AIMS/ERP ™

Engineering Management

Specifications & Guide to Use

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NOTICE

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Part Master File Maintenance

Screen Data Fields:

Part Number	Description
Purchase/Manufacture Code	Part Group
Lot/Serial Control	Last ECO
ECO Pending	Product Line (display only)
Product Class	Document Revision Level
Document Number	Weight
Stocking Unit of Measure	Shipping Volume/Cube
Weight Unit of Measure	Foreign Source?
Inspect?	Vendor ID
Routing Name	
Vendor's P/N	Part Engineering Status C ode

Functional Logic:

- Refer to data base description for field functions, requirements, validity rules.

- Allow add, change to data in Part Master File.

- Write history record to the Part Number History File including those data fields that were affected by the transaction, both the before update image and after update. Do not include those fields that were not affected by the update.

- Allow deletion only if there are no existing uses of this part number, including Product Configuration File, Open Work Order File, Open Purchase Order File, Routing File (in Operation P/N Exception field), Inventory File, or Open Sales Order File. If the deletion is allowed, write a record to the Part History File, Transaction Type = Deleted, then delete the Part Master Record

- Unit of Measures must be in Unit of Measure Table

- Part Group, Product Class, Product Line must exist in the associated tables.

- Routing Name may not be blank if the Purchase/Manufacture Code indicates that the part is a manufactured part number; must be a valid Routing Name in the Routing Master File. If the P/M code is Purchased, Routing Name must be blank.

- Document Number - optional, if entered, must be in Document Master file

- Lot/Serial Control - must be blank as function is not in system.

Manufacturing Calendar Maintenance

This screen creates and updates the Calendar Master File, which is used by all scheduling programs to determine valid working days on a global basis. Exceptions to the global calendar that affect individual work centers are shown in the Work Center Master File data record for the work center effected.

Screen Data Fields:

Calendar Horizon Date:

Month: Year:

Sun	Mon	Tues	Wed	Thurs	Fri	Sat

Functional Logic:

- Prompt for entry of calendar horizon if no calendar records exist; if calendar has previously been generated, retrieve horizon date, display and allow changes.

- If horizon is changed, generate new calendar matrix through the new horizon, using weekends as default holidays using calendar generation math formula.

- Display resulting calendar matrix; allow user to scroll through the time periods, showing day of week, highlight or shade holidays and non-working days.

- Accept entry on screen (either in calendar date boxes or in separate command line style entry) of additional non-working days. Valid non-working days are either "holidays", or "Closed". Allow override of defaulted non-working days (week-ends).

- When user is finished, write records to Calendar Master File.

Work Center Master File Maintenance

CHANGED 11/11/93

Screen Data Fields:

Work Center ID
Work Center Description
Work Center Location
Normal Working Hours/Day
Scheduled Closing Dates
Scheduled Efficiency Factor
Parallel Operation Factor
Default/Standard Labor Rate

ADDITIONAL FIELDS:

Buffer Time Compression %
Non-Reporting WC? (Y/N)
Loaded W/C? (Y/N)

Functional Logic:

Changes:

Add additional data fields:

Buffer Time Compression % - default is 1.00 (no compression); may not be greater than 1.00, , negative value, or less than 0.01. This value is multiplied times the buffer times (in hours) to calculated a compressed buffer time. Typical entry is 0.xx where xx is the decimal value between 0.01 and 99. Example calculation is 20 hours (buffer time) times 0.60 (compression %) = 12 hours compressed buffer time. Compressed and Uncompressed buffer times are calculated by the Scheduling Data Preparation program from these values.

Parallel Operation Factor - validation logic (which may be different than at present) should be the following: the value being entered is an integer, in hours with one decimal, may not be negative, or greater than 500. This value is added to operation completion times for backscheduling or to operation start times for forward scheduling, to cause the operation number with this work center to be overlapped with another operation in its start and completion times.

Non-Reporting Work Center? - this flag indicates that work flows through this work center, and that it is to be scheduled, but that movement transactions will skip "over" it. Work Order Operation Move transactions will update this operation with the same quantity completed as the To Operation, which succeeds it. For example, if operation

10.00 and 30.00 are normal, reporting work centers, and operation 20.00 is flagged with Non-Reporting? = Y, when the Operation Move transaction is entered, the From operation is 10.00 and the To Operation is 30.00. When updated, the program will place the Quantity Moved in both operation 10.00 and 20.00 's Quantity Completed/moved, and in Operation 20.00 and 30.00's Quantity In.

Loaded Work Center? - this flag indicates that capacity is not a consideration, and to skip listing the calculated schedule data for this work center when printing work center load/schedule reports by work center. Enables schedulers to conveniently print schedules only for those work centers that "pace" the overal flow. For example, a shipping step in a routing would normally not receive its own schedule, nor would the capacity of shipping be a scheduling concern. However, the shipping step is included in the routing so facilitate tracking of movement of product.

End of Change

- Accept add or changes to Work Center Master File records. Record ID must be non-duplicate. Allow deletion of a record only if the Work Center ID is not found in Routing Master File, Open Work Order routing data.

- Mandatory entries are the W/C ID, Description, Normal Working hours/day (default is 8.0 hours/day).

- Use 1.0 as default Scheduled Efficiency Factor, and a Default/Standard Labor Rate from the Default Labor Rate Record in the Table Master File.

- Refer to Data Base description for further field descriptions.

Routing Master File Maintenance

CHANGES 3/29/94

Screen Data Fields:

Route Name
Routing Type Code
Work Center ID
Operation Description
Scheduling Before Buffer Time
Scheduling Setup/changeover Time
Scheduling Unit Run Time
Scheduling After Buffer Time
Product Exception Part Number
Exception S/U Time
Exception Scheduling Unit Run Time

Additional data fields:

Route Scheduled Hours Per Day
Routing Schedule Period
Change Open Schedule Rate? (Y/N)
Standard Move Quantity
Buffer Units Quantity

Standard Operation Attrition
Part Exception Operation Attrition.

Functional Logic:

CHANGES 11/11/93:

Add new data fields & associated validation logic:

Route Scheduled Hours Per Day - Defines the number of hours, with one decimal, that this routing/flow line is to be scheduled for. Must be not negative, between 0.1 and 24.0. Single value field; applies to route as a whole, not to an operation line. Default is the standard working day hours in the Manufacturing Calendar record. Required if the Route Type Code = F, optional if it is W.

Routing Schedule Period - Defines the normal number of regular calendar days between the Schedule Period Start Day and the last day of the period for this routing. Single value field; applies to the route as a whole, not to an operation line. Must be between 1 and 50, integer, no decimal, not negative. Required if the Route Type Code = F, optional if it is W.

Change Open Schedule Rate? - Y/N field, default is Y. Required if the Route Type Code = F, optional if it is W.

Standard Move Quantity - Quantity that is to be produced, held until complete, then moved as a group to the next higher assembly flow/repetitive line. Used where one flow/repetitive line feed directly to another. Required if the Route Type Code = F, optional if it is W. Default is 1.

Buffer Units Quantity - Quantity of units between each operation in the routing, calculated as a "pipeline to fill" when a new flow/repetitive schedule is being calculated. Default is 0. Must be non-negative, integer, (no decimal), equal to or greater than zero and less than 1000. Required if the Route Type Code = F, optional if it is W.

Standard Operation Attrition - This value is used to increase the scheduled operation completion quantities to account for expected loss at specific operations in the routing. This value plus 1, is multiplied times the subsequent operation's quantity to increase this operation line's quantity to be scheduled. Applies to each operation line. Used for Routing Type Code = W only, although may be present for F type.

Part Exception Operation Attrition - Same as Standard Operation Attrition, except applies to the Exception Part Number only. Applies to each operation line. Used for Routing Type COde = W only, although may be present for F type.

Operation Number - Add logic to edit operation numbers entered, so a decimal value (alternate operation) cannot be entered unless there is already a primary operation numbered line with the same integer value, i.e., to the left of the decimal. This will prevent alternates being entered when there is no associated primary, subverting the meaning of primary and alternate.

End of Change.

This screen adds and changes Routing Master File records that are used as the foundation for Product Configuration records. At least one routing master record must exist for a Part Master record to be entered with a M/B code of Make, since the Routing Name field is a mandatory entry for manufactured parts. Features include:

•   Route Name must be unique and non-duplicate. The scheduling system requires a routing to function, since production is scheduled first, then required material is associated with the schedule.

•   The Routing Type Code must be either R (repetitive) or W (work Order). It applies to all steps in the routing, as does the Route Name.

- Operation Number must be numeric and in sequence, but may have gaps, i.e., the numbering may be 10, 20, 30, etc., or 1, 2, 3, etc., but not 1, 3, 2.

- Buffer times (before and after) are to indicate how long the system should allow the material/parts to sit before and after the entire batch is complete while in transit to the next operation. The times are in working hours, but may be a reasonable multiple of the working day, i.e., if the standard working day is 8/day, to enter a buffer time of 2 days, enter 16 hours.

- Scheduling setup and unit run times are independent of cost data, and are used to calculate schedules. Cost data is maintained on a separate screen for cost accounting use.

- The scheduling factors are standards, used as defaults permitting a single routing to be used for a wide range of products having the same basic flow. For specific part numbers where the schedule and/or cost factors are significantly different than the standards, the Part Number and its associated exception data may be entered at the operations where the exceptions occur only, enabling other operations to be the standard. This approach allows significant reduction in the amount of data that must be maintained, while still allowing all production to be scheduled with reasonable accuracy.

- Exception part numbers may be deleted from the list for an operation on this screen if they have no exception cost data. The Cost Accounting Routing Maintenance screen may add exception part number for cost exceptions only, allowing the default to still be used for scheduling, and does not allow deletion of an exception part number having scheduling data.

Manufactured Part Configuration File Maintenance

Screen Data

Date From: Date To:

Parent Part Number
Description
Stocking Unit of Measure
Route Name
Operation No.   [Note: all part numbers following are linked to this Operation No.]
Tooling Used this Operation No.
Operation Comments
Part Number
Description
Unit of Measure
P/M Code
Quantity Required
Component Scrap factor
Engineering Change No.*
Manufacturer*
PCB*
Reference Designators*
Vendor Furnished Part Flag
Foreign/Domestic Flag
Work Station Used On*
Effectivity In Date*
Effectivity Out Date*

ADDED FIELDPhantom? (Y/N)*

ADDED 5/20/94 - Window for Engineering History Log:

From within the main configuration screen maintenance, pressing the Shift + F2 keys brings up the
Engineering History Log window, which has the following format:

                         Engineering History Log

Part Number x-----------x* (display only)   Description x----------------x (display)

Date   Engineering History Log Entry
xx/xx/xx   x---x
                         x---x
                         x---x

Pressing F9 key updates the log.

*From Parent Part Number on configuration maintenance window)

End of screen change for 5/20/94

* These fields are accessed via a pop-up window rather than screen scrolling to the right.

CHANGE 5/20/94 - add Engineering History Log capability; popup from within configuration window, adds to list in Part Master table record for parent part number.

Overview

CHANGE October 93: Add Phantom configuration data field maintenance

This screen maintains product configuration information by using the production sequence specified in the primary routing for the manufactured part or product. The screen's data and associated data record provide a "single-level" view of the product. "Goes-into" relationships are created by specifying a manufactured part or subassembly on this screen. This part in turn has its own routing and configuration. There is no system limit on how many levels one can have.

Since product structure is based on the routing, not a purely part number to part number set of relationships as in a traditional bill of material, it is automatically setup to manufacture, and many changes in the state of a purchased part or raw material can be defined by using steps in the routing, rather than a sequence of bill of material levels, each of which has a different part number.

The objectives of this aspect of system architecture include:

• Simplify product configuration by eliminating superfluous part numbers and assembly levels.

• Eliminate the as-designed versus as-built distinction and support the objectives of concurrent engineering.

• Allow the system to be capable of quickly and efficiently rescheduling a closely related set of open work orders or schedules through multiple assembly levels, especially to allow forward scheduling from a lower level up to the end item level, which is impossible with other architectures.

Material is specified on this screen as joining the product being made at a particular step in the routing used to manufacture the part or product.   This file, in effect, is overlaid on a standard routing which can be used by many different products. This in turn eliminates the need for redundant routing data, since the routings are defined and assigned a name, not the part number the routing makes.

Functional Logic:

Manufacturing Part Configuration records contain all required part numbers for all configurations in effect at any time. Effectivity In and Out dates serve to make changes in the exact configuration in effect at any one point in time.   Retrievals therefore must have a specific date to select require part numbers for display or omitting, thereby presenting the configuration that is or was in effect as of a paricular effectivity date.

• The program displays and accepts entries in Date From and Date To to select for Effectivity In and Effectivity Out Dates. Defaults are 00/00/00 (or earliest possible system date) and 99/99/99, indicating that all records are to be retrieved. These are not saved in a data file but are displayed only. Using this date range, the program then retrieves the Part Master data for the Parent Part Number entered. If valid, it then prompts for the operation number on the routing for which product configuration data is to be retrieved, then combining the parent part number with operation, retrieves the product configuration record. If there is no existing record, the program will allow a new one to be created.

NOTE: All component and configuration data for this parent part number and used on this operation are grouped into a single record in the data base, and so are saved at one time.

CHANGE 5/20/94:

At any time from within the main configuration maintenance window, if the Shift & F3 keys are pressed, the program calls the Engineering History Log maintenance program, which displays the window shown, using the Parent Part Number shown on the main configuration window. The Part Number cannot be entered separately from this window (to prevent erroneous update of the wrong part master record). The screen can be exited with the Escape key without updating. If the F9 key is pressed, the validation is that there must be some entry in the Engineering History Log Entry field. The Date is display only, and is the current system date.

End Change.

• Parent Part Number is the manufactured part number; must be on Part Master record and coded as a Manufactured part.

• Description, Unit of Measure and Route Name are retrieved from the Part Master file record for this P/N and displayed.

- Configuration Comments/text are free form and apply to the configuration as a whole. Use F3 to see the full text where necessary.

- Operation Number must be a valid operation number on the Route Name identified as the primary routing for making this parent part number.

- Operation Comments apply only to this operation on the routing when making this specific manufactured P/N. Use F3 to view the full text where necessary.

- Part Number is the part number of the component part going when combined with other component parts and the operation on the routing is performed transforms the components either partly or completely into the item identified by the Parent Part Number.

- Description and U/M are retrieved from the component part number's part master record and displayed.

- The P/M code is retrieved from the Part Master File record for that component part number and indicates whether it is a purchased part or "lower level" manufactured part or subassembly. This is how multi-level structures are defined in the system. A manufactured part entered here by definition goes into the higher level Parent Part Number at the top of the screen and for which the configuration is being defined here. This links not only the part numbers, but their associated routings as well, and how routings are linked to allow tight synchronization of production schedules and forward scheduling from lower assembly levels to function.

- Quantity Required may be a decimal quantity. "0.00" indicates that the part is a line supply, is purchased as an expense item, is used on an "As Required" basis, and is included here in order to specify its usage on this product.

- Component Scrap Factor is optional, with a default of 0.00. It is the percentage loss expected, or planned attrition, and will cause material planning or scheduling to plan a larger supply of the part number to provide for this expected attrition.

- Engineering Change No. is an optional field at this time. In upcoming versions of the system an Engineering Change Management module will update this field via an approved ECO and manual entry on this screen will be locked out.

- Manufacturer, PCB, Reference Designators, are optional fields, accessible via the popup window.

- Vendor Furnished Part Flag default is N (not furnished by vendor but procured through the normal material management cycle); Y causes the P/N to be excluded

from the material management cycle.   When a planned work order or repetitive schedule is created, and the work order's copy of the product configuration data is written to disk, this part number will not be included, effectively excluding it from the material planning cycle.

- Foreign/Domestic Flag default is N (not purchased abroad). Y indicates that a vendor who is local to an overseas assembler will supply this part to the assembly house and the kit pick list created in the US will not require this P/N to be picked, packed, included in customs drawback lists, or otherwise planned to be furnished to the assembly vendor.

- Work Station Used On is optional; default is blank, and allows material on the pick list to be grouped by the work stations it is physically being moved to. Sort sequence of the pick list uses this field first, then product group, then component part number. If none of the component part numbers on the pick list have a Work Station Used On assigned, the pick list will appear in straight product group then part number sequence (accessible in popup window).

- Effectivity In and Out Dates are optional, must be valid calendar dates, with effectivity out being later than effectivity in date. In upcoming versions of the system, the production scheduling and material planning process will phase component part numbers into use or phase them out using these dates. For product configuration purposes, this provides a product configuration history and allows one to extract a particular configuration of the product at a point in time (accessible in the pop-up window).

- Component Comments is a free form text field allowing entry of comment applying to this component part number only (accessible in a popup window).

- Continue entering component part numbers and their associated data until the complete product configuration is entered and ready to be saved, or updates to an existing one is completed.

- **ADDED**   When saved with the F9 key, the program saves the Manufactured Part Configuration record, revalidating all data entered, to insure its integrity, and for each material required part number, adds the Record ID and the Effectivity In and Effectivity Out Dates of the Manufactured Part Configuration record to the Where-Used ID's and associated fields to its Part Master record.

ADDED The Phantom? field adds the ability to document product structure one way and manufacture it another. Phantom configuration structures allow engineering to document a subassembly or manufactured component part as a distinct entity, yet not have it manufactured and placed in inventory as part of the production process.

The validation of this field is as follows:

Default is always "N" (No).

If the required part number is coded in the Part Master table as a "P" (purchased) part, then Phantom? <u>must</u> be N.

If the required part number is coded as an "M" (manufactured) part number, then the default is still "N", but Phantom? may be entered as "Y".

Entering a Y in this field will cause both the Work Order Entry program and the Production Scheduling and Planning program to "blow" through this assembly level. During the process of creating a new work order, either a Planned (PLND) or manually released (RNP) work order, these programs scan the list of required parts for each part number, checking parts coded as manufactured.

If the programs encounter a required manufactured part with a "Y" in the Phantom? field, the configuration record for this required part will be also retrieved and its required part numbers will be combined with those of the Parent Part Number for which the work order is being created. Required quantities will be extended in accordance with the quantity required of the phantomized subasssembly and the planned completion quantity for the work order.

The newly retrieved configuration record will also be scanned for Phantoms and the process may be repeated, each timing combining the required parts from the lower level(s) with those of the Parent Part Number. The "phantomized" subassembly part number itself is not included on the combined list, its identity not being needed for the production process.

The underlying assumption of this process is that the subassemby(s) that are indicated as phantoms, are manufactured, then immediately included in the next higher assembly process, their identify being needed only for product documentation purposes in the manufacturing process as documented for the work order's parent part number.

All routing data associated with the phantom subassembly(s) is ignored and therefore omitted from the process by which lower level required parts are added to higher assembly work order material records. If there are multiple Product Configuration records for the phantom subassembly (material linked to more than one routing operation), all records are retrieved with all required part numbers being added to the same parent part number's work order material record linked to the same operation in its routing where the phantom assembly is a required part number.

As a result, all required parts that are part of a Phantomized subassembly will have the same required date as the Parent Part Number's required parts.

Part Master Inquiry

Screen Data:

Part Number	Description
Purchase/Manufacture Code	Part Group
Lot/Serial Control	Last ECO
ECO Pending	Product Line (display only)
Product Class	Document Revision Level
Document Number	Weight
Stocking Unit of Measure	Shipping Volume/Cube
Weight Unit of Measure	Foreign Source?
Inspect?	Vendor ID
Routing Name	
Vendor's P/N	

Functional Logic

This inquiry is part of the system-wide inquiry list that is accessible via the popup menu.

The screen functions by allowing entry of any valid part number in the Part Master table, or accessing the table via a popup window containing part number and description, sorted in part number sequence, or via an alternate popup sorted in description sequence. When a valid part number has been entered or selected, upon pressing the enter key, the screen retrieves and displays the engineering part number data field shown above.

The format of this screen is essentially the same as the Part Master File Maintenance screen, except that all fields are display only except Part Number. The Escape key exits the screen, returning the user to the original screen or menu from which the sqeuence was initiated.

Work Center Inquiry

Screen Data

Work Center ID
Work Center Description
Work Center Location
Normal Working Hours/Day
Scheduled Closing Dates
Scheduled Efficiency Factor
Default/Standard Labor Rate

Functional Logic

This inquiry is part of the system-wide inquiry list that is accessible via the popup menu.

The screen functions by allowing entry of a valid Work Center ID, or selection f one from a popup window containing work center ID and Work Center Description.

When a valid Work Center ID has been entered or selected, upon pressing the enter key, the screen retrieves and displays the engineering part number data field shown above.

The format of this screen is essentially the same as the Work Center Master File Maintenance screen, except that all fields are display only except Work Center ID. The Escape key exits the screen, returning the user to the original screen or menu from which the sqeuence was initiated.

Routing Master Inquiry

Screen Data

Route Name
Routing Type Code
Operation Number
Alternate Operation?
Work Center ID
Operation Description
Scheduling Before Buffer Time
Scheduling Setup/changeover Time
Scheduling Unit Run Time
Scheduling After Buffer Time
Product Exception Part Number
Exception S/U Time
Exception Scheduling Unit Run Time

Functional Logic

This inquiry is part of the system-wide inquiry list that is accessible via the popup menu.

The screen functions by allowing entry of a valid Routing Name, or selection f one from a popup window containing Routing Name and Routing Type Code.

When a valid Routing Name has been entered or selected, upon pressing the enter key, the screen retrieves and displays the engineering part number data field shown above.

The format of this screen is essentially the same as the Routing Master File Maintenance screen, except that all fields are display only except Routing Name. The Escape key exits the screen, returning the user to the original screen or menu from which the sqeuence was initiated.

Manufacturing Part Configuration Inquiry

Screen Data

[Effectivity Date Selection:

Date From: Date To:] Effectivity Selection To Be Implemented in next phase

Parent Part Number
Description
Stocking Unit of Measure
Route Name
Operation No.   [Note: all part numbers following are linked to this Operation No.]
Tooling Used this Operation No.
Operation Comments
Required Part Number
Description
Unit of Measure
P/M Code
Quantity Required
Component Scrap factor
Engineering Change No.*
Manufacturer*
PCB*
Reference Designators*
Vendor Furnished Part Flag
Foreign/Domestic Flag
Work Station Used On*
Effectivity In Date*
Effectivity Out Date*

*   These fields are accessed via a pop-up window rather than screen scrolling to the
        right.

Functional Logic:

·   This screen provides the ability to access and display Manufacturing Part
        Configuration records.   This inquiry is part of the system-wide inquiry list that is
        accessible via the popup menu.

·   Manufacturing Part Configuration records contain all required part numbers for
        all configurations in effect at any time. Effectivity In and Out dates serve to
        make changes in the exact configuration in effect at any one point in time.
        Retrievals therefore must have a specific date to select require part numbers for

display or omitting, thereby presenting the configuration that is or was in effect as of a paricular effectivity date.

- The program displays and accepts entries in Date From and Date To to select for Effectivity In and Effectivity Out Dates. Defaults are 00/00/00 (or earliest possible system date) and 99/99/99, indicating that all records are to be retrieved. These are not saved in a data file but are displayed only. Using this date range, the program then retrieves the Part Master data for the Parent Part Number entered. If valid, it then prompts for the operation number on the routing for which product configuration data is to be retrieved, then combining the parent part number with operation, retrieves the manufacturing part configuration record and displays its associated data on the screen.

- The screen is essentially the same format and logic as the Manufacturing Part Configuration File Maintenance program, except that all fields other than Parent Part Number, Operation Number, and the effectivity selection date fields are display only.

- The Escape key exits the screen, returning the user to the original screen or menu from which the sqeuence was initiated.

Single Level Where-Used Inquiry

Screen Data:

Effe ctivity Date Selection:

Date From: Date To:

Part Number
Description
Stocking Unit of Measure
Part Group
Product Classification
Product Line

Used In Part No.	Opn No.	Part Desc.	U/M	Eff In Date	Eff Out Date
X----------X	X-----------X	X----------X	X---X	X--------X	X--------X
X----------X	X-----------X	X----------X	X---X	X--------X	X--------X
X----------X	X-----------X	X----------X	X---X	X--------X	X--------X

Functional Logic

This inquiry is part of the system-wide inquiry list that is accessible via the popup menu. It provides where-used visibility for a given part number to the next higher assembly level in the manufacturing part configuration data. While the data is retrieved from fields that are stored in the Part Master file records, it is updated by the program that maintains the manfuactured part configuration records. Its functions are as follows:

- Manufacturing Part Configuration records contain all required part numbers for all configurations in effect at any time. Effectivity In and Out dates serve to make changes in the exact configuration in effect at any one point in time. Retrievals therefore must have a specific date to select require part numbers for display or omitting, thereby presenting the configuration that is or was in effect as of a paricular effectivity date.

- The program displays and accepts entries in Effectivity Date From and Date To to select for Effectivity In and Effectivity Out Dates. Defaults are 00/00/00 (or earliest possible system date) and 99/99/99, indicating that all records are to be retrieved. These are not saved in a data file but are displayed only. Using this date range, the program then retrieves the Part Master where used data for the Part Number entered, which may be any valid part number.

- The screen then accepts entry of a single part number, or allows selection of one from a popup containing valid part numbers and descriptions, sorted in part

number sequence, or alternatively a popup containing part numbers and description, sorted in description sequence.

- The Escape key exits the screen, returning the user to the original screen or menu from which the sqeuence was initiated.

Part Master Listing

Report Data:

Part Number
Description
Stocking Unit of Measure
Purchase/Manufacture Code
Part Group
Product Classification
Product Line
Part Engineering Status Code

Functional Logic

This report lists all part numbers in the Part Master table, regardless of whether active or not. It is listed in Part Number sequence to facilitate looking up part numbers for correct description and other associated data.

Work Center Master Listing

Report Data:

Work Center ID
Work Center Description
Work Center Location
Normal Working Hours/Day
Scheduled Closing Dates
Scheduled Efficiency Factor
Outside Manufacturing Vendor ID

Functional Logic

This report lists all work center master table records in work center ID sequence upon initiation from the menu.

Routing Master Listing

Report Data:

Route Name
Routing Type Code
Operation Number
Work Center ID
Operation Description
Scheduling Before Buffer Time
Scheduling Setup/changeover Time
Scheduling Unit Run Time
Scheduling After Buffer Time
Product Exception Part Number
Exception S/U Time
Exception Scheduling Unit Run Time

Functional Logic

This report lists all routing records in the routing master table upon initiation from the menu.

Manufactured Part Configuration Report - Summary

Screen Data:

Selection:

- Effectvity Date

- Enter Parent Part Number or ALL

Report Data:

Effectivity Date Used for selection

Parent Part Number
Parent Part Description
Stk Unit of Measure
Route Name
Operation No.
    Required Part Number
    Description
    U/M
    P/M Code
    Quantiy Required
    Component Scrap Factor
    Vendor Furnished Part Flag
    Foreign/Domestic Flag

Functional Logic

This report provides relatively summary level data from the Manufactured Part Configuration table. A single effectivity date is used since Effectivity In and Out dates are not shown on the report. The user can select a single manufactured part number (which must be in the Manufactured Parts Configuration table), or print a full report for all manufactured part numbers in the table.

The initial screen requires selection of an effectivity date to be used to select Required Part Numbers for components linked to the parent part number in the configuration data. It is compared to both Effectivity In and Out Dates, skipping those records that either have an Effectivity Out date earlier than the selected date, or an Effectivity In Date later than the selected date. The current system date is the default.

Selection of a single parent part number will result in a listing of all manufactured part configuration records for that part number, to insure that the user receives complete product configuration information for that part number. The report's structure shows the parent/component relationships as maintained in the table records.

Saving the entry screen with the F9 key initiates the execution phase of the program, which either retrieves the selected Parent Part Number from the Manufactured Parts configuration table, or for all records in the file.

Manufactured Part Configuration Report - Detailed

Screen Data:

Selection:

- Effectvity Date From _____ to _____

- Enter Parent Part Number or ALL

Report Data:

Effectivity Date Range Used for selection

Parent Part Number
Parent Part Description
Stk Unit of Measure
Part Engineering Status Code
Part Group
Product Class
Weight
Weight U/M
Shipping Volume/Cube
Route Name
Document Number(s)
Document Revision
Last ECO
Operation No.
    Tooling Used This Operation
    Operation Comments
        Required Part Number
        Description
        U/M
        P/M Code
        Quantiy Required
        Component Scrap Factor
        Vendor Furnished Part Flag
        Foreign/Domestic Flag
        Engineering Change No.
        Manufacturer
        PCB
        Reference Designators/Position
        Effectivity In Date
        Effectivity Out Date

Functional Logic

This report provides fully detailed engineering data regarding the configuration of each manufactured part, including configuration history if desired.   The user can select a single manufactured part number (which must be in the Manufactured Parts

Configuration table), or print a full report for all manufactured part numbers in the table.

Also included in the configuration information is drawing and documentation related to the parent part number, shipping and weight information, and the last ECO applied to the parent part number. For each operation, the report includes tooling used on that operation when making this part, operation comments, and all required part numbers, both manufactured and purchased. Each required part number's data includes all associated engineering data as well as Effectvity In and Out dates.

The initial screen requires selection of an effectivity date range to be used to select Required Part Numbers for components linked to the parent part number in the configuration data. These are compared to the values in the Effectivity In and Effectivity Out Dates in the required part number data, skipping those records that fall outside of the selected range. The default is from 00/00/00 (or earliest system date) to 99/99/99 to retrieve all required component data for all Effectvity Dates.

Selection of a single parent part number will result in a listing of all manufactured part configuration records for that part number, to insure that the user receives complete product configuration information for that part number. The report's structure shows the parent/component relationships as maintained in the table records.

Saving the entry screen with the F9 key initiates the execution phase of the program, which either retrieves the selected Parent Part Number from the Manufactured Parts configuration table, or for all records in the file.

Single-Level Mfg'd Part Configuration - Physical Inventory Support

Screen Data:

Selection:

Part Group (enter one; default ALL)
Product Class (enter one; default ALL)
Product Line (enter one; default ALL)

Press F9 to generate the report

Report Format

Single Level- Mfg'd Part Configuration - Physical Inventory Support
report date, page, etc.

Multi-Level Product Configuration Report

Screen Data

Selection Screen:

Effectivity Date From xx/xx/xx to xx/xx/xx

Mfg'd Part Number (enter one or more)

Product Class (enter one)
Part Group (enter one)
Product Line (enter one)

Press F9 to generate the report

Report Format:

 Multi-Level Product Configuration Report
Page No. , Date Printed, etc.

Effectivity Date xx/xx/xx

Parent Part Number x----------x Description x-----------x U/M xx
Part Group xx   Product Class xx   Product Line xx

Lvl	Opn No.	Opn Desc	W/C	Route Name	Tooling						
0	xx.xx	xxxx	xxxx	xxx	xxxxxxxxxxxxxxxxxxxxx						
	W/S	Req'd P/N	Desc	U/M	M/P	Qty Req'd	Plnd Attr %	VF?	Frgn?	PCB	Eff In	Eff Out
	xxxx	xxxxx	xxxxxx	xx	P	xxxxx	xx	x	x	xxxx	xx/xx/xx	xx/xx/xx
	xxxx	xxxxx	xxxxxx	xx	P	xxxxx	xx	x	x	xxxx	xx/xx/xx	xx/xx/xx
	xxxx	xxxxx	xxxxxx	xx	P	xxxxx	xx	x	x	xxxx	xx/xx/xx	xx/xx/xx
0	xx.xx	xxxx	xxxx	xxxxxx	xxxxxxxxxxxxxxxx						
0	xx.xx	xxxx	xxxx	xxxxxx	xxxxxxxxxxxxxxxx						
	W/S	Req'd P/N	Desc	U/M	M/P	Qty Req'd	Plnd Attr %	VF?	Frgn?	PCB	Eff In	Eff Out
	xxxx	xxxxx	xxxxxx	xx	P	xxxxx	xx	x	x	xxxx	xx/xx/xx	xx/xx/xx
	xxxx	xxxxx	xxxxxx	xx	P	xxxxx	xx	x	x	xxxx	xx/xx/xx	xx/xx/xx
		xxxxx	xxxxxx	xx	M	xxxxx						
1	xx.xx	xxxx	xxxx	xxxxxx	xxxxxxxxxxxxxxxx						

```
┌─────────────────────────────────────────────────────────────┐
│ AIMS/ERP  -  Specifications & Guide to Use                   │
│ Engineering Management                                       │
└─────────────────────────────────────────────────────────────┘
```

	W/S	Req'd P/N	Desc	U/ M	M/ P	Qty Req'd	Plnd Attr %	VF?	Frg n?	PCB	Eff In	Eff Out
	xxxx	xxxxx	xxxxxx	xx	P	xxxxx	xx	x	x	xxxx	xx/xx /xx	xx/xx/x x
	xxxx	xxxxx	xxxxxx	xx	P	xxxxx	xx	x	x	xxxx	xx/xx /xx	xx/xx/x x
		xxxxx	xxxxxx	xx	M	xxxxx						
2	xx.xx	xxxx		xxxx	xxxxxx	xxxxxxxxxxxxxxx						
	W/S	Req'd P/N	Desc	U/ M	M/ P	Qty Req'd	Plnd Attr %	VF?	Frg n?	PCB	Eff In	Eff Out
	xxxx	xxxxx	xxxxxx	xx	P	xxxxx	xx	x	x	xxxx	xx/xx /xx	xx/xx/x x
	xxxx	xxxxx	xxxxxx	xx	P	xxxxx	xx	x	x	xxxx	xx/xx /xx	xx/xx/x x

Functional Logic

This program accepts selection options and generates a multi-level product configuration report by reading the routing for each parent part number meeting the selection criteria. It then associates the manufactured part configuration data to the routing operations to show how the entire product is configured through the production cycle. All retrievals start with the entered or selected parent part number, then retrieves all routing and configuration data from that "level" down.

The report shows details from the current routing used to manufacture each parent part number, current manufactured part configuration data, listing the parts within the effectivity date from and to dates entered, and associated component data.

The data on the report is retrieved as follows:

Parent Part Number - from the list entered, or belonging to the classificationg rouping entered in the selection screen. Associated description, unit of measure, part group, product class, and product line data is retrieved from the Part Master table record for the part number. Along with this is the Route Name used to manufactured this parent part number.

Routing Operations - The program uses the Route Name to retrieve the appropriate routing. Each step in the routing is printed, along with associated operation description and tooling used at that operation (if it has been entered).

Level ("LVL") - is calculated starting with the entered Parent Part Number. Each level containing a manufactured part, increments this level value by one. These values are carried for each step in a routing used by the same parent part number.

Configuration Data - All Manufactured Part Configuration records for the parent part number are retrieved to integrate the purchased material and to identify linkages to lower level manufactured parts. Required Parts in a configuration are sorted by P/M Code (with Purchased Parts first), then Work Station Used on, then Part Group, then Part Number to organize the list for analysis and to target areas for cost reductions.

Required Part Numbers - These include both purchased and manufactured part numbers. They are sorted so that purchased part numbers are listed first, sorted by work station used on, then manufactured parts, which are the linked to other routings. Also shown is associated engineering data for each part number.

Manufactured Required Part Numbers - these part numbers are themselves parent part numbers, either as subassemblies or manufactured components. Entering a manufactured part as a required part number in a configuration links the assembly levels together, and at the same time, their associated routing information. It is these linkages that enables AIMS/ERP to create a fully linked series of steps from the lowest to the top levels of even complex products, resulting in a network of manufacturing steps, each having their associated purchased material content. This resulting network can be scheduled efficiently in either direction according to a variety of scheduling techniques.

Effectivity In & Out Dates - These dates are used to phase out and in different required part numbers, which may be either purchased or manufactured. This program requires that some effectivity date be used to select, with the current date being the default. Entering a range of dates will cause the program to retrieve all effectivities within that range, so configuration changes, both historical and planned for the future can be reviewed on one report.

Power Supply Assignment Screen

Screen Data:

```
Part Number x-------------------x
Description x----------------x
Multiple Products Allowed? (Y/N)
Power Supply  PS'd              Default
Code          Part Number      Prod. Mix %
xx            x----------x      x.xx
xx            x----------x      x.xx
xx            x----------x      x.xx
xx            x----------x      x.xx
xx            x----------x      x.xx
xx            x----------x      x.xx
xx            x----------x      x.xx
```

Functional Logic

This screen allows a part number to be designed as having multiple products that can be made from a work order/product configuration carrying this Part Number as the Parent Part Number. It can only add or maintain this information for a part number that is already in the table, and cannot add a new part number record, and cannot change the Description Data.

Each Power Supply (or other similar designator code) serves as a convenient identifier for each variation of the common product. The table links the code to a specific manufactured part number under which the completed product, when associated with the power supply code, will be identified and stored. As work orders are created by the scheduler, this data is retrieved and added to the Planned WO header data, where it can be quickly be retrieved and used to validate material movement transactions.

This capability allows the parent part number of the product configuration record to function as the planning and control work order for a production process that can result in any of several different end, or in effect, parent part numbers.

When the program is selected from the menu, it displays the window, with the cursor at the Part Number field. Only a part number that is coded as a Manufactured part number that is already in the Part Master table is accepted. If a purchased part number, or one that is not in the table is entered, a message is displayed explaining the reason for the rejection. When a valid part number is entered, its associated Description (display only) and any existing Multiple Products Allowed Flag and other field values are displayed.

Entries or changes are allowed to the Multiple Products Allowed Flag, which must be Yes or No only (default is No), and the Power Supply, Part Number, and Default Production Mix fields. The following validation rules apply:

• The multivalue stack is "keyed" on Power Supply Code.
• There must be at least two lines in the multivalue stack, i.e., at least two Power Supply Codes must be designated al alternate forms of the Part Number. The Power Supply Codes may be any alpha/numeric value.
• If a Power Supply Code is entered, an associated Part Number and Default Product Mix % values must also be entered.
• The Part Number must be in the Part Master and must be coded as a manufactured part number. Each line's entry is validated upon field exit.
• The Default Product Mix values for any one line must not be greater than 0.99, and the sum of all values for all lines must not be greater than 1.00.

When entry is completed, the window is saved with the F9 key, which causes the validations to be reperformed before saving the data to the Part Master table record for the part number.

Grouped Product Bill of Material Report Family

Screen Data:

Selection Options:

Engineering Report Format
Accounting/Purchasing/Planning Format

Print Engineering History Log? (Y/N) x

Enter Product Part Number for Report   x------x

                                                                      x------x
                                                                      x------x
                                                                      x------x
                                                                      x------x

Enter Effectivity Date xx/xx/xx

Report Format: - Engineering Format - (Landscape Orientation)

Co Name   Page xxxx
Date/Time Printed
                        Engineering Product Bill of Material - Grouped by Level
                        (options selected) Effectivity Date xx/xx/xx Direct Costs Only

Product x--x   Desc. x---------------x   Assy Vendor x---------x Last Updated: xx/xx/xx

Final Assembly

Part No.	Desc	Req Qty	U/M	S F	FR N	V F	In c.	Ref Des	Mfg	Comments	Std Cost	Ext Cost
x----x	x---x x---z	x.xx	x x	x	x	x	x	xxx,xx x,xxx,x xx,	xxxx	x-----x x-----x	xxxx	xxxx
x----x	x---x x---z	x.xx	x x	x	x	x	x	xxx,xx x,xxx,x xx,	xxxx	x-----x x-----x	xxxx	xxxx
x----x	x---x	x.xx	x x	x	x	x	x		xxxx	x-----x	xxxx	xxxx
x----x	x---x	x.xx	x x	x	x	x	x		xxxx	x-----x	xxxx	xxxx
x----x	x---x	x.xx	x x	x	x	x	x		xxxx	x-----x	xxxx	xxxx
x----x	x---x	x.xx	x x	x	x	x	x		xxxx	x-----x	xxxx	xxxx

   Subcontract Costs

xxxx

    Subtotal Cost
xxxx

 Destination Configuration: xx   P/N xx-xx

Part No.	Desc	Req Qty	U/M	S F	FR N	V F		Comments	Std Cost	Ext Cost
x---x	x---x	x.xx	x x	x	x	x		x----x	xxxx	xxxx
x----x	x---x	x.xx	x x	x	x	x		x----x	xxxx	xxxx

   Total xx Cost $xxxx.xx

 Destination Configuration: xx   P/N xx-xx

Part No.	Desc	Req Qty	U/M	P M	FR N	V F		Comments	Std Cost	Ext Cost
x----x	x---x	x.xx	x x	x	x	x		x----x	xxxx	xxxx
x----x	x---x	x.xx	x x	x	x	x		x----x	xxxx	xxxx

   Total xx Cost $xxxx.xx

New Page

Co Name   Page xxxx
Date/Time Printed
                 Engineering Product Bill of Material - Grouped by Level
              (options selected) Effectivity Date xx/xx/xx Direct Costs Only

Product x--x   Desc. x----------------x   Assy Vendor x---------x Last Updated: xx/xx/xx

Sub- Assembly

 P/N x---------x Desc. x---------------x   Assy Vendor x---------x

Part No.	Desc	Req Qty	U/M	P M	FR N	V F	In c.	Ref Des	Mfg	Comments	Std Cost	Ext Cost
x----x	x----x x---z	x.xx	x x	x	x	x	x	xxx,xx x,xxx,x xx,	xxxx	x----x x----x	xxxx	xxxx
x----x	x---x x---z	x.xx	x x	x	x	x	x	xxx,xx x,xxx,x xx,	xxxx	x----x x----x	xxxx	xxxx
x----x	x---x	x.xx	x x	x	x	x	x		xxxx	x----x	xxxx	xxxx
x----x	x---x	x.xx	x x	x	x	x	x		xxxx	x----x	xxxx	xxxx

```
X----X    X---X   X.XX    X   X   X   X   X              XXXX    X-----X    XXXX   XXXX
                          X
X----X    X---X   X.XX    X   X   X   X   X              XXXX    X-----X    XXXX   XXXX
                          X
    Subcontract Costs
XXXX
      Subtotal Cost
XXXX
```

New Page

Co Name   Page xxxx
Date/Time Printed
                    Engineering Product Bill of Material - Grouped by Level
                (options selected) Effectivity Date xx/xx/xx Direct Costs Only

Product x--x   Desc. x---------------x   Assy Vendor x---------x Last Updated: xx/xx/xx

Product Engineering History:

```
Date                      Engineering History Log Entry
xx/xx/xx                  x------------------------------------------------------------x
                      x----------------------------------------------------------x
                      x----------------------------------------------------------x
xx/xx/xx                  x------------------------------------------------------------x
                      x----------------------------------------------------------x
                      x----------------------------------------------------------x
xx/xx/xx                  x------------------------------------------------------------x
                      x----------------------------------------------------------x
                      x----------------------------------------------------------x
xx/xx/xx                  x------------------------------------------------------------x
                      x----------------------------------------------------------x
                      x----------------------------------------------------------x
xx/xx/xx                  x------------------------------------------------------------x
                      x----------------------------------------------------------x
                      x----------------------------------------------------------x
```


Functional Logic

NOTE: The general organization and structure of this report is similar to the currently available report, the "Costed Product Configuration, Grouped By Level". This program and its approach should be reviewed with usable logic extracted.

This program generates a family of closely related reports. All report formats use the same basic logic and organization, with differences being confined to the data selected and/or data columns printed.

The general organization is grouped by product structure level and uses three major sections:

- Product Page(s) - includes the top level bill of material information, with a subtotal for the product, then power supply specific Desgination Configurations, with the final total cost for each alternative configuration.

- Subassemblies - includes the bill of materials for each subassembly, with the total cost for that subassembly shown as a subtotal.

- Product Engineering History - includes the complete log of entries for the product shown at the top/heading of the page, printed in chronological sequence from oldest to most recent last.

The program's functions via the following steps:

Upon selection from the menu, the program first displays the selection options, as shown in the Screen Data format above. Selections must include:

- One of the two general formats (engineering or Accounting/Purchasing/Planning format).

- A Yes or No to the Print Engineering History Log option.

- Entry of product part numbers that are to appear on the report.

- Entry of an Effectivity Date (default is today's date). Even though Effectivity Date may not be in use in the system, data is present in the data base which, without Effectivity Selection, will not be correctly retrieved and printed.

The overall processing logic starts with the identified product, interatively retrieving each subassembly and subsequent lower level assemblies, building a temporary work file used to accumulate the report's data. Once completed, this array is then reprocessed to generate the final report. This is due to the fact that the report format calls for starting with cost amounts that are not known until all subassembly levels have been retrieved and had their costs calculated.

The following characteristics of part number related and cost fields and associated calculations apply to the calculation process and the data as it appears on the report:

- Cost data is generated according to the logic described below. All costs are in terms of their direct costs only. No Burden, Overhead, or Foreign Indirect cost fields are used.

- Standard Costs are either the purchased standard cost for the item, or the total purchased and manufactured cost content for a manufactured item.

Extended Cost is simply the Standard Cost value mutiplied times the Required Quantity field for the part number on the same line.

- Subtotal Cost is the sum of all Extended Costs for the manufactured part number, either the product total, or a subassembly, and includes the Sub contract Cost portion of the of the cost of the item.

- Required Part Numbers identified with P/Mfg Code = "P" - Current Purchased Standard Cost data from the Part Master record.

- Required Part Numbers identified with P/Mfg Code = "M" - Sum of all manufactured and purchased part costs for all part numbers at all level below this part number, i.e., all subassemblies, manufactured component parts and purchased parts. This value is calculated during work file building. All direct cost elements are included.

- Subcontract Costs - Obtained for any given manufactured part, for this level only, by retrieving the routing shown in the Part Master record for the manufactured part number, and adding up all Labor Unit Costs and Outside Manufacturing Unit costs for all operations on the routing, checking for Exception Part Cost data. For subassemblies, their total direct cost, including Labor or Outside Manufacturing costs are included along with their purchased content in a single number for that part number when it is shown as a required part on a next higher level assembly bill of material.

NOTE: This report is a "Bill of Material" report, and as such, does not show linkages between required part numbers and their routing. A Bill of Material includes all material required to make the Parent Part Number at a given assembly level, regardless of which operation number the material is connected to. This requires retrieving all production configuration records for a given parent part number then combining the resulting lists.

The program generates the data for the report via the following steps:

1. Each product's data on the report is generated separately, calculated, then printed before the program goes on to the next product to be reported.

2. A relational index, linking Product Configuration record ID's to Part Master records is added to the system and used to speed processing. In this way, the retrieval process can begin at the Part Master record for each manufactured part number included in a product's assembly structure.

3. Beginning with the product part number being reported, the program retrieves product configuration record(s) for that assembly level and copies key data into a temporary BOM Work Table with the following dictionary. Using the relational index in the Part Master table for the Assembly Part Number, all Product Configuration records for that assembly part number are retrieved and added to a single BOM Work table record. Before printing on the report, these resulting Required Part Number multi-value lists are sorted into Part Number sequence. All data is taken from the Product Configuration record(s) unless otherwise specified:

Assembly Part Number (parent Part Number) (Record ID)
Assembly Level (starting at level 0 for the highest) (single value) (from
    Part Master record for Assembly Part Number)
Assembly Vendor (Route Name from Part Master table) (single value)
Assembly Total Extended Costs (sum of all Extended Cost values for all
    Requried Part Number lines; becomes valid during rolling up
    process as each lower level assembly's total costs is posted to
    the corresponding Required Part Number's unit cost field)
     (single value)
Assembly This Level Subcontract Cost (from Routing Master via
    program process) (single value)
Assembly Subtotal Cost (sum of:
            Assembly This Level Subcontract Cost
            + Total Extended Cost
    (single value)
NHA Part Numbers (multi-value list)
Last Updated (single-value) (latest value if there are multipe product
    configuration records)
Required Part Number (multi-value & "key" to multi-value stack)
Description (multi-value)(from part Master record)
Quantity Required (multi-value)
P/Mfg Code (multi-value) (from Part Master record for Required Part No.)
Foreign? (mutli-value)
Vendor Furnished (Y/N) (multi-value)
Phantom? (labeled Included on the report) (multi-value)
Reference Designators (multi-value)
Comments (multi-value)
Purchased Std Cost (Current Material Standard Unit Cost from Part Master)
    (multi-value)
Subcontract Unit Std Cost (from program process) (multi-value)
Extended Cost (Sum of Purch & Subcontract Unit Std Costs X Qty Required)
    (multi-value)

4. Each configuration record is created from data in other tables, then when completed, scanned for Required Part Number values that have P/Mfg codes = M

(manufactured) These are also retrieved, with their assembly information added to the BOM Work Table.

5. As each lower level of subassembly information is retrieved, its NHA references are stored in that assembly's record for use later.

6. As each assembly BOM Work table record is created, Current Material standard cost information for each Purchased Required Part is obtained via transaction from the Part Master table. The result of these entries at the Assembly Part Number is the Assembly This Level Material Cost value.

7. This Level Subcontract Cost data is obtained by retrieving the routing master record for the assembly part number, selecting for Exception Part Number Unit Cost data at each operation, and adding up all Unit Cost values in the Labor Unit Cost and Outside Manufacturing Unit Cost standard cost fields for all operations in the record.

8. At this point, each assembly, its subassemblies, and the purchased part content of each assembly should be reflected in the BOM Work Table data, and all single level purchased material costs and manufacturing cost (labor and outside manufacturing costs added together) data stored in each assembly's record. The data is now ready to have its cost data rolled up through assembly levels.

9. When all assembly levels for the entire product have been retrieved and their data assembled into the BOM Work Table records, the resulting table is then processed in reverse low level code sequence to calculate the rolled up costs.

10. Accessing the BOM Work Table in descending Low Level Code sequence (starting with the largest Low Level Code value), retrieve each assembly's Assembly Subtotal Cost value, and perform the following steps to post this value to the next higher assemblies's records, rolling the accumulated cost up the product structure:

*   Using the NHA references as Record ID's, retrieve each assembly's
*   BOM Work table record.

*   Locate the Required Part Number line that matches the assembly Part Number being posted.

*   Add the value to the Subcontract Unit Standard Cost field. Other fields that derive from this should update "automatically", being defined as symbolics.

- Repeat the process through all NHA references and for all assembly records at each low level code value until the "0" level is reached, which is the original product part number being reported.

- At this point, the product's assembly record in the BOM Work Table should contain all posted lower level costs, and the data is ready to be printed on the report.

11. A separate routine is used for the initial Product Page, in order to process and print the Multiple Products that may be associated with the product part number. If there are no multiple products defined, then there are no "Destination Configuration"s to cost and/or print.

12. If there are, this routine is used. Generate the print image as shown in the above format for the Product's Final Assembly (Low level Code of zero), when the Subtotal Cost line is generated, retrieve and cost the multiple product part numbers defined in the Part Master record for the product.

13. Each of the Destination configuration's is keyed to the Power Supply Code, and associated part number. The program attempts to retrieve the product configuration record for that part number. If the attmpt failes, the Destination configuration required part number lines are blank, and the Total configuration cost equals the Subtotal cost for the product.

14. If the attempt succeeds, the Required Part Number data for that multiple product part number is scanned. If a Required Part Number line with a part number that equals the product part number is encountered, it is skipped, to avoid a meaningless loop. All other Required Part Numbers are retrieved, their Purchased Standard Unit cost values retrieved from the Part Master table, Extended, and the Total Destination Configuration Cost calculated:

    (Product) Subtotal Cost
    + Destination Configuration Required Part Number Extended Costs
    = Destination Configuration Total Cost

15. After all Destination Configuration data has been generated and printed, the program then retrieves each subassembly's BOM Work table record and prints the data on the report, using the format shown for subassemblies, in low level code sequence groupings (i.e., all level 1 subassemblies, in part number sequence, then all level 2 subassemblies, etc.). Each new subassembly part number starts a new page. All pages have the same product oriented overall heading, showing the product being reported.

16. If the Product Engineering History Log option has been selected, after all subassemblies have been printed, the Engineering Log data is retrieved from the product's Part Master record and printed starting on a new page at the end of the report.

17. After the report for a product has been generated successfully, the BOM Work Table is cleared, and ready for the next product to be costed, or cleared because all products in the entered list have been retrieved, costed and printed on the report.

Copy Product Configuration

Screen Data:

Copy From:

Parent Part Number x-----------x
Operation No. x---x
Description x-------------------------x (display only)

Copy To:

Parent Part Number x-----------x
Operation No. x---x
Description x-------------------------x (display only)

Copy the following data:
Effectivity In/Out Dates? (Y/N) - default = N
PCB? (Y/N) - default = N
Reference Designators? (Y/N) - default = N
Manufacturer? (Y/N) - default = N
W/Station Used On? (Y/N) - default = N
Phantom? (Y/N) - default = N
Component Comments? (Y/N) - default = N

Press F9 to inititiate the Copy process.

Functional Logic

This program accepts entry of an existing product configuration record's identifing data, then prompts for entry of a new parent part number and material operation number under which it is to be identified. Some options are offered for data to be copied or created as blank values in the new record. This capability permits rapid creation of new configuration data for similar assemblies, such as where an assembly has received minor modifications but still requires identification under a new assembly part number.

Upon selection from the menu, the program presents the entry screen, cursor at the Copy From part number's field.   The parent Part number and material operation number are entered, and the program will retrieve the identified configuration record. If none exists, a message is displayed. If it does, the program displays the parent part number's description and the cursor is moved to the Copy To Parent Part Number's field.

The Copy To Parent Part Number must be coded as a manufactured part number in the part master table, validated upon field exit.

Next the new product configuration record's identifying material operation number is entered. This is validated by retrieving the part number's routing, then making sure that the Material Operation Number entered is a Primary Operation Number (xx.00 operation number; decimal value = zero). If it does, then an attempt is made to retrieve an existing product configuration record. If one already exists, the entry is rejected and a message is displayed informing the user that a record already exists and the copy operation cannot be performed.

If one does not exist, the cursor then accept entry of either default "No" to the data copying options, or overrides of "Yes" to any or all of the options.

When all option fields have been entered, (all are required), the F9 key will then initiate the copying process. A message is displayed informing the user that the copy process is being performed.

The program then copies the data from the Copy From product configuration record to the new one, using the options selected for copying data, saving the new record in the Product Configuration table. Data fields that are always copied are:

- Required (Component) Part Number
- Quantity Required
- Scrap/Attrition %
- Foreign?
- Vendor Furnished?

When the copy process is completed, the program displays a message showing completion of the copy process, and includes the Copy From and Copy To information. When the Enter key is pressed, the message is cleared and the program returns to the menu.