

About this Book

The **Qube Order Configuration User Guide** provides information about the Option Selection module. This book includes such topics as Basic Option Selection, Advanced Option Selection, and Rules-Based Order Configuration.

Use this book as a general reference book.

The **Qube Order Configuration User Guide** is part of a 14-volume set. The other books in the set are:

- General Information User Guide
- System Administration User Guide
- Inventory Management User Guide
- Production Scheduling and Bills of Material User Guide
- Sales Order Management User Guide
- Purchasing Management User Guide
- Accounting with Qube User Guide
- Accounting with Dynamics User Guide
- Job Costing User Guide
- Global Commerce User Guide
- Implementation Workbook
- Qube Sample Reports Book
- Index

Overview

This user guide contains the following topics:

- Basic Option Selection
- Setup Considerations
- Using Option Selection
- Rolling Up Costs Using Option Selection
- Reports
- Advanced Option Selection
- The Option Selection Rules Window

Basic Option Selection

This feature allows you to enter generic items with generic bill of material components in the item master file and then identify specific options at order entry. For example, without Option Selection, if you were a furniture manufacturer and sold one style of chair in 100 different fabrics with 5 arm styles, 4 caster types, and 3 different wood frames (maple, oak and cherry), you would have to create several thousand different item records - each with its own bill of material - to account for all the different combinations of chairs which are likely to be sold. The Option Selection function is designed for make to order items. It is not appropriate for items which are make to stock. Items made to stock need unique item records created for them so that you can track stock levels.

In **Basic Option Selection**, each item in a sales order may have five different option “slots,” each with a virtually unlimited number of choices. The **Basic Option Selection** module is an optional module that may be purchased separately.

More complex products may result in a very high number of possible configurations, and therefore require more option slots. **Advanced Option Selection** uses a rules-based order configurator to allow you to enter quotations, forecasts and sales orders for specific configurations of items without having to first set up the item and its bill of material in the item master file. The **Advanced Option Selection** module is an optional module that may be purchased separately. For more information, see [“Advanced Option Selection” on page OPT-29.](#)

Generic and Specific Items

The function works by setting up generic items in bills of material which are pointed to by non-generic options in sales orders. These options are then substituted during the MRP or production scheduling process, or when a nonscheduled assembly transaction is produced referencing the sales order. Therefore, if the function is to work correctly, the data file must be set up in advance to point the system in the right direction.

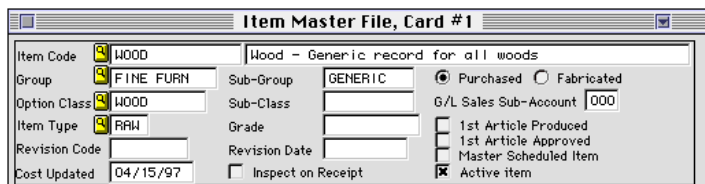
Setup Considerations





There are several areas where proper setup must occur. These include:

1. **Generic item codes** to be included in bills of material. These generic items may be purchased options or manufactured items with their own bills of material. These items have special characteristics which must be set up if they are to work. These are set up in **Item Master File, Card #1**.
2. **Option item codes** for those items which are inserted in place of the generic items in the bills of material during the order entry process. These items, too, have special characteristics which must be set up if they are to work. These are set up in **Item Master File, Card #1**.
3. **Bills of material with generic items** in them. When sales orders are entered, these generic items will be pointed to by options set up in the sales orders. These are set up in the **Bill of Materials** window.
4. **Option sets** which provide tools to facilitate entry of valid options and prices for each finished item. There is a special **Option Sets** window for this purpose.
5. **Valid options and prices for each finished item**, providing groups of options which are “allowed” for the item. For example, you would probably not want to allow various lamp shades as options for a couch. This function also provides the ability to charge specific amounts for the options in each finished good. There is a special **Valid Options and Prices** window for this purpose.

Setting Up the Item Master Records

Generic Items



Item Code  WOOD		Wood - Generic record for all woods	
Group  FINE FURN	Sub-Group	GENERIC	<input checked="" type="radio"/> Purchased <input type="radio"/> Fabricated
Option Class  WOOD	Sub-Class		G/L Sales Sub-Account 000
Item Type  RAW	Grade		<input type="checkbox"/> 1st Article Produced
Revision Code	Revision Date		<input type="checkbox"/> 1st Article Approved
Cost Updated 04/15/97	<input type="checkbox"/> Inspect on Receipt		<input checked="" type="checkbox"/> Master Scheduled Item
			<input checked="" type="checkbox"/> Active item

Generic items must be set up with an **Option Class** specific to the items they will represent and a **Sub-group** designation specific to generic items.

Sub-Group

In generic items, the **Sub-Group** field must contain the designation **GENERIC**, as shown in the example above.

Option Class

The **Option Class** field is used to determine which items will be substituted for other items. For example, if an item of furniture has several different woods which can be substituted, you might set up an **Option Class** designation of **WOOD** as shown in the example above. Then, when you enter an option in the sales order with an **Option Class** of **WOOD**, the system will look in the bill of material for the **generic** part with the same **Option Class**. That will be the item that is substituted, so only one item in the BOM can have the same option class, unless you use the **Sub-Class** field (see below).

Option Sub-Class

More complex setups involve situations where there may be several items of the same option class in the same bills of material. In these cases, you will need to set up option **Sub-Class** designations as well. Below is a table whose BOM includes a table top and four legs.

QUANTITY REQUIRED	ITEM CODE	DESCRIPTION
12" TABLE	5-Piece hypothetical table	
* 4.000	12" LEG	MILL [210] 1 Leg for 5-Pi
* 0.200	LEG BLANK	60" Leg blank for 5-Piece
* 0.015	MILL	Mill Room: Cut & shape wo
* 1.000	TABLE TOP	MILL [210] Top piece for
* 1.500	WOOD	Generic record for wood (
* 0.030	MILL	Mill Room: Cut & shape wo
* 0.060	PAINT	Paint Center.....

This issue can be handled by using the option **Sub-Class**. This example indicates a generic wood LEG.

Item Master File, Card #1

Item Code	LEG BLANK	60" leg blank for 5-Piece Table	
Group	TABLES	Sub-Group	GENERIC
Option Class	WOOD	Sub-Class	LEG
Item Type	RAW	Grade	
Revision Code		Revision Date	
Cost Updated	10/08/93	<input type="checkbox"/> Inspect on Receipt	<input checked="" type="radio"/> Purchased <input type="radio"/> Fabricated G/L Sales Sub-Account 000 <input type="checkbox"/> 1st Article Produced <input type="checkbox"/> 1st Article Approved <input type="checkbox"/> Master Scheduled Item <input checked="" type="checkbox"/> Active item

This is followed by specific wood legs. Here is one in OAK.

Item Master File, Card #1

Item Code	OAK LEG BLANK	60" Leg blank for 5-Piece table	
Group	TABLES	Sub-Group	OAK
Option Class	WOOD	Sub-Class	LEG
Item Type	RAW	Grade	
Revision Code		Revision Date	
Cost Updated	10/08/93	<input type="checkbox"/> Inspect on Receipt	<input checked="" type="radio"/> Purchased <input type="radio"/> Fabricated G/L Sales Sub-Account 000 <input type="checkbox"/> 1st Article Produced <input type="checkbox"/> 1st Article Approved <input type="checkbox"/> Master Scheduled Item <input checked="" type="checkbox"/> Active item

The **Option Groups** report shows two generic WOOD records, one used for the table top and the other used for the legs. Both of these items may be set up to be selected for the same item during the order entry process.

Option Item Groups Report

Report Printed on JUL 11 91 at 11:25, Page #1

Option Class	Sub-Class	Sub-Group	Item Code	Description
WOOD		*GENERIC*	WOOD	Generic record for wood (maple, cherry, oak)
		CHERRY	CHERRY	Cherry wood
		MAPLE	MAPLE	Maple wood
		OAK	OAK	Oak wood
WOOD	LEG	*GENERIC*	LEG BLANK	60" Leg blank for 5-Piece hypothetical table
	LEG	OAK	OAK LEG BLANK	60" Leg blank for 5-Piece hypothetical table
	LEG	MAPLE	MAPLE LEG BLANK	60" Maple Leg blank for hypothetical table

Option Items

Item Master File, Card #1			
Item Code	CHERRY	Wood - Cherry	
Group	FINE FURN	Sub-Group	CHERRY
Option Class	WOOD	Sub-Class	
Item Type	FRW	Grade	
Revision Code		Revision Date	
Cost Updated	04/15/97	Inspect on Receipt	<input checked="" type="checkbox"/>
		<input type="radio"/> Purchased	<input type="radio"/> Fabricated
		G/L Sales Sub-Account	000
		<input type="checkbox"/> 1st Article Produced	
		<input type="checkbox"/> 1st Article Approved	
		<input type="checkbox"/> Master Scheduled Item	

In addition to the generic items, **Item Master File** records must be set up for **each individual option** to be designated at **order entry**. For example, in the case of the **WOOD** option set up earlier, you might have several dozen woods which could be used. An individual record must be set up for each of these **WOOD** options. Options must have the following properties.

Sub-Group

Options *should not* have a **Sub-Group** designation of **GENERIC**. They may have any other designation you wish.

Option Class

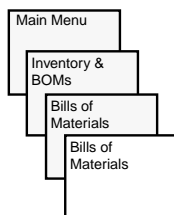
As with the generic items, the **Option Class** field is used to determine which items will be substituted for other items. The **Option Class** for the options must match that for the generic items they are to replace. This match must be exact; it is the only link between the generic place holder and the options. In the example above, the **CHERRY** option will replace the generic **WOOD** option, because they both share the same **Option Class**, **WOOD**.

Option Sub-Class

Sub-Class codes should also be included on options, in the same way they are included on the generic items (see [“Option Sub-Class” on page OPT-5](#)).

Setting Up BOMs

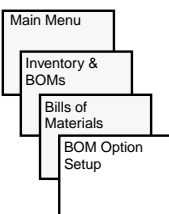
Options for BOMs are set up on the **Bill of Materials** window. Once the option has been set up, it is handled like any other component.



Item Code	Quantity	Unit	Labor Value	Overhead Value
9111-FAB/SEW	1.00000	A EA		
9111-F0/CUT	2.00000	P EA		
9111 FR/FIN	1.00000	A EA		
LAM-1	3.00000	EA		
FINAL	1.13600	A HR	11.36000	
LAM-2	3.00000	EA		

Subtotals from Item Master File, Card 1: 0.00000 0.00000

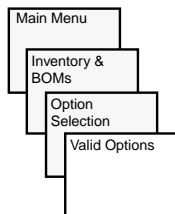
To view additional information about the option, use the **Bill of Materials Option Setup** window. You cannot edit these fields, except for **Quantity**.



Item Code	Quantity	Unit	Item Family	Material	Casing Type	Fab	Lead Time
9111-FAB/SEW	1.00000	EA	SUB FINE FURN		FABRIC	F	0
9111-F0/CUT	1.00000	EA	SUB FINE FURN	FRAME		F	0
9111 FR/FIN	1.00000	EA	SUB FINE FURN	FRAME		F	0
LAM-1	3.00000	EA	RAW FINE FURN		LAMINATE	P	30
FINAL	1.00000	HR	LAB			P	0
LAM-2	3.00000	EA	RAW FINE FURN		LAMINATE	P	30
BOX	1.00000	EA	RAW	GENERIC	BOX	P	30
FABRIC	1.00000	VD	RAW FINE FURN	GENERIC	FABRIC	P	30

Items must be set up with an item type, group, sub-group, and option class. Please note that you cannot structure a BOM to have an option within an option, unlike Item Master Records which have option sub-classes.

Valid Options & Prices



Option Item Code	Description	Option Class	Option Price	#
150	Medium Suede	FABRIC	20.000	4
151	Pebbles Fabric	FABRIC	22.000	4
152	Olympic Grid	FABRIC	26.000	4
154	Glimmer	FABRIC	27.000	4
170	Powder Suede	FABRIC	28.000	4
180	Tahiti	FABRIC	18.000	4
183	Power Tuill	FABRIC	19.000	4
JAZZ	Jazz Fabric	FABRIC	88.500	4
KALEID	Kaleidoscope Fabric	FABRIC	90.000	4
LAM-1	Laminate in Antique White	LAMINAT	6.000	3
LAM-2	Laminate in Aubergine	LAMINAT	4.500	3
LAM-3	Laminate in Cherry Veneer	LAMINAT	24.000	3
LAM-4	Laminate in Oak Veneer	LAMINAT	26.000	3
4001	Watco Natural Oil	FINISH	6.000	2
4002	Watco Medium Oil	FINISH	12.000	2
4004	Watco Fruitwood Oil	FINISH	10.000	2
4005	Watco Satin Max Natural	FINISH	12.000	2

This window provides the ability to set up valid options and prices for each item sold. For example, you would probably not want to have a lamp shade be an option for a couch, nor a throw pillow as an option for a lamp. This window allows you to set up those items which will be available as options for each item in each sales order.

In **Basic Option Selection**, each item in a sales order may have five different option “slots,” each with a virtually unlimited number of choices. As you are entering a sales order with options, a pop-up list will appear as you tab into each option field:

Item Code	Date	Status	Ordered	Shipping	Invoiced	B/O	Price	Unit	Extension
9111	03/18/97	H	2	0	0	2	139.651	EA	279.30

Options	Item Code	Description
MAPLE	154	Glimmer
	JAZZ	Jazz Fabric
	KALEID	Kaleidoscope Fabric
	150	Medium Suede
	152	Olympic Grid
	151	Pebbles Fabric
	170	Powder Suede
	183	Power Tuill
	180	Tahiti

Options	Item Code	Description
MAPLE	154	Glimmer
4002	154	Glimmer
LAM-3	154	Glimmer
	154	Glimmer
	154	Glimmer

The items available in this pop-up list and their impact on the pricing of the item sold are determined by the items set up in the **Valid Options & Prices** window above. When you enter an item code in the **Sales Order Items** window which matches an item with a valid op-

tions set, these items will be made available in the pop-up list, according to the number in the right-hand column of the list.

All FABRIC options are in Group #4

While all LAMNAT options are in Group #3

Option Item Code	Description	Option Class	Option Price	
150	Medium Suede	FABRIC	20.000	4
151	Pebbles Fabric	FABRIC	22.000	4
152	Olympic Grid	FABRIC	26.000	4
154	Glimmer	FABRIC	27.000	4
170	Powder Suede	FABRIC	28.000	4
180	Tahiti	FABRIC	18.000	4
183	Power Twill	FABRIC	19.000	4
JRZZ	Jazz Fabric	FABRIC	88.500	4
KALEID	Kaleidoscope Fabric	FABRIC	90.000	4
LAM-1	Laminate in Antique White	LAMNAT	6.000	3
LAM-2	Laminate in Aubergine	LAMNAT	4.500	3
LAM-3	Laminate in Cherry Veneer	LAMNAT	24.000	3
LAM-4	Laminate in Oak Veneer	LAMNAT	26.000	3
4001	Watco Natural Oil	FINISH	6.000	2
4002	Watco Medium Oil	FINISH	12.000	2
4004	Watco Fruitwood Oil	FINISH	10.000	2
4005	Watco Satin Wax Natural	FINISH	12.000	2

For example, in the above screen shot, all **FABRIC Option Class** items will be displayed in one pop-up list, because they are all designated as **Group # 4**, while all **LAMNAT** items will be shown in a separate list because they are in **Group #3**.

These items *do not* show up in separate lists *because they have different option class designations; rather they do so because the option group number is different*, so it is important that the group designation be carefully monitored when items are entered into this list.

• Adding valid options & prices

1. Click **<NEW>**.
2. Enter the **Item Code** of the item to which the options will apply.
3. Enter the first **Option Set**.

If you have already created an **Option Set** (see [“Option Sets” on page OPT-15](#)) to facilitate entry of the options for this item, **<TAB>** to the **Option Set** field and enter the code of the option



set (e.g., FABRIC). When you tab out of this field, the list of options from the selected option set will load into the list below.



Hint: If you first click in the # field and type a number between 1 and 5, all of the items will take on that number as they are loaded into the list. This saves the step of having to tab through this field and assign a number individually.

4. Add additional option sets.

If you wish to load another option set, click on the first blank line in the list. Then click in the # field and change the number to the next sequential number between 1 and 5. Then click in the **Option Set** field again and enter a second option set (e.g., WOOD). The list will load with all of the items in the second option set, assigning each with then number you have just designated.

5. Edit the list by removing items, adding new items individually, or editing the Option Prices (i.e., the price of the option when it is sold with the selected item).

Option Item Code *{All Caps, Validated, Required}* This field references the item code in the item master file.

Option Price *{Numeric, three decimal places}* This field represents the amount of money *added* to the unit price of the item when this option is used with the selected item. The assumption is that the price of an item may differ with different options, *and* the price of an *option* may vary when it is used *with different items*. The value in this field will default to the top left default price field in the item master file for the option record.

Default Selling Prices					
Quantity	Price	Quantity	Price	Quantity	Price
1	24.000	0	0.000	0	0.000

Then, as options are added to a sales order, this amount will be added to the price in the sales order item.



Note: The amount in this field may be positive or negative, depending on whether this option increases or decreases the price of the item with the generic option. For more information on how option selection affects pricing, see [“Rolling Up Costs Using Option Selection” on page OPT-21.](#)

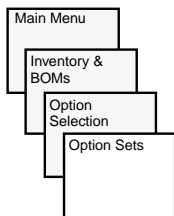
#

{One character, numeric, restricted to 1 through 5} The entry into this field may be from 1 through 5. It tells the system that this option can be used as the 1st, 2nd, 3rd, 4th or 5th option during order entry. It is through the use of this field that the system knows when to display this portion of the list of options in the pop-up list. Without this entry, the system would show all options for the item each time the user entered an option field during order entry. Since the list of options may be very long, this is less desirable than partitioning the options list to show only the appropriate section.

Option Selection



Option Sets



Option Sets are tools to facilitate entry of data in the **Valid Options and Prices** window. For example, if you had 50 different products (chairs) each of which may use up to 100 different options (fabrics), you would have to make up to 5,000 manual entries to **Valid Options and Prices** to record all of the valid fabrics for each chair. Using **Options Sets**, however, you can create one option set for all fabrics, requiring 100 manual entries. Then load that option set for each chair and edit the set, indicating which fabrics are valid for each chair and what the price of the option is when used with that chair. Your number of manual entries will be reduced from 5,000 to 150.

Creating Option Sets

• To create a new option set

1. Click **<NEW>**.
2. Enter the name of the option set in the **Option Set** field.

When you **<TAB>** out of this field, the system will check to make sure a set does not already exist with this name. If it does, it will display a message informing you of that fact:

3. Click <OK>, and the options in that option set will automatically load in the window.

You may then wish to edit the existing option set.

If the function does not find an existing option set with this name, it will guess at what you want the set to be by finding inventory item records with an **Option Class** code matching the code you entered and load the window with all the records it finds.

4. You may then add or delete records from this list.
5. Click <SAVE>, and the function will create an option set matching the data in the window.

Option Selection

Using Option Selection

Configuring a Sales Order, Forecast, or Quotation

In order for the order entry function to work with the Option Configurator, you must have the System Set Up window set to enable this function. For information on how to do this, see [“Enter Orders Using Option Selection Window” on page SYS-99](#).

When the **Option Selection** function is enabled, the **Sales Order Items**, **Quotation Items**, and **Forecast Items** windows provide spaces for you to enter up to five options, as shown below.

Item Code	Date	Status	Ordered	Shipping	Invoiced	B/O	Price	Unit	Extension
9111	02/22/94	O	4	4	0	4	386.200	ER	1,544.80
DR1	02/22/94	R	2	2		2	2,500.000	ER	5,000.00

Series 9 Chair Open 6,544.80

Options: OAK Oak Wood
 FIN-1 Finish in light oak
 LAM-3 Laminate in Cherry Veneer
 170 Powder Suede

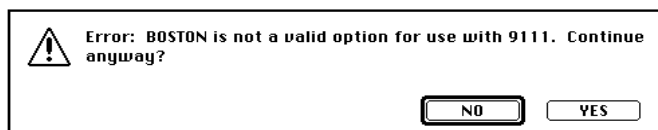
☐ Print on Work Order ☐ Print on Order/Invoice

After tabbing out of the **Shipping** field, the cursor will drop to the first of the **Options** fields, and a pop-up list will appear, displaying all of the options with the #1 designation (see [“#” on page OPT-14](#)). Double-click on the option you wish to insert; the list will disappear, and the item code for the option will be inserted into the first field.

Press <TAB>, and the cursor will jump to the second option field, the amount in the **Price** field will increase or decrease by the amount set up in the **Valid Options and Prices window**, and the pop-up list will appear again, this time displaying those options with the #2 designation. This will continue to happen as long as there are designated option sets for the item, up to five.

In this example, the list of **Valid Options and Prices** shows only four option groups, but there are spaces for five options in the order

entry item detail window. The system will allow you to enter a valid **Item Code** which is not in the list of **Valid Options and Prices**. It will caution you with a message that looks like this, but it will allow you to override the list if you wish.



Impact on Production Scheduling and MRP

Entry of options on this screen impacts the **MRP Summary Report** and production scheduling function (when run from sales orders and forecasts) automatically, since both of these functions are based on specific references to **Sales Order Items**. These functions are based on the sales order item data (what is scheduled to be shipped, on what date and including which options) by referencing the **Sales Order-Line #**. Therefore, you need to do absolutely nothing more to integrate the selected options with the MRP and production scheduling functions. Once the options are selected and entered into the **Sales Order Items**, the integration is automatic, as long as you are not generating your production schedule from the MPS function.

Integration with Scheduled Assembly Transactions

Integration with assembly transactions, however, *may* require some attention. If you are using the *scheduled assembly* transactions, the transaction performs the assembly based on a scheduled manufacturing order. Providing you ran production scheduling from **sales orders and forecasts** and not **MPS orders**, the manufacturing order was set up based on the sales order item or forecast item and the designated options. Therefore the integration is automatic.



It is important to emphasize, however, that once production scheduling has been run, the selection of options must not be changed in the forecast or sales orders without rerunning the scheduling function.

Non-Scheduled Assemblies

In the case of **Non-Scheduled Assemblies** there is no automatic integration with the options selected for each sales order item record. To link the two transactions, you must enter the **Sales Order-Line #** into the **Non-Scheduled Assembly** transaction, replacing the default **Made to Stock** designation with that number, as shown below. This will cause the system to look up the selected **Sales Order-Line #** to find out which options were selected. This may be done whether

you enter transactions one at a time or using the **Multiple Assembly Transactions**, as shown in the examples below.

Non-Scheduled Assemblies						
Transaction Number	Date	Posted To J/E #	Order Line # If Made to Order	Batch Number	Actual # Hrs	
	06/18/97		1855-3		0.3	
Assembled Item Code	Quantity	Sent to Location	Unit	Standard Unit Cost	Extension	
9111	1.000	200	ER	12.25000	12.25000	

Multiple Non-Scheduled Assembly Transactions					
Transaction Date 06/18/97					
Assembled Item's Code	Quantity Sent to	Assembled Location	Order-Line #	Batch #	Actual Hours Spent
9111	1.000	200	1860-2		2.000

Rolling Up Costs Using Option Selection

When the option selection feature is used, specific items replace generic items. Normally, the specific item has a cost associated with it that is greater than the generic item. The cost of these options must be reflected in two kinds of transactions: assemblies and customer shipments.

Assemblies

Reflecting the correct costs in assemblies that involve option selection requires some careful attention and understanding, especially when the BOM structure involves more than two levels of indention.

As an example, take a bill of material that indents four levels and involves generic items on more than one level:

```
.....
9111-FAB/SEW
.....
.FABRIC
.THREAD
.SEW
9111-FQ/CUT
.FOAM
.COVER
..SANDL
..CUT
..0001
.FINAL
9111 FR/FIN
.9111 FRAME
..WOOD
..STR WOOD
..0001
..MILL
.FINISH
.FIN
FINAL
LAM-2
```

In this example, the items FABRIC, WOOD, FINISH and COVER are generic items. Also, the item LAM-2 belongs to a group of options and may be replaced by other items in the same option group.

An order has been entered for the parent item, the 9111 chair, and the following options were selected on this order.

Options	CHEERY	 Cherry wood
	4001	 Watco Natural Oil
	LAM-1	 Laminate in Antique
	JAZZ	 Jazz Fabric
		

When the 9111 is used with all generic items, the costs shown on the item master file window will apply.

Material Cost	448.08600
Freight In	0.00000
Material O/H	0.0000
Outwork	0.00000
Labor	65.8480
Labor O/H	0.0000
Total Cost	513.9340

Printing an indented bill of material for the 9111 with these four options selected shows that the total cost of the item is \$605.43.

Quantity Required	Item Code and Description	Labor Unit Cost	Material Unit Cost	Extended Labor Cost	Extended Material Cost
Series 9 chair					
2.00000	9111 FR/FIN FIN [200] Finished frame for 9111-C	16.80000	214.00000	33.60000	428.00000
8.00000	4001 Watco Natural Oil		3.00000		24.00000
4.00000	9111 FRAME MILL [200] Assembled frame for 9111	6.00000	107.00000		
8.00000	0001 Description of 0001		50.50000		
20.00000	CHEERY Cherry wood		0.75000		15.00000
4.00000	MILL Mill Room: Cut & shape wood elements	6.00000			
8.00000	STR WOOD Structural wood used in frames - no		3.00000		
1.20000	FIN Wood finishing	8.00000			
1.00000	9111-FAB/SEW SEW [200] Cut & sewn fabric for 911	15.00000	0.15000	15.00000	0.15000
1.75000	JAZZ Jazz Fabric		30.00000		52.50000
0.60000	SEW Cut & sew fabric	25.00000			
1.00000	THREAD Thread used in making furniture		0.15000		
1.00000	9111-FO/CUT FINAL [200] Cut foam for 9111 chair	5.88800	15.43600	5.88800	15.43600
0.11200	0001 Description of 0001		50.50000		
1.00000	COVER CUT [200] Generic moisture barrier to co	0.88800	0.78000		
0.11100	CUT Cutting & shaping of foam	8.00000			
3.00000	SANDEL Sandel Moisture Barrier		0.26000		
0.50000	FINAL Final Assembly	10.00000			
6.00000	FOAM Foam used in making furniture		1.50000		
1.13600	FINAL Final Assembly	10.00000		11.36000	
3.00000	LAM-2 Laminite in Aubergine		1.50000		4.50000
	Total Cost for Series 9 chair			65.84800	539.58600
	Grand Total Cost				605.43400

Qube ERP™ will track the specific cost of all options used at each level of the assembly. Not only will the total cost of the top level item

reflect the cost of all options, but the cost of subassemblies contained in higher level assemblies will reflect their appropriate costs. It is essential that inventory be moved into and out of WIP at correct values which reflect cost of options, and that the correct value is credited to inventory and debited to cost of sales when the top level item is shipped to the customer.

In this example, there are four assemblies, one of which is a phantom assembly. It is easiest to understand how these assembly transactions work by comparing them to similar transactions which do not reflect the use of options.

Assembly #1 is the 9111-FAB/SEW.

Assembled Item Code	Quantity	Sent to Location	Unit	Standard Unit Cost	Extension
9111-FAB/SEW	1.000	200	EA	15.15000	15.15000
Component Item Codes	Quantity	Pulled From Location	Unit	Standard Unit Cost	Extension
FABRIC	1.750	1	VD		
FABRIC	1.750	1	VD		
THREAD	1.000	1	EA	0.15000	0.15000
SEW	0.600		HR	25.00000	15.00000
					15.15000

Because this assembly uses the generic item FABRIC which has a zero cost, the cost of the total assembly is only \$15.15.

The same assembly using a specific option has a much higher value:

Assembled Item Code	Quantity	Sent to Location	Unit	Standard Unit Cost	Extension
9111-FAB/SEW	1.000	200	EA	67.65000	67.65000
Component Item Codes	Quantity	Pulled From Location	Unit	Standard Unit Cost	Extension
JAZZ	1.750	1	SF		
JAZZ	1.750	1	SF	30.00000	52.50000
THREAD	1.000	1	EA	0.15000	0.15000
SEW	0.600		HR	25.00000	15.00000
					67.65000

The tricky part of this logic comes when a higher level assembly is entered. This assembly will contain the 9111-FAB/SEW and must do so at the correct component price. When no options are used this

item will produce the following assembly transaction, reflecting the generic value of every element of the transaction.

Assembled Item Code	Quantity	Sent to Location	Unit	Standard Unit Cost	Extension
9111	1.000	200	EA	513.93400	513.93400
Component Item Codes	Quantity	Pulled From Location	Unit	Standard Unit Cost	Extension
9111-FAB/SEW	1.000	200	EA		
FORM	6.000	1	BF	1.50000	9.00000
COVER	1.000	200	SF	1.66800	1.66800
0001	0.112	1	EA	50.50000	5.65600
FINAL	0.500		HR	10.00000	5.00000
9111 FR/FIN	2.000	200	EA	230.80000	461.60000
FINAL	1.136		HR	10.00000	11.36000
LAM-2	3.000	1	EA	1.50000	4.50000
					513.93400

When the transaction references options, the elements of the transaction reflect the cost of those options at each level.

Assembled Item Code	Quantity	Sent to Location	Unit	Standard Unit Cost	Extension
9111	1.000	200	EA	605.43400	605.43400
Component Item Codes	Quantity	Pulled From Location	Unit	Standard Unit Cost	Extension
9111-FAB/SEW	1.000	200	EA		
9111-FAB/SEW	1.000	200	EA	67.65000	67.65000
FORM	6.000	1	BF	1.50000	9.00000
COVER	1.000	200	SF	1.66800	1.66800
0001	0.112	1	EA	50.50000	5.65600
FINAL	0.500		HR	10.00000	5.00000
9111 FR/FIN	2.000	200	EA	250.30000	500.60000
FINAL	1.136		HR	10.00000	11.36000
LAM-2	3.000	1	EA	1.50000	4.50000
					605.43400

All procedures involving assemblies will reflect this logic, including scheduled and multiple assemblies.

Shipments to Customers

Normally, these are inventory transactions which were generated automatically during the invoicing procedures. The inventory transactions created during invoicing will contain the normal current and standard cost values reflecting the use of generic BOM components. When these transactions are posted, inventory is credited and cost of sales is debited. If the costs do not reflect the options used on that order, the wrong values are posted to inventory and to cost of sales.

Qube ERP™ replaces the generic cost values with those reflected in the options selected for each order item at three points:

1. Trial posting of invoices
2. Posting of invoices
3. Posting of inventory transactions

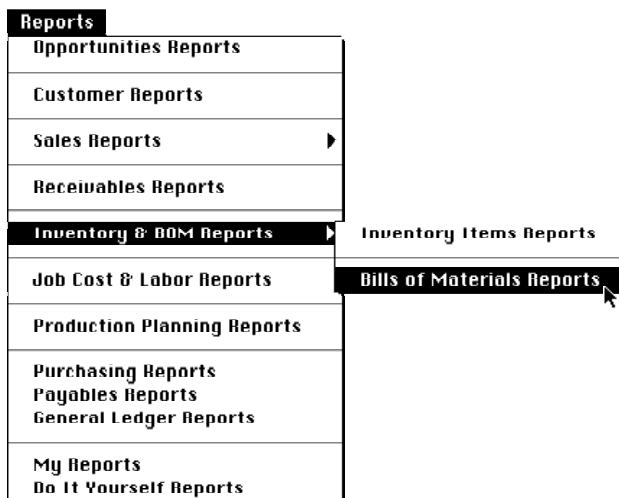
In other words, this procedure executes when posting either inventory transactions or invoices if it has not already been executed during a trial posting of invoices. Qube ERP™ can recognize easily whether the procedure has been done and therefore avoid repeating it.

It is important to avoid repeating the procedure because it can be quite lengthy. For example, a trial posting of about 350 invoices might normally take 15 minutes when no options are involved. If 1) a large number of these invoices represent sales order items which involve options, 2) the BOM structure of the items sold is complex and contains large BOMs and 3) the combinations of item codes and their associated options are unique for every invoice item, this procedure may take 2 hours.

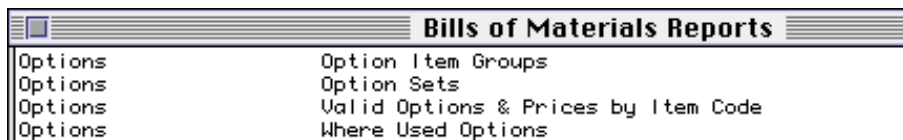
To minimize this time requirement, Qube ERP™ tracks the item code and option combinations encountered during each run of the procedure. It will only perform the time-consuming indented BOM computations once for each unique combination of an item and associated options. This means that the most amount of time is required if each item and option combinations is unique. The least time is required if the same item and option combination is used in several invoices, reducing the time requirement from hours to only minutes.

Reports

The **Option Selection Reports** are found under the Bills of Materials Reports as shown here:



The following reports are available.



You may also print any sales orders, quotations, forecasts, manufacturing orders, and indented bills of material reflecting the options selected in these records.

Auditing the Record Setup

Two reports are provided to help ensure that the records are set up correctly. One is the **Option Item Groups** report, found in the **BOM Reports list**. Below is a picture of the report. This report indicates that there are several different specific items which can be used to replace the generic item **FINISH**. This report is useful in verifying whether or not you have entered all of the options which are available for each option class.

World Class Industries Option Item Groups - Class FINISH Only

Report Printed on 03/18/97 at 13:37, Page #1

Option Class	Sub-Class	Sub-Group	Item Code	Description	Unit Cost
FINISH		*GENERIC	*FINISH	Generic record for all finishes	0.00000
			4001	Wato Natural Oil	6.00000
			4002	Wato Medium Oil	12.00000
			4003	Wato Dark Oil	8.00000
			4004	Wato Fruitwood Oil	10.00000
			4005	Wato Satin Wax Natural	12.00000
			4006	Wato Satin Wax Dark	10.00000
	FINISH		FIN-1	Finish in light oak	2.00000
	FINISH		FIN-2	Finish in Black Oak	2.00000

Indented BOM

Another way to check and see if you have set up your items correctly is to print an indented bill of material for the assembled item. When printing the indented bill and calling for no options, the report looks like this, showing only the actual items in the BOM, both real and generic. First print the generic items:

Quantity	Required	Item Code and Description
9111		Series 9 Chair
*	1.000	9111 FR/FIN FIN [220] Finished frame for 9111-C chair
**	1.000	9111 FRAME MILL [210] Assembled frame for 9111-C chair
***	2.000	GLUE Glue used to attach moisture barrier to
***	1.000	MILL Mill Room: Cut & shape wood elements
***	2.000	STR WOOD Structural wood used in frames - not vis
***	5.000	WOOD Generic record for wood (maple, cherry,
**	0.600	FIN Wood finishing
**	3.000	FINISH Generic record for all finishes
*	1.000	9111-FAB/SEW SEW [200] Cut & sewn fabric for 9111 chair
**	1.750	FABRIC Generic record for all fabrics
**	0.600	SEW Cut & sew fabric
**	1.000	THREAD Thread used in making furniture
*	1.000	9111-FO/CUT CUT [240] Cut foam for 9111 chair
**	3.000	COVER CUT [240] Generic moisture barrier to cover
***	0.111	CUT Cutting & shaping of foam
***	3.000	SANDEL Sandel Moisture Barrier
**	0.500	CUT Cutting & shaping of foam
**	6.000	FOAM Foam used in making furniture
**	0.112	GLUE Glue used to attach moisture barrier to
*	0.300	FINAL Final Assembly

Next print the indented bill with **Selected Options**, as shown on the screen below. If you have entered your codes correctly, the specific wood (OAK) would replace the generic item (WOOD), as would the

other options listed. The report would then show you the cost of the item using the selected options.

Enter the **Item Code** or "ALL" 9111

Enter the **Group** or "ALL" ALL

Selected **Options** FIN-1

JAZZ

LAM-1

OAK

Notice how the non-generic items have replaced the generic items in the BOM.

9111	Series 9 Chair
* 1.000	9111 FR/FIN FIN [220] Finished frame for 9111-C chair
** 1.000	9111 FRAME MILL [210] Assembled frame for 9111-C ch
*** 2.000	GLUE Glue used to attach moisture barrier to
*** 1.000	MILL Mill Room: Cut & shape wood elements
*** 5.000	OAK Oak Wood
*** 2.000	STR WOOD Structural wood used in frames - not vis
** 0.600	FIN Wood finishing
** 3.000	FIN-1 Finish in light oak
* 1.000	9111-FAB/SEW SEW [200] Cut & sewn fabric for 9111 cha
** 1.750	JAZZ Jazz fabric
** 0.600	SEW Cut & sew fabric
** 1.000	THREAD Thread used in making furniture
* 1.000	9111-FO/CUT CUT [240] Cut foam for 9111 chair
** 3.000	COVER CUT [240] Generic moisture barrier to co
*** 0.111	CUT Cutting & shaping of foam
*** 3.000	SANDEL Sandel Moisture Barrier
** 0.500	CUT Cutting & shaping of foam
** 6.000	FOAM Foam used in making furniture
** 0.112	GLUE Glue used to attach moisture barrier to
* 0.300	FINAL Final Assembly
* 0.250	GLUE Glue used to attach moisture barrier to
* 3.000	LAM-1 Laminate in Antique White

Advanced Option Selection

Overview

Advanced Option Selection uses a Rules-Based Order Configurator to allow you to enter quotations, forecasts and sales orders for specific configurations of items without having to first set up the item and its bill of material in the item master file. The number of different configurations possible for complex products can be very high, and producing and maintaining an item record with an accurate BOM for each possible configuration is practically impossible without a tool such as the Rules-Based Order Configurator. The Advanced Option Selection module is an optional module that may be purchased separately.

About Configurators

In addition to simplifying the maintenance of items and bills of materials, the configurator must provide the ability to enforce certain restrictions on the configurations entered so that orders are not accepted for configurations which cannot be built. Qube ERP™ provides this by allowing item combinations to be flagged as compatible or incompatible and also by applying user-entered rules. In addition, components and feature sets must be able to be flagged as required, since, in some cases, the user must not be allowed to leave certain choices empty or the configured product could not be made. These features are provided in Qube ERP™ through windows which involve minimal data entry and maximum visibility of the impact of the entries.

Configurators must also help in the area of costing and pricing. It is important to know not only if the given configuration can be made (contains compatible elements and follows the rules of compatibility) but that its pricing is appropriate and the cost associated with it is accurate. The configuration choices must be extensive:

1. providing reference lists to assist in looking up options, allowing quantities, unit prices, and comment fields to be associated with each option

2. providing validation of each option choice
3. allowing the user to flag which options and which comments will be printed on the customer documents (sales order and invoice).

Most companies will know in advance which configuration elements are likely to change and which must remain constant. Also, all configuration choices are normally made at the time of order entry. In some industries, however, (e.g., modular building manufacturers) any element may change at any time. Also, in these industries, it is common for the configuration choices to be made after the order has been entered and maybe even after the building of the item has begun. In this case, the configurator must provide a means of following up on options for which choices have not yet been made so that the customer will make choices in time for the product to be built on schedule.

The Qube ERP™ Advanced Option Selection module provides all these features.

Set Up

The setup function helps you define which configurations of each product can be made. This involves creating sets of options that logically go together and exceptions to define conditions under which selected options cannot be used.

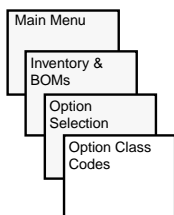
Option Class and Sub-Group Codes

The option class of each item is entered on the **Item Master File, Card #1** window. The word **GENERIC** in the Sub-Group field identifies an item which, when found in a BOM, is expected to be exchanged for a selected option. The field labeled Sub-Class currently

has no function. There should always be one record with a GENER-IC sub-group for each option class.

Item Master File, Car			
Item Code	FINISH	Generic record for all	
Group	FINE FURN	Sub-Group	GENERIC
Option Class	FINISH	Sub-Class	

Setting up these codes properly in a 5,000-record item master file could be a significant task. Therefore, Qube ERP™ provides you with a tool to help this get done easily and quickly. To access this new tool, select, from the **Option Selections** functions list, **Option Class Codes**.



Option Selection

Option Class Codes

This will open a window which can be used to view and edit the option class and sub-group codes of a large number of records at one time. The example below shows several records which have no option class codes set up.

To load the list, click the **NEW** button and tab through the type, group, sub-group and option class codes, entering values in any or all of these fields. When you tab out of the **Option Class** field, Qube ERP™ will load the list.

Option Class Code Setup									
If Type =		And If Group = FLR		And Sub-group =		And Option Class =			
Item Code	Type	Group Code	Sub-Group	Option Class	Option Sub-Class				
7104	Flr Carpet	Wilshire 20oz	1	RAH	FLR				
7105	Flr Sheet Vinyl	Classic Corlon		RAH	FLR				
7106	Flr Carpet	Olympic		RAH	FLR				
7107	Flr Carpet	Wilshire 26oz	12	RAH	FLR				
7108	Flr Carpet	Architect	12	RAH	FLR				
7111	Flr Sheet Vinyl	Congoleum Marath		RAH	FLR				
7117	FLR SHEET VINYL	SUFFIELD #86805		RAH	FLR				
7121	FLR CARPET	DECADE 20 OZ		RAH	FLR				
7136	FLR CARPET	CHARTECLAIR 12'		RAH	FLR				
7137	FLR CARPET	WATERFRONT 12' 20 OZ		RAH	FLR				
7143	FLR SHEET VINYL	PREVRIL		RAH	FLR				
7149	FLR SHEET VINYL	FOUNDATION		RAH	FLR				
7150	FLR TILE	1/8"X12"X12" #55502		RAH	FLR				

☒ Assign the Option Class Code as....
☐ Assign the Sub-group Code as....

To fix all of these records at once, select the lines in the list that you want changed and enter the option class code that you would like to have assigned to the selected records. Qube ERP™ will change the option class code, the sub-group code, or both, and it will update the Option Sets to include or remove the records, as well. After the edit is complete, the list will look like this:

Item Code		Type	Code	Group Code	Sub-Group	Option Class	Option Sub-Class
7104	Flr Carpet Wilshire 20oz	1	RAW	FLR		FLOOR	
7105	Flr Sheet Vinyl Classic Corlon		RAW	FLR		FLOOR	
7106	Flr Carpet Olympic		RAW	FLR		FLOOR	
7107	Flr Carpet Wilshire 26oz	12	RAW	FLR		FLOOR	
7108	Flr Carpet Architect	12	RAW	FLR		FLOOR	
7111	Flr Sheet Vinyl Congoleum Marath		RAW	FLR		FLOOR	
7117	FLR SHEET VINYL SUFFIELD #86805		RAW	FLR		FLOOR	
7131	FLR CARPET DECADE 20 OZ.		RAW	FLR		FLOOR	
7136	FLR CARPET CHARTECLAIR 12"		RAW	FLR		FLOOR	
7137	FLR CARPET WATERFRONT 12" 20 OZ		RAW	FLR		FLOOR	
7143	FLR SHEET VINYL PREVAIL		RAW	FLR		FLOOR	
7149	FLR SHEET VINYL FOUNDATION		RAW	FLR		FLOOR	
7150	FLR TILE 1/8"X12"X12" #55502		RAW	FLR		FLOOR	

Bill of Material Displays

Each bill of material will display the option class of each component and whether that component is a generic (optionable) item in both the flat and indented displays.

Bill of Materials							
9111 Series 9 chair							
Item Code	Quantity	Loc'n	Unit	Labor Value	Material & Overhead Value	Level	Option Class
9111-FAB/SEW	1.00000		EA	15.00000	0.15000	2	
9111-FAB/SEW	1.00000		A EA	15.00000	0.15000	2	
9111-FD/CUT	1.00000		P EA	5.88800	15.43600	2	
9111 FR/FIN	1.00000		A EA	16.80000	214.00000	2	FINISH
LAM-1	3.00000		EA		6.00000	2	LAMINAT
FINRL	1.13600		A HR	11.36000		2	
LAM-2	3.00000		EA		4.50000	2	LAMINAT

Changes in BOM Structures

The default list of options is maintained in list form in each item master record. Changes made in each BOM to add or remove GENERIC items will change the BOM but they will not immediately

change the default options list in the item record. This is done using the **Reconstruct BOMs** window.

Reconstruct All Bills of Material			
This procedure reconstructs all bills of materials to ensure that the current costs and the standard costs of all BOMs are rolled up correctly at all levels.			
		<u>Current</u>	<u>Standard</u>
Overhead applied to Material =	0.000 %	0.000 %	
Overhead applied to Labor =	0.000 %	0.000 %	
<input type="button" value="Select Rebuild Choices"/>			
Rollup Method: <input type="radio"/> Best for Flat BOMs <input checked="" type="radio"/> Best for Indented BOMs			
Reconstruct these values: <input checked="" type="checkbox"/> Standard Costs <input checked="" type="checkbox"/> Current Costs <input checked="" type="checkbox"/> Total Hours <input checked="" type="checkbox"/> Options			

The process is very fast and simple. For example, a file containing over 5,000 items and more than 10,000 BOM components can be rebuilt in less than 15 minutes.

Compatible and Incompatible Options

The **Valid Options** window allows you to set up compatibility flags for all options which may be used in the manufacture of any top level item. The window lists all generic options specified in each indented bill of materials.

Valid Options					
Item Code <input type="text" value="2466NON-COMBUST"/> STD 24 X 66 dbl WIDE Non-Combustible					
Item Code	Opt. Class	Parent Item	Option Set	Subgroup	Quantity
020 1520	PAINT	WALLS IDESTEEL	Paint	GENERIC	8.811
020 1520	PAINT	12HDENDSTEEL	Paint	GENERIC	4.000
12001	INSUL	RF 12HSDIDESTEEL	Insulation	GENERIC	1584.000
220 10	WLBRO	WALLS IDESTEEL		GENERIC	32.967
220 10	WLBRO	12HDENDSTEEL		GENERIC	12.000
3063	CHSIS	CHS525 1250P	Chassis	GENERIC	16.000
AIR SUPPLY	AIR	2466NON-COMBUST	Air Supply syst	GENERIC	99.000
ELECO 1S1PSP 125A	ELEC	2466NON-COMBUST	Electrical	GENERIC	2.000
HURC08S3THP	HURC	2466NON-COMBUST		GENERIC	2.000
POST ASSEMBLY	POST	2466NON-COMBUST		GENERIC	2.000
RECEPT 15A	ELECT	2466NON-COMBUST		GENERIC	15.000
SWITCH	SWITCH	2466NON-COMBUST		GENERIC	2.000
WD4639SG	WINDOW	2466NON-COMBUST		GENERIC	6.000
4x4 Post Assembly With Straps And Caps					
<input type="button" value="Home"/> <input type="button" value="Back"/> <input type="button" value="Forward"/> <input type="button" value="End"/> <input type="button" value="Refresh"/>					

Double-click on any line in this list and Qube ERP™ will display the choices available to replace each one of the generic options.

Valid Options

Item Code Series 9 chair

Item Code	Opt. Class	Parent Item	Subgroup	Quantity
9111-FAB/SEW	LEATHER	9111	GENERIC	1.000
FABRIC	FABRIC	9111-FAB/SEW	GENERIC	1.750
CONDITIONER	LEATHER	9111-FAB/SEW	GENERIC	1.000
COVER	MOIST	9111-FD/CUT	GENERIC	1.000
WOOD	WOOD	9111 FRAME	GENERIC	10.000
FINISH	FINISH	9111 FR/FIN	GENERIC	4.000
BOX	BOX	9111	GENERIC	1.000
150	FABRIC		LEATHER	
151	FABRIC		CLOTH	
152	FABRIC		CLOTH	
154	FABRIC		CLOTH	
155	FABRIC		LEATHER	
170	FABRIC		LEATHER	
180	FABRIC		CLOTH	
183	FABRIC		CLOTH	
9111 B	FABRIC		CLOTH	
FABRIC	FABRIC		GENERIC	
JAZZ	FABRIC		CLOTH	

Powder: Suede

Any one of these choices may be flagged as **Incompatible** by using the *FLAG AS INCOMPATIBLE* button. This means that the selected option may not be used when building the top level item displayed on this window (the 9111, in this example).

Valid Options

Item Code Series 9 chair

Item Code	Opt. Class	Parent Item	Subgroup	Quantity
9111-FAB/SEW	LEATHER	9111	GENERIC	1.000
FABRIC	FABRIC	9111-FAB/SEW	GENERIC	1.750
CONDITIONER	LEATHER	9111-FAB/SEW	GENERIC	1.000
COVER	MOIST	9111-FD/CUT	GENERIC	1.000
WOOD	WOOD	9111 FRAME	GENERIC	10.000
FINISH	FINISH	9111 FR/FIN	GENERIC	4.000
BOX	BOX	9111	GENERIC	1.000
150	FABRIC		LEATHER	
151	FABRIC		CLOTH	
152	FABRIC		CLOTH	
154	FABRIC		CLOTH	
155	FABRIC		LEATHER	
170	FABRIC		LEATHER	
180	FABRIC		CLOTH	
183	FABRIC		CLOTH	Incompatible
9111 B	FABRIC		CLOTH	Incompatible
FABRIC	FABRIC		GENERIC	
JAZZ	FABRIC		CLOTH	

Power: Twill

The Option Selection Rules Window

Whereas a BOM must be set up to reflect the order of assembly, the option selection process takes the point of view of the customer or order entry person, allowing high-level choices that may affect many stages of the manufacturing process. This window implements a simple expert system language for specifying rules about option selection.

Implementation Notes

You will create rules for your business by naming the new rule, specifying the syntax of the rule via popup menus and then filling in the blanks. These user-created records will be stored in the FOptionRules file. This file has a collection of fields sufficient to handle the data entry for all the different types of rules. How the contents of those fields are interpreted (and displayed to the user) is determined by the settings of the popup menus (i.e., the rule syntax).

Structure of Rules

Each rule will consist of three parts: Scope, Conditions, and Action.



Scope

For which BOMs will the rule be invoked?

The Scope affects which BOMs are looked at, based on characteristics of the top-level item only. This is the fastest way to screen out BOMs for consideration.

This section of the window displays one drop-down menu. The displays in this portion of the window will change as different selections are made in either drop-down menu. Changes can be made in this menu only when you are in edit mode. For example, this portion of the window may begin looking like this.

Scope of this Rule:

Rule applies to

any BOM

as a finished item

The choices available in this menu look like this:

- this BOM
- any of this set of BOMs
- any BOM



Conditions

What must be true in the current BOM for the rule to be invoked?

The Condition affects which BOMs are looked at, based on characteristics of the entire BOM. In general, when you use a Condition, the program must traverse through the whole BOM to see if certain items are present, filled in, blank, or meeting certain criteria. This is generally a much slower way to screen out BOMs for consideration.

This section of the window also provides two drop-down menus, with the display changing as different selections are made from these menus.

If this Condition is met:

If

this item in the BOM

is

blank

The choices available in these menus include the following:

- this item in the BOM

any BOM item of this class
- filled in

blank

this item

not this item

in this set

not in this set

present in the BOM

not present in the BOM

Action

What will be done if the rule is invoked?

The Action imposes restrictions on option choices to be made in the BOM. Actions can make certain options required, optional, or not applicable, and can restrict the choices available when options are allowed.

This section of the window displays either two or three drop-down menus, depending on which selection has been chosen from the second menu:

Take this Action:

Then

this item in the BOM ▼

 is

not applicable ▼

The choices available in the drop-down menus include the following

	required
	required, and
this item in the BOM	optional
any BOM item of this class	optional, and if chosen
	not applicable

The third drop-down menu appears only if the “Required, and” selection is made.

it must

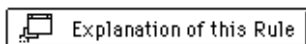
be in this set ▼

The choices in this menu are as follows:

be this item
not be this item
be in this set
not be in this set

Interpreting Each Rule

The Qube ERP™ rules capability is complex and sophisticated. In order to help you understand this complex capability, Qube ERP™ provides a rules interpreter. A button is provided at the bottom of the rules window labeled *EXPLANATION OF THIS RULE*.



If you click on this button, a window will pop up which contains a text explanation. Since the rules function keys off of field values in specific fields (option class, group, and sub-group), each rule explanation is explained with specific reference to these field values. This is designed to help you understand how to set up your data so that the rules will perform as desired.

Below are some examples of rules and their explanation, as provided automatically by Qube ERP™.

Option Selection Rules			
Rule #	3	Name	No Leather Conditioner with Cloth
Entered on	06/11/97		
Scope of this Rule:			
Rule applies to any BOM as a finished item.			
<input checked="" type="radio"/> If this Condition is met: <input type="radio"/> Under all conditions			
If any BOM item of this class is in this set ,			
Class	FABRIC	Group	FINE FURN
		Sub-Group	CLOTH
		Class	FABRIC
		151	Pebbles Fabric
		JRZZ	Jazz Fabric
		KALEID	Kaleidoscope Fabric
Take this Action:			
Then this item, anywhere in the BOM is not used.			
Item	LEATHERC		

Explanation of this Rule

(1) Required leather conditioners

For any BOM, if any BOM item of class FABRIC is in the set with group FINE FURN and subgroup LEATHER and class FABRIC, then any BOM item of class LEATHER is required, and it must be in the set with group FINE FURN and subgroup ACCESS and class LEATHER.

Option Selection Rules			
Rule #	Name		Entered on
3	No Leather Conditioner with Cloth		06/11/97
Scope of this Rule:			
Rule applies to any BOM as a finished item.			
<input checked="" type="radio"/> If this Condition is met: <input type="radio"/> Under all conditions			
If any BOM item of this class is in this set ,			
Class	Group	Sub-Group	Class
FABRIC	FINE FURN	CLOTH	FABRIC
	151	Pebbles Fabric	
	JRZZ	Jazz Fabric	
	KALEID	Kaleidoscope Fabric	
Take this Action:			
Then this item, anywhere in the BOM is not used.			
Item LEATHERC			

Explanation of this Rule

(3) No Leather Conditioner with Cloth

For any BOM, if any BOM item of class FABRIC is in the set with group FINE FURN and subgroup CLOTH and class FABRIC, then the item LEATHERC anywhere in the BOM is not used.

The following rules all deal with an example that most of us will be familiar with, that of configuring a computer.

Option Selection Rules			
Rule #	Name		Entered on
2	No Monitor Card when No Monitor		06/18/97
Scope of this Rule:			
Rule applies to any of this set of BOMs as a finished item.			
Group	Sub-Group	Class	
COMPUTER		COMPUTER	
COMPUTER	Computer Final Assembly		
<input checked="" type="radio"/> If this Condition is met: <input type="radio"/> Under all conditions			
If this item, anywhere in the BOM is blank ,			
Item MONITOR			
Take this Action:			
Then this item, anywhere in the BOM is not used.			
Item CARD-MONITOR			

Explanation of this Rule

(2) No Monitor Card when No Monitor

For the set with group COMPUTER and class COMPUTER, if the item MONITOR anywhere in the BOM is blank, then the item CARD-MONITOR anywhere in the BOM is not used.

Option Selection Rules			
Rule #	5	Name	Card for Small Monitor
Entered on	09/15/97		
Scope of this Rule:			
Rule applies to this BOM as a finished item.			
Item COMPUTER			
<input checked="" type="radio"/> If this Condition is met: <input type="radio"/> Under all conditions			
If any BOM item of this class is in this set ,			
Class	MONITOR	Group	COMPUTER
		Sub-Group	SMALL
		Class	MONITOR
		MONITOR-13 Computer Monitor, 13"	
		MONITOR-14 Computer Monitor, 14"	
Take this Action:			
Then this item, anywhere in the BOM is required, and...			
Item	CARD-MONITOR	it must be this item	
		Item	CARD-MONSMALL

Explanation of this Rule

(5) Card for Small Monitor

For the BOM of COMPUTER, if any BOM item of class MONITOR is in the set with group COMPUTER and subgroup SMALL and class MONITOR, then the item CARD-MONITOR anywhere in the BOM is required, and it must be the item CARD-MONSMALL.

Option Selection Rules			
Rule #	Name		Entered on
6	Card For Large Monitor		09/15/97
Scope of this Rule:			
Rule applies to this BOM as a finished item.			
Item COMPUTER			
<input checked="" type="radio"/> If this Condition is met: <input type="radio"/> Under all conditions			
If any BOM item of this class is in this set ,			
Class	Group	Sub-Group	Class
MONITOR	COMPUTER	LARGE	MONITOR
	MONITOR-17	Computer Monitor, 17"	
	MONITOR-19	Computer Monitor, 19"	
	MONITOR-21	Computer Monitor, 21"	
Take this Action:			
Then this item, anywhere in the BOM is required, and...			
Item CARD-MONITOR it must be this item			
Item CARD-MONLARGE			

Explanation of this Rule

(6) Card for Large Monitor

For the BOM of COMPUTER, if any BOM item of class MONITOR is in the set with group COMPUTER and subgroup LARGE and class MONITOR, then the item CARD-MONITOR anywhere in the BOM is required, and it must be the item CARD-MONLARGE.

Understanding Rules in Scope



Qube ERP™ also provides a top-down view of rules from the point of view of inventory items. You may view these on the **Item Master File Card #1** window. In the upper right corner, the **RULES** button is displayed,



All rules and incompatibilities (as set up on the **Valid Options** window) which include the selected item within their scope will be displayed with their name, number, and explanation. For example, clicking the **RULES** button while viewing the 9111 item will display the following.

Rules in Scope	
3 Rules in scope for 9111:	
Incompatible Option Choices (set in Valid Options)	
The following option choices are incompatible with generic item 9111 : B0X3, B0X4.	
No Leather Conditioner with Cloth (3)	
For any BOM1, if any BOM1 item of class FABRIC is in the set with group FINE FURN and subgroup CLOTH and class FABRIC, then the item LEATHERC anywhere in the BOM is not used.	
Required leather conditioners (1)	
For any BOM1, if any BOM1 item of class FABRIC is in the set with group FINE FURN and subgroup LEATHER and class FABRIC, then any BOM item of class LEATHER is required, and it must be in the set with group FINE FURN and subgroup ACCESS and class LEATHER.	

In the sample data file, the item **COMPUTER** is included within the scope of 17 different rules, so the display may look like this. You can scroll through the list to view each rule.

Rules in Scope		
17 Rules in scope for COMPUTER:		
Manuals for Advanced Application Software (9)		
For the BOM of COMPUTER, if the item SOFT-APPLIC anywhere in the BOM is the item SOFT-ADVANCED, then the item MANUAL-APPLIC anywhere in the BOM1 is required, and it must be the item MANUAL-ADVANCED.		
Manuals for Basic Application Software (8)		
For the BOM of COMPUTER, if the item SOFT-APPLIC anywhere in the BOM is the item SOFT-BASIC, then the item MANUAL-APPLIC anywhere in the BOM1 is required, and it must be the item MANUAL-BASIC.		
Modem Must Be Internal (4)		
For the BOM of COMPUTER, if any BOM item of class MODEM is , then any BOM item of class MODEM is required, and it must be in the set with group COMPUTER and subgroup INTERNAL and class MODEM.		

Using Rules to Establish Requirements and Incompatibilities

It may also be necessary to set up conditions where options are either incompatible or required depending on which other option was selected (i.e., not just which top level item, but which other option within the BOM structure of the top level item). These conditions may be set using the **Option Selection Rules** window. You can set up rules which establish requirements and incompatibilities based on item group, sub-group and option class codes. In the example shown below, a rule has been set up to ensure that whenever a leather fabric is selected for a chair, a leather conditioner is also included.

Option Selection Rules						
Entered on	Name			Rule #		
06/10/97	Required leather conditioners			1		
If Group = FINE FURN And Sub-group = LEATHER And Option Class = FABRIC						
Item Code		Group Code	Sub-Group	Option Class		
150	Medium Suede	FINE FURN	LEATHER	FABRIC		
155	Smooth finished Leather	FINE FURN	LEATHER	FABRIC		
170	Powder Suede	FINE FURN	LEATHER	FABRIC		
Then the following group, sub-group and option class set is <input checked="" type="radio"/> Required <input type="radio"/> Incompatible						
Group = FINE FURN And Sub-group = ACCESS And Option Class = LEATHER						
Item Code		Group Code	Sub-Group	Option Class		
LEATHERC	Leather conditioner	FINE FURN	ACCESS	LEATHER		

An example of a rule which specifies incompatibility is the following, which states in plain English that you can't use a leather conditioner when using a cloth fabric.

Option Selection Rules						
Entered on	Name			Rule #		
06/11/97	No Leather Conditioner with Cloth			3		
If Group = FINE FURN And Sub-group = CLOTH And Option Class = FABRIC						
Item Code		Group Code	Sub-Group	Option Class		
151	Pebbles Fabric	FINE FURN	CLOTH	FABRIC		
JAZZ	Jazz Fabric	FINE FURN	CLOTH	FABRIC		
KALEID	Kaleidoscope Fabric	FINE FURN	CLOTH	FABRIC		
Then the following group, sub-group and option class set is <input type="radio"/> Required <input checked="" type="radio"/> Incompatible						
Group = FINE FURN And Sub-group = ACCESS And Option Class = LEATHER						
Item Code		Group Code	Sub-Group	Option Class		
LEATHERC	Leather conditioner	FINE FURN	ACCESS	LEATHER		

Mac OS Windows



Reference lists may be used with this window. To load a reference list, press <COMMAND -, (COMMA)/CONTROL - / (FORWARD SLASH)>, or select **Reference Lists** from the **Action** menu. The **Reference List** window will display a list of group, sub-group, or option class codes to select from.

Each rule is implemented during order entry, and controls the order entry process. In this example, the options displayed during order entry are the following:

Opt. Class	Parent Item	Option Chosen		Quantity per 9111-FAB/SEW
LEATHER	9111	9111-FAB/SEW	Cut & sewn fabric	1.00000
LEATHER	9111	9111-FAB/SEW	Cut & sewn fabric	1.00000
FABRIC	9111-FAB/SEW	FABRIC	Generic record for	1.75000
LEATHER	9111-FAB/SEW	CONDITIONER	Different types of	1.00000
MOIST	9111-F0/CUT	COVER	Generic moisture b	1.00000
WOOD	9111 FRAME	WOOD	Generic record for	5.00000
FINISH	9111 FR/FIN	FINISH	Generic record for	4.00000
BOX	9111	BOX	Packing box	1.00000
FABRIC	9111	FABRIC	Generic record for	1.00000

If you select a leather fabric, Qube ERP™ will validate that selection and then implement Rule #1, requiring a leather conditioner. It does so by replacing the generic CONDITIONER with the option LEATHERC and flagging that option as required. The “required” flag will prevent you from emptying this option choice during later data entry.

Opt. Class	Parent Item	Option Chosen		Quantity per 9111
FABRIC	9111-FAB/SEW	155	Smooth finished Le	1.75000
FABRIC	9111-FAB/SEW	155	Smooth finished Le	1.75000
LEATHER	9111-FAB/SEW	LEATHERC	Leather conditio	1.00000
MOIST	9111-F0/CUT	FIBERGLAS	Fiberglass Moisture	1.00000
WOOD	9111 FRAME	MAPLE	Maple wood	5.00000
FINISH	9111 FR/FIN	FINISH	Generic record for	4.00000
BOX	9111	BOX	Packing box	1.00000
FABRIC	9111	170	Powder Suede	1.00000

If, on the other hand, you had selected a cloth fabric, Qube ERP™ will respond by removing the CONDITIONER choice and zeroing out all quantities associated with that option.

Opt. Class	Parent Item	Option Chosen		Quantity per 9111-FAB/SEW
FABRIC	9111-FAB/SEW	151	Pebbles Fabric	1.75000
FABRIC	9111-FAB/SEW	151	Pebbles Fabric	1.75000
MOIST	9111-FD/CUT	FIBERGLAS	Fiberglass Moisture	1.00000
WOOD	9111 FRAME	MAPLE	Maple wood	5.00000
FINISH	9111 FR/FIN	FINISH	Generic record for	4.00000
BOX	9111	BOX	Packing box	1.00000
FABRIC	9111	170	Powder Suede	1.00000

Order Entry

The **Order Items** window provides for the display and entry of selected options for each item on the order.

Sales Order Items

Item Code	Date	Status	Ordered	Shipping	Invoiced	B/O	Price	Unit	Extension
10072	08/11/97	H	15	0	0	15	0.000	ER	0.00
MODULE	08/11/97	H	15			15		ER	

Module building Credit Hold 0.00

Length 24.00 Width 24.00 Height 8.00

● Show Option Selection **○ Show Ship Dates & Order Item Notes**

Opt. Class	Parent Item	Option Chosen	Quantity per CHS1260T4IN	Quantity per MODULE	Unit Price
INSUL	RF12420L SIDE	12001	16.00000	1,440.000	0.163
CHASSIS	MODULE	CHS1260T4IN	12x50 Chassis With	2.00000	2.000
TIRES	CHS1260T4IN	2063	Tires 7 x 14 5 (US)	6.00000	12.000
FLOOR	MODULE	FLHD12HD50F20RF	Floor Wood 12 Wide	90.00000	90.000
ROOF	MODULE	RF12420L SIDE	Roof Comp. 12 Wide	90.00000	90.000
INSUL	RF12420L SIDE	12001	16.00000	1440.000	0.163
CEILING	MODULE	X11W08SCLG755B	12 Wide #755B (Ara)	90.00000	90.000
RLC	MODULE	DRAS3068	Active RLC 1 Sub A	2.00000	2.000
WON	MODULE	WD4639SG	WD46x39 BF BG SG	6.00000	6.000
ALBRD	MODULE	22010	ALBRD Birch Luan P	0.15000	0.900
SURPHNF	MODULE	FLC011S1PSP125R	Std. 12% Bmp. Single	2.00000	2.000

Selection Deadline: 09/01/97 Lead Time = 3 Days Required Option **INSUL R19 UNF 23"x24" #M562 138**

Notes for this Option: ☒ Print this Option on Sales Order and Invoice? ☒ Print this Option's Notes on Sales Order and Invoice?

These are comments which describe the selection of insulation as an option on order item #4012-1.

To view ship dates, click the radio button labeled **SHOW SHIP DATES**. This display can be changed in the middle of data entry.

Sales Order Items

Item Code	Date	Status	Ordered	Shipping	Invoiced	B/O	Price	Unit	Extension
10001	05/20/97	0	3	0	0	3	597.500	ER	1,792.50
9111	05/20/97	0	3			3		ER	

Series 9 chair Open 1,792.50

○ Show Option Selection **● Show Ship Dates**

☐ Print on Work Order ☐ Print on Order/Invoice

Rep Commission Batch Scheduling Priority Discounts % 20.00 10

Acct Mgr Comm 10.54 Budget \$ 289.134 1.136 Hrs Pre-Invoice 5 2

Currency Exchange 1.0000 Currency USA United States of America Home Unit Price \$

Sched Ship Date	Requested Ship Date	Ordered	Shipping	Invoiced	Back Ordered	Status	Sales Shipment Code	Batch
05/30/97	05/30/97	1		0		1 Not Sched	2055-2-1	
06/01/97	06/01/97	2				2 Unscheduled	2055-2-2	

When viewing the **Sales Order Items** window, you can click the zoom box found in the right portion of the top list on this window.

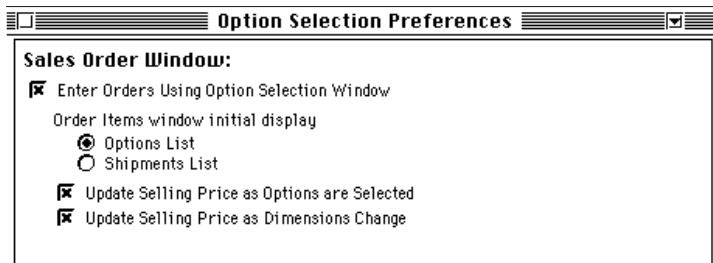


This will cause Qube ERP™ to switch to a window which displays a larger options list. Because the list is larger, you will be able to see more options without having to scroll up and down the long list.

When viewing the window with the larger options list, you can press **Cmd-P** to print. When printing from this window only, Qube ERP™ will print an **Option Detail** report instead of a sales order document.

Similar functions are provided in the **Quotations** module.

Sites will have a choice as to which display will be the initial display when opening the **Sales Order Items** window. This selection is made using the **Option Selection Preferences** window.

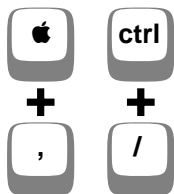


Reference Lists and Validation

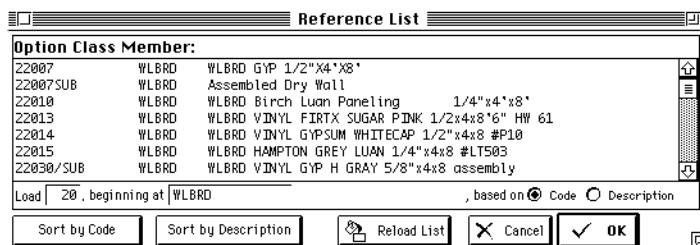
Qube ERP™ assists you in selecting options in two ways:

1. After you enter an item code and tab out of this field, Qube ERP™ will fill in the options list with all items in the indented bill of materials which can be expected to be changed (optionable components). The selected option in each case will be the generic item found in the current bill.
2. As you select non-generic items to replace selected optionable components, Qube ERP™ provides a reference list to aid that selection process. While in the **Option Chosen** field, press **<COMMAND -, (COMMA)/CONTROL - / (FORWARD SLASH)>**, or select **REFERENCE LISTS** from the **Action** menu.

Mac OS Windows



The **Reference List** window will appear.



The screenshot shows the 'Reference List' window. It has a title bar with a standard window icon and a close button. Below the title bar is a section labeled 'Option Class Member:' containing a list of items. The list has three columns: Item ID, Option Class, and Description. The items are as follows:

Item ID	Option Class	Description
22007	WLBRD	WLBRD GYP 1/2"x4"x8"
22007SUB	WLBRD	Assembled Dry Wall
22010	WLBRD	WLBRD Birch Luan Paneling 1/4"x4"x8"
22013	WLBRD	WLBRD VINYL FIRTX SUGAR PINK 1/2"x4"x8" HW 61
22014	WLBRD	WLBRD VINYL GYPSUM WHITECAP 1/2"x4"x8 #P10
22015	WLBRD	WLBRD HAMPTON GREY LUAN 1/4"x4"x8 #LT503
22030/SUB	WLBRD	WLBRD VINYL GYP H GRAY 5/8"x4"x8 assembly

Below the list is a 'Load' section with a dropdown menu showing '20', 'beginning at' 'WLBRD', and a label 'based on' with radio buttons for 'Code' (selected) and 'Description'. At the bottom are four buttons: 'Sort by Code', 'Sort by Description', 'Reload List' (with a refresh icon), and 'Cancel' and 'OK' (with checkmark icons).

Qube ERP™ will build this list using the option class field. It will exclude items which have been specified as incompatible.

Pricing

Selection of different options will trigger a change in the default selling price of the top level item. The logic used in determining these selling prices is exactly the same as the logic used to determine default selling prices when an item is sold. The source of the pricing data is found on the **Item Master File Card #1**. Qube ERP™ will pay attention to what is being sold (and therefore which pricing column should be used) and the quantity associated with each option.

The **Option Selection Preferences** window offers a choice to user sites on whether or not to update selling prices based on the selection of options. In some industries, items being sold are priced at negotiated values and their selling price does not have any direct relationship to the default selling prices of the options. In other industries, the ability to update the default selling price is important. Qube ERP™ offers both capabilities.

Update Selling Price as Options are Selected

Quantities

You can override the expected quantity. In order to do so intelligently, it is important to understand what these quantities mean. Two quantity fields are displayed on the options list. The subject of quantities can be confusing because options deal with components at different levels of a BOM structure.

For example, an item being sold may have a flat BOM containing two items, like this:

1st component	1
2nd component	2

The second component is a subassembly whose flat BOM looks like this:

3rd component	1
4th component	2

This implies that there are expected to be two units of the fourth component in the second level (subassembly) level and four units at the top level item (2 X 2).

You may edit the quantity of each component as it relates to the item being sold. Qube ERP™ will respond to any changes in these numbers by recalculating the quantity associated with the immediate parent item and displaying that number. This is done to ensure that you understand the impact this number is likely to have on the quantity of materials used.

An example can be seen using the sample data. These are the default options, quantities and prices for item 9111.

Opt. Class	Parent Item	Option Set	Option Chosen	Quantity per 9111-FAB/SEV	Quantity per 9111	Unit Price
FABRIC	9111-FAB/SEV	Fabric	FABRIC	1.75000	1.750	0.000
MOIST	9111-F0/CUT	Moisture Barriers	COVER	1.00000	1.000	
WOOD	9111 FRAME	Wood Cheap	WOOD	5.00000	10.000	
FINISH	9111 FR/FIN	Finish	FINISH	4.00000	4.000	
BOX	9111		BOX	1.00000	1.000	

Here is the same list with changes in options, quantities and prices:

Opt. Class	Parent Item	Option Set	Option Chosen	Quantity per 9111-FAB/SEV	Quantity per 9111	Unit Price
FABRIC	9111-FAB/SEV	Fabric	151	7.00000	7.000	22.000
FABRIC	9111-FAB/SEV	Fabric	151	7.00000	7.000	22.000
MOIST	9111-F0/CUT	Moisture Barriers	COVER	1.00000	1.000	0.500
WOOD	9111 FRAME	Wood Cheap	CHERRY	10.00000	20.000	25.000
FINISH	9111 FR/FIN	Finish	FIN-1			
BOX	9111		BOX4	1.00000	1.000	0.250

Notes

A note field is provided for each option. This field can contain up to 3,000 characters.

Printing Choices

Qube ERP™ allows you to choose whether to print or not print each option on the sales order and invoice. The same choice is offered for the comments associated with each option.

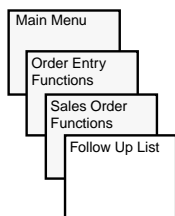
Deadline Dates

A customer may not be able to make all option choices at the time the order is placed. However, some options may require a selection deadline date, since the end item cannot be manufactured without a minimum lead time. Qube ERP™ allows that deadline date to be entered and followed up on.

Follow-up Dates & Reasons

The follow-up dates and reasons are provided to help you follow up with customers who may not have made all of their option choices.

A follow-up list window is also provided. The selection to open the follow-up list is made in the **Order Entry Functions** list (in the **Sales Order Functions** group).



It displays a window that looks like this:

Sales Order Shipments Schedule									
<input type="button" value="Load the Follow-up List"/>		Customer Phone # 213-444-5555 Purchase Order # ABC-123654							
Series 9 chair		Beginning Date		Ending Date		Reason Code		Customer Code	
ABC COMPANY		01/01/80		07/05/97		ALL		ALL	
Order-Line #	Sched. Date	Customer	Item Code	Qty Back-Ordered	Follow up Date	Reason Code	Reason Description	Option	Selection
2056-1	05/21/97	10001	151	7	05/20/97	0C	Option Selec		
2056-2	05/22/97	10001	B0X4	1	05/01/97	0C	Option Selec		
2056-1	05/21/97	10001	152	4	05/01/97				
2056-1	05/21/97	10001	151	7	05/20/97	0C	Option Selec		
2056-2	05/22/97	10001	B0X3	1	06/01/97				

You may enter a date range, one follow-up reason (or ALL) and one customer code (or ALL). Drill-down is provided to the selected order. Since follow-up dates and reasons may change as you do your follow-up work, you may also edit the follow-up date and reason using this list window.

Dimensional Factors

Sometimes the quantity of components used to build an item will vary with its dimensions. Qube ERP™ allows you to take advantage of this and further simplify your item master file and your bills of

materials. An example is found in the modular building industry. Modules may be engineered as 12 x 12, 12 x 24, 24 x 48, 24 x 60, etc. Hundreds of different sizes may be built. All of these sizes can be represented with only one bill of material, using the Qube ERP™ dimensional factors. This capability involves the entry of data in three different places. The **Item Master File Card #1** allows you to enter the length, width, and height of any item.

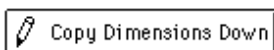
Width	12.00
Length	24.00
Height	14.00

The bill of material window set provides one window devoted to the entry of dimensional factors.

Bill of Materials Dimensional Factors									
MODULE		Modular building							
				Length	Width	Height			
		Dimensions of Parent Item		24.00	12.00	14.00			
Item Code	Quantity	Description	Length Factor	Width Factor	Height Factor				
AIR SUPPLY	18.00000	Endwall Return Ducted Fiberglass	0.00 %	100.00 %	0.00 %				
AIR SUPPLY	18.00000	Endwall Return Ducted Fiberglass		100.00					
AIRCON	1.00000	1 1/2 Ton A/C Marvair Wall Mou							
CHASSIS	1.00000	Standard Chassis							
CLOSE UP KIT	1.00000	Close Up Kit Assembly Per Modu	100.00						
DOORS	1.00000	MDW 24X53 BF BG SG X0 Sub Assy							
ELEC2S2X4REFIX	3.00000	Light Fixture 2x4 Recessed 4 T		100.00					
ELEC01S1PSP125R	1.00000	Std 125 Amp Single Phase Sup P		100.00					
FLOOR ASSV	1.00000	Floor Assembly		100.00					
RECEPT15R	6.00000	Std 15 Amp Perimeter Wall Rece							
RF12H2DL CENTER	18.00000	Roof Comp. 12 Wide 20# 2x6 240		100.00					
SIDENALL 2X4	36.00000	Sidewall 2x4 Std Assembly							
SWITCH	1.00000	Switch Assembly 3W 2P 15A							
WINDOWS	6.00000	MDW 24X53 BF BG SG X0 Sub Assy							
X11W01SHE	2.00000	12 Wide Endwall and End							
X11W08SCLG755B	18.00000	12 Wide #755B (Anstrong) Ceil		100.00					
ACCESSORY 1		Accessory Selection #1							
ACCESSORY 2		Accessory Selection #2							
ACCESSORY 3		Accessory Selection #3							

BOM
Comments
Effectivity Dates
Dimensional Factors

Entry of this data is made easier by using the *COPY DIMENSIONS DOWN* button. The button is enabled only during data entry. This is most useful with large BOMs where the dimensional factors are the same for many BOM components. Using the button allows you to enter the dimensional factors once instead of separately for each BOM component. With a 100-element BOM, this could reduce data entry from 300 entries down to only 3.



In this simple example, as the width of the parent item changes, the quantity of some of the components used to build it will change (up or down) in direct proportion.

The third place in which data is entered is on the **Sales Order Items** window. Directly below the order items list is a place in which you can enter the dimensions of the item being sold.

Length Width Height

If the dimensions of the item being sold are different than the generic item and dimensional factors are found in selected BOM items, the quantities associated with those options will be changed according to the information found in the BOMs.

Qube ERP™ also provides an ability to update the default unit price when it detects a change in the dimensions. The feature is enabled using the **Option Selection Preferences** window, clicking this check box.

☒ Update Selling Price as Dimensions Change

Display on Invoice Items window

In the **Accounts Receivable** module, you can view each invoice in detail. The **Invoice Items** window will display each item and all op-

tions associated with each item, as well as other relevant information. It looks like this:

Invoice Items

10001 ABC COMPANY Invoice Item 2158-1

Item Code	Ordered	Shipped	Prior	B/O	Price Unit	Extension
925	50	40	1	9	1.500 EA	60.00
9111	15	12	3		20.000 EA	240.00
9111 FR/FIN	5	5				
725	12	12			351.918 EA	4,223.02
F100	50	50			12.056 VB	602.20

Finished 925 Table 5,126.22

☐ Show Batch Info ☒ Show Option Selection ☐ Show Notes

Opt. Class	Parent Item	Option Chosen	Quantity per	Unit Price
H000	925 TOP	H000 Generic record f	2.00000	2.000
LAMINAT	925/KIT	LAMINATE Generic record f	8.00000	8.000
WOOD	925 LEGS	WOOD Generic record f	16.00000	16.000

Notes for this Option: ☐ Print this Option on Sales Order & Invoice? ☐ Print this Option's Notes on Sales Order & Invoice?

Header Items Payments

The display will change when you click the different radio buttons. Below are the two other displays used for this window:

☐ Show Batch Info ☐ Show Option Selection ☒ Show Notes

Sales Order Notes	Order Item 1858-1	Invoice Item Notes
Here's notes!		These are notes which are associated with invoice 2158-1. They are not related to the sales order but are specific to this invoice item.

☒ Show Batch Info ☐ Show Option Selection ☐ Show Notes

Batch	Quantity

Group FINE FURN
Sub-Group GENERIC
Posted to GL Account
☐ In Warranty
Standard Unit Cost 191.97
Current Unit Cost 200.89
Posting Map Code

Reporting

Option Selection Setup reports are found in the **BOM Reports** list.

Bills of Materials Reports	
Options	Option Item Groups
Options	Option Sets
Options	Valid Options by Item Code
Options	Where Used Options

A report of **Released Jobs** is found in the **Job Cost Reports** list.

Job Cost & Labor Reports	
Job Cost	Released Jobs

Enter the Beginning Order-Item Date 05/26/97

Please Enter Ending Order Item Date 06/26/97

Enter the Component Item Code or "ALL" ALL

Enter the Job (order-item) # or ALL ALL

Print Open Jobs? YES

Print Closed Jobs? NO

Print Subtotals Only? NO

The **Indented BOM** report allows entry of unlimited options and will default the option list to assist you in making entries.

Indented Indented Bill of Material

Please Double Click to Enter Parameters

Please Enter Beginning Effectivity Date 05/27/97

Please Enter Ending Effectivity Date 05/27/97

Enter the Item Code or ALL 9111

Enter the Group or ALL ALL

Enter the Sub-Group or ALL ALL

Opt. Class	Parent Item	Option Set	Option Chosen	Qty. per Item
FABRIC	9111-FAB/SEW	Fabric	FABRIC	1.75000
MOIST	9111-F0/CUT	Moisture Barrier	COVER	1.00000
WOOD	9111 FRAME	Wood Cheap	WOOD	10.00000

Include Active Items YES

Include Inactive Items NO

Value at Current Cost? YES

Value at Standard Cost? NO

Compare Current/Standard to Last Cost? NO

Exclude Phantom Assemblies (but print their components)? NO

Print BOM Top Level, + Phantoms only (Assy's & Components)? NO

Print BOM Top Level, + Components of Phantom Assemblies? NO

Print Top Level Only (Flat BOM)? NO



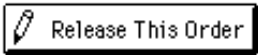
The Indented BOM report will highlight option replacements and the cost difference resulting from those replacements.

Quantity	Required	Item Code and Description	Drawing Location Unit	Labor Unit Cost	Material Unit Cost	Extended Labor Cost	Extended Material Cost
9111 Series 9 chair							
*	1.00000	9111 FR/IN FIN [200] Finished frame for 9111-C chair	FR	16.80000	214.00000	16.80000	214.00000
**	2.00000	9111 FR/ME MILL [200] Assembled frame for 9111-C chair	FR	6.00000	107.00000		
***	4.00000	0001 Description of 0001	FR		50.50000		
***	10.00000	0012 Maple wood	FR		0.40000		4.00000 #
***	2.00000	MILL Mill Room: Cut & shape wood elements	FR	6.00000			
***	4.00000	STR WOOD Structural wood used in frames - not visib	FR		3.00000		
**	0.60000	FIN Wood Finishing	FR	8.00000			
**	4.00000	FIN-1 Finish in light oak	FR		1.00000		4.00000 #
*	1.00000	9111-IRG/SEW SIW [200] Cut & sewn fabric for 9111 chair	IR	15.00000	0.15000	15.00000	0.15000
**	1.75000	152 Olympic Grid	IR		13.00000		22.75000 #
**	0.60000	SEW Cut & sew fabric	IR	25.00000			
**	1.00000	THGIRG Thread used in making furniture	IR		0.15000		
*	1.00000	9111-FO/CUT FINRL [200] Cut foam for 9111 chair	IR	5.88800	15.43600	5.88800	15.43600
**	0.11200	0001 Description of 0001	IR		50.50000		
**	1.00000	COVER CUT [200] Generic moisture barrier to cover foam	IR	0.88800	0.78000		
***	0.11100	CUT Cutting & shaping of foam	IR	8.00000			
***	3.00000	SHWEL Sanel Moisture Barrier	IR		0.26000		
**	0.50000	FINRL Final Assembly	IR	10.00000			
**	6.00000	FINRL Foam used in making furniture	IR		1.50000		
*	1.00000	BOX Packing box	IR		1.00000		1.00000
*	1.13600	FINRL Final Assembly	IR	10.00000		11.36000	6.00000
*	2.00000	LAM-1 Laminate in Marquis White	IR		2.00000		4.00000
*	3.00000	LAM-2 Laminate in Rubergine	IR		1.50000		4.50000
9111 Total Cost for Series 9 chair						49.04800	271.83600
						Grand Total Cost	320.88400

Options which have been substituted for generic items. "Unit Costs" & "Extended Costs" show the difference in cost from the generic item.

Handling Unexpected Changes (Releasing)

The option selection process at order entry will handle all of the expected changes, but it will not allow changes in items not set up as GENERIC items in the BOMs. To allow for this, Qube ERP™ allows you to “Release” the order, exploding it into its lowest level components. A new button is provided on the **Order Items** window.



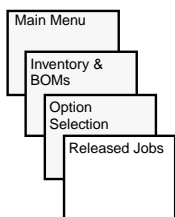
The release function is not a necessary function for all user sites and all jobs. In most businesses and most jobs, the option selection logic will handle all of the replacements involved in the configuration of any order item. However, in some businesses (e.g., manufacture of modular buildings) and in some jobs, there can be unexpected changes. This procedure allows changes to be made even when the BOM structure has not been set up for an expected change.

The time to use this function is when the order has been entered, along with all the options, and it is ready to be built. Clicking the button will display a window that looks like this:

Release Order Items for Order 3789				
Date	Quantity Back-ordered	Quantity	Item Code	Description
06/23/97	1	1	MODULE	Modular building
06/23/97	1	1	MODULE	Modular building

You are expected to enter the quantity (e.g., if the order is for 7 units, how many are ready to be built now?). If you enter a non-zero quantity and click the *OK* button, Qube ERP™ will respond by reading the complete indented BOM for each selected non-zero item on the order and set up a separate set of records for all components required to build the top level item. This process is called Releasing.

The **Released Jobs** window can be accessed either by double-clicking on the options list for a selected item on the **Sales Order Items** window or by selecting from the **Inventory Functions** list.



▼ **Option Selection**

- Option Selection Preferences**
- Option Class Codes**
- Valid Options**
- Rules**
- Released Jobs**

Qube ERP™ will determine how deeply to explode BOM using the same logic used throughout the software. First it will check the value of the variable found on **System Set Up Card #3**.

☒ Assembly transactions relieve inventory through all indented BOM levels

This setting is used when a user site never builds subassemblies to stock and always wishes to have the release procedure explode BOMs to their lowest level.

If this is not set (i.e., if it is normal practice to build some subassemblies to stock), Qube ERP™ will explode BOMs only if they are flagged as phantom assemblies. If this is set, all records loaded into this list are bottom level components; no assemblies are included. The indented display and the Parent's Item Code show the BOM dependencies (e.g., CHERRY and MILL are components of 9111 FRAME, which is a component of 9111 FR/FIN, which is itself a component of 9111).

Released Jobs									
Sales Order Item # 3789-2		Item Code: MODULE		Modular building		Job release location 2			
Qty Ordered	1	Current Qty Released	1						
Qty Backordered	1	Total Qty Released	1	Job Start Date 06/01/97		Job Finish Date 06/05/97		Elapsed Time 4 Days	

Item Code	Recommended Quantity	Adjusted Quantity	Order-Item	Material Cost	Labor Cost	Option Class	Parent's Item Code		
.0201280	2.394	2.394	3789-2	23.63			AIR SUPPLY	TAPE FOIL PRINTED #UL181A	
.05012	1.998	1.998	3789-2	13.71			AIR SUPPLY	HVAC REGISTER #104M 12x12	
.11021	23.994	23.994	3789-2	72.70			AIR SUPPLY	DUCT BOARD 1 X 20 X 8 10L	
.03008	1.000	1.000	3789-2	400.00			AIRCON	1028-31 8" 1-Beam Frame Wit	
.3063	8.000	8.000	3789-2	256.00			CHRSSIS	Tires 7 X 14.5 (USED)	
.3066	2.000	2.000	3789-2	44.92			CHRSSIS	Hanger With Fittings Double	
.3070	2.000	2.000	3789-2	182.00			CHRSSIS	Axle Recycled 10/12 Wide Br	
.3073	2.000	2.000	3789-2	164.00			CHRSSIS	Axle Recycled 10/12 Wide Id	
.3099	1.000	1.000	3789-2	460.20			CHRSSIS	1034-37 8" 1-Beam Frame Wit	
.FL00R			3789-2				CHRSSIS	Assemble flooring	
.0101770	33.000	33.000	3789-2	14.82			CLOSE UP KIT	FLR TILE 1/8"x12"x12" #5183	
.0201110	0.611	0.611	3789-2	2.29			CLOSE UP KIT	ADHESIVE TILE #1837 4 GAL	
.0201170	0.510	0.510	3789-2	2.50			CLOSE UP KIT	FIXALL 25lb/bg	
.0201250	2.800	2.800	3789-2	28.50			CLOSE UP KIT	ROOF COATING PREMIUM 1 GAL	
.0201300	3.500	3.500	3789-2	0.29			CLOSE UP KIT	TAPE PUTTY #5000B 1/8x1-1/2	
.05002	27.000	27.000	3789-2	4.50			CLOSE UP KIT	CLG GRID CMC #1419-01 12'x4'	
Totals				5,676.35	0.00		Extended Price = 8,000.00 Profit = \$2,323.65		

If the normal rules of exploding BOMs are too limited and options must be selected from assemblies which were not exploded, you can use the **REPLACE ASSEMBLY WITH COMPONENTS** button. This will explode any selected BOMs, replacing them with their components so that options may be applied within the BOM or quantities and item codes changed.

Replace assembly with components

Note that the Release records include references to both materials and labor. This gives you a complete picture of all expected cost elements of the job. Modifications can be made which impact both materials and labor costs.

Modifying Released Jobs

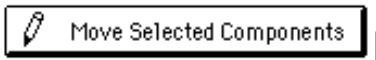
Once components have been released, modifications can be made at any level. For example, the component FOAM is included in this list, but it is not a GENERIC item. Therefore, you are not able to change this to a specific type of foam during order entry. You may, instead, make this change using this window. Changes in quantities may be made, as well.

If a sales order item is deleted (or if many items are deleted by deleting the entire order), Qube ERP™ will check to see if any of the order items have release records associated with them. If they do, Qube ERP™ will also delete all release records associated with each order item.

Sometimes a user may release a job by mistake and want to reverse the transaction set. If the reversal will represent the entire quantity released to date, this can be done easily by viewing the job on the **Released Jobs** window and executing a delete procedure.

Moving Released Components

In some cases, materials are first moved to a job site (a specific inventory location) and then relieved from inventory later, when the order is invoiced. This can be accomplished using the *MOVE SELECTED COMPONENTS* button. This button is found on the **Released Jobs** window.



When you click this button, you will see two fields in the upper right corner of the window:

Job release location	<input type="text" value="11"/>
Pull From Location	<input type="text" value="30"/>

Enter the new release location (the “To” location) and the “Pull From Location.” Then select which components will be moved. This may be all list lines or it may be selected list lines. The result will be a move transaction of each selected component.

Invoicing Released Orders

Once the detailed component list has been developed and the top level item has been built, the order can be invoiced. Qube ERP™ will check to see if the item being sold has been released. If it is, Qube ERP™ will use the list of components found in the released items file, pulling these from their current location and removing them from stock. If a partial invoice is issued, Qube ERP™ will pull an appropriate proportion of the total released quantity for each item which has been released for each order item.

Cost of Sales

When jobs are released, all material costs associated with the job are assumed to be found in the release list. During the invoicing process, inventory transactions will be created from the release list. The material cost of sales for each item on the invoice will be the total value of each of these inventory transaction lines.

When jobs are not released, they must have been assembled in various manufacturing steps with the final assembly being shipped either from stock or from the shop floor. Each assembly transaction is assumed to have referenced the sales order item for which it is being built. Associating the sales order item code in each assembly transaction will flag Qube ERP™ to use the options list to replace generic with selected options during the transaction.

Using Assembly Transactions Instead of Releasing

An alternative to releasing is to use assembly transactions. By referencing the job number in each transaction, Qube ERP™ will perform the appropriate replacement of items and quantities. For example, this job requires the replacement of MAPLE for the generic item WOOD. The quantity is normally five units for one unit of the parent item 9111 FRAME, but this set of chosen options sets the quantity

to twice that level. An assembly transaction not referencing the job would look like this:

Non-Scheduled Assemblies									
Transaction Number	Date	Posted To J/E #	Order Line # If Made to Order	Batch Number	Actual # Hrs				
85990	05/28/97		Made to Stock		1				
Assembled Item Code	Quantity	Sent to Location	Unit	Standard Unit Cost	Extension				
9111 FRAME	1.000	200	ER	113.00000	113.00000				
Component Item Codes	Quantity	Pulled From Location	Unit	Standard Unit Cost	Extension	Lot/Batch #			
WOOD	5.000	1	BF						
WOOD	5.000	1	BF						
STR WOOD	2.000	1	BF	3.00000	6.00000				
0001	2.000	1	ER	50.50000	101.00000				
MILL	1.000		HR	6.00000	6.00000				
Mill Room: Cut & shape wood elements					113.00000				

Quantities Costs Non-Scheduled Scheduled

The same transaction referencing this job will look, instead, like this:

Non-Scheduled Assemblies									
Transaction Number	Date	Posted To J/E #	Order Line # If Made to Order	Batch Number	Actual # Hrs				
85988	05/28/97		2056-2		1				
Assembled Item Code	Quantity	Sent to Location	Unit	Standard Unit Cost	Extension				
9111 FRAME	1.000	200	ER	117.00000	117.00000				
Component Item Codes	Quantity	Pulled From Location	Unit	Standard Unit Cost	Extension	Lot/Batch #			
MAPLE	10.000	1	BF	0.40000	4.00000				
MAPLE	10.000	1	BF	0.40000	4.00000				
STR WOOD	2.000	1	BF	3.00000	6.00000				
0001	2.000	1	ER	50.50000	101.00000				
MILL	1.000		HR	6.00000	6.00000				
Mill Room: Cut & shape wood elements					117.00000				

Quantities Costs Non-Scheduled Scheduled