

Three Ways to Track Work-in-Process using BellHawk

Introduction

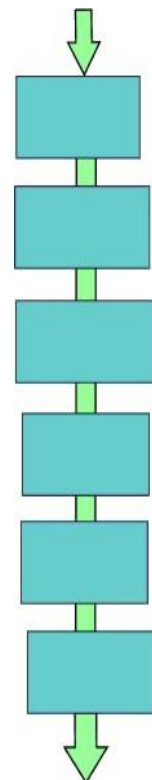
There are three ways to track work-in-process using the BellHawk software:

1. Use the BellHawk WIPS (Work-in-Process System) to track when work starts and stops on a work order operation. From this we can determine the amount of labor required.
2. Use the BellHawk BITS (Barcode Inventory Tracking System) to track items or containers of material with license-plate tracking barcodes as they move from operation to operation.
3. Use the BellHawk JMTS (Job and Materials Tracking System) to track the consumption and production of materials on work-order operations. From this we can build a materials traceability history.

These can be used in combination. For example we can use JMTS (which includes the WIPS and BITS capability) to track the cost of the labor and materials consumed on each operation of a work order.

In this white paper we summarize each of the methods and then examine the pros and cons of using each method.

Using BITS to Track Work-in-Progress



This is typically used to track the assembly, repair, and testing of serial numbered items, each of which has a unique license-plate tracking barcode attached to it.

Alternately, this can also be used to track containers of material, which have a unique license-plate tracking barcode attached.

Each of the work-center locations at which operations are to be performed are then named after the operations that take place at those locations, such as "Cutting", "Milling", "Final Test", "Packing" and "Shipping".

When an item or container of materials is first entered into BellHawk, it can be associated with a customer or work order. Then, as it moves from operation to operation a BellHawk move transaction can be used to record the movement of the

item or container to each operation by scanning its license-plate tracking barcode and selecting or scanning the new location/operation.

Finally a simple Ship transaction can be used to record the shipment of the item or container of material to the customer, again by scanning its license-plate tracking barcode.

Using WIPS to track Work-in-Progress

The process starts with the creation of a work order in BellHawk, which has a unique work-order-number and a route of operations. Alternately this can be imported from an external system.

Once the work order is created then a barcoded traveler, such as is shown at right, is printed out on an office laser printer.

This traveler has a barcode for the work order at top right and barcodes down the left-hand-side for each operation needed to be performed in the work order.

Work Order

Importance: Standard
Date Wanted: 12/22/2015
Sales Order #: CDE Furniture Manufacturers
Instructions: Make Stainless Steel Knobs

WO00000101

Step #: 1
Operation: Production: Lathe
Step Instructions: Lathe

Step #: 2
Operation: Production: Drill and Tap
Step Instructions: Drill and Tap

Step #: 3
Operation: Production: Polish and Inspect
Step Instructions: Polish and Inspect

To record starting work on an operation, the user selects a Start Work button from the screen of their device, which brings up the Start Work screen, shown at right.

The user then scans a barcode on their badge (identifying the employee) followed by scanning the work order and step barcodes from the barcoded traveler sheet.

The user then selects the [Submit] button to record that they have started work on that operation on that work order.

When they stop work on the operation, the user selects a Stop Work button on the screen of their device, which brings up the Stop Work screen, shown at right, and then scans a barcode on their employee badge followed by scanning the work order and step barcodes. They can then, optionally, enter a "piece work" quantity processed or made.

START WORK

User Badge
E301

NOT scanned into any Operation
Work Order Number
WO00001

Step Barcode
TW000001.1

Operation
Lathe

Submit Clear Return

STOP WORK

User Badge
E301

Scanned into Work Order WO00001 Step 1 (Lathe)

Work Order Number
WO00001

Step Barcode
TW000001.1

Operation
Lathe

Quantity
6

Check here if operation is completed

Submit Clear Return

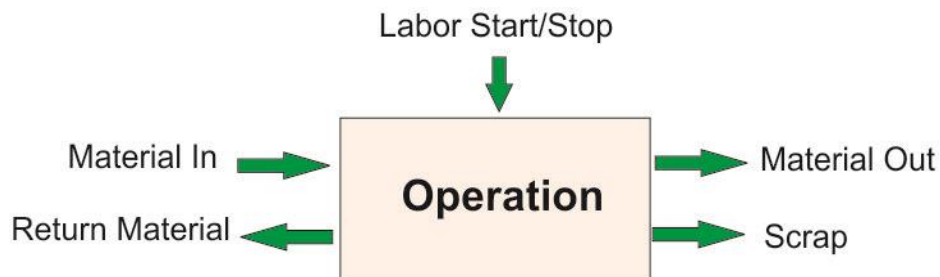
If work on the operation is complete then the user checks that the operation is complete and selects the [Submit] button to indicate they have stopped work and the operation is complete.

If the user is just going on break, then they leave the check-box unchecked, and the system records that they have stopped work on the operation but the operation is not completed.

When they come back from break the user records another Start Work operation, followed by another Stop Work, when they have stopped work.

In this way, BellHawk is able to track when each operation on each work order starts and ends, and the amount of labor required for each operation. The status of each work order and the amount of labor required are available for screen viewing and reporting, as well as in the form of Excel exports for subsequent reporting.

Using JMTS to track Work-in-Process



JMTS uses the same barcoded traveler as WIPS as its starting point. To record materials consumed on an operation, the operator scans a barcode on their badge followed by scanning the work order and operation from the work order. Then the license-plate tracking barcodes on containers of input material are scanned and the quantity consumed recorded.

Sometimes it is beneficial to record the whole of a container into the operation and then to weigh, or otherwise measure, the quantity of material returned to stock.

Optionally a BOM can be setup for the work order operation and this can be used by BellHawk to check that the correct that the correct materials are being used and to warn the operator if they are about to make a mistake.

This BOM can be setup as a recipe for the ingredients to be consumed on an operation, on the item master record for the part to be produced, based on a standard quantity to be produced. When a work order is generated automatically from the item master record, the quantities of material required for each operation on the route are computed based on the quantity to be made versus the standard quantity.

Optionally, the labor consumed on the operation, and the status of completing the operation can be recorded in the same way as for WIPS.

Material can be recorded out as containers of material by scanning license-plate tracking barcodes on the containers into which they are placed and recording the quantity placed in each container.

This can be done for finished product with their own part numbers or WIP materials. WIP materials have the same part number as the finished product but the containers of material have a WIP flag to distinguish them from finished products until they have completed the last operation on the route. In that way WIP materials are distinguished from finished materials inventory but can still be tracked as WIP moves from operation to operation without creating special part numbers for each different stage of transforming raw materials into finished products.



Scrap can also be recorded out from an operation. This can be for inventoried scrap, that will be recycled, and has an appropriate part number, such as for scrap paper, or non-inventoried scrap, in which case the quantity scrapped is simply recorded.

Because it is tracking WIP materials by container, JMTS is able to track some of the parts in a batch through special rework operations that are not on the traveler and to record the reasons for this for subsequent analysis.

Through its use of license-plate container tracking, JMTS is able to handle split batches and their recombination, which WIPS cannot do.

One of the primary roles of JMTS is to capture materials traceability records, recording which materials went into which products. The other primary role is to capture the labor and materials used to make a batch of products for job costing purposes.

Comparison of Methods

1. If all that is required is to track where serial numbered items are in their assembly, repair, or test process, then BITS provides a very simple way of getting real-time visibility into the status of each customer order.
2. If the primary goals are to be able to see the status of batches of material or individual items and to capture the labor required in the manufacture, repair, or testing then WIPS should be used.
3. If the primary goal is to capture a materials traceability history so that this can be used to track back from defective finished products to the raw materials used and to track forward from defective ingredients to the products in which these ingredients were used, then JMTS is the product to use.
4. If the primary goal is to prevent the use of the wrong materials to make products, then the JMTS system should be used to provide warnings to a user when they attempt to pick or use the wrong material for a job.

5. If the primary goal is to accurately capture labor and materials cost data then JMITS should be used. This can be augmented by capturing the setup, run, and down times of the equipment or machines used.

The above methods are presented in order of the amount of barcode scanning required, with BITS requiring the least and JMITS with the equipment tracking option (ETO) requiring the most barcode scanning and data entry.

It is recommended that clients start with the simplest method that meets their initial objectives. Then clients can always upgrade their BellHawk software to include the additional capabilities they may need in future.