Cⴝⴝⴝ CONTROL DATA
CORPORATION

BILL OF MATERIALS PROCESSOR
# VERSION 1
REFERENCE MANUAL

CDC® OPERATING SYSTEM:

INTERACTIVE TERMINAL-ORIENTED SYSTEM 1

REVISION RECORD

REVISION	DESCRIPTION
01	Prereleased edition
(4/77)	
A	Manual released.
(8/77)	
Publication No. 96768770	

ii

LIST OF EFFECTIVE PAGES

New features, as well as changes, deletions, and additions to information in this manual, are indicated by bars in the margins or by a dot near the page number if the entire page is affected. A bar by the page number indicates pagination rather than content has changed.

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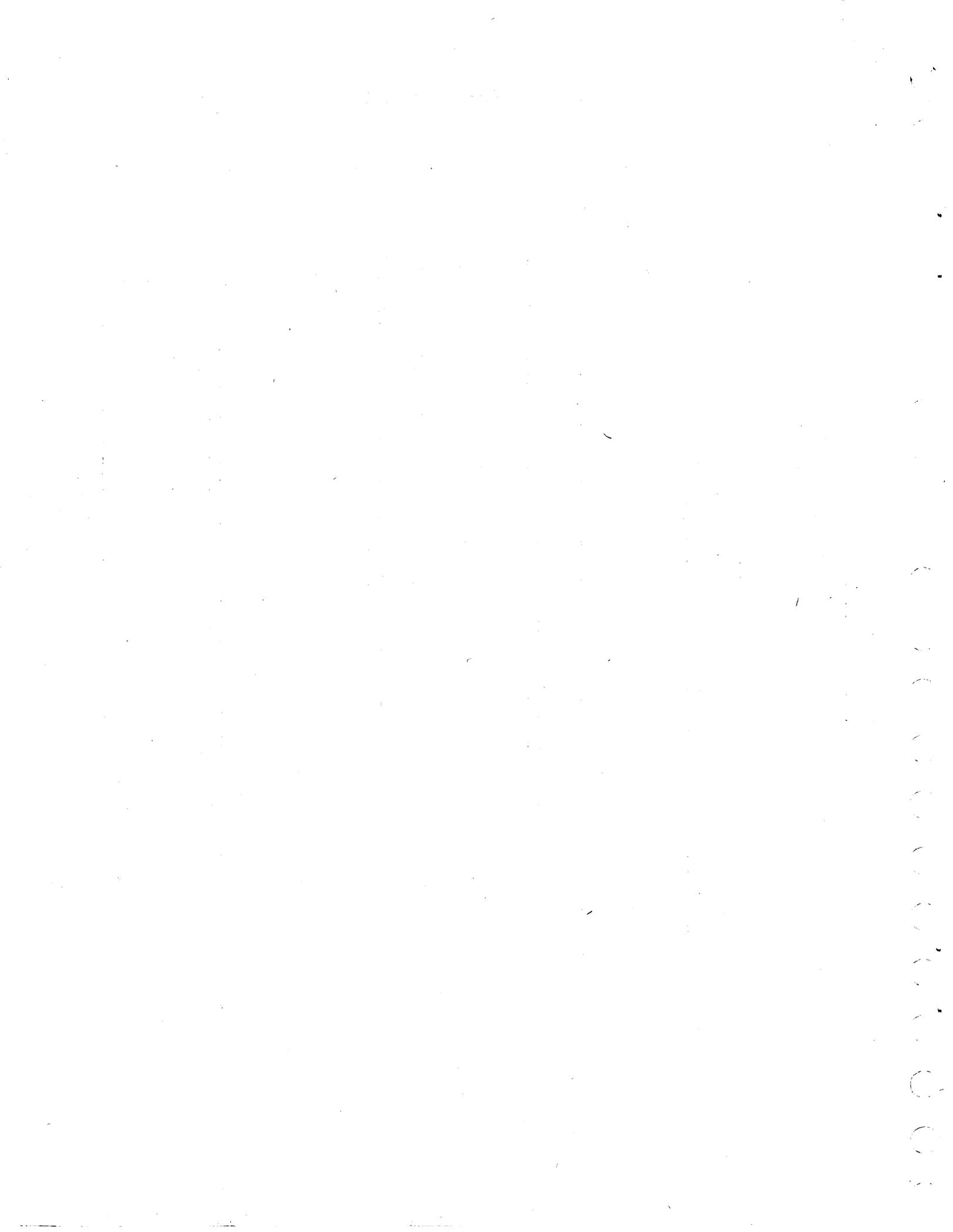
PREFACE

The four major divisions of this manual are intended for readers with four different areas of interest. The Introduction is intended for the reader who wants a general description of the bill of materials processor application module, its capabilities, requirements, and the services provided. The User Information section contains instructions and guidance for the person who must work with the system to perform day-to-day processing. The External Reference section is intended for the reader who is looking for a definition of the system; that is, a specification of what the module does, and, indirectly, an account of what the module does not do. The Internal Reference section contains information on the internal design of bill of materials processor module and is the most technical section. This section is intended for the reader who needs information about the organization and the implementation of this application module on the CYBER 18 computer.

For detailed information on the other modules in the manufacturing and distribution system, the reader should refer to the reference manual for the application module in which he is interested.

The following manuals describe modules in the manufacturing and distribution system with which Bill of Materials Processor 1 interfaces:

Publication	Publication Number
Routing 1 Reference Manual	96768760
Inventory Control 1 Reference Manual	96769120
Material Requirements Planning 1 Reference Manual	96768780

The reader may also wish to refer to the Interactive Terminal-Oriented System (ITOS) Reference Manual, publication number 96768290, under which the bill of materials processor runs.

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APPENDIX

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FIGURES

Bill of Materials Processor 1 is a module in the manufacturing and distribution system that performs two basic functions:

- It maintains information in system files for its own use and for the use of other modules in the manufacturing and distribution system.

- It makes information related to bills of material, use of materials, use of assemblies and subassemblies, and so forth, available to the user through printed reports.

The bill of materials processor module maintains information that enables it to explode the composition of any item in the user's inventory. This information also enables the module to implode the usage of any item in the user's inventory to indicate what assemblies that item is a part of and what larger assemblies these assemblies are parts of.

MAINTENANCE OF INFORMATION

This module is used to create and maintain the product structure data base. This source of information is composed of records for each item in the user's inventory. These records tell what assemblies each item is a part of and what assemblies and materials each item is composed of. The operator enters and updates this information using interactive procedures executed on the CRT terminal. These procedures enable the user to update information already in the file and to enter new information; for example, to build new records for new products.

INFORMATION AVAILABLE TO THE USER

Bill of Materials Processor 1 provides a variety of reports to make information related to the product structure available to the user. These reports include a bill of materials report and a where-used report giving either single level composition or multiple level composition of each item in the inventory.

INTERFACE WITH OTHER MODULES

The bill of materials processor module communicates with a number of other modules in the manufacturing and distribution system. This module obtains inventory information from the inventory control module. The bill of materials processor module obtains routing information from the routing module to be used to calculate costed bill of material reports. This module also provides the material requirements planning module with the product structure information that that module needs for determining material requirements. The mechanism that provides this communication between modules is the use of shared files used in common by more than one module.

MODULE ORGANIZATION

For a better understanding of the execution flow of this application module and a view of the information flow both within this module and between this module and the other modules in the manufacturing and distribution system, figure 1-1 has been provided. Figure 1-1 illustrates that on-line disk files provide the means of communication between programs within this application module, while the CRT terminal and reports are the means used for communication between the system and its users. Transaction files, which are picked up and processed against system files by other application modules, are the means of communication between this module and the other modules.
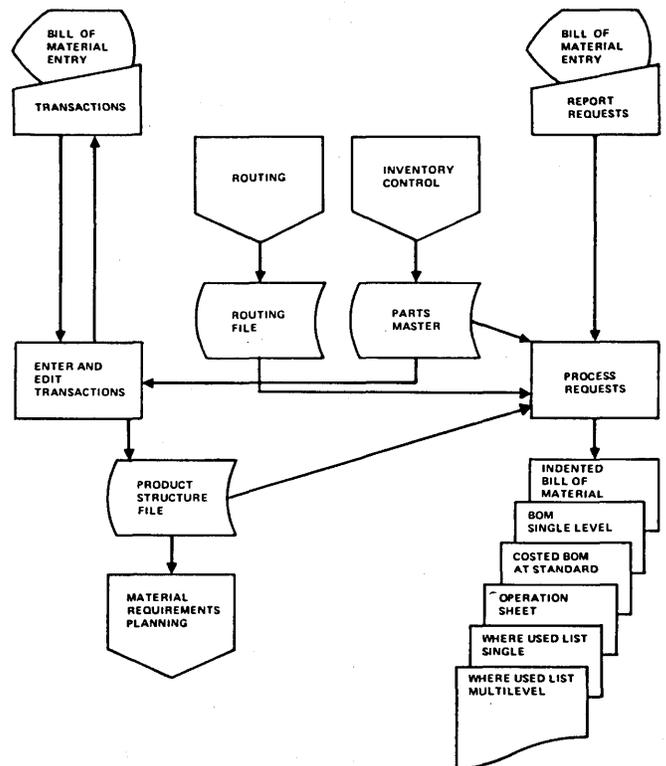
Figure 1-1. Bill of Materials Module Organization

ENVIRONMENT

The procedures within the bill of materials processor module are executed as procedure streams by ITOS, the Interactive Terminal-Oriented System. ITOS processes the requests to execute each procedure and controls the order of execution of the programs within a given procedure. In addition, it provides the environment for the execution of each program. Thus, such facilities as the allocation of resources, file management, and interface with the CRT terminals are provided by ITOS.

A WARNING ABOUT CONFLICTS

The run sheets also contain warning notes indicating conflicts between procedures: certain procedures within this application should not be run from one terminal while other specified procedures are being run from other terminals. The user should be aware that he is responsible for monitoring the use of different procedures from different terminals and for preventing such conflicts. The software provided does not prevent these conflicts automatically.

This section provides detailed, step-by-step instructions on how to use the bill of materials processor module and the procedures within that module. The reader should already be familiar with the bill of materials processor application area. This section also contains instructions on how to perform each of the daily, monthly, and yearly tasks, how to enter data into the system, how to update information within the system, how to request reports, and how to make inquiries to obtain information from the system.

In the Run Sheets section below, one run sheet is provided for each procedure. These run sheets give the job control statements needed to execute the procedure, any required set-up for the procedure, the order of the job steps and programs executed within the procedure, and the files used by each program. The Reports Description section describes each report and explains how to use the report and the meaning of each of the fields in the report.

PROCEDURE FLOW AND SCHEDULE

This section contains a description of the execution flow and the schedule for the bill of materials processor application module. The operator should use this schedule to determine when each of the various procedures within the bill of materials processor module is to be run. As indicated in this schedule, some procedures and the results they produce are optional or may be run less or more often, depending upon individual needs. Figure 2-1 gives the schedule for the tasks to be performed in this module.

PROCESSING NARRATIVE

The bill of materials functions may be run on request. Figure 2-1 shows the functions. There are no daily, weekly, or monthly processing cycles that must be executed.

To perform maintenance on the bill of materials files, procedure PSENT1 is executed. Product structure records can be added, changed, and deleted. Procedure BMUPD is then executed to edit the transactions entered. An edit list is printed that can later be analyzed for possible entry errors. A new product structure file is built to reflect maintenance transactions.

Bill of materials or where-used lists requests may be entered by executing procedure PSENT2. BOMP request 1 allows the user to print a multiple level bill of materials. BOMP request 2 allows the user to print a single level bill of materials. BOMP request 3 allows the user to print a multiple level where-used list. BOMP request 4 allows the user to print a single level where-used list. Following request entry, procedure BILLS is executed to print the bill of materials and where-used list.

Costed bill of materials requests may be entered by executing procedure PSENT3. BOMP request 5 allows the user to print a costed bill of materials. Following the entry of requests, procedure BILLSC is executed to print the costed bills of material.

Costed bills of material with product cost updating requests may be entered by executing procedure PSENT4. BOMP request 5 allows the user to print a costed bill of materials. Following the request entry, procedure BILLCU is executed to print the costed bills of material and update the product costs.

Procedure CSTALL may be executed to update product cost on all products without printing costed bills of material.

All requests through procedures PSENT1, PSENT2, PSENT3, PSENT4, and CSTALL can be input at the same time from multiple terminals. However, none of the procedures BMUPD, BILLS, BILLSC, or BILLCU should be executed at the same time CSTALL is being run.

OPERATING INSTRUCTIONS

The tables provided in this section give the detailed instructions needed to enter data into the system, update or change data already in the system, and perform whatever other tasks a given procedure enables the operator to do. The tables are intended to be used as detailed, step-by-step instruction sheets by an operator learning to use the system and as refresher and reference sheets for an operator already experienced with the system.

Each procedure used in the conversational mode is described below by:

● An introduction to the procedure giving a brief description of the procedure, what it does, what information is needed when it is used, and so forth

● Samples of the screens displayed by the procedure

● The operating instructions table giving step-by-step instructions on what should be done to accomplish the required task.

SYSTEM INITIATION

These operating instructions tell how to:

● Autoload the operating system (figure 2-2 shows the screen displayed).

● Start ITOS (figure 2-3 shows the screen displayed).

● Log on with ITOS (figure 2-4 shows the screen displayed).

● Log off from ITOS (figure 2-5 shows the screen displayed).

● Stop ITOS (figure 2-6 shows the screen displayed).

Of the above operations, logging on and off may be done from any terminal; the other operations may be done only from the system console.
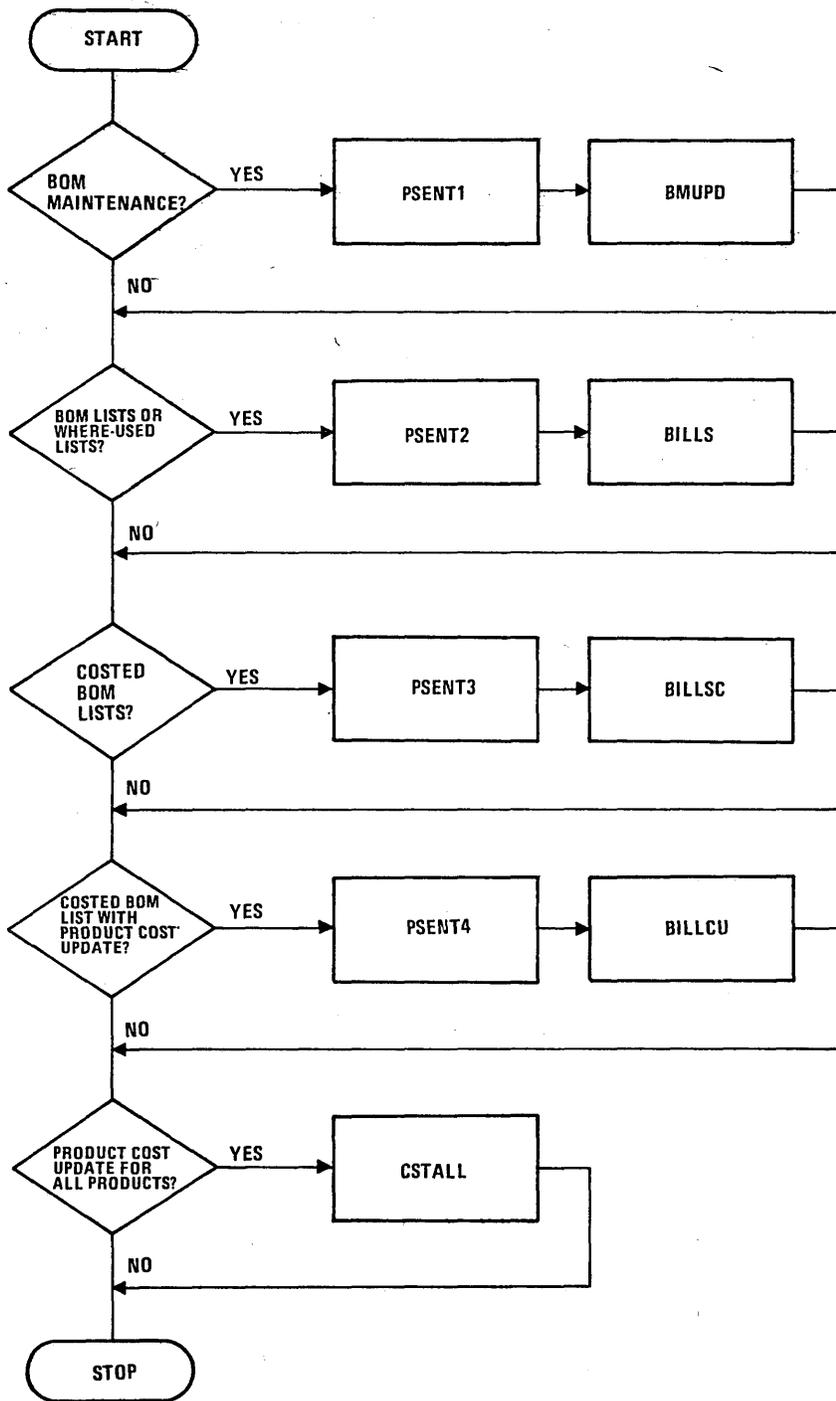
Figure 2-1. Bill of Materials On-Request Work Flow Processing

```
MSOS 5.0 -- PSR LEVEL XXX MM/DD/YY

SET PROGRAM PROTECT

J28 @


65 K MODE

ENTER DATE/TIME   MMDDYYHHMM
>

0825770830

DATE:  25 AUG 77  TIME: 0830:00
```

Figure 2-2. Autoload Display Screen

```
MI
>

START

BUILDING SYSTEM FILES

ITOS ACTIVE AT  HHMM
```

Figure 2-3. Starting ITOS Display Screen

```
CDC  CYBER-18 ITOS SYSTEM - VER 1.0

'SYSTEM NAME'

TERMINAL = 1

PASSWORD =

USER ID =

REQUEST =
```

Figure 2-4. ITOS Log-On Display Screen

```
REQUEST=EX

ITOS OFF AT HHMM
```

Figure 2-5.   ITOS Log-Off Display Screen

```
MI

>

STOP

VERIFY

OK

UNTIL  HHMM
```

Figure 2-6.   Exit from ITOS Display Screen

MENU AND PROCEDURE INITIATION

This set of operating instructions tells how to display the menu for Bill of Materials Processor 1 and how to initiate the procedures in this module. Figure 2-7 shows the menu for this module.

PROCEDURE PSENT1

This procedure is used to construct the bill of materials product structure file. The procedure enters transactions specifying parent and component part numbers into a temporary transaction file. These transactions are processed later to form the product structure file. Figures 2-8 through 2-10 give the screens displayed by this procedure.

PROCEDURE PSENT2

This procedure is used to enter requests for explosions to be printed in the bill of materials and implosions to be printed in the where-used list. The operator enters a part number

```
B I L L   O F   M A T E R I A L

A  - PRODUCT STRUCTURE MAINTENANCE              {PSENT1}
B  - PRODUCT STRUCTURE EDIT AND UPDATE           {BMUPD}
C  - EXPLODE/IMPLODE REQUEST ENTRY              {PSENT2}
D  - PRINT B O M AND WHERE USED LISTS            {BILLS}
E  - COSTED BILL OF MATERIAL REQUEST ENTRY      {PSENT3}
F  - PRINT COSTED BILLS OF MATERIAL              {BILLC}
G  - COSTED B O M WITH COST UPDATE REQUEST ENTRY {PSENT4}
H  - PRINT COSTED B O M WITH COST UPDATE        {BILLCU}
I  - UPDATE PRODUCT COST ON ALL PRODUCTS        {CSTALL}
J  - MAINTAIN MACHINE MASTER FILE              {BMMACHM}
K  - LIST MACHINE MASTER FIL                   {BMMACHL}
L  - MAINTAIN LABOR MASTER FILE                 {BMLABM}
M  - LIST LABOR MASTER FILE                     {BMLABL}
N  - PURGE MACHINE MASTER FILE                 {BMMACHP}
O  - PURGE LABOR MASTER FILE                    {BMLABP}
Z  - EXIT
```

Figure 2-7.   Bill of Materials Processor 1 Menu

```
ENTER BEGINNING RELATIVE RECORD NUMBER        1
ENTER ENDING RELATIVE RECORD NUMBER           100
```

Figure 2-8. Procedure PSENT1 Set Record Range Display Screen

```
MODE -A
PROG # -1
AUTO DUP -F
```

Figure 2-9. Procedure PSENT1 Set Options Display Screen

```
CURRENT SEQUENCE NBR           00001

ENTER 'PS'              MFG100    1    OFF    00001PS

ACTION {A,C,D,M}        A

PARENT PART #           13304

COMPONENT PART #        13301

QUANTITY                26

INVENTORY CODE { ,N}    N
```

Figure 2-10. Procedure PSENT1 Structure Entry Display Screen

for each explosion or implosion desired along with a code that specifies the type of printout desired. These codes are:

1   Multiple level explosion in the bill of materials

2   Single level explosion in the bill of materials

3   Multiple level implosion in the where-used list

4   Single level implosion in the where-used list

5   Product cost entry in the costed bill of materials report

The requests are stored in a temporary file and are processed later when the bill of materials, the where-used list, and the costed bill of materials are printed. Figures 2-11 through 13 give the screens displayed by this procedure.

PROCEDURE BMLABM

This procedure is used to maintain the labor grade master file. By entering a new labor grade the user can add a new labor grade to the file. And, by entering an existing labor grade code, the user can display information already in the file for inquiry purposes or can update that information. Figures 2-14 and 2-15 show the screens displayed by this procedure.

PROCEDURE BMMACHM

This procedure enables the user to maintain the machine master file. By entering a work station that is not in the user's machine master file, a new work station can be added to the file. And, by entering an existing work station, the user can display information contained in the file for inquiry purposes or can update that information. Figures 2-16 and 2-17 show the screens displayed by this procedure.

```
ENTER BEGINNING RELATIVE RECORD NUMBER        10
ENTER ENDING RELATIVE RECORD NUMBER           50
```

Figure 2-11. Procedures PSENT2, PSENT3, and PSENT4 Set Record Range Display Screen

```
MODE -A
PROG # -2
PROG NAME -MFG105
NEXT PROG # -2
AUTO DUP -F
```

Figure 2-12. Procedures PSENT2, PSENT3, and PSENT4 Set Options Display Screen

```
CURRENT SEQUENCE NBR            00001

ENTER 'PS             MFG105    2    OFF     00001PS

PART #             13-XF3441

QUANTITY {XXXX}        75

BOMP REQUEST {1 - 5}   2
```

Figure 2-13. Procedures PSENT2, PSENT3, and PSENT4 Request Entry Display Screen

```
            LABOR GRADE MASTER FILE INQUIRY/MAINT          MFG030

LABOR GRADE [XX]

SECTION [X]

 SECTION CONTENTS

        1 DESCRIPTIVE INFORMATION

        R RETRY LABOR GRADE
        E END OF JOB
        D FLAG TO DELETE
```

Figure 2-14. Procedure BMLABM Labor Grade Maintenance Control Display Screen

```
<XX>        LABOR GRADE MASTER FILE INQUIRY/MAINT-SECTION 1        MFG030

                     DELETE CODE [X]
                     DESCRIPTION [XXXXXXXXXXXXXXXXXXXX]
           LABOR RATE {$XXXX.XXX/BR} [9999999]
                   BURDEN FACTOR [9999]
```

Figure 2-15. Procedure BMLABM Labor Grade Maintenance Descriptive Information Display Screen

```
            MACHINE MASTER FILE INQUIRY/MAINT              MFG020

  WORK STATION [99999]

  SECTION [X]

   SECTION CONTENTS

          1 DESCRIPTIVE INFORMATION

          R RETRY WORK STATION
          E END OF JOB
          D FLAG TO DELETE
```

Figure 2-16. Procedure BMMACHM Machine Master File Maintenance Control Display Screen

```
   <XXXXX>    WORK STATION MASTER FILE INQUIRY/MAINT-SECTION 1       MFG020

                     DELETE CODE [X]
                     DESCRIPTION [XXXXXXXXXXXXXXXXXXXX]
            CAPACITY {XXX HRS/MTH} [999]
        BURDEN RATE {$XXXX.XXX/HR} [9999999]
```

Figure 2-17. Procedure BMMACHM Machine Master File Maintenance Descriptive Information Display Screen

Procedures PSENT1, PSENT2, PSENT3, and PSENT4 use a common program for data entry and modification that is also used by several other application modules in the manufacturing and distribution system. This program controls the entry of data by using format specifications stored in an online file. The operator selects the correct set of data specifications by entering a specific number in response to the prompt PROG #. The operator controls data entry by selecting options in response to the following prompts:

● MODE – The operator may choose to add new records (by entering A), to change records that have been added previously (by entering C), or to exit from the program (by entering E).

● PROG # – The operator's response to this prompt selects the series of prompts that will be isdplayed for data entry. Refer to the operating instructions for the correct program number to be entered.

● AUTO DUP – This entry controls whether data from certain fields entered for a previous record will be automatically duplicated for entry in this record. The operator may enter the following.

O   On – Data from the previous entry is duplicated

F or any   Off – Data must be entered manually
other
character

- SEQ # – In response to this prompt the operator should enter the relative record number of the record to be modified when in change mode. During data entry in add mode, the sequence number is automatically incremented for subsequent entries. When in change mode, however, sequence number must be entered for each entry.

After making the parameter selections described above, the operator enters data for the first record. Any time after data entry or modification has begun, the operator may select new options by entering RUBOUT in response to the first prompt for any of the data entry tasks performed by this procedure. The procedure will then display the prompts MODE, PROG #, or AUTO DUP, depending upon whether the operator followed RUBOUT with CARRIAGE RETURN, P, or D, so that the operator can enter new options or exit from the program (by entering E in response to the prompt MODE).

When entering data into individual fields, the operator may also enter LINE FEED to duplicate data entered in a previous record.

USING OPERATING INSTRUCTION TABLES

To use these instructions, the operator should first select the table for the procedure to be executed. With the needed data and information, proceed through the instructions sequentially, step-by-step, repeating instructions or groups of instructions as needed. For each step, the operator should note the prompt or message that appears on the screen to ensure that he is at the correct step. Then he should enter the appropriate operator response as specified in the instruction, keeping within the requirements given for maximum length, data type, and special entry columns.

The instructions may also specify possible system responses. The operator should compare these with the system response that actually occurs on the screen to ensure that the desired result has been obtained. The Next-Step column tells which instruction step should be used next.

The following general instructions apply when using any of the procedures on the CRT to update files in the bill of materials module:

- After each entry, press CARRIAGE RETURN.

- To change any field that has been entered on the screen (for example, when an error has been detected before the display on the screen is displayed), use the RUBOUT key. This key has the following effects:

  -If one or more characters have been entered into a field, the cursor is repositioned to the beginning of the field.

  -If no character has been entered into the field, the cursor is repositioned to the beginning of the previous field.

- To skip an item of information (that is, leave the field the way it was), press LINE FEED.

- To skip the remaining fields on the screen (leaving them the way they were on entry to the screen), enter an @ sign as the first character of any field.

- Although some information items have decimal positions, the decimal point should not be entered when the item is keyed in. The operating instructions specify the number of assumed decimal positions in each numeric field. If the Data Type column contains an N, the field is numeric. The number immediately following N is the number of positions to the right of the decimal point. (If there is no number after the N, the number of decimal positions is assumed to be zero.) Each decimal position to the right of the implied decimal point must be keyed in, although leading zeros to the left of the number may be omitted.

The following pages contain the operating instruction tables.

OPERATING INSTRUCTIONS	PROCEDURE NAME Menu & Procedure Selection		PROGRAM NAME				SHEET 1 OF 1
STEP	SCREEN PROMPT, MESSAGE, OR CONDITION	OPERATOR RESPONSE	MAX LTH	DATA TYPE	SPECIAL ENTRY	SYSTEM RESPONSE	NEXT STEP
1	REQUEST =	Enter the code for this module: BM	2	A		Displays the menu for this module	2
		Enter the procedure name	8	AN		Initiates the procedure	3
2	SELECTION	Select the letter code for the procedure desired	1	A		Initiates the procedure	3
3		Refer to the operating instructions for the chosen procedure					

LEGEND:

MAX LTH   -   Maximum length
Data type   -   A   Alphabetic
                      AN   Alphanumeric

OPERATING INSTRUCTIONS	PROCEDURE NAME System Initiation				PROGRAM NAME		SHEET 1 OF 2	
STEP	SCREEN PROMPT, MESSAGE, OR CONDITION	OPERATOR RESPONSE	MAX LTH	DATA TYPE	SPECIAL ENTRY	SYSTEM RESPONSE		NEXT STEP
TO AUTOLOAD								
1		Ready the system disk pack (SYSVOL) on drive 0. Push STOP, MASTER CLEAR, and RUN in that order on the CYBER 18 control panel.				Loads the operating system into main memory and initiates execution		2
2	MSOS 5.0 -- PSR LEVEL xxx mm/dd/yy SET PROGRAM PROTECT	Enter ESC @ J28						3
3	ENTER DATE/TIME MMDDYYHHMM	Enter the date and time	10	N		Displays date and time		--
TO START ITOS FROM THE SYSTEM CONSOLE								
1		Enter manual interrupt (CONTROL G)						2
2	MI	Enter: START	5	A		Builds system files and initiates ITOS. Displays ITOS ACTIVE AT nn		--
		START,X	7	AN		Initiates ITOS, but bypasses building system files. Displays ITOS ACTIVE AT nn		--
TO LOG ON UNDER ITOS FROM ANY TERMINAL								
1		Enter + CARRIAGE RETURN						2
2	PASSWORD =	Enter password if password is enabled				Password entry is not echoed on the terminal screen except at the system console		3
3	USER ID =	Enter: CARRIAGE RETURN - To log on as a common user User ID - To log on with a user ID				ITOS indicates that it is ready to accept requests by displaying:		4
4	REQUEST =							--
TO LOG OFF FROM ITOS								
1	REQUEST =	Enter EX	2	A		ITOS OFF LINE AT hh:mm:ss		--

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	OPERATING INSTRUCTIONS	PROCEDURE NAME System Initiation			PROGRAM NAME		SHEET 2 OF 2	
STEP	SCREEN PROMPT, MESSAGE, OR CONDITION	OPERATOR RESPONSE	MAX LTH	DATA TYPE	SPECIAL ENTRY	SYSTEM RESPONSE		NEXT STEP
	TO EXIT FROM ITOS AT THE SYSTEM CONSOLE							
1		Enter manual interrupt (CONTROL G)						2
2	MI	Enter STOP	4	A				3
3	VERIFY	Enter OK	2	A				4
4	UNTIL HHMM	Enter: Expected restart time (a value between 0000 and 2400)	4	N		Displays at every active terminal: ITOS OFF-LINE AT hhmm UNTIL hhmm		--
		CARRIAGE RETURN						

LEGEND:

MAX LTH - Maximum length
Data type - A   Alphabetic
           AN   Alphanumeric
           Nx   Numeric with x decimal positions

STEP	SCREEN PROMPT, MESSAGE, OR CONDITION	OPERATOR RESPONSE	MAX LTH	DATA TYPE	SPECIAL ENTRY	SYSTEM RESPONSE	NEXT STEP
1	ENTER BEGINNING RELATIVE RECORD NUMBER	Enter the relative record number of the first record to be updated	5	N			2
2	ENTER ENDING RELATIVE RECORD NUMBER	Enter the relative record number of the last record to be updated	5	N			3
3	MODE	Enter mode A Add	1	A		Displays prompts for adding records	4
		C Change				Displays prompts for updating records	4
		E Exit				Exits from program	—
		Other Error				Displays MODE MUST BE A,C, OR E	3
4	PROG #	Enter program number 1	1	N			5
		2, 3, or 4 Error					5
		Other Error				Displays PROG # MUST BE 1 - 4	
5	AUTO DUP	Enter O On F or Off other	1	A		Displays program name, program number, auto dup on or off, and sequence number on the right side of the screen	6
6	ENTER 'PS'	Enter PS	2	A			7
7	ACTION (A,C,D,M)	Select action A Add C Change D Delete M Multiple delete	1	A			8
8	PARENT PART #	Enter parent part number	12	N			9
9	COMPONENT PART #	Enter component part number	12	N			10

	OPERATING INSTRUCTIONS	PROCEDURE NAME PSENT1		PROGRAM NAME BM1ENT			SHEET 2 OF 2	
STEP	SCREEN PROMPT, MESSAGE, OR CONDITION	OPERATOR RESPONSE	MAX LTH	DATA TYPE	SPECIAL ENTRY	SYSTEM RESPONSE		NEXT STEP
10	QUANTITY	Enter quantity	7	N3				11
11	INVENTORY CODE (,N)	Enter inventory code N No Other Yes	1	A				6

STEP	SCREEN PROMPT, MESSAGE, OR CONDITION	OPERATOR RESPONSE	MAX LTH	DATA TYPE	SPECIAL ENTRY	SYSTEM RESPONSE	NEXT STEP
1	ENTER BEGINNING RELATIVE RECORD NUMBER	Enter the relative record number of the first record to be updated	5	N			2
2	ENTER ENDING RELATIVE RECORD NUMBER	Enter the relative record number of the last record to be updated	5	N			3
3	MODE	Enter mode A Add	1	A			4
		C Change					4
		E Exit					—
		Other Error				Displays MODE MUST BE A, C, OR E	3
4	PROG #	Enter program number 2	1	N			5
		1, 3, or 4 Error					5
		Other Error				Displays PROG # MUST BE 1 - 4	
5	PROG NAME	Enter MFG105 for PSENT2 MFG106 for PSENT3 MFG107 for PSENT4	6	AN			6
6	NEXT PROG #	Enter 2	1	N			7
7	AUTO DUP	Enter O On F or Off other	1	A		Displays program name, program number, auto dup on or off, and sequence number on the right side of the screen	8
8	ENTER 'PS'	Enter PS	2	A			9
		Or press RUBOUT followed by: CARRIAGE RETURN to change the program number				Displays PROG #	4
		M to change the mode	1	A		Displays MODE	3
		D to change the auto dup function				Displays AUTO DUP	7

STEP	SCREEN PROMPT, MESSAGE, OR CONDITION	OPERATOR RESPONSE	MAX LTH	DATA TYPE	SPECIAL ENTRY	SYSTEM RESPONSE	NEXT STEP
9	PART #	Enter the part number	12	AN			10
10	QUANTITY (XXXX)	Enter the quantity	4	N			11
11	BOMP REQUEST (1 - 5)	Enter the bill of materials request number: 1 Bill of materials multiple level explosion 2 Bill of materials single level explosion 3 Where-used list multiple level implosion 4 Where-used list multiple level implosion 5 Product cost	1	N			8

	OPERATING INSTRUCTIONS	PROCEDURE NAME BMMACHM			PROGRAM NAME MFG020	SHEET 1 OF 1	

STEP	SCREEN PROMPT, MESSAGE, OR CONDITION	OPERATOR RESPONSE	MAX LTH	DATA TYPE	SPECIAL ENTRY	SYSTEM RESPONSE	NEXT STEP
	CONTROL SCREEN						
1	WORK STATION	Enter work station number	5	N			2
2	SECTION	Enter section or option 1	1	AN		Displays descriptive information screen	3
		R				Retries new work station number	1
		E				Ends job	—
		D				Flags record for deletion	1
	DESCRIPTIVE INFORMATION SCREEN						
3	DELETE CODE	Enter delete code D Delete ɓ Do not delete	1	A			4
4	DESCRIPTION	Enter description	20	AN			5
5	CAPACITY (XXXXXX HRS/MTH)	Enter hours per month capacity	6	N			6
6	BURDEN RATE ($XXXX.XXX/HR)	Enter burden rate per hour	7	N3			1

OPERATING INSTRUCTIONS		PROCEDURE NAME BMLABM		PROGRAM NAME MFG030		SHEET 1 OF 1	
STEP	SCREEN PROMPT, MESSAGE, OR CONDITION	OPERATOR RESPONSE	MAX LTH	DATA TYPE	SPECIAL ENTRY	SYSTEM RESPONSE	NEXT STEP
CONTROL SCREEN							
1	LABOR GRADE	Enter labor grade	2	N			2
2	SECTION	Enter section or option i	1	AN		Displays descriptive information screen	3
		R				Retries new labor grade	1
		E				Ends the job	—
		D				Flags record for deletion	1
DESCRIPTIVE INFORMATION SCREEN							
3	DELETE CODE	Enter delete code D Delete Other Do not delete	1	A			4
4	DESCRIPTION	Enter description	20	AN			5
5	LABOR RATE ($XXXX.XXX/HR)	Enter labor rate per hour	7	N3			6
6	BURDEN FACTOR	Enter burden factor	4	N			1

RUN SHEETS

This section contains run sheets specifying the order of program execution within each procedure, the files used by each program, backup and restart procedures, and special instructions for the computer operator. One run sheet is provided for each procedure. The operator may use the run sheets to determine the setup necessary for the execution of a procedure, which files are being affected by a particular procedure, and how recovery may be made for any given procedure. The operator may want to refer to these run sheets to determine which files are required for the execution of a given procedure or which files are affected (altered) by the execution of a given procedure.

These run sheets contain the following information:

- Operator Instructions – These tell the operator what must be done to initiate the procedure properly.

- Job Steps – Typically, these are the points at which the procedure may be restarted. Each job step may contain one or more programs. Note that once a procedure is restarted at a particular job step, it continues through the execution of not only that job step, but also the job steps that follow.

- Programs – These programs are individual jobs or tasks executed by the computer. They are stored in the user's library as individual executable units.

- Files – These are the sources of the information used by the programs and the destination of the results to be stored for later use. These files are listed next to the particular program that uses them.

- Input/Output/Update – This column indicates whether a file is used as input (I) or output (O), has records added to it (ADD), or is updated (U) by the program.

- Forms and Alignment – The proper forms to be mounted during the procedure setup are specified in this box.

- Special Instructions – This box contains special conditions that may occur during the execution of the program along with the steps that must be taken if recovery and rerun are to be performed. The reader should note, however, that in some cases special procedures are executed for backup and recovery. In these instances, the user should consult the run sheets for these procedures.

These run sheets should always be kept at the computer site so they are available in case of special or abnormal conditions.

GƎ CONTROL DATA
CORPORATION

RUN SHEET

PROCEDURE: ___BMINIT___

SYSTEM: ___Bill of Material Processor___

DESCRIPTION   Initialize
Transaction
File

OPERATOR INSTRUCTIONS:	MASS STORAGE ASSIGNMENTS:
REQUEST = BMINIT	

JOB STEP	PROGRAM	FILES	UNIT	INPUT/ OUTPUT UPDATE	RERUN O.K.	RERUN? ____ YES ____ RECOVERY BELOW		
BMINIT	BMIN1	BM1OUT		U		FORMS & ALIGNMENT		
	BMIN2	BM2OUT		U		SPECIAL INSTRUCTIONS:		
	BMIN3	BM3OUT		U				
						This Procedure Only Run At System STARTUP		
	BMIN4	BM4OUT		U				

CD CONTROL DATA
CORPORATION

RUN SHEET

PROCEDURE: _____PSENT1_____

SYSTEM: _Bill of Material Processor_

DESCRIPTION Transaction entry for
adds, changes, and deletion to
the bill of material files.

OPERATOR INSTRUCTIONS: REQUEST = PSENT						MASS STORAGE ASSIGNMENTS:		
JOB STEP	PROGRAM	FILES	UNIT	INPUT/ OUTPUT UPDATE	RERUN O.K.	**RERUN?**	_____ YES _X_ RECOVERY BELOW	
PSENT1	BM1ENT	BM1DUM		I		FORMS & ALIGNMENT		
		KPROGS		I				
		BM1OUT		U		SPECIAL INSTRUCTIONS: RECOVERY REQUEST = BM107 PROGRAM BM107 will display the last transaction entered and the relative record number used. The operator may now continue making entries. REQUEST = PSENT1		

CD CONTROL DATA
CORPORATION

RUN SHEET

PROCEDURE: __PSENT2__

SYSTEM: __Bill of Material Processor__

DESCRIPTION   Enter REQUESTS for
EXPLODES for bills of material
and implosions for where used
lists

OPERATOR INSTRUCTIONS:	MASS STORAGE ASSIGNMENTS:
REQUEST = PSENT2	

JOB STEP	PROGRAM	FILES	UNIT	INPUT/ OUTPUT UPDATE	RERUN O.K.
PSENT2	BM2ENT	BM1DUM		I	
		KPROGS		I	
		BM2OUT		U	

RERUN?   _____ YES
            __X__ RECOVERY BELOW

FORMS & ALIGNMENT

SPECIAL INSTRUCTIONS:

RECOVERY

REQUEST = BM1D8

PROGRAM BM1D8 will display the
last transaction entered and
the relative record number
used. The operator may now
continue making entries.

REQUEST = PSENT2

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G∋ CONTROL DATA CORPORATION

RUN SHEET

PROCEDURE: ___PSENT3___

SYSTEM: _Bill of Material Processor_

DESCRIPTION   Enter request for explosions for costed bills of material

OPERATOR INSTRUCTIONS:						MASS STORAGE ASSIGNMENTS:		
REQUEST = PSENT3								

JOB STEP	PROGRAM	FILES	UNIT	INPUT/ OUTPUT UPDATE	RERUN O.K.	RERUN?	___ YES _X_ RECOVERY BELOW	
PSENT3	BM3ENT	BM1DUM		I		FORMS & ALIGNMENT		
		KPROGS		I				
		BM3OUT		U		SPECIAL INSTRUCTIONS:		
						RECOVERY		
						REQUEST = BM119		
						PROGRAM BM119 will display the last transaction entered and the relative record number used. The operator may now continue making entries.		
						REQUEST = PSENT3		

CONTROL DATA CORPORATION

RUN SHEET

PROCEDURE: ___PSENT4___

SYSTEM: _Bill of Material Processor_

DESCRIPTION Enter requests for
explosions for costed bills of
material with product cost up-
dating.

OPERATOR INSTRUCTIONS:

REQUEST = PSENT4

MASS STORAGE ASSIGNMENTS:

JOB STEP	PROGRAM	FILES	UNIT	INPUT/ OUTPUT UPDATE	RERUN O.K.
PSENT4	BM4ENT	BM1DUM		I	
		KPROGS		I	
		BM4OUT		U	

RERUN? ___ YES   _X_ RECOVERY BELOW

FORMS & ALIGNMENT

SPECIAL INSTRUCTIONS:

RECOVERY

REQUEST = BM118

Program BM118 will display
the last transaction entered
and the relative record num-
ber used. The operator may
now continue making entries.

REQUEST = PSENT4

CONTROL DATA CORPORATION

RUN SHEET

PROCEDURE: BMUPD

SYSTEM: BILL OF MATERIAL PROCESSOR

DESCRIPTION EDIT BILL OF MATERIAL MAINTENANCE TRANSACTIONS AND BUILD A NEW PRODUCT STRUCTURE FILE.

OPERATOR INSTRUCTIONS:						MASS STORAGE ASSIGNMENTS:			
REQUEST = BMUPD									

JOB STEP	PROGRAM	FILES	UNIT	INPUT/ OUTPUT UPDATE	RERUN O.K.	RERUN?	_____ YES __X__ RECOVERY BELOW		
BMUPD	BM101	BM10UT		I		**FORMS & ALIGNMENT**			
		BOMINP	—	O					
BMUPDA	SORT(109)	BOMINP		I		**SPECIAL INSTRUCTIONS:**			
		STRCHNG		O					
						PROCEDURE MUST BE RUN FROM THE SYSTEM CONSOLE.			
BMUPDB	BM110	PARTMST		I					
		HEADING		I					
		BOMSTR		I		RECOVERY			
		STRCHNG		I		BM101-			
		BOMSEQ		O		REQUEST = BMUPD			
		$LP1		O		SORT (109)-			
						REQUEST = BMUPDA			
BMUPDC	SORT(114)	BOMSEQ		I		BM110			
		BOMWOUT		O		REQUEST = BMUPDB			
						SORT114-			
BMUPDD	COPY	BOMWOUT		I		REQUEST = BMUPDC			
		BMWOUT		O		COPY-			
						REQUEST = BMUPDD			
BMUPDE	BM115	BOMWOUT		U		BM115-			
		BOMSEQ		I		REQUEST = BMUPDE			
		BOMMST		O		BM116-			
						REQUEST = BMUPDF			
BMUPDF	BM116	BOMWOUT		I		BMIN1-			
		BOMSTR		O		REQUEST = BMUPDG			
BMUPDG	BMIN1	BM10UT		U					

CONTROL DATA CORPORATION

RUN SHEET

PROCEDURE: _____ BILLS _____

SYSTEM: Bill of Material Processor

DESCRIPTION Print Bills of Material and where used lists

OPERATOR INSTRUCTIONS:						MASS STORAGE ASSIGNMENTS:		
REQUEST = BILLS								

JOB STEP	PROGRAM	FILES	UNIT	INPUT/ OUTPUT UPDATE	RERUN O.K.	RERUN?	___ YES _X_ RECOVERY BELOW	
BILLS	COPY	BM20UT		I		**FORMS & ALIGNMENT**		
		BM10UTA		O				
BILLSA	BM109	BM10UTA		I		**SPECIAL INSTRUCTIONS:**		
		BOMINP		O		PROCEDURE MUST BE EXECUTED		
						FROM THE SYSTEM CONSOLE.		
BILLSB	BM120	BOMMST		I				
		BOMSTR		I				
		BOMINP		I		RECOVERY		
		BOMWRK		O		RENAME- REQUEST = BILLS		
						BM109- REQUEST = BILLSA		
BILLSC	BM125	PARTMST		I		BM120-		
		HEADING		I		REQUEST = BILLSB		
		BOMWRK		I		BM125-		
		$LP1		O		REQUEST = BILLSC		
						BMIN2-		
BILLSD	BMIN2	BM20UT		U		REQUEST = BILLSD		

CONTROL DATA CORPORATION

RUN SHEET

PROCEDURE: ___BILLSC___

SYSTEM: __Bill of Material Processor__

DESCRIPTION Print costed bills of Material

OPERATOR INSTRUCTIONS:						MASS STORAGE ASSIGNMENTS:

REQUEST = BILLSC

JOB STEP	PROGRAM	FILES	UNIT	INPUT/ OUTPUT UPDATE	RERUN O.K.		
						RERUN?	——— YES __X__ RECOVERY BELOW
BILLC	COPY	BM30UT		I		**FORMS & ALIGNMENT**	
		BM10UTA		O			
						SPECIAL INSTRUCTIONS:	
BILLCA	BM109	BM10UTA		I			
		BOMINP		O			
						PROCEDURE MUST BE EXECUTED FROM THE SYSTEM CONSOLE.	
BILLCB	BM120	BOMMST		I			
		BOMSTR		I			
		BOMINP		I		RERUN/RECOVERY	
		BOMWRK		O		RENAME-	
						REQUEST = BILLC	
BILLCC	BM145	PARTMST		I		BM109-	
		HEADING		I		REQUEST = BILLCA	
		BOMWRK		I		BM120-	
		$LP1		O		REQUEST = BILLCB	
						BM145-	
BILLCD	BMIN3	BM30UT		U		REQUEST = BILLCC	
						BMIN3-	
						REQUEST = BILLCD	

GƏ CONTROL DATA
CORPORATION

RUN SHEET

PROCEDURE: _____ BILLCU _____

SYSTEM: Bill of Material Processor

DESCRIPTION Updates incremental and
cumulative costs in the parts mas-
ter file and print costed bills of
material.

OPERATOR INSTRUCTIONS:						MASS STORAGE ASSIGNMENTS:		
REQUEST = BILLCU								

JOB STEP	PROGRAM	FILES	UNIT	INPUT/ OUTPUT UPDATE	RERUN O.K.	RERUN?	____ YES / X RECOVERY BELOW	
BILLCU	COPY	BM40UT		I		FORMS & ALIGNMENT		
		BM10UTA		O				
						SPECIAL INSTRUCTIONS:		
BILLCUA	BM109	BM10UTA		I				
		BOMINP		O		PROCEDURE MUST BE EXECUTED FROM THE SYSTEM CONSOLE.		
BILLCUB	COPY {A}	PARTMST		I				
		BPARTMT		O				
						RECOVERY		
BILLCUC	BM130	ROUTING		I		RENAME- REQUEST = BILLCU		
		MACHMST		I		BM109- REQUEST = BILLCUA		
		LABMST		I		COPY {A}- REQUEST = BILLCUB		
		PARTMST		U		BM130- REQUEST = BILLCUC		
BILLCUD	COPY {B}	BOMSTR		I		COPY {B}- REQUEST = BILLCUD		
		BBMSTR		O		BM135- REQUEST = BILLCUE		
BILLCUE	BM135	BOMSTR		U		COPY {C}- REQUEST = BILLCUF		
		BM1DUM		I				
BILLCUF	COPY {C}	BOMSTR		I		COPY {D}- REQUEST = BILLCUJ		
		BBMSTR		O				
BILLCUJ	COPY {D}	PARTMST		I				
		BPARTMT		O				

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CONTROL DATA CORPORATION

RUN SHEET

PROCEDURE: ___BILLCU {Con't}___   DESCRIPTION

SYSTEM: __Bill of Material Processor__

OPERATOR INSTRUCTIONS:						MASS STORAGE ASSIGNMENTS:		
REQUEST = BILLCU								

JOB STEP	PROGRAM	FILES	UNIT	INPUT/ OUTPUT UPDATE	RERUN O.K.	RERUN?	_____ YES _X_ RECOVERY BELOW	
BILLCUG	BM140	PARTMST		U		**FORMS & ALIGNMENT**		
		BOMMST		I				
		BOMINP		I				
		BOMSTR		U		**SPECIAL INSTRUCTIONS:**		
		BOMWRK		O				
BILLCUH	BM145	BOMWRK		I		RECOVERY {Con't}		
		PARTMST		I		BM140-		
		HEADING		I		REQUEST = BILLCUG		
		$LP1		O		BM145-		
						REQUEST = BILLCUH		
BILLCUI	BMIN4	BM40UT		U		BMIN4-		
						REQUEST = BILLCUI		

GD CONTROL DATA
CORPORATION

RUN SHEET

PROCEDURE: __CSTALL__

SYSTEM: __BILL OF MATERIAL PROCESSOR__

DESCRIPTION UPDATE COST ON ALL
PRODUCTS

OPERATOR INSTRUCTIONS:						MASS STORAGE ASSIGNMENTS:	

REQUEST = CSTALL

JOB STEP	PROGRAM	FILES	UNIT	INPUT/OUTPUT UPDATE	RERUN O.K.
CSTALL	BM102	BOMMST		I	
		BOMCST		O	
CSTALLA	RENAME	BOMCST		I	
		BOMINP		O	
CSTALLB	COPY {B}	PARTMST		I	
		BPARTMT		O	
CSTALLC	BM130	ROUTING		I	
		MACHMST		I	
		LABMST		I	
		PARTMST		U	
CSTALLD	COPY {C}	BOMSTR		I	
		BBMSTR		O	
CSTALLE	BM135	BM1DUM		I	
		BOMSTR		U	
CSTALLF	COPY {D}	PARTMST		I	
		BPARTMT		O	
CSTALLG	COPY {E}	BOMSTR		I	
		BBMSTR		O	
CSTALLH	BM140	PARTMST		U	
		BOMSTR		U	
		BOMMST		I	
		BOMINP		I	
		BOMWRK		O	

RERUN? _____ YES
        __X__ RECOVERY BELOW

FORMS & ALIGNMENT

SPECIAL INSTRUCTIONS:

<u>RECOVERY</u>

BM102-
    REQUEST = CSTALL
RENAME-
    REQUEST = CSTALLA
COPY {B}-
    REQUEST = CSTALLB
BM130-
    REQUEST = CSTALLC
COPY {C}-
    REQUEST = CSTALLD
BM135-
    REQUEST = CSTALLE
COPY {D}-
    REQUEST = CSTALLF
COPY {E}-
    REQUEST = CSTALLG
BM140-
    REQUEST = CSTALLH

NOTE: PROCEDURES BMUPD, BILLS,
       BILLSC, BILLCU SHOULD
       NOT BE RUN WHILE THIS
       PROCEDURE IS BEING RUN.

REPORT DESCRIPTIONS

The bill of materials processor module produces several different reports with several selectable variations on these reports to provide the user with these basic types of information:

- Verification of updates to the product structure and indications of errors in those updates

- Bill of materials explosion of the composition of each part

- Where-used implosion of the items in which a part is used

- Costed bill of materials giving product costs computed on the basis of component costs

The following sections describe these reports in detail. Each section gives a general description of the report and what it is used for, tells how to request or produce the report, and gives a detailed description of what the various fields and columns in each report mean.

PRODUCT STRUCTURE FILE UPDATE LISTING

This report provides a listing of the day's updates to the bill of materials master product structure file. The listing may be used to check for errors in the updates entered and as a verification that any given update was performed as expected. For each update, the listing gives the relative record number, the parent, the component part, the quantity, and the action taken; that is, whether an add, change, delete, or multiple delete was performed. The report is produced by procedure BMUPD. Instructions on how to execute the procedure are given in the run sheet for the procedure. Figure 2-18 gives a sample of this listing and descriptions of the contents of the fields and columns in it.

BILL OF MATERIALS

This report shows the composition of each part in the user's inventory and is an exploded view of the structure and composition of each of the user's products. The report may be produced in a single-level form that shows only the major subcomponents composing part. The report may also be printed in a multiple-level form that shows the major components of each part and their subcomponents down to a maximum of 28 levels. For each part, the report gives header information, such as the part number and description, the quantity, the unit of measure and class, and the engineering revision date and engineering revision letter. Then a line is printed for each subcomponent and, in the case of multiple-level bills of materials, each of their subcomponents. In each of these lines, the following information is included: the line number, the level number, the part number and description, the quantity, the unit of measure and class, the inventory code, and the engineering revision letter. The report is produced by procedure BILLS. Instructions on how to execute this procedure are given in the run sheet for the procedure. Figures 2-19 and 2-20 give samples of multiple and single level bills of materials and descriptions of the contents of the fields and columns in them.

WHERE-USED LISTING

For each part in the inventory, this report shows in which assemblies the part is included. The report also shows where each part is used to assemble larger assemblies, and it is thus an imploded view of the structure of the user's products. The operator may decide to print this report in a single level form showing only the next higher level part in which the part in question is included, or the operator may print the report in a multiple level form that shows the parts in which a given part is included and the parts in which these are included up to a maximum of 28 levels. The report contains the same fields and columns as the bill of materials report (see Bill of Materials above). This report is produced by procedure BILLS. The run sheet for this procedure contains instructions on how to execute the procedure. Figures 2-21 and 2-22 give samples of single and multiple level where-used listings and descriptions of the contents of the fields and columns in them.

```
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                                  PRODUCT STRUCTURE FILE UPDATES

    RRN    PARENT        COMPONENT     QUANTITY   I/N    ACTION     ERRORS/REMARKS

      1   10-00200  .      6314          2.000            ADD
      2   3247            6473          3.000            ADD      ALREADY ON FILE
      4   3359            6473          1.000            ADD
      5   3359            9921          2.000            ADD
      3   6314           21036           .500            ADD
      6   9921           60022         1.500            CHG
      7   9921           60024         1.750            CHG
      8   9921           60156         2.000            CHG
      9   9921           90006                           DEL


   END OF JOB.  THERE WERE    4 ADDS,    3 CHANGES,   1 DELETES,   0MULT DELETES, AND    1 ERRORS.    81 RECORDS NOW EXIST.
```

Figure 2-18. Sample Product Structure File Update Listing Report

CONTROL DATA CORP.

BILL OF MATERIAL - MULTIPLE LEVEL

PART NUMBER	DESCRIPTION	QTY	UM	CLS	INV	REV DATE	REV LTR
2003R	CHASSIS PUMP UNIT	10	EA	F		0/00/00	

LINE	LEVEL	PART #	DESCRIPTION		STRUCTURE QUANTITY	UM	CLS	INV	REV LTR	EXTENDED QUANTITY
1	X	1480R	DRUM COVER	W	1	EA	M	N		10.000
2	X	2072R	CHASSIS PUMP		1	EA	M	N		10.000
3	XX	2073R-1	LUB AIR MOTOR		1	EA	M	N		10.000
4	XXX	1288	OUTLET VALVE BODY	23	1	EA	M		A	10.000
5	XXX	262	NIPPLE		1	EA	P			10.000
6	XXX	3015	O RING		1	EA	P			10.000
7	XXX	3042A	ACTUATING VALVE ASBLY		1	EA	M			10.000
8	XXXX	3042	VALVE ACTUATOR		1	EA	M			10.000
9	XXXX	3042B	NUT		1	EA	M			10.000
10	XXXX	3056	O RING		1	EA	P			10.000
11	XXX	3043	VALVE CAP		1	EA	M			10.000
12	XXX	3044	O RING (310-70)		3	EA	P			30.000
13	XXX	3045	VALVE SPRING		1	EA	P			10.000
14	XXX	3046	ACTUATOR GUIDE		1	EA	M			10.000
15	XXX	3047	VALVE SLEEVE		1	EA	M			10.000
16	XXX	3049	TUBE CAP		1	EA	M			10.000
17	XXX	3050	O RING (310-70)		2	EA	P			20.000
18	XXX	3051	O RING		3	EA	P			30.000
19	XXX	3052	VALVE SPOOL		1	EA	M			10.000
20	XXX	3053	VALVE BODY	1	1	EA	M			10.000
21	XXX	3054	CUSHION SPRING		1	EA	P			10.000
22	XXX	3055	RETAINER RING		2	EA	M			20.000
23	XXX	3057	TRANSFER TUBE		1	EA	P			10.000
24	XXX	3058	O RING		1	EA	P			10.000
25	XXX	3059	PISTON BODY		1	EA	M			10.000
26	XXX	3061	ANCHOR NUT		1	EA	M			10.000
27	XXX	3062	DISC RETAINER	29	1	EA	M			10.000
28	XXX	3063	ROD RETAINER	29	1	EA	M			10.000
29	XXX	3064	PUMP ROD		1	EA	M			10.000
30	XXX	3065	AIR CYLINDER		1	EA	M			10.000
31	XXX	3066	O RING		2	EA	P			20.000
32	XXX	3067	BASE	2	1	EA	M			10.000
33	XXX	3480	O-RING		1	EA	P			10.000
34	XXX	4659	SEAL		1	EA	P			10.000
35	XXX	4659MB	MODULAR BEARING		1	EA	P			10.000
36	XXX	4663P	BASE ADAPTER		1	EA	M			10.000
37	XXX	4664	SEAL RETAINER		1	EA	P			10.000
38	XXX	715	GASKET		1	EA	P			10.000
39	XXX	9C	O RING, A-111 BUNA-N 70		1	EA	P		A	10.000
40	XX	2072R-2	LUB STEM		1	EA	M	N		10.000
41	XXX	1206	PISTON HOUSING	10	1	EA	P			10.000
42	XXX	1207	PRIMER HOUSING		1	EA	M			10.000
43	XXX	1209A	SEAT & ROD ASBLY	A	1	EA	P			10.000
44	XXXX	1208	BALL SEAT		1	EA	M			10.000
45	XXXX	1211	PRIMER ROD		1	EA	M			10.000
46	XXXX	30	ROLL PIN (3/32*9/16 CAD.)		1	EA	P		A	10.000
47	XXX	1209R	SLEEVE		1	EA	M			10.000
48	XXX	1210R	PISTON		1	EA	M			10.000
49	XXX	1212	VALVE BODY		1	EA	P			10.000
50	XXX	1212S	SPACER		1	EA	M		A	10.000
51	XXX	1213	VALVE DISC		1	EA	P			10.000
52	XXX	1214A	FOOT VALVE ASBLY	A	1	EA	M			10.000
53	XXXX	1214	FOOT VALVE BODY		1	EA	M		A	10.000
54	XXXX	1240	RETAINING NUT		1	EA	M		A	10.000
55	XXXX	593	SEAL, PRIMER ROD		2	EA	P		A	20.000
56	XXX	1222	CHECK SPRING		1	EA	P			10.000
57	XXX	1235A	STRAINER ASBLY		1	EA	M			10.000
58	XXXX	1235	INTAKE SCREEN		1	EA	P			10.000
59	XXXX	1236	SCREEN RETAINER		1	EA	P			10.000
60	XXXX	1238	INTAKE BODY		1	EA	M			10.000
61	XXXX	258C	SCREW		3	EA	P			30.000
62	XXX	1271	SPACER TUBE	9	1	EA	M			10.000
63	XXX	1274	PUMP ROD	38	1	EA	M			10.000
64	XXX	1285	MOUNTING ADAPTER	8	1	EA	M			10.000
65	XXX	3180	SHAKEPROOF NUT		2	EA	P			20.000
66	XXX	375	BALL (5/16 GRD 200,440 S)		1	EA	P		A	10.000
67	XXX	757	SCREW		1	EA	P			10.000
68	X	4042H	HOSE ASBLY		1	EA	M	N		10.000
69	X	6048R	HOSE:4C-4MS-48.00"		1	EA	P	N		10.000
70	X	918	AIR COUPLER		1	EA	P			10.000

NOTES:

(1) CLASS:

F   FINISHED GOODS
M   ASSEMBLY
P   PURCHASED GOODS

(2) INVENTORY CODE:

Y   YES, INVENTORIED
N   NO, NOT INVENTORIED

Figure 2-19. Sample Multiple Level Bill of Materials Report

BILL OF MATERIAL -   SINGLE LEVEL

PART NUMBER   DESCRIPTION   QTY UM CLS INV REV DATE REV LTR
2072RK-1   PUMP   10 EA F   N   0/00/00

LINE	LEVEL	PART #	DESCRIPTION	STRUCTURE QUANTITY	UM	CLS	INV	REV LTR	EXTENDED QUANTITY
1	X	3016	O RING	1	EA	P			.000
2	X	3042A	ACTUATING VALVE ASELY	1	EA	M			.000
3	X	3043	VALVE CAP	1	EA	M			.000
4	X	3044	O RING (310-70)	3	EA	P			.000
5	X	3045	VALVE SPRING	1	EA	P			.000
6	X	3046	ACTUATOR GUIDE	1	EA	M			.000
7	X	3047	VALVE SLEEVE	1	EA	M			.000
8	X	3049	TUBE CAP	1	EA	M			.000
9	X	3050	O RING (310-70)	2	EA	P			.000
10	X	3051	O RING	3	EA	P			.000
11	X	3052	VALVE SPOOL	1	EA	M			.000
12	X	3053	VALVE BODY 1	1	EA	M			.000
13	X	3054	CUSHION SPRING	1	EA	P			.000
14	X	3055	RETAINER RING	2	EA	M			.000
15	X	3065	AIR CYLINDER	1	EA	M			.000
16	X	3066	O RING	2	EA	P			.000
17	X	3075A	FOOT VALVE ASBLY A	1	EA	M			.000
18	X	4801	ROD RETAINER 29	1	EA	M		A	.000
19	X	4803	ANCHOR NUT	1	EA	M		A	.000
20	X	4812	BASE, AIR MOTOR	1	EA	M		A	.000
21	X	715	GASKET	1	EA	P			.000

Figure 2-20.   Sample Single Level Bill of Materials Report

COSTED BILL OF MATERIALS REPORT

This report gives the production costs for each product in the user's inventory computed on the basis of the production cost of each of the product's components, which are also shown. For each part, the report gives the part number, description, and unit of measure. Then a line is printed for each component of the part giving the level; the part number and description; the extended quantity; the unit of measure; the costs for material, labor, and burden; the total cost; and the extended cost. A final line is then printed giving totals of the quantities and costs of the components; that is, the cost of the major product in question. This report is printed by procedure BILLSC. Instructions on how to execute the procedure are given in the run sheet for the procedure. Figures 2-23 and 2-24 give samples of costed bills of materials at average and standard and descriptions of the contents of fields and columns in them.
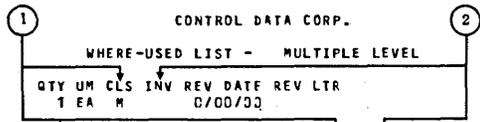
① CONTROL DATA CORP. ②   2/16/77

WHERE-USED LIST -   MULTIPLE LEVEL

PART NUMBER DESCRIPTION   QTY UM CLS INV REV DATE REV LTR
3042   VALVE ACTUATOR   1 EA M   0/00/00

LINE	LEVEL	PART #	DESCRIPTION	STRUCTURE QUANTITY	UM	CLS	INV	REV LTR	EXTENDED QUANTITY
1	X	3042A	ACTUATING VALVE ASBLY	1	EA	M			.000
2	XX	2053R-1	3" OIL AIR MOTOR	1	EA	M	N		.000
3	XXX	2053R	OIL PUMP (55GAL/120#,3:1)	1	EA	M	N		.000
4	XXXX	2010RK	AIR OP. GEAR OIL UNIT	1	EA	F	N		.000
5	XXXX	2010TRK	AIR OPERATED ATF UNIT	1	EA	F	N		.000
6	XXXX	2011R	AIR OP. GEAR OIL UNIT	1	EA	F	N		.000
7	XXXX	2011TR	AIR OP. T.F. UNIT	1	EA	F	N		.000
8	XXXX	2053RA	OIL PUMP UNIT	1	EA	F			.000
9	XXXX	2053RAC	OIL PUMP UNIT	1	EA	F			.000
10	XXXX	2053RT	OIL PUMP UNIT	1	EA	F	N		.000
11	XXX	2053RHR	OIL PUMP (55GAL/120#,P:1)	1	EA	M	N		.000
12	XXXX	2053RHRA	OIL PUMP UNIT	1	EA	F			.000
13	XXXX	2053RHRT	OIL PUMP UNIT	1	EA	F	N		.000
14	XXX	2082PR	STUB PUMP (4:1)	1	EA	M	N		.000
15	XXXX	2082PRA	STUB PUMP UNIT	1	EA	F	N		.000
16	XX	2053RD-1	AIR MOTOR	1	EA	M	N		.000
17	XXX	2053RD	OIL PUMP (55GAL,3:1)	1	EA	M	N		.000
18	XXXX	2053RDA	OIL PUMP UNIT	1	EA	F			.000
19	XXXX	2053RDT	OIL PUMP UNIT	1	EA	F			.000
20	XXX	2082PRD	STUB PUMP (3:1)	1	EA	M	N		.000
21	XXXX	2082PRDA	STUB PUMP UNIT	1	EA	F	N		.000
22	XX	2054R-1	AIR MOTOR	1	EA	M	N		.000
23	XXX	2054R	OIL PUMP (55GAL/120#,5:1)	1	EA	M	N		.000
24	XXXX	2054RA	OIL PUMP UNIT	1	EA	F			.000
25	XXX	2054RHR	OIL PUMP(55GAL/120#,14:1)	1	EA	M	N		.000
26	XXXX	2054RHRA	OIL PUMP UNIT	1	EA	F			.000
27	XXX	2085PR	STUB PUMP (8:1)	1	EA	M	N		.000
28	XXXX	2085PRA	STUB PUMP UNIT	1	EA	F	N		.000
29	XX	2054RD-1	AIR MOTOR	1	EA	M	N		.000
30	XXX	2054RD	OIL PUMP	1	EA	M	N		.000
31	XXXX	2054RDA	OIL PUMP UNIT	1	EA	F			.000
32	XXXX	2054RDT	OIL PUMP UNIT	1	EA	F	N		.000
33	XXX	2085PRD	STUB PUMP	1	EA	M	N		.000
34	XXXX	2085PRDA	STUB PUMP UNIT	1	EA	F	N		.000
35	XX	2060RK-1	RUST PROOF AIR MOTOR	1	EA	M	N		.000
36	XXX	2060RK	RUST PROOF PUMP	1	EA	M	N		.000
37	XXX	2062RK	RUST PROOF PUMP	1	EA	M	N		.000
38	XXXX	2215RK	RUST PROOF UNIT, 16 GAL	1	EA	F	N		.000
39	XXX	2063RK	RUST PROOF PUMP	1	EA	M	N		.000
40	XXXX	2255RBK	RUST PROOF UNIT, 55 GAL	1	EA	F	N		.000
41	XXXX	2255RK	RUST PROOF UNIT, 55 GAL	1	EA	F	N		.000
42	XX	2070R-1	LUB AIR MOTOR	1	EA	M	N		.000
43	XXX	2070R	CHASSIS PUMP	1	EA	M	N		.000
44	XXXX	2002R	CHASSIS LUBRICATOR	1	EA	F	N		.000
45	XXXX	472R	CHASSIS LUBRICATOR	1	EA	F	N		.000
46	XXX	2072R	CHASSIS PUMP	1	EA	M	N		.000
47	XXXX	2001R	AIR OP. CHASSIS UNIT	1	EA	F	N		.000
48	XXXX	2003R	CHASSIS PUMP UNIT	1	EA	F			.000
49	XXXX	2005R	AIR OPERATED CHASSIS UNIT	1	EA	F	N		.000

NOTES:

① CLASS:

F FINISHED GOODS
M ASSEMBLY
P PURCHASED GOODS

② INVENTORY CODE:

Y YES, INVENTORIED
N NO, NOT INVENTORIED

Figure 2-21.   Sample Multiple Level Where-Used List Report

PAGE   1   CONTROL DATA CORP.   2/16/77

WHERE-USED LIST -   SINGLE LEVEL

PART NUMBER DESCRIPTION   QTY UM CLS INV REV DATE REV LTR
593   SEAL, PRIMER ROD   1 EA F   10/27/76   A

LINE	LEVEL	PART #	DESCRIPTION	STRUCTURE QUANTITY	UM	CLS	INV	REV LTR	EXTENDED QUANTITY
1	X	1214A	FOOT VALVE ASBLY	A 2	EA	M			.000

Figure 2-22.   Sample Single Level Where-Used List Report

CONTROL DATA CORP.

COSTED BILL OF MATERIAL-AVERAGE

2/16/77

PART NUMBER	DESCRIPTION	UM	INV
2003R	CHASSIS PUMP UNIT	EA	

① UM ② INV ③ O.P.

NO.	LEVEL	PART NUMBER	DESCRIPTION		EXTENDED QUANTITY	UM	MATERIAL	LABOR	BURDEN	O.P.	TOTAL	EXTENDED TOTAL
***		2003R	TOP ASSEMBLY		1.000	EA						
1	X	1480R	DRUM COVER	W	10.000	EA					.000	.000
2	X	2072R	CHASSIS PUMP		10.000	EA					.000	.000
3	XX	2070R-1	LUB AIR MOTOR		10.000	EA					.000	.000
4	XXX	1288	OUTLET VALVE BODY	23	10.000	EA					.000	.000
5	XXX	262	NIPPLE		10.000	EA	.294				.294	2.940
6	XXX	3016	O RING		10.000	EA	.041				.041	.410
7	XXX	3042A	ACTUATING VALVE ASBLY		10.000	EA					.000	.000
8	XXXX	3042	VALVE ACTUATOR		10.000	EA					.000	.000
9	XXXX	3042B	NUT		10.000	EA					.000	.000
10	XXXX	3056	O RING		10.000	EA	.019				.019	.190
11	XXX	3043	VALVE CAP		10.000	EA					.000	.000
12	XXX	3044	O RING (310-70)		30.000	EA	.479				.479	14.370
13	XXX	3045	VALVE SPRING		10.000	EA	.105				.105	1.050
14	XXX	3046	ACTUATOR GUIDE		10.000	EA					.000	.000
15	XXX	3047	VALVE SLEEVE		10.000	EA				.100	.000	.000
16	XXX	3049	TUBE CAP		10.000	EA					.000	.000
17	XXX	3050	O RING (310-70)		20.000	EA	.031				.031	.620
18	XXX	3051	O RING		30.000	EA	.048				.048	1.440
19	XXX	3052	VALVE SPOOL		10.000	EA					.000	.000
20	XXX	3053	VALVE BODY	1	10.000	EA					.000	.000
21	XXX	3054	CUSHION SPRING		10.000	EA					.000	.000
22	XXX	3055	RETAINER RING		20.000	EA					.000	.000
23	XXX	3057	TRANSFER TUBE		10.000	EA					.000	.000
24	XXX	3058	O RING		10.000	EA	.112				.112	1.120
25	XXX	3059	PISTON BODY		10.000	EA					.000	.000
26	XXX	3061	ANCHOR NUT		10.000	EA					.000	.000
27	XXX	3062	DISC RETAINER	29	10.000	EA				.030	.000	.000
28	XXX	3063	ROD RETAINER	29	10.000	EA					.000	.000
29	XXX	3064	PUMP ROD		10.000	EA				.100	.000	.000
30	XXX	3065	AIR CYLINDER		10.000	EA					.000	.000
31	XXX	3066	O RING		20.000	EA	.083				.083	1.660
32	XXX	3067	BASE	2	10.000	EA					.000	.000
33	XXX	3480	O-RING		10.000	EA	.018				.018	.180
34	XXX	4659	SEAL		10.000	EA	.733				.733	7.330
35	XXX	4659M9	MODULAR BEARING		10.000	EA	.934				.934	9.340
36	XXX	4663B	BASE ADAPTER		10.000	EA					.000	.000
37	XXX	4664	SEAL RETAINER		10.000	EA					.000	.000
38	XXX	715	GASKET		10.000	EA	.122				.122	1.220
39	XXX	9C	O RING, A-111 BUNA-N 70		10.000	EA	.016				.016	.160
40	XX	2072R-2	LUB STEM		10.000	EA					.000	.000
41	XXX	1206	PISTON HOUSING	10	10.000	EA					.000	.000
42	XXX	1207	PRIMER HOUSING		10.000	EA					.000	.000
43	XXX	1208A	SEAT & ROD ASSLY	A	10.000	EA					.000	.000
44	XXXX	1208	BALL SEAT		10.000	EA					.000	.000
45	XXXX	1211	PRIMER ROD		10.000	EA					.000	.000
46	XXXX	30	ROLL PIN (3/32*9/16 CAD.)		10.000	EA	.007				.007	.070
47	XXX	1209R	SLEEVE		10.000	EA					.000	.000
48	XXX	1210R	PISTON		10.000	EA					.000	.000
49	XXX	1212	VALVE BODY		10.000	EA	.051				.051	.510
50	XXX	1212S	SPACER		10.000	EA					.000	.000
51	XXX	1213	VALVE DISC		10.000	EA	.039				.039	.390
52	XXX	1214A	FOOT VALVE ASBLY	A	10.000	EA					.000	.000
53	XXXX	1214	FOOT VALVE BODY		10.000	EA					.000	.000
54	XXXX	1240	RETAINING NUT		10.000	EA					.000	.000
55	XXXX	593	SEAL, PRIMER ROD		20.000	EA	.090				.090	1.800
56	XXX	1222	CHECK SPRING		10.000	EA					.000	.000
57	XXX	1238A	STRAINER ASBLY		10.000	EA					.000	.000
58	XXXX	1235	INTAKE SCREEN		10.000	EA	.098				.098	.980
59	XXXX	1236	SCREEN RETAINER		10.000	EA	.116				.116	1.160
60	XXXX	1238	INTAKE BODY		10.000	EA					.000	.000
61	XXXX	259C	SCREW		30.000	EA	.017				.017	.510
62	XXX	1271	SPACER TUBE	9	10.000	EA					.000	.000
63	XXX	1274	PUMP ROD	36	10.000	EA					.000	.000
64	XXX	1286	MOUNTING ADAPTER	9	10.000	EA	1.349			.050	1.349	13.490
65	XXX	313B	SHAKEPROOF NUT		20.000	EA	.025				.025	.500
66	XXX	37S	BALL (5/16 GRD 200/440 S)		10.000	EA	.022				.022	.220
67	XXX	757	SCREW		10.000	EA	.024				.024	.240
68	X	4042H	HOSE ASBLY		10.000	EA					.000	.000
69	X	6048H	HOSE:4C-4MS-48.00"		10.000	EA	4.097				4.097	40.970
70	X	918	AIR COUPLER		10.000	EA	.847				.847	8.470

TOTAL LABOR/UNIT   .000 HRS   EXTENDED TOTALS   .000   .000   .000   .000   .000   .000

UNIT COSTS NOT UPDATED

****

NOTES:

① UNIT OF MEASURE

② INVENTORY TYPE

③ OUTSIDE PROCESSING

Figure 2-23. Sample Average Costed Bill of Materials Report

COSTED BILL OF MATERIAL-AT STANDARD

PART NUMBER	DESCRIPTION	UM	INV
2072RK-1	PUMP	EA	N

NO.	LEVEL	PART NUMBER	DESCRIPTION		EXTENDED QUANTITY	UM	- - - - - - - U N I T C O S T S - - - - - - - - -					EXTENDED TOTAL
							MATERIAL	LABOR	BURDEN	O.P.	TOTAL	
***		2072RK-1	TOP ASSEMBLY		1.000	EA						
1	X	3016	O RING		.000	EA	.042				.042	.000
2	X	3042A	ACTUATING VALVE ASBLY		.000	EA	1.190				1.190	.000
3	X	3043	VALVE CAP		.000	EA	.820				.820	.000
4	X	3044	O RING (310-70)		.000	EA	.024				.024	.000
5	X	3045	VALVE SPRING		.000	EA	.113				.113	.000
6	X	3046	ACTUATOR GUIDE		.000	EA	.670				.670	.000
7	X	3047	VALVE SLEEVE		.000	EA	.930			.100	.930	.000
8	X	3049	TUBE CAP		.000	EA	.150				.150	.000
9	X	3050	O RING (310-70)		.000	EA	.032				.032	.000
10	X	3051	O RING		.000	EA	.051				.051	.000
11	X	3052	VALVE SPOOL		.000	EA	.570				.570	.000
12	X	3053	VALVE BODY	1	.000	EA	3.200				3.200	.000
13	X	3054	CUSHION SPRING		.000	EA	.420				.420	.000
14	X	3055	RETAINER RING		.000	EA	.025				.025	.000
15	X	3065	AIR CYLINDER		.000	EA	1.590				1.590	.000
16	X	3066	O RING		.000	EA	.124				.124	.000
17	X	3075A	FOOT VALVE ASBLY	A	.000	EA	1.760				1.760	.000
18	X	4801	ROD RETAINER	29	.000	EA	.430				.430	.000
19	X	4803	ANCHOR NUT		.000	EA	.210				.210	.000
20	X	4812	BASE, AIR MOTOR		.000	EA	2.920				2.920	.000
21	X	715	GASKET		.000	EA	.119				.119	.000

TOTAL LABOR/UNIT	.000 HRS	EXTENDED TOTALS	.000	.000	.000	.000		.000

****

Figure 2-24.   Sample Standard Costed Bill of Materials Report

This section contains external specifications for the bill of materials processor application module. Therefore, it serves two separate purposes:

- Reference – Because of its organization and the table of contents in this manual, this section provides an easy-to-use reference and source of information for the reader who is already familiar with the module.

- Definition – This section defines the module, its capabilities, its limitations, the user interface with the module, and the interface between the module and other systems. Thus, the reader may look to this section to determine what can and cannot be expected from the system.

This section is not intended to be used as an introduction or learning text for the bill of materials processor module. It is a reference document to enable a user acquainted with the application area and the use of the bill of materials processor module to find details about the system. The reader should already be familiar with the information presented in section 2, User Information.

The remainder of this section is divided into separate subsections, one for each of the areas that is visible to and affects the reader. These areas are: data entry and capture, control statements and commands, reports, and other functions and services.

DATA ENTRY AND CAPTURE

Bill of Materials Processor 1, like other modules in the manufacturing and distribution system, uses two basic methods for the input of data:

- Interactive data entry. The module provides procedures that enable the operator to communicate with the system through a CRT terminal. Data is entered by the operator in response to a prompt on the CRT screen for each data item to be entered. The particular procedure executed and the options selected during the execution of that procedure determine the particular data items prompted and the use made of the data items entered within the system.

- Data capture from other modules. To avoid duplication of work, when this module is used in conjunction with certain other modules in the manufacturing and distribution system, this module captures data for those other modules, and those other modules capture data to be used by this module. This communication is provided by the sharing of certain files used in common by more than one module in the manufacturing and distribution system. The specific modules and information shared is specified below.

INTERACTIVE DATA ENTRY

This module provides a procedure that enables the operator to update information on the product structure contained in the user's product structure master file. The procedure is interactive in that the procedure displays a prompt for each item of information to be entered; the operator responds to the prompt by entering an item of information; and then the procedure responds to the operator's entry by displaying messages to indicate any errors in the operator entry and continuing on to prompt the next item of information to be entered. This procedure enables the operator to input the following information into the product structure master file:

- Parent part number

- Component part number

- Quantity

- Inventory code

DATA CAPTURE FROM OTHER MODULES

To avoid entering the same data through more than one module and to avoid the errors possible with such duplicate data entry, Bill of Materials Processor 1 captures data that is entered and maintained through other modules in the manufacturing and distribution system. This module obtains information on the user's inventory from the inventory control module. The bill of materials processor module obtains routing information to be used to calculate costed bill of materials reports. This module also provides the material requirements planning module with the product structure information that that module uses in determining material requirements. The mechanism that provides this communication between modules is the use of shared files used in common by more than one module. The routing file is maintained in the routing application module and used by the bill of materials processor module. Information in the parts master file is entered and maintained through the inventory control module and used by the bill of materials processor module. The bill of materials processor module is used to enter and maintain information in the product structure file; that information is used by the material requirements planning module.

STATEMENTS AND COMMANDS

Since the operator interacts with the application module through the CRT terminal, the statements and commands used to initiate procedures, to control these procedures while they execute, and to terminate procedures provide the human-machine interface. To facilitate communication across this interface, these statements and commands have

been given a format that is simple and yet powerful enough to enable the user to perform any tasks required. In the bill of materials processor application module there are two basic types of commands and statements: job control language and procedure control language.

JOB CONTROL LANGUAGE

This language is used to initiate procedures and to request menus. The commands in this language are only applicable and may only be used when the terminal at which the operator is working is not currently executing a procedure. The general format for this job control language is:

System prompt: REQUEST=

User entry: $\left\{ \begin{matrix} \text{menu code (BM)} \\ \text{procedure name} \end{matrix} \right\}$

Entering the name of a procedure causes the operating system to initiate execution of that procedure. Entering the menu code, BM, causes the operating system to display the names and descriptions of the procedures in Bill of Materials Processor 1. At the end of this list is the prompt:

SELECTION   =   [   ]

The user may then enter the number of the procedure he wishes to execute. (This number is taken from the list displayed on the screen.)

In the case of program or system failure during procedure execution, it is also possible to execute job steps within a procedure, even though the names of these job steps do not appear in the menu for the module. However, the user should be aware that arbitrarily executing a job step in the middle of a procedure (without having executed the previous job steps) could destroy the integrity of the files utilized by the procedure. Thus, executing any job step within a procedure must be done with extreme caution, only after consulting the appropriate run sheet for the use of that job step during restart and only after performing all the steps and obeying all the restrictions specified in that run sheet.

PROCEDURE CONTROL ENTRIES

These are the entries the operator makes while running a procedure from his terminal. Thus, in the bill of materials processor module, the procedure control entries consist of all those used to enter data and to update information stored in the system. For the most part, these entries are data that is entered in response to prompts displayed by the system, though in some cases the operator may also enter options that allow him to choose from among different blocks of information he may wish to update or from among different types of entries and records he may wish to create. The operating instructions in the User Information section contain a set of general instructions for the use of the CRT terminal that specify the general format of entries made by the operator and individual operating instructions for each procedure that calls for interactive communication from the operator. The user should consult both of these sources for information on the format and content of the entries to be made during the execution of any given procedure from the CRT terminal.

REPORTS

The reports printed by the bill of materials processor module provide both a source of information and a means of obtaining a hard copy and a permanent record of information contained in the data files. These reports may also be used as a means of obtaining a permanent record of information that is extremely voluminous. (The user should be aware, however, that if individual and scattered items of information are needed or if there is a requirement that the information needed be up-to-the-minute, then rather than printing a report, the user may employ the inquiry facility provided to enable him to display information contained in the system on the CRT terminal.) Each of the reports is obtained by initiating the procedure that produces it from the CRT terminal. A more detailed description of these reports, including the name of the procedure that produces each one, can be found in section 2. The remainder of this subsection contains only brief summaries of the content of each report.

● The product structure file update listing gives the day's updates to the product structure master file.

● The bill of materials reports show the composition of each part in the user's inventory and are therefore an exploded view of the structure and composition of each of the user's products. These reports may be produced in either a single level form or in a multiple level form giving up to 28 levels of the subcomponents of each product.

● The where-used listings show where each part is used in the production of other higher level assemblies. This report can also be produced in a single or multiple level form.

● The costed bill of materials gives the production costs for each product in the user's inventory computed on the basis of the production cost of each of that product's components.

This section contains information on the design and implementation of the bill of materials processor application module and is of interest to personnel who have questions and problems concerning the installation of the manufacturing and distribution system modules at their site. This section explains the internal organization and functioning of the bill of materials processor module, and thus enables an applications programmer at the user's site to solve problems concerning the internal functioning of the procedure and programs in this module. This section contains several different kinds of implementation and design information:

- Organization – The organization, structure, and overall design of the module

- Program information – A narrative describing the task performed by each program in the module

- File information – Tables giving the layout of each file, with one table listing the programs that reference the file.

MODULE ORGANIZATION AND STRUCTURE

The bill of materials processor module, like other modules in the manufacturing and distribution system, is organized into procedures, each composed of procedure steps, each of which is composed of programs. The operator at a CRT terminal executes procedures. If recovery for a given procedure becomes necessary, the operator should refer to the run sheets for the action to be taken and the procedure steps to be executed. An overview of the organization of the programs from which the procedures are formed and the files these programs operate on within the bill of materials application module is given in figure 4-1. The structure and composition of each procedure may be found in the run sheet for that procedure in the User Information section of this manual. These run sheets contain the names of the procedure steps within each procedure and the names of the programs that make up each of these procedure steps.

PROGRAM NARRATIVES

The following program narratives give brief descriptions of the particular programs within the bill of materials application module. It should be kept in mind that the operator at a terminal does not execute individual programs, but rather a procedure or procedure steps, each of which is composed of one or more programs. Thus, the reader may have to refer to several program narratives to obtain a description of the programs within a given procedure and the task it performs. The run sheet together with the program narratives for the programs listed on the run sheet provides a comprehensive description of the task performed by a given procedure. Since there is a separate narrative for each individual program, the reader may learn what part of a procedure's task is performed by which program.

BM1ENT ENTER UPDATES TO PRODUCT STRUCTURE MASTER FILE

This program uses parameter file MFG100 for entering updates to the product structure master file (BOMSTR) and subsequently to the bill of materials master file (BOMMST).

BM2ENT REQUEST BILL OF MATERIALS AND WHERE-USED LISTINGS

This program uses parameter file MFG105 to enter requests for explosions for bill of materials and implosions for where-used lists.

BM3ENT REQUEST COSTED BILL OF MATERIALS LISTING

This program uses parameter file MFG105 to enter requests for explosions for costed bills of material.

BM4ENT REQUEST COSTED BILL OF MATERIALS LISTING

This program uses parameter file MFG105 to enter requests for explosions for costed bills of material with product cost updating.

BMIN1 INITIALIZE BM1OUT

This program initializes BM1OUT with the characters < and > in positions 1 and 2 of all records.

BMIN2 INITIALIZE BM2OUT

This program initializes BM2OUT with the characters < and > in positions 1 and 2 of all records.

BMIN3 INITIALIZE BM3OUT

This program initializes BM3OUT with the characters < and > in positions 1 and 2 of all records.

BMIN4 INITIALIZE BM4OUT

This program initializes BM4OUT with the characters < and > in positions 1 and 2 of all records.

BM101 CREATE BOMINP

This program creates the file BOMINP by outputting all nonblank records from BM1OUT.
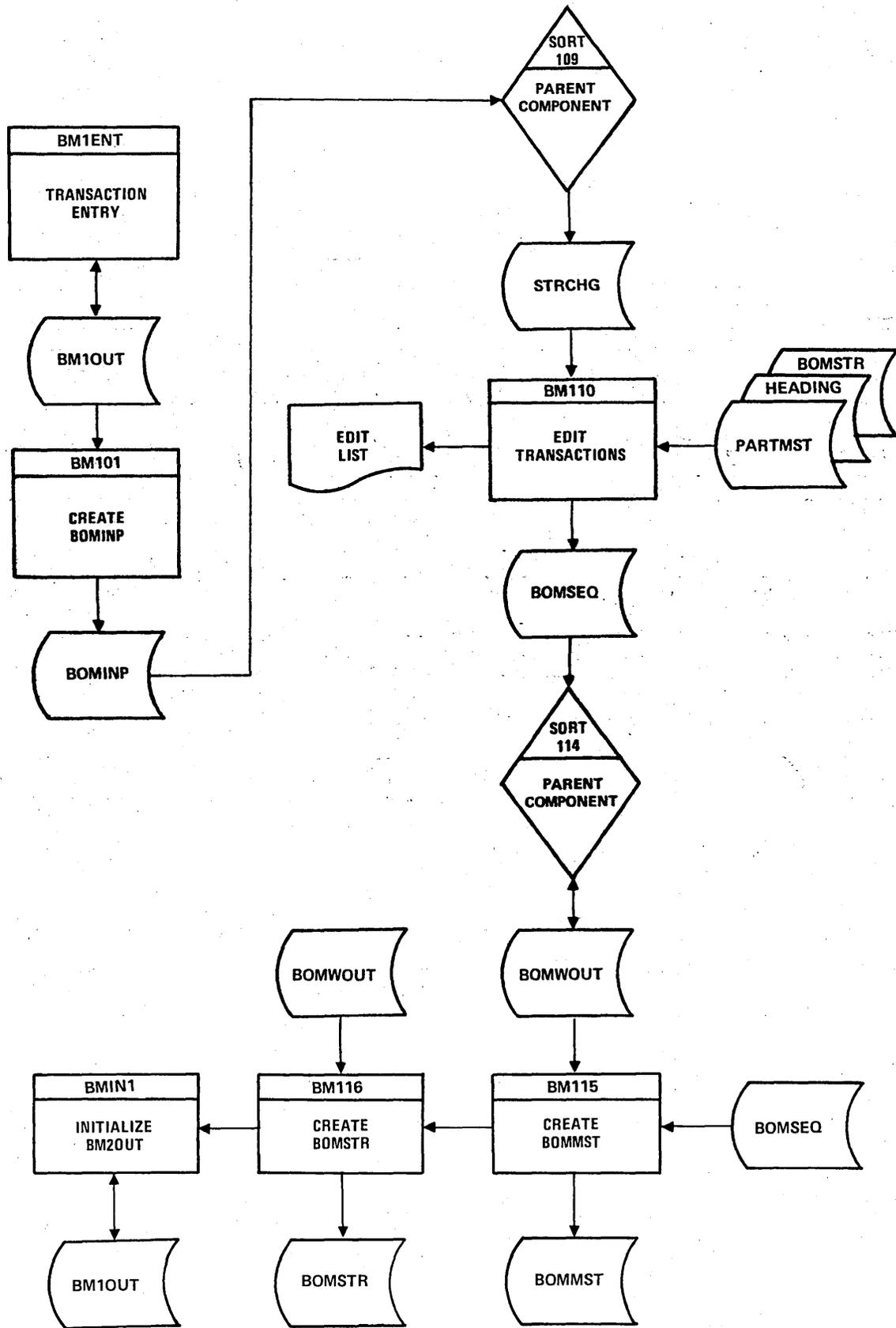
Figure 4-1. Bill of Materials Application Flow Chart (Sheet 1 of 4)
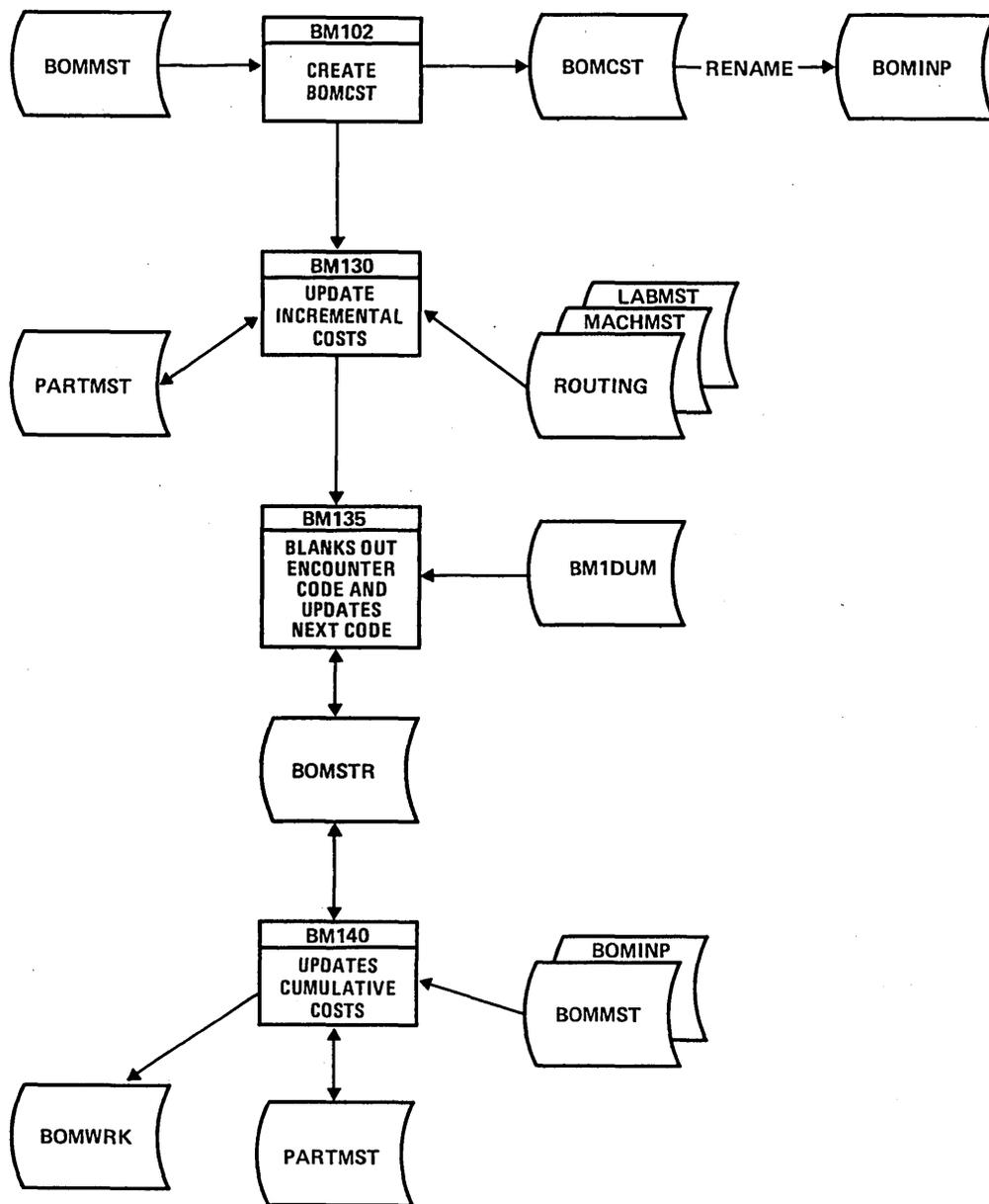
Figure 4-1. Bill of Materials Application Flow Chart (Sheet 2 of 4)

BM102 CREATE BOMCST

In BOMMST, a finished good has a zero-value in the where-used relative record number field. For every finished good in BOMMST, a record is output to BOMCST.

BM107 DISPLAY LAST TRANSACTION

This program displays on the terminal screen the last transaction entered and the relative record number used in file BM1OUT.
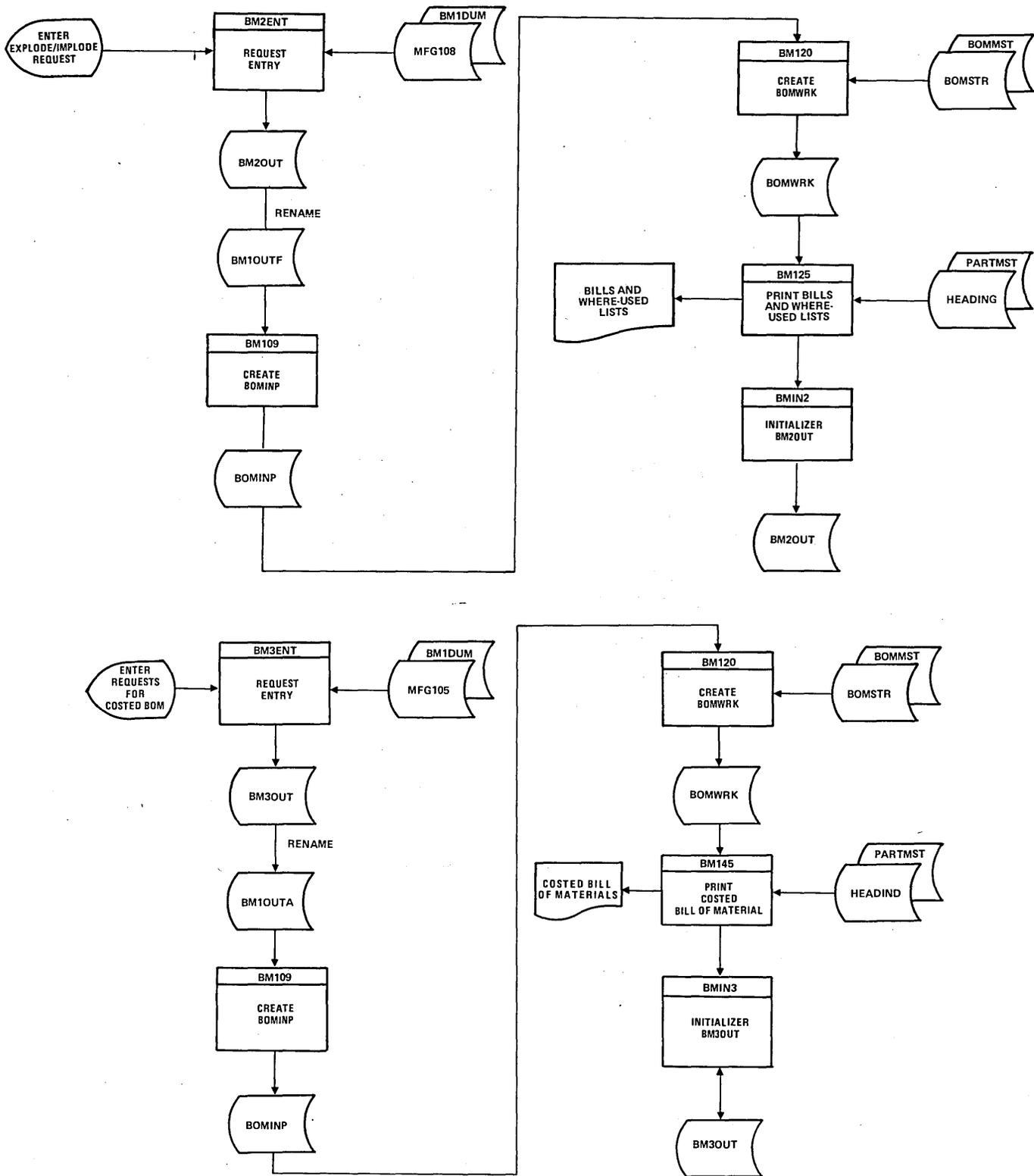
Figure 4-1. Bill of Materials Application Flow Chart (Sheet 3 of 4)
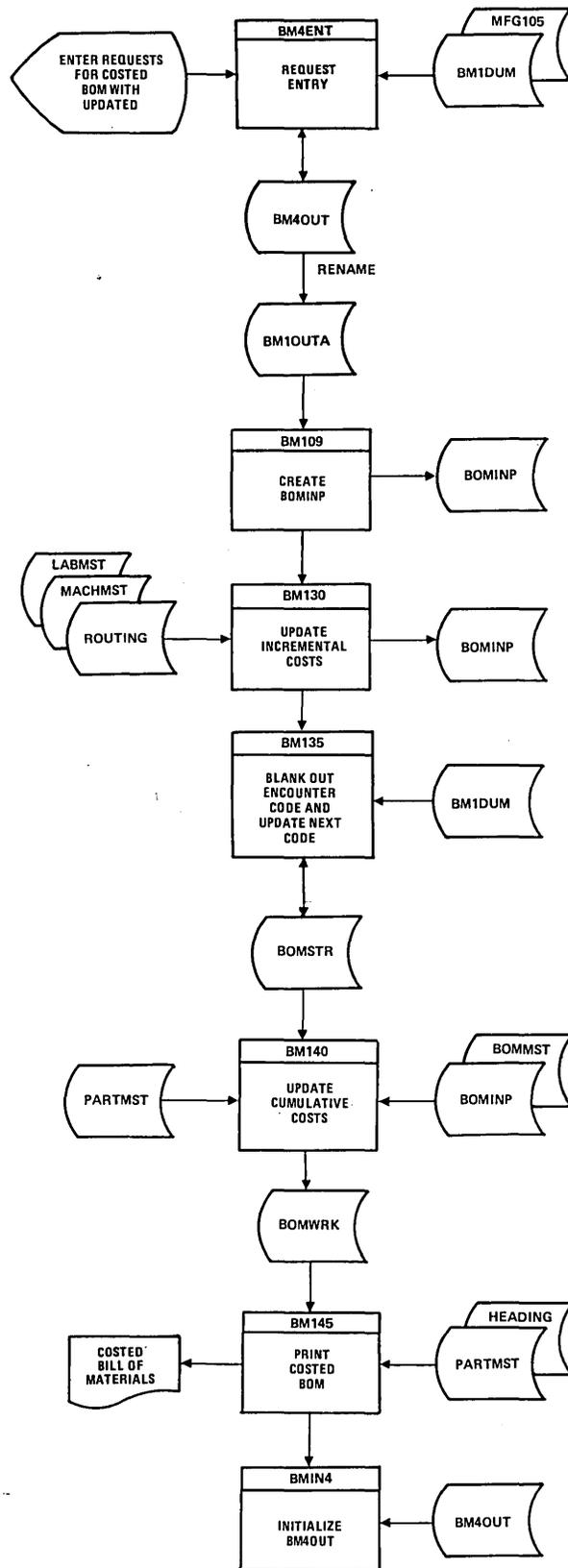
Figure 4-1. Bill of Materials Application Flow Chart (Sheet 4 of 4)

BM108 DISPLAY LAST TRANSACTION

The program displays on the terminal screen the last transaction entered and the relative record number used in file BM2OUT.

BM109 CREATE BOMINP

This program creates the file BOMINP by outputting all nonblank records from BM1OUTA.

BM110 EDIT STRCHNG AND CREATE BOMSEQ

This program edits the STRCHNG records and uses the good STRCHNG records and the original product structure information is BOMSTR to produce the new product structure file, BOMSEQ. The following error messages could appear on the edit report:

    NO QUANTITY
    NO PARENT PART NO.
    NO COMPONENT PART NO.
    PARENT-COMPONENT NOT ON FILE
    DUPLICATE TRANSACTION
    INVALID TRANSACTION
    ALREADY ON FILE
    INVALID PART NUMBER
    PARENT NOT ON FILE
    INVALID MULTIPLE DELETE

BM115 CREATE BILL OF MATERIALS MASTER FILE

Two versions of the product structure file, BOMSEQ in PARENT/COMPONENT order and BOMWOUT in COMPONENT/PARENT order, are used to recreate the bill of material master file, BOMMST. Also, BOMWOUT is updated as a step toward the final version of the new product structure file.

BM116 CREATE PRODUCT STRUCTURE FILE

This program uses BOMWOUT to create the final updated version of the product structure file, BOMSTR.

BM118 DISPLAY LAST TRANSACTION

This program displays on the terminal screen the last transaction entered and the relative record number used in file BM4OUT.

BM119 DISPLAY LAST TRANSACTION

This program displays on the terminal screen the last transaction entered and the relative record number used in file BM3OUT.

BM120 SELECT RECORDS FOR LISTINGS

According to the requests in BOMINP, this program uses BOMSTR and BOMMST to output to BOMWRK the records to be included in the bill of materials and where-used list produced by BM125.

BM125 PRINT LISTINGS

This program prints bill of materials and where-used lists using the data in the BOMWRK file.

BM130 UPDATE PART MASTER FILE

This program updates the incremental costs in the part master file, PARTMST.

BM135 UPDATE PRODUCT STRUCTURE FILE

This program blanks out the encounter code and updates the next code in the product structure file, BOMSTR.

BM140 UPDATE PART MASTER FILE

This program uses BOMMST and BOMSTR to update the cumulative costs in the part master file, PARTMST. In addition, this program outputs records to BOMWRK to be printed in a report by BM145.

BM145 PRINT COSTED BILLS

This program prints costed bills using the data in the BOMWRK file.

FILE/PROGRAM CROSS REFERENCE

The file/program cross reference provides a quick reference for determining which programs affect and which are affected by a given file. The applications programmer responsible for the maintenance of the bill of materials processor module should refer to this table to determine the possible scope and effect of changes to programs and files that he is considering.

FILE DESCRIPTIONS

These layouts describe individual fields within the records of each file. For each field within the record of a file, these layouts give the field description, size, location, data format (alphabetic, numeric, or alphanumeric), and number of decimal positions to the right of the decimal point for numeric fields. No field names are given, since the same field may be referred to in different programs and in different application modules by different names. However, since the location within the record is given in this table, this should cause no confusion. All locations of fields within each record are given relative to one, the first character position in the record.

CONTROL DATA CORPORATION

APPLICATION: BILL OF MATERIALS

BM1OUT	BM2OUT	BM3OUT	BM4OUT	BMWOUT	BBMSTR	MFG100	MFG105	BM1DUM	LABMST	MACHMST	ROUTING	BOMWRK	BPARTMT	BOMWOUT	BOMSEQ	HEADING	PARTMST	STRCHNG	BOMSTR	BOMCST	BOMMST	BOMINP	BM1OUTA	PROGRAM
I																						O		BM101
																					O	I		BM102
															O	I	I	I	I					BM110
														U	I							O		BM115
															I				O					BM116
													O						I		I	I		BM120
													I				I	I						BM125
									I	I	I							U						BM130
								I										U						BM135
													O				U	U			I	I		BM140
													O				U	U			I	I		BM145
U						I		I																BM1ENT
	U						I	I																BM2ENT
		U					I	I																BM3ENT
			U				I	I																BM4ENT
U																								BMIN1
	U																							BMIN2
		U																						BMIN3
			U																					BMIN4
I																								BM107
	I																							BM108
		I																						BM119
			I																					BM118
																		O			I			SORT {109}
															O	I								SORT {114}
				O										I										COPY
																						O	I	BM109
														O			I							COPY
					O																I			COPY

FILE

PROGRAM

FILE DESCRIPTION

SHEET	**OF**	
REV.		

FILE NAME: BOMWRK	**FILE/ID NO:**	**DATE**	
NO. RECS:	**FILE TYPE:** SEQUENTIAL		
RECORD SIZE: 36	**BLOCK SIZE:**	**DEVICE:**	

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
	4	1	4	N	0	Sequence number	
	1	5	5	A		Break Code ∅ - first	
						record on bill	
	12	6	17	A		Part number	
	2	18	19	N	0	Level or explode type	
	7	20	26	N	3	Structure quantity	
	9	27	35	N	3	Extended quantity	
	1	36	36	A		Inventory code	
						'∅' - Inventoried	
						'N' - Non-inventoried	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS   FILE ID: _____

96768770 A

FILE DESCRIPTION

SHEET	**OF**
REV.	

FILE NAME: BOMINP, STRCHNG, BOMCST	**FILE/ID NO:**	**DATE**
NO. RECS:	**FILE TYPE:** SEQUENTIAL	
RECORD SIZE: 54	**BLOCK SIZE:**	**DEVICE:**

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
	2	1	2	A		Record Type PS	
	1	3	3	A		Transaction code	
						ƀ - Explode code is 1	
						to 5	
						non-ƀ - Explode code	
						is ƀ	
						A - Add	
						C - Change	
						D - Delete	
						M - Muliple delete	
	12	4	15	A		Parent part number	
	12	16	27	A		Component part number	
	7	28	34	N	0	Quantity	
	1	35	35	A		Explode code	
						ƀ - Product structure	
						update	
						1 - Multiple level	
						explode/BOMP	
						2 - Single level	
						explode/BOMP	
						3 - Multiple level	
						implode/Where-used	
						4 - Single level	
						implode/Where-used	
						5 - Product cost request	
	1	36	36	A		Inventory code	
						ƀ - Inventoried	
						N - Non-inventoried	
	5	37	41	N	0	RRN in KPFILE	
	13	42	54			Unused	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS   **FILE ID:** _____
             RRN = RELATIVE RECORD NUMBER

FILE DESCRIPTION

SHEET	OF
REV.	

FILE NAME: ROUTING	FILE/ID NO:	DATE
NO. RECS:	FILE TYPE: Direct	
RECORD SIZE: 85	BLOCK SIZE:	DEVICE:

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
	12	1	12	A		Part number	
	2	13	14	N	0	Sequence number	
	3	15	17	A		Operation code	
	20	18	37			Operation descript	
	5	38	42	N	3	Production rate	
						{hours/piece}	
	3	43	45	N	1	Set-up time {hours}	
	3	46	48	N	1	Queue time {hours}	
	5	49	53	A		Work station no.	
	2	54	55	A		Labor grade {stand.}	
	3	56	58	N	2	Queue factor	
	7	59	65	N	3		
	1	66	66	A		Machine operation	
						'X' - O. P. OP	
						'B' - Machine OP	
	15	67	81	A		Comment	
	1	82	82	A		No status code	
						'B' - Used in status	
						work orders in	
						WIP.	
						'X' - Not used to	
						status order	
						in work-in-	
						progress.	
	3	83	85			Unused	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS   FILE ID: _____

96768770 A

FILE DESCRIPTION

SHEET	OF
REV.	

FILE NAME: MACHMST	FILE/ID NO:	DATE
NO. RECS:	FILE TYPE: Indexed	
RECORD SIZE: 48	BLOCK SIZE:	DEVICE:

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
	5	1	5	A		Work station no.	Primary
	20	6	25	A		Description	
	7	26	32	N	3	Burden rate {$/hour}	
	3	33	35	N	0	Capacity {hour/month}	
	1	36	36	A		Delete code	
						'D' - Delete	
						'B' - Not deleted	
	12	37	48			Unused	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS

FILE ID: _____

96768770 A

FILE DESCRIPTION

SHEET	OF
REV.	

FILE NAME: LABMST	FILE/ID NO:	DATE
NO. RECS: .	FILE TYPE: Indexed	
RECORD SIZE: 48	BLOCK SIZE:	DEVICE:

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
	2	1	2	A		Labor grade	Primary
	20	3	22	A		Description	
	7	23	29	N	3	Labor rate {$/hour}	
	1	30	30	A		Delete code	
						'D' – Delete	
						'd' – Not deleted	
	4	31	34	N	1	Burden Factor	
	14	35	48			Unused	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS   FILE ID: _____

96768770 A

FILE DESCRIPTION

REV.	

FILE NAME: PARTMST {BPARTMT}	FILE/ID NO:	DATE
NO. RECS:	FILE TYPE: Indexed	
RECORD SIZE: 300	BLOCK SIZE:	DEVICE:

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
	12	1	12	A		Part number	Primary
	25	13	37	A		Description	
	2	38	39	A		Unit of measure	
	1	40	40	A		Product class	
						'F' - Finish	
						'M' - Assembler	
						'P' - Purchase	
	3	41	43	N	0	Product group	
	3	44	46	N	0	Lead time {days}	
	3	47	49	N	0	Safety stock {days}	
	1	50	50	A		ABC code	
	1	51	51	A		Inventory code	
						'B' - Inventoried	
						'N' - Not inventoried	
	5	52	56	N	0	RRN 1st operation in	
						ROUTING	
	5	57	61	N	0	Vendor number	
	12	62	73	A		Vendor's part no.	
	1	74	74	A		Delete code	
						'D' - Delete	
						'B' - Not deleted	
	7	75	81	N	3	Standard Material	
						{{$/UM}	
	7	82	88	N	3	Average material	
						{$/UM}	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS   FILE ID: _____

FILE DESCRIPTION

	REV.

FILE NAME: PARTMST {cont'd}	FILE/ID NO:	DATE
NO. RECS:	FILE TYPE:	
RECORD SIZE:	BLOCK SIZE:	DEVICE:

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
	7	89	95	N	3	Incre. labor cost	
	7	96	102	N	3	Incre. burden cost	
	7	103	109	N	3	Incre. O.P. cost	
	7	110	116	N	3	Cumul. labor cost	
	7	117	123	N	3	Cumul. burden cost	
	7	124	130	N	3	Cumul. O.P. cost	
	7	131	137	N	3	Incre. labor hours	
	7	138	145	N	3	Cumul. labor hours	
	7	146	152	N	0	Stock on hand	
	7	153	159	N	0	Stock on order	
	7	160	166			Unused	
	7	167	173	N	0	Allocated	
	7	174	180			Unused	
	7	181	187	N	0	Minimum {re-order pt}	
	7	188	194	N	0	Maximum {E.O.Q.}	
	1	195	195	A		Min/max code	
						'B' - update with	
						req.gen. code	
						'X' - update w/o reg.	
						gen. code	
						'M' - no update with	
						reg. gen. code	
						'N' - no update w/o	
						req. gen. code	
	7	196	202	N	0	M-T-D usage	
	7	203	209	N	0	Average usage	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS

FILE ID: _____

FILE DESCRIPTION

REV.	

FILE NAME: PARTMST {cont'd}	FILE/ID NO:	DATE
NO. RECS:	**FILE TYPE:**	
RECORD SIZE:	**BLOCK SIZE:**	**DEVICE:**

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
	2	210	211	N	2	Alpha	
	7	212	218	N	0	Year-to-date usage	
	1	219	219	A		Engin. rev. letter	
	6	220	225	N	0	Engin. rev. date	
	5x7	226	260	N	3	Price {5 fields}	
	5	261	265	N	0	Bin number	
	5	266	270	N	0	RRN of 1st MRP detail	
	30	271	300			Unused	

A = ALPHANUMERIC
N = NUMERIC
P = PACKED

DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
KEY = PRIMARY, SECONDARY, ETC. BLANK FOR MOST ELEMENTS
RRN = RELATIVE RECORD NUMBER

FILE ID: _____

FILE DESCRIPTION

SHEET 1 OF 1	
REV.	

FILE NAME: BM1DUM	FILE/ID NO:	DATE
NO. RECS:	FILE TYPE: Sequential	
RECORD SIZE: 72	BLOCK SIZE:	DEVICE:

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
						This file has one	
						blank record	

A = ALPHANUMERIC
N = NUMERIC
P = PACKED

DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
MOST ELEMENTS

FILE ID: _____

96768770 A

FILE DESCRIPTION

FILE DESCRIPTION		**SHEET**	**OF**
		REV.	
FILE NAME: NULL	**FILE/ID NO:**	**DATE**	
NO. RECS:	**FILE TYPE:** Sequential		
RECORD SIZE: 72	**BLOCK SIZE:**	**DEVICE:**	

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
						NOTE: This file	
						contains no records	
						and is used to satis-	
						fy the RPG input	
						cycle requirements	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS   FILE ID: _____

FILE DESCRIPTION

SHEET	OF
REV.	

FILE NAME: MFG100 {MFG65}	FILE/ID NO:		DATE
NO. RECS:	FILE TYPE: Indexed		
RECORD SIZE: 36	BLOCK SIZE:	DEVICE:	

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
	6	1	6			PROGRAM FORMAT NAME	
	2	7	8	0	0	SEQ. # {bb,01-19}	
	20	9	28			PROMPT FIELD TO BE	
						DISPLAYED	
	1	29	29			A/N	
	1	30	30			AUTODUP {D-YES,b-NO}	
	3	31	33			START POS. IN	
						OUTPUT RCD	
	2	34	35			FIELD LENGTH	
	1	36	36			DELETE CODE {D-DELETE	
						b-KEEP}	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS   FILE ID: _____

FILE DESCRIPTION

SHEET	**OF**
REV.	

FILE NAME: BOMMST	FILE/ID NO:	DATE
NO. RECS:	FILE TYPE: Indexed	
RECORD SIZE: 28	BLOCK SIZE:	DEVICE:

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
	12	1	12	A		Part Number	Primary
	5	13	17	N	0	Structure RRN	
	5	18	22	N	0	Where-used RRN	
	5	23	27	N	0	RRN in BOMMST	
		28	28			Unused	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS   FILE ID: _____
     RRN = RELATIVE RECORD NUMBER

FILE DESCRIPTION

		SHEET	OF
		REV.	

FILE NAME: BOMWOUT BOMSEQ / BOMSTR BBMSTR BMWOUT

FILE/ID NO:		DATE
NO. RECS:	**FILE TYPE:** Direct	
RECORD SIZE: 54	**BLOCK SIZE:**	**DEVICE:**

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
	12	1	12	A		Parent part number	
	12	13	24	A		Component part number	
	7	25	31	N	3	Structure Quantity	
	5	32	36	N	0	RRN this record	
	5	37	41	N	0	RRN next down	
	5	42	46	N	0	RRN next where-used	
	5	47	51	N	0	RRN component in	
						BOMMST	
	1	52	52	A		Next Code {1=End Chain	
	1	53	53	A		Encounter code	
	1	54	54	A		Inventory code	
						ƀ - Inventoried	
						N - Non-inventoried	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS
     RRN = RELATIVE RECORD NUMBER

FILE ID: _____

96768770 A

FILE DESCRIPTION

{BM3OUT} {BM4OUT}

FILE NAME: BM1OUTA {BM1OUT} {BM2OUT}

SHEET	OF
REV.	
FILE/ID NO:	DATE

NO. RECS:	FILE TYPE: Direct	
RECORD SIZE: 128	BLOCK SIZE:	DEVICE:

DATA ELEMENTS

NAME	NO. CHARS	BEG. POS.	END POS.	A/N/P	DP	DESCRIPTION	KEY
						OUTPUT FILE CREATED	
						BY DATA ENTRY PROGRAMS	
						BM1ENT, BM2ENT	
						BM3ENT, AND BM4ENT	

A = ALPHANUMERIC   DP = NO. OF PLACES TO RIGHT OF DECIMAL POINT
N = NUMERIC   KEY = PRIMARY, SECONDARY, ETC. BLANK FOR
P = PACKED   MOST ELEMENTS   FILE ID: _____

ASSEMBLY – A part composed of (assembled from) other parts

BACKUP – Duplicate information maintained to restore information that was lost, invalidated, or destroyed; for example, by a system failure. In the manufacturing and distribution system, backup takes the form of copied files.

BILL OF MATERIALS – A report that gives the composition of each product in terms of its component parts, the composition of each of these component parts, and so on. The act of printing or displaying this hierarchical structure of products and their components is called exploding the bill of materials.

CARRIAGE RETURN – The key on the CRT terminal keyboard that, when pressed, causes the data to be passed from the terminal to the system

CRT TERMINAL – The device consisting of a cathode ray tube screen and a keyboard used to provide the interactive communication between the system and the operator. The system communicates with the operator by displaying messages of the CRT screen; the operator communicates with the system by entering data and commands through the terminal keyboard.

CURSOR – This marker on the CRT terminal screen indicates the position at which any character entered by the operator appears on the screen

DATA CAPTURE – The method by which a module acquires information from some source other than direct operator entry

DATA ENTRY – Entry of information into the system by an operator. In the case of the manufacturing and distribution system, data is entered through CRT terminals while communicating with interactive procedures.

FILE – A collection of data consisting of records, each of which usually has the same layout and information items

FILE MAINTENANCE – The addition or modification of data items in a file. Modules in the manufacturing and distribution system provide procedures that enable the operator to perform file maintenance through interactive communication using the CRT terminal.

INQUIRY – Also interactive inquiry. Used to obtain desired items of information and display them on the CRT screen through requests made at the CRT keyboard

INTERACTIVE – A mode of communication between the operator and the system in which each (the operator and the system) responds to the other's entries

INTERFACE – A point of communication between modules, programs, systems, and so forth. For example, shared files used in common by more than one module within the system provide the interface between modules within the system.

LEVELS OF PRODUCT STRUCTURE – In some cases, a product is composed of subassemblies and those subassemblies are composed of lesser subassemblies. Each of these levels (subassemblies, lesser subassemblies, and so forth) defines a level of the product structure. Also see Product Structure.

LINE FEED – The key on the CRT terminal keyboard that, when pressed, causes the system to bypass a CRT data entry for this field

MENU – A list of procedures available for execution by the operator. Under the operating system, the operator can request displays of different menus.

MODULE – A collection of programs, procedures, and files, and the reports, processing, and facilities they provide that are designed for a specific application area

PROCEDURE – The executable units for the operator. The operator chooses the procedure that does the task he needs done, then initiates that procedure from the CRT terminal

PRODUCT STRUCTURE – The organization of the composition of assemblies out of subassemblies and those subassemblies out of smaller subassemblies. The information specifying this structure for the user's products is contained in the user's product structure master file.

PROGRAM – A precise sequence of coded instructions, written in a form acceptable to a computer, and necessary to solve a problem

PROMPT – A message displayed on the CRT terminal and used to indicate to the operator the next item of information to be entered

RECORD (in a file) – A collection of data items, treated as a unit. A set of such records may form a file. Also see File.

RECOVERY – Action taken to re-establish a former state of the system and the information in it after a disasterous system or user failure; for example, after the entry of a large volume of incorrect information by the operator or after a hardware failure

RESTART – The process of initiating the execution of a procedure again after that procedure has terminated without completing its task

RUBOUT – The key on the CRT terminal keyboard that, when pressed, causes the cursor to return to the beginning of the field if data has already been keyed into the field and causes the cursor to be moved to the beginning of the previous field if data has not been keyed into the field.

SINGLE-LEVEL BILL OF MATERIALS – This report specifies, for each product, only the major subassemblies of which that product is composed and does not specify the components of which these major subassemblies are composed.

UPDATE – To update a file is to replace information items in that file with new information (Also see File Maintenance)

WHERE-USED LISTING – This is the bill of materials viewed from the bottom up. This listing tells which assemblies a given part is used in, which larger assemblies each of these parts is used in, and so forth.

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