

# Material Items & Manufactured Items (or Parts)

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## Introduction (Seminar 4)

The ManuDyn system is essentially a manufacturing control application which has at its core a **Manufactured Item** (or Part) database, which represents the things that you make. The creation of Parts in the system is a critical activity and it needs to be performed accurately for you to get the most out of your ManuDyn system.

The Part Number should define precisely how the product is to be made. It should contain a complete Bill-Of-Material (BOM) definition and the exact process routing information. The BOM consists of a list of **Raw Materials**, which in the first instance are **Material Items** in ManuDyn, but you will see later consists of much more. If the part definition is different to how the work is actually done then clearly the ability of the system to provide a planning aid is restricted.

In this seminar I will not be examining the mechanics of creating parts. The procedure is described in the video tutorials related to creating Material Items (*Create a Material Item*: <https://www.youtube.com/watch?v=MjRKhhfD554>) and Parts (*Create a Manufactured Item*: <https://www.youtube.com/watch?v=me8Z5hP-t4>). In this Seminar we will primarily be examining the various elements of the Part and in particular how best to utilize some of the “subtle” facilities available.

In ManuDyn Material Items and Manufactured Items are actually stored in the same database. The difference between the two Items is that Manufactured Items have a BOM and a Routing and **You** are the Supplier (or Vendor). A Part may be created either selecting the **Database Entry/Material Items** system menu option, entering the item detail and selecting the **Manufactured Check** button option; or by selecting the **Database Entry/ Manufacturing Item** menu option. The latter is the most appropriate way to enter this routine as the **Lookup** will automatically be filtered for parts and the Manufactured Check will be automatically assigned.

There are three additional components associated with a **Manufactured Item**, namely;

- The **Sizes Tab** which contains information concerning the **Critical Sizes** such as unit length, width, thickness and weight, and will only be activated if Critical Sizes have been setup in the **System Settings/Product Types – Critical Sizes** tab.

- The **Materials Tab** where the Bill-Of-Materials (BOM) may be defined. The BOM may contain Material Items (both stock and non-stock items), other Manufactured Items (which become **Sub-Assemblies** of the parent **Part**), and also “special” non-stock items called **Sub-Contract** Items. The material description, units-of-measure, supplier and price are all defined in addition to the quantity of each material that is required.
- The Process Routing which is a list processes, selected from a pre-defined list of **Work Areas** setup in the **System Settings/Work Areas** menu selection. The Process Routing definition stores information concerning the set-up and process time, in addition to process descriptive and tooling details.

In all other respects the two things (Material Items and Manufactured Items) are the same and indeed are interchangeable. In the discussion below we will examine each of these components in turn, concentrating on the “why” rather than the “how to” aspects of the Material Item and Part Number creation. In particular, I will be concentrating on some of the little known and obscure features of the Part definition routine, which extends its applicability across a wide range of varying manufacturing environments.

## The Attributes Tab

The data entry requirements associated with the “descriptive” component of the Manufactured Item is the same as that for the Material Item as shown below:

The screenshot displays the 'Attributes' tab for a 'PART' item. The interface includes a toolbar with icons for saving, printing, and help, along with a 'Quote' button. The main form is organized into several sections:

- Item Specification:** Contains a checked 'Manufactured Item' checkbox, an unchecked 'Disabled' checkbox, a 'Revision' field, a 'Customer' field, and a 'Description' text area with the text 'manufactured part'.
- Stock Holding Specification:** Includes a 'Units Of Measure' dropdown set to 'units', checkboxes for 'Non Stock Item', 'Enable Serial Tracking', and 'Enable Lot Tracking', a 'Re Order Level' field set to '0', a 'Re Order Quantity' field set to '0', a 'Barcode' field, a 'Standard Cost' field set to '0.0000', a 'Shelf Life' field set to '0' days, and a 'Format' dropdown set to 'Code39'.
- Product Code:** Features a 'Product Type' dropdown set to '1 GENERAL' and an 'Estimator Initials' field.
- Record Comment:** A large text area for entering a comment.

Once the “Manufactured” check box is activated the *Sizes* (if appropriate), *Materials* and *Routing* tabs will be activated. We will look at these tabs shortly.

Note that the Item Specification section of the Attributes include an option to nominate a Revision Level as well as Customer identification.

The Stock Holding Specification includes the *Units of Measure* definition used to describe the Part. This, in the first instance is how both Material Items and Parts are “stored”. You are not restricted to “units” as the only Units-Of-Measure for the Part. The part definition being created may describe “metre”, or “kilogram”, of the product, or “any-thing-else” for that matter.

***An important point to note is that during the part definition the operator is defining what it takes to manufacture one (1) item (unit, metre or kilogram), of the part.***

The other data entry fields in this section relate to “Inventory Control” which we will discuss in another Seminar. We do however need to discuss the other item in this section, namely, the *Standard Cost*. This cost is what is drawn into the BOM item by default when the item is added to the BOM of a Part.

The Standard Cost of a Material Item (raw material) is usually related to purchase cost. For Manufactured Items in a Job-Shop environment however, the Standard Cost is usually set to zero(0). The system uses this as a trigger to perform a “Parts Explosion” in order to determine the Labour and Material costs of a BOM Item, particularly where it is used as a Sub-Assembly in some other parent part. If the Standard Cost is set to a “fixed” amount, similar to a Material Item, then that is what is used as the cost and a “Parts Explosion” does not occur.

**Note i.** With regard to Sales Order entry a fixed cost of a Manufactured Item in a BOM does not affect whether or not a Sub-Assembly job is generated. This is solely determined by Inventory considerations (see later Seminars)

The next thing to examine is the Product Code and in particular the *Estimator Initials* component of the *Product Code*. This is probably the first time you have encountered this term so let me explain it in detail. The Product Code consists of three segments each of which is defined at different points during the processing of a Sales Order, namely:

- The **Product Type** – This is the description of the products which are defined in *System Settings/Procut Types* menu option.
- The **Estimator Identification** – This is a 3-character alpha-numeric code usually representing the initials of the estimator and is used to identify the person responsible for initiating or modifying the part.
- The **Sales Code** – This is an alpha-numeric code usually representing the sales area associated with the Quote or Sales Order. This is usually a sales region or zone abbreviation or the initials of the sales representative and it may be entered at either *Quoting/Quote Entry & Review* or *Sales Orders/Order Management* menu options.

The Product Code, Product Type and Sales Code definitions are used throughout the ManuDyn system as selection criteria associated with data recall, during search or printout processes, on parts, quotes, orders, job history and invoicing information. As such, it is a useful and versatile product identifier used across a wide section of the system database.

## The Vendors Tab

The next tab to examine in detail is the *Vendor* (or Supplier). We will skip the *Stores* tab for now as it is discussed in another Seminar.

#	Vendor	Vendor Item Code	Price	UOM	Conversion Factor	Lead Time
1	QBOUS	PART	0.0000	units	1	0

The main thing to note here is that for Manufactured Items the Vendor is *YOU*

In this system the Company name is QBOUS. Where I am the Vendor (or Supplier) of an Item then it must be procured by manufacturing. If anyone else is the supplier then the Item is procured by purchasing and the usual purchase information needs to be defined as shown below.

Item Number: 1

Vendor Code: QBOUS

Vendor Item Code: PART

UOM: units

Conversion Factor: 1 ? units = 1 units

Price per UOM: 0.0000 for quantities above 0

Lead Time: 0 day(s)

Delete Move Record Before: 1 - QBOUS Move OK Cancel

**Note ii.** You can have many vendors for an Item including a mixture of yourself (manufactured) and other suppliers (purchased goods). The default Vendor is the first one in the list.

## Size Details

The next component of the Part to be examined concerns the definition of the “size” information associated with it. The precise nature of the screen display will vary depending upon which setup options are selected through the *Critical Sizes* tab in *System Settings/Product Types* menu option. In the example below only the Length, Width and Thickness have been defined and activated; the other Size Detail information is disabled:

The first thing to note is that if a **Critical Size** is activated then the operator is required to make an entry into each of the activated fields. That entry must conform with the minimum and maximum size limits set and if the tab is “skipped” or the Critical Size fields are left blank than the minimum size limit will be saved by default, against the part number.

*All Critical Sizes that are activated will appear on the Quote and Order Advice as well as the Job Ticket (unless deactivated via the advice setup).*

Not all products manufactured require Critical Size units. A reference to a Length or Width for a final assembly may be meaningless for example. As such, where Critical Sizes are required there may need to be at least 2 Product Types defined. One product type to cover the situation where length, width or thickness may be required and one product type where this is not the case.

## The Materials Tab

The next component of the Part Number concerns the definition of the Bill-Of-Material. There may be numerous materials associated with the Manufactured Item and each one needs to be defined in turn. Upon first selecting this tab the operator is required to indicate which item on the BOM is to be examined and then select (or confirm) the material selection. A sample screen display upon selecting this tab is shown below:

#	Material Code	Description	Vendor	Quantity	UOM	Unit Price
1	RM	raw material	ACCOR	1	units	2.1000
2	PART_ASSEM	assembly	QBOUS	1	units	0
3	SUBCONTRACT	Powder Coating	ACCOR	1	units	2.50

In this example my BOM consists of 3 different items, namely a Raw Material, another Part and a sub-contract item.

They represent the three types of Material Items that may occur in the BOM for a Part, namely:

- Raw Materials (Stock) items – These are usually (but not always) purchased from a Vendor (they could be Customer's supplied materials for example).
- Non-Stock items – Material that are not stored as Inventory. These cover such things as sub-contract operations.
- Other Parts – These represent Sub-Assembly items

Each of these BOM items requires a Code definition, a Description, a Supplier, Units-of-measure, a Quantity and a Cost as shown below:

Item Code: PART

Item Number: 1  Bulk Issue

Material Code: RM

Description: raw material

Pricing Information	
Vendor	Unit Price
ACCOR	4

Vendor: ACCOR

Quantity: 1 (units)  Quantity fixed at 1

Price per Unit: 2.1000

Date price set: 2016-06-01

Material Markup: 30 %

Record Comment:

Linked to Process: Not Linked

Delete Move Record Before: 1 - RM Move OK Cancel

For new Part the Stock Material Item the Description, Units-Of-Measure, Supplier and Material Unit Cost are all recalled directly from the Material Item file. If the Part is being reviewed the information is recalled from the BOM for this Part and will only be updated with the Stock file information if the operator chooses to do so (via a prompt which will display).

From this you can infer that the information on the BOM may be different to that on the Stock file. The reason for this is that the Part Number is a historical reference that will not be updated automatically. The operator has to choose to update it.

This seems like a cumbersome process and it is but it retains the integrity of the Part as a historical record. The *Quoting/Cost Price Update* routine may be used to make global changes to BOM pricing structures when or if you decide to update this price data.

For Non-Stock items the operator will need to enter all of the information directly. A Non-Stock item can be turned into a Stock Material Item by selecting the “New” icon adjacent to the “Lookup” icon shown in the screen display above.

The second item listed in this BOM is another Part and the supplier is YOU. The price is recalled from the Standard Cost setting discussed earlier which in this case is zero (0). That is, the system sees this Item as a Manufactured Sub-Assembly of this Part and as a result a Parts Explosion will occur to cost it’s Labour and Materials.

*The operator may set the cost of a sub-assembly part to something other than zero. Where this is done a fixed price is set for the BOM item, and the parts explosion that normally occurs during quoting is by-passed.*

If the sub-assembly cost is zero the system does a complete explosion on the sub-assembly part applying all setup changes with the result that an inflated price for the sub-assembly component may be determined, particularly with small quantities, that are usually missed by simply setting a fixed price.

Once the material has been selected the next element to define is the **Quantity** of the material which is required. First you should examine the following notes:

- Note iii.** The Units-Of-Measure for the Bill-Of-Material item should not be confused with the Units-Of-Measure for the Part. They may be different.
- ii.** Where the BOM item is also a Material Item the Units-Of-Measure to be used is the “Stock Holding” units defined on the Attributes tab.
- iii.** This is not to be confused with the Purchase Units-Of-Measure which, for the Material Item, may be different to that of the “Stock Holding” units.

So we could have, for example, a Material Item such as steel which is stored and used by the SHEET and purchased by the KILOGRAM for a Part which is defined by the UNIT. The material price will be \$/SHEET, and the quantity required will be the number of SHEETS per UNIT of the Part.

*For each Bill-Of-Material item the primary element to be defined is how much of the material item is required to make one (1) “unit” of the Part. That is what Unit-Of-Measure quantity of the material (in Stock Holding units where appropriate), is required to make one (1) Unit-Of-Measure quantity of the Part.*

- Note i.** You can have many vendors for an Item including a mixture of yourself (manufactured) and other suppliers (purchased goods). The default Vendor is the first one in the list.

One other situation that comes up from time to time is the requirement for a constant BOM item cost. That is no matter how many of the part being manufactured there is always a once-off cost on each production run. This often occurs with “soft” tooling; Operations such as printing, for example, where there is a charge associated with the preparation of the screen. The **Quantity Fixed at 1** option may be used in such cases. The system will always apply a quantity of 1 at a fixed cost, irrespective of the quantity of the Part Number required.

The **Material Markup** may be altered item-by-item basis in the BOM. This over-rides the default material markup set in *System Setting/Product Types-Quote Defaults* tab.

If the Markup is set to zero(0) then no material markup will be applied to the material item when quoting. If the Markup Fraction is 100% then twice the material cost is applied. The default condition for all material is the Product Type default.

The next item on the BOM item dialog to examine is the **Bulk Issue** check box. This option has nothing to do with determining material quantity or cost. It only effects the presentation of the Job Ticket. Basically, if the Bulk Issue option is activated the BOM item will not be displayed on the Job Ticket. In all other respects, a Bulk Issue material item is treated like all other BOM items.

This facility may be used for a number of purposes, for example:

- To hide the precise material requirements. I have seen this done where some proprietary formula is involved.
- To simplify the presentation of the Job Ticket by removing all the obvious items such as nuts bolts and washers.
- To make the Job Ticket smaller so that it fits onto a single page printout.

Finally, to conclude this examination of the Bill-Of-Material components of the Manufactured Item, I should mention something about the **Order of Listing items** in the BOM. I have already mentioned that there are 3 basic components, namely, Stock items, Non-Stock items and Other Parts.

In general these Bill-Of-Material items should be grouped together so that all the Other Parts (representing the various sub-assemblies) are toward the top of the list. The raw material items specific to the part can then be listed, usually placed in either order of significance or order of use, with the Stock items before the Non-Stock items.

There is one special Non-Stock item however that deserves special mention and that is the subcontract “material” item. This item is unique in that it is the only one that usually appears in both the Bill-Of-Material and also the Process Routing. It occurs in the BOM so that we can take account of the cost and also potentially generate a “material” requirement for which a Purchase Order may be raised.

It is in the Process Routing so that we can identify the stage of processing where the sub-contract operation needs to be carried out and also to accommodate it for purposes of scheduling. I will examine this shortly, first however, where should the sub-contact “material” be placed within the BOM item list?

***The sub-contract “material” should be placed first in the BOM item list.***

The reason for this will become apparent shortly when we examine the **Linked Material** option shown at the bottom of the BOM item dialog above, in association with the Process Routing tab described below.

## Process Routing

The next tab of the Manufactured Item to examine is the **Routing**. An unlimited number of process operations may be defined in the **System Setting/Work Areas** setup and incorporated into Parts selectively. The initial display upon selecting this tab is as follows:

#	Work Area	Setup Time	Process Time	Process Description	Tooling
1	DRILL	10	1	drill 3 holes each 1.0mm	
2	DISPATCH	0	0	pack in pink bages	

If the part is being recalled for review the existing operations are displayed. To review operations select them in the grid or select the blank grid item to add a new operation to the list. The screen display upon doing this will be as follows:

Item #: 1

Work Area: DRILL

Setup Time: 10 Minutes

Process Time: 1 Minutes

Process Description: drill 3 holes each 1.0mm

Tooling:

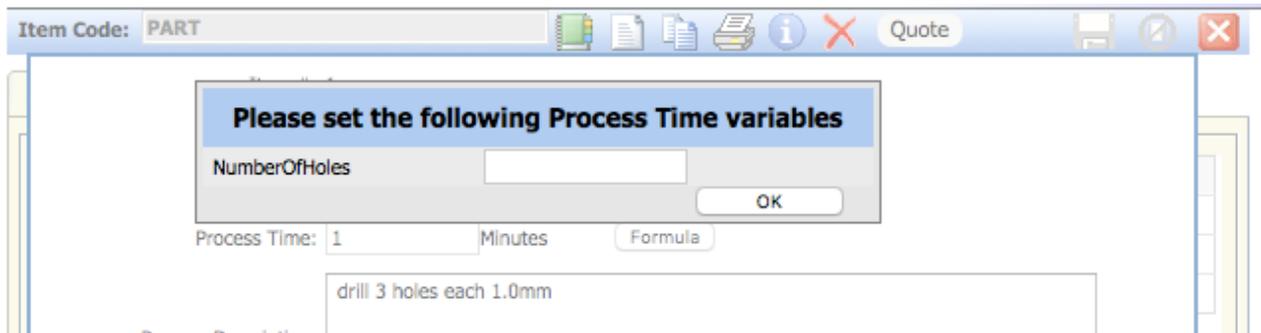
Drawing Filename:

Record Comment:

Move Record Before: 1 - DRILL

Once the Work Area is selected the user is required to enter the **Setup** and **Process Times** for (to make 1 unit of the Part).need to be defined. The Setup Time is applied once for each job, the Process Time is applied depending on the number of units of the Part required.

There is a “Formula” option associated with the setup and process time which may be setup in the **System Setting/Work Areas** menu item, or indeed a fixed rate default may be established which is recalled automatically when the Work Area is initially selected. If the “Formula” option is setup then the **Formula Button** (see above) will be displayed and selecting it will causes the Formula dialog to be displayed as shown below.



The Formula option provides a useful tool for assisting the operator in creating parts, moreover it has the potential to generate greater consistency in estimating, particularly where this is done by many different users. This consistency comes about because the user is “asked” a specific question, as in above (the Number of Holes) to determine process time rather than relying upon the user’s best guess or “guesstimate” as it is sometimes called.

The *Process Details* field is designed so that you can write a “story” as to what you want the operator to do. Tooling and drawing information may be included as other detail and where a *Drawing* is required (or some extended work instructions) this can be added (uploaded) via the *Attachments Tab*. An unlimited number of drawings and other attachments may be incorporated into the Part definition. In practice however it would be best if you keep this to simple drawing and the minimum number of attachments.

I have mentioned the *Linked Material* option in discussing the Material Tab. What exactly does a Linked Material item do and why is it here? If you ‘Link’ and Material to a Routing operation there are 2 things that can potentially occur.

Firstly a “Material Requisition” may be printed along with the standard Job Ticket printout. This requisition may be used as the authority to do work and is usually employed for sub-contract operations as a “router” or identifier to be dispatched along with the Job when sending it to the sub contractor.

The router is part of the “Job Bag” which travels with the Job during production and is simple removed and attached to the job at the appropriate time. When the job reaches the sub-contracting stage it is sent to the store (to be dispatched to the sub-contractor). The Material Requisition can be sent with the goods and act as the Purchase Order. The Job Ticket (or “Job Bag”) should be retained at the Store so you know where the job is. When the job returns from the supplier it is “married” once again with the Job Ticket and sent on to the next operation.

The second use of the “Linked Material” is to identify when, during the production cycle, the raw material is to be issued from stock. Such setups are complex and require all operators for fully understand your processing procedure. In the initial stage it is recommended that you do not go down this path but rather set the system up for relieving of inventory at the “Job Issue” stage.

**Note i.** With regard to the Touch Screen operation the Store operator should “clock the job though” the S/CONTRACT processing stage when the goods are returned from the Sub Contractor.

- ii. If you have a defined price for the sub-contract “material” (process) and you have recorded job cost materials at the point of job issue (our recommended practice), there is no need to record any other job cost information.
- iii. With regard to the accounting system you should encourage your sub-contractor to provide you with an invoice with the goods when they are returned so that the count can be validated prior to sending it onto accounts where it can be entered as a Supplier Invoice directly.

One final point concerning the sub-contract process is that you may wish to simulate the sub-contract delay in your scheduling activities. The best way to do this is to add Setup Time against the a process called “SUBCONTRAT”.

Now most sub-contract operations take days to complete. If your time units of measure is in minutes this may represent a number like 3000 minutes say (approximately 2 days). One trick to avoid this is to set the process capacity, for this operation to say 1 hour per day. This is done from the *System Setting/Work Areas* as shown below:

**Work Area:** SUBCONTRACT

**Estimating and Scheduling Variables**

Priority: 1  Disabled

Recovery Rate: 0 (\$/man-hour)

Efficiency: 100.00 %

Record Comment:

Setup Time: 60 Formula:

Process Time: 0 Formula:

Process Detail:

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**Standard Capacity Minutes**

Minutes per Hour: 60 Monday: 60

Hours Per Standard Day: 1 Tuesday: 36

Average Wait Time: 0 (minutes) Wednesday: 60

Thursday: 60

Friday: 0

Saturday: 0

Sunday: 0

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**Non Standard Production Days**

Date	minutes

**Reschedule**  OK  Cancel

Some clients set a capacity of 0.0167 hours per day. That is, each minute of setup time represents 1 day. This however gives you very little flexibility with regard to fractions of a day. The better approach is to set a capacity of 1 hour per day where every 60 minutes of setup time represents 1 day and 90 minutes for example is 1.5 days.

**Note i.** The sub-contract cost is accounted for in the BOM item list. If you add time against this process operation you will need to set the recovery rate for this process to zero(0), in order to avoid addition costs being accrued against this process operation at the quoting stage.

To conclude this discussion on the Process Routing I would like to say something about the *order of processes*, the use of a **process many times in a routing**, and the need for *Control Points* particularly for the last operation.

Generally a process routing describes the work centers in the order in which you wish them to be carried out. This is called a “*Logical Process Routing*” and under such a régime the percentage done or complete for any one operation can not be greater than the operation immediately preceding it. This is in fact how the Touch Screen scheduling system works in its default condition.

Sometimes however the process operations can be interchangeable in the sense that 2 or more operations can be carried out concurrently or in reverse order. This is called a “*Non-Logical Process Routing*”. If this option is activated under the Scheduling system the percentage completed by any operation is not dependant on any preceding process.

In general however you will construct the process routing according to your preferred option (even when the Non-Logical Process Routing is applicable). There is however one other problem that occurs with a Non-Logical operation where the job is a sub-assembly and the last operation is 100% complete. This is the system trigger to remove the job from the ‘Current’ list of jobs, and if the job is an Inventory Item the quantity completed is placed into stock.

***Clearly, for Non-Logical operation a control point is required for the last operation.***

Even when a Logical Process Routing is present a control stage may be needed to ensure that the “correct” amount is transferred into inventory. Good names for Control Points are “STORES”, “INSPECTION” or “QC-CHECK”

Multiple process occurrences within a routing are perhaps the most difficult processing situation to manage, particularly through the Touch Screen scheduling system. Basically, there is only one schedule for all of the multiple occurrences and a job may only appear once on the Touch Screen Schedule for that operation

So, with regard to the operation of the Touch Screen Schedule, which occurrence of the process is listed?

The answer is simply that the first occurrence of the process that is not 100% complete will be listed, and any subsequent occurrence will not be listed until the initial occurrence is completed. This applies irrespective of whether a Logical or Non-Logical Process Routing is in operation.

*Clearly, the use of multiple occurrences of a process within a Process Routing, though permissible is not necessarily a good idea.*

What I recommend is that if a process is required to be listed more than once within a routing that you define work center with names like PROCESS-1 and PROCESS-2 rather than have multiple occurrences of the PROCESS work center. This will present you with the least number of scheduling difficulties.

## Other Criteria Tab

An important facility we need to examine with respect to Material Items generally is the Alternative Item and/or Redirected Part. The re-direction option is activated by defining an alternative item code and activating the “Redirection Date” option as shown below.

The screenshot shows a software window titled 'Item Code: PART'. The 'Other' tab is active, displaying the following fields:

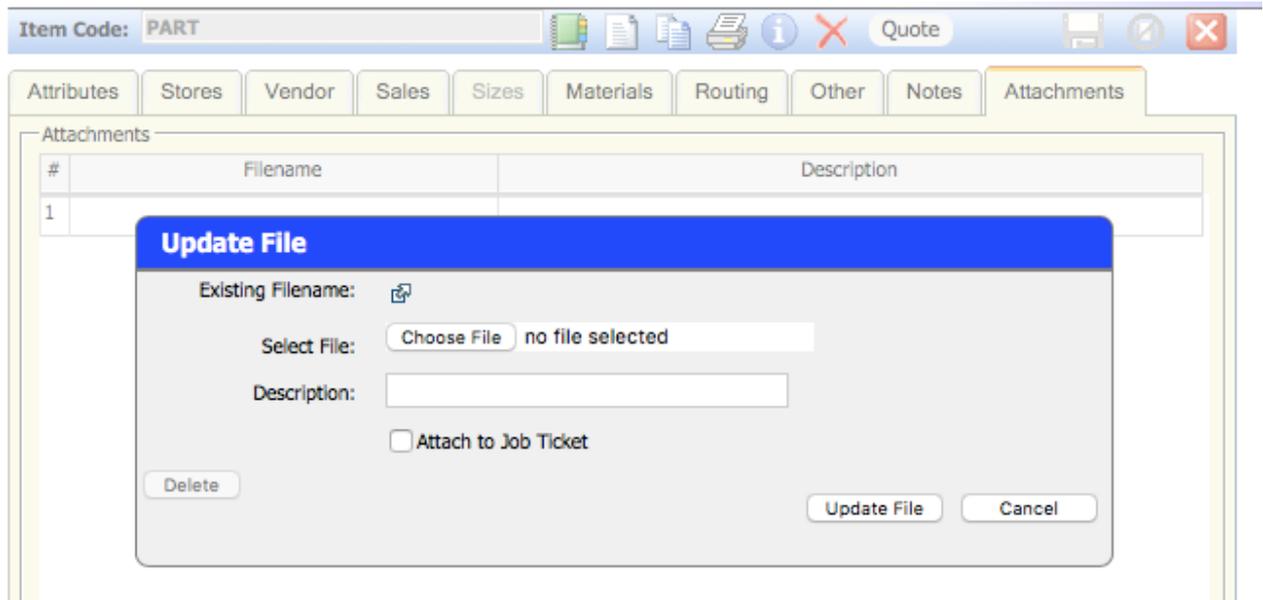
- Alternative Item:** An empty text input field.
- Redirection Date:** A dropdown menu currently set to 'Null'.
- Material Description:** A text input field.
- Drawing Number:** A text input field.
- User Defined Fields:**
  - User Defined Date:** A dropdown menu set to 'Null'.
  - User Defined Number:** A text input field containing '0'.
  - User Defined Comment:** A text input field.
  - User Defined Amount:** A text input field containing '0.0000'.
  - User Defined Description:** A text input field.

The operator is required to set a Re-direction Date from which the redirection is to apply and the effect of this is to re-direct inventory order processing, in particular affecting material commitments and requirements, from the parent Part code (in this case PART) to an Alternative Part code. The most common use for this facility is in relation to the run out of obsolete materials.

**Note i.** An Alternate Part reference also implies an Alternate Bill-Of-Material and/or an Alternate Routing.

## Notes & Attachments Tabs

The final tabs to examine are the Notes and Attachments tabs associated with Material and Manufactured Items. You should examine the Video Tutorials to see how these options work and in particular the uploading procedure.



**Note i.** With respect to Drawings in particular you should note that it is in this tab that you indicate whether or not the drawing (or attachment) is to be printed along with the Job Ticket (see above).

## Item Routing Sheet

This report is accessed from the *Database Entry/Item Routing Sheet* menu selection. It provides a useful summary of the information that is entered against the Manufactured Item (Part) and is called a “Part Routing” because it can be used as a “Job Ticket” to provide processing information to the factory (without actually raising a Sales Order). An example of the report is shown below.

**Print Preview**

**Manufacturing Software Pty Ltd** Operator: Jim Roach  
**Part Routing- Quote Number** Date: 8/9/2016 7:59:01 AM

Item Code: PART  
 Order Quantity: 1  
 Description: A manufactured part  
 a note against the part

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**Material Details:**

#	Description	Supplier	Quantity Required	Price
1	RM_1 Raw Material 1	SUPPLIER	10 units	\$1.00
2	RM_2 Raw Material 2	BESBUY	1 units	\$ .00
Total Material Cost				\$10.00

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**Processing Details:**

#	Operation Details	Setup Time	Process Time	Process
1	CUT make cuts 200mm then paint it blue with pink spots Tooling:12345	0	15	
2	FOLD 5 folds as per drawing the send line says nothing	20	5	
Total Labour Time:		40.00 Minutes		

## Indented Bill-Of-Material Report

There is an Indented Bill-Of-Material report is accessed from the *Database Entry/Indented Bill of Material* menu item.

This report provides a list of the Material Items contained within a Manufactured Part. It has a complete sub-assembly parts listing capability providing a breakdown of the materials in each sub-assembly part. The latter is displayed in an indented format in accordance with the sub-assembly level as per the example below.

Item Code	Description	Quantity Required	Value
<b>PART-A</b>	A manufactured part	1 units	\$0.00
↳ RM_1	Raw Material 1	10 units	\$10.00
↳ RM_2	Raw Material 2	1 units	\$0.00
Total Material Value for PART-A = \$10.00			
<b>PART-B</b>	Another manufactured part	2 units	\$0.00
↳ RM_1	Raw Material 1	20 units	\$20.00
↳ RM_3	Raw Material 3	2 units	\$0.00
Total Material Value for PART-B = \$20.00			
RM	Raw Material 1 Raw material	1.5 units	\$2.85
Total Material Value for PART-ASSEMBLY = \$2.85			
<b>Total Material Value for all items = \$32.85</b>			

The report shows the material item description, together with the quantity required and the material item value for the manufacture of one (1) final assembly part. The value for each sub-assembly item together with the total material value is also provided.

## Item Schematic Explosion

The final report I want to look at in relation to parts is the Item Schematic Explosion. This report provides a useful summary listing all the assemblies that may comprise a final assembly part. This printout shows the precise parts “explosion” indicating how the various sub-assemblies are related to their respective “parent” assembly, and the quantity of each required as shown in the example below;

Item Code	Description	Quantity
<b>PART-FINAL-ASSEMBLY</b>	a final assembly part	Quantity: 1
↳ PART-ASSEMBLY		Quantity: 1
↳ PART-A		Quantity: 1
↳ PART-B		Quantity: 2
↳ PART-C		Quantity: 2

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## Concluding Remarks

This Seminar is now complete. I recommend that you consult the Video Tutorials listed at the beginning of this Seminar as they provide a good overview of this section of the system.

During this seminar I have tried to indicate the interrelated nature of various aspects of the system that revolve around how Parts are constructed. For further information you should consult the system installation Seminar 1 in particular the ***Product Types*** and ***Work Area*** sections of the ***System Setup***. The Quoting and Estimating discussion (Seminar 5) follows on directly from this seminar and will be examined next. In fact ALL areas of the system are directly affected by your construction and definition of the Manufactured Item.

When you think about it you realize how important your construction of the Manufactured Item (or Part) really is.