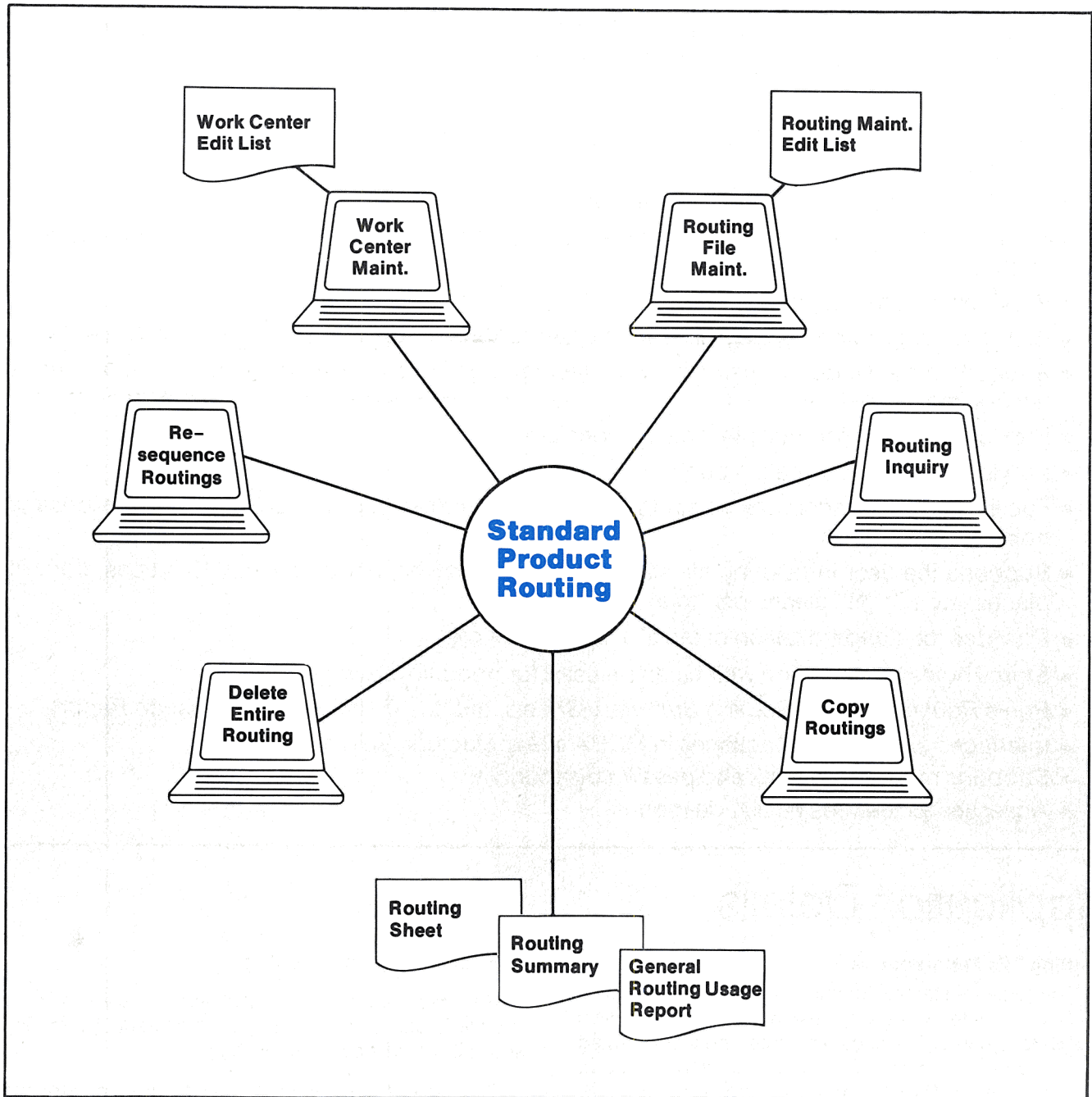


# STANDARD PRODUCT ROUTING

in DIBOL® for DEC® PDP®-11s



# Application Overview

Standard Product Routing (SPR) is the application package within MCBA's Manufacturing System that handles the creation, maintenance and reporting of data describing operations, tools and notes used in standard product manufacturing. (SPR is sometimes referred to as the Bills of Labor package.)

SPR is oriented toward small to medium sized repetitive manufacturers (make-to-stock/assemble-to-order); small to medium job shops (make-to-order/engineer-to-order) will also find it useful for those jobs that tend to be repetitive.

SPR is efficiently designed, taking advantage of space-saving techniques such as general routings and specific routings. General routings are subsets of operations, tools, and notes that are common to more than one product. Specific routings identify complete sets of operations, tools, and notes used in a product's manufacture. In SPR, several products or items can use the same routing. Specific routings are complete routings (the route or path a shop order travels when being manufactured), and can incorporate general routings.

SPR includes the following capabilities:

- Allows interactive entry and editing of routing data — operations, tools, notes, and pointers to general routings.
- Maintains labor standards at the operation level.
- Supports "Same-As-Except" routings — a way of easily creating a new routing by copying another.
- Provides for alternate routings.
- Allows routings to be copied into a shop order in MCBA's Shop Floor Control package.
- Supports a multitude of operation types including productive (most common), setup, move, rework, etc.
- Provides routings for multiple locations per item.
- Provides tooling information control.
- Facilitates higher accuracy of standards by allowing user-specified location of the decimal point in critical fields.
- Supports the user in tailoring his standard hours; allowing per piece, per 10 pieces, per 100 pieces, etc., or "N" pieces per hour.
- Provides for standardization of multi-usage operations.
- Stores notes by operation which can be used for operational instructions.
- Prints *Routing Sheets*, *Routing Summary Sheets*, and the *General Routing Usage Report*.
- Interfaces to four other packages in MCBA's Manufacturing System.
- Supports multi-companies and password security.
- Accesses all features easily, via menus.

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## Application Details

### Routing File Maintenance

The route master file contains records for operations, tools, and notes unique to any given routing. It also contains "general" routings which can be incorporated in any "specific" routing. The general routing is a group of operations, tools, and notes which are common to

more than one specific routing.

General routings are attached by means of a "pointer" record, which resides within a specific routing and "points" to the general routing.

Routing File Maintenance provides on-line entry and

editing to add, change, and delete routings. It utilizes data from the work center file, thereby reducing keystrokes which would normally be required to manually enter this data.

SPR's route master file contains four basic record types:

- operation record
- tool record
- pointer (to a general routing) record
- note record

An Operation record contains data regarding the work center, machines, operation types, and function, plus standard man and machine hours per "N" pieces (where N is 1, 10, 100, or 1000 as set by the user).

A tool record is an information only record which contains data regarding special tools required for an operation, including description, location, and wear (per usage).

A pointer record, in a specific routing, contains the route number of a general routing to be incorporated. It also contains a multiplication factor which is used to convert the standard man and machine hours in the general routing to a corrected value for this specific routing.

A note record can contain notes pertinent to a particular operation or tool, or any other data the user wishes.

## Routing Reports

SPR prints three reports:

- *Routing Sheet*
- *Routing Summary Sheet*
- *General Routing Usage Report*

The *Routing Sheet* fully describes each routing. General routings are shown properly inserted within any specific routings which use them.

The *Routing Summary Sheet* is an 8½" x 11" version of the *Routing Sheet*, summarized at the operations and tools level.

The *General Routing Usage Report* is a cross-reference of general routings and the specific routings which access them.

All reports may be displayed on a screen, spooled to a disk file for later printout, printed on a local printer, or printed on one of four possible printers. At run-time the user is given the choice of how to see the report.

## Routing Inquiry

If a user does not have sufficient data to access a routing in Routing File Maintenance, Routing Inquiry allows the user a simplified way to sequentially step through each record within any routing.

## Copy Routings

Copy Routings allows the user to create new routings

from existing routings. This is sometimes referred to as the "same-as-except" routing feature. SPR provides three ways to do this:

- copy and resequence routings
- copy routings without resequencing
- copy routings to Shop Floor Control

The first two options save the user data entry time by duplicating existing routings or portions of routings into new routings. This is particularly useful when large routings for two or more items differ by only a few operations. Resequencing means changing the sequence of the operation numbers within a routing so they are evenly spaced. This makes the routing easier to read, as well as accommodating new insertions.

The third copy option is via MCBA's Shop Floor Control (SFC), which creates the operational side of shop orders from standard routings. If general routings are also copied over to SFC, they become part of the new shop floor routing being created.

## Work Center Maintenance

The work center file and Work Center Maintenance function are used by both SPR and SFC. Work Center Maintenance allows on-line entry and editing, to add, change, and delete work center records, as well as offering an option to print the *Plant Facilities List*. The report may be displayed on a screen, spooled to a disk file for later printout, or printed on a local printer.

Work center records contain the data unique to a given department/work center within a shop. Such data as machine number and description, standard and set-up labor grades, queue time, and number of men are automatically transferred from the work center file to a routing operation record upon entry of a department/-work center combination in SPR.

## Resequence Routings

Since routings may be added to or subtracted from, excessive or insufficient space may remain between operation numbers. The Resequence Routings function will automatically step through a routing, resequencing operation numbers by a given increment. This is normally run during routing setup and prior to copying to SFC, since this operation may not be done to routings once they are copied to SFC.

## Delete Entire Routing

When a specific or general routing becomes unnecessary, it can be deleted in its entirety from the route master file with just one selection from the menu. This saves time by bypassing the tedious job of manually deleting each record in a routing via Routing File Maintenance.

## Optional Report Displays

Users with VT100 CRTs have the option of displaying any SPR report on their CRT, as opposed to printing it.

### Security

The security system allows up to 200 passwords and provides access restrictions at the file level by company.

### Multiple Companies

Multiple company support allows up to eight companies to use the system at any time. Users who do not need this many will still find this feature useful for test files and/or operator training.

### Interfaces to Other MCBA Packages

SPR requires MCBA's Inventory Management (I/M). It optionally interfaces to Shop Floor Control (SFC) via the copy routings to Shop Floor Control function and via

sharing the work center file; to Standard Product Costing (SPC), via the Routing Cost Build-up application in SPC; and to Labor Performance (L/P), via the standards in the route master when neither SFC nor MCBA's Job Costing (J/C) are installed.

### Record Size

Route Master .....	115 characters
Route Master Index .....	34 characters
Work Center .....	65 characters

### Run Size

The SPR executable programs take up about 220 Kb of disk space.