currently used.

FOB Point. Enter the free on board (FOB) point for shipments made against this order. The FOB point identifies when title passes from the seller to the buyer.

Shipping Config ID. Enter the shipping configuration to use for the order from those defined in Base|Addresses|Shipping|Shipping Configuration Maintenance.

During data integration, the system locates and adds a shipping configuration ID to the sales order header. The shipping configuration must have the ship-to defined for the sales order and the ship-from defined for the JIT/S instance.

Taxable. Select if the items on this order are subject to tax; otherwise, leave the check box empty. This field is not currently used.

Tax Class. Enter a tax class used during tax calculations. This field is not currently used.

Tax Date. Enter the date for determining which tax rates apply to items on this order. This field is not currently used.

Tax Percent. Enter the tax rate to use in tax calculations. This field is not currently used.

Container Management. Indicate if the items on this order will be placed in containers for shipment. This field is not currently used.

Container Needed. When this field is selected, the system displays warnings when a sufficient number of required containers are not in stock for shipping. This field is not currently used.

Inventory Container. Select this field when containers are defined as items in Base|Items|Item Maintenance. When selected, the system generates an inventory transaction transfer to the customer location at shipment. This field is not currently used.

Transport Days. Specify the lead time days required to transport from the Ship-From site to the Ship-To destination. This field is not currently used.

Sales Order Details

Select an order in the Sales Order Maintenance browse; then choose Options|Sales Order Details to display a summary of lines associated with the order. Enter parameter values in the list boxes and click Apply to filter the line records.

Fig. 8.14
Sales Order Details Browse

Seq	Item ID	Description 1	Color ID	Revision ID
1	YFDFYAN	Driver, Airbag, Lumbar,	YW	
2	YFFPYAN	Passenger, Airbag-S,	YW	
3	YFRBHR210N	Rear Back, Head 2	YW	
4	YFRCN	Rear Back, Cushion	YW	
5	BDFDYAS	Driver, Airbag, Lumbar,	BK	
6	BFFPYAPSS	Passenger, Airbag-S,	BK	
7	BFRBHR210S	Rear Back, Head 2, Sport	BK	
8	BFRCS	Rear Back, Cushion,	BK	
9	BDFFNAL	Driver, Luxury	BK	
10	BFFFNAL	Passenger, Luxury	BK	
11	BFRBHR364L	Rear Back, Head 3, Sport	BK	
12	BFRCL	Rear Back, Luxury	BK	
13	BFRBHR210L	Rear Back, Head 2,	BK	

Select a record; then click Modify Record to open it for update.

Fig. 8.15
Sales Order Details

The screenshot shows the 'Sales Order Details [tent01 - QAD]' window. It contains several input fields and checkboxes. The 'Details' tab is active. Fields include: Sequence (1), Item ID (17YCDFYAN), Color (Yellow color for BCT 3), Revision (Rev 00), Description (YCDFYAN), Reference, Customer PO Reference (jack), Customer Item (1017YCDFYAN), JIT Item (checked), Container ID, Secondary Container, Standard Pack Quantity (0), Secondary Pack Quantity (0), Cont Fill Qty (0.00), Secondary Cont Fill Qty (0.00), Cum Shipped (0), Dock, Unit of Measure, Start Effective Date, End Effective Date, Lead Time Working Days (0), Lead Time Calendar Days (0), and Safety Days (0).

Field Descriptions

Sequence. The sequence is assigned by the system and displayed once the record is saved. This number must match that in the ERP System; therefore, be careful if you are manually entering Sales Order Details.

Reference. Use this field to specify any implementation-specific reference value.

Customer PO Reference. Specify the number of the purchase order that generated the demand that this sales order line fills. This is a key element that is passed to the customer with all communications related to items on the sales order, such as packing slips.

Customer Item. Optionally, this field contains the item number the customer uses to reference your internal item number. Data imported from the ERP application is validated against values defined in “Customer Items” on page 98.

JIT Item. Select this field to enable the mapping of customer items to internal item IDs.

Container ID. This defaults from the container associated with the item in Item Maintenance. This field is not currently used.

Standard Pack Quantity. Specify the number of items normally shipped in the container specified in Container ID. Order multiples are used to calculate scheduled ship quantities so that they conform to packaging configurations and transportation constraints. This field is not currently used.

Secondary Container. Enter the ID of a secondary container if necessary. This is useful if more than one container must be used in a shipment, such as special packing crates and pallets. This field is not currently used.

Secondary Pack Quantity. Specify the number of items shipped in the container specified in Secondary Container ID. This field is not currently used.

Container Fill Quantity. This field is used when multiple items are shipped in one container. Specify the maximum percentage of the container allowed for the item on this sales order line. This field is not currently used.

Example A container pack quantity is 10 and you want to include 4 different items in the container. Specify a fill quantity of 25%.

Secondary Container Fill Quantity. This field is used when multiple items are shipped in one container. Specify the maximum percentage of the secondary container allowed for the item on this sales order line. This field is not currently used.

Cum Shipped. This field displays the number of items currently shipped against this order line. This field is not currently used.

Dock. Enter the shipping dock where the items on this order line should be shipped. This field is not currently used.

Unit of Measure. UM defaults from the item record defined in Base|Items|Item Maintenance. You can modify it if necessary.

Start and End Effective Date. Specify optional dates controlling the introduction and duration of this line item on the order. Only a start date is associated with an order imported from the QAD ERP application.

Lead Time Working Days. Enter the normal or average number of working days, based on your shop-floor calendar, required to manufacture this item. This includes the time to process paperwork, issue components, inspect the finished product, and receive it into stock. Planning functions use lead time to determine the suggested release date for orders. This field is not currently used.

Lead Time Calendar Days. Enter the number of calendar days required to manufacture this item. This is often more than working days, since it includes non-working days such as weekends and holidays. This field is not currently used.

Safety Days. Enter the number of working days early that the system should plan to ship orders for this item, as protection against late shipments. Planning functions schedule orders to be shipped this many days early. This field is not currently used.

Sales Order for Multiple Ship-To Destinations

Setup is required to ship items from one order to multiple ship-to destinations:

- For each ship-to, set the ShippableAU parameter in a copy of the order scheduler rule OSFifoScheduleWOs.
- Create a sales order header for each ship-to. Use Shipping Configuration ID to set the ship-to. Assign the appropriate items to each sales order.

To support multiple ship-to destinations, the order processor sets packing sequence by ship-to, the order scheduler schedules by ship-to, and any shipping validations are done by ship-to.

Customer Order Maintenance

The order processor creates a customer order for a unit the first time that it processes a COV for that unit.

In Operations|Lists/Orders|Customer Order Maintenance, select a broadcast point in the list box, then click Refresh to filter the customer order records.

Fig. 8.16
Customer Order Maintenance Browse

Broadcast Point	Order Number	Sequence Number	Batch Quantity	Created Date	Created Time	Customer Order ID
S4	CUST-9550	9550	0	10/03/2006	18:14:54	20060310-00004063-00000000
S4	CUST-9560	9560	0	10/03/2006	17:08:05	20060310-00004062-00000000
S4	Cust-9540	9540	0	10/03/2006	12:00:01	20060310-00004060-00000000
S4	CUST-9530	9530	0	02/03/2006	10:31:55	20060302-00003797-00000000
S4	CUST-9520	9520	0	01/03/2006	16:19:40	20060301-00003778-00000000
S4	CUST-9510	9510	0	01/03/2006	16:19:05	20060301-00003777-00000000

Select a record; then double-click to display it for review.

Fig. 8.17
Customer Order Maintenance

Customer Order ID: 20060310-00004063-00000000

Description: System Generated

CO Type: SEQ (Sequence Order for JIT)

Broadcast Point: S4

Order Number: CUST-9560

VIN Number: 7470

Model Year: 3

Sequence Number: 9550

Batch Quantity: 0

Vehicle Line ID: Toyota

Process Status: R

Production Status: U

Pack Status: U

Backflush Status: U

Created Date: 10/03/2006

Created Time: 18:14:54

Updated Date: 10/03/2006

Updated Time: 18:15:36

Closed Date:

Closed Time: 00:00:00

CO Key 1: 3

CO Info 1:

CO Info 2:

Field Descriptions

Customer Order ID. This is the internal ID for the customer order. This is also known as the CO Number.

CO Type. This is a member of class code `corder_type` defined in Tools|System Data Tools|Class Code Maintenance. Currently, the only valid member is SEQ, for a sequenced order.

Broadcast Point. This is the internal name for the point on the customer's assembly line where this broadcast originated.

Order Number. This is the order ID used by the customer. It is also called the Customer CO Number.

VIN Number. This is the vehicle identification number for the vehicle covered by the CO.

Model Year. This is the model year for the vehicle represented by the customer order.

Sequence Number. This is the sequence number communicated in the broadcast message indicating the order in which a specific car passed a specific broadcast point on the customer's production line.

Batch Quantity. When customer order type is SEQ, batch quantity is 1.

Vehicle Line ID. The Vehicle Line ID for the vehicle line on this customer order.

Process Status. These statuses are assigned based on the status fields of the linked product family orders. The system-assigned status can be any of the following:

- U Unscheduled is the default status when an order processor creates a work order.
- N Not schedulable; for example, there is a dependency error.
- S When the order scheduler rearranges the sequence of an order, the status is Scheduled.
- F When the order scheduler deploys the order to the work cell, the status is Firmed for production.
- R When the order scheduler releases the order for label printing, the status is Released for production. This is the highest process status.

Note If all of the product family orders linked to a customer order are not in the same status, the system assigns the latest status to the customer order Process Status field and appends the pound sign (#) to indicate a partial status. For example, if a customer order has two work orders and only one is released, the process status is set to R#.

Canceled. This is selected if the order is canceled.

Closed. This is selected if the order is closed.

Production Status. The status code—a pound sign (#) indicates a partial status—in this field is updated automatically as associated work orders move through production.

- U Unproduced: Production has not started on the work order.
- W WIP: The work order is currently being produced.
- B Built: The work order has been completed in production. This is the final production status.

Backflush Status. This field indicates whether the components associated with linked work orders have been backflushed and is updated automatically by the system when backflush occurs. Valid values are U (unbackflushed) and B (backflushed). The system appends a pound sign (#) to indicate a partial status.

Pack Status. This field indicates the packaging status of associated work orders. Pack status can be one of the following:

- U Unpacked: Packing has not started.

- P Packed: Packing is confirmed through a scan message.
- S Shipped: The BOL is closed.

The system appends a pound sign (#) to indicate a partial status.

CO Key 1. The order processor uses this field to store plant-specific information.

CO Info 1. Use this field to store any additional customer-specific information.

CO Info 2. Use this field to store any additional customer-specific information.

In the Operations|Lists/Orders|Customer Order Maintenance browse, use Options|CO Detail to display detail records for each line of the CO.

Fig. 8.18
Customer Order Detail

The screenshot shows a window titled "Customer Order Detail for 20060310-00010270-00000000 [amnt40 - DEV]". The window has a menu bar with "File", "Window", and "Help". Below the menu bar is a toolbar with navigation icons and "Exit" and "Help" buttons. The main area is labeled "Details" and contains the following fields:

- Line Number: 20060310-00010270-00000000
- Description: System Generated
- Ship-To ID: CUSTSHIP
- Product Family: PF1
- Item Quantity: 1
- Order Info: (empty field)

Field Descriptions

Line Number. The system automatically enters the line number.

Ship-To ID. This is the ship-to address for the item on this line.

Product Family. This is the product family for the CO line. Define product families in Base|Items|Product Family Maintenance.

Item Quantity. This is the item quantity for the line.

Order Info. Enter information such as special instructions or tooling. This field is for information only, it is not accessed by other JIT/S functions.

Product Family Order Maintenance

The order processor creates a product family order for each product family in a CO. Each PF represents an assembly unit tree of one or more assembly units and shippable assembly units.

In Operations|Lists/Orders|Product Family Order Maintenance, use the list box to filter the browse by PF. Select a record; then click Modify Record to open it for changes.

Fig. 8.19
Product Family Order Maintenance

The screenshot shows a software window titled "Product Family Order Maintenance [amnt40 - DEV]". It contains a "Details" tab with the following fields:

- Product Family Order ID: 20060310-00007547-00000000
- Description: System Generated
- Product Family: PF1
- PFO List ID: 00000562
- CO ID: 20060310-00004063-00000000
- Broadcast Point: S4 / S4
- Sequence Number: 9550
- Packing Sequence: 1,909.00
- Process Status: R
- Production Status: U
- Pack Status: U
- Backflush Status: U
- Created Date: 10/03/2006
- Created Time: 18:14:54
- Updated Date: 10/03/2006
- Updated Time: 18:15:36
- Due Date:
- Due Time: 00:00:00
- Closed Date:
- Closed Time: 00:00:00
- ☐ Canceled
- ☐ Empty Scan Required
- ☐ Closed

You can update the Description, Package Sequence, and Empty Scan Required fields. All other fields are read-only.

Field Descriptions

Product Family Order ID. The ID number is generated by the order processor.

Product Family. This is the product family for the order. Define product families in Base|Items|Product Family Maintenance.

PFO List ID. This is the ID for the PFO list version. PFO list versions are generated by the order processor from the COV and can also be manually created in Operations|Lists/Orders|PFO List Version Maintenance (see page 393). The order processor reuses existing PFO list versions where appropriate.

CO ID. This is the internal ID for the customer order that the product family order is part of.

Broadcast Point. This is the internal ID for the customer broadcast point defined in Setup|Communications|Broadcast Point Maintenance.

Sequence Number. The system displays the sequence number of the PFO. The sequence number is communicated in the broadcast message and indicates the order in which a specific vehicle passed a specific broadcast point on the customer's production line.

Packing Sequence. When out-of-sequence errors have been mistakenly accepted and an out-of-order package is created by the order processor and order scheduler, use this field to correct the packing sequence number.

Process Status. Process status for the PFO is updated by the system based on the status of associated work orders. System-assigned status can be any of the following:

- U Unscheduled is the default status when the order processor creates a work order.
- N Not schedulable; for example, there is a dependency error.
- S When the order scheduler rearranges the sequence of an order, the status is Scheduled.
- F When the order scheduler deploys the order to the work cell, the status is Firmed for production.
- R When the order scheduler releases the order for label printing, the status is Released for production. This is the highest process status.

Note If all of the work orders linked to a PFO do not have the same process status, the system assigns the latest status to the PFO and appends the pound sign (#) to indicate a partial status. For example, if a PFO has two work orders and only one is released, the process status is set to R#. This notation applies also to the Production Status, Backflush Status, and Pack Status fields.

Production Status. The status code in this field is updated automatically as the associated work orders move through production.

- U Unproduced: Production has not started on the work order.
- W WIP: The work order is currently being produced.
- B Built: The work order has been completed in production. This is the final production status.

Pack Status. This field indicates the packaging status of associated work orders.

- U Unpacked: Packing has not started.
- P Packed: Packing is confirmed through a scan message.
- S Shipped: The BOL is closed.

Backflush Status. This field indicates whether the components associated with linked work orders have been backflushed and is updated automatically by the system when backflush occurs. Valid values are U (unbackflushed) and B (backflushed).

Canceled. This is selected if the order status is Canceled.

Empty Scan Required. The order processor selects this field under these conditions:

- A customer order is canceled and the status is not beyond the value for the pointOfNoReturn parameter for the OPCancelOrder rule.
- The PF is one of the values in the EmptySlotPGFs parameter.
- Process status for the order is set to one of the values for the parameter EmptySlotOrderStatus.

Clearing the field if the orders are pre-racked leads to an error during packaging. If the orders are not pre-racked, the field can be cleared without triggering a sequence validation error when packaging.

Closed. This is selected if the order status is Closed.

Work Order Maintenance

The order processor creates a WO for each shippable assembly unit (SAU) in an assembly unit tree covered by a product family order. Each PF represents an assembly unit tree of one or more assembly units and shippable assembly units.

When the order processor creates a WO, the production status is always unscheduled. You can track the status of work orders until they enter production using the “Released WO Status Monitor” on page 347.

Use Operations|Lists|Orders|Work Order Maintenance to view WO records. Use the list boxes and buttons at the top to filter the display. The browse retains the filter settings when closed and uses those same settings the next time you open it.

Use the right-click menu in the browse to specify the columns to display and other browse controls.

Fig. 8.20
Work Order Maintenance Browse

Work Order ID	Description	Shippable AU	WO List ID	WO List Version	Product Family	Product Family ID
20060327-00010508-00000000	System Generated	BCT4 Seat Sets Shippable 00000729	00000012	00000012	PF1	20060309-00007
20060327-00010507-00000000	System Generated	BCT4 Seat Sets Shippable 00000729	00000012	00000012	PF1	20060309-00007
20060324-00010466-00000000	System Generated	BCT4 Seat Sets Shippable 00000729	00000012	00000012	PF1	20060309-00007
20060324-00010465-00000000	System Generated	BCT4 Seat Sets Shippable 00000729	00000012	00000012	PF1	20060309-00007
20060324-00010464-00000000	System Generated	BCT4 Seat Sets Shippable 00000729	00000012	00000012	PF1	20060309-00007

Select a record; then click Modify Record to open it for updating.

Fig. 8.21
Work Order Maintenance

You can update the Description, Allow Scheduling, and Allow Netting Out fields. All other fields are read-only.

Field Descriptions

Work Order ID. The WO number for the shippable AU is generated by the order processor.

Product Family. This is the product family for the WO; product family is inherited from the PFO. Define product families in Base|Items|Product Family Maintenance.

PFO ID. The PFO number is generated by the order processor.

Packing Sequence. When out-of-sequence errors have been mistakenly accepted and an out-of-order package is created by the order processor and order scheduler, use this field to correct the packing sequence number.

Ship-To. This is the ship-to ID for this shippable AU; set up ship-to records in Base|Addressses/Shipping|Ship-To Maintenance.

Shippable AU. This is the ID for the shippable AU; set up shippable assembly unit records in Base|Work Cell/Assembly Unit|Assembly Unit Tree Maint, Options|Shippable AU Maintenance.

WO List ID. This is the ID for the WO list version. WO list versions are generated by the order processor from the COV and can also be manually created in Operations|Lists/Orders|WO List Version Maintenance. The order processor reuses existing WO list versions where appropriate.

WO List Version. Each time the work order list (WOLV) is changed, the version is incremented.

Pre-Schedule Key. The value of this field is generated by the order scheduler based on parameters associated with the OPUdatePSK rule. It determines the assembly sequence based on such factors as the broadcast point priority, the sequence, the date and time, and the number of finished goods currently available. The pre-schedule key is important in ensuring that dependent work orders are completed as needed for higher-level assemblies.

Batch ID Scheduled. The system displays the unique reference assigned by the order scheduler to this work order to group it with other work orders scheduled for release together. The number of orders to schedule is defined as a parameter of the order scheduler process.

Batch Serial Scheduled. The system displays the number assigned by the order scheduler to determine the scheduling sequence of work orders associated with the batch ID displayed in Batch ID Sched.

Release Order. The system displays the number identifying the sequence order assigned when the work order was released. The number is zero unless the process status is Released.

Note In a JIT sequencing environment, batch ID, batch serial, and release order may have little significance because the scheduling process typically schedules, firms, and releases individual orders at one time. In a batch environment, you may want to schedule and firm a large group of orders, but release them in smaller batches.

Reported Build Group Number. The work order is a member of this group of orders that were reported as built.

Reported Shipment Group Number. The work order is a member of this group of orders that were reported as shipped.

Process Status. The system-assigned status can be any of the following:

- U Unscheduled is the default status when an order processor creates a work order.
- N Not schedulable; for example, there is a dependency error.
- S When an order scheduler rearranges the sequence of an order, the status is Scheduled.
- F When an order scheduler deploys the order to the work cell, the status is Firmed for production.
- R When an order scheduler releases the order for label printing, the status is Released for production. This is the highest process status.

Production Status. The status code in this field is updated automatically as a work order moves through production.

- U Unproduced: Production has not started on the work order.
- W WIP: The work order is currently being produced
- B Built: The work order has been completed in production. This is the final production status.

Pack Status. This field indicates the packaging status of the work order.

- U Unpacked: Packing has not started
- P Packed: Packing is confirmed through a scan message.
- S Shipped: The BOL is closed.

Backflush Status. This field indicates whether the components associated with this work order have been backflushed; it is updated automatically by the system when backflush occurs. Valid values are U (unbackflushed) and B (backflushed).

Manual Order. This is selected to indicate that this order has been created manually; it is not the result of an incoming customer order.

Hot Build. This is selected to indicate that this work order should be processed first.

Allow Scheduling. Select to indicate that the order scheduler can schedule this order. By default, this is not selected when the order processor creates the order. See the Schedulable field.

This is set originally by the order processor rule OPAllowScheduling. Add the rule to the order processor that processes data from the order receiver for the broadcast point chosen for scheduling. In the rule parameter, SAUList, supply the comma-separated list of SAUs that the order processor should allow scheduling for at this broadcast point.

In Dependency. If this is selected, the order cannot be scheduled.

Schedulable. This is selected when Allow Scheduling is selected and the order does not have the On Hold, Canceled, or Closed statuses set. The order scheduler schedules only those orders where this is selected.

Netted Out. The order scheduler selects this field to indicate that it has netted out this build-ahead order against an incoming order for the same WOLV.

Build Ahead. This is selected if this work order is created to produce build-ahead quantities not directly associated with customer demand such as safety stock. These build-ahead orders have no parent product family order and are available for the order scheduler to net out.

Allow Netting Out. This field can be set manually or by the order processor. You can select this field to indicate that a manually created build-ahead work order is available for netting out.

The order processor selects this field to indicate that the order is available to the order scheduler for netting out against an incoming order with the same WOLV.

This condition arises when an order change—WOLV change—cannot be applied to the work order because the order is already set for production. The order processor creates a new, normal work order with the changed WOLV and selects this field in the original order. The original work order no longer has a parent product family order.

Nettable. This is selected when Allow Netting Out is selected and the order does not have the In Repair, On Hold, Canceled, or Closed statuses set.

In Repair. This is selected when the status for the order is set to In Repair automatically or manually in Operations|Order Status Maintenance|Work Order Status Maintenance.

Hold. When this field is selected, it indicates that the order is temporarily on hold. The process status cannot be changed until the hold is removed. This is set automatically or manually in Operations|Order Status Maintenance|Work Order Status Maintenance.

Scrapped. This is selected when the status for the order is set to Scrapped after being swapped out. Swap/Scrap Work Order is on the Options menu in Operations|Monitors/Workbenches|Work Order Workbench.

Canceled. This is selected when the status for the order is set to Canceled automatically or manually in Operations|Order Status Maintenance|Work Order Status Maintenance.

Closed. This is selected when the status for the order is set to Closed automatically or manually in Operations|Order Status Maintenance|Work Order Status Maintenance.

Reported as Shipped. This is selected when the work order is associated with a bill of lading that is reported as shipped.

Package Info. Package Info has the following format:

package number: slot number (package status)

Label into a comma-delimited list of label serial numbers associated with this order.

Scrap Reason. Displays the reason a scrapped order was scrapped.

Assembly Order Maintenance

Choose Operations|Lists/Orders|Assembly Order Maintenance to view assembly order (AO) records. Use the Product Family and Assembly Unit list boxes as well as the Customer, Ship-From, and Ship-to fields to filter and display the records. The browse retains the filter settings when closed and uses those same settings the next time you open it.

Use the right-click menu in the browse to specify the columns to display and other browse controls.

When a master scheduler or the order scheduler firms a WO by deploying it to a work cell, this creates all of the AOs that are subsequent to the WO. The relevant attributes for each work cell are extracted from the WO list version.

You can track the status of assembly orders through production using the Released WO Status Monitor.

Use Options|Print Production Label to print labels. Most label printing happens automatically based on process setup. For example, labels can be automatically printed when the work order is released. However, the Print Production Label function is useful if you need to resend the event that caused the initial printing; for example, when the printer fails. See “Label Queues and Printing Configuration” on page 189.

Select a record; then click Modify Record to open it for updating.

Fig. 8.22
Assembly Order Maintenance

The screenshot shows the 'Assembly Order Maintenance' window with the following data:

Assembly Order ID:	20060310-00207311-00000000	Started Date:	10/03/2006
Description:	System Generated	Started Time:	18:15:36
Ship-To ID:	CUSTSHIP	Finished Date:	
Assembly Unit:	BCT4 Seat Sets	Finished Time:	00:00:00
Work Cell ID:	BCT4 Workcell 1	Pack Order:	0
Work Order ID:	20060310-00010295-00000000	☐ Milestone Operation Reported	
Batch ID Released:	1793	☐ Components Changed	
Batch Serial Released:	2		
Batch Qty:	0		
Production Status:	R		
To Do Quantity:	0		
Package Info:			

Field Descriptions

Assembly Order ID. This is the system-generated assembly order ID.

Ship-To ID. Ship-to records are only relevant if the assembly unit has a linked shippable assembly unit. Set up ship-to records in Base|Addressses/Shipping|Ship-To Maintenance. Define shippable assembly unit in Base|Work Cell/Assembly Unit|Assembly Unit Tree Maint, Options|Shippable AU Maintenance.

Assembly Unit. This is the ID for the AU as defined in Base|Work Cell/Assembly Unit|Assembly Unit Tree Maintenance.

Work Cell ID. There is a one-to-one relationship between AUs and work cells, defined in Base|Work Cell/Assembly Unit|Work Cell Maintenance.

Work Order ID. This is the ID for the WO that the AO is derived from.

Batch ID Released. This is the ID of the group of orders released together. The number of orders released is defined as a parameter of the order scheduler process.

Batch Serial Released. This number identifies the sequence in which this work order was released within the batch identified in Batch ID Released.

Batch Qty. When customer order type is SEQ, batch quantity is 1.

Production Status. The system-assigned status can be any of the following:

- U Unscheduled is the default status when an order processor creates a work order.
- N Not schedulable; for example, there is a dependency error.
- S When an order scheduler rearranges the sequence of an order, the status is Scheduled.
- F When an order scheduler deploys the order to the work cell, the status is Firmed for production.
- R When an order scheduler releases the order for label printing, the status is Released for production. This is the highest process status.

To Do Quantity. For a batch work order, this field displays the number of items in the batch that remain to be produced.

Package Info. Package Info has the following format: package number: slot number (package status).

Pack Order. Enter a value that determines the order in which scheduled orders are packed for shipment. This can be useful when processing batch orders.

Example A batch work order is released for 100 pieces. The order scheduler creates 100 assembly orders. The pack order determines the sequence to use during the packing process.

Milestone Operation Reported. If this field is selected, it indicates that a milestone backflush message has been sent.

Components Changed. Use this field to indicate that the material normally consumed in this work cell was modified and that the backflush process should take into account these changes.

Build-Ahead/Nettable Orders and Safety Stock

Build-ahead orders are created and consumed in response to several circumstances:

- Amended Customer Orders
- Canceled Customer Orders
- Increased Inventory
- Consuming Build-Ahead Orders

Amended Customer Orders

When a customer order is amended resulting in changes to the work order list version, the order processor marks any released orders associated with that customer order as build-ahead orders.

However, when work has reached a certain point on an order, it may no longer be possible to amend it. You can use two order processor rules to manage when amendments are allowed:

- OPValidateAmendConditions
- OPCreateOrders

OPValidateAmendConditions

When the system determines that a broadcast requires an amendment, it first checks the PointOfNoReturn parameter of the order processor rule OPValidateAmendConditions.

This parameter specifies a broadcast point. You should set it to the broadcast point at or before the one where shipment occurs or based on any agreement you have with your customer that specifies when amendments are too late. Then when an amendment is received for an order that has reached that broadcast point, the order processor generates an error for the COVH.

If necessary, you can then create a cancellation for the old order and create an insertion for the amended order.

OPCreateOrders

If the amendment passes the first check, the system then checks two parameters for the order processor rule OPCreateOrders.

- The AllowReproduce parameter must be set to Yes for changes to be allowed. If the parameter is set to No, the order processor generates an error. If it is Yes, it then checks the Generate Error parameter. See “Status Codes” on page 420.
- The GenerateError parameter contains a comma-separated list of work order production status codes. If the summary status of the order matches a value in the parameter list, an error is generated.

Note In managing order amendments, it is assumed you are dealing with an order with a process status of P, Processed. In this case, the work order production status is the important status to consider.

The status values can include summary statuses, indicated by the pound sign (#). When multiple assembly orders are associated with a work order, the work order takes the highest status of any associated assembly order. The system indicates that this is a summary status by appending the pound sign. So the list of statuses could include U, U#, B, B#, and so on.

Canceled Customer Orders

When a customer order is canceled, any scheduled or released orders associated with that customer order are marked as build-ahead orders.

The disposition of other work orders is determined by the value for the pointOfNoReturn parameter of the OPCancelOrder rule in the order processor. If the work order status does not exceed the value for the pointOfNoReturn parameter, the order processor cancels the order; otherwise, there is an error.

The valid values for the parameter are scheduled, firmed, released, packed, and shipped. The default is shipped.

Increased Inventory

To increase inventory for items, you can manually create COV records and work orders and mark them as build-ahead. For the orders to be available for use, they must also be marked as nettable. See “Cust Order Version Maint” on page 386 and “Work Order Maintenance” on page 406.

Consuming Build-Ahead Orders

Use Operations|Production Utilities|Build-Ahead/Net/Safety Quantity to set the quantity of safety stock for each work order list version. Safety stock is not consumed by incoming orders.

To determine if nettable build-ahead orders exist for a work order list version—that is, build-ahead quantities available to satisfy new incoming orders—the order processor calculates the difference between the safety stock quantity and the combined system- and user-created build-ahead work orders. If there is a surplus, the order processor uses the oldest build-ahead order to satisfy the new customer order and marks the build-ahead order as netted out.

You can also view build-ahead, nettable, and safety stock quantities for each work order list version in Build-Ahead/Net/Safety Qty. The NetOutBuiltOnly parameter for the OPCreateOrders order processor rule specifies whether a build-ahead order must have a status of Built before it can be netted out.

Note When status is set to On Hold, In Repair, Canceled, or Closed for a build-ahead order, it is not available to be netted out and the quantity on the WOLV is decremented.

Order Status Maintenance

JIT/S tracks manufacturing events with Process, Production, and Pack status codes, reporting events with Backflush and Report as Shipped codes, and business events with general status codes: On Hold, In Repair, Scrapped, Canceled, and Closed.

Automatic and Manual Updates

Use the menu choices in Operations|Order Status Maintenance to manually update order statuses. Status changes are not always independent of one another or of other JIT/S processing; see “Effects and Limitations” on page 422.

Statuses can be set and removed automatically through workbenches and rules for scanning, shipment, and order processor rule groups. See “Automatic Status Maintenance” on page 421.

Note See your QAD Support representative for the latest information on the rules included with the default JIT/S system data.

Customer and Product Orders

Use Operations|Order Status Maintenance|Customer Order Status Maintenance and Product Order Status Maintenance to set or remove the Canceled, Closed, and On Hold status of work orders associated with selected customer and product orders, respectively.

Order status is maintained at the work order level and summarized upward to product and customer orders.

- The status for a product order is set to Canceled when all of the associated work orders are build-ahead orders or the status for the work orders is set to Canceled.
- The status for a product order is set to Closed when status for all of the associated work orders is set to Closed.
- The status for a customer order is set to Canceled or Closed when status for all of the associated product orders is set to Canceled or Closed, respectively.

Work Order Status Maintenance

Use Operations|Order Status Maintenance|Work Order Status Maintenance to manually update work orders with status changes, add orders to a BOL, and to report work orders as built.

In each of the order status maintenance screens, use the fields in the top of the screen to define filtering criteria for the order display; then click Apply to populate the browse.

- Entering a broadcast point enables the Sequence From, To fields.

- Entering an attribute name enables the Attribute Value field.
- Entering a date filter type enables the date and time fields.

Double-click any record in the browse for a read-only display of the appropriate order maintenance screen. Select one or more orders in the browse; then choose the action from the Options menu.

Fig. 8.23
Work Order Status Maintenance

Broadcast Point	Sequence Number	Order Number	Product Family	Product Family Order ID	Work Order ID	Description	WULV ID	Description	Yes/No
A4	3260	CUST-9260	PF1	20060306-00007066-00000000	20060306-00009591-00000000	System Generated	00000729	LYANE	00000
A4	3260	CUST-9260	PF2	20060306-00007068-00000000	20060306-00009796-00000000	System Generated	00000726	W	00000
A4	3260	CUST-9260	PF3	20060306-00007090-00000000	20060306-00009797-00000000	System Generated	00000725	YFNS	00000

Work Order Options Menu Choices

Note For the options that apply to leading/led orders: if the action cannot be applied to the leading order or to one of the led orders, it is not applied to any orders in that leading/led order group.

Set status to In Repair. When the status for a work order is set to In Repair, associated assembly orders can be built in the AO Workbench if they are not affected by the repair issue or they can be skipped without triggering a build sequence error. In the Packaging Workbench, you are warned that the order status is set to In Repair. If they choose to continue, the order is packed and retains the status; if they choose to not continue, the Packaging Workbench proceeds as if the order had not been scanned.

Remove In Repair status. When this action is completed, you must indicate whether to set the status for the selected orders to Built or WIP; the latter leaves open the possibility of setting some, but not necessarily all, of the associated assembly orders to Built.

Set Status to On Hold, Remove On Hold Status. When the status for a work order is set to On Hold, the associated assembly orders are skipped in the AO Workbench without triggering a build sequence error. An On Hold order cannot be packed from the Packing Workbench or added to a BOL in the Shipping Workbench.

Set Status to Closed, Remove Closed Status. When the status for an order in a package is set to Closed, the package cannot be added to a BOL in the Shipping Workbench.

Set Status to Shipped. Sets the Pack status for the selected orders to Shipped. If any of the selected orders are leading orders, as specified on their shippable assembly units, the status for their led orders is changed as well. Pack status cannot be set to Shipped for any order that has the Canceled, Closed, or On Hold statuses set.

Remove Shipped Status. Sets the Pack status to Packed for those orders where at least one assembly order is assigned to a package. Otherwise, sets the Pack status to Unpacked.

Set Status to Unproduced. Sets Production status to Unproduced for the selected orders. If any of the selected orders are leading orders, as specified on their shippable assembly units, the status for their led orders is changed as well.

Set Status to WIP. Sets Production status to WIP for the selected orders. You are prompted to indicate which assembly orders for the selected work orders. If any of the selected orders are leading orders, as specified on their shippable assembly units, the status for their led orders is changed as well. If you chose to move the work order to work in process, they will be prompted to select the assembly orders that they wish to mark as built.

Set Status to Built. Sets Production status to Built for the selected orders. If any of the selected orders are leading orders, as specified on their shippable assembly units, the status for their led orders is changed as well.

Report as Built. Reports the selected orders as built to the ERP application. If any of the selected orders are leading orders, as specified on their shippable assembly units, their led orders are reported as built also.

Unreport as Built. Creates a reverse backflush message for the ERP application.

Important This reversal applies to all selected orders regardless of whether they were reported as built manually or automatically.

Add Orders to BOL. Creates a BOL and adds the selected orders to it. For the selected orders that are identified as leading orders on their shippable assembly units, their led orders are added to the BOL as well.

Send Log Report to Excel. Exports the log records to Excel.

Section 4

Reference

This section provides reference information for use with your JIT/S implementation.

JIT/S Reference **419**

JIT/S Reference

These topics provide reference information about codes and system data used to manage activity in JIT/S.

Status Codes ***420***

Menu Listing ***424***

XML Documents ***432***

Status Codes

JIT/S tracks key events by updating status codes—Process, Production, Pack—as orders move through the manufacturing life cycle. Table A.1 shows the key events and how they affect customer order versions, work orders, and assembly orders. The table includes the reporting statuses for work orders: Backflush and Report as Shipped.

Orders also have general statuses that reflect their position in business terms—On Hold, In Repair, Scrapped, Canceled, and Closed. The various maintenance screens, browses, and workbenches display the manufacturing, reporting, and general status values.

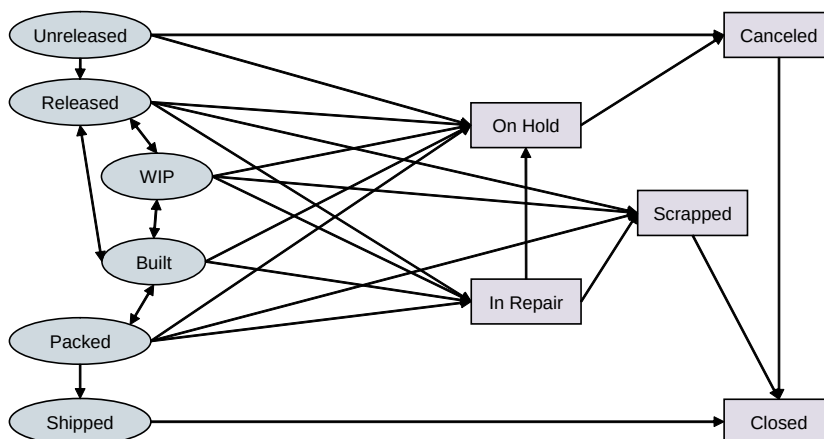
Statuses from lower-level records are displayed on higher-level records. For example, the work order backflush status can be seen on the associated customer order. The general statuses accumulate up when all of the lower-level records have the new status set. For the Process, Production, Pack, and Backflush statuses, JIT/S uses the following convention since one customer order may have several associated work orders and one work order may have several associated assembly orders:

The higher-level record shows the highest status from among its associated lower-level records. If all of the lower-level records do not have the same status, the status on the higher-level record is followed by a pound sign (#).

Order status changes can be logged by customer—for all of the customer’s product families—or by product family; set this up in Customer Maintenance or Product Family Maintenance; see “Customers” on page 68 and “Product Families” on page 91. The data is written to the order logging table in the logging database; it can be viewed in Tools|Logging/Debug Tools|Order/Package Change Logs. Use the JIT/S Archive/Delete client to delete log records that are no longer of use.

Orders maintain their current manufacturing and reporting status when general statuses are set and removed; for example, an order with the WIP manufacturing status maintains that status both when it is set to the general status On Hold and when the On Hold status is removed. A general status can be removed without assigning a new one; for example, when repairs are complete and the In Repair general status is removed from an order, you do not have to replace the removed general status with another.

Fig. A.1 Setting and Removing General Status Codes



Manual Status Maintenance

Use the choices from the Operations|Order Status Maintenance menu to manually update general, manufacturing, and reporting statuses for work orders. See “Order Status Maintenance” on page 414.

- Use Customer Order Status Maintenance to set or remove the On Hold, Canceled, and Closed status of work orders associated with selected customer orders.
- Use Product Order Status Maintenance to set or remove the On Hold, Canceled, or Closed status of work orders associated with selected product orders.
- Use Work Order Status Maintenance to:
 - Set or remove the general statuses In Repair, On Hold, and Closed.
 - Set or remove the manufacturing status Shipped.
 - Set the manufacturing statuses Unproduced, WIP, or Built.
 - Set or remove the reporting status Report as Built.

Automatic Status Maintenance

Order statuses can be set automatically through workbenches and rules used by order processors, scanners, and business events.

General Statuses

The setClosed rule can be added to order processor, shipping, or scanning rule groups:

- Order processor closes an order on processing a broadcast.
- Shipping closes an order on shipment of the order.
- Scanning closes an order on scanning it.

The setInRepair, clearInRepair, and clearOnHold rules can be added to scanner rule groups:

- setInRepair sets the status on scanning the order.
- clearInRepair removes the status on scanning the order; a parameter for rule specifies whether the order status should be set to Built.
- clearOnHold removes the status on scanning the order.

See your QAD Support representative for the latest information on the rules included in the default JIT/S system data.

Manufacturing Statuses

- Each individual assembly order changes status from Released to WIP to Built—depending on workbench setup—as it is built in the Assembly Order Workbench. While the start of production can be triggered by building the first assembly order, the other assembly orders retain the status Released until they are built.

Start of production is the first of the following to occur:

- The first assembly order of a work order is built from the Assembly Order Workbench.
- An export work order message that is configured to start production through a rule parameter is sent through an API.

- An end-of-production event occurs in the absence of a start-of-production event. This changes the status from Unproduced to Built immediately.
- The status for a work order is manually set to Built.

End of production is the first of the following to occur:

- All assembly orders for a work order are built.
- The CompleteWorkOrder message is received for a work order.
- All packaging assembly units for the work order have been packed.
- The status for a work order is manually set to Built.
- When a work order is set to Built, all of its assembly orders are set to Built whether or not they are being built on the Assembly Order Workbench.
- An order scheduler rule determines whether an order is backflushed as soon as it is released or later in the production cycle.
- When a work order is backflushed, all of its assembly orders also are set to Backflushed. The following are the backflush triggers:
 - An order scheduler rule that indicates that a work order is backflushed as soon as it is released
 - Manual backflushing through production reporting
 - Scanning by a backflush scanner
 - Packing the last packaging assembly unit for a work order
 - Shipping a work order

Effects and Limitations

Status changes are not necessarily independent of one another or of other JIT/S processing:

- When status is set to On Hold, In Repair, Canceled, or Closed for a build-ahead order, it is not available to be netted out and the build-ahead quantity on the WOLV is decremented.
- The order scheduler cannot schedule an order when the manufacturing status is Unscheduled, the general status is On Hold, Canceled, or Closed, or when the process status for parent customer order is Dependency.
- An order can be set to On Hold status if its current general status is In Repair or if its manufacturing status is Unreleased, Released, WIP, Built, or Packed. Only the Canceled business status can be set for an order that is currently On Hold.
- An order can be assigned to the In Repair general status if its manufacturing status is Released, WIP, Built, or Packed. Only the On Hold or Scrapped status can be set for an order that is currently In Repair.
- An order can be set to the Scrapped general status if its current status is In Repair or if its manufacturing status is Released, WIP, Built, or Packed. Only the Closed status can be set for an order that is currently Scrapped.
- A work order can be set to the Canceled general status only if its manufacturing status is Unreleased; this includes Unreleased orders that are currently On Hold. When a customer order or product order is canceled, the Canceled status is set for only the unreleased work orders; any released work orders are marked as Build Ahead orders and retain their current manufacturing status. Only the Closed status can be set for an order that is currently Canceled.

Table A.1 Manufacturing and Reporting Status Codes

	Event	COVH/CO Status	Work Orders					Assembly Order Status	
			Manufacturing Status			Reporting Status		Production	Backflush
		Process	Production	Pack	Backflush	Report as Shipped			
Order Receiver	Manual COVH entry	Temporary							
	Order received	Not processed							
Order Processor	Data validation failed	Error							
	Auto skipped error	XA							
	Manually skipped error	X							
	To be recycled	Recycle							
	Has dependency	Dependency	Not schedulable	Unproduced	Unpacked	Unbackflushed			
	Order process successful	Processed	Unscheduled	Unproduced	Unpacked	Unbackflushed			
Order Scheduler	Work order scheduled	Processed	Scheduled	Unproduced	Unpacked	Unbackflushed			
	Work order firmed	Processed	Firmed	Unproduced	Unpacked	Unbackflushed		Firmed	Unbackflushed
	Work order released	Processed	Released	Unproduced	Unpacked	Unbackflushed or Backflushed		Released	Same as work order
Build	Start of production	Processed	Released	WIP	Unpacked	Unbackflushed or Backflushed		Released or Built	Same as work order
	End of production	Processed	Released	Built	Unpacked	Unbackflushed or Backflushed		Built	Same as work order
	Backflush finished good	Processed	Released	Built	Unpacked	Backflushed		Built	Backflushed
Pack	Package completed	Processed	Released	Built	Packed	Backflushed		Built	Backflushed
Ship	Shipment finalized	Processed	Released	Built	Shipped	Backflushed		Built	Backflushed
	Set status manually	Processed	Released	Built			Status set		

Menu Listing

The following tables list menus located on each of the top-level menu choices in JIT/S.

Administration Menu

Table A.2 Administration Menu

Menu Sections	Menu Items	Options
	Security Control	
	UI Preferences	
	Message Queue Maintenance	

Tools Menu

Table A.3 Tools Menu

Menu Sections	Menu Items	Options
Logging/Debug Tools		
	Logging Database Viewer	
	Sonic Cache Viewer	
	Message Queue Viewer	
	Order/Package Change Logs	
	Monitored Event History View	
Exception Management		
	Message Maintenance	
	Message Log Viewer	Options Message Purge
System Process Tools		
	Manual OS Launcher	
	HFD Print Process	
System Data Tools		
	Counter Maintenance	Options Associate Function
	Counter Configuration	
	Counter Function Maintenance	
	Counter Field Activation	Options Details
	Attribute/Item Import	
	Class Code Maintenance	Options Valid Members
	State Overview	Options Possible Next States
	Technical Verification	
	Load Translation Term	
Development Tools		
	Update User-Defined Fields	
	System Controls	

Base Menu

Table A.4 Base Menu

Menu Sections	Menu Items	Options
Addresses/Shipping		
	Postal Code Maintenance	
	Country Code Maintenance	
	General Address Maintenance	
	Site Maintenance	Options Address Assignment
	Customer Maintenance	Options Work Week Maintenance Options Address Assignment
	Ship-From Maintenance	
	Ship-To Maintenance	Options Address Assignment
	Ship-To Dock Maintenance	Options Address Assignment
	Carrier Maintenance	Options Address Assignment
	Transport Configuration Maintenance	
	Shipping Group Maintenance	Options Packaging AU Assignment Options Shippable AU Assignment
	Shipping Configuration Maintenance	Options Shipping Groups Assignment
Work Patterns		
	Shift Maintenance	
	Work Week Maintenance	
Attributes		
	Attribute Maintenance	Options Attribute Value Options Attribute Value Browse Options Attribute Assignment
	Attribute Assignment	
	Attribute/Item Import	
	Attribute Name/Value Browse	Options Attribute Value Browse
Items		
	Unit of Measure Maintenance	
	Color Code Maintenance	Options Color Matrix
	Color Relationship Maintenance	
	Revision Level Maintenance	
	Product Family Maintenance	Options Attribute Assignment Options Data Verification Tests
	Item Type Maintenance	
	Item Status Maintenance	
	Vehicle Line Maintenance	Options Attribute Assignment
	Commodity Maintenance	
	Item Maintenance	Options Attribute Value Options Shippable AU Options Data Verification Tests
	Customer Item Maintenance	

Table A.4 Base Menu

Menu Sections	Menu Items	Options
Packaging		
	Package Unit Maintenance	Options Subrack Maintenance Options Data Verification Tests
Work Cell/Assembly Unit		
	Work Cell Maintenance	Options Attribute Assignment Options Printer Assignment Options User Assignment Options Data Verification Tests
	Assembly Unit Tree Maintenance	Options Workbench Defaults Work Instruction Maintenance Options Shippable AU Maintenance Options Packaging Options Attribute Assignment Options Label Restriction Options Data Verification Tests
	Shopping List Maintenance	
	AOWB Button Profile Maintenance	Options Button Profile Detail Maintenance
	AOWB Color Profile Maintenance	Options Color Profile Detail Maintenance
Product Structures		
	Product Structure Maintenance	Options Create Finished Goods
	Product Structure Copy	
	PS Component Update	
	PS Explosion/Implosion	

Setup Menu

Table A.5 Setup Menu

Menu Sections	Menu Items	Options
Communications		
	Channel Maintenance	
	Broadcast Point Maintenance	Options Previous Points Options Order Processor Browse
	QAD ERP Parameter Maintenance	
Processes		
	Process Maintenance	Options Process Status Options Process History Options Process Parameter Options Process Rule Options Launch Process Options Stall/Unstall Process Options Stop Process

Table A.5 Setup Menu

Menu Sections	Menu Items	Options
	Process Detail Viewer	
	Event Listener Maintenance	Options Event Listener Detail Options Event Listener Parameters Options Event Listener Status
	Scanner Maintenance	Options Scanner Status
Factory Dashboard		
	Severity Level Maintenance	
	Monitored Event Maintenance	Options Filter Maintenance
	Dashboard Indicator Maintenance	Options Threshold Maintenance Options Manual Adjustment
	Dashboard View Maintenance	
Printers		
	Printer Type Maintenance	
	Paper Size Maintenance	
	Printer Maintenance	Options Printer Type Maintenance
Labels/Documents		
	Label Group Maintenance	
	Label Format Maintenance	Options Label Format Detail Options Printer Type Maintenance Options Import Template Options Maintain Variables
	Label Data Variable Maintenance	Options Link Variable Details
	Label Data Var Detail Maintenance	
	Label Data Query Maint	Options Link Variables Options Override Detail Variables Options Data Verification Tests
	Label Queue Maintenance	
	Label Printing Configuration	Options Label Configuration Detail Options Print Destinations Options Label Restriction
	Document Format Maintenance	Options Format Parameter
	Barcode Data ID Maintenance	
	Barcode Delimiter Maintenance	

Operations Menu

Table A.6 Operations Menu

Menu Sections	Menu Items	Options
	Factory Dashboard Monitor	
	Detailed Order Viewer	Options CO Detail Options COVH Data Options COV Detail Options ORDI Information Options PFO Data Options Item Data Options Attribute Data Options WO Data Options Labels Options Test Results Options Item Data Options Attribute Data Options AO Data Options Labels Options Package Details Options Packing Slip/BOL Details Options Package Details Options Packing Slip/BOL Details Options Package Details Options Packing Slip/BOL Details Options Package Details Options Packing Slip/BOL Details
Assembly		
	Assembly Order Workbench	
	Assembly Order Monitor	
Packaging/Shipping		
	Packaging Workbench	
	View/Rebuild Packages	
	Shipping Sequence Viewer	
	Shipping Workbench	
	Finalized Shipment Viewer	
	Update Packing Sequence	
	Alternative Packaging Workbench	
	BOL Processing	Options Add to MBOL Options Report BOL Options Print BOL Options Show Work Orders

Table A.6 Operations Menu

Menu Sections	Menu Items	Options
	MBOL Processing	Options Report MBOL Options Unreport MBOL Options Print MBOL Options Show BOLs
	Production/Ship Labels Cross Reference	
Monitors/Workbenches		
	Customer Order Version Monitor	
	Work Order Scheduling Monitor	
	Released Work Order Status Monitor	
	In-Transit Order Monitor	
	Customer Order Version Workbench	Options Cust Order Version Monitor Options CO Version Detail Options View PFO List Versions Options View WO List Versions Options Manual COV Entry Options CO Version Detail Options Copy Customer Order Version Options Delete Cust Order Version
	Work Order Workbench	Options Cust Order Version Workbench See Options under COV Workbench. Options COV Error Maintenance Options Assembly Order Maintenance Options Print Production Label Options Label Reprint Options Label Detail Options Preview Label Options Print Label Swap/Scrap Work Order
	ASRS Overview	
Labels		
	Print Job Maintenance	Options Print Queue Details Options Print Label Options Cancel Label
	On-Demand Label Print Variable Maintenance	Options Select Printer Options Print Label
	Label Reprint	Options Label Detail Options Preview Label Options Print Label
	Label Inquiry	
Trace Data		

Table A.6 Operations Menu

Menu Sections	Menu Items	Options
	Trace Data Viewer	
Replenishment		
	Shopping List Workbench	
	Shopping List Picking	
	Work Cell Picking Workbench	
Reports		
	JIT Sequence	
	Work Order List Version Detail	
	Ordered Items	
	Order Aging	
	Open Orders	
Production Utilities		
	Scanner Startup	
	Build-Ahead/Net/Safety Qty	Options Build Ahead Work Orders
Lists/Orders		
	Item List Maintenance	Options Item List Detail
	Attribute List Maintenance	Options Attribute List Detail
	PFO List Version Maintenance	Options Attribute List Detail Options Item List Detail Options Recalculate Attribute Short Code
	WO List Version Maintenance	Options Attribute List Detail Options Item List Detail Options Recalculate Attribute Short Code
	Manual COV Entry	Options CO Version Detail
	Cust Order Version Maintenance	Options CO Version Detail Options COV Error Maintenance Options Delete Selected COV Options Recycle Selected Record Options Recycle All Records
	COV Error Maintenance	
	Sales Order Maintenance	Options Sales Order Details
	Customer Order Maintenance	Options CO Detail
	Product Family Order Maintenance	
	Work Order Maintenance	
	Assembly Order Maintenance	Options Print Production Label
Order Status Maintenance		

Table A.6 Operations Menu

Menu Sections	Menu Items	Options
	Customer Order Status Maintenance	Options Set status to Cancelled Options Remove Cancelled status Options Set status to On Hold Options Remove On Hold status Options Set status to Closed Options Remove Closed status Options Product Order Status Maintenance See options under Product Order Status Maintenance Options Work Order Status Maintenance See options under Work Order Status Maintenance
	Product Order Status Maintenance	Options Set status to Cancelled Options Remove Cancelled status Options Set status to On Hold Options Remove On Hold status Options Set status to Closed Options Remove Closed status Options Work Order Status Maintenance See options under Work Order Status Maintenance
	Work Order Status Maintenance	Options Set status to In Repair Options Remove In Repair status Options Set status to On Hold Options Remove On Hold status Options Set status to Closed Options Remove Closed status Options Set status to Shipped Options Remove Shipped status Options Set status to Unproduced Options Set status to WIP Options Set status to Built Options Unreport as Built Options Add Orders to BOL Options Send Log Report to Excel

Message Manager Menu

Table A.7 Message Manager Menu

Menu Sections	Menu Items	Options
Setup		
	Document Definition Maintenance	

Table A.7 Message Manager Menu

Menu Sections	Menu Items	Options
	Application Definition Maintenance	
	Implementation Definition	
	Transmission Group Maintenance	
	Trading Partner Maintenance	
	Function Maintenance	
	Transformation Maintenance	
	Parameter Maintenance	
	Default Parameter Maintenance	
	Default Directory Maintenance	
	Error Message Maintenance	
	Gateway Maintenance	
	Subsystem Maintenance	
	Document/Subsystem Cross-Reference	
	Sonic Queue Maintenance	
	HTTP Adapter Maintenance	
	Event Maintenance	
	Import/Export Utilities Setup Export Setup Import	
Operations		
	Inbound Workbench	
	Outbound Workbench	
	Document Repository Maintenance	
	Application Repository Maintenance	
	Document/Application Cross-Reference	
	Turnaround Data Maintenance	
	Transmission Queue Maintenance	
	Archive Queue Maintenance	

XML Documents

These tables map the XML file elements and the JIT/S fields that are part of the backwardExplodedReceipts document for reporting production and the billOfLading document for reporting shipments.

backwardExplodedReceipts

There is no nesting in the backflush document.

Table A.8 Backflush Document: backwardExploded Receipts

XML	Notes
ptPart	Part number including item ID, color ID, and revision ID
wipSite	Site to backflush raw material from and create finished goods
lotserialQty	Quantity of the part number
site	Site to move received finished goods inventory into
effDate	Transaction date

billOfLading

There are several levels of nesting in the shipment document.

```
<billOfLading>
  <billOfLadingDetail>
    <packingSlip>
      <packingSlipDetail>
      </packingSlipDetail>
      <packingSlipDetail>
      </packingSlipDetail>
    </packingSlip>
    <packingSlip>
      <packingSlipDetail>
      </packingSlipDetail>
      <packingSlipDetail>
      </packingSlipDetail>
    </packingSlip>
  </billOfLadingDetail>
</billOfLading>
```

Table A.9 Shipment Document: billOfLading

XML	Notes
billOfLading	Top level
bohe_id	Initial temporary ID
bohe_trailer_id	Entered truck identifier
bohe_driver_name	Entered driver name
bohe_etd_date	Entered estimated departure date
bohe_etd_time	Entered estimated departure time
bohe_etd_ddt	Date/time as a number of seconds.since 4713 BC
bohe_dec1 to 5	
bohe_log1 to 5	
carrier_id	Carrier unique ID
Freight_payment_terms	Selected terms
Transportation_mode	Selected mode
billOfLadingDetail	Next level down (one only)
bode_id	next level ID (shipment)
bode_bode_gross_weight	Calculated weight
bode_status	Always Finalized
bode_create_date	Creation date

XML	Notes
bode_create_time	Creation time
bode_create_ddt	Creation date/time as a number of seconds.since 4713 BC
bode_finalize_date	Date finalized
bode_finalize_time	
bode_finalize_ddt	
bode_print_time	Time the BOL was printed
bode_print_ddt	
bode_dec1 to 5	
bode_log1 - 5	
customer_id	Customer
packingSlip	Next level down (multiple)
pckd_id	Next level ID
pckd_create_date	Create date for this level
pckd_create_time	Create time for this level
pckd_create_ddt	
pckd_net_weight	Calculated weight
pckd_dunnage_weight	Calculated weight
pckd_weight_adj	Entered +/-
pckd_no_of_units	Quantity
pckd_print_time	Time packing slip printed
pckd_print_ddt	
pckd_gross_weight	Gross weight
pckd_dec1 to 5	
pckd_lot1 to 5	
ship_from_id	Ship-from entity
ship_from_site_id	Ship-from site
ship_to_id	Ship-to ID
production_method	Sequenced
packingSlipDetail	Multiple detail for one packing slip
shhi_bol_number	BOL detail ID
shhi_shipment_finalized_date	
shhi_shipment_finalized_time	
shhi_shipment_finalized_ddt	
shhi_truck_id	Copy of trailer ID
shhi_carrier_via_code	Carrier via code
shhi_pack_slip_number	Packing slip number
shhi_site_number	Sending site
shhi_current_date	
shhi_current_time	
shhi_current_ddt	
shhi_customer_code	Customer ID
shhi_ship_to	Ship-to ID

XML	Notes
shhi_destination	Dock or door within ship-to
shhi_customer_end_item	Customer part number
shhi_int_end_item_part	Internal item number
shhi_quantity	Quantity
shhi_int_end_item_color	Color code
shhi_int_end_item_rev	Revision number
shhi_cha1	Sales order line number
shhi_cha2	Sales order
shhi_cha3	Customer's reference
shhi_dec1 to 5	
shhi_log1 to 5	
mfgpro+part_id	ERP part number

Glossary

A

Advance Ship Notice (ASN). EDI document that notifies the customer of what was shipped.

ASN. See *Advance Ship Notice (ASN)*.

Assembly Order. The order scheduler process generates an assembly order for each assembly unit that is in a work order generated by the order processor.

Assembly Unit (AU). AUs are customer-independent and manufacturing-oriented definitions of the items that a plant can manufacture. AUs are organized in a tree structure:

- The top-level unit is the root AU; it represents the product family.
- Below the root unit are the shippable AUs. The order processor generates a product family order for each root AU and a work order for each shippable AU. Shippable AUs are shown in blue in the AU tree.
- Nested in the shippable AUs are other AUs and assemblies.
- There is a one-to-one relationship between assembly units and work cells on the shop floor. The order scheduler generates an assembly order for each AU.

Assembly Unit Tree. A hierarchical structure that reflects how the finished product units are built. The members of the tree are the AUs and the work cells linked to them. The AU tree maps the shop floor.

Attributes. Attributes carry option information for product families, assembly units, work cells, and items. They can also be used to identify tests for an item. Each attribute is a member of an `attribute_type` class and has a defined set of valid values.

AU. See *Assembly Unit (AU)*.

B

Backflushing. The deduction from inventory, after manufacture, of the component items used in a parent by exploding the bill of materials by the production total of parents produced. For JIT/S, backflushing is completed by sending backflush messages to the QAD ERP application, where inventory is tracked.

Bank. A special type of count that measures quantities between two monitored events in the Factory Dashboard. These two events typically represent two broadcast points on the production line.

Barcode. A series of alternating bars and spaces printed or stamped on items, containers, labels, or other media representing encoded information that can be read electronically.

Bill of Lading (BOL). A legal shipping document that is a detailed breakdown of a shipment; for example, products shipped, total weight of product, and containers used for packing. Typically, this is a third-party carrier's contract and receipt for goods transported between two points and deliverable to a specified individual.

Bill of Materials (BOM). A listing of items needed to manufacture a product, showing the quantity of each required to produce each end item. A bill of material is similar to a parts list except that it usually shows how the product is fabricated and assembled. Also called a product structure record, formula, recipe, or ingredients list.

Blocked. No more items can be stored in an area or shelf.

BOL. See *Bill of Lading (BOL)*.

BOM. See *Bill of Materials (BOM)*.

Broadcast. Electronic message used to communicate order information from a customer.

Build Ahead. Build-ahead items are produced without customer orders and consumed (netted out) when the customer order comes in; for example, if component items are built in response to a customer order for a unit and then the order is canceled, the built-ahead components can be netted out the next time an order is placed for a unit that uses them.

Business Integration Server (BIS). Middleware to integrate applications. Combines with EDI communication systems. Also known as Business Interchange Service.

C

CIM. Computer Integrated Manufacturing. An electronic bridge networking separate computer systems into a coherent, integrated whole.

CO. See *Customer Order*.

Consumer. A type of process based on an event listener that initiates an action when an event occurs.

Commodity. Items or assemblies that are referred to in bulk, such as metals or plastics.

Component. An item, ingredient, or assembly that is both a component to a higher-level item and a parent item to other components

Constraint Scheduling. Load or line balancing.

Container. A packing item used to hold goods and subsets of other containers such as a box, pallet, rack, or trailer.

COV. See *Customer Order Version (COV)*.

COVD. See *Customer Order Version Detail (COVD)*.

COVH. See *Customer Order Version Header (COVH)*.

Customer Order. The order processor generates a customer order for each customer order version generated by the order receiver.

Customer Order Type. Type of order:

- Batch: Batch order used in a component plant
- MRP: MRP Plan
- SEQ: Sequence order for JIT

Customer Order Version (COV). Customer order version is generated by the order receiver each time it receives a broadcast communication regarding that order.

Customer Order Version Detail (COVD). Customer order version detail contains item and attribute information for a COV.

Customer Order Version Header (COVH). Customer order version header contains customer, unit sequence, and COV number information.

Cutting Point. Definition of planning horizons that determine how to use calculated short- and long-term requirements.

Cycle Counting. The continual physical counting of stock rather than counting stock periodically. A cycle is the time required to count all items in the inventory at least once. The frequency of cycle counting can be varied to focus management attention on the more valuable or important items or to match work processes. Some of the systems used are:

- ABC: The highest count frequency for items with the highest annual usage value.
- Reorder: Stocks are counted at the time of order.
- Receiver: Goods are counted when they are received.
- Zero balance: Items are counted when a backorder situation is reached to confirm that no stock is held.
- Transaction: Stocks are counted after a specified number of transactions.

D

Data Universal Numbering System (DUNS). A unique nine-digit sequence recognized as the universal standard for identifying and keeping track of businesses worldwide. It is used in EDI transactions to recognize the issuer or receiver of an electronic data interchange.

Delivery Order Number (DON). Used by international customers to group several line items together for shipping purposes.

DELJIT. Delivery just-in-time message.

DOM. A programming interface specification being developed by the W3C that lets a programmer create and modify HTML pages and XML documents as program objects, rather than data structures.

DON. See *Delivery Order Number (DON)*.

Dunnage. Packing material used to protect a shippable assembly unit from damage during transport. Dunnage count and weight is calculated during shipment and package processing.

DUNS. See *Data Universal Numbering System (DUNS)*.

E

EDI. See *Electronic Data Interchange (EDI)*

EDIFACT. Electronic data interchange for administration, commerce, and transport. Generally used to refer to the set of international standards that were developed to enable EDI among businesses located in North America, Europe, and other geographic regions. In 1987, the EDIFACT syntax proposals were accepted by the ISO Technical Board and the number ISO 9735 was allotted. These standards are application, communications medium, and machine-independent.

Electronic Data Interchange (EDI). An international protocol for electronically transmitting documents such as purchase orders, supplier schedules, sales orders, customer schedules, invoices, and advance ship notices (ASNs) between trading partners.

Entity Mnemonic. Dump name of a table; for example, gd mf part is made up of:

- gd: general data
- mf: master file
- part: parts table

Extensible Markup Language (XML). A specification designed especially for Web documents that allows the definition, transmission, validation, and interpretation of data between applications and organizations.

F

Fab Auth Days. Fabrication authorization days. The time period or authorization horizon during which a customer authorizes a supplier to fabricate items.

Fab Qty. Fabrication quantity. The maximum quantity of an item a customer authorizes you to produce in anticipation of the customer's scheduled demand.

FAST BOL. Ford-specific requirement. Ford wants the same BOL number for all the suppliers and shipments made in a day. The BOL contains the Julian date and either a route number (fixed or per day) or the last two digits of a trailer number.

FIFO. With the first-in-first-out method, the goods that have been longest in stock are delivered or consumed first. This method can also be applied to the production line.

Finalized. Action the shipper makes that prevents any changes being made to a shipment and triggers the AR, inventory, and ASN processes.

Finished Goods. Inventory to which the final increments of value have been added through manufacturing.

Finished Goods Stock. Stock that is available for supply to an external consumer, including items that have been supplied but not invoiced to an external consumer.

Firm Planned Work Order. A planned order frozen in quantity and time that cannot be changed by MRP; it can only be changed by the planner.

Free on Board (FOB). Terms of a sale that identify when title passes from a seller to a buyer, and who pays shipping.

Freeze. Indicates that additional changes are not allowed; for example, picking is not allowed from a particular shelf.

G

Golden Gate. A broadcast area that triggers a message that a car has successfully completed the production line.

Group ID. A code used to group items on a purchase order or assembly unit order for similar treatment, such as the same packaging or shipping on the same truck.

GSFS. Global shop floor system.

H

HTTP. Hypertext Transfer Protocol.

I

Item. Any unique manufactured or purchased item, material, component, assembly, or product tracked for inventory, planning, manufacturing, or financial transactions. Items in JIT/S have a unique identifier, color, and revision level.

J

Just in Time (JIT). A dependent demand inventory control philosophy that views production as a system in which all operations—including the delivery of materials needed for production—occur just at the time they are needed. Thus, stocks of material are nearly eliminated.

JIT Pipeline. A term used to describe the sequence of broadcast points representing the customer requirement, from the beginning of the OEM's production line to the point-of-fit broadcast point.

K

Key Performance Indicator (KPI). A quantifiable measurement that reflects a critical success factor for an organization or system.

L

Labor Burden. The overhead cost associated with labor. Usually stated as a percent of direct labor or cost per direct labor hour.

Labor Cost. The dollar amount of added value due to labor performed during manufacturing.

Lead Time. The time in calendar days required to perform an activity. May include time needed for purchasing, order preparation, queuing, transportation, receiving, and inspection.

Leading/Led SAUs and Orders. In Shippable AU Maintenance, you can specify a leading SAU for the current SAU; the current SAU is then considered a led SAU. Actions taken on work orders for leading SAUs in Operations|Order Status Maintenance and Shipment Reporting are also applied to work orders—for the same customer order—for any associated led SAUs. Nesting is not allowed; that is, a led SAU cannot also be a leading SAU.

Led SAUs and Orders.

Load Balancing. Ship-delivery pattern to offset peaks on the assembly line. Load balancing is a process that evenly spreads the activity across an assembly line so that no single work cell is overwhelmed. Load balancing is especially important for those assembly lines where it is difficult to predict the complexity as well as the number of requests that will be issued to a work cell. Also known as line balancing.

Lot. A batch or part of a batch having uniform character and quality within specified limits. Or, in the case of a pharmaceutical produced by a continuous process, a specific identified amount produced in a unit of time or quantity, and in a manner that assures uniform character and quality within specified limits.

Lot Number. The allocation of a unique number to one or more of a product during manufacture or assembly to provide traceability.

M

Manufacturing Execution System (MES). A factory-floor information and communication system that can provide real-time feedback and analysis of activity monitored by physical devices on a production line.

Mask. A pattern that determines how values are formatted and replaced at run time.

Master Bill of Lading (MBOL). A receipt given a carrier that includes details from several bills of lading; often represents an entire truck. See also *Bill of Lading (BOL)*.

Material Requirements Planning (MRP). A key manufacturing planning process that uses a site's master schedule and all other sources of demand and supply to calculate gross item requirements and projected on-hand inventory, schedule and plan orders, and produce action messages. MRP supports manufacturing and fabrication organizations by the timely release of production and purchase orders using the production plan for finished goods to determine the materials required to make the product. Orders for dependent demand items are phased over time to ensure that the flow of raw materials and in-process inventories matches the production schedules for finished products.

MBOL. See *Master Bill of Lading (MBOL)*.

MES. See *Manufacturing Execution System (MES)*.

Milk Run. Term used to describe shipments when one truck is used to deliver items to multiple customers.

N

Net-Out. Build-ahead items are produced without customer orders and consumed (netted out) when the customer order comes in; for example, if component items are built in response to a customer order for a unit and then the order is canceled, the built-ahead components can be netted out the next time an order is placed for a unit that uses them.

Nettable. An inventory status attribute that determines whether MRP includes items in its planning.

Netting. Calculating net requirements by subtracting quantity-on-hand from gross requirements.

O

ODBC. Open Database Connectivity (ODBC) is an open standard API for accessing a number of different databases. In addition to the ODBC software, a separate module or driver is needed for each database to be accessed.

ODETTE. Organization for Data Exchange by Teletransmission in Europe. The primary standards organization for automotive EDI in Europe.

Original Equipment Manufacturer (OEM). A manufacturer that buys and incorporates another supplier's products into its own products.

Orders. See *Customer Order*, *Programmable Logic Controller (PLC)*, *Assembly Order*, and *Work Order*.

ORDi. One type of record created by the order receiver when it parses the broadcast messages received from the customer. ORDi records contain additional customer-specific information about the order.

P

Package. This is a physical entity that holds items for shipping from the end of a production line or from a packing area. It is built based on a defined packaging assembly unit.

Packaging Assembly Unit (PAU). Specifies the packaging unit, ship-to, and rules for building a package for a specific assembly unit.

Packaging Unit. A definition of a package including the package type and capacity. When the package type is rack, the definition includes rules for sorting, printing, and validation order.

Pareto's Law. A small percentage of a group typically accounts for the greatest percentage of value or effort generated by the group. For example, 20% of items in inventory comprise 80% of inventory value. Also known as the 80/20 Rule.

Part Verification. The process where a PLC validates an item and some indicator is passed back to the shop floor system indicating it has passed or failed.

PAU. See *Packaging Assembly Unit (PAU)*.

Pay Point. See *Golden Gate*.

Pegging. In MRP and MPS, the ability to identify, for a given item, the sources of its gross requirements or allocations. Alternatively, the process of consuming a shipper line that is tied to a required ship schedule requirement record.

PF. See *Product Family (PF)*.

PFO. See *Product Family Order (PFO)*.

PFOLV. See *Product Family Order List Version (POLV)*.

Phantom. An item or assembly directly consumed into its parent items and not planned or stocked upon completion. Normally, lead time is zero and lot sizing is lot for lot. MRP can drive requirements through the phantom item to its components while retaining the ability to net against any assembly inventories. Phantoms facilitate the use of common product structures for engineering and manufacturing.

Physical Inventory. The actual inventory or an actual count of inventory. Can be taken on a continuous, periodic, or annual basis.

Picking List. An output from an inventory control system designating those items, by item number, description, and quantity, to be picked from stock to satisfy customer demand.

Picklist. A document that lists material to be picked for manufacturing or shipping orders. In distribution functions, known as a pre-shipper.

Pipeline. The total collection of sequenced orders that can be built for each product family based on the different broadcast messages you receive from the customer.

Planned Work Orders. A suggested order quantity, release date, and due date created by MRP processing when it encounters net requirements. They are generated only outside an item's time fence. Must be approved by the master planner to become firm planned orders in the master production schedule.

PLC. See *Programmable Logic Controller (PLC)*.

PLC. Production Line Control.

PLIP. Persistent library of internal procedures. A Progress Dynamics term for a unit of source code.

PML. See *Product Module Codes (PML)*.

Product Family (PF). The items in a customer order can be grouped in multiple ways to result in the various final items to be shipped. These final items can be classified as various product families and depending on the composition of the product, can vary from customer to customer even for the same assembled finished good in the plant. From a COV, the order processor generates a product family order for each product family.

Product Family Order (PFO). The order processor generates a product family order for each product family that is in a customer order version generated by the order receiver.

Product Family Order List Version (POLV). Each version of the product family order list has the latest lists of items, attributes, and components required for the product family covered by the product family order. The order processor generates the POLV based on the latest COV.

Product Module Codes (PML). A code used by Volvo Car Corporation in broadcast messages to represent items. These must be mapped to items defined within the application.

Programmable Logic Controller (PLC). An electronic device that is programmed to test the state of input process data and to set output lines in accordance with the input state. PLCs provide factory floor operations with the ability to monitor and control activities.

Purchase Order (PO). A contract with a supplier to purchase a specific quantity of items to be delivered at an agreed-upon date for a set price. It includes order quantity, description, price, discounts, payment terms, transportation terms, and all other terms pertinent to the purchase and its execution.

Q

QDoc. An inbound data document to the QAD ERP application in XML format that conforms to generated schemas and events files.

QXtend Inbound. A component of the QAD QXtend interoperability framework that delivers inbound data to the QAD ERP application and JIT/S menu-level programs. The inbound data is in the form of XML data documents, called QDocs, delivered in either a proprietary XML format or, for a select few programs, as direct code APIs.

R

Radio Frequency (RF). In warehousing, refers to the portable data collection devices that use radio frequency to transmit data to a host system.

RAN. See *Release Authorization Number (RAN)*.

Receiving. Physical receipt of material includes checking a purchase order against a receipt document, delivery to the proper destination, and completion of receiving reports.

Release Authorization Number (RAN). Release authorization number is used by international customers at a line-item level to order, reconcile receipt of product in the facility, and invoice.

Rough-Cut Capacity. Used to determine estimated load on key pieces of equipment or resources.

Routing. A set of operations required to manufacture a product. It shows work centers, machines used, sequence of operations, and tools and standard hours required. Setup and run time can also be entered. In some companies, it includes information on tooling, operator skill levels, inspection operations, testing requirements, and so on.

Used in conjunction with the product structure in manufacturing operations.

S

Safety Days. Number of days stock you must have in the plant.

Safety Stock Level. Minimum amount of stock that you must have in the plant.

Sales Order (SO). An agreement to provide a customer with a quantity of a certain item or items at a set price by a set date.

SCAC. See *Standard Carrier Alpha Code (SCAC)*.

Scheduled Work Order. See *Assembly Order*.

SDP. See *Ship-Delivery Pattern (SDP)*.

SEQ. Sequence.

Sequencing. Determining the order in which a manufacturing facility processes jobs in order to achieve objectives.

Ship To. Delivery Address.

Ship-Delivery Pattern (SDP). An industry-standard code set that schedules ship and delivery dates for EDI transmissions. These codes eliminate the need to transmit discrete quantities and dates for each required shipment or delivery by assuming that a bucketed quantity is to be divided equally by the ship/delivery pattern. For example, a weekly quantity of 100 with a delivery pattern of Monday and Wednesday would result in 50 to be delivered on Monday and 50 to be delivered on Wednesday.

Shipper. A supplier document that issues and structures shipments. It is sent to the customer as an ASN. It identifies items and, optionally, all containers by individual shipment. The shipper constitutes the master container.

Shopping List. A list of components used at a particular consumption point on a production line. In response to demand, the replenishment process picks the listed components from a storage location and delivers them to the consumption point.

SMS. Short messaging system.

Standard Carrier Alpha Code (SCAC). A unique two-to-four-letter code used to identify transportation companies and adopted as the standard by the American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 and United Nations EDIFACT for EDI transaction sets such as the 856 Advance Ship Notice.

Storage Retrieval System (SRS). A type of programmable logic controller that typically interfaces with a warehouse system

System Owned. Fields or records that are system owned can be updated by only users with Maintain System Data checked in Administration|Security Control. It highlights that the fields or records should not be updated by end users.

T

Takt Time. In a flow environment, the rate at which items must be manufactured to satisfy demand. Also known as operational cycle time.

Transaction Set (TS). A raw detail file.

TS. See *Transaction Set (TS)*.

U

UI. User interface.

Unplanned Issue. An issue transaction that updates quantity on hand when an order does not exist.

Unplanned Receipt. A receipt transaction that updates quantity on hand when an order does not exist

UM. Unit of measure.

V

Vehicle Identification Number (VIN). A standard number to describe and identify motor vehicles. It consists of three sections:

- World Manufacturer Identifier (WMI), positions 1-3, identifies the maker of the vehicle.
- Vehicle Descriptor Section (VDS), positions 4 through 9, identifies vehicle attributes.
- Vehicle Identifier Section (VIS), the last 8 positions, identifies a specific vehicle.

W

Web Server. A Web server is a program that, using the client/server model and the World Wide Web's Hypertext Transfer Protocol (HTTP), serves the files that form Web pages to Web users (whose computers contain HTTP clients)

WO. See *Work Order*.

WOLV. Work order list version. Each version of the work order list has the latest lists of items, attributes, and components required for the shippable assembly unit covered by the work order. It is generated by the order processor based on the latest COV.

Work Cell. A production unit formed from a group of dissimilar machines used to produce a family of items with similar routings. In JIT/S, work cells are the smallest units on the production assembly line and are linked to assembly units.

Work Order. A document, group of documents, or schedules authorizing manufacture of specified items in specified quantities by a specified date. It can also be used to designate orders to a machine shop for tool manufacture or maintenance. The order processor generates a work order for each shippable assembly unit that is in a product family order that it has generated.

Workbench. A tool that lets you perform multiple functions on related records. Workbenches can be used for packaging, shipping, and managing customer order versions.

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