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# **ROMI-RIP: ROugh MII RIP-First Simulator User's Guide**

R. Edward Thomas

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## **Abstract**

The ROugh Mill RIP-first simulator (ROMI-RIP) is a computer software package for IBM compatible personal computers that simulates current industrial practices for gang-ripping lumber. This guide shows the user how to set up and examine the results of simulations regarding current or proposed mill practices. ROMI-RIP accepts cutting bills with up to 300 different part sizes. Plots of processed boards are easily viewed or printed. Detailed summaries of processing data (number of rips and crosscuts) and yields (single boards or entire board files) can be viewed or printed.

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The computer program described in this publication is available upon request with the understanding that the U.S. Department of Agriculture cannot assure its accuracy, completeness, reliability, or suitability for any other purpose than that reported. The recipient may not assert any proprietary rights thereto nor represent it to anyone as other than a Government-produced computer program.

For an executable copy of the program write to:

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FORESTRY SCIENCES LABORATORY  
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ROUTE 2, BOX 562-B  
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# 1. Introduction

ROMI-RIP, the ROugh Mill RIP-first computer simulator, is the latest in a series of gang-rip-first simulators from the USDA Forest Service. The ROMI-RIP install disk contains sample runs, all required programs, and a lumber data bank containing more than 3000 digitized boards (Gatchell et al. 1992; Wiedenbeck et al. 1994). A digitized board is board dimension and defect information expressed in x,y coordinates. A custom datafile creation utility allows you to create board samples corresponding to your lumber supply. ROMI-RIP processes the board data according to your gang-rip specifications. Output--including part counts and yields, graphs, and processing requirements--is available for each run. This user's guide will show you how to install and run ROMI-RIP, and aid in understanding the simulation results. The companion manual, "*ROMI-RIP: Rough Mill Rip-First Simulator*" (Thomas 1995a), describes the ROMI-RIP processing options and algorithms.

ROMI-RIP was developed to simulate current rough-mill practices more accurately than previous gang-rip simulators (Thomas et al; 1994, Hoff et al. 1991; Stern and MacDonald 1978). Previous simulators had limited arbor options, lacked cutting bill support, and allowed fewer part sizes. ROMI-RIP allows the user to pick from six different arbor types, including a new all-blades-movable arbor and a fixed-blade-best-feed arbor. Arbors can have as many as 15 saw spacings and be as wide as 48 inches. ROMI-RIP allows you to create cutting bills by associating quantities with as many as 300 different part sizes. In addition, ROMI-RIP allows 30 lengths and 10 widths for primary parts. If needed, additional lengths and widths can be used for salvage parts.

ROMI-RIP was developed on IBM<sup>1</sup> compatible personal computers using the C and assembly programming languages. The minimum computer system requirements to run ROMI-RIP successfully are:

1. An IBM AT, 386, 486, Pentium, or compatible computer
2. 512K of Random Access Memory (RAM)
3. A hard disk with at least 10 Mb free space
4. MS DOS 4.0 or later (MS DOS is a trademark of Microsoft Corp.)
5. A high-density 3.5-inch or 5.25-inch floppy drive
6. An EGA or VGA graphics display
7. A mouse (optional, but recommended)
8. A printer (optional, but recommended)

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<sup>1</sup> The use of trade, firm, or corporation names in this publication is for the information and convenience of the reader. Such use does not constitute an official endorsement or approval by the U.S. Department of Agriculture or the Forest Service of any product or service to the exclusion of others that may be suitable.

## 2. Installation

An installation program is included with ROMI-RIP to make installation as easy as possible. Installation places the ROMI-RIP programs, support files, samples, and copies of the "1992 Data Bank for Red Oak Lumber" (Gatchell et al. 1992) and "Data Bank for Short-Length Red Oak Lumber" (Wiedenbeck et al. 1994) on your hard disk. The boards in the data banks are graded according to 1994 NHLA Rules (Natl. Hardwood Lumber Assoc. 1994).

### 2.1 Running the Install Program

To begin installation, place the ROMI-RIP disk in the floppy disk drive and make it the working drive. For example, if the disk is in drive A: enter

**A:**

Next, to start the install program, enter:

**INSTALL**

When the program begins, it displays the screen shown in Figure 2.1. Press any key to begin the installation. The program begins by determining the hard drives available on your machine. There is a brief pause while this is being done. If the computer has a CD-ROM drive with no disk in it, you may encounter an error such as "CDR-101: Not ready reading drive D:". If this occurs, press F at the **Abort, Retry, Fail** prompt. The installation will continue normally after this is done.

```
ROMI-RIP Installation Program
USDA Forest Service
Forestry Sciences Laboratory, Princeton WV

ROMI-RIP must check your system for valid destination drives.
During this check if a protected network drive or CD-ROM drive is
encountered, you may receive an error message such as:

    CDR101: Not ready reading drive D
    Abort, Retry, or Fail

If this occurs, simply respond F for fail and the install program
will not consider the drive as a possible install destination.

Press any key to begin installation
```

Figure 2.1. Installation program initial screen.

## 2.2 Confirming Install Destination

Figure 2.2 shows the install destination screen with the default destination of drive C: and subdirectory \ROMI-RIP. If this destination is acceptable, press the "C" key and proceed to Step 2.4. If you would like to install ROMI-RIP on a different drive or subdirectory, press "M" and proceed to Step 2.3. Press "A" if you want to stop the installation.

```
ROMI-RIP Installation Program
USDA Forest Service
Forestry Sciences Laboratory, Princeton WV

ROMI-RIP programs and data will be installed to

Drive: C:
Subdirectory: ROMI-RIP

Press
C to Continue if these options are acceptable.
M to Modify destination of installed files
A to Abort installation
```

Figure 2.2. Install destination screen.

## 2.3. Modifying Install Destination

This step allows you to customize the install location of ROMI-RIP. First, choose a new destination drive from the menu. In the example below (Fig. 2.3), the system check found two hard drives, G: and D:. We will enter "2" to select drive D:.

```
ROMI-RIP Installation Program
USDA Forest Service
Forestry Sciences Laboratory, Princeton WV

ROMI-RIP Custom Installation

A check of your system indicates the following drives:

1. C: 2. D:

Enter number identifying destination drive: 2

Enter the name of the destination subdirectory: \YLDSTUDY\RIP
```

Figure 2.3. Destination modification screen

After selecting the drive, you are prompted to enter the name of the installation subdirectory. This subdirectory may be a new one or an existing one. When entering the name of the subdirectory, give the complete path of the subdirectory starting with the root directory. For example, to install ROMI-RIP in the subdirectory \YLDSTUDY\RIP, at the prompt enter:

**\YLDSTUDY\RIP**

Figure 2.3 shows this entry. After you enter the new destination, the computer will show the screen in Figure 2.2 with the new destination drive and subdirectory. Refer to Step 2.2 to continue.

## 2.4 Software Installation Phase

After the install destination is confirmed, the computer checks if the install subdirectory exists or needs to be created. If the subdirectory exists, you are prompted whether to continue. If you answer "N", the installation will be cancelled. If you answer "Y", ROMI-RIP will be installed to the directory. As the files are decompressed and copied, the filenames scroll across the screen. Please note that ROMI-RIP seeks confirmation before overwriting any previously existing files. Then installation is complete, you will be returned to the DOS prompt.

## 2.5 Configuring Your System

The CONFIG.SYS file, located in the root directory of the C: drive, defines devices and run time parameters for your computer. After the ROMI-RIP files have been copied to your computer, check to see that the CONFIG.SYS file includes the following lines:

```
FILES = 30  
BUFFERS = 30
```

The sequence, spacing, and location of the lines in the file are not important. It is only important that the values for the FILES and BUFFERS settings are at least 30. If the settings are less than 30, you must edit the CONFIG.SYS file and correct the settings. After editing the CONFIG.SYS file, you must reboot the computer before the changes take place.

If you will be using a LASER or color printer with ROMI-RIP, refer to Appendix I for help in configuring the ROMI-RIP setup files for use with your printer.

### **3. Running ROMI-RIP**

To start ROMI-RIP, your working drive and subdirectory need to be the ones that contain the ROMI-RIP files. If you accepted the default installation drive and subdirectory, enter:

**C:**

followed by:

**CD \ROMI-RIP**

These two commands will take you to the drive and directory that contain the ROMI-RIP program.

Now, you are ready to run the ROMI-RIP program. At the DOS prompt enter:

**RIP**

To run ROMI-RIP with a monochrome monitor, enter:

**RIP +M**

When ROMI-RIP begins running, it first checks for the presence of the setup options file (SETUP.RIP) in the same directory as the other ROMI-RIP software. This file stores all the options (arbor type, lengths, widths, etc.) that define the ROMI-RIP simulation. If SETUP.RIP does not exist, a default setup file is created. If the file exists, it is read and its options are displayed. Figure 3 shows the main menu of ROMI-RIP using the default setup list. Notice that the main menu is along the top of the screen and the setup options are displayed in the rest of the window.

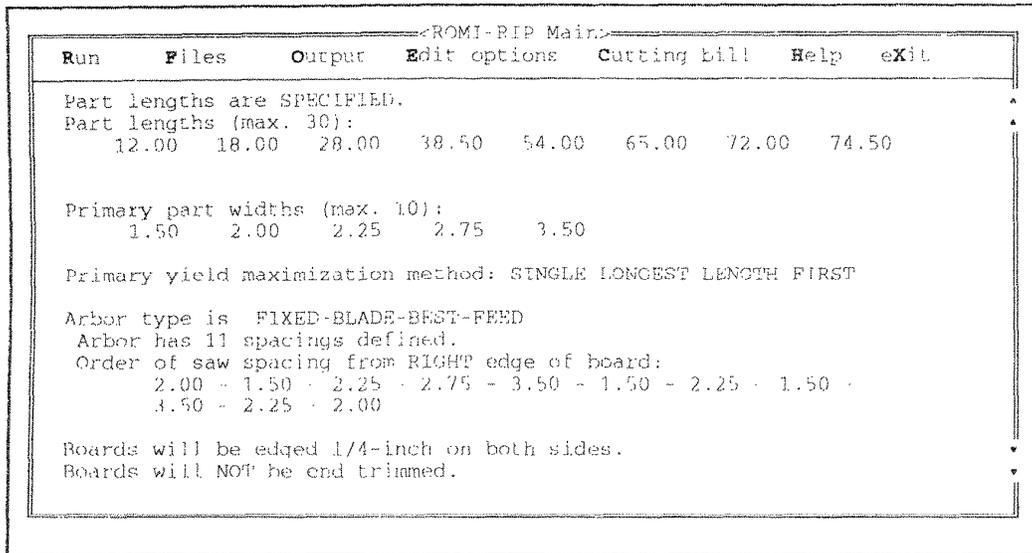


Figure 3. ROMI-RIP main menu.

ROMI-RIP uses a point and click environment along with hot keys for ease of use. To choose an item, move the mouse to the menu item or line you want and press the left mouse button once. If you do not have a mouse, you can press the letter of the item that is designated as a hot key. Hot keys are highlighted numbers or capital letters--for example, R in "Run" and F in "Files". Windows with ▲ and ▼ to the right allow you to scroll the window's contents (Fig. 3). Click on the ▲ or press the PAGE UP key to scroll the screen up. Click on ▼ or press the PAGE DOWN key to scroll the screen down. To close any window, choose the CANCEL or EXIT item. These items are found in the upper right corner (menu windows) or at the bottom left of the screen (list windows). A window's hot keys and click items are valid only within that window. For example, if any other windows are open, the click items of the Main Menu are unavailable.

Several of ROMI-RIP's windows will ask you to enter a value or filename. If you find yourself at one of these prompts by mistake, press ENTER to continue. ROMI-RIP will return you to the closest window menu.

## 4. Editing Setup Options

To edit the setup options, click on "Edit options", or press "E" at the ROMI-RIP main menu. This will display the EDIT OPTIONS window shown in Figure 4. The EDIT OPTIONS window allows you to change arbor specifications, lengths, widths, and summary length and width ranges. For an explanation of any option, see "*ROMI-RIP: Rough Mill Rip-First Simulator*" (Thomas 1995a).

```
<ROMI-RIP Main>
Run      Files      Output      Edit options      Cutting bill      Help      eXit
-----
Edit Options
Lengths  Widths  Arbor  width ranges  length Ranges  Default  eXit
-----
Part lengths are SPECIFIED.
Part lengths (max. 30):
  12.00  18.00  28.00  38.50  54.00  65.00  72.00  74.50

Primary part widths (max. 10):
  1.50  2.00  2.25  2.75  3.50

Primary yield maximization method: SINGLE LONGEST LENGTH FIRST

Arbor type is  FIXED-BLADE-BEST-FEED
Arbor has 11 spacings defined.
Order of saw spacing from RIGHT' edge of board:
  2.00 - 1.50 - 2.25 - 2.75 - 3.50 - 1.50 - 2.25 - 1.50 -
  3.50 - 2.25 - 2.00 -
```

Figure 4. Edit options window.

You may select and modify any item at any time. Different menu choices are presented depending upon the options you select. This is done so that only valid menu choices are available for selection. For example, if you are using random-lengths, only the maximum and minimum part lengths may be changed, not the 30 specified part lengths.

When you exit the EDIT OPTIONS window you are asked if you want to save your changes to the setup options. Answering "NO" will erase any changes you have made, "YES" will save them.

## 4.1 Modifying Lengths

The LENGTH MODIFICATION window allows you to change any primary or salvage part length setting. Select "Lengths" from the EDIT OPTIONS window (Fig. 4) to display the LENGTH MODIFICATION window (Fig. 4.1A).

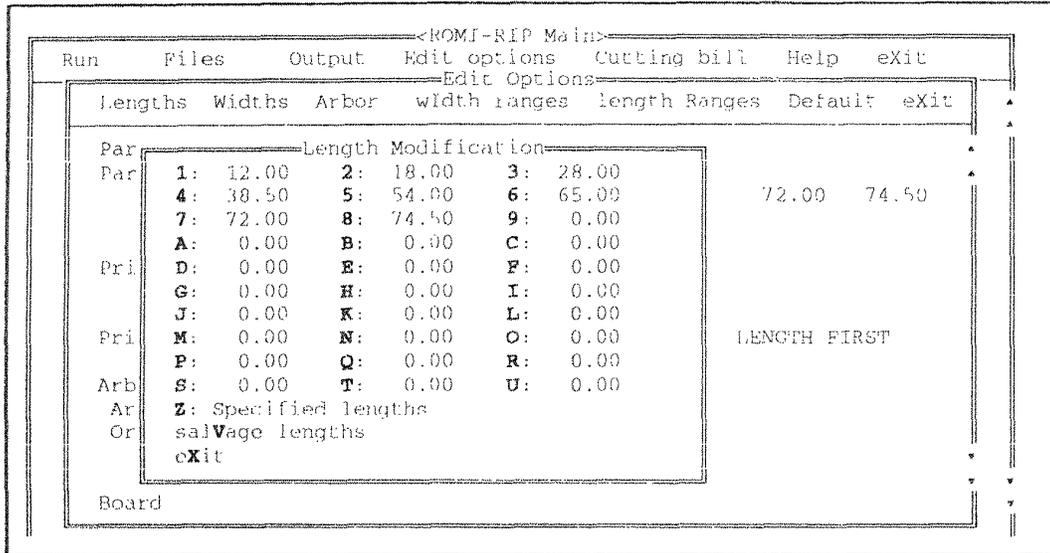


Figure 4.1A. Specified length modification window.

To switch from specified to random lengths, or vice-versa, select item "Z" from the LENGTH MODIFICATION window. Figure 4.1A shows the specified length modification window. The modification window for random lengths is shown in Figure 4.1B. **Note, all lengths are rounded to the nearest ¼-inch measurement.**

To modify any length, select it using either the mouse or its associated hot key. A modification window for the length will appear and prompt you to enter a new length value. For example, to change the specified length 74.5 inches to 78 inches, you would first select item 8. The modification window for the 74.5 length will appear.

Select the salvage length item from the LENGTH MODIFICATION window to modify salvage lengths (Fig. 4.1A and 4.1B). This will display the SALVAGE LENGTH MODIFICATION window (Fig. 4.1C). ROMI-RIP offers two ways to handle salvage lengths. One method allows you to use primary lengths for salvage. Alternatively, you can specify as many as 12 lengths specifically for salvage. Selecting the salvage type item, the first menu selection, alternates between the two methods. Editing salvage specific lengths is permitted only when they are selected. Salvage lengths are modified the same way as primary lengths: select the length to modify, and enter the new value at the pop-up edit window's prompt.

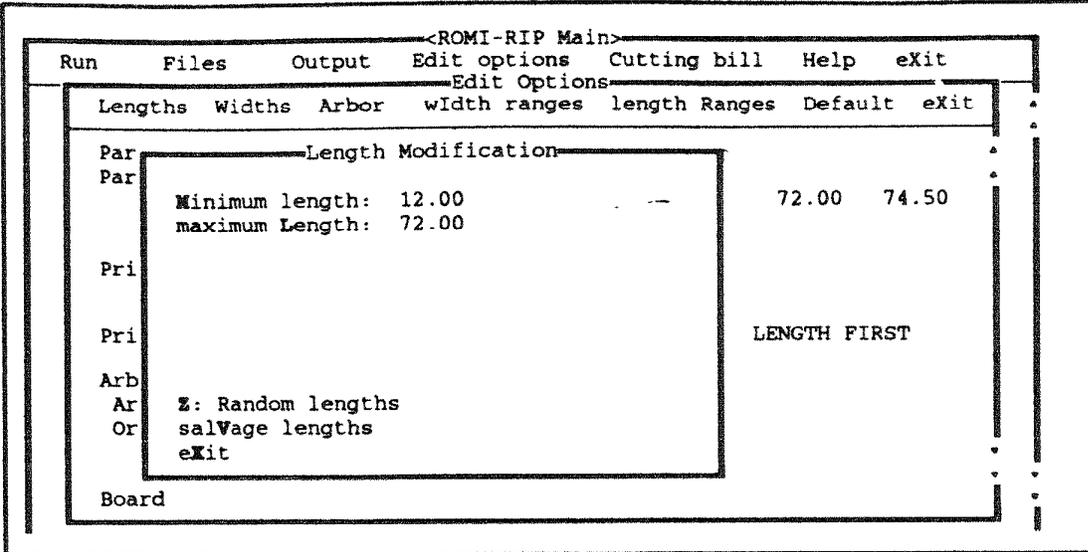


Figure 4.1B. Random length modification window.

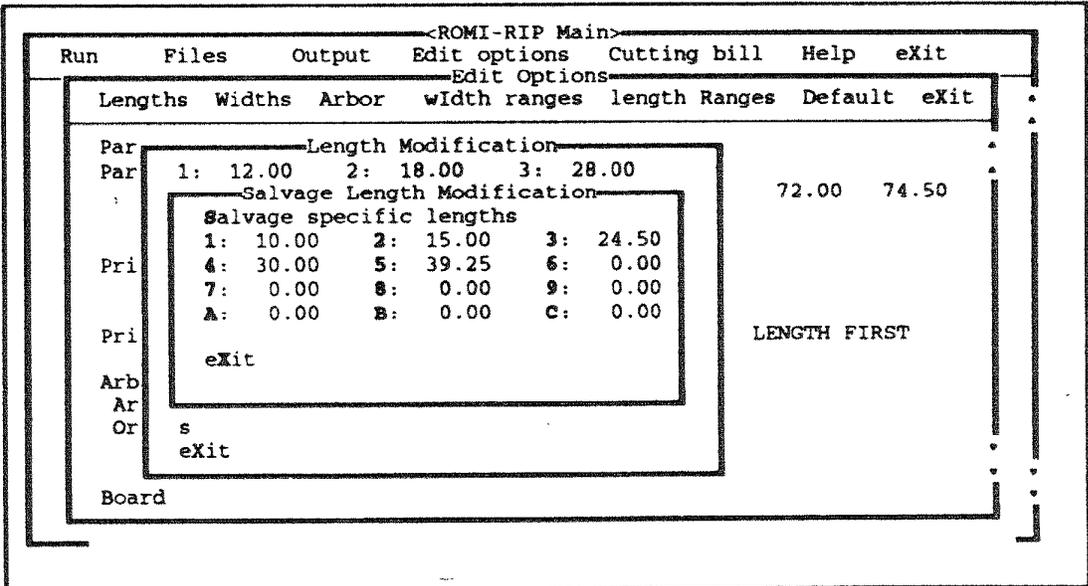


Figure 4.1C. Salvage length modification window showing salvage specific lengths.

## 4.2 Modifying Widths

The WIDTH MODIFICATION window allows you to change all primary and salvage width settings. Select "Widths" from the EDIT OPTIONS window (Fig. 4) to display the WIDTH MODIFICATION window (Fig. 4.2A). Figure 4.2A shows the default primary part widths. To modify any of these widths, select the width and enter the new width value. **Note, all widths are rounded to the nearest 1/4-inch measurement.** If you are using a movable outer blade arbor, the WIDTH MODIFICATION window displays a "min. Primary" item. Selecting this item allows you to specify the minimum acceptable primary width for the movable blade. If you are using an arbor type without a movable outer blade, this menu item is not displayed.

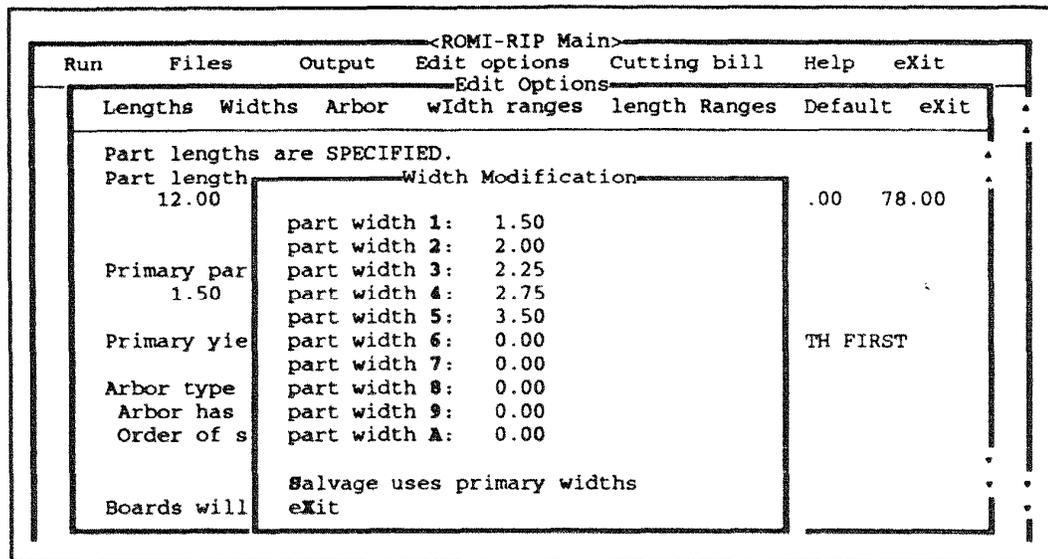


Figure 4.2A. Width modification window.

There are three different salvage width options: 1) random width, 2) salvage specific part widths, and 3) salvage uses primary part widths. Select the salvage type item from the WIDTH MODIFICATION window to change the salvage width type (Fig. 4.2A). This will bring up the SALVAGE TYPE SELECTION window shown in Figure 4.2B. Select the type of salvage part width you want to use or "Cancel" to keep the current selection.

If you are using random width salvage, a "Min. salvage" item appears at the top of the screen. Use this item to specify the minimum width for random width salvage. If you are using salvage specific widths, the top menu item becomes "Modify salvage widths". Selecting this item will bring up a window displaying all the salvage part widths (Fig. 4.2C). As with primary part widths, select any width and enter a new value. If you specify that salvage uses primary part widths, the salvage width modification item disappears from the WIDTH MODIFICATION window (Fig. 4.2A).

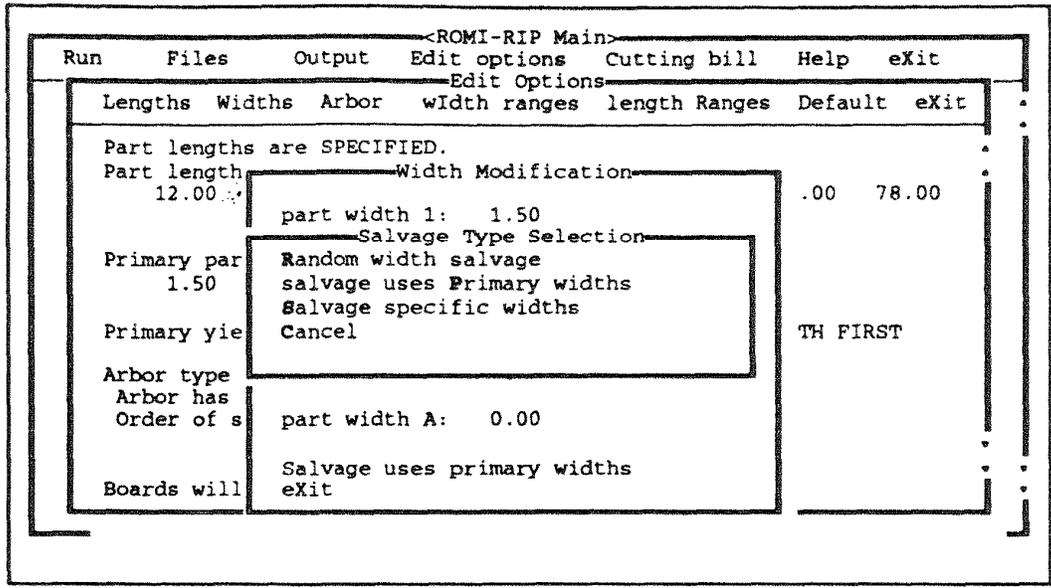


Figure 4.2B. Salvage type selection window.

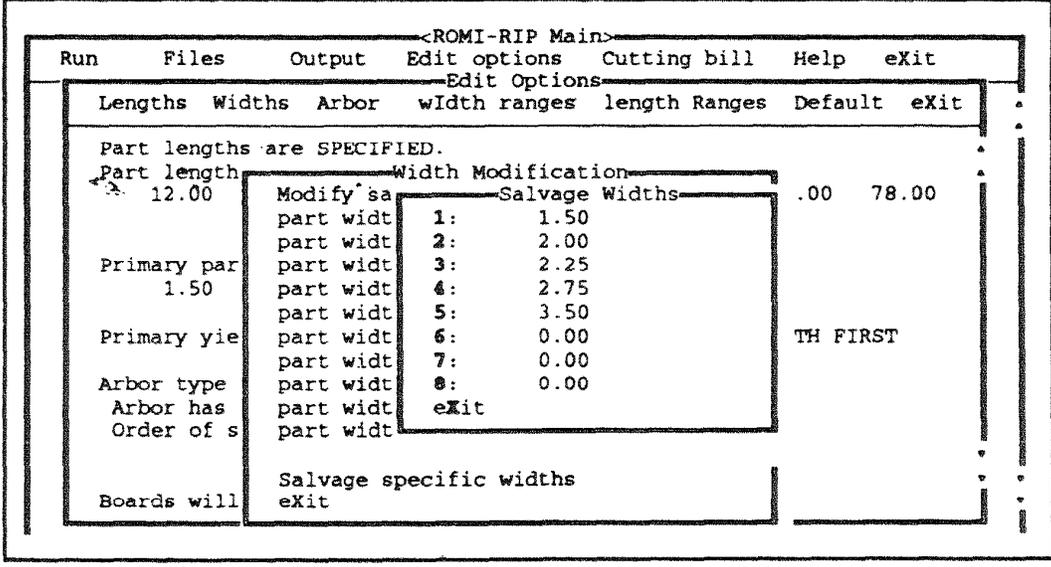


Figure 4.2C. Salvage width modification window.

When you exit the WIDTH MODIFICATION window, the primary and salvage part widths are sorted in ascending order. If you are using a fixed arbor type and have added or removed primary part widths, the sorting may change the sequence of the saw spacings. See Sections 4.3 and 4.3.5 for an explanation of how to view and modify the saw space sequence.

## 4.3 Arbor Options

The ARBOR window allows you to change the arbor type, saw spacings, processing options, and the yield maximization method (Fig. 4.3). To modify any item in the ARBOR window, simply select it. This section will show you how to modify the arbor options.

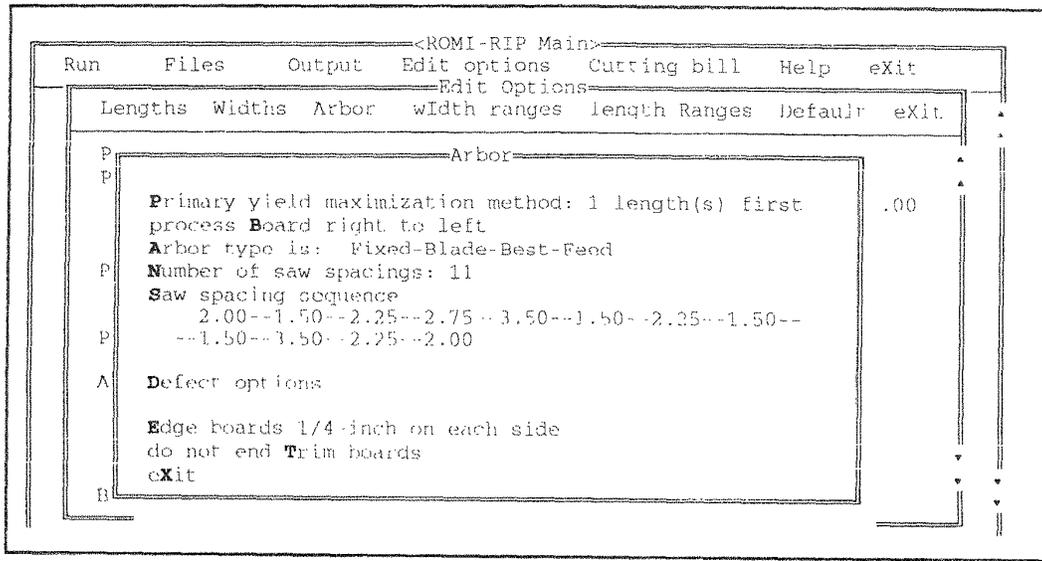


Figure 4.3. Arbor options editing window.

### 4.3.1 Primary Yield Maximization Method

To change the yield maximization method, select "Primary maximization method" from the ARBOR window. **Note: if you are using a cutting bill, this menu item will not be displayed.** The pop-up window shown in Figure 4.3.1 contains the primary yield maximization choices. You can choose to have the longest single cutting length placed between defects (1 longest length), or you can choose to place the 2 longest lengths or 3 longest lengths between defects. The 2 and 3 longest length options will produce somewhat higher yields and shorter parts than the 1 longest length option. See Section 4 of *"ROMI-RIP: Rough Mill Rip-First Simulator"* (Thomas 1995a) for a complete description of this option. Select the primary yield maximization method that you want to use. If you do not want to change the current method, select "Cancel".

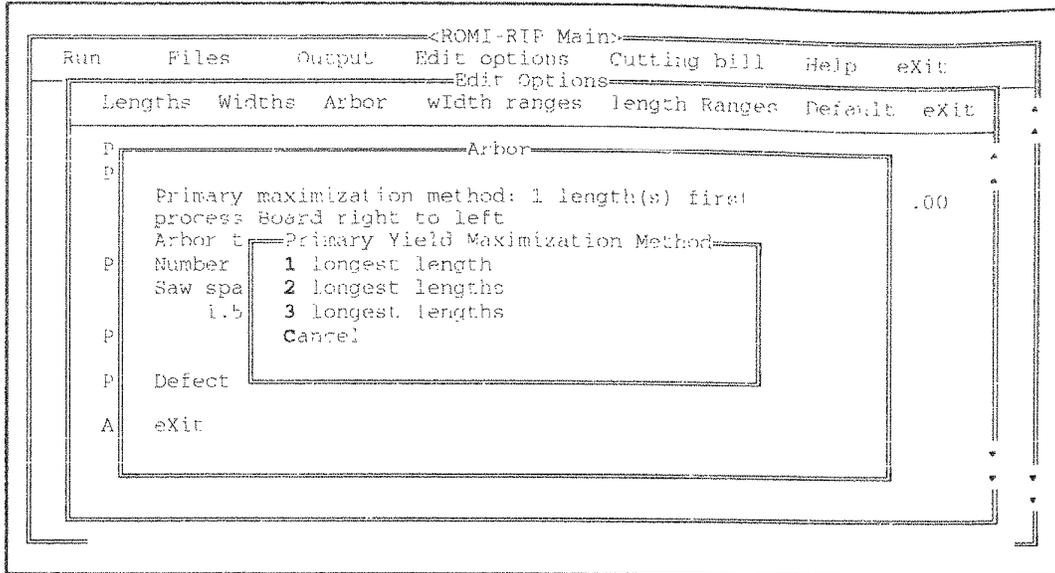


Figure 4.3.1. Primary yield maximization method modification window.

### 4.3.2 Board Processing Direction

ROMI-RIP allows a board to be processed from either the right edge or the left edge. By default, ROMI-RIP processes the board from right to left. This default setting is shown in the "process Board" item in the ARBOR window (Fig. 4.3). Selecting the "process Board" option will toggle the processing direction between the right to left and left to right options. When processing the board from left to right, the board is flipped over and the left edge is placed against the fence.

### 4.3.3 Arbor Types

Select the "Arbor type is:" option from the ARBOR window to change the arbor type. This will display the ARBOR SELECTION window shown in Figure 4.3.3. The features of each arbor type are discussed in Section 3 of *"ROMI-RIP: Rough Mill Rip-First Simulator"* (Thomas 1995a). Select the arbor type or "Cancel" to preserve your current selection. If you select a movable-outer-blade arbor, be sure to check your minimum primary part width (see Section 4.2). If you have selected a fixed-blade arbor type, check the number of saw spacings (Section 4.3.4) and the saw space sequence (Section 4.3.5)

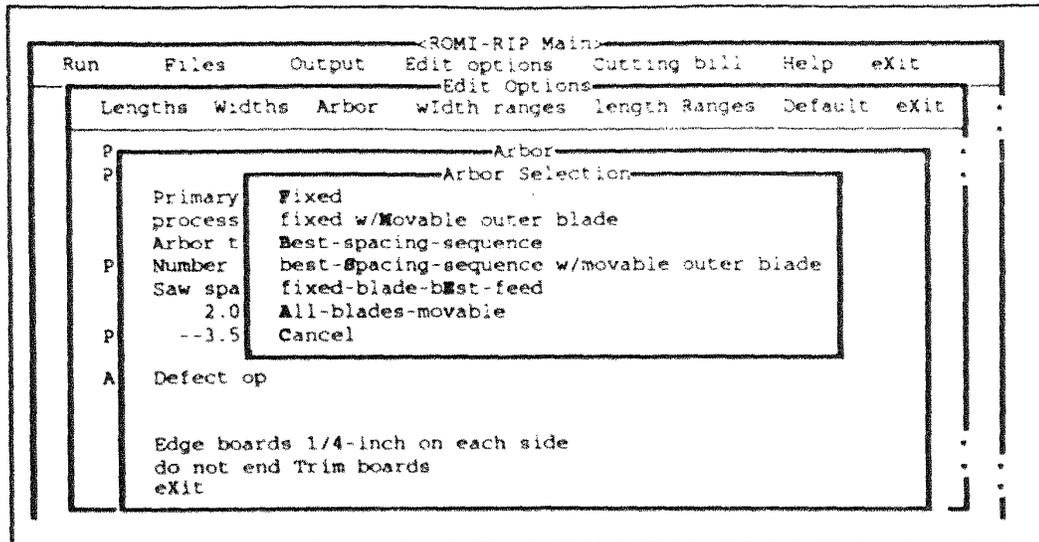


Figure 4.3.3. Arbor selection window.

#### 4.3.4 Number of Saw Spacings

ROMI-RIP allows the number of spacings on the arbor to be adjusted to suit your simulation needs. To change the number of spacings, select the "Number of saw spacings" item from the ARBOR window. A cursor will appear beside the current number of saw spacings. Enter the desired number of spacings at this prompt. You may specify from 3 to 15 spacings. (Note: the maximum arbor size is 48 inches.) If you are using a fixed-blade arbor type, now is a good time to check the saw space sequence (Section 4.3.5)

### 4.3.5 Saw Spacing Setup

When simulating a fixed-blade arbor type, you must be concerned with saw space sequencing. Check the saw spacing sequence whenever a primary part width is added or removed, or the number of saw spacings changes. Facing the infeed end of the saw, the saw space sequence is specified from the right edge of the saw toward the left. Figure 4.3.5A shows the relationship between arbor, fence, and board. The saw spacing sequence is shown in the ARBOR window (Fig. 4.3). To modify the sequence, select "Saw spacing sequence" from the ARBOR window. This will display the SPACING SEQUENCE window shown in Figure 4.3.5B. Select any spacing to change the associated part width. Selecting a spacing will bring up the WIDTH SELECTION window (Fig. 4.3.5C). At the WIDTH SELECTION window, select the replacement part width for the selected spacing. If you do not want to change the selected spacing, select "Cancel". The modified saw spacing will be reflected in the SPACING SEQUENCE and ARBOR windows.

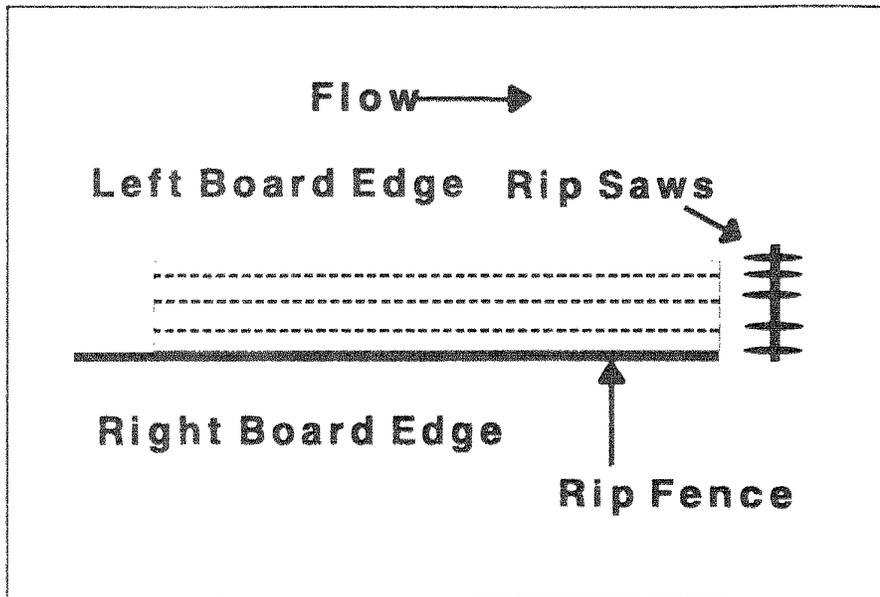


Figure 4.3.5A. Rip-Fence, board and arbor relationship.

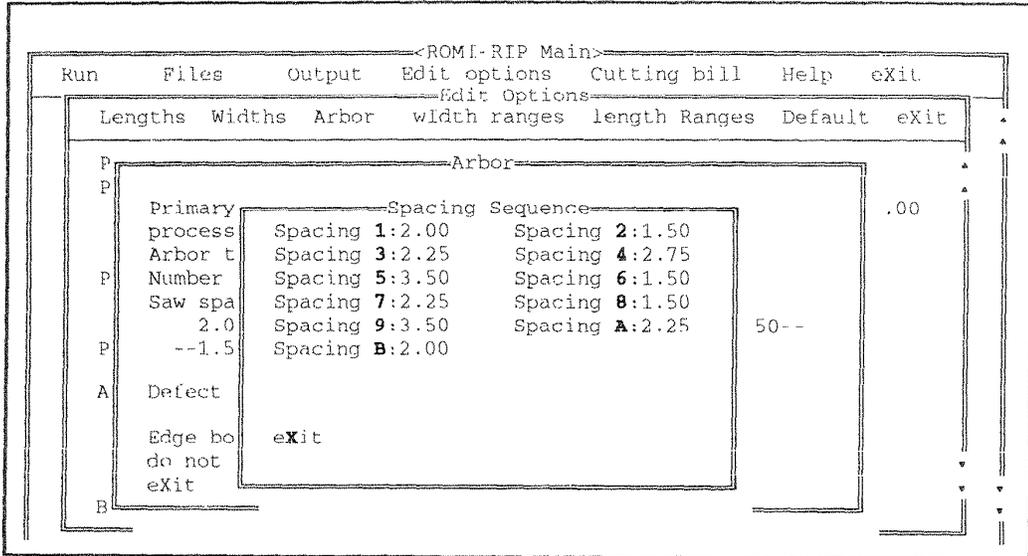


Figure 4.3.5B. Saw spacing sequence modification window.

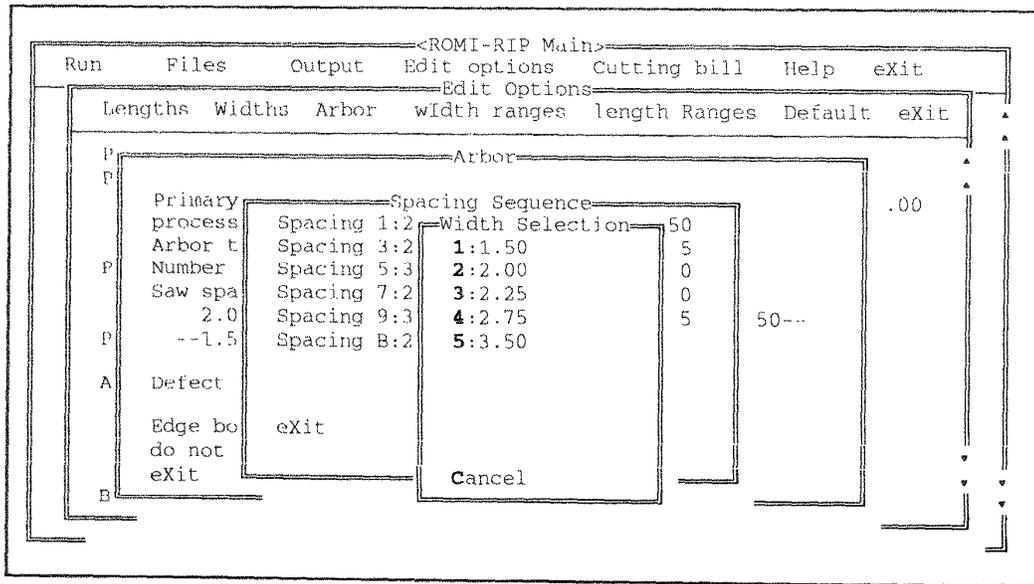


Figure 4.3.5C. Saw spacing width selection window.

### 4.3.6 Defect Options

Sometimes it is acceptable to have defects in your parts. For example, if you are manufacturing upholstered furniture frames, defects that do not compromise structural integrity are acceptable. ROMI-RIP allows you to choose the defect types and sizes that you find acceptable. In the default setup, clear defect-free parts are specified. To specify a defect type or types as acceptable, select the "Defect Options" item from the ARBOR window. This will bring up the ACCEPTABLE DEFECTS SETUP window (Fig. 4.3.6). When you mark a defect as acceptable, a small checkmark appears to the left of it. Selecting a defect will toggle its acceptability on and off. ROMI-RIP allows all selected defects to be located on both faces of all parts.

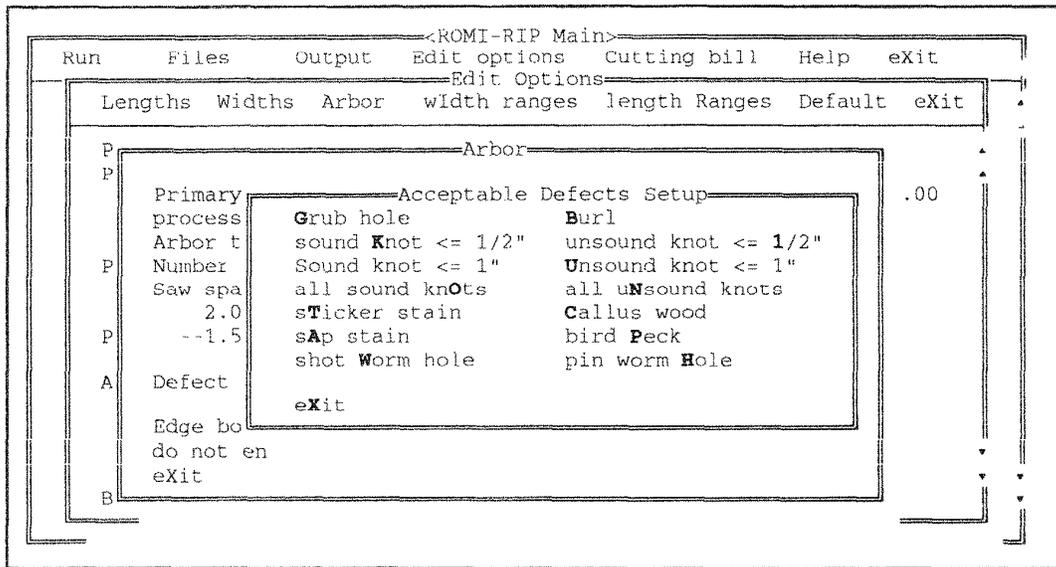


Figure 4.3.6. Acceptable defects setup window.

### 4.3.7 Edging Specification

You have the option of specifying that a ¼-inch to 1-inch edging be taken from each edge of the board. This can simulate removal of small amounts of crook. It also simulates the creation of clean straight edges for gluing. To specify the amount of edging you want, select "Edge boards" from the ARBOR window (Fig. 4.3). This will display the EDGING MODIFICATION window (Fig. 4.3.7). To specify a new edging amount enter 1 for ¼ inch, 2 for ½ inch, 3 for ¾ inch, or 4 for 1 inch. Enter 0 to turn off edging. **Note: the fixed-blade-best-feed arbor requires at least one-quarter of an inch of edging.**

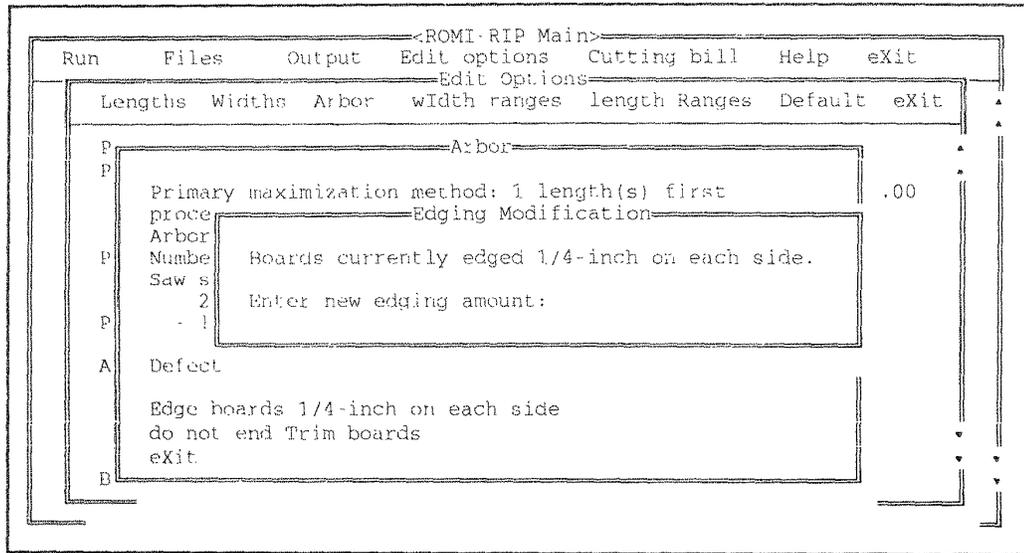


Figure 4.3.7. Edging modification window.

### 4.3.8 End Trim Specification

If your operation frequently end trims boards, you can specify that your ROMI-RIP simulation do the same. ROMI-RIP allows from one-quarter of an inch to as much as 6 inches of end trim to be taken from each end of the board. To specify an end trim amount, select the "end Trim" option from the ARBOR window (Figure 4.3). This will display the END TRIM MODIFICATION window (Figure 4.3.8) and ROMI-RIP will prompt you to enter a new end trim amount. Please note that end trim is specified in ¼-inch units. For example, to specify 1 inch of end trim, enter 4 (4/4 = 1 inch); 1¼ inches, enter 5 (5/4 = 1¼ inches); and so on. Enter 0 to turn off end-trim.

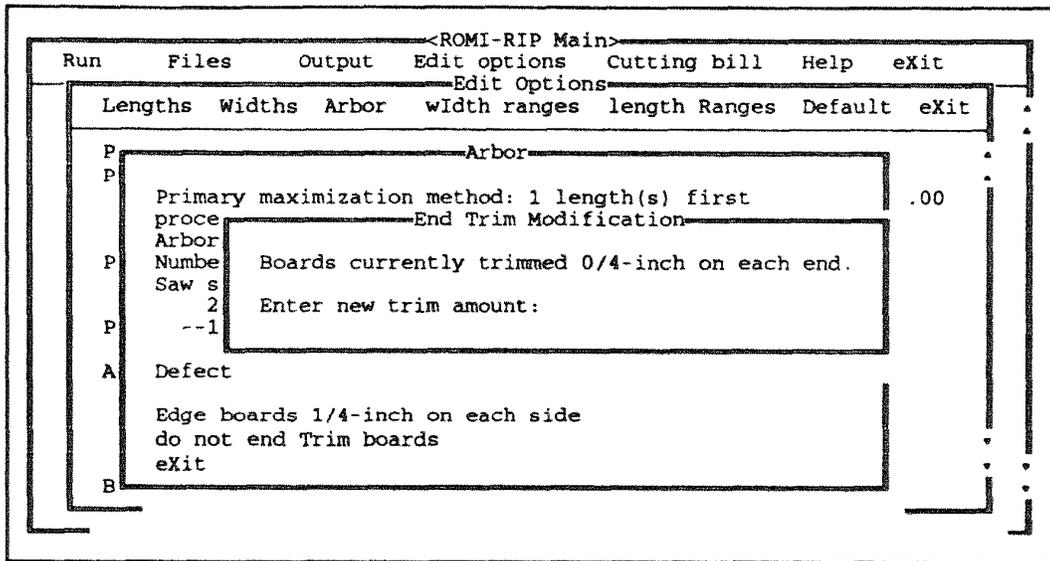


Figure 4.3.8. End-trim modification window.

## 4.4 Modifying Width and Length Ranges

For purposes of data presentation, it is necessary to specify width ranges and, in the case of random length processing, length ranges. The examples in this section will deal with width ranges. However, the steps involved are the same for length ranges. If you are using specified part lengths and try to specify length ranges, you will be advised of the error. Select "width ranges" or "length Ranges" from the EDIT OPTIONS window (Fig. 4) to modify width or length ranges. This will display the edit window for width or length ranges (Fig. 4.4A).

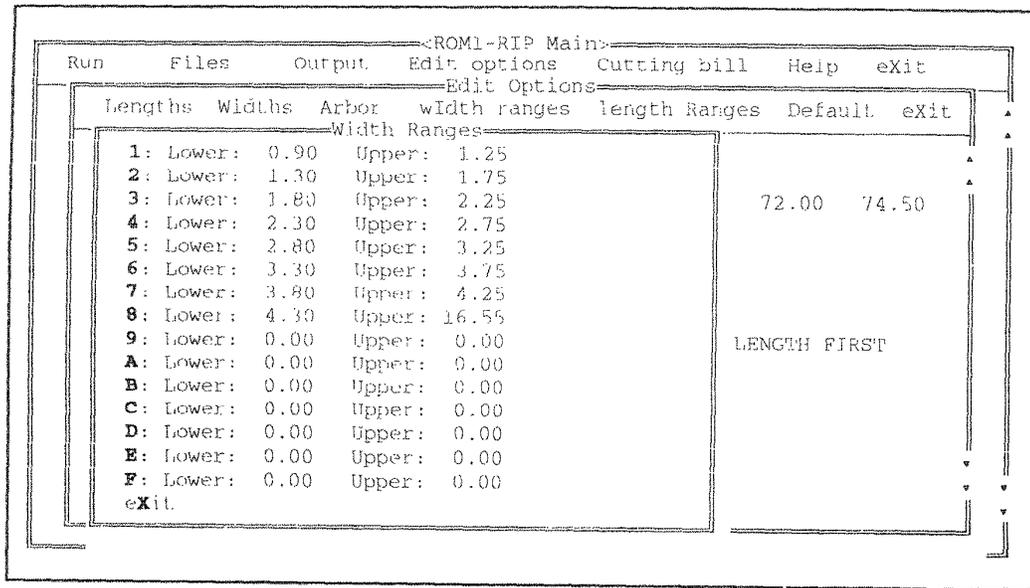


Figure 4.4A. Width range modification screen.

Fifteen width and 10 length ranges allow yield information to be grouped and subtotaled according to your interest. Do not use specified widths to begin or end a width range. This may cause inaccurate subtotals due to rounding within some computers. For example, to specify a width range that includes the two widths 1.5 and 2.0 inches, specify a lower range value of 1.45 and an upper value of 2.05.

Length ranges allow you to group random length results by length groupings. The LENGTH RANGES window has "Activate" and "deActivate" toggle items. Selecting one of these items will turn on or off the usage of length ranges. If length ranges are deactivated, then a subtotal will be created for every different part length produced. For even medium-size runs, this can create **very** large tables. If there are too many lengths, the summary program will not be able to process them all, and instead will report that there are too many lengths. As with width ranges, to avoid possible rounding problems specify upper and lower range values that are not in even ¼-inch values. For example, one way to group the lengths 10.00, 10.25, 10.50, and 10.75 together is to specify a range with a lower value of 9.95 and an upper value of 10.80.

Select any range to modify it. Selecting a range will bring up its edit window (Fig. 4.4B). From the edit window you may choose to modify the upper, lower, or both range values. Selecting "eXit" will return you to the main width or length range window.

There are two things to watch for when editing width and length ranges. One is that the ranges do not exclude any particular length or width. ROMI-RIP looks for this error and will tell you which length or width values you have excluded. You must also watch for overlapping ranges. This error, also detected by ROMI-RIP, occurs when the same length or width can be placed in two or more different ranges. Error detection and an ascending sort for width and length ranges occur when you exit the WIDTH or LENGTH RANGES windows. If the respective ranges have problems, a small pop-up window notifies you of the problem and returns you to the range editor.

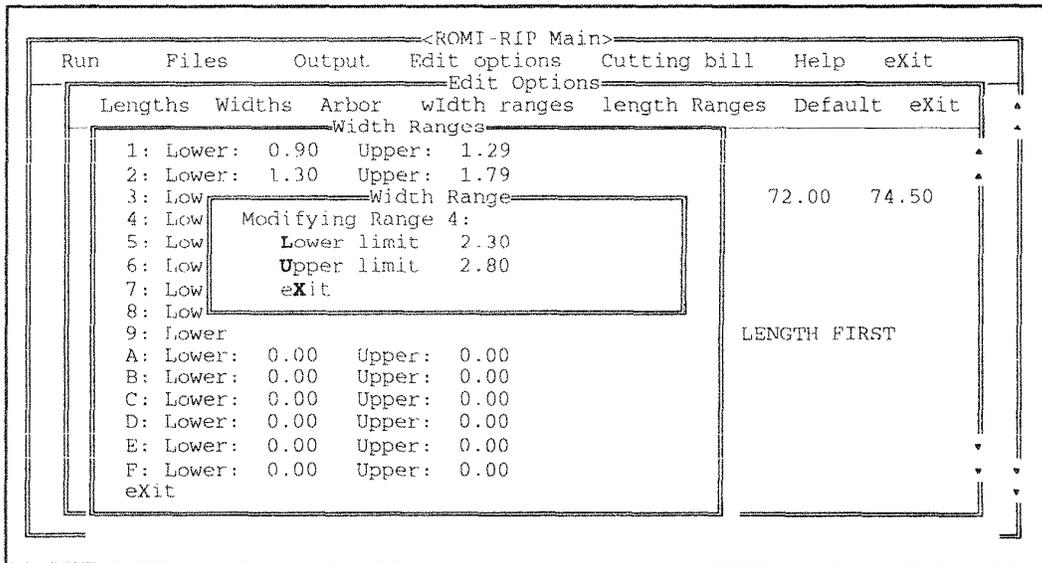


Figure 4.4B. Range modification window.

## 4.5 Default Options

If you have a problem with your current setup options list and cannot determine what the problem is, you may want to reset the options to the ROMI-RIP defaults. To do this, select the "Default" item from the EDIT OPTIONS window. This will display a pop-up window (Fig. 4.5) asking you to confirm the reset. Select "Yes" to continue or "No" to cancel the reset.

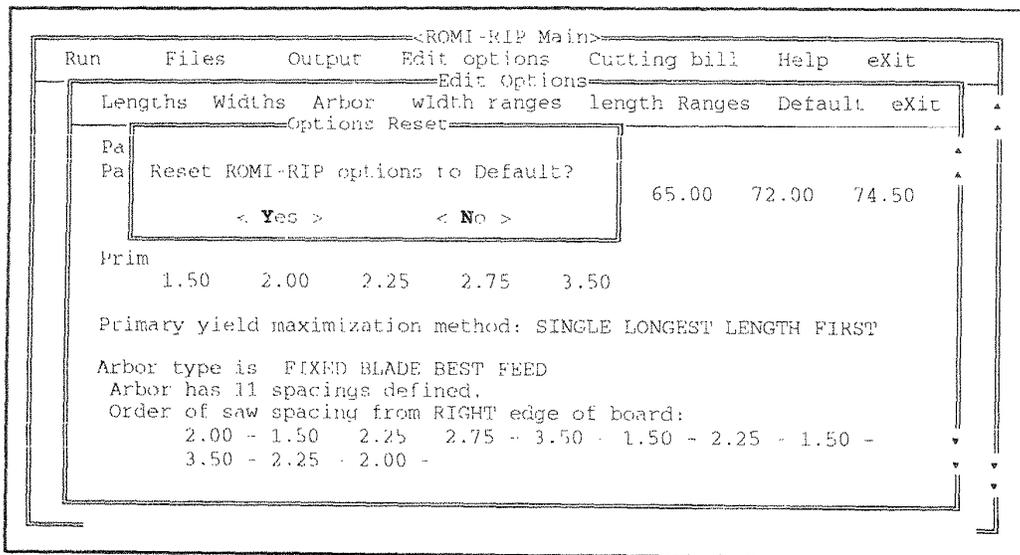


Figure 4.5. Default options reset confirmation window.

## 5. Cutting Bill Setup

ROMI-rip has two very distinct operating modes that allow you to examine the impact of arbor setup and other processing options before a single board is physically processed. The first is with a setup list that specifies processing options and part sizes. The second is with a cutting bill, which is a setup list with part quantities added. The setup list is useful for examining different gang-rip-first strategies and the yield potential of lumber samples. Cutting bill mode allows you to examine the interactions among cutting bill, lumber, and processing options for different lumber grade mixes, given specific part quantities.

To create a new cutting bill or use an existing one, select the "Cutting bill" item from the ROMI-RIP main menu (Fig. 3). This will display the CUTTING BILL DEFINITION window (Fig. 5). If you have not previously used a cutting bill during your current ROMI-RIP session, you will only be able to select a cutting bill with the "no Cutting bill file defined" or "eXit". Once you select a cutting bill, all the remaining items will be available. In addition, the first menu item will now appear as "Cutting bill file:" followed by the name of the cutting bill currently selected. If you are currently using a cutting bill and decide that you no longer want to use it, select the "Turn off cutting bill" option. The remainder of this section will show you how to create new cutting bills and edit existing ones.

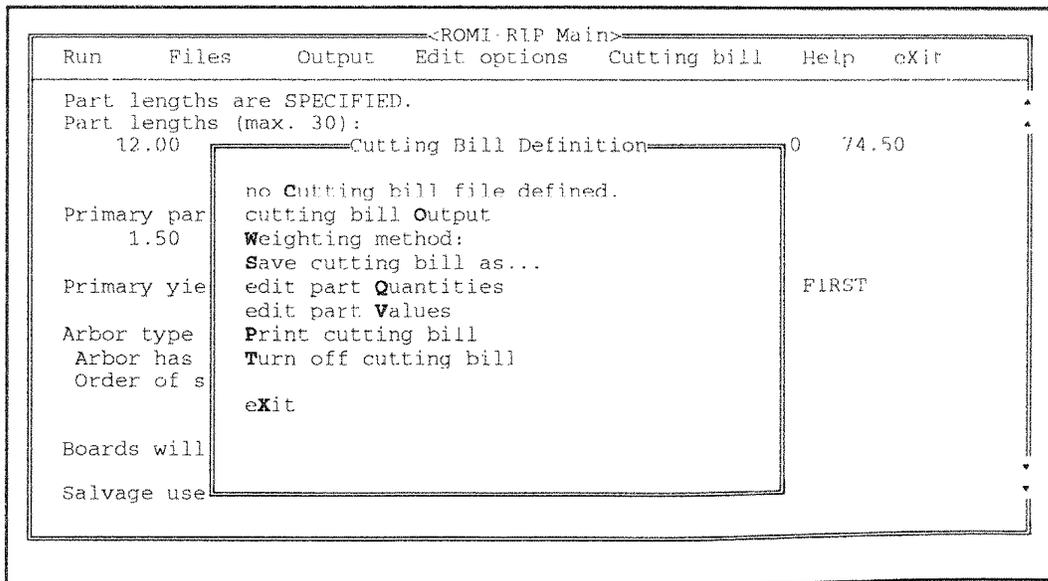


Figure 5. Cutting bill definition menu.

## 5.1 Creating a Cutting Bill

The first step in creating a cutting bill is entering the primary parts' widths and lengths. See Sections 4.1 and 4.2 for information on how to set up your lengths and widths. Creating a cutting bill is easier if your lengths and widths are entered first. For practice in creating a cutting bill, we will use the name "DEMO" and the default lengths and widths. You will supply the part quantities.

You can add, delete, and modify widths and lengths anytime after the creating the cutting bill. First, select "no Cutting bill file defined" or "Cutting bill file" from the CUTTING BILL DEFINITION window (Figure 5). Note, "no Cutting bill file defined" is displayed when there is no cutting bill currently being used. "Cutting bill file:" is displayed along with the name of the currently selected cutting bill when a cutting bill is in use.

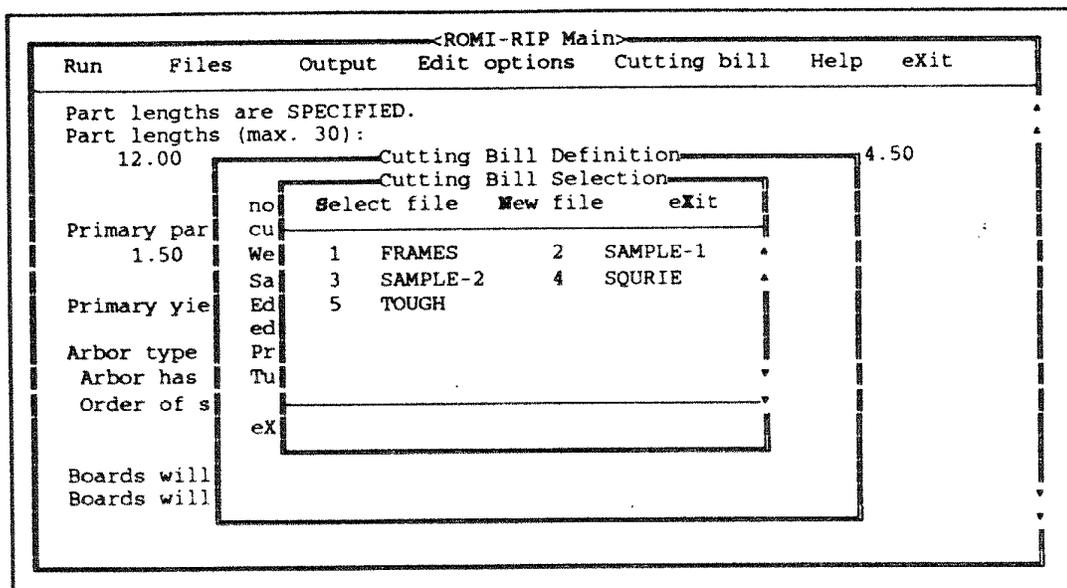


Figure 5.1A. Cutting bill selection window.

The CUTTING BILL SELECTION window (Fig. 5.1A) displays the names of all available cutting bills. Select "New file" to create a new cutting bill using the part widths and lengths. ROMI-RIP will prompt you to enter the name for your new cutting bill. In the sample window shown in Figure 5.1B, I have specified "DEMO" as the name of my cutting bill. After entering the cutting bill name, ROMI-RIP will ask you to verify that this is a new bill. Answer "Yes" to continue; "No" to abort. As part of the cutting bill creation process, ROMI-RIP creates a setup file and a cutting bill definition file. The setup file describes the part sizes and processing options to be used with the cutting bill, that is, arbor type, saw spacings, smart salvage, and so on. The cutting bill definition file describes the part quantities, prioritizing strategy, and optionally, part values.

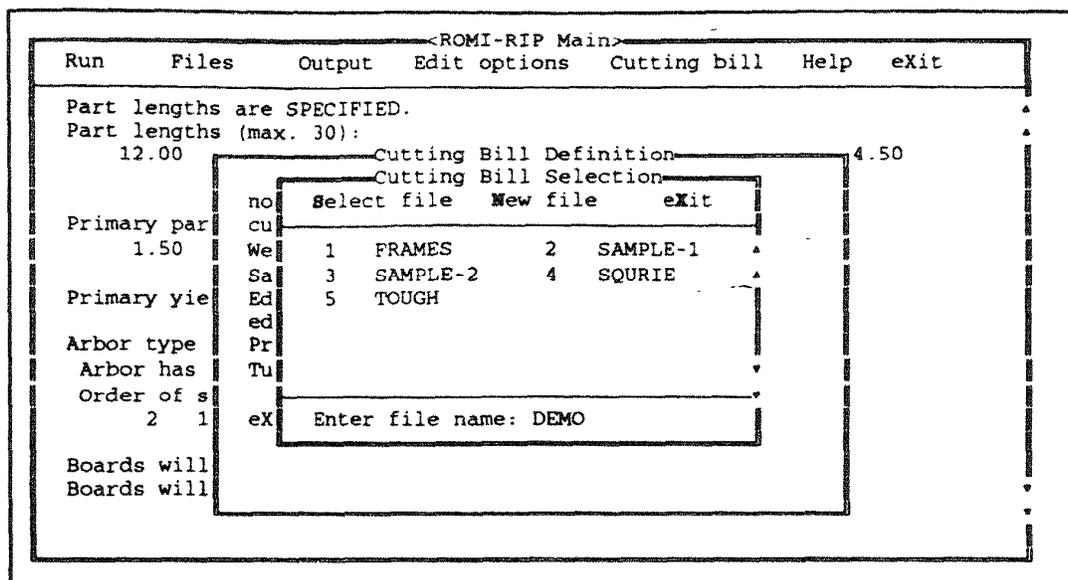


Figure 5.1B. New cutting bill filename prompt.

## 5.2 Editing a Cutting Bill

Once you create a cutting bill, you can change any cutting bill or processing option. This flexibility allows you to examine many different ways of processing your cutting bills, with minimal effort. Refer to Section 4 for more information about modifying processing options. The rest of this section concerns the modification of cutting bill options such as part quantities, part sizes, part values, and prioritization strategy.

### 5.2.1 Part Quantities

A cutting bill consists of two main elements, part sizes and quantities. This section will show you how to assign quantities to your part sizes. The part quantity has two menu levels. In the first level, you select a part width. The second level allows you to edit the part quantities by part length for the selected part width. Select "edit part Quantities" from the CUTTING BILL DEFINITION window (Fig. 5) to see the PART WIDTH SELECTION window (Fig. 5.2.1A). From this window, select a part width whose part quantities you want to edit. Once you have selected a part width, ROMI-RIP will display all the part lengths and quantities associated with that part width (Fig. 5.3.1B). To change a quantity, select the corresponding part length from this list. A prompt will appear allowing you to enter the new quantity for the selected length.

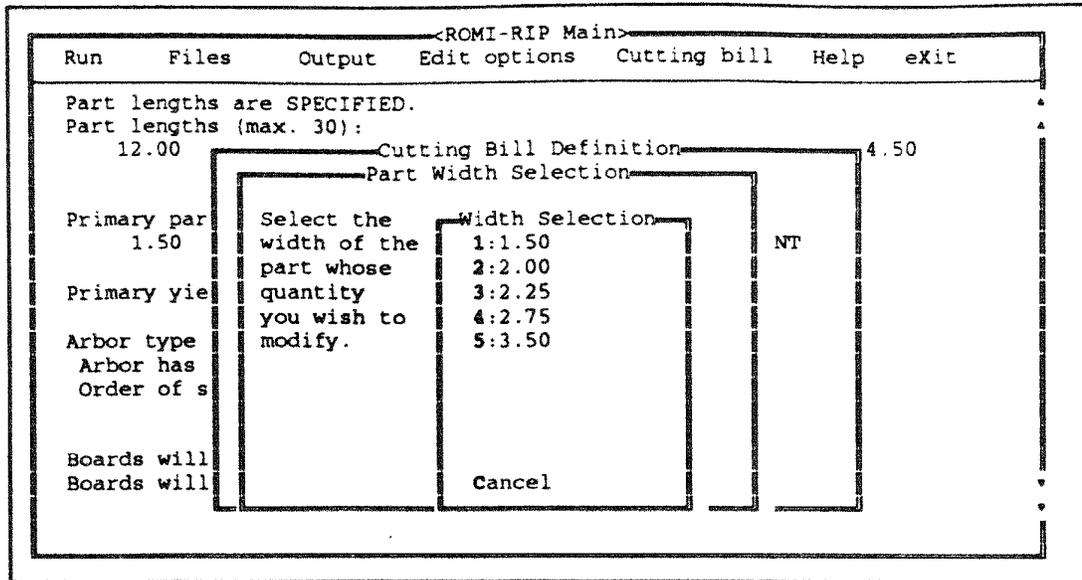


Figure 5.2.1A. Part width selection window.

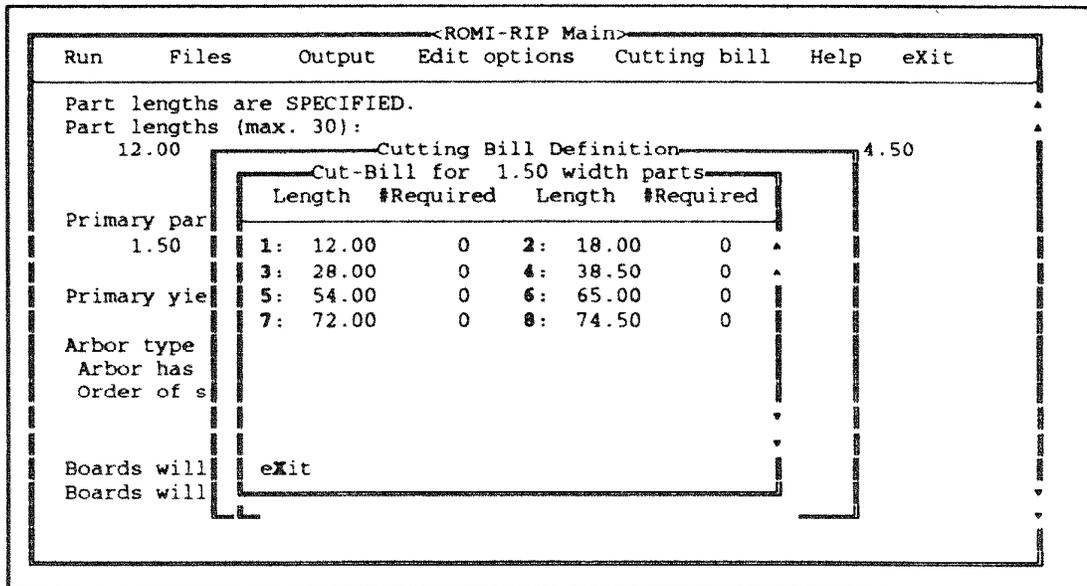


Figure 5.2.1B. Part size quantity editor window.

## 5.2.2 Weighting Method

When processing a cutting bill, various strategies can be used to decide which parts to cut from each board. There are several types of prioritization strategies available in ROMI-RIP. These strategies are based either on area, value, or a dynamic exponent that incorporates quantity (Thomas 1995b). To change the cutting bill prioritization method, select "Weighting method:" from the CUTTING BILL DEFINITION window (Fig. 5). ROMI-RIP will display the PRIORITIZATION STRATEGY window (Fig. 5.2.2). Select any strategy to replace the current one. If you do not want to select a new strategy, select "Cancel" to return to the main cutting bill window menu. Overall, the "Complex Dynamic Exponent" (CDE) strategy performs the best. CDE generally requires less board footage to meet cutting bill requirements than do the other strategies. Please note, if you use the "Value" or "Dynamic Value" strategy, you must also assign each part a value.

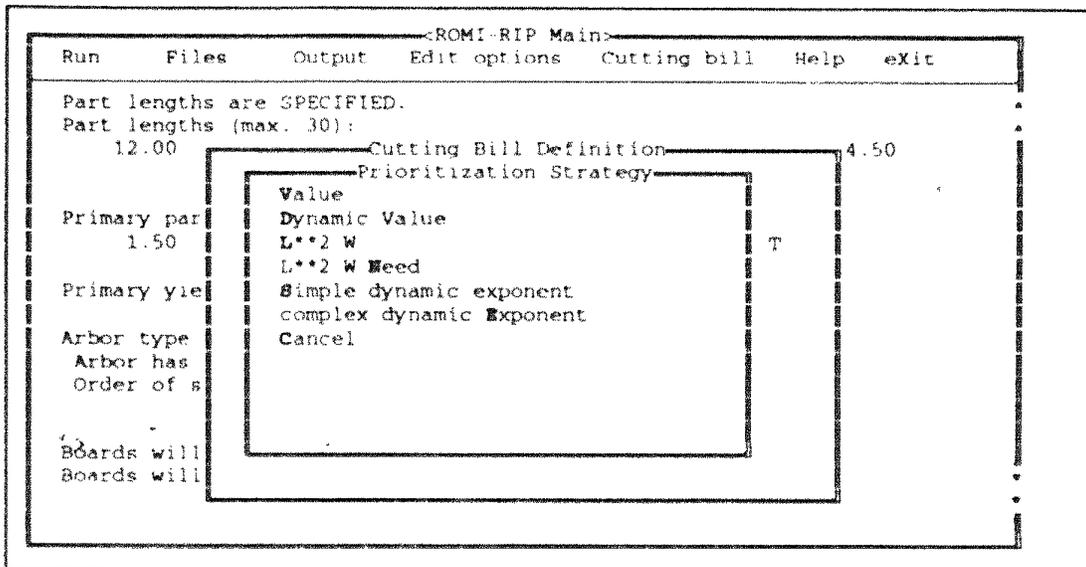


Figure 5.2.2. Cutting bill part prioritization strategy selection window.

## 5.2.3 Part Values

You are allowed to assign a value to a part only with "Value" or "Dynamic Value" strategies. Assigning a value to a part size is much like assigning part quantities. First, select a part width whose values you want to edit (Fig. 5.2.3A). ROMI-RIP will then display the PART VALUE EDITOR window (Fig. 5.2.3B) for the selected part width. From this window, select the part lengths whose values you want to modify, and enter the new value. Select "eXit" when you are done editing part values. At this point, select another part width to edit or select "Cancel" to return to the main cutting bill window (Fig 5).

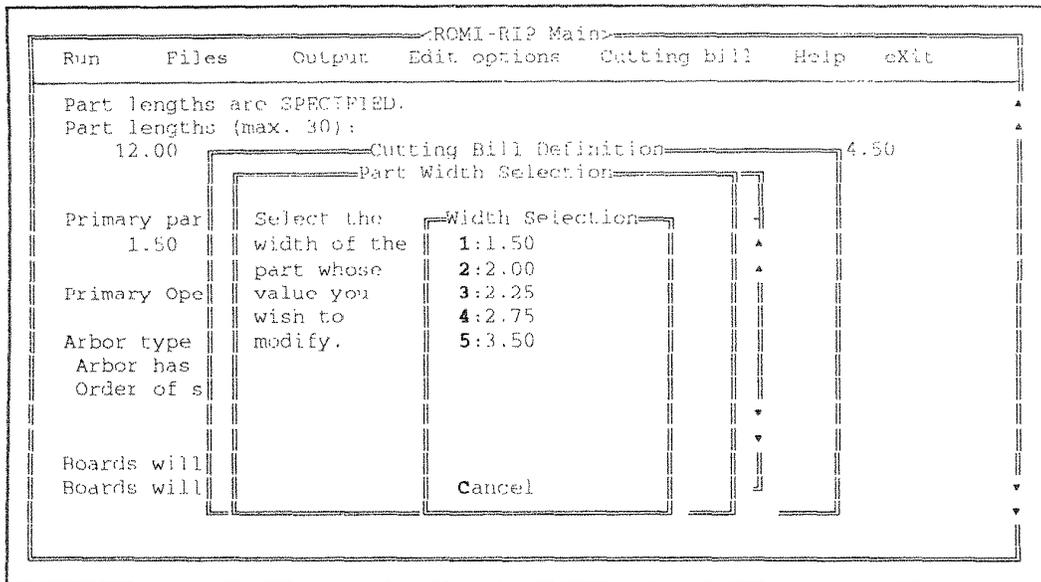


Figure 5.2.3A. Part value width selection window.

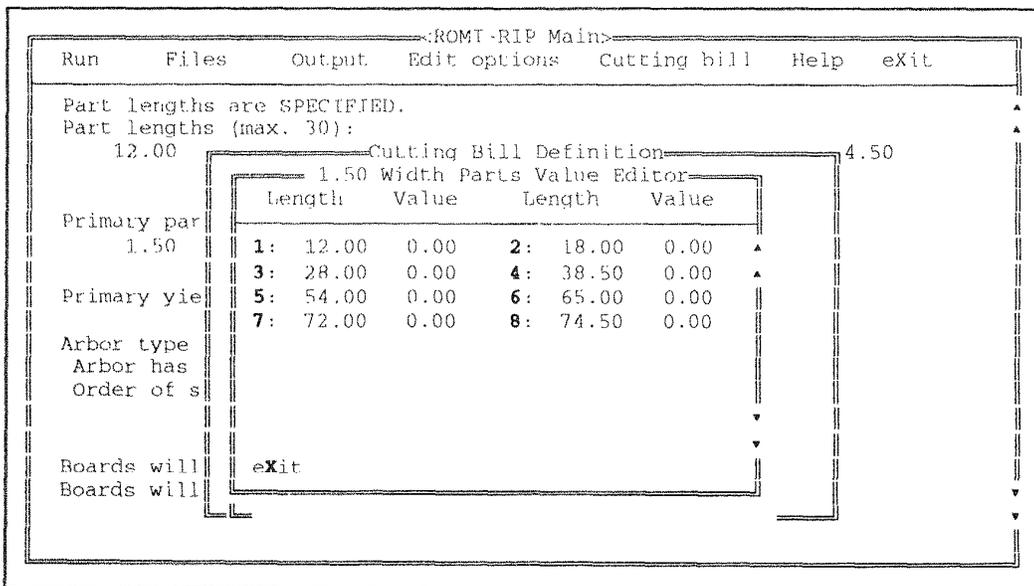


Figure 5.2.3B. Sample part value editor window.



## 5.4 Renaming Cutting Bills and Results

The "Save cutting bill as..." option creates a new copy of the current cutting bill under a specified name. This option is useful when you want to create a cutting bill that is similar to an existing one. Select "Save cutting bill as" from the CUTTING BILL DEFINITION window (Fig. 5) to access the SAVE CUTTING BILL AS window (Fig. 5.4A). Enter the name of the new cutting bill. ROMI-RIP will notify you if a cutting bill already exists under the proposed name. After the cutting bill is created, it becomes the current cutting bill.

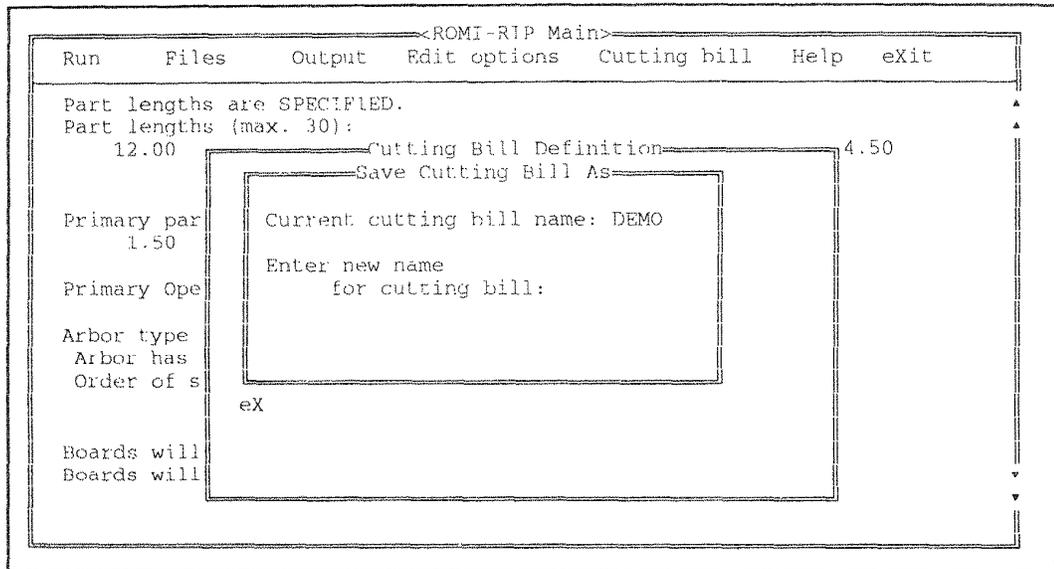


Figure 5.4A. Save cutting bill as window.

You can specify that cutting bill processing results be saved to a specifically named file. By default, cutting bill results are stored in a file that has the same name as the cutting bill, but with an .OUT extension. You cannot specify a different extension, but you can specify a new filename. To store the cutting bill output under a new name, select "cutting bill Output" from the CUTTING BILL DEFINITION window (Fig. 5). Next, the window displaying all the current cutting bill output files will appear (Fig. 5.4B). Select any file to overwrite its current contents, or select "New file" to specify a different output filename.

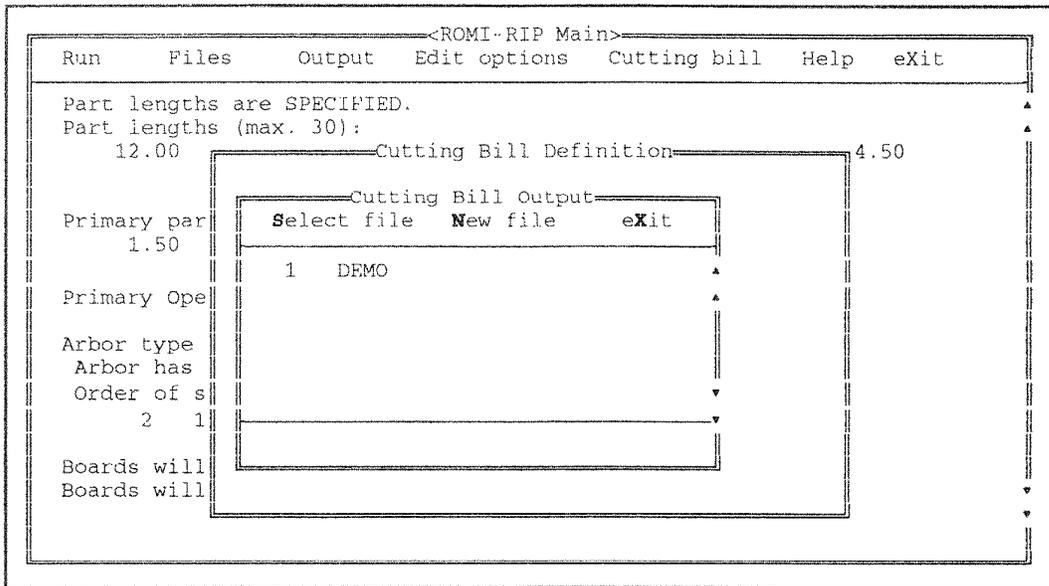


Figure 5.4B. Custom naming cutting bill output.

## 5.5 Loading a Cutting Bill

Loading a cutting bill loads both part sizes and quantities as well as the bill's processing options. Select "no Cutting bill file defined" or "Cutting bill file:" from the CUTTING BILL DEFINITION window (Fig. 5). This will display the CUTTING BILL SELECTION window (Fig. 5.1B) showing all available cutting bills. Select a cutting bill by clicking on one or using "Select file". Until the cutting bill option is turned off, or another is loaded, all editing changes are recorded to the selected cutting bill.

## 5.6 Printing Cutting Bills

Select "Print cutting bill" to print the current cutting bill specifications. The printout will be printed on the printer connected to the PRN or LPT1 port (most computers only have this one printer connection). The cutting bill printout lists part sizes, quantities, prioritization strategy, and when applicable, values. A sample printout is shown in Figure 5.6.

page: 1

ROMI-RIP VER 1.0 Beta Cutting Bill Definition File  
Cutting Bill File: DEMO

Prioritization Strategy: VALUE

Cutting Bill for 1.50 parts:

Lengths	Quantity	Value
12.00	288	0.90
18.00	340	2.50
28.00	0	0.00
38.50	0	0.00
54.00	500	3.00
65.00	0	0.00
72.00	0	0.00
74.50	120	4.00

Figure 5.6. Sample print for the DEMO cutting bill 1.50-inch part width.

## 6. Datafile selection

To select a datafile, or to create your own custom datafiles, select the "Files" item from the ROMI-RIP main menu (Fig. 3). This will display the DATAFILE SELECTION window shown in Figure 6. ROMI-RIP allows you to create custom datafiles that contain either selected boards or a specified grade and size mix.

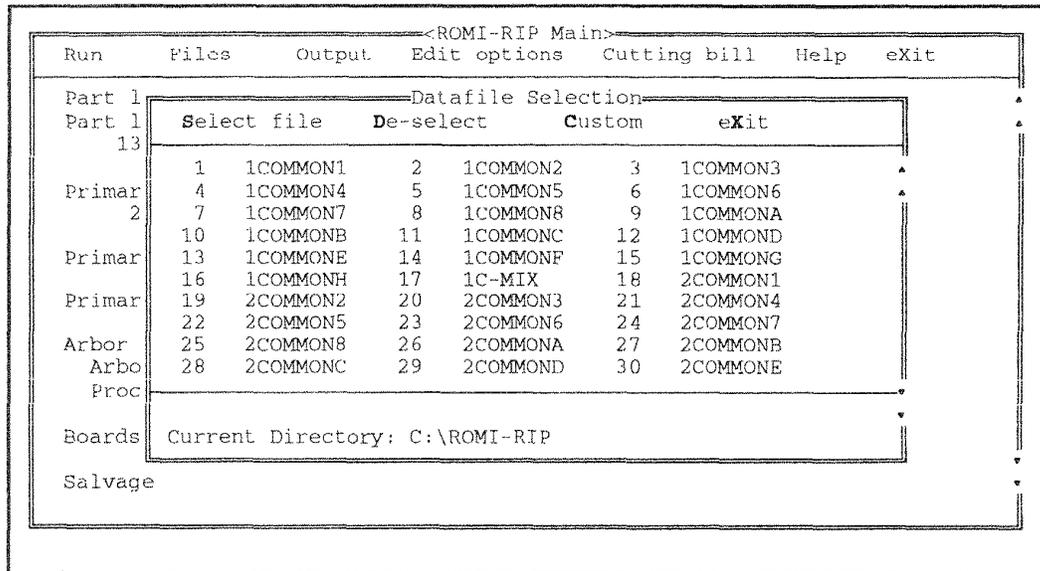


Figure 6. Datafile selection window.

### 6.1 File Selection

The DATAFILE SELECTION window shows you all the datafiles that are in the ROMI-RIP working directory. Appendix III describes the individual board files included with ROMI-RIP. The status line at the bottom of the window shows the working directory. The datafiles are sorted in alphabetical order. To scroll back and forth in the list, click on the arrows at the right of the window. You may also use the PAGE-UP and PAGE-DOWN keys.

There are two ways to select datafiles. For the first method, all you need to do is click on the files you want. The second method uses the "Select file" item at the top of the screen (Fig. 6). Selecting this item will bring up a prompt at the bottom of the window asking for the number of the file to use. For example, if you wanted to use the datafile 1C-MIX, you would enter "17". Selected datafiles are highlighted. You may select up to 10 datafiles to be processed together.

If you decide that you do not want to use a particular datafile, you can "De-select" it. If you click on a selected datafile, the file will be removed from selected datafile set and displayed normally. If you use "De-select", ROMI-RIP will prompt you to enter the number of the datafile to de-select. For example, you would enter "17" to de-select the 1C-MIX file chosen above.

## 6.2 Custom Datafile Generation

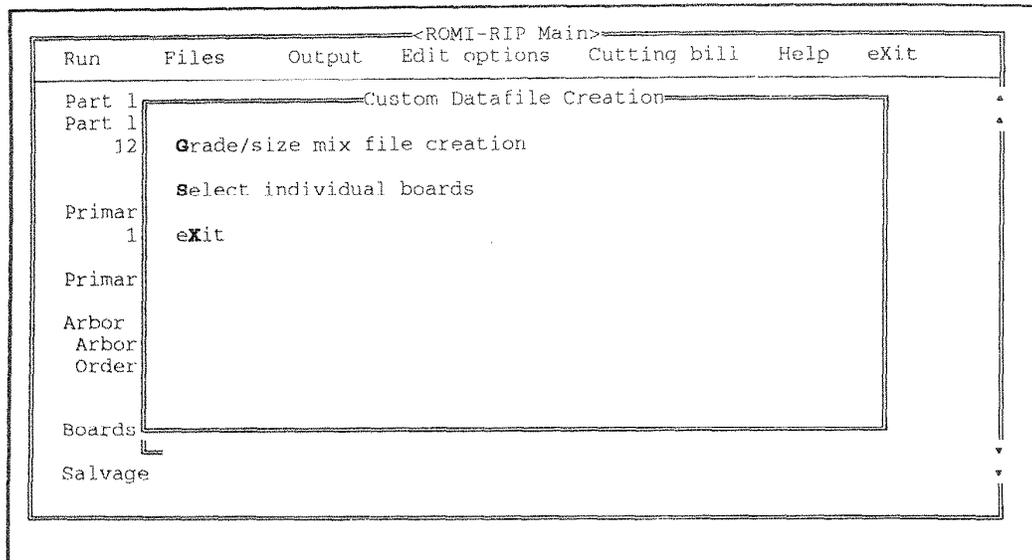


Figure 6.2. Custom datafile creation menu.

ROMI-RIP contains extensive facilities that allow you to create custom datafiles. You can create datafiles that consist of a single board, or a custom grade and board size mix. Select the datafile type you want to create from the CUSTOM DATAFILE CREATION menu (Fig. 6.2). To create a file using a custom grade or board size mix, select the "Grade/size mix file creation" item, and refer to Section 6.2.1. To create a datafile composed of individually selected boards, choose "Select individual boards", and refer to Section 6.2.2.

### 6.2.1 Custom Grade/Size Mix Datafiles

In actual processing, several lumber grades are often processed together. ROMI-RIP allows you to create custom datafiles that are composed of different grades in any percentages you desire, such as: 30 percent 1 Common and 70 percent 2A Common. In addition, you can specify a range of board sizes for your custom file.

ROMI-RIP references a catalog file, FILES.LST, that describes all available datafiles. FILES.LST contains information such as grade and number of boards for each grade and file. When you specify a custom mix, ROMI-RIP references this file to determine which files to use in making the random mix. If you have your own board data and would like to use it to create random samples, you must add your information to FILES.LST. Instructions for editing are contained within the file. To see the instructions, enter at the DOS prompt:

**TYPE FILES.LST**

When creating a custom grade/size mix datafile, ROMI-RIP displays the CUSTOM GRADE/SIZE MIX DATAFILE CREATION window (Fig. 6.2.1A). There are two steps in creating a custom mix datafile: 1) specify the file options you want, 2) generate the file. You specify the percentage of boards you want for each grade. If you want 30 percent 1 Common, you select "1 Common" and enter 30. Similarly, if you want 70 percent 2A Common, you select "2A Common" and enter 70. The total percentage for all grades is displayed on the totals line.

The default board sample size is approximately 50 boards. The sample size is approximate ( $\pm 1$  board) due to potential rounding errors that can occur in grade percentages for some sample sizes. To change the sample size, select "Totals" and enter the sample size you want. When you change the sample size, ROMI-RIP automatically recalculates the number of boards chosen for each grade and displays it beside the percentage. The sample size is limited to number of boards available for each grade (Gatchell et al. 1992).

Once the datafile creation program selects a datafile, it begins selecting boards. After selecting a board, the program skips over a random number of other boards before selecting the next board. Usually one to three boards are skipped. This reduces the possible sample size to approximately one-third the total number of boards available in the data bank. Table 1 shows suggested sample size limits for each grade for the supplied datafiles.

Lumber Grade	Total Selected Boards
FAS	125
Selects	125
1 Common	350
2A Common	350
3A Common	N/A

Table 1. Suggested maximum number of boards to select from each lumber grade.

In the example shown in Figure 6.2.1B, we specified a 30 percent 1Common, 70 percent 2A Common data file, where all the boards are 95 inches or longer. The total number of boards in the sample is increased to 150. Once you are through specifying your options, you are ready to generate the custom file. Select the "Generate" item from the window (Fig. 6.2.1B) to start the file generation. The CUSTOM FILE GENERATOR window will ask you to enter a name for your file. ROMI-RIP will determine if the file already exists. If the file exists, you are given the option of overwriting the file or cancelling the file generation. If you cancel the file generation, your options are unchanged and you can specify a new name for the file. ROMI-RIP keeps you informed of progress made while the file is being generated. ROMI-RIP will notify you if you specified more boards than those that are available from the board databank. When this occurs, ROMI-RIP continues to generate the datafile with what is available. After the file is generated, ROMI-RIP returns you to the CUSTOM GRADE/SIZE MIX DATAFILE CREATION window (Fig. 6.2.1A). From here you may create another datafile or exit and begin using your new datafile(s).

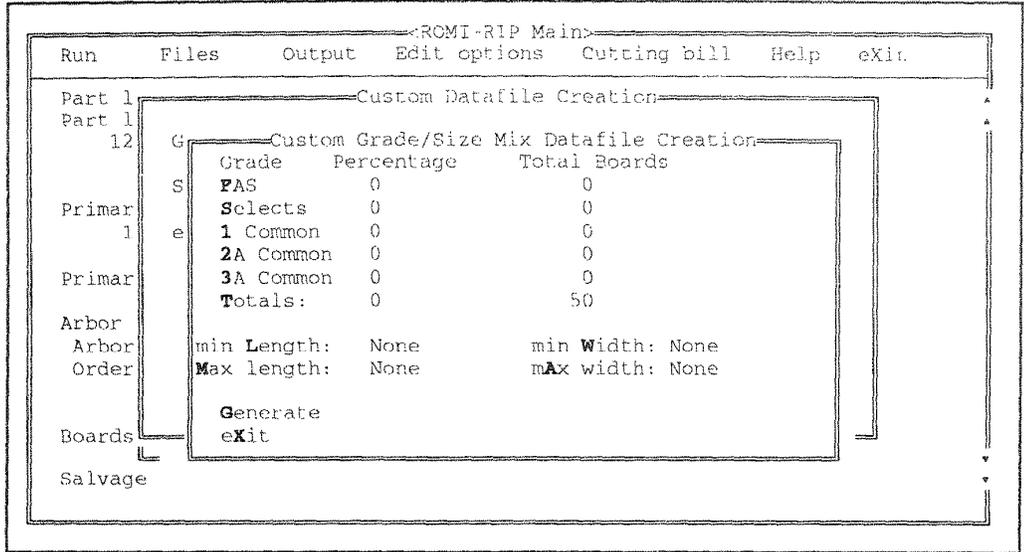


Figure 6.2.1A. Custom grade/size mix datafile creation window.

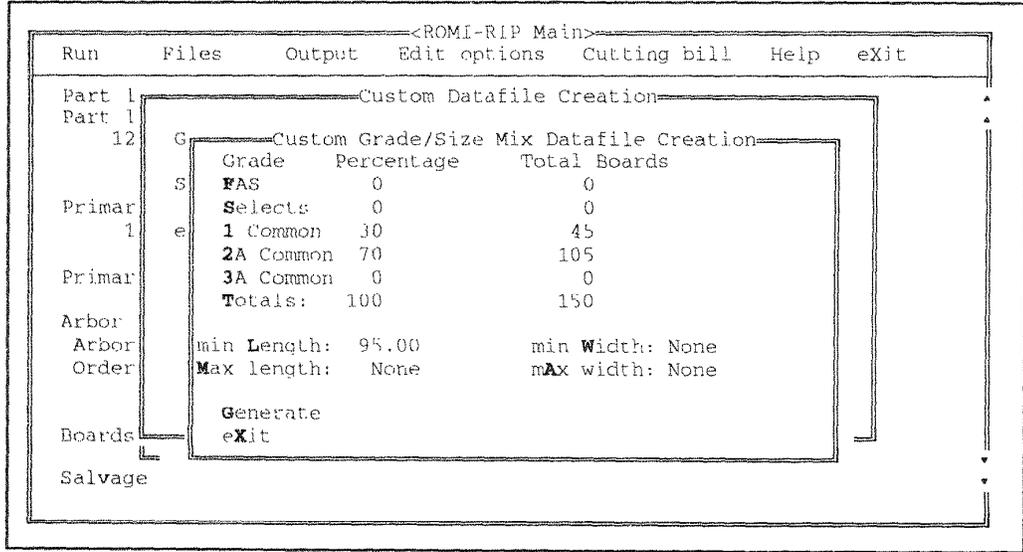


Figure 6.2.1B. Sample settings for custom datafile creation.

## 6.2.2 Selected Boards Datafile

When you opt to create a new datafile from selected individual boards, you are given the **SELECTED BOARDS DATAFILE CREATION** window (Fig. 6.2.2A). To create a selected boards file: 1) select a source datafile, 2) select a destination datafile, and 3) select the board(s). Details for these three steps follow. To see if you have a datafile and destination file selected, refer to the status bar at the bottom of the window. In Figure 6.2.2A, no source or destination datafiles have been selected yet; this is reflected in the status bar.

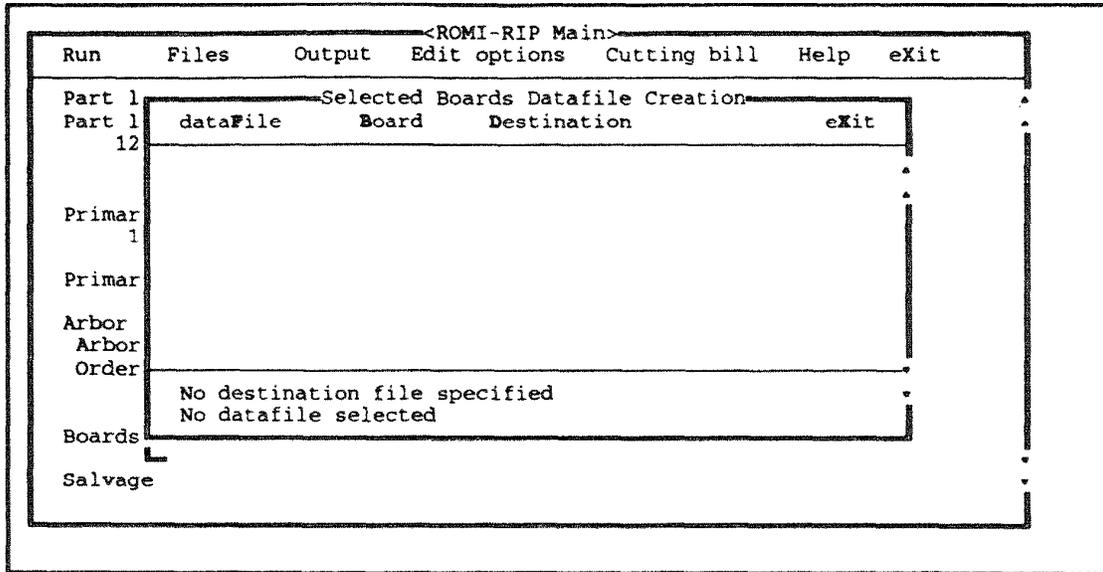


Figure 6.2.2A. Selected boards datafile creation window.

To select a source datafile, select the "dataFile" item from the **SELECTED BOARDS DATAFILE CREATION** window (Fig. 6.2.2A). The **DATAFILE SELECTION** window will appear on your screen (Fig. 6.2.2B). To select a datafile, you may either click on it with the mouse, or use the "Select file" item. The **DATAFILE SELECTION** window will automatically close when you select a datafile. In this example, we will select the fifth file, 1COMMON5. If you do not want to change your currently selected source datafile, select "eXit" to close the **DATAFILE SELECTION** window. Although you can only have one source datafile open at a time, you may open as many as you want during the selection sequence.

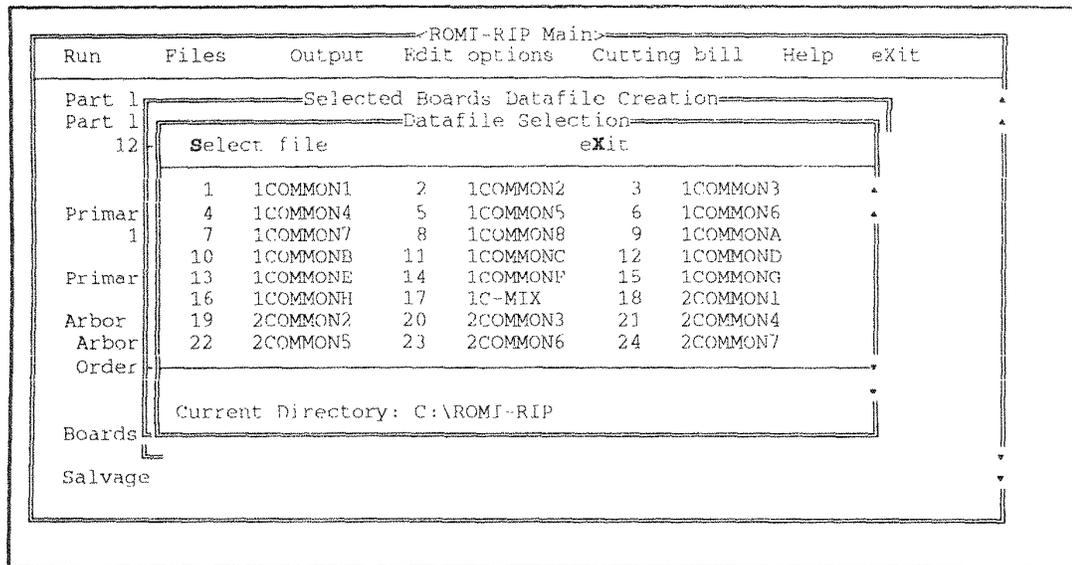


Figure 6.2.2B. Datafile selection window.

After you have selected an input datafile, you are ready to select a destination datafile. To do this, select the "Destination" item from the SELECTED BOARDS DATAFILE CREATION window (Fig. 6.2.2A). This will display the DESTINATION DATAFILE window (Fig. 6.2.2C). You may select a file with the mouse or use the "Select file" item. For this example, I will create a file using "New file". ROMI-RIP will prompt you to enter your destination filename. This prompt is shown in the status bar of Figure 6.2.2C. Enter SAMPLE as the destination file name. If you decide not to specify a new file after selecting the "New file" item, press return and the "Enter file name:" prompt will vanish. Once you specify a destination datafile, the DESTINATION DATAFILE window closes. Select "eXit" to close the window without selecting a datafile. If you select or specify a file that currently exists, you are given the option of overwriting or appending to the file. The datafiles supplied with ROMI-RIP are write-protected to prevent them from being destroyed or altered.

After you have selected source and destination datafiles, you are ready to start selecting boards. Selecting the "Board" item from the SELECTED BOARDS DATAFILE CREATION window will bring up the BOARD SELECTION window (Fig. 6.2.2D). The BOARD SELECTION window displays all of the boards that are in your source datafile. Clicking on the arrows at the right of the window, or using the PAGE UP and PAGE DOWN keys, will scroll the board display. Selecting a board either with the mouse or "Select a board" copies the selected board's data to the destination datafile. ROMI-RIP will display a message in the status bar at the bottom of the window confirming that the selected board was copied. **Note: ROMI-RIP does not check to see that a board is copied only once.**

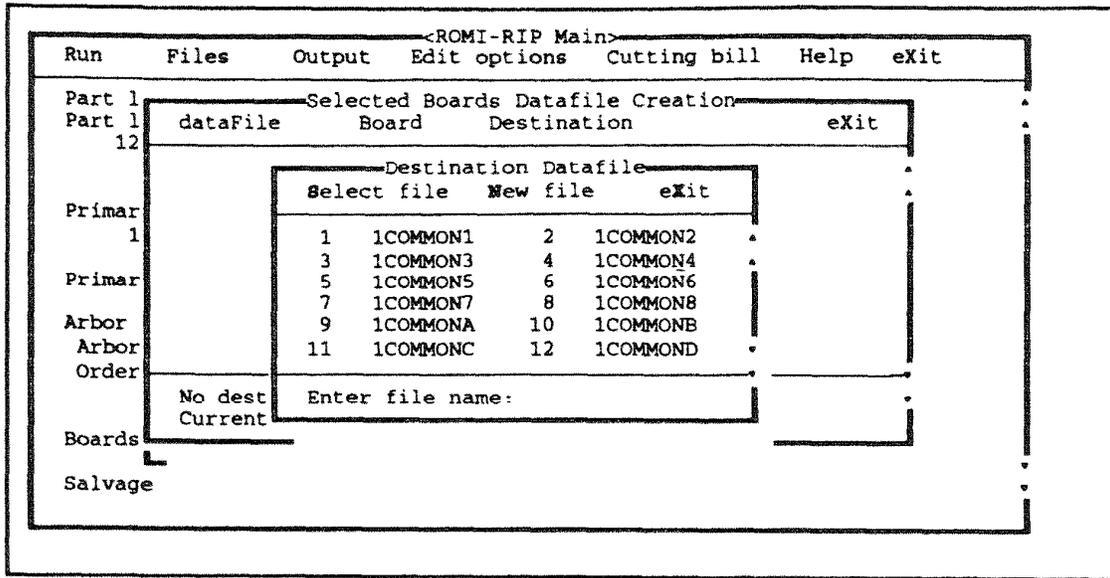


Figure 6.2.2C. Destination datafile selection window.

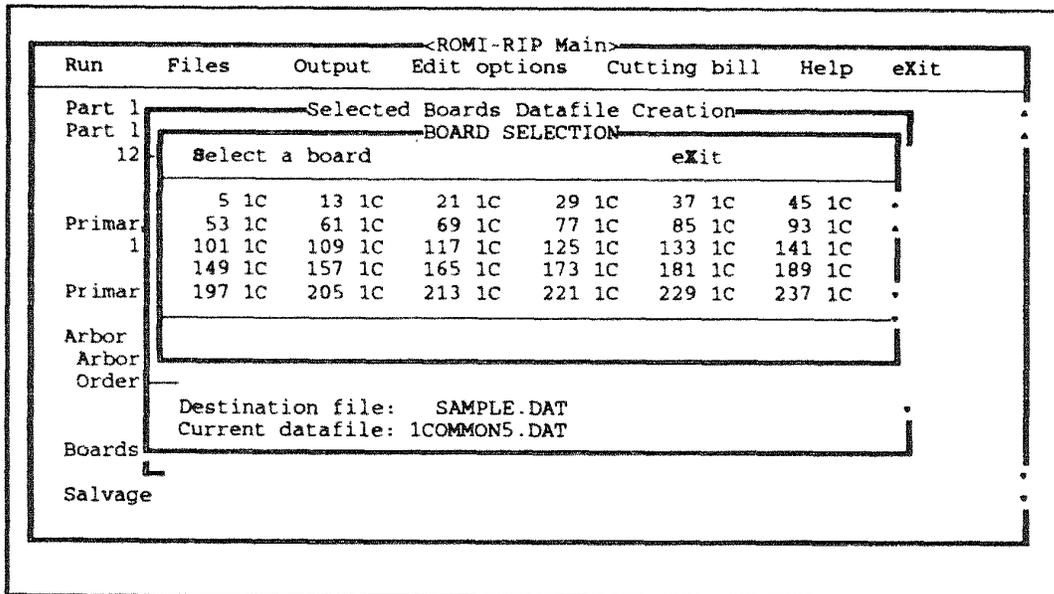


Figure 6.2.2D. Board selection window.

After you have selected all the boards you want from a file, select "eXit" from the BOARD SELECTION window (Fig. 6.2.2D). At this point you may select another source datafile and continue to add boards to your destination file. Alternatively, you could select a new destination file to work with. When you are finished generating custom files, select "eXit" to return to the DATAFILE SELECTION window (Fig. 6).

## 7. Output Options

ROMI-RIP generates several types of output that allow you to analyze your simulation in depth. Certain output types are produced by default, others must be selected before each run. Select the "Output" item from the ROMI-RIP main menu (Fig. 3) to choose or verify the types of output you want. ROMI-RIP will then display the OUTPUT OPTIONS menu (Fig. 7). See Section 10, Viewing ROMI-RIP Results, for a complete description of the different output types discussed here.

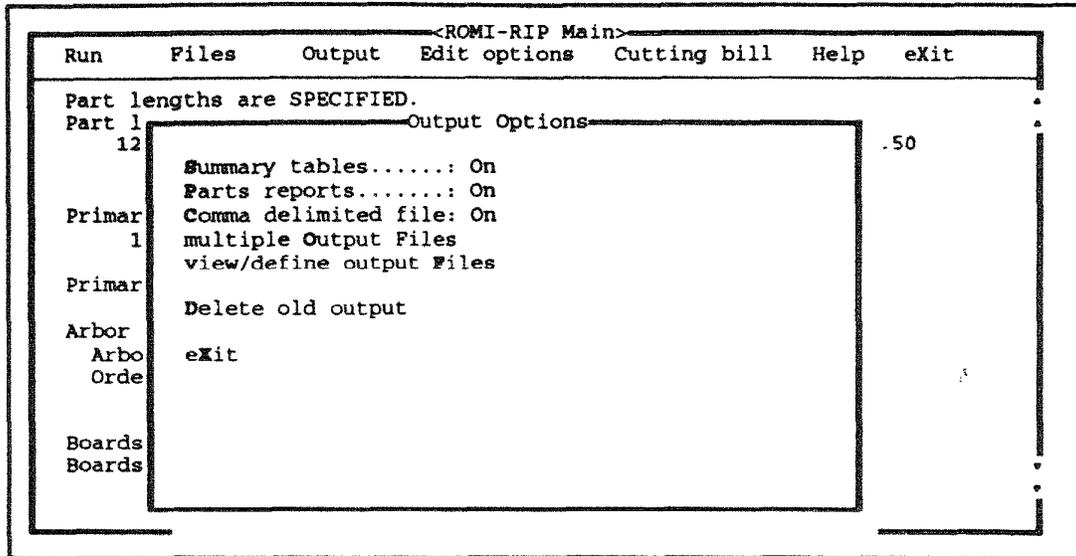


Figure 7. Output options menu.

The first three items in the OUTPUT OPTIONS menu concern the type of output produced. These menu items are simple toggles, selecting any item will turn that item on and off. Figure 7 shows the default settings. From this window, you can see that ROMI-RIP generates summary tables, parts reports, and comma-delimited output (datafiles that can be read by spreadsheet packages) by default. If you do not need one of these options, turn it off by selecting that menu item.

If you are using multiple input datafiles, ROMI-RIP will, by default, generate a separate set of output files for each input file. If you are using multiple input datafiles and would like a single output file that covers all the different input files, select the "multiple Output files" item so that it displays "single Output file". This option indicates whether single or multiple output file sets will be created. The single output file option is preferable when processing a cutting bill with multiple data files. ROMI-RIP automatically enables the single output file option when using a cutting bill.

By default, ROMI-RIP generates output files with the same name as the input file. For example, the default name for the 1COMMON1.DAT output file set is 1COMMON1, with each output type having a different extension; that is, SUM, RPT, PLT. While this makes it easy to determine the input datafile from which an output file is derived, it does mean that two runs on the same input file would cause old output files to be overwritten. If you want to keep your old output files, you should specify different names for them. Section 7.1 shows how to define a new output file name when using a single output file set. If you are generating multiple output files, see Section 7.2.

## 7.1 Single Output File Definition

To define a new name for a single output file set, select the "output File" item from the OUTPUT OPTIONS menu shown in Figure 7.1A. Note: if you have not selected any input datafiles before this step, "no output File selected" will be displayed instead of "output File". Selecting either item will produce the same results. Please note that these items are displayed **ONLY** when the "single Output file" option is enabled. In this example, we have already chosen the file 1COMMON1 as an input file. (See Section 6 for information regarding datafile selection.) The screen is displaying the default name, 1COMMON1, for the output file set.

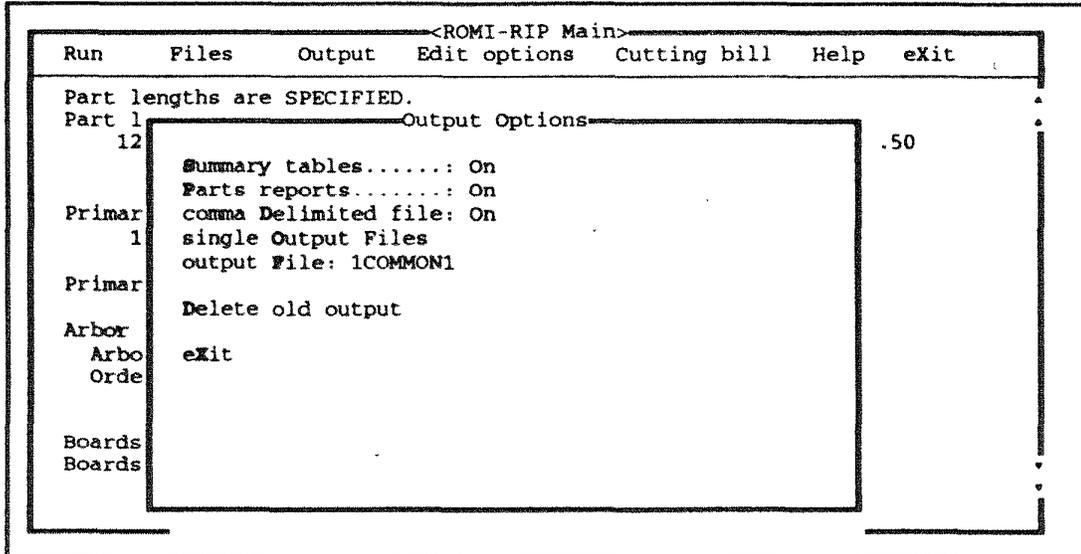


Figure 7.1A. Output options window for single output file option.

Selecting "output File" will display the OUTPUT FILE SELECTION window (Fig. 7.1B). This window displays all the names of output file sets currently in the working directory. The arrows to the right of the window allow you to scroll through all the file names. If you want to overwrite one of these files, click on the file with the mouse or select the "Select file" item. If you use the "Select file" item, ROMI-RIP will prompt you for the number of the file you want to use. For example, if you wanted to overwrite the output file set 1C-MIX, you would enter "2" as the selected file number. If you do not want to overwrite any existing files, select the "New file" item. ROMI-RIP will prompt you to enter the name of the file set you want to use. After you select a file set or enter a new file name, ROMI-RIP will return to the OUTPUT OPTIONS menu showing the newly selected output file name.

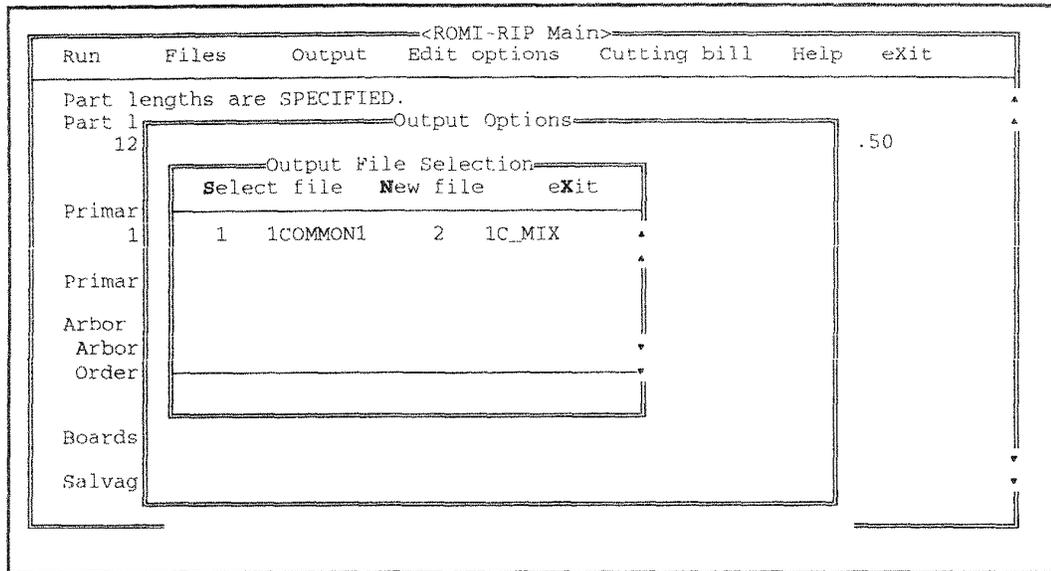


Figure 7.1B. Output file selection window for single output file option.

## 7.2 Multiple Output File Definition

To create an output file set with a different name, select the "view/define output Files" item from the OUTPUT OPTIONS menu (Fig. 7). Figure 7.2A shows the OUTPUT FILES menu for multiple output file sets. You can have up to 10 different input files and may change the output file name set for each. In the example shown, the datafiles 1COMMON1 and 2COMMON1 were selected. To rename the respective output files to 1C\_RUN1 and 2C\_RUN1, select the file name from the OUTPUT FILES menu (Fig. 7.2A). This will bring up the OUTPUT FILE SELECTION window (Fig. 7.2B).

The OUTPUT FILE SELECTION window displays all of the output file sets that exist in the working directory. If you would like to overwrite one of these files, select it using the mouse or with the "Select file" item. If you use the "Select file" option, you will be prompted to enter the number associated with the chosen file. For example, If you wanted to specify that output for the selected file set be named 1C\_MIX you would enter "2". If you do not want to overwrite any files, select the "New File" item. ROMI-RIP will prompt you to enter a file name for the output set.

After you have selected or entered a file name, you will be returned to the OUTPUT FILES menu (Fig. 7.2A).

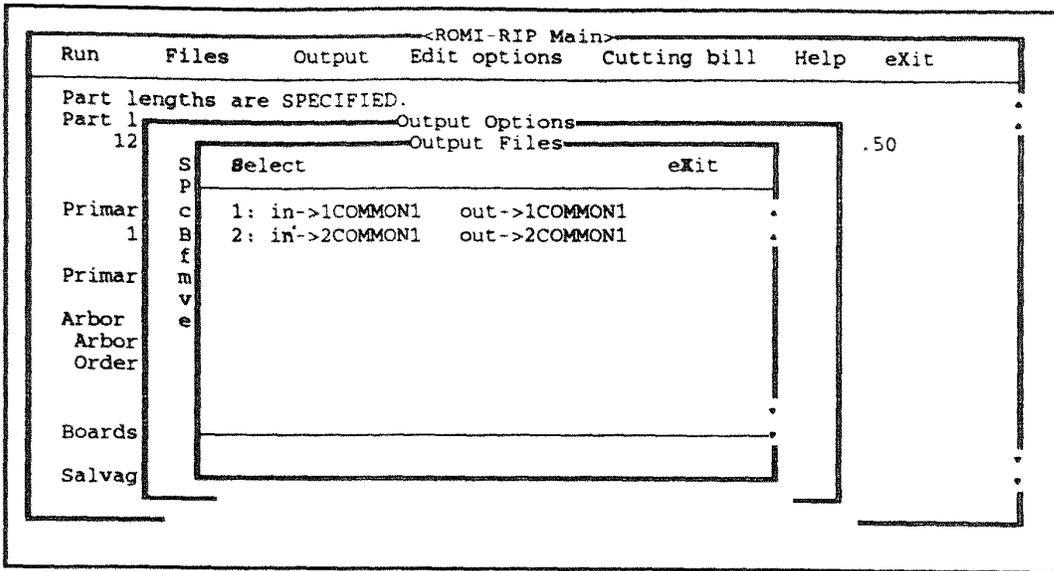


Figure 7.2A. Output files menu.

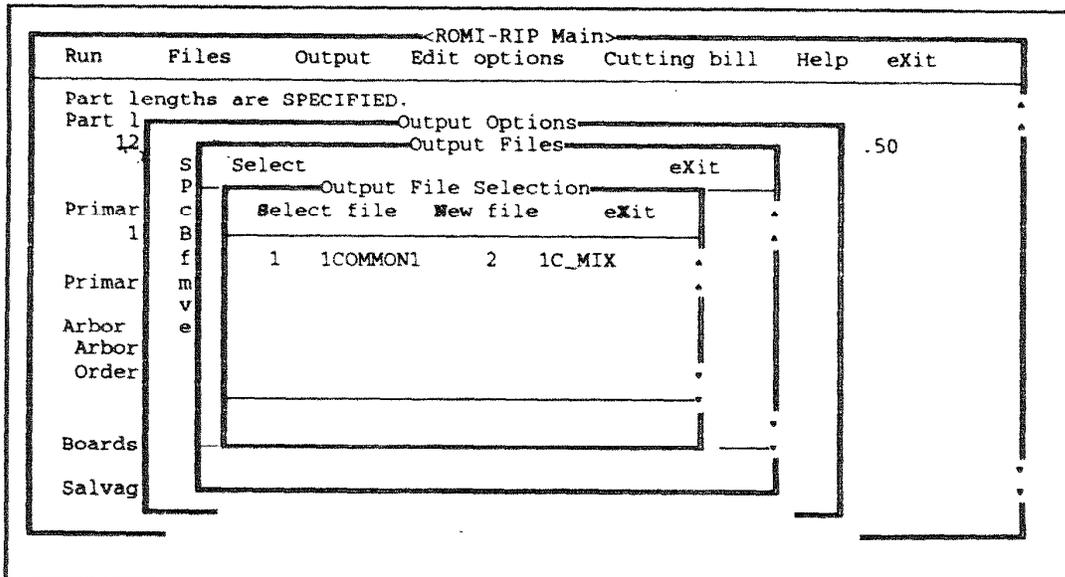


Figure 7.2B. Output file selection window.

### 7.3 Deleting Old Output Files

After using ROMI-RIP several times, you may find a number of old ROMI-RIP results in your working directory. If you find yourself getting lost in all the files or low on available hard disk space, you can delete these files.

Select "Delete old output" from the OUTPUT OPTIONS window to remove old output files (Fig. 7). The computer will ask what type of output you want to delete (Fig. 7.3A). Select "cutting Bill results" to delete results from past cutting bill runs. Select "Summary and report files" to delete summary, report, and plot information. Select "Cancel" if you do not want to delete any files at this time.

Once the type of output to delete is selected, the deletion window will appear (Fig. 7.3B). To delete an output file set, click on the desired filename or use "Select file". Once a file is selected, ROMI-RIP will ask you to confirm its deletion. Answer "Yes" to continue with the deletion or "No" to stop the deletion. When you are finished deleting files, select "eXit" to return to the OUTPUT OPTIONS window.

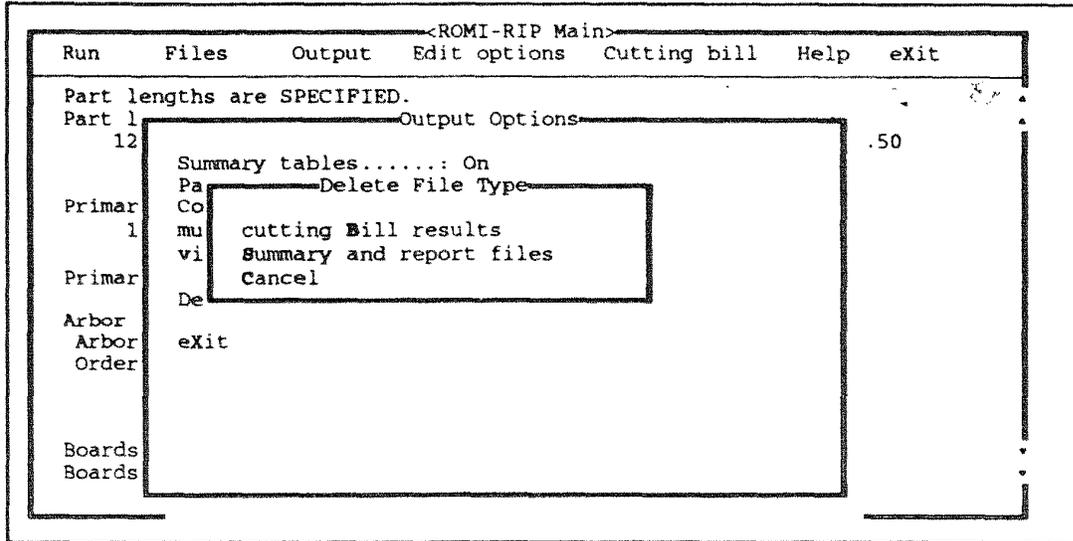


Figure 7.3A. Delete file type selection window.

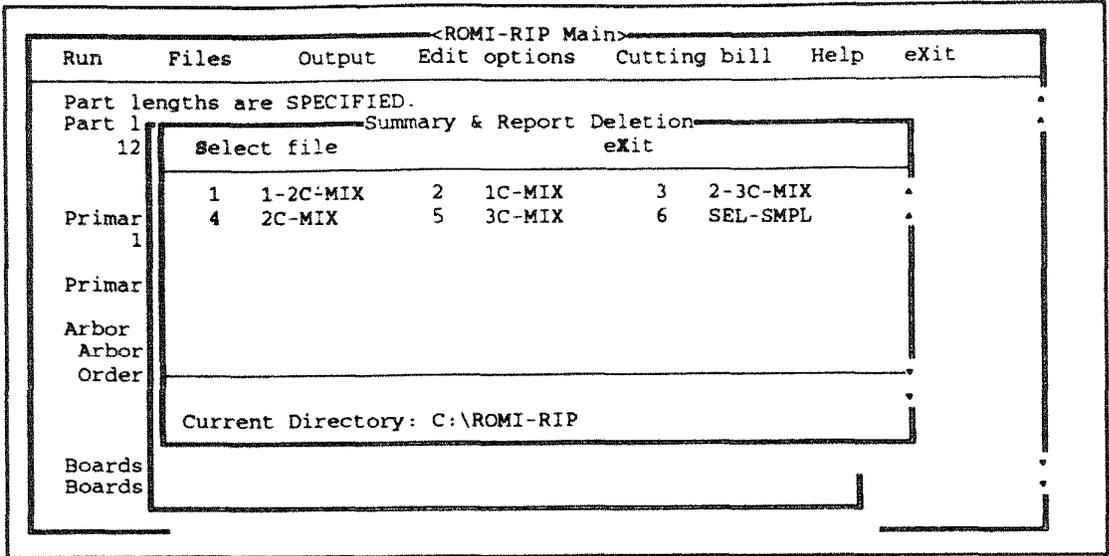


Figure 7.3B. Deletion window sample.

## 8. Beginning the Simulation

To begin the simulation, select "Run" from the ROMI-RIP main menu (Fig. 3). This will display the RUN menu shown in Figure 8.1. Next, select the "start ROMI-RIP" item. The ROMI-RIP simulation program will begin to run. If you failed to select any input datafiles, ROMI-RIP will report an error and ask you to select an input datafile.

If everything is set up correctly, you will see the processing window shown in Figure 8.2. The processing window tells you the datafile name and the board number that are currently being processed. If you need to cancel the current simulation, select the "Cancel" button displayed at the bottom center of the processing window. If you cancel, all settings except datafile selection are retained.

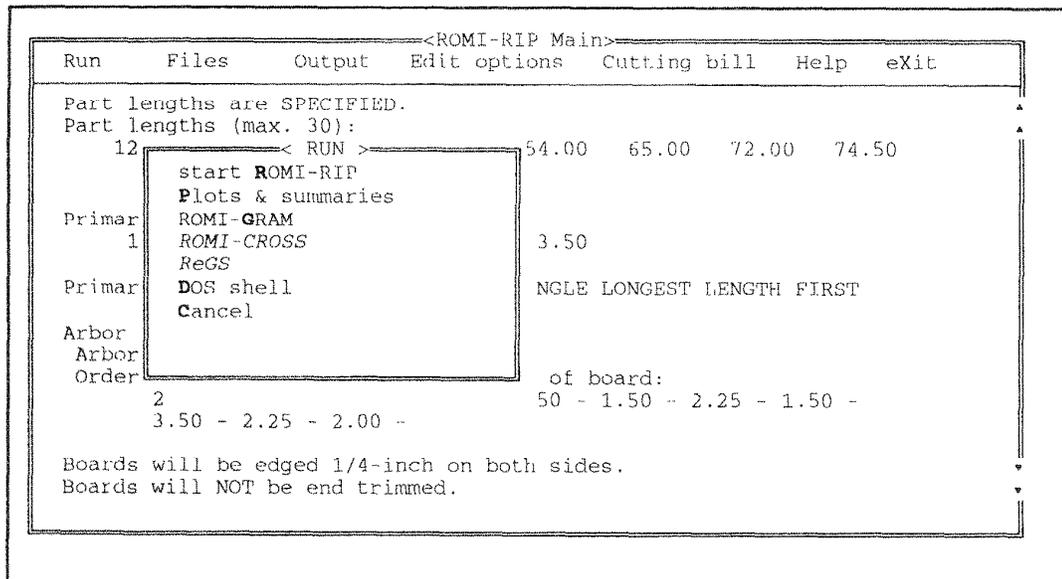


Figure 8.1. ROMI-RIP run menu.

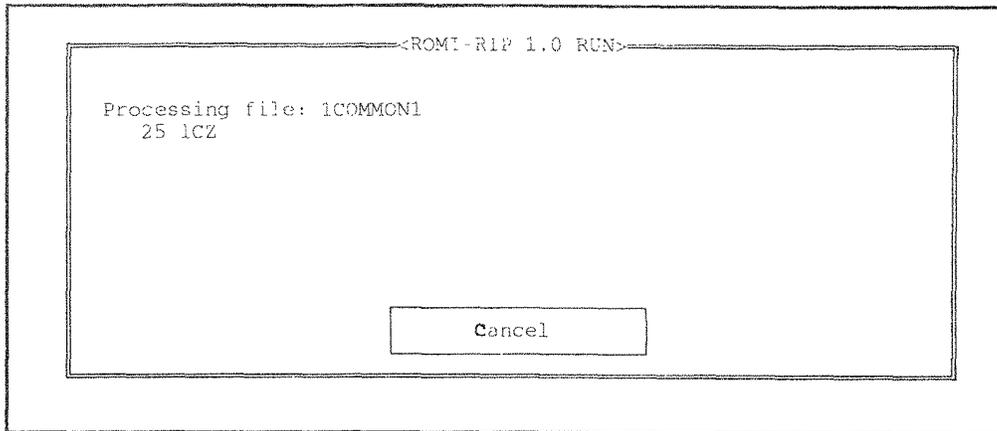


Figure 8.2. ROMI-RIP processing window.

If you are using a cutting bill and all the part requirements for the bill have been met, ROMI-RIP will stop processing and ask you whether you want to continue processing (Fig. 8.3). If you answer "NO", processing will stop and you will return to the ROMI-RIP main menu (Fig. 3). If you respond "YES", ROMI-RIP will continue until all the boards in the input datafile(s) are processed.

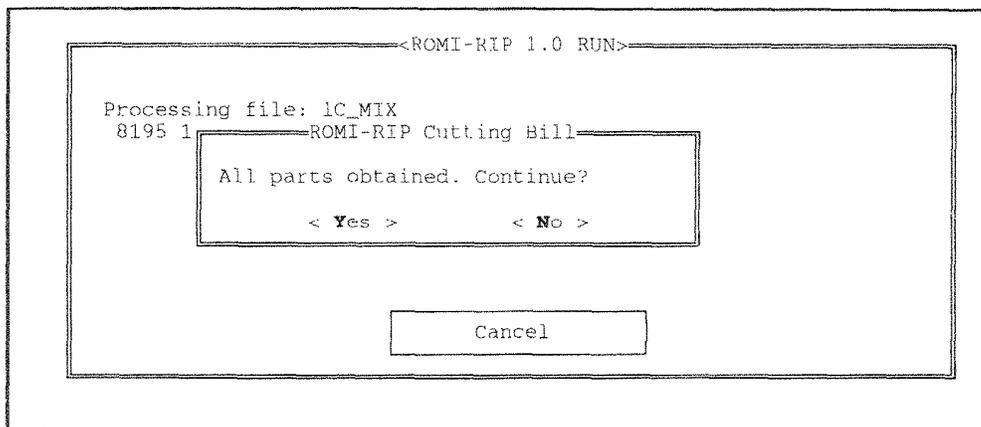


Figure 8.3 ROMI-RIP cutting bill confirmation window.

## 9. Running ROMI-RIP in Batch Mode

ROMI-RIP has extensive batch run capabilities. This is useful if you have several large simulations you would like to run overnight. To run ROMI-RIP in batch mode, you need to have access to a DOS text editor such as EDIT, which is included with MS-DOS versions 5.0 and later.

Under batch mode, you need to have all your cutting bills and options lists already defined. If you are not running a cutting bill, the options list used will be one currently defined by the RIP program. Instead of running RIP.EXE, you will run the simulation program ROMI-RIP.EXE directly. In fact, the RIP program does nothing more than assemble your options together and submit them to the ROMI-RIP.EXE program. In batch mode, you do this yourself. Figure 9 shows all the program options available for batch runs. To see these options on your computer, enter at the DOS prompt:

### ROMI-RIP

```
ROMI-RIP Command line error: Too few arguments
Usage:
      ROMI-RIP in1[,in2,...inN] out1[,out2,...outN] [arguments]
Where arguments consist of a list of one or more of the following options.
      B   Batch mode                      P   Parts listings by board
      S   Summary tables                  C   Comma-delimited output
      M   Monochrome display              Lcutbillfile Cutting Bill
      O   cutting bill output file

To turn a specific option on precede it with a + 'plus' sign.
To turn a specific option off precede it with a - 'minus' sign.
For example to run ROMI-RIP in batch mode to obtain a parts list the
argument list would be +B +P. The default argument list is:
      -B +S +P -L +C

C:\ROMI-RIP>
```

Figure 9. ROMI-RIP command line display.

Immediately following ROMI-RIP on the command line are the input data file name(s). You can specify up to 10 different data file names separated by commas. Following the datafile names are the output file names. If a single output file name is specified, all the output will be stored with the same root name. Each output type will still have its own file and a different file extension as with non-batch operation. If you specify more than one output file name, the number of output file names and the number of input file names must be the same. Option arguments follow the input and output file names.

ROMI-RIP does not create the summary tables directly. Instead, a ".SAS" file is created that is processed by another program, ASAS2.EXE, to generate the summary tables. ASAS2.EXE must be run once for each output file. Running ASAS2 is easy; just enter ASAS2 followed by the output file name. Examples showing how to run ROMI-RIP and ASAS2 follow.

```
ROMI-RIP 1COMMON1 1COM +B  
ASAS2 1COM
```

This example processes the 1COMMON1 data file and stores the output set under the name 1COM.\*. The "+B" option tells ROMI-RIP that this run will be in batch mode. "ASAS2 1COM" processes the 1COM.SAS file to produce the summary table file 1COM.SUM.

```
ROMI_RIP 1COMMON1,2COMMON1 1C-2C +B  
ASAS2 1C-2C
```

This example processes the 1COMMON1 and 2COMMON1 datafiles and stores the output file set under the name 1C-2C.\*. Please note that in batch mode, ROMI-RIP does not check to see if a previous output file set exists under the specified output name. If a previous output file set does exist with the same name, the old set will be deleted and replaced by a new file set with the same name.

```
ROMI_RIP 1COMMON1,2COMMON1 1COM,2COM +B  
ASAS2 1COM  
ASAS2 2COM
```

This example processes the 1COMMON1 and 2COMMON1 data files. The 1COMMON1 results are stored in the 1COM output file set, and the 2COMMON1 results are stored in the 2COM output file set. As many as 10 data files may be processed in this manner. Please note that ASAS2 is run twice, once for the 1COM output file, and once for the 2COM output file.

By default, ROMI-RIP generates summary table information, part reports and comma-delimited report files. To turn an option off, precede its key letter with a minus "-" sign. Similarly, to turn an option on, precede its key letter with a plus "+" sign. For example:

```
ROMI-RIP 1C-MIX 1C-MIX +B -S
```

batch processes the 1C-MIX data file. This run does not produce a summary table ".SAS" file, and stores all the output in a file set named 1C-MIX. Since the SAS file was not generated, the ASAS2 program is not run.

To process a cutting bill, use the "L" and "O" options. Use "L" to specify the name of the cutting bill to use, and "O" to optionally specify the name of the cutting bill output file. If you do not specify a cutting bill output file name, the cutting bill results will be stored in a file with the same name as the cutting bill, but with a ".OUT" extension. When ROMI-RIP processes a cutting bill, it uses the options list associated with the cutting bill, not the default list currently defined by the RIP program. To process a cutting bill named SQUIRE using the 2C-MIX datafile, enter:

```
ROMI-RIP 2C-MIX 2CSQUIRE +B +LSQUIRE +O2CSQUIRE  
ASAS2 2C-SQUIRE
```

This would process the 2C-MIX data file storing the output in a file set named 2CSQUIRE. The cutting bill SQUIRE and its associated options list would be used to process the 2C-MIX datafile and the cutting bill output would be stored in the file 2CSQUIRE.OUT. There is no problem in giving the cutting bill and the processing results the same name as each uses different file extensions.

Within each batch file many runs can be processed sequentially. For example, you could process two different cutting bills on two different lumber grades. To do this, the batch file would look like:

```
ROMI-RIP 2C-MIX 2CSQUIRE +B +LSQUIRE +O2CSQUIRE  
ASAS2 2CSQUIRE  
ROMI-RIP 1C-MIX 1CSQUIRE +B +LSQUIRE +O1CSQUIRE  
ASAS2 1CSQUIRE  
ROMI-RIP 2C-MIX 2CFRAMES +B +LFRAMES +O2CFRAMES  
ASAS2 2CFRAMES  
ROMI-RIP 1C-MIX 1CFRAMES +B +LFRAMES +O1CFRAMES  
ASAS2 1CFRAMES
```

## 10. ROMI-RIP Results

ROMI-RIP provides many different types of output to help you completely analyze your simulation results. ROMI-RIP provides detailed part, strip, rip, and crosscut statistics, cutting bill results, yield information, and more, in several different file formats. This section illustrates actual output samples from the ROMI-RIP program. To make viewing results easier, a summary program is provided with ROMI-RIP. To run the summary program, select "Plots and summaries" from the ROMI-RIP RUN window menu (Fig. 10A). You can also run the plots and summaries program by entering at the DOS prompt:

### ROMIDRAW

```

<ROMI-RIP Main>
Run   Files   Output  Edit options  Cutting bill  Help  eXit
-----
Part lengths are SPECIFIED.
Part lengths (max. 30):
  12  < RUN >  54.00  65.00  72.00  74.50
      start ROMI-RIP
      Plots & summaries
Primar ROMI-GRAM
  1    ROMI-CROSS      3.50
      ReGS
Primar DOS shell      NGLG LONGEST LENGTH FIRST
      Cancel
Arbor
Arbor
Order 2      of board:
      50 - 1.50 - 2.25 - 1.50 -
      3.50 - 2.25 - 2.00 -
Boards will be edged 1/4-inch on both sides.
Boards will NOT be end trimmed.
```

Figure 10A. ROMI-RIP run window.

The summary program begins by asking you to select the output file set you want to view (Fig. 10B). You may select an output file set using the mouse or "Select file". All of the sample output presented in this section uses the TESTDATA output which was processed using the ROMI-RIP output defaults. Once you have selected an output file set, ROMI-RIP will display the ROMI-DRAW main menu (Fig. 10C).

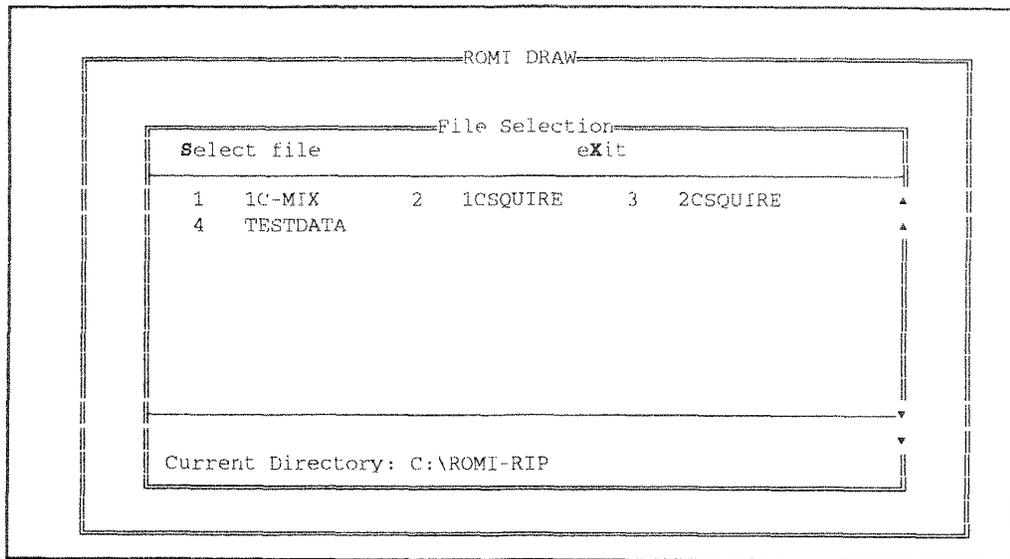


Figure 10B. ROMI-DRAW output file selection menu.

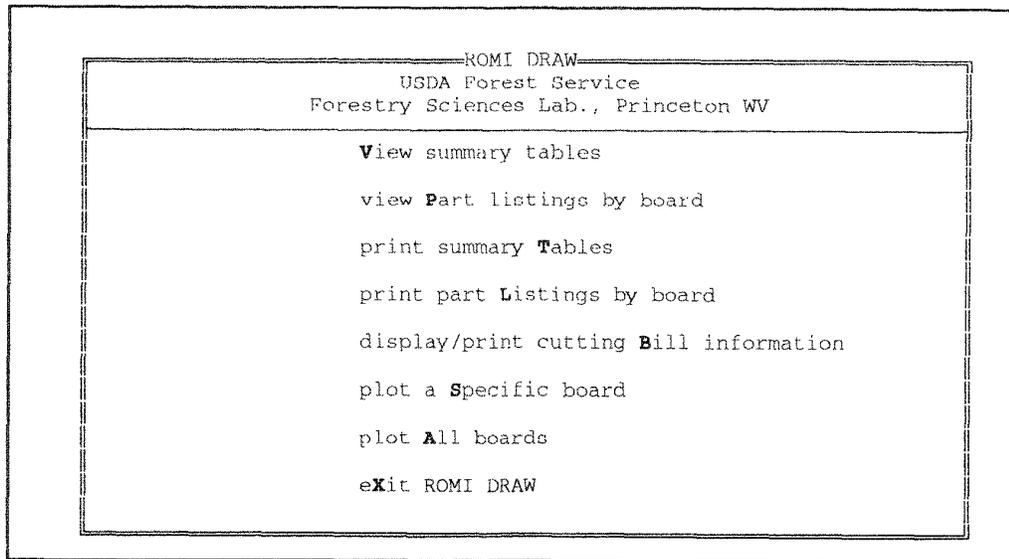


Figure 10C. ROMI-DRAW main menu.

## 10.1 Summary Tables

Summary tables provide detailed information on parts and yield, listing the number of parts generated, area, and percentage of parts by user-defined width and length groupings. Select "View summary tables" from the ROMI-DRAW main menu (Fig. 10C) to examine the summary tables. Because summary tables can be quite large, you may want to print them for easier examination. Select "print summary Tables" from the ROMI-DRAW main menu if you want a summary table printout. All summary tables for an input file are placed in a single output file that has the three letter extension .SUM.

The first page of the summary table file contains a setup options summary and a summary table of accumulated yields and totals (Fig. 10.1A). The options summary describes the options that were used in that ROMI-RIP run. The accumulated yields/totals table follows the options summary and lists the number of boards and the total board area processed. The table also lists the amount of area in primary and salvage strips and parts, the total number of strips and parts, and the total number of rips and crosscuts required to process the lumber. Note that the area amounts are in square inches, divide by 144 to obtain area in board feet.

When viewing summary tables, use the PAGE-UP and PAGE-DOWN keys to scroll the display. Please note that you can never scroll back more than two screens. You can also use the cursor keys to pan the screen left, right, down, or up. Press "H" to see a help window describing all the options available when viewing summary tables. Press "X" to exit the summary table viewer.

ROMI Summary Screen							
Part lengths (max. 30) (inches):							
12.00	18.00	28.00	38.50	54.00			
	65.00	72.00	74.50				
Widths for primary parts (max. 10) (inches):							
1.50	2.00	2.25	2.75	3.50			
Primary yield maximization method: SINGLE LONGEST LENGTH FIRST							
Arbor type is FIXED-BLADE-BEST-FEED							
Order of saw spacing from RIGHT edge of board:							
-2.00-	-1.50-	-2.25-	-2.75-	-3.50-	-1.50-	-2.25-	-1.50-
-3.50-	-2.25-	-2.00-					
Width Ranges:							
0.90	1.70	2.20	2.40	2.90	3.20		
1.60	2.10	2.30	2.80	3.10	3.60		
Boards will be edged 1/4-inch on both sides.							
Boards will NOT be end trimmed.							
Salvage uses primary widths.							
Salvage uses primary lengths.							
Parts are clear on both sides.							
Accumulated yields/totals for this run:							
Total Board area: 10190.50							
Total boards: 10							
	Strip Area	Part Area	Yield	# Strips	# Parts	X-Cuts	Rips
Primary	8853.81	7175.38	70.41	28	71	100	44
Salvage	0.00	78.00	0.77	0	3	4	4
-----							
Total	8853.81	7253.38	71.18	28	74	104	48
-----							
<<MORE>> H for HELP							

Figure 10.1A Summary table processing options and statistics page.

There are six summary tables that describe the yield distributions. The first three tables give the yield distributions based on surface area. A sample of one of these tables is shown in Figure 10.1B. In each length-width cell, the upper number is the square inches of surface area and the lower number is the yield percentage. The percentages in each column add up to 100. The first table is the distribution of total yield. The second and third tables contain the surface area distributions for the primary and salvage cuttings. The last three tables are based on the number of parts produced. These tables are organized in the same manner as the first three tables. In each length-width cell, the upper number is the part quantity and the lower number is the percentage of total part quantity.

ROMI Summary Screen							
SURFACE AREA YIELD OF PARTS (ALL PARTS) (SURFACE AREA & PERCENT BY LENGTH AND WIDTH)							
Length\	Width						Total
	0.90 1.60	1.70 2.10	2.20 2.90	2.40 2.80	2.90 3.10	3.20\  3.60\	
12.00\	18.00	24.00	162.00	99.00	0.00	84.00\	387.
	0.25	0.33	2.26	1.38	0.00	1.17\	5.
18.00\	0.00	0.00	202.50	49.50	0.00	252.00\	504.
	0.00	0.00	2.82	0.69	0.00	3.51\	7.
28.00\	0.00	0.00	189.00	154.00	0.00	196.00\	539.
	0.00	0.00	2.63	2.15	0.00	2.73\	7.
38.50\	57.75	0.00	173.25	105.88	0.00	269.50\	606.
	0.80	0.00	2.41	1.48	0.00	3.75\	8.
54.00\	162.00	0.00	243.00	297.00	0.00	189.00\	891.
	2.26	0.00	3.39	4.14	0.00	2.63\	12.
65.00\	292.50	0.00	146.25	178.75	0.00	0.00\	617.
	4.08	0.00	2.04	2.49	0.00	0.00\	8.
72.00\	108.00	0.00	162.00	0.00	0.00	252.00\	522.
	1.50	0.00	2.26	0.00	0.00	3.51\	7.
74.50\	335.25	0.00	1005.75	204.88	0.00	1564.50\	3110.

<<MORE>> H for HELP

Figure 10.1B. Sample surface area yield table for all parts.

## 10.2 Parts Reports

ROMI-RIP can provide detailed parts information for each board processed. Although similar in form to the parts reports generated by AGARIS, ROMI-RIP provides much more information. Select "view Parts listings by board" from the ROMI-DRAW main menu (Fig. 10C) to view the parts reports on the screen. Alternatively, you can print the report by selecting "print part Listings by board". For each board, the parts reports include the dimensions of each primary and salvage cutting; counts for the total number of primary and salvage strips, rips, parts, crosscuts; part and strip area and yield. A sample parts listing and accumulated totals for board 468 are shown in Figure 10.2. At the bottom of Figure 10.2 are the accumulated yields and totals for all boards processed up to and including board 468.

ROMI Summary Screen							
Board: 468 1C2							
Primary Parts:							
2.25 x 38.50	2.25 x 74.50						
2.25 x 38.50	2.25 x 12.00						
2.75 x 54.00	2.75 x 12.00						
2.75 x 28.00	2.75 x 45.00						
3.50 x 38.50	3.50 x 12.00						
3.50 x 18.00	3.50 x 74.50						
3.50 x 18.00							
Salvage Parts:							
2.00 x 12.00	2.25 x 12.00						
Yields/Totals for this board:							
Brd Area	1789.88						
	Strip Area	Part Area	Yield	# Strips	# Parts	X-Cuts	Rips
Primary	1644.75	1368.62	76.46	3	13	21	5
Salvage	0.00	51.00	2.85	0	2	2	2
Total	1419.62	1644.75	79.31	3	15	23	7
Accumulated yields/totals for this run:							
Total Board area:	6958.38						
Total boards:	8						
	Strip Area	Part Area	Yield	# Strips	# Parts	X-Cuts	Rips
Primary	5984.94	4980.50	71.58	19	47	66	32
Salvage	0.00	78.00	1.12	0	3	4	4
<<MORE>> H for HELD							

Figure 10.2. Sample parts report.

When viewing parts reports, use the PAGE-UP and PAGE-DOWN keys to scroll the display. Please note that you can never scroll back more than two screens. You can also use the cursor keys to pan the screen left, right, down, or up. Press "H" to see a help window describing all the options available when viewing parts reports. Press "X" to exit the parts report viewer.

### 10.3 Cutting Bill

The information ROMI-RIP generates when processing lumber to meet a cutting bill allows you to analyze both the lumber volume and the processing required to meet the bill. The output for a cutting bill is stored in a file with a .OUT extension. By default, the output file has the same name as the cutting bill processed. For example, if you process a cutting bill named SQUIRE, the output is stored in SQUIRE.OUT. The SQUIRE cutting bill as well as other sample bills are included on the ROMI-RIP install diskette.

To view or print cutting bill results, select "display/print cutting Bill information" from the ROMI-DRAW main menu (Fig. 10C). Next, you will be asked to select the cutting bill output you want (Fig. 10.3A). You may use the mouse or "Select file" to select a cutting bill output file.

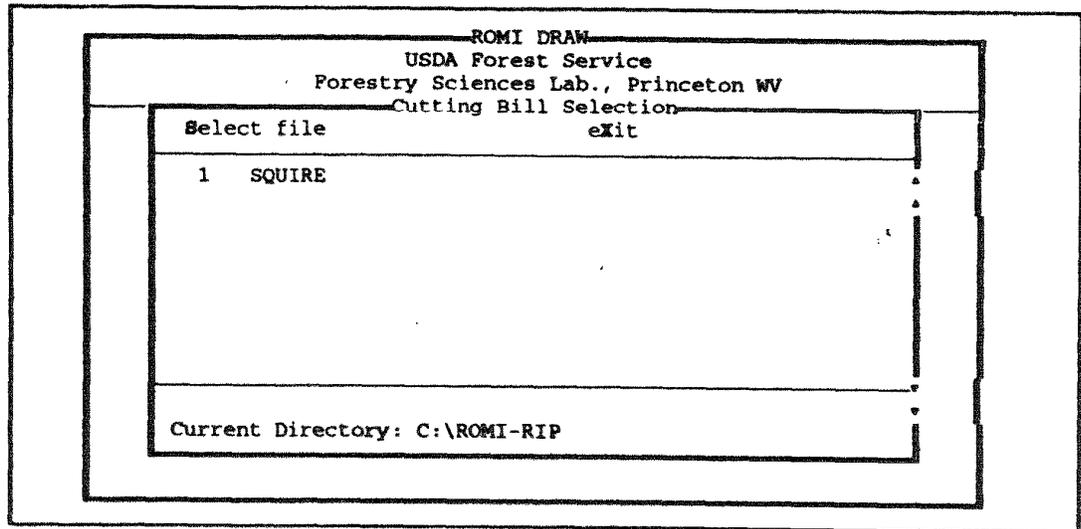


Figure 10.3A. Cutting bill result file selection window.

Once you have chosen a cutting bill, you will see the CUTTING BILL OUTPUT window (Fig 10.3B). To print the results of the cutting bill processing, select "Print output". If you would like to view the cutting bill results on the screen, select "Display output to screen". The rest of this section explains how to view the output and describes the cutting bill information available.

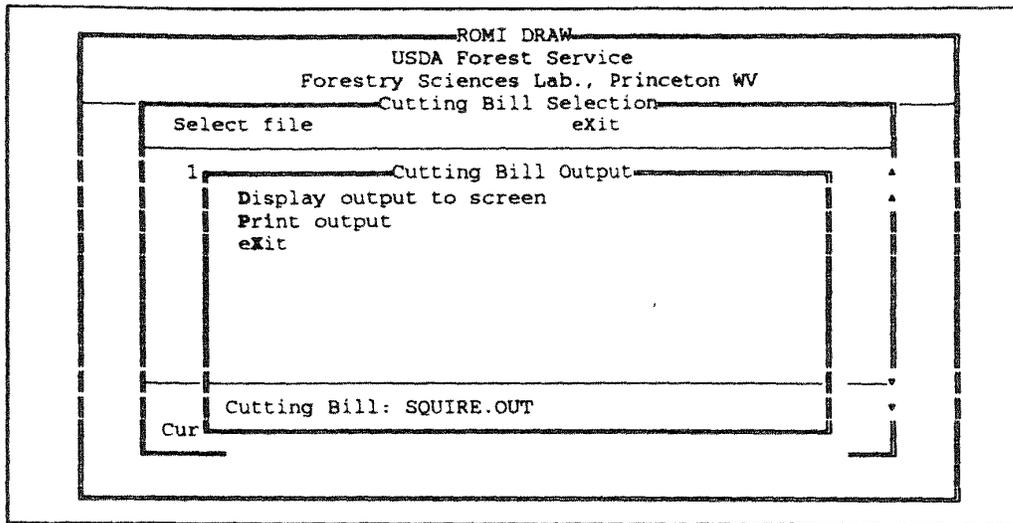


Figure 10.3B. Cutting bill output display selection window.

The first part of the output tells you the datafile(s) processed, options used, and cutting bill used to process them (Fig. 10.3C). Next in the report is the accumulated yield and totals information for the run (Fig. 10.3D). This information includes counts for the total number of primary and salvage parts, strips, rips, crosscuts, part and strip area and yields. The area and yield in orphan parts, as well as the total number of boards and area processed, is also provided. Recall that an orphan part is a primary part that is cut for which there is no need.

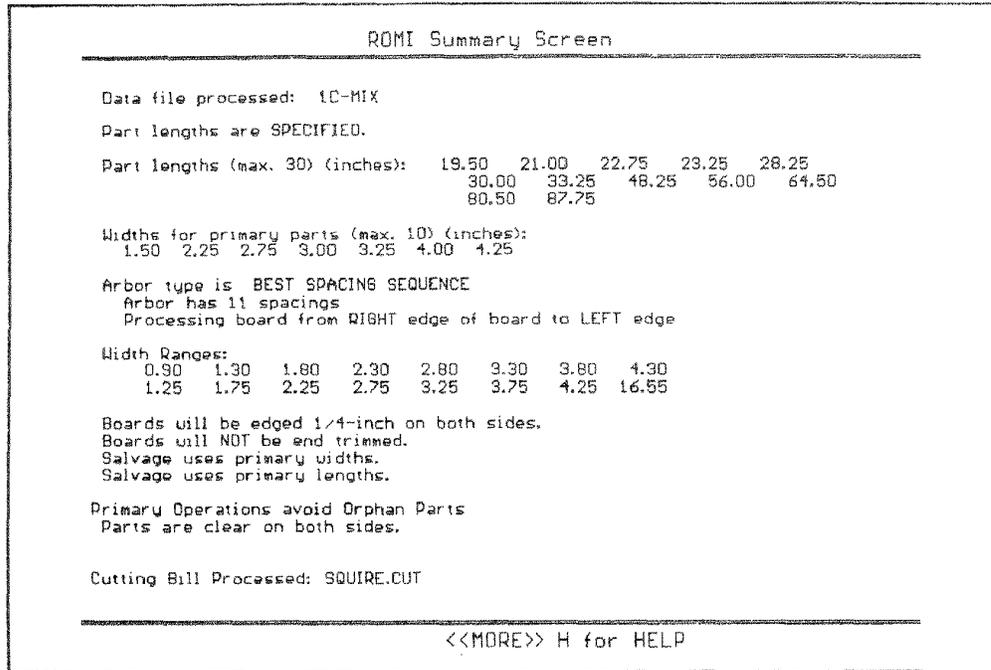


Figure 10.3C. Cutting bill processing options display.

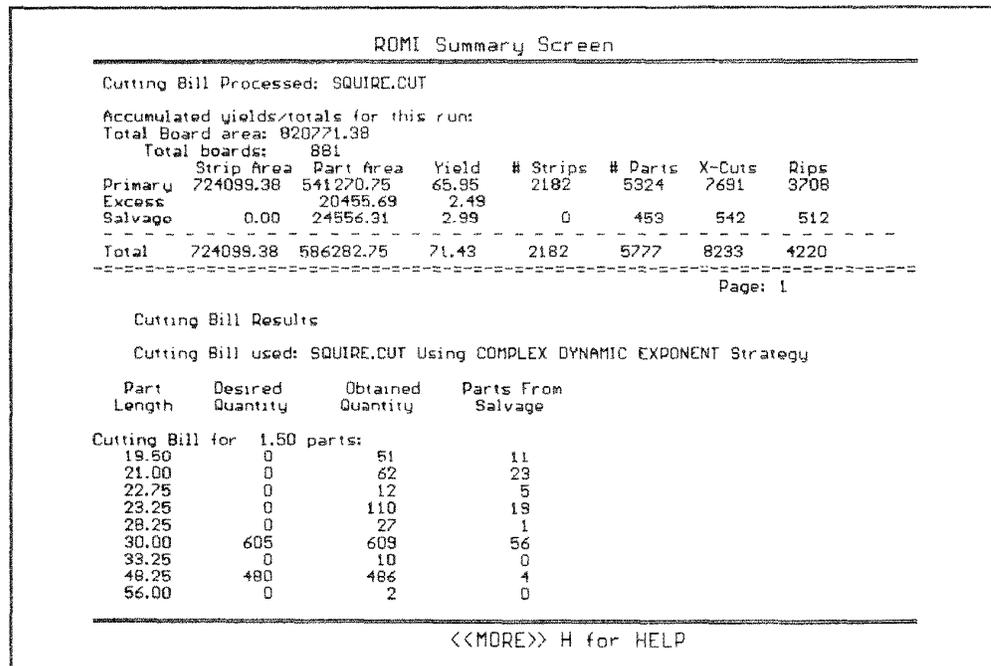


Figure 10.3D. Cutting bill processing statistics and obtained parts report.

The rest of the cutting bill output describes the parts in the cutting bill. The parts are listed by width and length. For each part size the desired part quantity, part count, and number of parts cut from salvage or re-rip are listed. The first part of the cutting bill part report can be seen at bottom of Figure 10.3D. If a part's required cuttings were not met, then the message "\*\*\*\*UNMET\*\*\*\*" is displayed to the right of its part counts. Following the part report is a summary that contains the accumulated width of orphan and salvage parts (Fig. 10.3E). This table is useful when trying to determine the amount of material available for glue-up.

ROMI Summary Screen			
Cutting Bill Results			
Cutting Bill used: SQUIRE.CUT Using COMPLEX DYNAMIC EXPONENT Strategy			
Part Length	Desired Quantity	Obtained Quantity	Parts From Salvage
Cutting Bill for 4.25 parts, cont'd:			
64.50	0	1	0
80.50	0	0	0
87.75	0	0	0
			Page: 4
Accumulated Part Widths by Length (Parts and salvage not required in above bill)			
Length		Total Width	
19.50	x	289.50	
21.00	x	253.75	
22.75	x	57.00	
23.25	x	349.00	
28.25	x	60.25	
30.00	x	20.00	
33.25	x	40.50	
48.25	x	21.25	
56.00	x	3.00	
64.50	x	14.00	
80.50	x	2.25	
87.75	x	9.00	
<<DONE>> X to EXIT>			

Figure 10.3E. Sample accumulated width table.

## 10.4 Board Plots

ROMI-RIP allows you to view or print plots of individual boards along with their parts, defects, and kerfs. The information used to generate board plots is kept in output files with the extension .PLT. You can view board plots for an entire run, or a specific board. To view all the boards processed, select "plot All boards" from the ROMI-DRAW main menu (Fig. 10C). Select "plot a Specific board" from the ROMI-DRAW main menu to view a selected board. When plotting specific boards, you are given a menu window that allows you to choose which board to view (Fig 10.4A). To select a board, simply click on it with the mouse or use the "Select a board" item. If you use "Select a board", you will then be prompted to enter the ID number and grade of the board. The boards shown in Figure 10.4A are from the TESTDATA.DAT datafile.

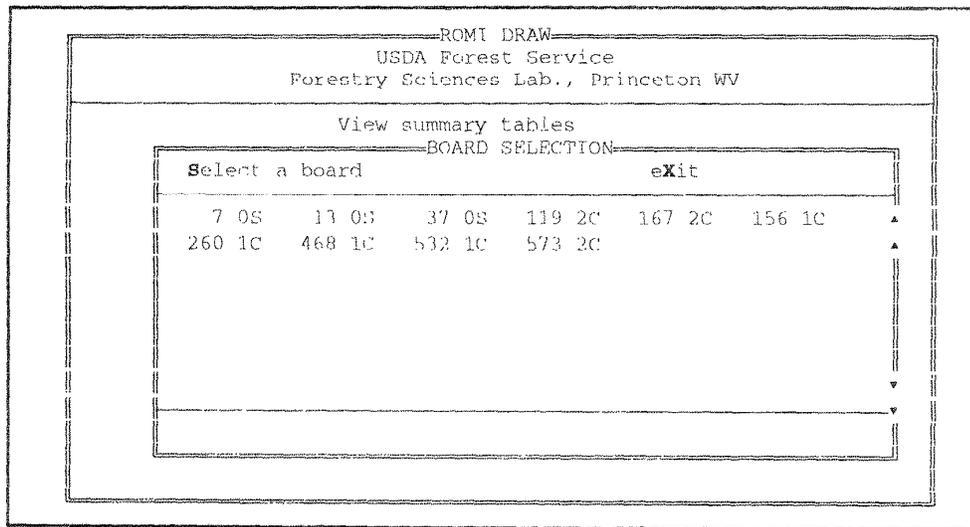
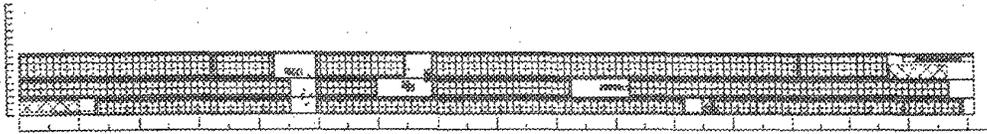


Figure 10.4A. Board selection window for selected board plots.

By default, boards are displayed in their entirety with all parts, defects, and kerfs shown (Fig. 10.4B). The board is displayed as if it were transparent, with defects from both sides visible at once. Defects from side one are displayed in a lighter color than those from side two. Scale rulers show the board's size. The width ruler is in inches, the length ruler has minor ticks every six-inches, with a major tick every foot. Select "Print" at the bottom of the plot screens to print the board plot.

Board 468 GRADE 1CZ 9.25 x 193.50



Primary  Salvage  Defect  Kerf

Primary 2.25 x 98.50  
Primary 2.25 x 74.50  
Primary 2.25 x 38.50  
Primary 2.25 x 12.0  
Primary 2.75 x 54.0  
Primary 2.75 x 12.0  
Primary 2.75 x 28.0  
Primary 2.75 x 68.0  
Primary 3.50 x 38.50  
Primary 3.50 x 12.0  
Primary 3.50 x 18.0  
Primary 3.50 x 74.50  
Primary 3.50 x 18.0  
Salvage 2.0 x 12.0  
Salvage 2.25 x 12.0

Enlarge

Cuttings

Print

Exit

Figure 10.4B. Default board plot for board 468.

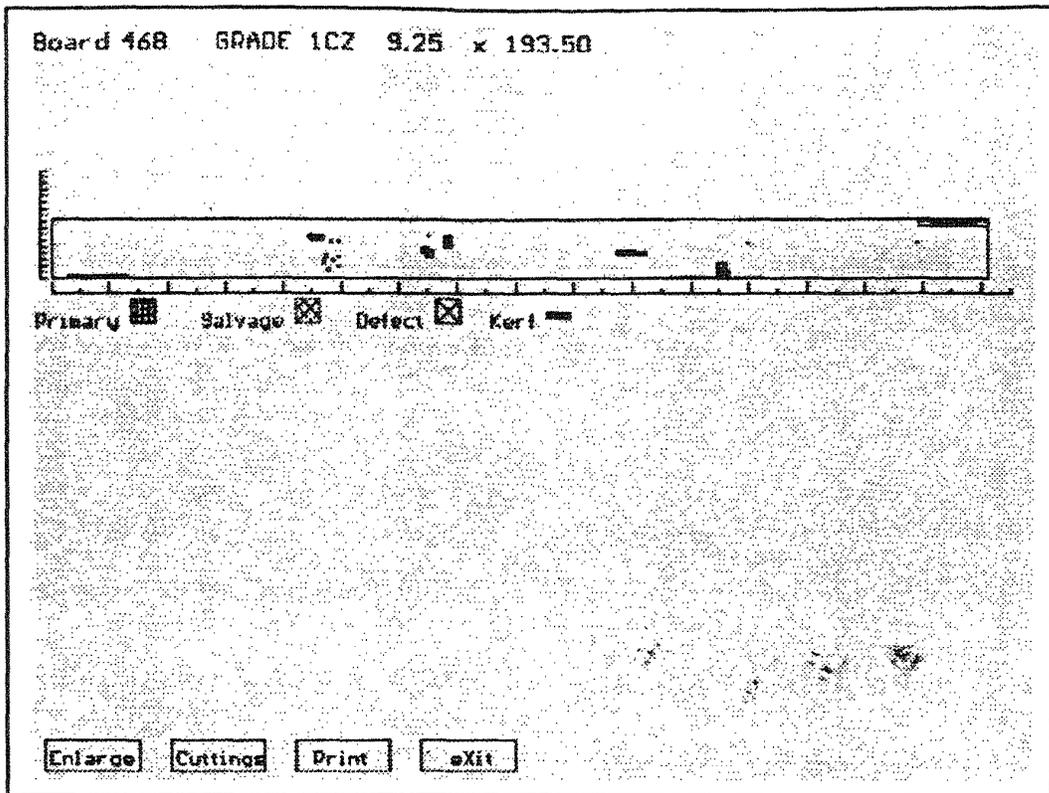


Figure 10.4C. Sample board with cuttings hidden.

Cuttings are hidden by selecting "Cuttings" at the bottom of the screen. This displays only the board and its defects (Fig. 10.4C). Select the "Cuttings" again to display the cuttings. To examine the board closer, the plot can be enlarged by selecting "Enlarge" (Fig.10.4D). Cuttings may still be hidden or displayed by the user. Note that only a few feet of the board can be displayed at one time. The screen can be panned to left or right by pressing the left and right arrow keys. Select "rEgular" to return the board to normal size.

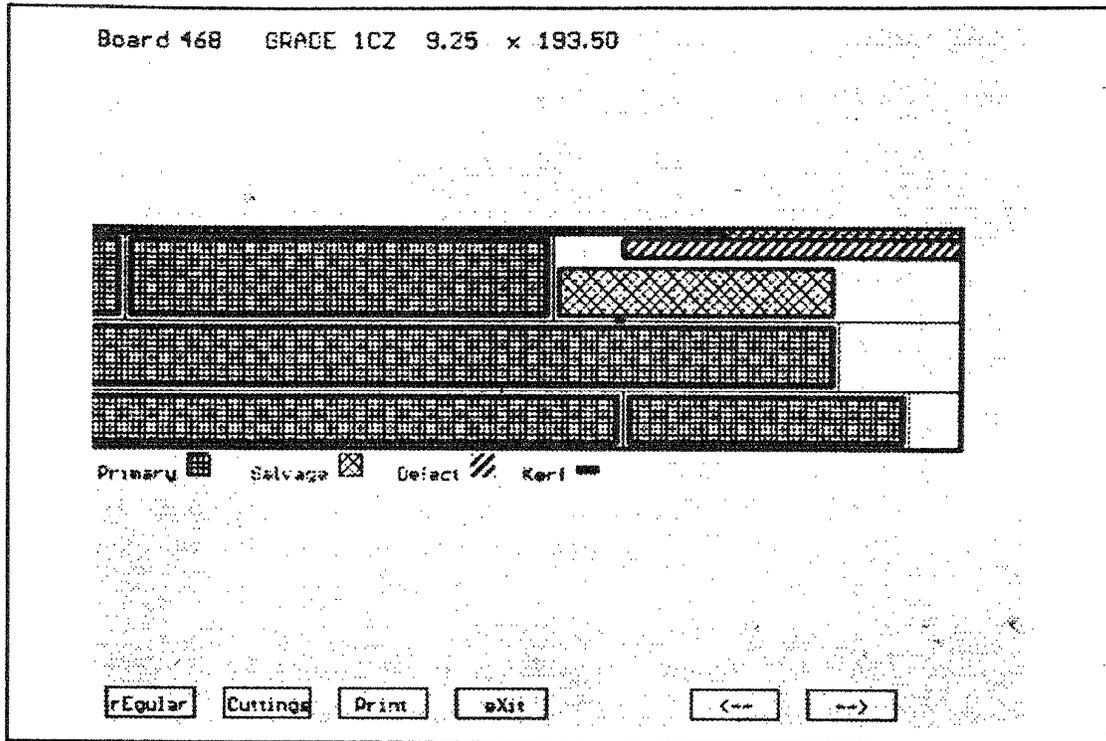


Figure 10.4D. Enlarged view of a section of board 468.

## **Acknowledgment**

The author would like to thank Charles Gatchell for his conceptual contributions as well as numerous discussions regarding ROMI-RIP and rough-mill practices. The author would also like to thank Jan Wiedenbeck and Phil Araman for their comments and testing of the ROMI-RIP simulator.

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## PENDIX I. Laser Printer Configuration

Starting with MS-DOS version 5, Microsoft Corporation began supporting the printing of graphics screens to laser printers. Previously, only dot matrix and thermal printers were supported. For ROMI-RIP to use the laser printer successfully, you must do the following:

1. Determine the type of the laser printer and any current emulation settings.
2. Refer to the GRAPHICS command in your MS-DOS version 5.0 reference guide, or on-line help in MS-DOS version 6.0 and later. Read the documentation for the GRAPHICS command and determine the correct printer driver for your printer type.

After you have determined your printer type, you must use a text editor to edit the RIP.BAT file to allow plotting to your laser printer. For the following example, we are changing the RUN-DRAW.BAT file to allow plotting to a standard HP Laserjet II printer or a laser printer capable of emulating a HP Laserjet II printer. Using the EDIT text editor supplied with MS-DOS versions 5 and 6, perform the following steps to make the necessary changes:

- i) Make the working directory the directory that contains the ROMI-RIP programs and data. To do this, type at the MS-DOS prompt: (Assuming a default installation)

```
C:  
CD \ROMI-RIP
```

- ii) Edit the RIP.BAT file by entering:

```
EDIT RUN-DRAW.BAT
```

- iii) Move the cursor to the end of the line that reads:

```
GRAPHICS
```

Specify the correct laser printer type at the end of this line. To specify the HP Laserjet II, edit the GRAPHICS line so that it looks like:

```
GRAPHICS LASERJETII
```

- iv) Exit the Editor and save the edited RIP.BAT file. To do this using the MS-DOS EDIT editor, hold the ALT key down and press F, press the X key, press Y to answer "YES, save this file".

are now able to print graphics screens to the laser printer.

## APPENDIX II. System Limitations

The current specifications and limitations of the ROMI-RIP system are listed below:

Arbor width, maximum (inches):	48
Arbor spacings, maximum:	15
Arbor spacings, minimum:	3
Board width (inches):	16.5
Board length (feet):	16.5
Cutting bill maximum individual part quantity:	32000
Cutting bill maximum individual part value:	340000000
Cutting bill maximum number of part sizes:	300
Input files processed at once:	10
Length ranges:	10
Lengths, primary:	30
Lengths, salvage:	12
Width ranges:	15
Widths, primary:	10
Widths, salvage:	8

### Appendix III. Board Data Bank Description

This appendix describes the contents of the individual data files included with ROMI-RIP. All data files have an eight letter primary file name followed by a ".DAT" extension. All the boards in each data file are one of four grades. The grade of lumber in a particular data file is determined by looking at the file name.

<u>If the file name begins with.</u>	<u>the grade is:</u>
FAS,	Firsts and Seconds.
SELECTS,	Selects.
1COMMON,	No. 1 Common.
2COMMON,	No. 2A Common.

The boards supplied with ROMI-RIP are found in Tables 10, 11, 12, and 13 of the "1992 Data Bank for Red Oak Lumber." The following tables show the total number of boards for each of the four grades. Datafiles ending with a letter contain boards that are mirror images or their corresponding files with number endings. For example, 1COMMONA contains boards that are mirror images of the boards in 1COMMON1, 2COMMONC mirrors boards in 2COMMON3, and so on. MIX files contain all boards, both normal and mirrored for the grade.

#### First and Seconds:

Data file name	Total boards
FAS1.DAT	67
FAS2.DAT	66
FAS3.DAT	66
Totals for grade	199

#### Selects:

Data file name	Total boards
SELECTS1.DAT	70
SELECTS2.DAT	70
SELECTS3.DAT	70
Totals for grade	210

No. 1 Common:

Data file name	Total boards
1COMMON1.DAT	75
1COMMON2.DAT	74
1COMMON3.DAT	74
1COMMON4.DAT	74
1COMMON5.DAT	74
1COMMON6.DAT	74
1COMMON7.DAT	74
1COMMON8.DAT	74
Totals for grade	593

No. 2A Common:

Data file name	Total boards
2COMMON1.DAT	73
2COMMON2.DAT	73
2COMMON3.DAT	73
2COMMON4.DAT	73
2COMMON5.DAT	73
2COMMON6.DAT	73
2COMMON7.DAT	72
2COMMON8.DAT	72
Totals for grade	582

## APPENDIX IV. Definition of Terms

**All-Blades-Movable Arbor:** A commercially available gang-rip-saw arbor type where all blades on the arbor are movable. Arbor spacings are automatically changed for each board. This arbor can rip narrow random-width waste strips that contain a series of defects. This permits wider defect-free primary width strips to be taken on either side of the narrow defect strip.

**Best-Spacing-Sequence Arbor:** A gang-rip-saw arbor type that generates, for each board, the optimum fixed-blade saw space sequence. This arbor rips all boards with one edge against the rip fence. This arbor differs from the all-blades-movable arbor in that waste or cull strips cannot be sawn.

**Cutting Bill:** A specified list of primary part sizes and quantities and, optionally, values or a selected prioritization method. See also: Dynamic Prioritization Methods and Static Prioritization Methods.

**Dynamic Prioritization Methods:** A method of prioritizing parts required in a cutting bill so that the part priorities change as part requirements are satisfied. Dynamic methods generally require less board footage than static methods to meet any given cutting bill. See also: Cutting Bill and Static Prioritization Methods.

**Excess Part:** See orphan part.

**Fixed Arbor:** An arbor type where the user specifies the saw space sequence to be used with all boards. All boards are sawn with one edge against the right rip fence.

**Fixed-Blade-Best-Feed Arbor:** A commercially available gang-rip-saw arbor type where the user has specified the saw space sequence. Each board is examined with respect to every possible arbor feeding position. The arbor position that will generate the optimum results is used to rip the board.

**Minimum Primary Width:** The minimum primary width to generate when using a movable-outer-blade arbor. See also: Movable-Outer-Blade.

**Movable-Outer-Blade:** An arbor type modification that moves the last saw blade on the arbor depending on the specified minimum primary width. If the rip sequence would generate an edging that is less than the minimum primary width, the last blade is moved and a single wider strip is taken.

**Orphan Part:** A primary part that is cut but is not needed; that is, the cutting needs for a particular part size have been met already, making this an "extra" piece.

**Primary Part Widths:** These widths are used to set up the saw space sequence. Any part width to be used in a cutting bill must be specified as a primary part width.

**Primary Part Lengths:** Any part length to be used in a cutting bill must be specified as a primary part length. The primary part lengths are the lengths that are crosscut from the strips.

**Salvage:** Parts that are obtained by at least one additional rip operation. The additional work makes these parts more expensive to produce and, therefore, less desirable.

**Saw Space Sequence:** The sequence of primary part widths set up on the arbor from the right edge.

**Smart Salvage:** A special operating mode that minimizes the generation of orphan parts. Rather than sawing a strip into orphan parts, the strip is examined to see if it can be ripped to a narrower width to obtain one or more required parts. See also: Cutting Bill.

**Static Prioritization Methods:** A method of prioritizing parts required in a cutting bill. The priority assigned to a part at the start of processing is the same priority used at the end of processing. Static prioritization is generally less efficient than dynamic strategies. See also: Cutting Bill and Dynamic Prioritization Methods.

## APPENDIX V. ROMI-RIP Software Trouble Report

If you encounter **ANY** problems with the ROMI-RIP programs, please fill out the following form and mail or fax it to:

**Edward Thomas**  
**USDA Forestry Sciences Laboratory**  
**Route 2, Box 562-B**  
**Princeton, WV 24740**

**FAX: (304) 425-1476**

Once I receive your report I will try to resolve the problem. Please include your phone number as it is very likely that you will be contacted for additional information.

Thank you.

-----  
Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: ( ) \_\_\_\_\_ FAX: ( ) \_\_\_\_\_

Version of DOS installed (eg: Ver 5.0): \_\_\_\_\_

Total random access memory (RAM) Installed (eg: 4 MB): \_\_\_\_\_

If you are using extended or expanded memory, which memory manager (include version) are you using: \_\_\_\_\_

Processor type, check one:

8088  80286  80386  80486  Pentium  PowerPC

Are you using a math coprocessor?  Yes  No  Unsure

Are you running ROMI-RIP from Windows?  Yes  No

Are you running ROMI-RIP on a Local Area Network (LAN)?  Yes  No

On a separate sheet of paper describe the problem(s) you have encountered.