QAD JIT Sequencing Release Notes

May 2008

These release notes include information about the latest QAD JIT Sequencing (JIT/S) fixes and changes. These changes may affect the way you implement and use JIT/S.

Review this document before proceeding with any phase of a JIT/S implementation.

These release notes are cumulative, with the most recent changes displayed first. Review the notes for all releases after your currently installed release. Installation and configuration changes may have occurred in those intermediate releases, and unless otherwise noted, apply to the release where they were announced, as well as subsequent releases.

QAD highly recommends that you implement the latest JIT/S release available. Check the QAD Online Support Center Web site to make sure you have the latest JIT/S release notes, installation errata, installation guide, and installation media.

http://support.qad.com

Use the following list to find a specific release:

Release Notes for Current Release

JIT Sequencing Version: 3.0

Date: May 2008

QAD ERP Applications Compatibility: MFG/PRO eB2 SP4 through SP12, eB2.1 SP1 through SP4, QAD 2007, QAD 2007.1, QAD 2008 Standard, and QAD 2008 Enterprise

Languages: English, Spanish, Simplified Chinese, Japanese

User Guide: QAD JIT Sequencing (item number 78-0755A) and *Installation Guide: QAD JIT Sequencing* (item number 78-0754A) have been updated for this release.

This release includes the following changes and fixes:

- New Communication Methods with the QAD ERP Application
- Progress Support
- Message Manager Modularization
- Unicode Support
- DB-Based Asynchronous Message Processing
- E-Mail Service
- Message Acknowledgement
- Customer Order Version Attribute List
- Assembly Order Workbench Scan Input
- Export Empty Fields Option
- Archive Script
- Process Import/Export
- Pre-rack Process
- Corrections to Existing Features

New Communication Methods with the QAD ERP Application

JIT/S now employs new communication methods to synchronize data with the QAD ERP application.

QAD ERP base data is now synchronized from the QAD ERP application to JIT/S through QXtend Outbound. Previously, this data was synchronized between the two systems by database triggers in the QAD ERP application implemented using QAD's DataSync and outgoing messages from the QAD ERP application were queued and sent through the QAD Q/LinQ application.

When JIT/S is integrated with QAD 2008 Enterprise, both the backflush and shipment information is sent to an instance of QXtend Inbound that then pushes the updates to the QAD ERP application.

When JIT/S is integrated with QAD 2008 Standard and earlier versions of QAD ERP applications, the backflush information is communicated to the QAD ERP application through QXtend Inbound. Shipment information is sent in XML format as a QDOC to EDI eCommerce in the QAD ERP application.

Progress Support

This release of JIT/S supports only OpenEdge 10.1B02.

Message Manager Modularization

The Message Manager function is redesigned with a focus on modularization:

- On the JIT/S user interface, all Message Manager-related functions are centrally grouped under the Message Manager menu.
- A separate Message Manager database is created to store Message Manager-related data.

Unicode Support

This release of JIT/S is fully Unicode-compliant:

- The Message Manager and JPS databases are deployed using the UTF-8 code page by default.
- You specify code page of inbound messages for each channel so that inbound messages are converted to the UTF-8 code page when loaded into JIT/S.
- You specify code page of outbound messages for each transmission group so that outbound messages are converted to the target code page when sent from JIT/S.

DB-Based Asynchronous Message Processing

JIT/S now uses the cache database to manage and process internal communication messages. However, external communication messages can still be handled using Sonic. The Sonic status icon on the JIT/S user interface is replaced by the cache database status icon.

E-Mail Service

A general e-mail service is provided in place of the original SendMail service for sending e-mail.

Message Acknowledgement

You can now view message error information in Message Queue Viewer when backflush or shipment information is not successfully communicated to the QAD ERP application from JIT/S. Previously, there was no such feedback to indicate whether or not the message transfer was successful.

Customer Order Version Attribute List

You can now view attribute list values of each item in Customer Order Version Detail.

Assembly Order Workbench Scan Input

The Assembly Order Workbench now lets you select a work cell/assembly unit by scanning an assembly unit barcode. The system validates the input assembly unit ID and launches the workbench. Previously, you had to use a keyboard or mouse to select a work cell/assembly unit to display the workbench.

Export Empty Fields Option

An Export Empty Fields option is now available in Trading Partner Documents that lets you specify whether empty fields in the outbound XML document should be exported. Previously, Message Manager ignored all empty fields in outbound XML documents.

Archive Script

This release of JIT/S provides an archive batch script that you can schedule to execute to perform archiving tasks.

Process Import/Export

JIT/S now provides a Process Import/Export tool that lets you save process data including parameters and rule groups into an XML process file and load process data from an XML process file into the database

Pre-rack Process

The pre-rack process has been modified to give you better control of the range of orders to be pre-racked. The pre-rack process has two parameters: product family group and number of orders. Each run of the process pre-racks a pre-defined number of product orders for the selected family group.

Corrections to Existing Features

- The Label Print option in the Work Order Workbench now shows selected work order labels as well as labels of assembly orders associated with the selected work orders.
- The Assembly Order Workbench now validates the existence of the workbench images directory, even if no images are used.
- The Shipping Workbench now displays unassigned BOLs.
- The system has been modified to correctly handle pre-packed work orders.
- The Current Picking Operator can no longer be updated in Shopping List Maintenance.
- The system has been modified to correctly reprint labels.
- The system has been modified to correctly display combo lists in the European numeric format.
- The system has been modified to correctly create empty fields when exporting outbound messages.
- Item number is now included in shipper export.

Release Notes for Release 2.0

JIT Sequencing Version: 2.0

Date: July, 2007

MFG/PRO Compatibility: MFG/PRO eB2, eB2.1

Languages: English, Spanish, Simplified Chinese, Japanese

Installation guide: QAD JIT Sequencing (item number 78-0626E) has been updated for this release.

This release includes the following new features:

- Support for OpenEdge 10.1A01
- Support for Sonic 7.0 Applications
- Support for HP-UX
- Automated Installation Scripts
- Localization Capabilities
- HFD Print Queue Manager
- JIT Pipeline for MEW integration
- Support for VCCBOM Messages
- New Process Status

Documentation

Updated installation, conversion and integration instructions can be found in *Installation Guide: QAD JIT Sequencing*, item 78-0626E.

Support for OpenEdge 10.1A01

JIT/S 2.0 support components are built on the Progress Dynamics framework that is a part of OpenEdge 10.1A01.

Support for Sonic 7.0 Applications

This release of JIT/S uses Progress SonicMQ 7.0 and Sonic ESB 7.0 to manage and process messages.

Support for HP-UX

JIT/S now supports the HP-UX operating system, version 11 or higher, as well as Windows Server 2003 Enterprise Edition.

Automated Installation Scripts

This release of JIT/S ships with fully automated installation scripts for both Windows and HP-UX systems.

Localization Capabilities

JIT/S now has localization capability. Date and number formats can be localized with translations of a number of the visual elements of the application screens:

- Menus and labels
- Error messages
- Column headings and other non-data driven information in standard reports and queries
- Crystal reports
- Descriptions of rules and rule groups
- Some seed data
- Character user interface

MFG/UTIL provides a function to load translated strings into JIT/S.

HFD Print Queue Manager

You can now 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.

JIT Pipeline for MEW integration

JIT/S can now send the sequenced orders in its pipeline to QAD Manufacturing Execution Workbench for planning sequenced demand. The pipeline represents the customer demand from the beginning of the production line to the point-of-fit broadcast point.

Support for VCCBOM Messages

Volvo uses a mixture of Product Modules (PML) and item numbers to communicate demand in a single broadcast message. JIT/S now supports VCCBOM (Volvo Car Corporation) messages in the following ways:

- Processing and storing VCCBOM files
- Validating and mapping PML codes to item numbers
- Supporting SYNCRO, BANAN, and LINE-UP messages

New Process Status

This release of JIT/S introduces a new process status, In Error, in the order processor. With this new status, the end user is informed immediately when the order processor encounters an error in validation rules. The status can also be used to automatically recycle errors.

Release Notes for Release 1.8

JIT Sequencing Version: 1.8

Date: April, 2006

MFG/PRO Compatibility: MFG/PRO eB2 and eB2.1

This release includes the following new features:

- Improved Integration Framework
- Improved Attribute Management and Validations
- Enhanced Production Reporting
- Improved Packaging Features
- Swapping and Scrapping Work Orders
- Extended Management of Order Status
- Improved Order Visibility
- Improved Archiving and Data Retention
- Build and Ship Sequence Association
- New Assembly Order Workbench Features
- Order Scheduler Rule Changes: Short Rack Packages
- Product Order and Work Order List Version Update
- Expanded Use of Document Counters
- User Interface Improvements

For a summary of added, replaced, and obsoleted menu functions, see “Menu Changes” on page 17.

Documentation

The documentation for the 1.8 functionality described here is included in *User Guide: QAD JIT Sequencing*, item 78-0624D. This information is also now provided as an online help system that can be accessed from JIT/S functions by using the Help button.

Installation and integration instructions can be found in *Installation Guide: QAD JIT Sequencing*, item 78-0626D.

Improved Integration Framework

JIT/S is now integrated with external ERP systems, programmable logic controllers, and manufacturing execution systems through the Message Manager, a communication framework for managing inbound and outbound messages. Messages can be sent and received through files, Sonic queues, and HTTP.

The existing order receiver processes are now just one example of inbound message receivers. Outbound messages are defined as documents created in response to processing events and are assigned to transmission groups.

Using the data receivers, gateways, and documents included with JIT/S as models, you can develop your own site-specific inbound and outbound message communication. JIT/S includes processes and messages.

- Inbound message receiver processes for files, Sonic, HTTP.

Note As delivered, JIT/S only uses file transfer for communicating messages in the integration framework, but examples of other receiver types are provided.

- Inbound messages for static base data from an ERP system, order updates such as rebuild, positive and negative acknowledgments, and test validations.
- Outbound messages for backflushing, requesting an order for shipment, scrapping or transferring an order, and releasing a work order. Business logic can be made part of responses to received messages.
- Inbound and outbound workbenches support message tracking and resending.
- Inbound and outbound backflush and shipment requirements.

New maintenance and workbench functions are listed in the following table.

Function	Description
HTTP Maintenance	Sets up the configuration for HTTP; HTTPS is not supported.
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.
Transmission Group Maintenance	Specifies how messages are exported.
Trading Partner Maintenance: Document	Specifies the handling—transformation, gateway, transmission group, and so on—of outbound document types for a particular trading partner/destination.
Transmission Queue Maintenance	Tracks unloaded outbound messages that are awaiting acknowledgment.
Archive Queue Maintenance	Tracks outbound messages by document and destination. If the appropriate data was not written to the Application repository, you can resend that message; that is, indicate that the outbound document should be recreated and the data retrieved again from the database.
Inbound/Outbound Workbenches	Tracks issues between the communicating systems. Messages can be marked here for reprocessing.

Improved Attribute Management and Validations

Attribute Types and Contexts

The Attribute Type field has been removed from Attribute Maintenance. When an attribute is assigned, it is now given a context, which indicates how it is used. For example, when an attribute with the context DisplayAttributeAsText is assigned to an assembly unit, the Assembly Order Workbench displays the name and value of the attribute when processing orders for that assembly unit.

If you use Microsoft Excel spreadsheets to import items and attributes, you should remove the Attribute Type column since it is no longer supported.

Label queries using attribute type also need to be updated to use attribute context.

Validate Product Family Orders and Attributes

You can now validate that a customer order includes items for all of the required product families and that attributes have the same values across product families. Both validations are based on attributes and are optional. Previously, these validations were available only within product families.

The presence of items for product families is based on the vehicle line specified in the customer order and the attributes assigned to that vehicle line in JIT/S. For each attribute that is assigned to the vehicle line as mandatory, JIT/S determines whether an item on the order has a matching attribute. For example, if the

vehicle line has the mandatory attribute Carpet, at least one product family item must also have the attribute Carpet.

For each non-mandatory attribute assigned to a vehicle line on an order, JIT/S determines whether the value is the same for that attribute in all of the product families on the order that have that attribute assigned. For example, the value for the attribute Color is the same across all product families that have the Color attribute.

Enhanced Production Reporting

Production can be reported for receipt and backflush of an entire work order or for various milestones in the order building process. An order can be set up to trigger reporting for all associated assembly and work orders when it is built.

Milestone Reporting

In addition to receipt and backflush production reporting, JIT/S can now report to the MFG/PRO Advanced Repetitive module:

- Intermediate or final production milestones for manufactured items
- Quantity of manufactured items scrapped
- Location transfers for purchased items at production milestones or when scrapped

JIT/S can initiate intermediate production reporting when scanning work orders or building orders on the Assembly Order Workbench under these conditions:

- Milestone data is set up for the AU.
- Milestone data is set up for the SAU for the associated work order.
- Production reporting for the entire work order is not set up for the AU.

For a scanner to report intermediate production, the scanner rule must use a new scanner rule parameter—AssemblyUnit—to identify an AU for intermediate backflush reporting.

Receipt and Backflush Reporting

For AUs or SAUs not set up for milestone reporting, the existing receipt and backflush reporting now has these effects:

- Manufactured items continue to be reported as receipt and backflush.
- Location transfers are reported for purchased items set up manually with report from and to locations on the SAU.
- Inventory must be adjusted manually in response to scrap transactions; there are no scrap messages sent.

The backflush and location transfers can be reversed with the exception of intermediate milestone backflushing for a single AU.

Full Work Order Reporting

There is now an option to report production for an entire work order when a particular assembly order is built.

JIT/S triggers production reporting for full work orders—milestones or receipt and backflush as specified on the SAU—in a number of ways:

- Scanner application backflushing a single work order
- Building an order on the Assembly Order Workbench
- An API from a PLC system backflushing one or more work orders
- A scheduling rule backflushing all work orders released in the current run of the order schedule
- A package completion rule backflushing all work orders contained in packages that are fully packed
- A shipment finalization rule backflushing all work orders contained in a shipment
- Manually reporting a work order as built

Separate Production and Shipment Reporting

Production and shipment can now be reported separately:

- Work orders can be manually marked/unmarked as shipped (without having been packaged), reported/unreported as built, and added to bills of lading (BOL).
- BOLs can be added to an existing master bill of lading (MBOL) or reported as shipped. Reporting as shipped creates an MBOL and assigns the selected BOLs to it, generates a reported shipment group number, and updates the reported date and time fields.
- MBOLs can be reported/unreported as shipped. Reporting an MBOL reports each of the BOLs on the MBOL as shipped. Unreporting an MBOL reverses the shipment report for each of the BOLs on the selected MBOLs whether the reporting was automatic from the Shipping Workbench or manual.

  Important JIT/S does not reverse MBOL shipment reports to the ERP application automatically; the ERP application must be updated manually.

Improved Packaging Features

You can now address packaging issues such as:

- Flexibility to accept or override errors that occur during package building
- Filling in missing items or building special packages
- Unpacking, resequencing, and rebuilding packages

Accept or Override Errors

While building a package through either the Packaging Workbench or a hand-held scanner, you can now accept or override packaging validation errors when orders are out of sequence, when status is set to In Repair, or when the trace data is missing.

When accepting a packaging error, you can:

- Continue adding items until the package is full, as long as pre-racking is not used.
- Stop building the package until the issue is resolved.
- Scan a barcode—missing item when the sequence error is unexpected, empty slot when the order is canceled—into that spot in the package.

Later, when the previously missing item is scanned in the Packaging Workbench, the application reports that the item was supposed to be in a particular, now-closed package and whether the package has shipped.The application then directs you to Alternative Packaging Workbench.

Build Special Packages

Use the Alternative Packaging Workbench for inserting orders labeled as missing into their original packages and for creating special one-off packages.

- For missing orders, you can scan the package label. The application verifies that the order should have been in the current package, adds the order to the package, optionally regenerates the package labels, and closes the package.
- For missing orders where the package has been shipped or for other orders needing a one-off package, you can create a special package. You specify in the system configuration file (`config.xml`) whether special packages use standard or non-standard numbering.

Unpack, Resequence, and Rebuild Packages

Sequence issues can be created by the supplier accepting out-of-sequence orders or the customer rebroadcasting a range of orders.

Sequence issues in nonpre-racked packages are addressed in PFO Maintenance.

If there is a sequencing issue with a pre-racked package—in this case packing sequence is at the product family order (PFO) level—that has not been shipped, all of the packages containing orders from that PFO must be unpacked, resequenced, and rebuilt.

- In View/Rebuild Package, you can unpack a package that has not been shipped when the fill status is Complete. Since a Complete package is a physical reality, you must physically unpack it as well.
- In Update Packing Sequence, you can resequence pre-racked orders and empty slots. New production labels can be created as well. Confirming a new sequence 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; to avoid creating new conflicts, the order processor and packaging activities should be paused while using this screen.

Once the packing sequence has been updated, you can use the Packing Workbench for building or rebuilding packages.

Swapping and Scrapping Work Orders

New features in JIT/S 1.8 let you swap and scrap work orders.

Swapping Work Orders

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 filled with the output of another order. To address these situations, you can use the new Swap/Scrap Work Order choice on the Options menu for the Work Order Workbench. Select a work order to be replaced in the 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. Each choice has different effects.

- Replacing a swapped-out order with a donor order

  You specify the search criteria for the donor order, the new status for the swapped-out order, and whether to replace labels for either order. Clicking Find Donor displays the orders, by status, that match the search criteria: Build Ahead, WIP, Released, In Repair, On Hold, Packed. You can then 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.

- Replacing a swapped-out order with a Hot Build order

  You select Hot Build to create a Hot Build order as the replacement order, select the new status for the swapped-out order, and then 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.

- Scrapping a Build Ahead order

  If the selected order is a Build Ahead order, the Swap Work Orders screen opens with None – Scrap Only selected in the Replacement Options. This is the only allowed action for a Build Ahead, and only Build Ahead orders can be swapped out without replacement.

Trace data and test results remain with the work order that the data was collected against.

Scrapping Work Orders

Orders can now be scrapped from the Swap Work Orders screen; the specified scrap reason code is stored with the work order.

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. The inventory must be adjusted manually in response to the scrap transaction.

Extended Management of Order Status

Existing and new order statuses are now organized into three categories:

- Manufacturing status types: Process, Production, and Pack
- Reporting status types: Backflush and Report as Shipped
- General statuses: On Hold, In Repair, Scrapped, Canceled, and Closed

Status changes can be logged by customer or by product family. The data is written to the order logging table in the `logging` database; the viewer is available on the Tools|Logging/Debug Tools menu. Log records can be archived and deleted.

For a product order or customer order, when all work orders or product orders attached to that order are canceled or closed, that status also applies to the parent order.

Orders maintain their current manufacturing and reporting statuses when general statuses are assigned and removed; for example, an order with the WIP (Production) status maintains that status both when the On Hold status is set for it and when the status is removed. General order statuses can be removed without setting a new general status; for example, when repairs are complete and the In Repair status is removed from an order, there is no requirement to replace the removed status with another.

Statuses can be set manually or automatically through rules used by order processors, scanners, and business events. Use the maintenance screens available through the new Operations|Order Status Maintenance menu for manual updates. Use the new rules for automatic updates:

- setClosed can be added to order processor or shipping rule groups.
- setClosed, setInRepair, clearInRepair, and clearOnHold can be added to a scanner rule group.

See your QAD Support representative for the latest information on the rules included with JIT/S.

Build-ahead orders with the On Hold, In Repair, Canceled, and Closed statuses are not available for net out. Orders with the On Hold, Canceled, and Closed statuses are not available for consideration by an order scheduler.

The introduction of the screens for maintaining order status introduces several changes to the user interface:

- Status fields are read-only on work, product, and customer order screens.
- On Hold check boxes are removed from product and customer order screens.
- The Hold/Unhold buttons have been removed from the Work Order Workbench.

Improved Order Visibility

This release of JIT/S provides improved order visibility in the form of an enhanced Detailed Order Viewer and three new reports.

Detailed Order Viewer

In Detailed Order Viewer, JIT/S now displays all of the data related to a particular customer order to address a variety of situations:

- Determine when an assembly unit with a quality problem was manufactured.
- Use label numbers to locate an order on the production floor for a progress check.
- Based on a VIN, provide vehicle configuration information such as color and arrangement of seats to a law enforcement agency.

The customer order of interest can be located based on data such as VIN, sequence, label ID, broadcast point, or the ID for a product family order, a work order, or an assembly order.

For the located customer order, JIT/S then displays customer order details, COVH details, product family data, package details, and packing slip/BOL details. Any of this data can be exported to an Excel spreadsheet.

This is a viewer only; print and update functions are not available and records are not locked while being viewed. Data that has been archived is no longer available for viewing.

Reports

Three new reports are now available. You specify data filter parameters and then display the report data; you can also save/export the reports to MS Excel.

Ordered Items

For a selected customer, product family, or shippable assembly unit, the report displays the items that occur in a range of sequences at specified broadcast points. You can optionally include canceled and on-hold orders. The items can be displayed by customer item number, internal item number, and work order list

version. This report may be useful for manually reconciling payment files that include only items and quantities.

Order Aging

For a selected customer, the report displays orders that have been received at one broadcast point but not received at subsequent broadcast points within a specified time limit. This gives an indication of how long the orders have been in the system. You can optionally include canceled orders. The report includes order number, sequence number, date received, number of hours/days old, product families, shippable assembly units, and work order list version ID by product family.

Open Orders

For a selected customer and customer ship-to address, the report displays orders that are not closed. Orders can be grouped by product family, shippable assembly unit, or work order list version ID. You can optionally include on-hold orders. The report includes site ID, order number, sequence and date received by broadcast point, VIN, production status, backflush status, and process status.

Improved Archiving and Data Retention

This release of JIT/S includes improvements in managing data through archiving and being able to remove obsolete broadcast data.

Archiving

You can now archive data to XML or flat files for future reference as well as delete records to maintain disk space and performance levels.There is no provision to return data to JIT/S after it has been archived.

Records that can be archived or deleted include log files, internal label files, trace data, test results, order receiver data, customer order version header and detail information, customer order information, and transaction information. The archived data can be analyzed or stored as needed.

Business reasons for archiving data include:

- An OEM may require suppliers to retain this information for an extended period of time or to provide information about both current orders and those that were processed years ago.
- Suppliers must be prepared to respond to product recall or defect information requests by identifying by order or VIN where a particular lot trace number, such as for an air bag, was installed.
- Trace data and test results may need to be retained on the system even after the order has been archived.

Deleting Broadcast Point Data

A new order processor rule, OPDeletePreviousBPData, deletes outdated broadcast point information when called by the order processor. For example, the order processor at the late warning broadcast point can call the rule to delete the information from earlier broadcast points since that data is no longer useful. As with archiving, this supports conservation of disk space and performance levels. This is best reserved for those intermediate broadcast points that serve as only as checkpoints.

If the field Keep Orders is selected for a broadcast point in Broadcast Point Maintenance, order information at this broadcast point is preserved even when the new rule is executed.

Build and Ship Sequence Association

JIT/S now has a scanning application to associate an order number/sequence from a build signal broadcast point with a different order number/sequence from a ship signal broadcast point. The association indicates that the earlier order number/sequence was used to fulfill the later ship signal.

JIT/S can be configured to expect a JIT/S or non-JIT/S production label to be scanned when retrieving a product from an automated storage and retrieval system (AS/RS).

- For JIT/S production labels, JIT/S can be configured to match the production and shipping labels by WOLV ID or WOLV ID and version. If the scanned labels do not match, you can override the error when 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 either quit or scan a valid label.

  When the production label and shipping label are validated, JIT/S associates the trace data captured for the build order with the shipping sequence/order and records the build order that was used to fulfill the ship order.
- For non-JIT/S production labels, the system records the production label and associates it with the ship order/sequence for traceability.

You can use rules to add additional validations to the scanning application.

New Assembly Order Workbench Features

In the Assembly Order Workbench (AOWB), you can now:

- Display work instructions and pictures. The work instructions and pictures are developed and maintained outside of JIT/S and associated with AUs in Assembly Unit Tree Maintenance and Attribute Maintenance. The system configuration file `(config.xml)` file specifies the directories where these files are stored on the server.
- Specify the one- or two-step process for completing the current order and displaying the next order.
- Validate components for the current order and record trace data.
- Customize the workbench to differentiate between primary and secondary attributes for an order and customize the workbench buttons.

Order Scheduler Rule Changes: Short Rack Packages

Users can now set up order schedulers to temporarily release less than the usual number of orders for production, packaging, and shipping.

A short-rack package might be needed at the end of a shift or business day when the orders that have been received need to be released for production, packaging, and shipment but all of the orders for a usual order scheduler batch have not been received.

With this JIT/S release, the package resizing capability for pre-racked packages is now at an earlier point in the process, before orders have been released by an order scheduler.

To release a smaller batch size of orders for production, change the rule parameter in the order scheduler. To complete the packaging of these pre-racked orders, the package size must be adjusted as well. Package size is not an issue for nonpre-racked packages since their size can be adjusted in the Packaging Workbench while packing.

In View/Rebuild Package, you can 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.

The next received pre-racked order starts a new package.

Product Order and Work Order List Version Update

For each product family, users now have options for creating lists and list versions:

- Create a new version of an existing list when the attributes on the order remain the same but the parts list changes and create a new list version ID only when the attributes change.
- Create a new list version ID each time that either the attributes or the parts list changes.

Expanded Use of Document Counters

JIT/S uses a number generator (counter) to automatically number key documents; the counter determines the document number format and content. The following types of numbers can now be counter controlled:

- Application status sequence number
- Assembly order number
- Customer order detail number
- Customer order header number
- Document session sequence number
- Document status sequence number
- Picking list number
- Product order detail number
- Work order number
- Work order batch number

Each of these documents is controlled by a single counter; there are no parameters associated with the documents that would allow for configuring them to use different counters.

With this release, you can use a new counter function that returns the date in the format YYYYMMDD. You can choose between this new function and the existing Julian Year (YYDDD) function when defining a mask that determines how the generated number is formatted and placed at run time.

User Interface Improvements

With this release, the order number that comes into JIT/S from the customer is now referred to and displayed in fields with the label Order Number. Previously, the field was labeled Customer CO Number.

JIT/S internal identifiers for orders are now all IDs: Customer Order ID, Product Family Order ID, Work Order ID, Assembly Order ID.

A new status line displays on the bottom of the JIT/S main screen. Included in the status information is an icon indicating the current status of the Sonic integration component. This icon can have three colors:

- Green indicates that Sonic is up and running and that messages are being processed.
- Orange indicates that Sonic is running and messages in the cache database are being cleared. The number of remaining messages displays; when they are cleared, the icon turns green.
- Red indicates Sonic is not running. Users should notify their IT department when they see this icon.

Menu Changes

New Menu-Level Functions

- Tools|Logging/Debug Tools|Order/Package Change Logs
- Tools|System Data Tools|State Overview
- Tools|System Data Tools|Technical Verification
- Base|Work Cell/Assembly Unit|AOWB Button Profile Maintenance
- Base|Work Cell/Assembly Unit|AOWB Color Profile Maintenance
- Setup|Message Manager|HTTP Adapter Maintenance
- Setup|Message Manager|Transmission Group Maintenance
- Setup|Message Manager|Event Maintenance
- Operations|Detailed Order Viewer
- Operations|Packaging/Shipping|Update Packing Sequence
- Operations|Packaging/Shipping|Alternative Packaging Workbench
- Operations|Packaging/Shipping|BOL Processing
- Operations|Packaging/Shipping|MBOL Processing
- Operations|Message Manager|Inbound Workbench
- Operations|Message Manager|Outbound Workbench
- Operations|Message Manager|Transmission Queue Maintenance
- Operations|Message Manager|Archive Queue Maintenance
- Operations|Reports|Ordered Items
- Operations|Reports|Order Aging
- Operations|Reports|Open Orders
- Operations|Order Status Maintenance|Customer Order Status Maint
- Operations|Order Status Maintenance|Product Order Status Maint
- Operations|Order Status Maintenance|Work Order Status Maint

Replaced Functions

Old	New
Setup|Order Receiver	Setup|Message Manager
• Order Receiver Control	• Default Directory Maintenance
• Sonic Queue Setup	• Sonic Queue Maintenance
• Utility|Transformation Dump	• Import/Export Utilities|Setup Export
• Utility|Transformation Load	• Import/Export Utilities|Setup Import
Operations|Order Receiver	Operations|Message Manager

Removed Functions

- Setup|Communications|MFG/PRO Interchange Maintenance
- Setup|Order Receiver|Order Receiver Message Maintenance
- Operations|Trace Data|Cust Order Trace Data Inq

- Operations|Trace Data|Test Results History Inquiry
- Operations|Production Utilities|Manual Backflush

Release Notes for Release 1.7 SP2

JIT Sequencing Version: 1.7 SP2

Date: June, 2005

MFG/PRO Compatibility: MFG/PRO eB2 and eB2.1

Documentation

The documentation for the SP2 functionality described here is integrated into *User Guide: QAD JIT Sequencing*, item 78-0624C.

Installation and integration instructions can be found in *Installation Guide: QAD JIT Sequencing*, item 78-0626C. The chapter on integration previously in the user guide is now included in the installation guide.

Item Number Changes

The integration solution for managing item numbers between JIT/S and MFG/PRO has been enhanced and expanded. This enhancement addresses a disparity between the MFG/PRO and automotive industry methods for identifying items for fulfillment. In MFG/PRO, the item ID is sufficient to identify an item for fulfillment. In the automotive industry, many OEMs and tier-one suppliers use product data management systems that require three elements to identify an item: item ID, revision, and color. With defined configurations, JIT/S now accommodates both approaches.

This release of JIT/S supports the following three combinations; others are possible, but require additional customization supplied through QAD Services.

1. Only the item ID component is used in both JIT/S and MFG/PRO. The item ID is either fixed or variable in length.
2. Three elements are used in JIT/S and are combined as fixed-length segments in the MFG/PRO item number in the following order: item ID, revision level, color.
3. Three elements are used in JIT/S but their length is variable in MFG/PRO and indicated by a delimiter character. The elements are combined in the following order: item ID, revision level, color.

You configure how you want to manage item numbering based on settings in the system configuration file, and style sheet transformations. These settings are determined during system implementation and then should not be changed. *Installation Guide: QAD JIT Sequencing* includes complete details on setting up this integration.

Setup and Configuration Reports

JIT/S can now verify that components of the technical installation—JIT/S processing, directories, and Sonic communication—are functioning as expected. You can also use tests to verify that product families, assembly unit trees, work cells, items, labels, and packages are set up appropriately in the database. Using these tests can streamline the implementation and setup tasks and ensure data integrity.

The tests are defined as rules that are members of verification test rule groups; users can define additional tests and assign them as rules to these rule groups. Application tests are run from the Options menu on the maintenance screens for the associated subject. Technical verifications are run from a new menu option located at Tools|System Data Tools|Technical Verification.

JIT/S reports test the results as success or failure and includes messages explaining the results.

A new browse has been added as an option to Broadcast Point Maintenance that displays the order processors that will run when a broadcast is received on a certain point. You can use this browse to verify that setup is correct.

Sequence Validation for Building Shipments

For each packaging assembly unit, the new shipment sequence rule validates that packages are being added to the shipment in the correct order as each package is scanned onto the shipment. Otherwise, the sequence is validated only when the shipment is finalized.

Error Handling and Order Processor Tracing

This release includes improvements to error handling and logging for JIT/S processes.

Exception handling for the process engine, order processors, order schedulers, and the label engine is always enabled. The system checks for setup errors and writes errors and warnings to files in process-specific subdirectories such as `OP` or `Label_Engine` in the `logdir` directory that is defined in the `logging` section of `config.xml`.

Basic process tracing is also available for all processes. It is enabled by setting the TRACE process parameter to True and specifying a tracing level. Additional business process tracing is available for order processor processes (program name is `OPEnginePlipp.p` and the program procedure is `orderProcessor)`. The additional trace information can be used during system implementation and setup to understand each step the processor executes.

Tracing information is written to *`processID`*`-Trace.log` in the `logdir` directory, as specified in the `logging` section of `config.xml`.

Multiple Ship-To Addresses for a Single Production Line

JIT/S now manages production and packaging for multiple ship-to destinations—for the same customer—from a single production line. The sequence validation programs in packaging and shipping consider the shipping destination of the package or shipment while doing sequence validations rather than just the customer.

When the order processor is processing an order from a broadcast, it validates that for each item there is a sales order line with an assigned shipping configuration. The shipping configuration must have the ship-to that is defined for the sales order and the ship-from that is defined for the JIT/S instance.

Shopping List Picking

JIT/S now supports the pull replenishment process between the bulk storage locations and the line-side storage locations. Items can be picked interactively with a hand-held scanner or manually based on a shopping list printed from the Shopping List Workbench. You can optionally allow simultaneous picking for the same shopping list type; however, only one picker can pick for a single instance of a shopping list.

For scanner picking, before the application accepts a scanned item as picked, it runs validations from the rule group assigned to the list.

Order Scheduler Changes

With new rules and rule parameters, order scheduler processes can now be configured for the following functionality:

- Schedule multiple shippable assembly units for production on a single production line.
- Determine whether to include hot-build orders in the counts for the maximum number of orders to schedule, firm, and release. Hot-build orders that are not included in these counts are released separately and first.
- Determine whether a group of orders should be released in forward or reverse order. Hot-build orders can optionally be included in the group and reversed.
- Specify whether fewer than the maximum number of orders to release can be released. Hot-build orders can optionally be included in the group.

Packaging and Shipping CHUI Interface

The packaging and shipping workbenches can now be accessed through a character interface (CHUI) by any hand-held, mobile computing device capable of supporting a telnet session to the JIT/S server. This includes radio data terminals (RDT) and Intermec wireless scanners running the Pocket PC 2003 operating system. The devices are integrated into the local network of the facility using TCP/IP as the communications protocol and connect to the JIT/S server using telnet.

With the CHUI packaging and shipping workbenches, users can build packages and shipments.

- For packaging, scan production labels to signal that the built item is added to a package.
- For shipping, scan package labels to signal that the package is loaded onto the truck and added to the bill of lading (BOL) for the shipment.

The scanned information is sent to JIT/S for validation and recording.

Order Processor Status Management

The various statuses that are used in JIT/S and associated with COVH records, work orders, and assembly orders have been standardized and streamlined. Unreferenced statuses have been removed, and all statuses—Process, Production, Backflush, and Pack—have been synchronized with the appropriate business event.

MES Interface Enhancements

Additional application programming interfaces (API) have been added to support communication between JIT/S and a manufacturing execution system (MES). The MES in turn communicates with programmable logic controllers (PLC).

If you are using a 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. This workOrderRelease message can be configured with a rule so that it is sent for only those shippable assembly units that you need to manage this way.

If assembly is being managed by a 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 MFG/PRO.

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.

Release Notes for Release 1.7 SP1

JIT/S Version: 1.7 SP1

Date: October 2004

MFG/PRO Compatibility: MFG/PRO eB2

The documentation for the SP1 functionality described here is integrated into *User Guide: QAD JIT Sequencing*, item # 78-0624B.

Order Receiver

The order receiver now allows users to map data from incoming files into any database field within the context of the gateway transaction.

The new process parses the incoming data and places it into a repository. This repository is then pushed through a table-based transformation, which creates the transactions for the target database. The transformation data is placed into a second repository, which populates the gateway processes. The gateway process creates the necessary transactions within the database.

Order Scheduler and Backflushing

There is a new rule available for order schedulers: OSSendBackflushMessage; it has one parameter: disableBF.

When the OSSendBackflushMessage rule is used and the disableBF parameter is set to False, the order scheduler triggers the backflushing of a work order when it successfully releases the order. This applies to only work orders released by the order scheduler—not those that are released manually through the work order workbench. Orders released through the workbench can be backflushed through the existing means such as finalizing packages or shipments.

Hot Build Orders

Hot build functionality is now available from the work order workbench; use it to prioritize the sequence in which orders are scheduled. If you select a work order and click Hot Build, it will be scheduled first. Each time that the order scheduler runs, it first schedules the orders marked as hot build 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.

Hot build is only effective for unscheduled orders.

Build-Ahead Orders, Nettable Orders, and Safety Stock

Build-ahead orders are created under several circumstances:

- 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.
- When a customer order is canceled, any scheduled or released orders associated with that customer order are marked as build-ahead orders.
- To increase inventory for items, users can manually create work orders and COV records and mark them as build-ahead. For the orders to be available for use, they must also be marked as nettable.

Use Operations|Production Utilities|Build-Ahead/Net-Out Maint to set the quantity of safety stock for each work order list version. Safety stock is not consumed by incoming orders.

To determine if there are nettable build-ahead orders 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.

View build-ahead, nettable, and safety stock quantities for each work order list version in Operations|Production Utilities|Build-Ahead/Net-Out Maint. The new 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.

Amended 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.

Two parameters for the order processor rule OPCreateOrders determine additional order processor actions:

- If the AllowReproduce parameter is set to Yes, the order processor updates work orders that have not been released or scheduled with the new work order list version information. If the parameter is set to No, the order processor generates an error.
- The GenerateError parameter determines whether an order is amended immediately or only after the order processor generates an error. This parameter is independent of AllowReproduce.

Use the order processor rule OPValidateAmendConditions to specify up to which broadcast point order amendments are accepted and to address pre-racking and packaging issues for amended orders:

- The PointOfNoReturn parameter specifies a broadcast point. Set this parameter to the broadcast point at or before the one where the order processor creates pre-racked, planned packages. When an amendment is received for an order that has reached the specified broadcast point, the order processor generates an error for the COVH.
- The rule verifies that the work orders connected to an amended order have not already been pre-racked or packed. If they have, the order processor generates an error.

In response to either of these errors, you can create a cancellation for the old order, and then create an insertion for the amended order.

Canceled Orders

When a customer cancels a vehicle order, the current work order status and whether the order was pre-racked by the order processor determine packaging and shipping changes.

- JIT/S cancels the customer order, product family order, and any related work orders that are not released.
- Released or scheduled 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 changes the package status to scrapped, creates a new package with status set to rebuild, copies the package information and the contents, and creates empty slots in the package. Users can then repack the package.

JIT/S now has empty slots so that the spaces in racks that held the canceled items are still considered occupied. 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.

- The point-of-no-return status is specified by the pointOfNoReturn parameter value in the OPCancelOrder rule. The valid values for the parameter are: scheduled, firmed, released, packed, and shipped. The default is shipped.
  - If the work order status does not exceed the point-of-no-return, the order processor cancels the order.
  - If the work order status is beyond the point-of-no-return, there is a cancellation error. If the work order has also been shipped, there are no changes to the package.

Short-Shipping Pre-Racked Packages

Previously, users could short-ship only packages that were not pre-racked by an order processor; now pre-racked packages can also be short-shipped. In Operations|Packaging/Shipping|Packaging Workbench:

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. The package number for the new package is in 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.

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.

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 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 new 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.

The packing sequence for an insertion is calculated as:

lower sequence + (higher sequence – 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

Pre-Racked Packages

There is a new parameter, InsertAction, for the pre-racking rule, OPPreRackOrders, in order processors. The parameter has two possible values:

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 sets the existing package fill status to Invalid, assigns the insertion order to the appropriate slot, and generates new labels.

Regular Packages

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 sets the status to Invalid for that package and any subsequent packages.

Shipping Validations

In the shipping workbench, packages with status set to Invalid cannot be scanned into a shipment. The shipping finalize validations now validate that no packages in a shipment have status set to Invalid.

Print Server

Previously JIT/S sent labels directly to a printer; now you can also use a print server, through a shared directory interface, to print labels.

To use the shared directory interface, store the name of the shared directory in `config.xml` in the Base section as in this example:

```
<printServerDir>D:\PrintServer\</printServerDir>
```

Print Control Program

There are now two print control programs set in Printer Maintenance:

- Use `printshareddirectory.p` to print through a print server.
- Continue to use `print_file.p` to print directly to a print device.

Template File Formats

Previously you could import a template from Loftware in the `.dat` and `.dwn` formats. These formats are no longer supported by Loftware although you can continue to use them in JIT/S. The Loftware print server now supports three new file formats for Loftware templates: `.xml`, `.pas`, and `.csv`.

Each template file format requires a parser program; you specify the template parser program in Label Format Maintenance:

- `parserdatdwn.p` to parse `.dat` and `.dwn` files
- `parsetemplatefile.p` to parse `.pas`, `.csv`, and `.xml` files

Sending the Label Layout File to the Printer

The new Print Server field in Printer Maintenance specifies whether you are sending labels directly to the printer or using a print server.

When using a print server, JIT/S first sends the label data file to the shared directory specified in `config.xml`. A print server command in the data file, SENDFORMAT, specifies whether the printer server is to send the label layout file to the printer. The value for this command is set by the value for Print Definition in Label Format Maintenance.

Print Server Routine and Commands

Use the new Server Routine field in Printer Maintenance to specify a routine for setting the print server commands, such as SENDFORMAT. When using the Loftware print server, specify this server routine to populate the print server commands:

```
basgen/app/printserverloftware.p
```

If you are using a different print server, specify your user-defined print server routine in this field.

Shipping Sequence Viewer

A shipping sequence viewer is now available from Operations|Packaging/Shipping.

The viewer displays the shipping sequence of customer orders to support picking from inventory with a transfer to a staging location and to support independent shipping and production sequences.

The record display can be filtered by product family, shippable assembly unit, ship-to, and broadcast point. The viewer displays the records organized by the customer shipping sequence. Only orders that have not been shipped are included in the display.

The bottom browse displays sequences that have errors.