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BARR/SPOOL

Print spooling for the PC

Documentation Edition 2

Software Version 94A13

Programmer

Al Hodges

Editors

Craig R. Lee
Jeanine M. McGuire
Kathy Sutton

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Barr Systems, Inc.
4500 NW 27 Avenue
Gainesville, FL 32606-7031

Phone:	800-BARR-SYS 800-227-7797 352-491-3100
Fax:	352-491-3141
Internet:	Support@BarrSys.com
Web site:	www.BarrSys.com
FTP site:	ftp.BarrSys.com

About the Cover

Peacock Springs in North Central Florida is a tributary of the world-famous Suwanee River, one and one-half miles downstream. The spring pool—50-75’ wide, 300’ long, and 20-40’ deep—is fed by three different vents or orifices that are part of a vast subterranean network of caves. Above ground is swampy and overgrown with cypress trees, brush, and water plants. Peacock Springs is a long-time favorite of scuba divers. Photography by James Valentine, *Florida Images of the Landscape.*

September 1994

Preface

This manual describes how to install and use BARR/SPOOL software on your PC. Additionally, it explains the fundamentals of print spooling.

Barr Systems offers a variety of options for the spooling of files. BARR/SPOOL is the core software for print spooling of files from PC, LAN, and NetWare sources. Options added to BARR/SPOOL expand the possible file sources. BARR/PRINT for TCP/IP enables files from a UNIX host to be placed in the print spool. Files from DEC/VMS hosts can be added using the BARR/PRINT for LAT option. And the PRINT/TWINAX option allows spooling of files from midrange systems, such as the AS/400.

BARR/SPOOL drives parallel, serial, and LAN-based printers. Additional options support other types of printers. PRINT370 added to BARR/SPOOL enables you to drive up to six S/370 channel-attached printers from a PC. PRINT/TWINAX allows you to emulate 5250-series printers.

Whether you have technical or non-technical experience, the purpose of BARR/SPOOL is to help you to efficiently and effectively manage the printing of files. Concise installation and operation instructions in this manual guide you every step of the way.

Features

Print Speed

BARR/SPOOL can be used with a variety of printers. Print speeds on single and multiple printers range from 30 characters-per-second to beyond 40,000 lines-per-minute (lpm). BARR/SPOOL drives even the fastest laser printers at maximum efficiency.

Multiple Printers

BARR/SPOOL supports up to eight printer streams on any combination of parallel, serial, or channel printers. The parallel ports have the DOS names LPT1, LPT2, and LPT3. The serial ports have the names COM1, COM2, COM3, and COM4. Additional printer streams can be assigned to disk and screen. You can at any time assign the spool printers to any of the DOS devices.

Special Forms Support

Printing on special forms such as checks and invoices is a popular use of BARR/SPOOL. BARR/SPOOL also provides high-speed printing support for the Dataproducts and Centronics Vertical Form Units (VFU).

Ease of Operation

Many features simplify and extend the uses of BARR/SPOOL — making it easy to learn and simple to operate. The software is menu-driven. It shows you what to do at each stage. Operator instructions, prompts, and messages appear whenever you need to know about special conditions or make decisions. Introductory menus lead you into the program.

Simultaneous Use of DOS and BARR/SPOOL

While BARR/SPOOL is at work, you can enter a DOS session and use all of its features. This means you can enter data while simultaneously printing.

Package Contents

Your BARR/SPOOL package includes the following software, hardware, and documentation.

If you purchased Barr option software or hardware, refer to the option manuals for a list of additional items that are enclosed.

BARR/SPOOL Software

The BARR/SPOOL software disk includes program files and reference files.

BARR/SPOOL Manual

The *BARR/SPOOL* manual provides instructions for installing and operating the PC software.

Systems Integration Notes

This document provides descriptions of other software and hardware products you may want to use with BARR/SPOOL. It includes prices plus vendor names, addresses, and phone numbers.

BBS User Guide

This document provides instructions for using the Barr Bulletin Board System (BBS). The BBS provides you with easy access to product information and the ability to send messages to Barr Systems.

Other Manuals

If additional Barr software and/or hardware options were purchased for use with BARR/SPOOL, the corresponding manuals are included.

Equipment Checklist

In addition to the Barr package, you need the equipment listed below.

PC The minimum requirements are a personal computer with either an ISA, an EISA, or a Micro Channel bus.

Additional requirements vary depending on your application, the environment at your site, peak workloads, and other considerations. After evaluating your performance needs, you may discover that your site needs a 386\25-33 or 486 machine.

Contact Barr Systems Technical Support if you need a recommendation on which type of PC to use.

Memory Requirements

The PC running BARR/SPOOL should have at least 640 kilobytes of memory. Extended memory is supported by Barr products and can be used to enhance performance.

Barr products do *not* use the expanded memory feature of memory managers or expanded memory drivers. (Barr software can use *extended* memory.)

Disk Space Requirements

BARR/SPOOL should be installed on your PC hard disk.

To achieve optimum performance when print spooling or performing other disk-intensive tasks, we suggest using a hard drive with fast access and fast transfer times. The size of hard drive needed depends on the storage needs at your site. When determining how much storage is needed, estimate that 2,000-5,000 bytes of storage are required per page of data or that it is possible to store 200-500 pages of data per megabyte of hard-drive capacity.

DOS The PC and the host computer each have operating systems — programs that direct the flow of data and sort out details to free the user from complexity. The primary operating system for the PC, and the one that BARR/SPOOL requires, is DOS. BARR/SPOOL is compatible with DOS 3.0 or later versions.

Using This Manual

Organization

The order in which chapters are presented in this manual reflects the logical sequence of BARR/SPOOL installation and operation. Each chapter is an independent unit that can be used for reference.

You need only to be familiar with the most basic features of print spooling to operate BARR/SPOOL. Chapter 1 presents basic print spooling concepts. Refer to the glossary at the back of the manual for a description of terms and acronyms that appear in the text.

Technical Support

If you have any difficulties installing or using BARR/SPOOL please contact Barr Technical Support.

Barr Phone Numbers

Toll-free technical support is available for Barr software and hardware products. Call Barr Systems, Inc. at 800-BARR-SYS or 904-371-3050 from 9 a.m. to 8 p.m. Eastern time.

Support Requests

Here are some things you can do to help the Technical Support staff serve you as quickly and effectively as possible:

- **Serial number.** If you purchased an adapter, please be sure to have the serial number of your Barr adapter on hand when you call. When faxing a support request, be sure to include the serial number in your fax. There are three possible ways to obtain the serial number: from the front of the adapter box, from a sticker on the adapter edge that is visible from the rear of the PC, or from the back of the adapter, where it is handwritten.
- **Problem number.** If you are calling about a previously reported problem, tell the Support Analyst your assigned problem number. If you are calling about a new problem, be sure to note the problem number for future reference.
- **Version number.** Determine the version number (e.g. 94A1) of the Barr software you are using. Check the version number displayed on the second screen of the Installation Description, on the console portion of the Operation screen at software startup, or on the Quit menu during software operation. Provide the software version number to the Support Analyst.
- **Problem Description.** Be prepared to supply details about your problem. The Support Analysts also may ask you to supply information about your host computer, PC, or printers.
- **Diagnostics.** When asked to provide a line trace, memory dump, or other diagnostic information, please respond as quickly as possible. Your quick response helps us solve the problem in a timely manner and underscores your level of concern.
- **Schedule for return calls.** If you are frequently away from the phone, please advise our staff of the best possible time we can reach you.

Bulletin Board Access

An electronic Bulletin Board System (BBS) provides you with easy access to product information and the ability to send us messages. Refer to the *BBS User Guide* for more information.

CompuServe Access

Files and messages can be sent to Barr Systems via CompuServe. For overseas customers, this method is less expensive than using the BBS. Access to CompuServe requires a CompuServe account, an asynchronous modem, and asynchronous communications software. The CompuServe Information Manager (CIM) program available from CompuServe is the easiest software tool to use when contacting CompuServe.

When logging on directly to CompuServe, the mail address for Barr Systems is **`>MHS:Mail@BarrSys`**. If you have an MHS mail system which interfaces with CompuServe's MHS hub, the mail address is **`Mail@BarrSys`**. For more information about obtaining a CompuServe account, contact Barr Systems.

Internet Access

Messages can be sent to Barr Systems through the Internet. You must have access to an Internet network mail system to use this method. File attachments cannot be sent to Barr Systems via this connection. For overseas customers, this method is less expensive than using the BBS. The Internet address for Barr Systems is **`Mail@BarrSys.Com`**.

Trademarks

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Red Sigle, Electronic Data Systems, San Diego, CA

Clive Stirling, Mentecaptus, Epsom Surrey, England

References

These selected publications are listed to guide you in choosing appropriate documentation. Refer to the listed publications that apply to your systems environment.

The publication number listed for the manuals relates to the version number of the related software. The number for your publication may be different, depending on the version of your software.

DOS *Microsoft MS-DOS User's Guide and Reference*

Using IBM Disk Operating System Version 4.00

3270 *IBM 3270 Information Display System 3274 Control Unit Description and Programmer's Guide, GA23-0061*

Options and Adapters

IBM Technical Reference, Options and Adapters, Volume 1

Local Area Network Technical Reference, SC30-3383

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Chapter

1 Introduction

An introduction to print spooling with BARR/SPOOL.

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Chapter 1 Introduction

The spooling process begins when you set up your Barr PC to receive files. Parameters entered from the Installation Description screens define to BARR/SPOOL the devices you are using, the flow of files to printers, and the initial assignment of file and printer attributes.

The Installation Description screens present numerous configuration choices. Understanding the following spool concepts will help you decide which of the many configuration options to use.

1.1 Spool Concepts

You already know that you want to send files to printers, but you may not realize the importance of file and printer attributes in getting the files to the printers. While files and printers are the bricks of print spooling, file attributes and printer attributes are the mortar. BARR/SPOOL maintains attributes for each file in a record at the top of the file called a *file header*. (The file header is described in detail in section 1.2.) File attributes describe the file and how it is to be printed. For example, the Copies attribute tells how many copies of the file to print.

Before a file can print, its attributes must match a printer's attributes. Printer attributes describe the status of the printer and are used to select files for printing. Printer attributes are preset in the BARR/SPOOL software and are maintained on the Print Spool screen.

BARR/SPOOL provides three different ways to set file attributes. You can set file attributes:

- Before you send a PC or LAN file to the print spool
- As a host file is being received by BARR/SPOOL
- From the Print Spool screen, while the file is waiting to print

How and when you set the file attributes determines how, when, and where the file prints.

Before the File is Sent to the Print Spool

Before the file is sent, the user, who is usually most familiar with the contents of the file, has the opportunity to set the attributes for the file.

File Attributes Set by PRT

Files from DOS sources, such as the LAN and the PC, can be added to the print spool using the PRT utility or the DOS copy command. The PRT utility is the preferred method because it sets file attributes. The PRT utility is included with the Barr software files. It can run in either a menu-driven, interactive mode or in a batch mode. Users may have individual copies of the PRT utility on their PCs or they can share a network copy of the utility.

The PRT utility lets you set *all* file attributes (see Table 1-1). Adding file attributes before the file is sent to the print spool makes management of the print spool easier. Attributes such as Form and State tell the print spool operator which actions to take before printing the file or enable the file to print automatically.

File Attributes Set by Data in the File

When using the BARR/PRINT for TCP/IP, PRINT/TWINAX, or BARR/PRINT for LAT option for BARR/SPOOL, you can use an Output statement to specify file attributes. The Output statement is added to the data in the file. When BARR/SPOOL receives the file, it searches for the Output statement. After if finds the Output statement and reads the file attributes, BARR/SPOOL deletes the Output statement from the file so that it is not part of the print-out of the file.

When the File is Received by the Print Spool

BARR/SPOOL has several features that allow it to change or add attributes, according to preset criteria, as a file is being placed in the spool directory.

Receiving vs. Copying Files

Files are placed in the spool directory either when they are *received* or *copied*.

The term *received* applies only to BARR/SPOOL with options. When using the BARR/PRINT for TCP/IP, PRINT/TWINAX, or BARR/PRINT for LAT option, files originate from a host computer (an AS/400 or a VAX). As host files are received and processed by BARR/SPOOL, both the file attributes and the file format may be changed.

By contrast, the PRT utility simply *copies* files from the PC or LAN to the print spool directory, then updates the file header with attribute information.

File Attributes

When a file is added to the print spool by the PRT utility, attributes that were set by PRT are added to the file header.

As files from host sources such as an AS/400 or VAX are received, BARR/SPOOL processes them. During this processing, file attributes can be changed. If an Output statement is specified in the data, values in the Output statement are translated to file attributes. The Spool Header from Data parameter also can be used to build the file header using data within the file.

BARR/SPOOL makes one final check of both copied and received files before adding them to the print spool. It checks the attributes of the files against the File Attribute Table and makes changes as specified in the table. These changes can override attributes that were set by the PRT utility or when a host file was received.

File Format

Files from a PC or LAN undergo no format conversion. However, files received from a host are processed by BARR/SPOOL. This processing includes a format conversion when you specify a receive mode in the BARR/SPOOL parameters.

A receive mode tells BARR/SPOOL to perform a format conversion of the data in the file. You can use a receive mode to convert ASCII data to EBCDIC format, or to convert EBCDIC data to ASCII format. The receive mode you choose should be based on the printer that will print the file. EBCDIC data prints only on S/370 (channel-attached) printers. ASCII data prints on ASCII (PC) printers.

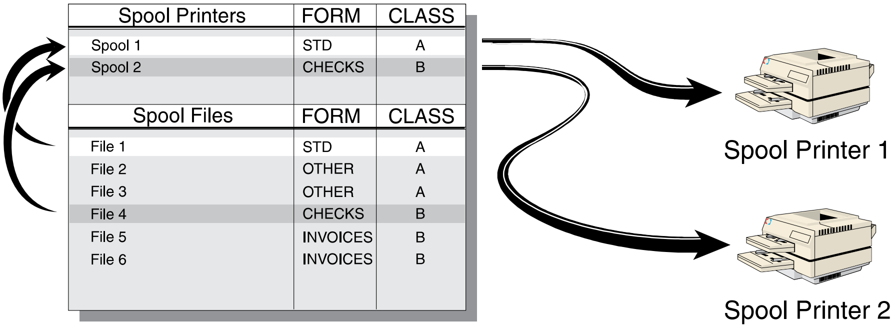
Before the File Prints

The printing of files can be a completely automated process or it can require user intervention. It is up to you. Once a file is in the print spool, it will print automatically when the file attributes match a printer's attributes. If the file attributes do not match a printer's attributes, either the file attributes or the printer attributes must be changed before the file can print.

A file prints when a printer is available and the file's:

- State is ready.
- Form is on the printer.
- Class matches the printer Class.

You control the printing of files using the Print Spool screen to change file and printer attributes. For example, if you load a paper form for checks on printer LPT1, then you should change the Form attribute of LPT1 to **CHECKS**. This prevents any file with a Form attribute other than **CHECKS** from printing on LPT1 and signals BARR/SPOOL to send files with a Form of **CHECKS** to LPT1.



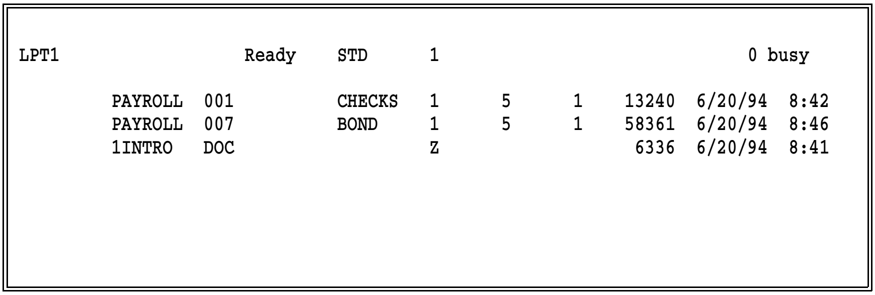
Spool Printers	FORM	CLASS
Spool 1	STD	A
Spool 2	CHECKS	B

Spool Files	FORM	CLASS
File 1	STD	A
File 2	OTHER	A
File 3	OTHER	A
File 4	CHECKS	B
File 5	INVOICES	B
File 6	INVOICES	B

The attributes of a print spool file are compared to the attributes of the Spool printer. When the Form and Class for the file match the Form and Class of a Spool printer, the file prints.

File Attributes

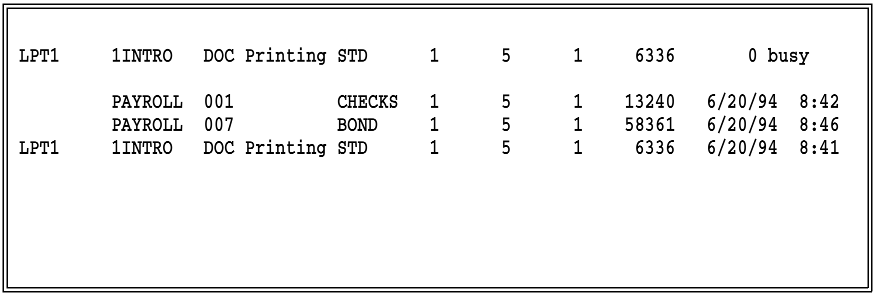
You can change the file attributes which control when a file will print using the Print Spool screen (see Table 1-1). For example, the minimal attributes of the file 1INTRO.DOC, which was DOS-copied into the print spool:



```
LPT1                 Ready    STD      1                             0 busy

         PAYROLL  001         CHECKS   1      5      1    13240  6/20/94  8:42
         PAYROLL  007         BOND     1      5      1    58361  6/20/94  8:46
         1INTRO   DOC                  Z                   6336  6/20/94  8:41
```

can be changed to print the file on the appropriate printer.



```
LPT1     1INTRO   DOC Printing STD     1      5      1     6336        0 busy

         PAYROLL  001         CHECKS   1      5      1    13240   6/20/94  8:42
         PAYROLL  007         BOND     1      5      1    58361   6/20/94  8:46
LPT1     1INTRO   DOC Printing STD     1      5      1     6336   6/20/94  8:41
```

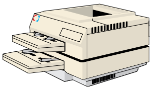
Printer Attributes

You also control the printer from the Print Spool screen. Printer attributes maintain the status of the printer and determine which files are selected for printing. There are three printer attributes that can be changed — State, Form, and Class.

The State attribute reflects the status of the printer. The printer State can be ready, printing, draining, disabled, or reprinting. Changing the printer State enables you to take down a printer for repairs and to reprint files that were stopped by a paper jam.

The Form attribute can be set to show the paper form that has been loaded on the printer. You might use special paper for printing checks, letters, invoices, etc. When you set the Form attribute, BARR/SPOOL prints only files with that Form.

The Class attribute can be used to send a specific group of files to a specific printer. Use of the Class attribute is completely user-defined. A Class can be any one-character, alphanumeric value. Up to 5 Classes can be entered for each printer. A file's Class must match the printer's Class, for the file to print on that printer.



When the File Prints

BARR/SPOOL performs any processing needed up until the moment that each line of the file is printed. It can send control strings to the printer, combine a form overlay with the text of the file, and save a backup copy of the file after it prints. You will learn more about the processing BARR/SPOOL performs as you proceed through the Installation Description.

Table 1-1. Methods for Setting File Attributes

File Attribute	Description	Method					
		DOS Copy	PRT Utility	Print Spool Screen	Output Statement	Spool Header from Data	File Attribute Table
Class	Spooling class. Provides for grouping of similar files.		✓	✓	✓		✓
Copies	Number of copies of the file to print.		✓	✓	✓		✓
Disposition	Delete or retain the file after printing.		*	✓			✓
FCB name	An 8-character FCB name.		✓		✓		
File name	Name of the file.	✓	✓		✓		
File separator headers	Used to identify printed files. Job header information prints with the file.		✓				
Form name	An 8-character form name. Often indicates preprinted forms that must be mounted on the printer.		✓	✓	✓	✓	
Job name	An 8-character job name.		✓		✓	✓	
Lines-per-form	Number of lines used for printing the form.		✓				
Lines-per-inch	Number of print lines-per-inch.		✓				
Printer control	Printer control string selector.		✓				
Priority	Indicates the priority in which BARR/SPOOL prints files.		✓	✓	✓		✓
State	Spooling state. The file is either Ready to print or on Hold.		✓	✓			✓

*With the PRT utility, you cannot specify the disposition of the file after printing but you can specify the disposition of the file after copying to the spool directory.

Highlighting indicates file attributes that must match printer attributes before the file can print.

Table 1-2. Software for Which Methods are Available

Software	**Method**					
	DOS Copy	**PRT Utility**	**Print Spool Screen**	**Output Statement**	**Spool Header from Data**	**File Attribute Table**
BARR/SPOOL alone	✓	✓	✓			✓
BARR/SPOOL with PRINT/TWINAX	✓	✓	✓	✓	✓	✓
BARR/SPOOL with BARR/PRINT for TCP/IP	✓	✓	✓	✓	✓	✓
BARR/SPOOL with BARR/PRINT for LAT	✓	✓	✓	✓	✓	✓

1.2 Barr File Header

BARR/SPOOL stores information about how each file is to be printed in a record at the beginning of each file. This record is called the *file header*.

When a file is ready to be sent to the printer, the software processes the information in the file header. Information, such as lines-per-form, lines-per-inch, and printer control codes, is sent to the printer as commands. The file header record itself is not sent to the printer.

It usually is not necessary to have detailed knowledge of the file header format. Most users need only to work with file attributes and let the Barr software update the file header. However, if files do not print in the expected format you can view the information in the file header to help pinpoint the problem.

> ***Note:*** Some users may want to write application programs that generate the file header. However, the format of the header is subject to change without notice. This means that if you update your version of the software and the file header format has changed, you will have to modify your application programs. To obtain the current format of the file header, enable **`Write spool header to file?`** under **`Assign Devices`** and receive a test file using **`SPOOLn→(FILE)`**.

File Header Format

The file header consists of identifier text and data. Most values are preceded by an identifier and an equal sign. For example, **`FORMNAME=`** is an identifier, and **`CHECKS`** is the value. The file header ends with a form feed (**`FF`**) character. A sample file header is pictured below:

```
PRINTER FORMNAME=CHECKS   LPF=066 PLPF=042 LPI=6 CONTROL=00 LOCNAME=
JOBNAME=jobname  COPIES=      1 PRIORITY=5 STATUS=READY CLASS=1
FCBNAME=fcbname  UCS=               0   D6C101
CARRIAGE CONTROL STOPS
1
END OF PRINTER FORM.
```

The following fields are included in the file header:

`PRINTER`

Text identifying this as the spool file header.

FORMNAME=CHECKS

The form name for the file, usually indicating the type of form paper to use in the printer. CHECKS and INVOICES are examples of form names.

LPF=066

The number of lines-per-form, indicating the vertical page size.

PLPF=042

The number of print lines-per-form, indicating the print area of each page.

LPI=6

The number lines-per-inch that will be printed on the page.

CONTROL=00

An optional printer control code index. This value is set using the PRT utility. It references an entry in the Barr **Printer Control Data** table for an LPT, COM, or NET device.

LOCNAME=

A field used internally by the Barr software for locating a form overlay file. If you are using a PC application program to generate the file header, leave this field blank.

JOBNAME=jobname

The job name for the file.

COPIES=1

The number of copies to print.

PRIORITY=5

The file print priority. Valid values are **0-9**.

STATUS=READY

Indicates the state of the file. Valid states include **Hold** or **Ready**.

CLASS=1

The file class, represented by a digit or letter.

FCBNAME=fcbname

The name of the FCB (Forms Control Buffer). Usually this field is used only with files received from IBM mainframes.

UCS=

The name of the UCS print train. Usually this field is used only with files received from IBM mainframes.

0 The PDIR identifier byte. This number indicates whether the file contains a PDIR Job Separator. This field does not apply to BARR/SPOOL. Leave it blank.

D6C101

A six-character group code generated by the Barr software to group together separate Spool files that originated from the same host file. This field does not apply to BARR/SPOOL. Leave it blank.

CARRIAGE CONTROL STOPS

Carriage control character, or *stops*, are used to quickly advance the paper. Only one carriage control stop may be defined per line.

Notes:

Chapter

2

Software Screen Conventions

Conventions for editing software screens are presented in this section.

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2.3 Screen Keys 19

Chapter

2 Software Screen Conventions

This chapter describes how software screens are represented in this manual and lists the keys which are used during software installation and operation. These conventions are easy to master.

2.1 Screen Documentation

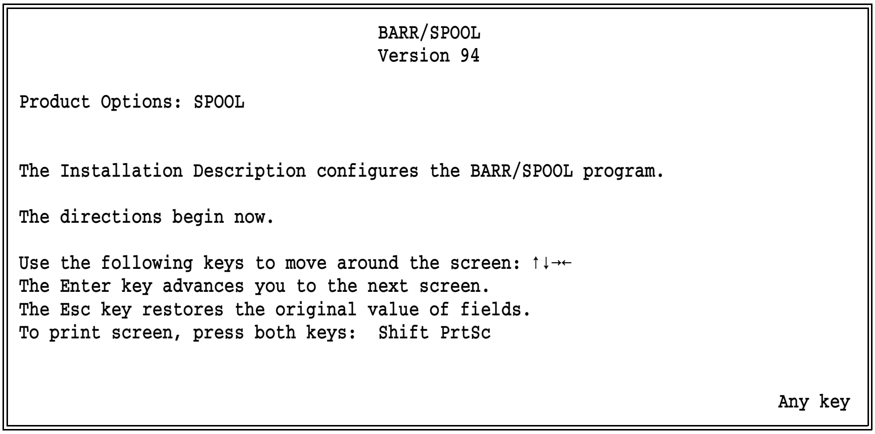
Text in the manual assists you in navigating through the software screens. As each screen is presented, the text lists any steps you need to perform.

Screen and Option Names

In the text, screen names and option names often appear in **bold type**. This makes it easier to scan the text for information about a particular screen or option. Additionally, file names, directory names, messages, and commands appear in **bold type**.

Screen display

In the manual, software screens are enclosed in a box. Text marked with an arrow (➤) above or below the screen indicates what action to take. For example:



```
                                    BARR/SPOOL
                                    Version 94

Product Options: SPOOL


The Installation Description configures the BARR/SPOOL program.

The directions begin now.

Use the following keys to move around the screen: ↑↓→←
The Enter key advances you to the next screen.
The Esc key restores the original value of fields.
To print screen, press both keys:  Shift PrtSc


                                                                        Any key
```

➤ Press any key to advance to the next screen.

Typing Commands

In the text, when you are instructed to *type* or *enter* a command, you must subsequently press the ENTER key. Commands are typed at the DOS prompt or at prompts in the software during software operation. They are represented in the text in **bold type**.

Selecting Options

When you are instructed to *select* an option on a menu, move the cursor to that option on the screen and press ENTER. When you are instructed to *select* an option value from a list of choices, advance through the list using the PLUS SIGN or MINUS SIGN key on the numeric keypad.

Message display

During software operation, messages may display on the screen. In the manual, long messages are enclosed in a box and short messages appear in **bold type**.

2.2 Screen Cues

Each software screen lists which keys may be used. Cues display in the bottom right corner of each screen indicating the keystrokes to press or the type of data to enter. The cues change for each field as you move around the screen.

Screen cues and their meanings are listed below.

Any key
Read the information on the screen then press any key on the keyboard. ENTER is an easy key to use.

Selection ↑↓→←
Use the arrows or TAB keys to move around the screen. Move to the desired selection and press ENTER. A shortcut to selecting a menu option is to type the highlighted character of the option name.

Choice? + -
Use the PLUS SIGN or MINUS SIGN key to toggle through choices.

Enter character
Type a character.

`Enter number`

Type a number.

`Enter hex number`

Type a hexadecimal number using the digits **`0-9`** and **`A-F`**.

2.3 Screen Keys

The keys listed below may be used on all screens. Even if some of these keys are omitted from the screen cue, they can still be used. Keys appear as key symbols in the text.

The function of the keys described below is the same on nearly all screens. On a few screens the function of a key may be different, but these exceptions are noted in the text.

UP ARROW, DOWN ARROW, TAB

Use the up arrow, down arrow, and tab keys to move between fields on a screen. A shortcut for quickly moving from the first field to the last field on a screen is to press the up arrow key.

RIGHT ARROW, LEFT ARROW

Use the right and left arrows to move between fields and within a field.

DELETE

The Delete key deletes the current character.

ESC

The Escape key returns fields to their original values and returns to the previous screen.

ENTER

The Enter key retains data entered on the screen and advances to the next screen. On some installation screens, additional options display on the lower portion of the screen when the ENTER key is pressed.

Notes:

Chapter 3 Installation

Install the software files from the software disk to your PC.

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Chapter 3 Installation

This chapter presents step-by-step installation instructions for BARR/SPOOL and the PRT utility. The text describes how to install the software files and how to configure software options. Easy-to-use menus guide you during each step of the software installation process.

3.1 Installation Steps

To install the Barr package, follow these general steps.

1. **Hardware Installation:** Before installing the software files, install any Barr hardware adapters you purchased. Individual adapter manuals document installation instructions for each adapter.
2. **BARR/SPOOL Installation:** Next, follow the steps in section 3.2 of this manual for installing the BARR/SPOOL software files on your PC.
3. **PRT Installation:** If you plan to use the PRT utility to place files in the print spool, install PRT next. Follow the directions in section 3.3 for installing the PRT software files on your PC.
4. **Installation Description:** Finally, enter the **`Installation Description`** parameters in the BARR/SPOOL software.
    - Follow the instructions in the adapter manual(s) for entering software parameters for any communication adapters or option adapters you installed.
    - Follow the instructions in Chapters 4-10 for entering the rest of the software parameters.

3.2 BARR/SPOOL Installation

Disk Drive

We recommend that you install BARR/SPOOL on a computer hard drive.

Disk Size

BARR/SPOOL software is available on 3.5 or 5.25 inch disks.

Software Disk Files

The Barr software disk contains the Barr program and reference files in a self-expanding, compressed format. The automated installation process copies the files to your PC then expands them.

You can install the different types of software files in separate directories.

INSTALL program files on the software disk include:

READ.ME	A text file containing information about the INSTALL program. You can view this file with the DOS **type** command or a file editor.
INSTALL.EXE	The program to expand and copy the files from the software disk to the PC.
CONTROL.DAT	A text control file used by INSTALL.EXE.

Barr software files on the software disk include:

PRODUCT.EXE	Barr software files compressed into one file.
REF.EXE	Barr Reference files compressed into one file.
@nnnn.ADF	Adapter Description Files for installing Barr Micro Channel adapters on PS/2 machines. These files are not compressed.

Additional files may be included on your disk if you purchased other software options. Refer to the corresponding option manuals.

Changes to CONFIG.SYS

Files Parameter

In the **CONFIG.SYS** file, the DOS **FILES** parameter should be set to a minimum of 40 to allow the Barr software to access up to 40 files at a time. **CONFIG.SYS** is located in the root directory of the PC boot disk. Refer to your DOS manual for instructions on how to modify **CONFIG.SYS**.

The value needed for **FILES** depends on the number of features you have enabled in the Barr software and the combined number of files that those features must access simultaneously. **FILES=40** works in most cases.

If the Barr software needs to access more files than you have allocated, during program operation this message will display on the console:

```
DOS ERROR: Too many open files, use FILES=40 in file /CONFIG.SYS
```

If you see this message, set `FILES=40` or increase the value by increments of 10 until the problem is resolved.

Install the Software Files

The automated installation process is easy to use and is the most convenient way to load the software files onto your PC. The installation process allows you to install new software or a software update, choose which files to install, and select whether to enter the configuration parameters immediately or at a later time. Follow the steps below.

Load Software Disk

➤ Start the PC using DOS 3.0 or a later version.

> ***Monochrome monitors:*** If you are using a monochrome monitor and a color adapter (CGA, EGA, VGA), set the display mode to black and white by entering this command from the DOS prompt:
>
> ```
> MODE BW80
> ```

➤ Put the Barr software disk in the PC disk drive.

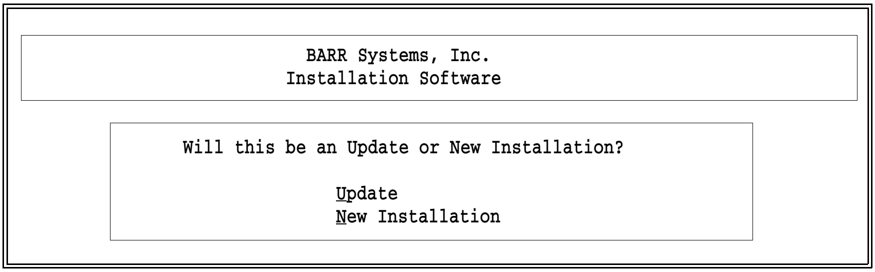
➤ At the DOS prompt enter the drive letter followed by the INSTALL command. For example:

```
A:INSTALL
```

The automated installation process is simple to use. Just follow the steps displayed on the PC screen. Refer to the text which follows if you have any questions.

Update or New Installation?

This menu displays when the **`INSTALL`** program is loaded:

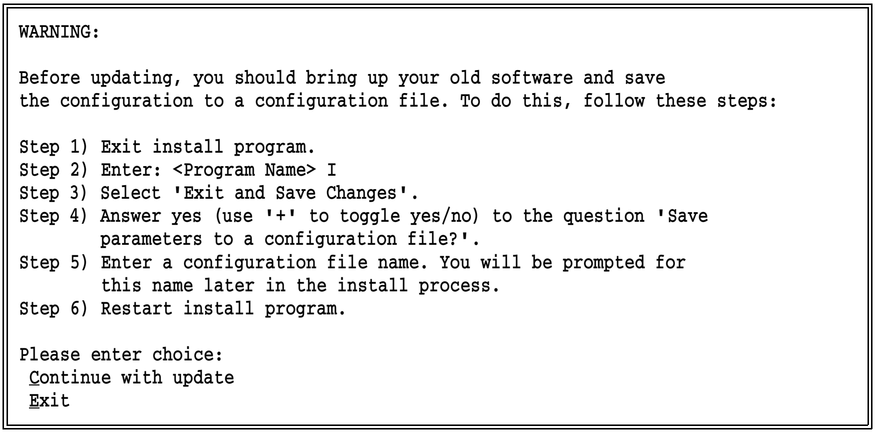


```
                        BARR Systems, Inc.
                       Installation Software

           Will this be an Update or New Installation?

                           Update
                           New Installation
```

- ➤ Press U for **`Update`** if you already have the Barr program and are installing a new version of the software. Or press N for **`New Installation`** if this is a new Barr product.

Software Update

If you select **`Update`**, the warning screen below reminds you to save the configuration parameters from the old software before continuing:

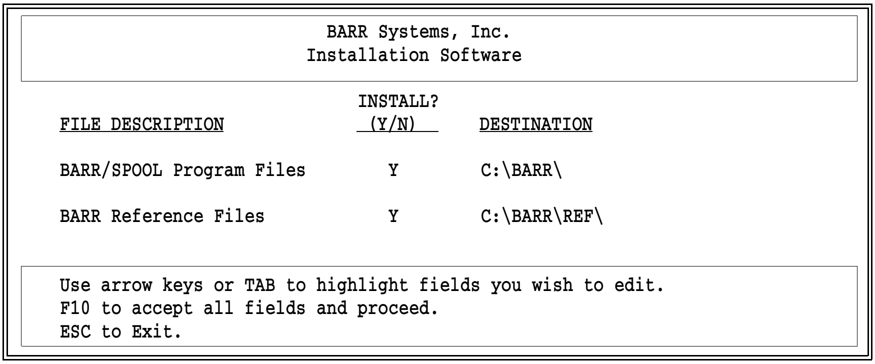


```
WARNING:

Before updating, you should bring up your old software and save
the configuration to a configuration file. To do this, follow these steps:

Step 1) Exit install program.
Step 2) Enter: <Program Name> I
Step 3) Select 'Exit and Save Changes'.
Step 4) Answer yes (use '+' to toggle yes/no) to the question 'Save
        parameters to a configuration file?'.
Step 5) Enter a configuration file name. You will be prompted for
        this name later in the install process.
Step 6) Restart install program.

Please enter choice:
 Continue with update
 Exit
```

- ➤ If you do not wish to save the parameters at this time, press C to **`Continue`**. To save the configuration parameters before continuing, read the instructions on the screen, press E to **`Exit`** the install program, then perform the steps from the DOS prompt.

Choose Which Files to Install

After you choose **`Update`** or **`New Installation`**, the installation menu displays:



```
                    BARR Systems, Inc.
                  Installation Software

                                INSTALL?
   FILE DESCRIPTION              (Y/N)      DESTINATION

   BARR/SPOOL Program Files        Y        C:\BARR\

   BARR Reference Files            Y        C:\BARR\REF\


   Use arrow keys or TAB to highlight fields you wish to edit.
   F10 to accept all fields and proceed.
   ESC to Exit.
```

- ➤ Use the arrow keys or TAB to move around the **`INSTALL`** menu.
- ➤ Choose which files to install. Type Y to install a file or N to skip it.
- ➤ Enter the destination path, including the drive letter and directory name(s), where you would like the software installed. Directories will be created if they do not already exist. The default path for the BARR/SPOOL software is **`C:\BARR`**, with other files stored in subdirectories of this path.
- ➤ Press F10 when you are done.

The screen displays messages indicating the progress of the installation, such as these:

```
Creating Directories
Installing Software
```

As the files are expanded from the distribution disk to the destination directories, additional messages display, including:

```
Exploding
Unshrinking
```

Configure Software?

When the software files have been copied, the following screen displays:

```
Copy of software is complete.  Ready to load
software. When software is loaded you will need to:

Step 1) Enter configuration information.
Step 2) Select 'Exit and Save Changes'.

Please enter choice:
 Continue loading software
 Exit
```

➤ The software is configured from the **`Installation Description`**. To load the **`Installation Description`**, press C to **`Continue`**. Or press E to **`Exit`** to the DOS prompt.

Software Update

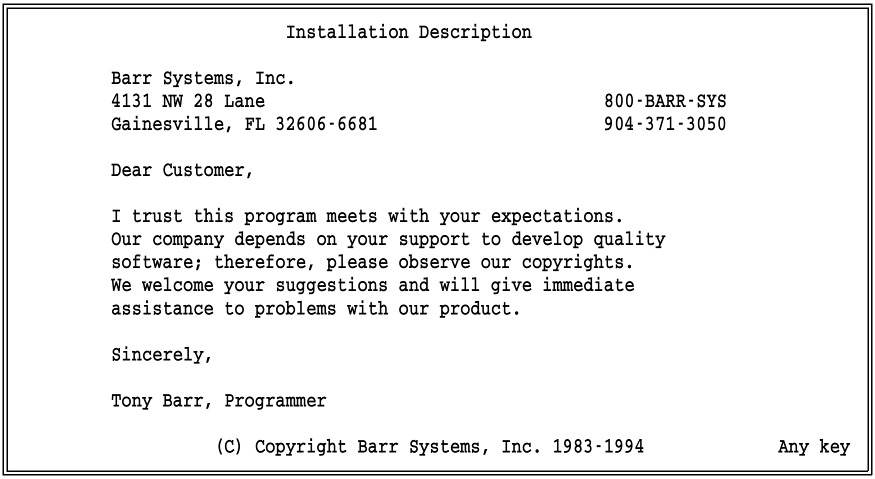
If you are installing a software **`Update`** and choose **`Continue`**, you are prompted to enter the name of the configuration file:

```
Please enter configuration drive:\path\file:________
```

To load the configuration file, enter the configuration file path and file name. If you do not want to include a configuration file at this time, leave the field blank.

Installation Description

The following screen displays when the **`Installation Description`** is loaded:



```
                          Installation Description

          Barr Systems, Inc.
          4131 NW 28 Lane                                800-BARR-SYS
          Gainesville, FL 32606-6681                     904-371-3050

          Dear Customer,

          I trust this program meets with your expectations.
          Our company depends on your support to develop quality
          software; therefore, please observe our copyrights.
          We welcome your suggestions and will give immediate
          assistance to problems with our product.

          Sincerely,

          Tony Barr, Programmer

                    (C) Copyright Barr Systems, Inc. 1983-1994          Any key
```

➤ Follow the instructions in Chapters 4-9 to configure the software. When software configuration is complete, remember to **`Exit and Save Changes`** to preserve the installation parameters.

Store the Software Disk as a Backup

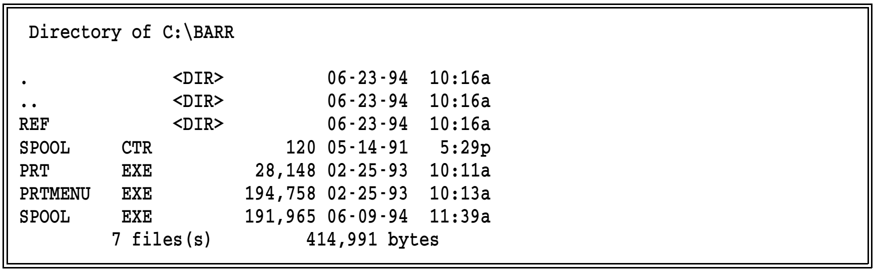
After the software files are copied from the software disk to the PC, store the software disk in a safe place. The software disk serves as a backup copy of the software in case of a PC hard disk failure.

Accessing the Installed Files

- To view a list of the installed files, use the DOS directory (**`dir`**) command. For example, type at your DOS prompt:

```
dir c:\barr
```

A list of files and subdirectories will display:



```
 Directory of C:\BARR

.              <DIR>          06-23-94  10:16a
..             <DIR>          06-23-94  10:16a
REF            <DIR>          06-23-94  10:16a
SPOOL     CTR             120 05-14-91   5:29p
PRT       EXE          28,148 02-25-93  10:11a
PRTMENU   EXE         194,758 02-25-93  10:13a
SPOOL     EXE         191,965 06-09-94  11:39a
         7 files(s)        414,991 bytes
```

- To view a list of files in a subdirectory, specify the subdirectory name. For example:

```
dir c:\barr\ref
```

- To access files in a directory, use the DOS change directory (`cd`) command to change the directory. For example:

```
cd \barr\ref
```

Refer to your DOS manual for additional information about accessing files in directories and subdirectories.

Returning to the Installation Description

After you have saved your changes to the Installation Description, if you wish to re-enter the **Installation Description** at a later time, type at your DOS prompt the program (`.EXE`) name followed by the letter `i`. For example:

```
SPOOL i
```

Bypassing the Automated Installation Process

We recommend that you use the automated INSTALL program when installing a new Barr product or an update. The automated process is easy to use and performs some important steps. However, if you wish to bypass the automated INSTALL process, and you are familiar with DOS commands, follow these steps:

1. Copy the compressed software files from the software disk to the desired directories with DOS commands.
2. Type the name of each compressed file at the DOS prompt to expand it within its corresponding directory.
3. You may delete the original compressed files from the hard disk after they are expanded.

3.3 PRT Installation

In the process of installing the BARR/SPOOL software, the PRT software files were copied to the directory you selected for the Barr software files. You also can copy the PRT files to a local PC hard drive or a network drive if you want the utility to be accessible to all users.

Three files make up the PRT software:

- **`PRT.EXE`**
- **`PRTMENU.EXE`**
- **`SPOOL.CTR`**

> ***Note:*** Both the **`PRT.EXE`** file and the **`PRTMENU.EXE`** file are required regardless of whether you run the utility interactively or in batch mode.

Refer to Chapter 11 for instructions to configure and operate the PRT utility.

Notes:

Chapter

4 Devices and Printers

Define PC printers and other devices to use with the software.

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Chapter 4 Devices and Printers

From the **`Devices and Printers`** menu, you select the types of printers and other devices to use with BARR/SPOOL. The devices you enable on this screen display on the **`Assign Devices`** menu.

This chapter introduces you to the concepts of source and destination devices and describes the devices you can enable from the Devices and Printers menu.

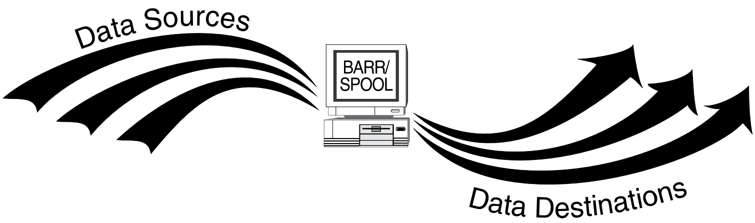
4.1 Sources, Destinations, and Device Assignment

When defining devices in the Barr software, you need to understand the concepts of source devices, destination devices, and device assignment.

Devices used to input data to the software are called data *sources*. For example, LAN directories are data sources because data travels from the network files into the PC and is processed by the software.

Devices that handle data output by the software are known as data *destinations*. PC printers and disk files are destinations because data on the PC is sent out to the printer or to a file on the hard disk.

Routing data from a source to a destination is called *assigning* devices. For instance, files received from the LAN directory are directed or *assigned* to write to a printer attached to the PC parallel port.



Devices used with Barr software are either data sources or data destinations. Data travels from sources to the Barr PC, and from the Barr PC to destinations.

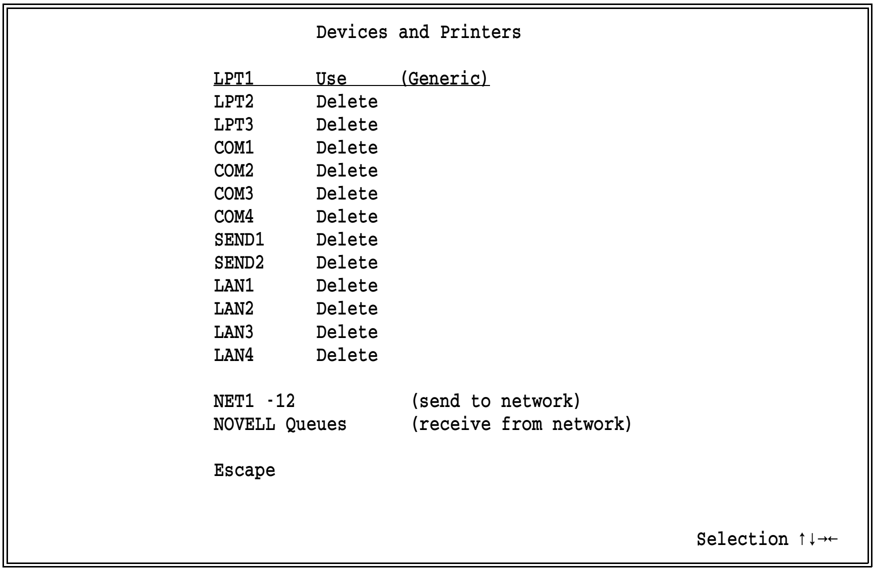
Source and destination devices are defined from the **`Devices and Printers`** menu, as discussed in this chapter. Once devices are defined, device assignments are made on the **`Assign Devices`** menu described in Chapter 6.

4.2 Devices and Printers Menu

The Devices and Printers menu lists standard PC devices as well as some devices unique to the Barr software.

Devices used with any option software you purchased are not included on this screen. These options display as separate items on the **`Installation Description`** menu. (Available print options include PRINT370, PRINT/TWINAX, BARR/PRINT for LAT, and BARR/PRINT for TCP/IP.)

To access Devices and Printers, from the **`Installation Description`** menu select **`Devices and Printers: LPT, COM, NET, SEND, LAN`**.



```
                    Devices and Printers

          LPT1      Use      (Generic)
          LPT2      Delete
          LPT3      Delete
          COM1      Delete
          COM2      Delete
          COM3      Delete
          COM4      Delete
          SEND1     Delete
          SEND2     Delete
          LAN1      Delete
          LAN2      Delete
          LAN3      Delete
          LAN4      Delete

          NET1 -12            (send to network)
          NOVELL Queues       (receive from network)

          Escape


                                                 Selection ↑↓→←
```

The devices on this screen are described briefly below. The brief descriptions are followed by separate sections giving a detailed discussion of each device.

The LPT, COM, and NET device sections are presented first. These devices have several options in common. Parameters for the **Miscellaneous printer options** differ for these devices and are described separately for each device type. Sections discussing the common options **Choose printer type**, **Printer control data**, and **Forms overlay** are described next. Then the remaining devices SEND, LAN, and NOVELL Queues are described.

LPT1-LPT3

Parallel printers are attached to the PC parallel ports. The DOS names for the parallel printer ports are LPT1, LPT2 and LPT3. LPT1 is enabled by default.

> ***Performance Tuning:*** With Barr software, using the parallel ports is more efficient than using the serial ports.

COM1-COM4

Serial printers and other serial devices are attached to the PC serial ports. The DOS names for the serial ports are COM1, COM2, COM3, and COM4. Barr software supports both input and output on the serial ports.

COM3 and **COM4** are supported only on standard PC (ISA) bus machines. Using them requires COM3 and COM4 adapters that can be set to interrupt levels other than the standard IRQ4 and IRQ3, so that the four serial ports COM1-COM4 use four different interrupt levels. (Usually COM1 and COM3 use IRQ4, and COM2 and COM4 use IRQ3. However, interrupt sharing is not allowed on the ISA bus, meaning all four ports cannot be used at once with interrupts when IRQ4 and IRQ3 are the only choices.)

> ***Performance Tuning:*** If the serial devices are not used, they should be disabled to free buffers that may then be used for other program features.

SEND1-SEND2

The SEND devices specify destinations for the Barr **Send Files** command issued from the **Operation** menu. The most common application is to direct files to the host. At least one SEND device must be enabled if you plan to use the **Send Files** command. Both SEND1 and SEND2 are enabled by default.

`LAN1-LAN4`

LAN connection devices are used to automatically move files from a directory on a local area network to another location. Files can be directed to another LAN directory or to a printer from four different LAN directories.

`NET1-12 (send to network)`

Barr software allows you to send data from the PC to printers on the local area network. Most networks support redirection of LPT1, LPT2, and LPT3 using device drivers, but some networks support redirection of LPT1-LPT12. For Novell networks, NetWare print queues are supported.

`NOVELL Queues (receive from network)`

Data can be received to the PC from Novell job queues or print queues. The software can direct the received data to PC printers or the data can be routed to the mainframe as a job. Up to four Novell NetWare queues may be used.

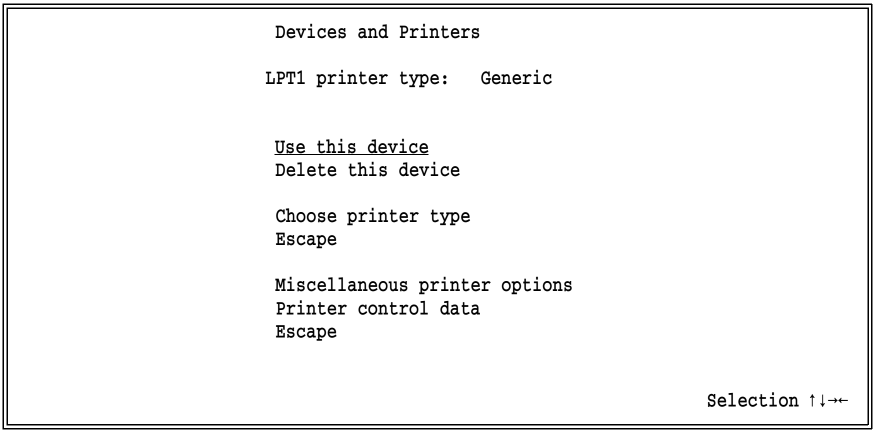
4.3 LPT1-LPT3 Devices

This section describes parameters you need to set when attaching devices to the PC parallel ports.

When you finish configuring your printer, you can print a test file to verify that the configuration is correct. Refer to Appendix C, *Printer Test*.

LPT Device Menu

From the **`Devices and Printers`** menu, select the desired LPT device, for example **`LPT1`**. These options are the same for whichever LPT device you select.



```
                  Devices and Printers

                 LPT1 printer type:   Generic


                  Use this device
                  Delete this device

                  Choose printer type
                  Escape

                  Miscellaneous printer options
                  Printer control data
                  Escape


                                                    Selection ↑↓→←
```

The following options may be selected:

`Use this device`

Select this option to enable the LPT device. You must enable the device before you can use it. The selected LPT device displays as a destination device on the **`Assign Devices`** menu. LPT1 is enabled by default.

`Delete this device`

The LPT device is disabled and does not display on the **`Assign Devices`** menu. The status **`(deleted)`** displays next to the device name at the top of the screen. The **`Assign Devices`** menu is easier to read if unused devices are disabled.

`Choose printer type`

You must choose the type of printer to use. When you select this menu item, a list of printers displays. The choices are discussed in section 4.6, *Choose Printer Type*. Your selection displays on the **`Devices and Printers`** menu, next to the device name.

`Miscellaneous printer options`

Several parameters are available which affect printer performance. These parameters are discussed under *Miscellaneous Printer Options for LPT Devices.*

See section 9.2, *Tuning Data, Printer Control,* for additional parameters that affect printing.

Printer control data

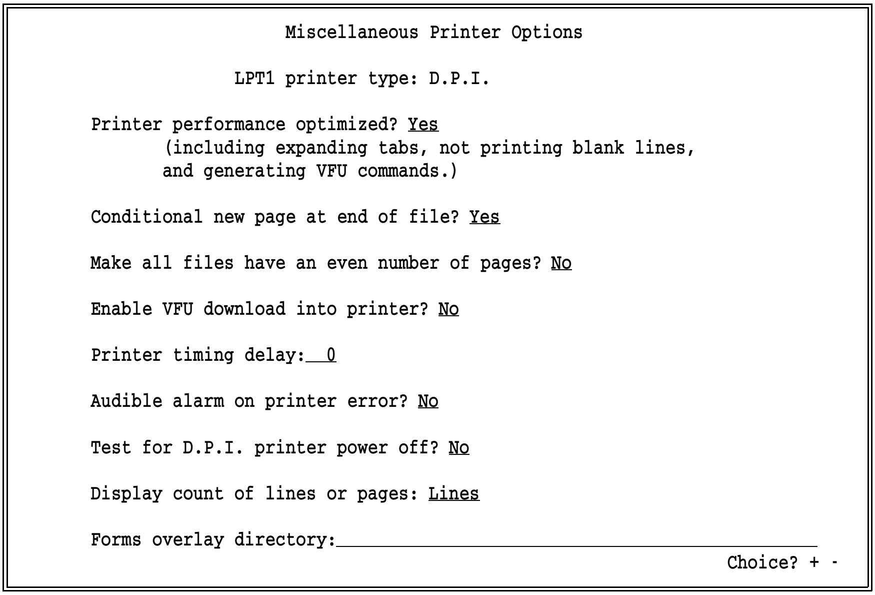
Printer control data is used to send control codes to the printer, such as commands to set the lines-per-form and lines-per-inch, or commands to reset the printer. This option is described in section 4.8, *Printer Control Data*.

Escape

The Escape option appears twice on the menu. Select **Escape** or press the ESC key to return to the **Devices and Printers** menu.

Miscellaneous Printer Options for LPT Devices

Several printer options may be used with LPT devices to simplify processing of the print data or to solve printing problems. To reach these options, from the **Devices and Printers** menu select **Miscellaneous printer options**.



```
                      Miscellaneous Printer Options

                 LPT1 printer type: D.P.I.

      Printer performance optimized? Yes
             (including expanding tabs, not printing blank lines,
             and generating VFU commands.)

      Conditional new page at end of file? Yes

      Make all files have an even number of pages? No

      Enable VFU download into printer? No

      Printer timing delay:  0

      Audible alarm on printer error? No

      Test for D.P.I. printer power off? No

      Display count of lines or pages: Lines

      Forms overlay directory:_______________________________________________
                                                               Choice? + -
```

Printer performance optimized?

Choose whether to optimize printer performance by converting data as it is sent to the printer. This option *cannot* be used with laser printers.

`Yes` Default. Printer performance is improved by altering the data as follows:

- Blank lines are converted to line feeds.
- If the printer has DAVFU support, the hardware skip-to-VFU channel commands are used to perform high-speed skipping of blank lines. Direct Access Vertical Forms Unit (DAVFU) is a Dataproducts convention for specifying vertical forms control.
- Horizontal tab characters are converted to the required number of blanks to emulate tab settings at every eight positions.

`No` Data is sent to the printer without alteration. Use this setting for all laser printers.

`Conditional new page at end of file?`

Choose whether the software should add a form feed (**`FF`**) to the end of a file, if needed. This ensures that each file begins at the top of a new page, which is helpful when form feeds are missing from some files.

`Yes` Default. At the end of each file, the software determines whether a form feed is included or whether the maximum page length is reached. One of these conditions is necessary to ensure that the next file begins at the top of a new page. If neither condition is met, the software adds a form feed. The software remembers if it adds a form feed, and if the next file contains a form feed at the beginning, the software removes it to prevent printing a blank page.

`No` Form feeds are not added to or removed from files.

`Make all files have an even number of pages?`

Choose whether all files should have an even number of pages for easier job separation.

`No` Default. The number of pages printed may be even or odd.

Yes If a file has an odd number of pages, add a blank page to make the number of pages even. This ensures that the job banner page always faces up on the fan-fold paper stack.

Enable VFU download into printer?

This option displays only if you select a printer which supports Vertical Forms Unit (VFU) download on the **Choose Printer Type** screen. Printers that support VFU include: Dataproducts, D.P.I., Genicom Linewriter, Printronix, Sand, Fujitsu, Hitachi, or STC (D.P.I.). For a complete list of the printers with VFU capability, refer to *Lines-per-form and Lines-per-inch* in section 4.6, *Choose Printer Type.*

No Default. Do not use VFU to control line skips. This option may be necessary with forms that do not have a **1** in the first position of the VFU. To print extended ASCII codes, such as the cent symbol (**¢**), this option must be set to **No**.

Yes Use VFU to control line skips. The Dataproducts BP1500 requires a **1** in the first position of the VFU. You also should enable **Printer performance optimized**.

Printer timing delay:

Some line printers cannot accept data as quickly as the software can send data to the printer. This option allows you to slow the rate at which data is sent to the printer, so the printer does not become backed up. Indications that you need to use this option include dropped or duplicate characters in the print output. This option also may be necessary with forms that do not have a **1** in the first position of the VFU. The timing delay feature applies only to line printers, not to laser printers.

The printer uses a busy line to signal whether it can receive data. When the printer is busy it sets the busy line. Before the software sends data to the printer, it checks whether the busy line is set. If the busy line is active, the software will pause before sending more data. However, some printers are slow in setting the busy line. The **Printer timing delay** option introduces a delay after each byte sent to the printer so the printer has time to set the busy line before the software sends more data.

The timing delay is measured in internal program cycles, and the length of the delay depends on the speed of the PC processor. The amount of the delay required also depends on your line printer.

The default value of **8** is used for PC AT workstations and most line printers. If you are using a BARR/DPI printer adapter, the value should be **0**. (The BARR/DPI adapter supports printers with the Dataproducts interface.)

If it is necessary to change the timing delay, adjust it on a trial-and-error basis. First, set the timing delay parameter to a large value such as **300**. Note the effect on the printer. If the value is too high, you will see a noticeable slowdown of the print speed. If the value is too low, the original problem still will be evident. Adjust the value up or down in smaller increments, until the problem is resolved and the print speed seems normal.

For a description of the busy line, refer to the *IBM Technical Reference, Options and Adapters, Volume 1, Section Graphics Printer*. Overdriving the printer is impossible if you use the IBM definition. Unfortunately, not all printers use this definition. Barr Systems Technical Support representatives are always glad to assist you in tuning this parameter.

Audible alarm on printer error?

Choose whether the PC will make a shrill beep when an **error** or **paper** condition occurs. The noise will stop when you correct the condition or press a key on the keyboard.

No	Default. The error alarm is disabled.
Yes	The error alarm is enabled. This option is especially useful for laser printers because you usually cannot hear a laser printer stop when a problem occurs.

Test for D.P.I. printer power off?

This option is valid only for printers with a Dataproducts Interface (DPI). Use this option to test for a printer power-off condition. Some printers and some older BARR/DPI adapters do not support this test. To determine if your printer supports the test, set this option to **Yes** and turn off the printer. The Status Line on the second line of the **Operation** screen should display **Off** for the printer. Turn the printer power on. The Status Line should show a status other than **Off**. If the status does not respond correctly, disable this option. For more information on the Status Line refer to Chapter 13.

No Default. Do not test for the power off condition.

Yes The software determines whether the printer is powered off before attempting to print to it. This option should work with all DPI-attached printers except the IBM 6262.

Display count of lines or pages:

This option controls the count of lines or pages printed which appears on the Status Line (the second line of the **Operation** screen) and under **Units** on the **Print Spool** screen.

Lines

Default. Display the number of lines printed. This selection is commonly used for line printers.

Pages

Display the number of pages printed. This choice is typically used for laser printers.

Forms overlay directory:

The printer forms overlay feature of many laser printers sets up a form that prints automatically on every page of data — the electronic version of the pre-printed form. The Barr forms overlay feature has several applications. It can be used for electronic forms or to send additional printer control data or printer resources to the printer.

Enter the name of the directory where the overlay files are stored, including the drive letter and full directory path. Remember to create the actual directory with the DOS make directory (**md**) command. If you will not use this feature, leave the directory name blank.

The forms overlay feature is discussed in detail in section 4.7, *Forms Overlay*.

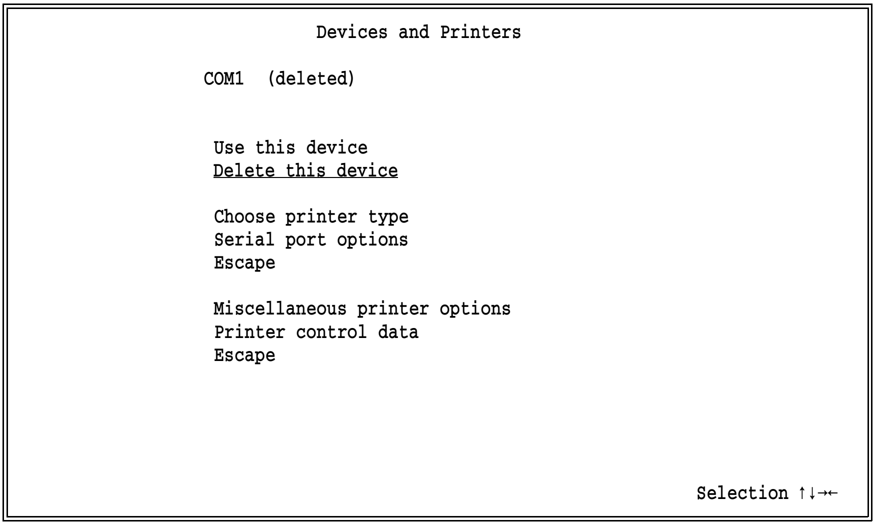
4.4 COM1-COM4 Devices

This section describes parameters you need to set when attaching devices to the PC serial ports. Serial input devices also are supported.

When you finish configuring your printer, you can print a test file to verify that the configuration is correct. Refer to Appendix C, *Printer Test*.

COM Device Menu

From the Devices and Printers menu, select the desired COM device, for example **`COM1`**. These options are the same for whichever COM device you select, unless otherwise noted.


Devices and Printers
COM1 (deleted)
Use this device
Delete this device
Choose printer type
Serial port options
Escape
Miscellaneous printer options
Printer control data
Escape
Selection ↑↓→←

The following options may be selected:

`Use this device`

Select this option to enable the COM device. You must enable the device before you can use it. The selected COM device displays as a destination device on the **`Assign Devices`** menu.

`Delete this device`

Default. The COM device is disabled and does not display on the **`Assign Devices`** menu. The status **`(deleted)`** displays next to the device name at the top of the screen. The **`Assign Devices`** menu is easier to read if unused devices are disabled.

> ***Performance Tuning:*** If any COM devices are not used, they should be disabled to free buffers that may then be used for other program features.

`Choose printer type`

You must choose the type of printer to use. When you select this menu item, a list of printers displays. The choices are discussed in section 4.6, *Choose Printer Type*. Your selection displays on the **`Devices and Printers`** menu, next to the device name.

`Serial port options`

Additional information about the COM port must be specified. The mode of the serial port (including baud, parity, data bits, and stop bits) must match the mode of the device attached to the serial port. Consult the device user manual for the mode settings.

`Miscellaneous printer options`

Several parameters are available which affect printer performance. These parameters are discussed under *Miscellaneous Printer Options for COM Devices*.

See section 9.2, *Tuning Data*, *Printer Control*, for other parameters that affect printing.

`Printer control data`

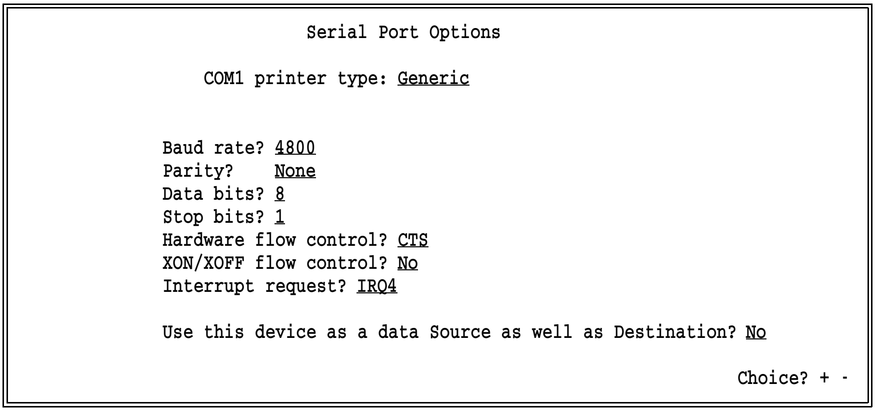
Printer control data is used to send control codes to the printer, such as commands to set the lines-per-form and lines-per-inch, or commands to reset the printer. See section 4.8, *Printer Control Data*.

`Escape`

This option appears twice on the menu. Select **`Escape`** or press the ESC key to return to the **`Devices and Printers`** menu.

Serial Port Options

Select **Serial port options** from the **COM** device menu to reach this screen:



```
                         Serial Port Options

                  COM1 printer type: Generic


              Baud rate? 4800
              Parity?    None
              Data bits? 8
              Stop bits? 1
              Hardware flow control? CTS
              XON/XOFF flow control? No
              Interrupt request? IRQ4

              Use this device as a data Source as well as Destination? No

                                                              Choice? + -
```

Baud rate?

Baud rate (bits per second) determines the rate at which data bits are transmitted. The receiver and sender must transmit at the same rate. Supported speeds depend on the COM port in your PC. To achieve **57.6K** and **115K**, the COM port must have a buffering 16550 UART chip.

Parity?

A parity bit may be added to each transmitted character to aid in error detection. The parity selection must be the same for both the sender and receiver.

None

Default. No parity.

Odd Sum of 1 bits is odd.

Even

Sum of 1 bits is even.

Data bits?

Specify the number of bits that are transmitted for each character. The number of data bits for both the sender and receiver must match.

`8` Default. Eight bits are required for binary data.

`7` Typically this value is not used, although it is sufficient for 7-bit ASCII data.

`Stop bits?`

Data travels on a serial line as a `1` or `0`. The beginning of a data string is indicated by one start bit. The end of a character is indicated by one or two stop bits. Choose the number of stop bits required by the receiver.

`1` Default. One stop bit is used at the end of each character.

`2` Two stop bits are used at the end of each character.

`Hardware flow control?`

Flow control prevents congestion of data caused by one device transmitting data faster than another device can receive the data. Some printers use XON/XOFF flow control, some printers use hardware flow control, and other printers use both.

A printer that uses hardware flow control uses a signal on an RS232 pin to show that it is ready to receive data. The printer cable normally connects this signal to Clear-To-Send on the PC's serial port. The serial port interface is described in Appendix A. Sections A.1 and A.2 discuss serial port signals for sending and receiving data. Sections A.3 and A.4 describe serial cable specifications.

`CTS` Default. Test Clear-To-Send (`CTS`) before sending data.

`DSR` Test Data-Set-Ready (`DSR`) before sending data.

`DSR & CTS`

Test both Data-Set-Ready and Clear-To-Send before sending data. The Status Line on the `Operation` screen indicates which of the signals is low. If both signals are low, DSR=0 is used. DOS uses this method of flow control.

`None`

Do not test `CTS` or `DSR`. Some printers do not use hardware flow control. They use only XON/XOFF flow control.

To determine whether you have selected the correct flow control option, refer to the Status Line on the **`Operation`** screen. When you take the printer off line, the Status Line on the **`Operation`** screen displays **`XOFF`**, **`CTS=0`**, or **`DSR=0`**. When you put the printer online, the Status Line displays **`normal`**. For more information on the Status Line, refer to Chapter 13.

`XON/XOFF flow control?`

XON/XOFF is a type of software flow control. For a general discussion on flow control, refer to the option **`Hardware flow control`** above.

`No` Default. XON/XOFF flow control is not used.

`Yes` Some plotters and printers use XON/XOFF flow control to prevent overrun on the data line when the printer or plotter is busy.

The XOFF character from the printer suspends output. XOFF is the ASCII **`DC3`** character and is coded as hexadecimal **`13`**.

XON resumes output to the printer. XON is the ASCII **`DC1`** character and is coded as hexadecimal **`11`**.

The flow control mechanism ignores the parity of XON and XOFF characters.

`Interrupt request?`

This option displays only for COM3 or COM4. Specify the Interrupt request to be used. Each COM port must have a different IRQ setting. (COM1 uses **`IRQ4`**, COM2 uses **`IRQ3`**.) If two COM ports are set to the same IRQ an error message displays.

`Use this device as a data Source as well as Destination?`

Data may be input or output from a serial port. When data is input, the serial port is referred to as a data source. When data is output, the serial port is a data destination. Source and destination devices are discussed in sections 4.1 and 6.3.

`No` Default. The serial port is used only as a destination.

Yes Data may be input on the serial port. A serial port can be used as either a source, a destination, or both. This means you can route input from a serial port to any destination device, and you can route output from any source device to a serial port.

When you press ENTER, the **Serial Port Source Options** screen displays. The parameters which must be specified are described in the following section, *Serial Port Source Options.*

Serial Port Source Options

When data is input on a serial port, it can be sent to a printer attached to a PC parallel port, a PC serial port, or the network. Data also can be written to a file.

Error Handling for Serial Input

If a receive error occurs during input from the serial port, the software inserts a question mark (**?**) in the file, and an error message displays on the screen.

```
Input from COM1 lost, a ? is substituted for lost character.
```

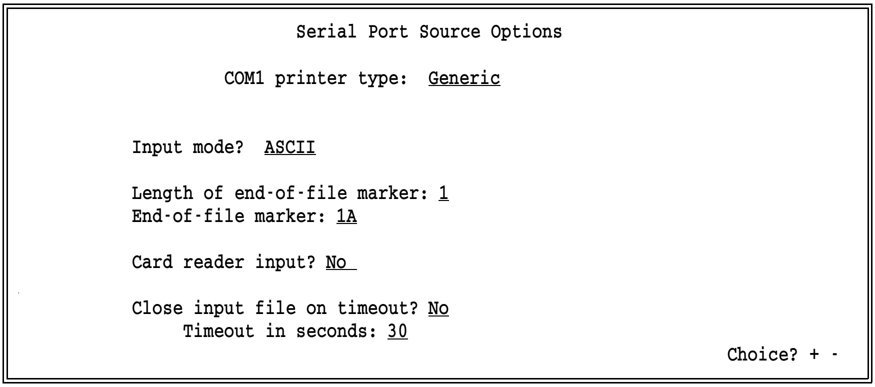
This condition may occur when interrupts are turned off by software other than BARR/SPOOL (i.e., LAN or device driver software) or when data transmission errors occur.

Serial port conventions are documented in Appendix A, *Serial Port Interface.*

If a serial device is set to be both a data source and a destination and XON/XOFF flow control is specified, XON/XOFF flow control will work in both directions.

Serial Input Parameters

To reach the Serial Port Source Options, from the Serial Port Options screen set **`Use this device as a data Source as well as a Destination?`** to **`Yes`**. The following screen displays:



```
                         Serial Port Source Options

                 COM1 printer type:  Generic


          Input mode?  ASCII

          Length of end-of-file marker: 1
          End-of-file marker: 1A

          Card reader input? No

          Close input file on timeout? No
               Timeout in seconds: 30
                                                             Choice? + -
```

`Input mode?`

Select the character set of the data to be input on the serial port.

`ASCII`

Default. Data to be input on the serial port is in ASCII format. The software checks for the specified **`End-of-file marker`** to indicate the end of the input file. When the end of the file is reached, the software adds the DOS end-of-file character, hexadecimal **`1A`**, before routing the file to the destination device.

Additional processing is performed if you set the **`End-of-file marker`** option to a value other than **`1A`**. If **`End-of-file marker`** is not **`1A`**, the software converts any **`1A`** characters occurring in the data to a tilde (~). Because **`1A`** is the end-of-file marker used by DOS, it must be removed to prevent DOS from prematurely ending the file.

`Binary`

Data to be input on the serial port is in binary format.

The software checks for the specified **`End-of-file marker`** to indicate the end of the input file. However, unlike **`ASCII`** input mode, when the end of the file is reached the DOS end-of-file character is not added.

XON/XOFF flow control is not recommended if you are using binary input mode.

`Length of end-of-file marker:`

Specify the length of the end-of-file marker. The maximum value is **`8`**. BARR/SPOOL recognizes the end-of-file marker that it receives from the serial port. The default marker is the one-byte, hexadecimal **`1A`**, which is the DOS and VAX/VMS end-of-file marker. A four-byte end-of-file marker should be used if **`Input mode`** is **`Binary`**.

`End-of-file marker:`

Enter the end-of-file marker using hexadecimal digits. The entry line reflects the length specified by the previous option. The default value, **`1A`**, is the end-of-file marker used by DOS.

`Card reader input?`

If you plan to receive data from a card reader, select how the end of file will be handled. Some card readers generate additional characters after the end-of-file marker which, if not discarded, would cause the Barr software to open a new file. Your selection depends on how your card reader signals end-of-file.

`No` Default. Data will not be input from a card reader. The end-of-file marker is handled normally.

`Yes` Data will be received from a card reader. After the end-of-file marker has been detected, all characters are discarded up to and including the next carriage return. This is the most common method.

`Verify`

This method checks that each card contains 80 bytes.

If **`Input mode`** is **`ASCII`**, the software verifies that after every 80 data columns there is a carriage return and line feed (**`CR LF`**) and includes them in the data file.

If **`Input mode`** is **`Binary`**, the software verifies that after every 80 data columns there is a carriage return (**`CR`**) then discards the carriage return.

During data input if a character is lost, the job is canceled and the next job will start following the end-of-file card.

FF After the end-of-file marker has been detected, all characters are thrown away up to and including the next form feed.

Close input file on timeout?
Timeout in seconds:
This option is useful for releasing the COM port if the source device becomes disabled while sending a file or if the end-of-file marker was accidentally omitted from the file. Otherwise, the COM port will remain busy and other data cannot be sent or received on it.

If data input on the serial port stops, after a specified period of time the software will close the input file. This time period during which no data is received is called a *timeout* and is measured in seconds. After the file is closed, the data is sent to the destination device.

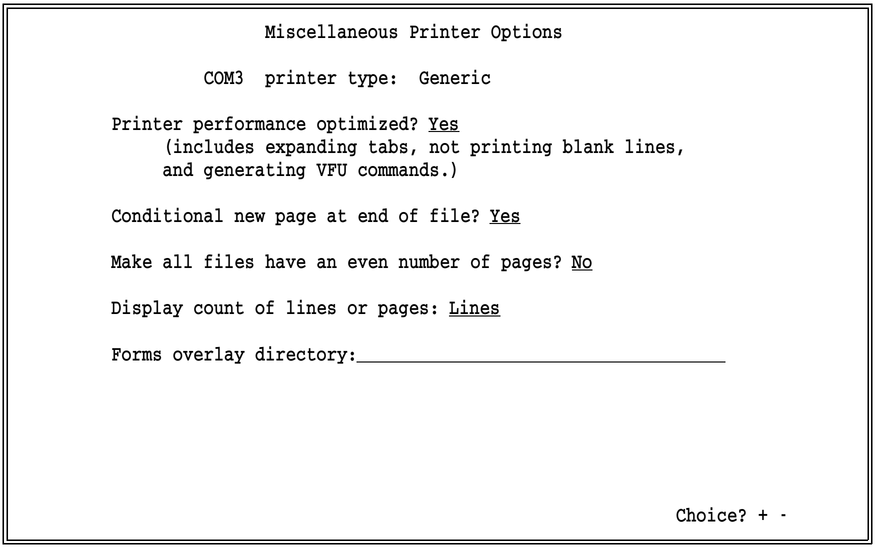
The default timeout period is **30** seconds, but timeout can be set to anywhere from **0** to **999** seconds. The timeout feature can be used with the end-of-file marker to indicate the end of a file.

No Default. The file is not closed until an end-of-file marker is detected.

Yes If an end-of-file marker is not detected, the file is closed after the specified timeout period.

Miscellaneous Printer Options for COM Devices

Several printer options can be used with COM devices to simplify processing of the print data or to solve printing problems. To reach these options, from the **Devices and Printers** menu select **Miscellaneous printer options**.



```
                    Miscellaneous Printer Options

               COM3  printer type:  Generic

      Printer performance optimized? Yes
           (includes expanding tabs, not printing blank lines,
           and generating VFU commands.)

      Conditional new page at end of file? Yes

      Make all files have an even number of pages? No

      Display count of lines or pages: Lines

      Forms overlay directory:____________________________________




                                                          Choice? + -
```

Printer performance optimized?

Choose whether to optimize printer performance by converting data as it is sent to the printer. This option *cannot* be used with laser printers.

Yes Default. Printer performance is improved by altering the data as follows:

- Blank lines are converted to line feeds.
- If the printer has DAVFU support, the hardware skip-to-VFU channel commands will be used to perform high-speed skipping of blank lines. Direct Access Vertical Forms Unit (DAVFU) is a Dataproducts convention for specifying vertical forms control.
- Horizontal tab characters are converted to the required number of blanks to emulate tab settings at every eight positions.

No Data is sent directly to the printer without alteration. Use this setting for all laser printers.

Conditional new page at end of file?

Choose whether the software should add a form feed to the end of a file, if needed. This ensures that each file begins at the top of a new page, which is helpful when form feeds are missing from some files.

Yes Default. At the end of each file, the software determines whether a form feed is included or whether the maximum page length is reached. One of these conditions is necessary to ensure that the next file begins at the top of a new page. If neither condition is met, the software adds a form feed. The software remembers if it adds a form feed, and if the next file contains a form feed at the beginning, the software removes it to prevent printing a blank page.

No Form feeds are not added to or removed from files.

Make all files have an even number of pages?

Choose whether all files should have an even number of pages for easier job separation.

No Default. The number of pages printed may be even or odd.

Yes If a file has an odd number of pages, add a blank page to make the number of pages even. This ensures that the job banner page always faces up on the fan-fold paper stack.

Display count of lines or pages:

This option controls the count of lines or pages printed which appears on the Status Line (the second line of the **Operation** screen) and under **Units** on the **Print Spool** screen.

Lines

Default. Display the number of lines printed. This selection is commonly used for line printers.

Pages

Display the number of pages printed. This choice is typically used for laser printers.

`Forms overlay directory:`

The forms overlay feature of many laser printers sets up a form that prints automatically on every page of data — the electronic version of the pre-printed form. The Barr forms overlay feature has several applications. It can be used for electronic forms or to send additional printer control data or printer resources to the printer.

Enter the name of the directory where overlay files are stored. Include the drive letter and full directory path. Remember to create the actual directory with the DOS make directory (**`md`**) command. If you are not using this feature, leave the directory name blank.

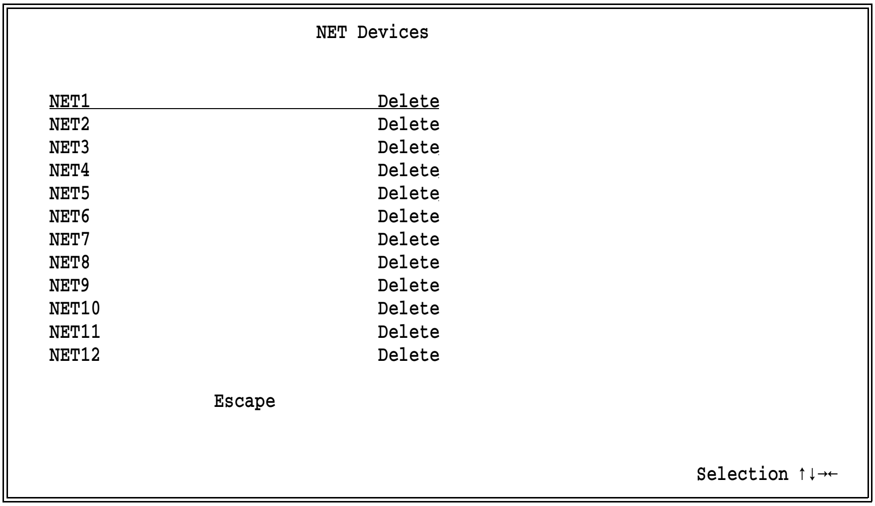
The forms overlay feature is discussed in section 4.7, *Forms Overlay*.

4.5 NET1-NET12 Devices

This section describes parameters you need to set when routing print output to network printers. The NET devices can use a **`Device driver`**, **`Novell Print Queue`**, or **`Unix Print Queue`** to route files to printers. Each NET device uses a separate set of Printer Control Data, which allows different types of network printers to be used.

NET Device Menu

From the **`Devices and Printers`** menu, select **`NET1-12`**. The **`NET Devices`** menu displays. The options to specify are the same for whichever NET device you select.



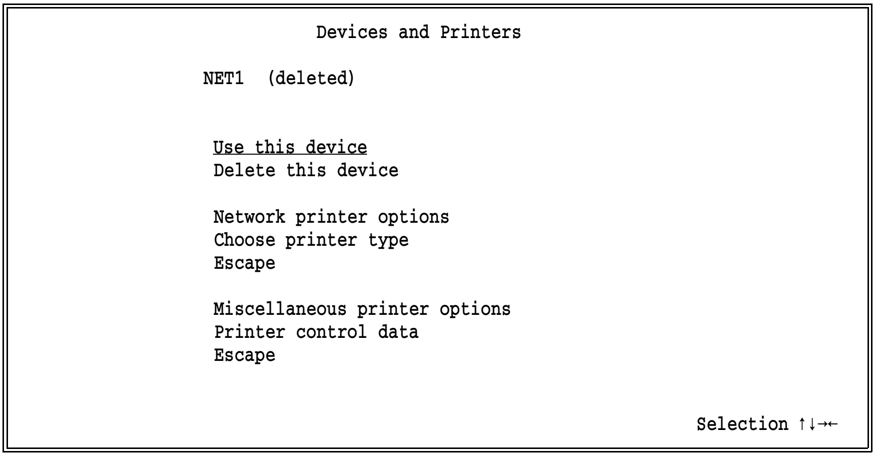
```
                          NET Devices


   NET1                           Delete
   NET2                           Delete
   NET3                           Delete
   NET4                           Delete
   NET5                           Delete
   NET6                           Delete
   NET7                           Delete
   NET8                           Delete
   NET9                           Delete
   NET10                          Delete
   NET11                          Delete
   NET12                          Delete

                 Escape


                                                            Selection ↑↓→←
```

➤ Select **`NET1`**.



```
                          Devices and Printers

                 NET1  (deleted)


                  Use this device
                  Delete this device

                  Network printer options
                  Choose printer type
                  Escape

                  Miscellaneous printer options
                  Printer control data
                  Escape


                                                            Selection ↑↓→←
```

The following selections display for each NET device.

`Use this device`

Select this option to enable the NET device. You must enable the device before you can use it. The selected device displays as a destination choice on the **`Assign Devices`** menu. The device is not enabled in the Barr software unless you select this option.

`Delete this device`

Default. The NET device is disabled and does not display on the **`Assign Devices`** menu. The status **`(deleted)`** displays next to the device name at the top of the screen. The **`Assign Devices`** menu is easier to read if unused devices are disabled.

`Network printer options`

Select which type of Network printer to use. Choices are **`Novell Print Queue`**, **`Device driver`**, and **`Unix Print Queue`**. When you press ENTER, additional information displays at the bottom of the screen. Refer to the following section, *Network Printer Options,* for a description of these parameters.

`Choose printer type`

You must choose the type of printer to use. When you select this menu item, a list of printers displays. The printer choices are discussed in section 4.6, *Choose Printer Type*. Once a selection is made, it displays on the **`NET Devices`** menu, next to the device name.

`Miscellaneous printer options`

Several options are available which affect printing. These parameters are discussed under *Miscellaneous Printer Options for NET Devices* later in this section.

See section 9.2, *Tuning Data*, *Printer Control,* for additional parameters that affect printing.

`Printer control data`

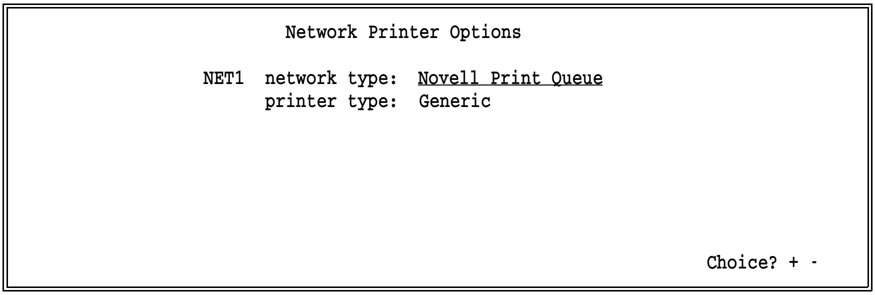
This feature is used to send control codes to the printer, such as commands to set the lines-per-form and lines-per-inch or commands to reset the printer. For network printers, printer control data has a special function. Printer control data specific to network printers is discussed under *Printer Control Data for Network Printers.*

`Escape`

The Escape option appears twice on the menu. Select **`Escape`** or press the ESC key to return to the **`Devices and Printers`** menu.

Network Printer Options

From the **Devices and Printers** menu for the selected NET device, select **Network printer options**. On the **Network Printer Options** screen, you specify how files are routed to the network printers.



```
                    Network Printer Options

             NET1  network type:  Novell Print Queue
                   printer type:  Generic





                                                    Choice? + -
```

network type:

Choose which type of network printer to use. Once you make a selection, additional parameters display on the lower half of the screen. Three choices are available:

Novell Print Queue

Default. Direct the output files to the specified Novell print queue. This option allows you to route files to any print queue on the Novell network. Refer to the section *Novell Print Queue.*

Device driver

Direct the output files to the specified DOS device driver. Refer to the section *Device Driver*.

Unix Print Queue

Direct the output files to the specified queue on your Unix host. This option is available upon request from Barr Systems. Refer to the section *Unix Print Queue.*

printer type:

The printer type you select on the **Printer type** screen displays here.

Novell Print Queue

This section describes the parameters you set when **`Novell Print Queue`** is selected as the NET device **`network type`**.

Network Queues and Servers

On the network, files are stored in *queues* while they wait to be printed. Queues reside on network *file servers*. The software uses NET devices to write files to the network print queues.

For each NET device, you can route all output to one print queue on a specific file server, or you can route output to different print queues on any server using the print file's FCB name or form name.

The number of Novell print queues you may access is determined by the number of NET devices you define and the number of entries you make in the **`FCB/FORM to Novell Print Queue Translation Table`**.

Network Connections

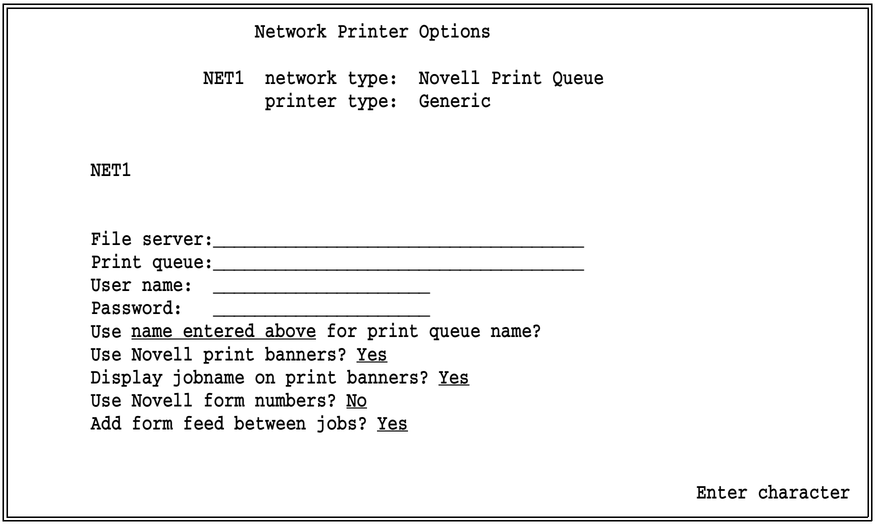
The Novell network allows a PC to connect to a maximum of eight different file servers at a time. For the NET devices, the Barr software logs in to and out of servers as needed to access additional queues. The software connects to the servers as a network user.

Of the eight possible server connections, the number available for the NET devices depends on how many server connections are being used for other purposes. The PC may log into file servers when it is powered on, before the Barr software is started. These server connections are used to access network drives and cannot be logged out by the Barr software. However, these connections can be used by the Barr **`LAN Connections`** feature.

If the Barr **`NOVELL Queues`** option is used, the software will log onto one file server as a Print Server. This type of connection is different than the user connection made by the NET devices. The software will not log out of the NOVELL Queues connection, either, during program operation. Because Novell does not allow a PC to log in to the same file server as both a user and a Print Server, the NET devices cannot access the same server used by the NOVELL Queues.

Parameters for Novell Print Queue

If you select **`Novell Print Queue`** as the NET device **`network type`**, the following parameters display on the lower half of the screen:



```
                        Network Printer Options

                   NET1  network type:  Novell Print Queue
                         printer type:  Generic


        NET1


        File server:____________________________________
        Print queue:____________________________________
        User name:   _____________________
        Password:    _____________________
        Use name entered above for print queue name?
        Use Novell print banners? Yes
        Display jobname on print banners? Yes
        Use Novell form numbers? No
        Add form feed between jobs? Yes


                                                          Enter character
```

`File server:`
`Print queue:`

Enter the **`File server`** and **`Print queue`** names if you want to route all output for the NET device to one print queue. When routing output to many devices based on FCB name or form name, you may leave these fields blank or you may enter a default value in case of an error condition. (Refer to the section *FCB/FORM to Novell Print Queue Translation Table.*)

The software can be logged into a maximum of 8 different file servers at one time. Refer to *Network Connections* earlier in this section for a discussion of the available server connections.

`User name:`
`Password:`

A **`Username`** and **`Password`** are used by BARR/SPOOL to connect to file servers. Only one **`Username`** and **`Password`** may be used for logging into all the servers, and the values entered for one NET device display on all the **`NET`** device screens. If these fields are changed on one screen, the change is reflected on all the other **`NET`** device screens.

The **Password** does not display on the screen when it is entered because the Barr software uses a *keyed* login to allow login on servers restricted to encrypted passwords.

During operation, if the software is already logged into a given server, the existing login is used. No additional login is performed even if the Barr software is logged in to the server with a different user name than that specified in the **Username** field.

If the Barr software performs a login to connect to a print queue, then when the print job completes the software will log out. BARR/SPOOL can be logged into a maximum of eight file servers at one time. If a login is needed but the software is already logged into eight servers, login is deferred until a print job completes and frees a server slot. If a NET device is unable to connect to the specified server/queue because the server/queue is unavailable, it will retry the connection repeatedly at 5-minute intervals.

Refer to *Network Connections* earlier in this section for a discussion of the available server connections.

Use ___ for print queue name?

Output is routed to the print queue specified by this option. Three choices are available.

name entered above

Default. Use this option if all output for this NET device will go to only one print queue on a file server, as specified in the **File server** and **Print queue** fields above.

FCBNAME
FORMNAME

Output can be routed to any print queue on any file server using the FCB name or form name specified in the file. The **FCB/FORM to Novell Print Queue Translation Table** displays when you choose either FCB name or form name. The translation table is used to associate the FCB name or form name in the file with a file server and print queue. The software routes files to the Novell queues based on entries in the table.

To include the FCB name or form name information in the file, use the Barr **OUTPUT statement** or the Barr **Spool header from data** option.

`Use Novell print banners?`

Select whether Novell print banners will be used.

`Yes`	Default. A Novell print banner page is generated which includes the Novell user name and optionally the job name. Banner pages are useful for identifying printouts.
`No`	Print banners are not generated.

`Display jobname on print banners?`

This option applies only if Novell print banners are enabled. Select whether the job name will be included on the banner page.

`Yes`	Default. When **`Use Novell print banners?`** also is set to **`Yes`**, the job name is displayed on the lower half of the Novell print banner page.
`No`	The job name is not included on the print banner page.

`Use Novell form numbers?`

This option allows you to control Novell form number processing for NET devices. The Novell PRINTDEF utility is used to define forms on the network print queues.

`No`	Default. Novell form numbers are not used.
`Yes`	The mainframe form number in the file is passed to the Novell Print Queue, so that a Novell form may be used when printing the file. If the form name in the file is not numeric, the Novell form number is set to **`0`**.

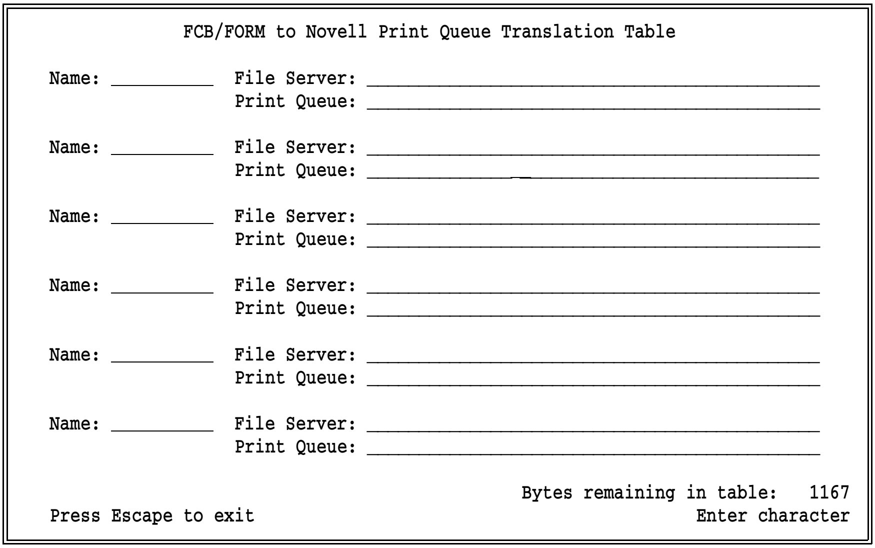
`Add form feed between jobs?`

This option is useful when sending jobs to laser printers to ensure that the last page of the job is flushed from the printer before the next job starts.

`Yes`	Default. Form feeds are added between print jobs.
`No`	Form feeds are not added.

FCB/FORM to Novell Print Queue Translation Table

If you select `FCBNAME` or `FORMNAME` as the print queue name on the Network Printer Options screen, the screen titled `FCB/FORM to Novell Print Queue Translation Table` automatically displays. The translation table is used to route files to specific print queues based on the file FCB name or form name.



```
                  FCB/FORM to Novell Print Queue Translation Table

    Name: __________  File Server: ____________________________________________
                      Print Queue: ____________________________________________

    Name: __________  File Server: ____________________________________________
                      Print Queue: ____________________________________________

    Name: __________  File Server: ____________________________________________
                      Print Queue: ____________________________________________

    Name: __________  File Server: ____________________________________________
                      Print Queue: ____________________________________________

    Name: __________  File Server: ____________________________________________
                      Print Queue: ____________________________________________

    Name: __________  File Server: ____________________________________________
                      Print Queue: ____________________________________________

                                         Bytes remaining in table:   1167
    Press Escape to exit                                      Enter character
```

How the Table Works

When a file is being routed to a Novell Print Queue, the software checks the file's FCB name or form name against the entries in the translation table. You determine which value is checked by your selection for `Use __ for print queue name?` on the `Network Printer Options` screen.

If a match is found in the table, the file is routed to the corresponding file server and print queue that is listed in the table. If a match is not found, the software performs the action described under *Error Handling.*

Tips for Making Translation Table Entries

The `FCB/FORM to Novell Print Queue Translation Table` is a fixed size in bytes and holds a variable number of entries depending on the size of the entries. If the table entries are short, more entries can be put in the table.

As each entry is made in the translation table, the number of bytes remaining in the table displays in the bottom right corner of the screen. Data entry continues until you press ESC or the table fills. The table size is 1167 bytes and usually holds 20 to 30 entries. If you need a larger table, you can request a special version of the software from Barr Systems.

- To move between fields within a table entry, use the TAB or UP ARROW, DOWN ARROW, LEFT ARROW and RIGHT ARROW keys.
- Press ENTER to save the current entry and advance to the next entry.
- To remove an entry, use the SPACEBAR to blank it out.
- Press ESC to exit the table when you are done.

Translation Table Parameters

The following options are specified on the **FCB/FORM to Novell Print Queue Translation Table** screen:

Name:

Specify the FCB name or form name that is included in the source file. The software can provide the desired FCB name or form name using the Barr **OUTPUT statement** or the **Spool Header from data** option.

> ***Note:*** DOS wildcards are not valid for entries in this table.

File Server:
Print Queue:

Enter the name of File Server and Print Queue where jobs with the specified FCB name or form name will be routed.

Error Handling

When using the table to route print files, you have two choices for handling any errors that may occur. For example, an error occurs if the form name or FCB name from a file is not listed in the table.

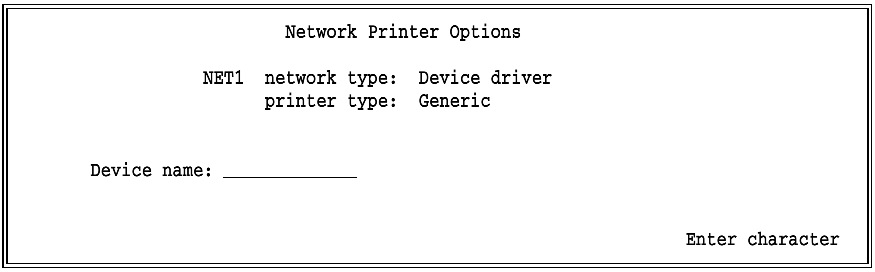
- The output can be directed to a default printer. For this method, enter a default value for the **File Server** and **Print Queue** fields on the **Network Printer Options** screen.
- The source device is set to **SUSPEND** and an error message displays on the Barr console. Operator intervention is required. This is the same

action that occurs after a disk write error. For this method of error handling, the **File Server** and **Print Queue** fields on the **Network Printer Options** screen should be blank.

This error can be corrected from the Assign Devices menu. Change the destination from SUSPEND to a NET device that does not use the FCB/FORM to Novell Print Queue Translation Table or to a NET device that has a default **File Server** and **Print Queue**. When the file finishes printing, change the destination back to the original destination.

Device Driver

If you select **Device driver** as the NET device **network type**, the following parameter displays on the lower half of the screen:



```
                         Network Printer Options

                  NET1  network type:  Device driver
                        printer type:  Generic


       Device name: ____________


                                                     Enter character
```

Device name:

Enter the DOS device name for the network printer. The device name can be either the name of a device or a file. Common device names are **LPT1**, **LPT2**, or **LPT3**. If a device name is specified, network redirection of the device must also be enabled on the network.

If you specify a file name for the device name, the file extension is optional. When writing to a file, any files with duplicate names are renamed using automatic generation of numeric file extensions. The software assigns the first file with a duplicate name an extension of **.001**, the next file with that same name is given extension **.002**, and so on. For an example of the automatic naming sequence, refer to *File Name Extensions, Automatic Naming Sequence* in section 6.5.

Unix Print Queue

Support for Unix Print Queues allows you to write files from the PC to print queues on a Unix host. The LPR protocol is used to write to an LPD at the specified IP address. (LPR is used to submit jobs to LPD print queues, and LPD manages the print queues.)

This option is available upon request from Barr Systems.

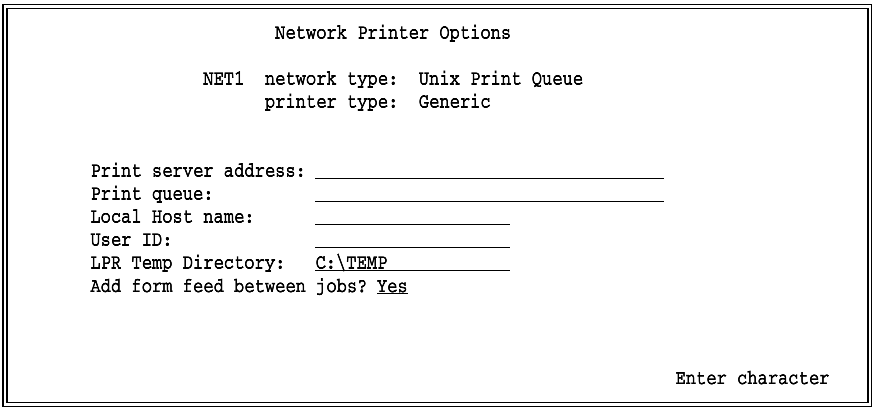
Use of this feature requires FTP Software's PC/TCP kernel, version 2.2 or later. PC/TCP provides the PC interface to the TCP/IP network.

The number of TCP connections is limited only by the number of NET devices you define. Because the Barr software has 12 NET devices, up to 12 TCP connections are possible.

In the PC/TCP software, the default number of TCP connections is 6. This value is specified as **`tcp-connections=6`** in the **`PCTCP.INI`** file. If you need more than 6 connections, increase this value in the **`PCTCP.INI`** file.

Parameters for Unix Print Queue

If you select **`Unix Print Queue`** as the **`network type`** for the NET device, the following parameters display on the lower half of the screen:



```
                           Network Printer Options

                    NET1  network type:  Unix Print Queue
                          printer type:  Generic


     Print server address: __________________________________
     Print queue:          __________________________________
     Local Host name:      ___________________
     User ID:              ___________________
     LPR Temp Directory:   C:\TEMP____________
     Add form feed between jobs? Yes



                                                     Enter character
```

`Print server address:`

Enter the IP address or the equivalent host name of the print server where files will be sent.

`Print queue:`

Enter the name of the print queue on the print server.

`Local Host name:`

This name indicates the origin of the file. When viewing a queue of files on the Unix host, it is helpful to determine the file source. The Local Host name is added to the LPR/LPD control file on the Unix host and is required by some LPDs.

`User ID:`

Choose a User ID to identify the user submitting the job. The same User ID must be used for all your **`NET`** devices. The User ID is added to the LPR/LPD control file on the Unix host and is required by some LPDs.

`LPR Temp Directory:`

Files are written to a temporary directory to determine the file size. The LPR/LPD protocol requires that the exact file size is known before the file can be processed. Only files originating from the PC disk have a known file size. Because files can originate from sources other than the PC disk, all files are written to the temporary directory to determine their size before being sent to the Unix host.

Specify the name of the directory where the temporary files will be stored, including the drive letter and full directory path. The software automatically creates the directory using the DOS make directory (**`md`**) command.

`Add form feed between jobs?`

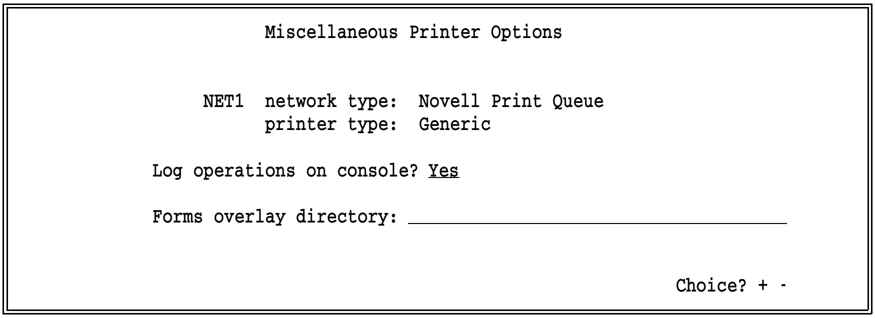
Specify whether to add a form feed between jobs for easier job separation.

`Yes` Default. Insert a form feed between jobs to separate jobs by a blank page.

`No` Do not add a form feed between jobs.

Miscellaneous Printer Options for NET Devices

Two printer options are available for network printers. From the **Devices and Printers** screen for the selected NET device, select **Miscellaneous printer options**.



```
                     Miscellaneous Printer Options


                NET1  network type:  Novell Print Queue
                      printer type:  Generic

             Log operations on console? Yes

             Forms overlay directory: _____________________________________


                                                               Choice? + -
```

These options are specified separately for each NET device.

Log operations on console?

This option controls the console messages **START NETn** and **END NETn**. These messages display when output is sent to the NET devices.

Yes Default. **START** and **END** messages display on the console when jobs are sent to the NET device.

No No status messages display on the console when jobs are sent to the NET device.

Forms overlay directory:

The printer forms overlay feature of many laser printers sets up a form that automatically prints on every page of data — the electronic version of the pre-printed form. The Barr forms overlay feature has several applications. It can be used for electronic forms or to send additional printer control data or printer resources to the printer.

Enter the name of the directory where overlay files are stored. Include the drive letter and full directory path. Remember to create the actual directory with the DOS make directory (**md**) command. If you are not using this feature, leave the directory name blank.

The forms overlay feature is discussed in detail in section 4.7, *Forms Overlay.*

Printer Control Data for Network Printers

Printer Control Data has some uses that are especially important to NET printers, as described below. For a complete discussion of Printer Control Data, refer to section 4.8.

Printer Reset Strings

It is important to send an appropriate reset string at the beginning of each file printed on a Network printer. These printers print data from many different applications, and data from the Barr software may not print correctly unless the proper reset string is sent.

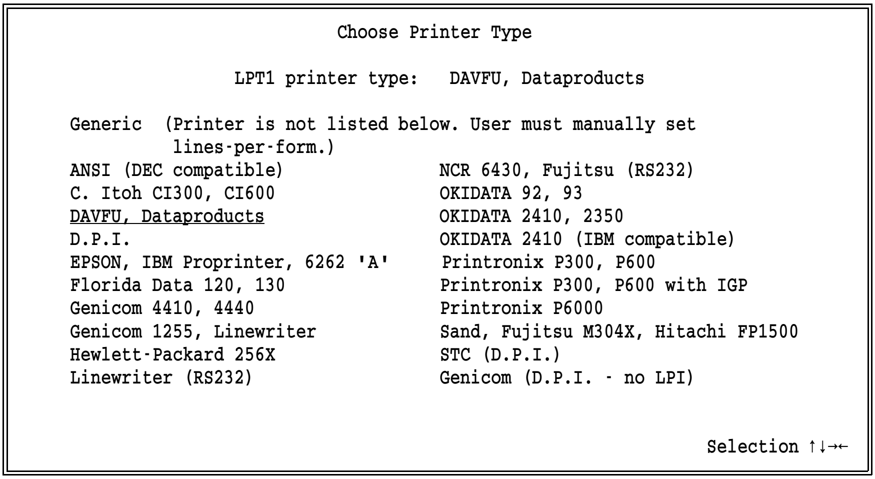
Printer reset strings should be entered in the **Printer Control Data** table for the NET devices.

Using Form Overlays as Reset Strings

For **Novell Print Queue**, if FCB name or form name is used to route output to different types of printers, form overlay files can be used to send the various reset strings. Set the **Search for form overlay by?** option to **FCBNAME** or **FORMNAME** on the **Tuning Data**, **Printer Control** screen. For more information about form overlays, refer to section 4.7.

4.6 Choose Printer Type

You must assign a printer type for each LPT, COM, and NET device you use. Select **Choose printer type** from the **Devices and Printers** screen for the selected device. A list of printer types displays.



```
                         Choose Printer Type

               LPT1 printer type:   DAVFU, Dataproducts

   Generic  (Printer is not listed below. User must manually set
             lines-per-form.)
   ANSI (DEC compatible)               NCR 6430, Fujitsu (RS232)
   C. Itoh CI300, CI600                OKIDATA 92, 93
   DAVFU, Dataproducts                 OKIDATA 2410, 2350
   D.P.I.                              OKIDATA 2410 (IBM compatible)
   EPSON, IBM Proprinter, 6262 'A'     Printronix P300, P600
   Florida Data 120, 130               Printronix P300, P600 with IGP
   Genicom 4410, 4440                  Printronix P6000
   Genicom 1255, Linewriter            Sand, Fujitsu M304X, Hitachi FP1500
   Hewlett-Packard 256X                STC (D.P.I.)
   Linewriter (RS232)                  Genicom (D.P.I. - no LPI)


                                                          Selection ↑↓→←
```

➤ Select the printer type.

Except for the special selection **`Generic`**, all of the printers listed are line printers. For most selections, the Barr software automatically sets lines-per-form and lines-per-inch on the printer, so you do not have to adjust these settings manually.

The selections fall into three categories:

- Generic, which does not provide the lines-per-form and lines-per-inch settings and is used for laser printers.
- Line printers for which the software sends lines-per-form and lines-per-inch control codes.
- Line printers for which the software sends lines-per-form and lines-per-inch control codes and implements VFU (Vertical Forms Unit).

The lines-per-form and lines-per-inch settings provided by the Barr software are listed under *Lines-per-form and Lines-per-inch* in this section.

Printer Selection Notes

Additional information is provided below for printer selections which have specific requirements.

If you have a line printer which is not listed on the screen, check Table 4-1 for a compatible selection. Compare the control codes in Table 4-1 to the control codes listed in your printer manual to determine if one of the selections will work.

`Generic`

Use this selection for laser printers or if you wish to use settings other than the ones supplied by the software. You need to set the lines-per-form and lines-per-inch using other BARR/SPOOL options (**`Printer Control Data`** or **`Forms Overlay`**) or you must set them on the printer.

This selection also is useful if you do not want the data to be altered by the software. To prevent the data from being modified you also must set **`Printer performance optimized?`** to **`No`** under **`Miscellaneous Printer Options`**.

`DAVFU, Dataproducts`
`Printronix P300, P600`

Only the lines-per-form is set by the Barr software when you use one of these printers. The lines-per-inch must be set manually on the printer.

`D.P.I.`

Use this selection only if you are using the BARR/DPI adapter from Barr Systems.

The BARR/DPI printer adapter and cable support all printers which use the Dataproducts Interface. The adapter can be configured for the devices **`LPT1`**, **`LPT2`**, or **`LPT3`** and is fully compatible with BIOS and DOS. (The adapter is available in both long-line and short-line versions. The cable is available with either a Winchester connector or a D-type 50-pin connector.)

Because the Dataproducts VFU feature is fully implemented in Barr software, the printer can jump directly to a specific line without printing blank lines. This results in faster printing.

The BARR/DPI adapter also supports extended ASCII codes (8-bit data). An example of an extended code is the cent (**¢**) sign. To use the extended ASCII codes, on the **Miscellaneous Printer Options** screen set **Enable VFU download into printer** to **No**. This has no effect on printing other than disabling optimization. Failure to disable optimization will result in errors in the printed output.

Use of extended ASCII codes also disables the Paper Instruction (PI) line. With regular ASCII format (7-bit data), the 8th data bit is sent to the printer's PI line. The PI line is driven only for printer control data or DAVFU commands. With extended ASCII format, the 8th data bit is used as data, so the PI line is idle.

Genicom (D.P.I. - No LPI)

This printer type is similar to the **D.P.I.** selection but does not send the lines-per-inch (LPI) setting to the printer. Use this selection for printers which supply the LPI setting but need the software to set the lines-per-form (LPF). The Genicom 1255 is an example of such a printer.

Lines-per-form and Lines-per-inch

Control codes, also called escape sequences, are used to specify the lines-per-form, lines-per-inch, and other format settings for printers. The control codes used for your printer are described in your printer manual. The Barr software supplies the most common codes used for various printers. Consult your printer manual for a list of the control codes your printer supports.

Table 4-1 shows common control codes for the printers listed on the **Choose Printer Type** screen. Values for lines-per-form and lines-per-inch are provided by form information in the original file. If the lines-per-form (LPF) and lines-per-inch (LPI) values are not provided in the file at the time it prints, the software uses the default values of **LPF=66** and **LPI=6**. When data is sent to the printer, the software interprets the value for these settings and sends the corresponding escape sequences to the printer.

If your printer is not listed in Table 4-1, check to see if one of the selections provides the control codes used by your printer. If the correct codes are listed, select the corresponding printer from the list. If the codes for your printer are not listed, use the selection **`Generic`** and enable another Barr option (**`Printer Control Data`** or **`Forms Overlay`**) to provide the control codes.

Table 4-1. Common Printer Control Codes

Printer Model	Parameter	Control Codes

ANSI (American National Standards Institute)
DEC, DATA South
	`LPI=6`
	
	`LPI=8`
	
	`LPF=nn`
		`ESC [  1  z`
		`1B  5B 31 7A`
		`ESC [  2  z`
		`1B  5B 32 7A`
		`ESC [  nn t`
		`1B  5B nn 74`
		nn=1 to 99 as ASCII digits

C. Itoh
CI300,CI600
	`LPI=6`
	
	`LPI=8`
	
	`LPF=nn`
		`ESC ?  !  └  CR`
		`1B  3F 21 22 0D`
		`ESC ?  !  #  CR`
		`1B  3F 21 23 0D`
		`ESC ?  SP x  CR`
		`1B  3F 20 x  0D`
		`x=(nn * 6/lpi) + 31 as binary byte`
		`nn=1 to 99`

DAVFU, Dataproducts, Data Printer
 	
(VFU Support)
	`LPI=6`
	`LPI=8`
	`LPF=nn`
		`User manually sets switch.`
		`User manually sets switch.`
		`1D 41 40 r 41 40 1E`
		r=nn-1 repetitions of 40 40
		nn=1 to 126

D. P. I. (Dataproducts Interface)
 	
(VFU Support for BARR/DPI adapter)
	`LPI=6`
	
	`LPI=8`
	
	`LPF=nn`
		`m  SOH`
		`6D 01`
		`m  STX`
		`6D 02`
		`6E 41 40 r 6F`
		r=nn-1 repetitions of 40 40
		nn=1 to 143
		
		All codes sent with Paper Instruction high.

EPSON, IBM
in serial matrix mode
	`LPI=6`
	
	`LPI=8`
	
	`LPF=nn`
		`ESC 2`
		`1B  32`
		`ESC 0`
		`1B  30`
		`ESC C  nn`
		`1B  43 nn`
		`nn=1 to 127 as binary byte`

Florida Data
120, 130
	`LPI=6`
	
	`LPI=8`
	
	`LPF=nn`
		`ESC RS BS`
		`1B  1E 08`
		`ESC RS ACK`
		`1B  1E 06`
		`ESC FF nn`
		`1B  0C nn`
		nn=1 to 126 as binary byte

Table 4-1. Common Printer Control Codes (Cont'd)

Printer Model	Parameter	Control Codes*
Genicom 4410, 4440	`LPI=6`	`ESC [  1  2  0  ;  SP G` `1B  5B 31 32 30 3B 20 47`
	`LPI=8`	`ESC [  9  0  ;  SP G` `1B  5B 39 30 3B 20 47`

	`LPF=nn`	`ESC [  x r`
		`1B  5B x 72`
		`x=(nn*720)/LPI as ASCII digits`
		`nn=1 to 132`

Genicom 1255, Linewriter (parallel)	`LPI=6`	`Esc [  1  z` `1B  5B 31 7A`
	`LPI=8`	`Esc [  2  z` `1B  5B 32 7A`

(VFU Support)	`LPF=nn`	`1D  41 40 r 1E`
		`r=nn-1 repetitions of 40 40`
		`nn=1 to 180`

Hewlett-Packard 256x (This is not the LaserJet.)	`LPI=6`	`ESC &  l  6  D` `1B  26 6C 36 44`
	`LPI=8`	`ESC &  l  8  D` `1B  26 6C 38 44`

	`LPF=nn`	`ESC &  l  nn P`
		`1B  26 6C nn 50`
		nn=1 to 128 as ASCII digits

Linewriter 400, 800 (RS232 serial)	`LPI=6`	`?? 1  2  0  SP G` `9B 31 32 30 20 47`
	`LPI=8`	`?? 9  0  SP G` `9B 39 30 20 47`

NCR 6430, Fujitsu M304x
(RS232 serial)
	`LPF=nn`	`?? #  T  nn ?? ?? #  L  1  ;  1  ??`
		`90 23 54 nn 9C 90 23 4C 31 3B 31 9C`
		nn=1 to 180 as ASCII digits

OKIDATA 92, 93	`LPI=6`	`ESC 6` `1B  36`
	`LPI=8`	`ESC 8` `1B  38`

	`LPF=nn`	`ESC F  nn`
		`1B  46 nn`
		nn=01 to 99 as ASCII digits (if less than 10, requires leading 0)

OKIDATA 2410, 2350	`LPI=6`	`ESC 4` `1B  34`
	`LPI=8`	`ESC 5` `1B  35`

	`LPF=nn`	`ESC 2  nn`
		`1B  32 nn`
		nn=7 to 112 as binary byte

*Double question marks (??) in the control codes represent characters with no ASCII equivalent.

Table 4-1. Common Printer Control Codes (Cont'd)

Printer Model	Parameter	Control Codes
OKIDATA 2410 IBM compatible	LPI=6	ESC 2 ESC A FF 1B 32 1B 41 0C
	LPI=8	ESC 0 1B 30
	LPF=nn	ESC C nn 1B 43 nn nn=1 to 127 as binary byte
Printronix P300, P600 (VFU Support)	LPI=6	User manually sets switch.
	LPI=8	User manually sets switch.
	LPF=nn	1E 10 r 1F r=nn-1 repetitions of Hex 1C nn=1 to 132
Printronix P300, P600 with IGP (VFU Support)	LPI=6	CR ETX L P I ; 6 CR LF 0D 03 4C 50 49 3B 36 0D 0A
	LPI=8	CR ETX L P I ; 8 CR LF 0D 03 4C 50 49 3B 38 0D 0A
	LPF=nn	1E 10 r 1F r=nn-1 repetitions of Hex 1C nn=1 to 132
Printronix P6000 (VFU Support)	LPI=6	SOH 2 01 32
	LPI=8	SOH 0 01 30
	LPF=nn	1E 10 r 1F r=nn-1 repetitions of 1C
Sand, Fujitsu M304x, Hitachi FP1500 (parallel) (VFU Support)	LPI=6	ESC 6 1B 36
	LPI=8	ESC 8 1B 38
	LPF=nn	1D 41 40 r 1E r=nn-1 repetitions of 40 40 nn=1 to 176
STC (D. P. I.)	LPI=6	Start LPF with EC instead of EE
	LPI=8	Start LPF with ED instead of EE
	LPF=nn	EE 41 40 r 1E r=nn-1 repetitions of 40 40 nn=1 to 143

4.7 Forms Overlay

The Barr forms overlay feature has several applications. It can be used to print electronic forms or to send printer control data or printer resources to the printer. Each application is described below.

When a file is ready to be printed, the software searches the forms overlay directory for a specific overlay file. If the overlay file is found, it is sent to the printer before the print file.

The name of the directory used to store the overlay files is specified on the **`Miscellaneous Printer Options`** screen for the LPT, COM, or NET devices. Additionally, the form overlay options listed below must be specified under **`Tuning Data`** on the **`Printer Control`** screen. The following parameters are described in section 9.2:

`Search for form overlay by?`
`Use overlay default file if overlay not found?`
`Default overlay file:`
`Suspend printing if overlay not found?`

Naming the Overlay File

Overlay files must be named for the FORMNAME or JOBNAME. The naming convention is specified using the **`Search for form overlay by?`** option on the **`Tuning Data`**, **`Printer Control`** screen. Overlay file names must not have an extension. For example, **`INVOICE`** is an acceptable overlay name, but **`INVOICE.001`** is not.

Using Electronic Forms

Electronic forms are a replacement for pre-printed forms. The forms overlay feature of many laser printers allows an electronic form to be printed automatically on every page of a file and allows you to use plain paper. For example, the text of an invoice form is sent to the printer only once and is loaded as an overlay. Next, the data file is sent, and each page of data is *overlayed* with the invoice form, so that both the form and the data print on the page.

Electronic forms are created using a forms composition package. This type of software allows you to easily design forms and insert special printer codes. The completed forms must be stored as overlay files in the forms overlay directory. Before the Barr software prints a file, it checks the forms overlay directory and sends the corresponding form overlay file to the printer.

Additional information on forms composition packages and management of forms is discussed in the publication *Electronic Forms Management*, which is available upon request from Barr Systems.

Loading Printer Control Data or Printer Resources

The forms overlay feature may be used to send printer control codes to the printer as an alternative to using the **Printer Control Data** screen in the Barr software. This method is especially useful if you have more printer control codes to enter than will fit on the **Printer Control Data** screen. The printer control codes must be entered in the overlay file in hexadecimal format using a program editor.

Some printers may require that additional resources are loaded before printing certain jobs. Files containing printer resources can be placed in overlay files and will be loaded automatically by the Barr software. For example, the SNPFORM and SNPIMAGE utilities for Siemens printers are used to generate additional fonts or other resources. These files are placed in the forms overlay directory.

Overlay Files for PostScript Printing

Barr software offers data conversion from EBCDIC to PostScript. Use of this feature requires Barr-supplied overlay files. The overlay files **2UP**, **LAND**, and **PORTRAIT** are included with the Barr Reference files and must be placed in the forms overlay directory. Additionally, the Receive Mode for the host printer or punch device must be set to **PostScript** in the Barr software. Refer to the discussion on **Receive Mode** in section 6.8.

Creating an Overlay from Several Files

An overlay can be composed of more than one file by using the Barr embedded send command, **##**. This command allows you to store common overlay features in separate files so they can be shared. Otherwise you would have to store duplicate copies of the same information in many overlay files.

To create an overlay file composed of other files:

1. Use a program editor to create individual files containing the overlay features you want. For example, create one file that contains a font code and another file that contains a company logo.
2. Use the editor to create an overlay file and enter the names of the files containing the features you want. The form of the text is:

   ```
   ##file1 file2 ... filen
   ```

   - The embedded **Send Files** command, **##**, must be at the beginning of the list.
   - Separate the file names with a space, tab, or blank line.
   - If the files are not located in the overlay directory, specify the full directory path as part of each file name.
   - The overlay file containing the list can have a maximum size of 512 bytes.

For example, you can create an overlay file that includes a tax form, a company logo, and the courier font from three other overlay files. First, create a file named **TAXFORM** that contains the form text, a file named **LOGO** that contains the company logo, and a file named **COURIER** that contains the courier font code. Next, create an overlay file named **TAXES** that contains this text:

```
##taxform logo courier
```

When a job with the form name **TAXES** is ready to print, the files containing the form taxform, the logo text, and the courier font are loaded into the printer as an overlay. Additionally, the **TAXFORM**, **COURIER**, and **LOGO** files can be included in other overlay files you create.

4.8 Printer Control Data

Printer Control Data is an optional feature for **LPT**, **COM**, and **NET** devices that is used to control special functions of the printer. Special printer functions include setting portrait and landscape mode, page size, lines-per-form, lines-per-inch, characters-per-inch, and typeface.

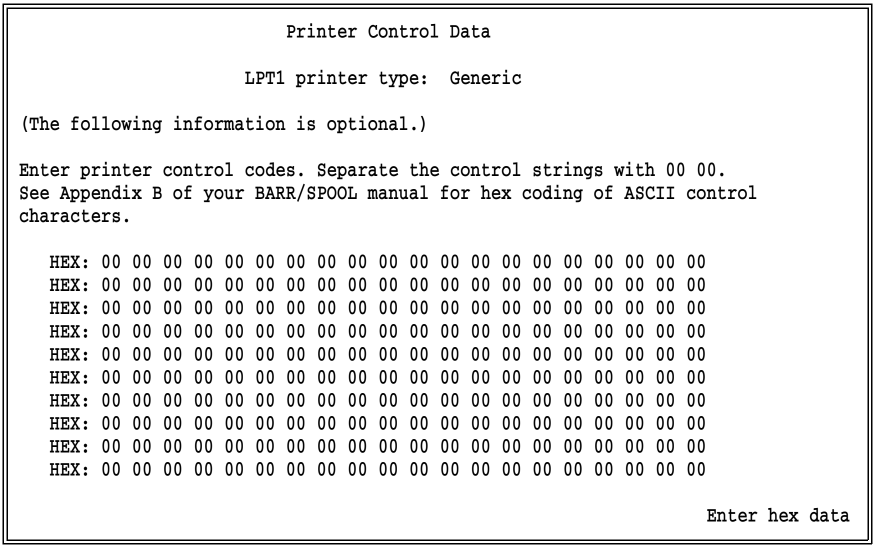
On the **`Printer Control Data`** screen, you enter printer codes for these functions as strings of characters in hexadecimal format. Each control string is terminated by two bytes of hexadecimal zeros (**`00 00`**). When the software sends a file to the printer, it sends the codes to the printer ahead of the file. Some strings can be sent at the end of the file.

The escape sequences used by your printer are documented in your printer manual.

This section tells how to enter control codes on the **`Printer Control Data`** screen, describes special control characters, and gives several control code examples.

Control Code Entry Screen

➤ From the **`Devices and Printers`** menu for the selected LPT, COM, or NET device, select **`Printer Control Data`**.



```
                             Printer Control Data

                        LPT1 printer type:  Generic

 (The following information is optional.)

 Enter printer control codes. Separate the control strings with 00 00.
 See Appendix B of your BARR/SPOOL manual for hex coding of ASCII control
 characters.

    HEX: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
    HEX: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
    HEX: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
    HEX: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
    HEX: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
    HEX: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
    HEX: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
    HEX: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
    HEX: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
    HEX: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

                                                          Enter hex data
```

➤ Enter the printer control data as pairs of hexadecimal digits. As each code is entered, the corresponding ASCII character displays in the space after the code.

Tips for Making Table Entries

The **`Printer Control Data`** screen contains 10 entry lines that can hold up to 20 control characters each. Follow the guidelines listed below for entering control codes.

If you need to enter more printer control codes than will fit on this screen, you can create files containing these codes instead of entering them here. Use a program editor that supports entry of hexadecimal codes to create the files, then use the **`Forms Overlay`** feature to send the codes to the printer. Refer to section 4.7, *Forms Overlay*, for a detailed description of this method.

- Use the arrow keys to move around the screen.
- If you make an error, you can use the ESC key to return the screen to its original values.
- When you press ENTER the new values are stored. The ESC key will not clear stored values; you will need to type over any values you want to replace.

Special Control Characters

In the Printer Control Data table, different types of control strings are distinguished by special control characters. Applications for the various control strings are described below.

- **Control string separator.** Each control string must be terminated by two sets of hexadecimal zeros (`00 00`). Strings do not have to start on a new line. A string that begins on one line may wrap to the next line.
- **Control string sent before each file.** A string that begins in the first position of the table is sent to the printer at the start of every file. If you do not want to use a global string, begin your table entries after the first two pairs of zeros (`00 00`).
- **Control string sent after each file.** A string that starts with **`FF`** is sent to the printer at the end of every file. You may want to use a string beginning with **`FF`** to reset the printer after each job, especially if the printer is shared by the Barr PC and users on the network.
- **Control string used as a serial port input header.** A string beginning with **`FE`** is called a Serial Port Input Header and has a

different use than other control strings. Rather than being sent to the printer as control codes, this string is appended to the beginning of all files input on the selected serial (COM) port. If the header is composed of multiple lines, indicate the line breaks by inserting a hexadecimal `0D` (carriage return). Refer to the earlier discussion on Serial Port Input under *Serial Port Options.*

Printer Control Data Examples

Following are several examples that show how printer control data can be used. Each example shows codes for a different type of printer.

Example 1: HP Laserjet

A laser printer is capable of printing in both portrait (8.5 x 11) and landscape orientation (11 x 8.5). Printer commands are used to set the desired mode on the printer. This example shows how to send a reset command each time a printer control string is used and how to enter two printer control strings — one for portrait and one for landscape.

```
HEX: 1B 45 01 1B 26 6C 31 4F 00 00 02 1B 26 6C 30 4F 00 00 00 00 00
```

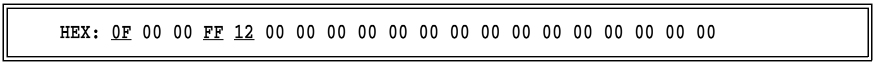
- ➤ The first pair **`1B 45`** resets the printer. Anytime the Barr software comes into the Printer Control Data table looking for an entry, it also will reset the printer. If you did not want the printer to be reset, you would enter **`00 00`** instead.
- ➤ Printer Control **`01`** is the HP Laserjet landscape control string.
- ➤ Printer Control **`02`** is the HP Laserjet portrait control string.

The printer control string for a file is set using the PRT utility. When a file using the Printer Control **`01`** is ready to print, BARR/SPOOL searches the Printer Control Data table for an entry beginning with the index **`01`** and sends the corresponding codes to the printer. In this case, index **`01`** is the control string for landscape printing.

Example 2: EPSON/IBM

Control codes are useful when the printer is shared between the Barr PC and users on the network. Codes entered in this example cause files sent to the printer by the Barr software to print in a compressed-text format. Files sent to the printer from other sources print at a normal density.

The control code **0F** causes the EPSON/IBM printer to print compressed text at a density of 132 characters-per-line. To reset the printer at the end of each file, use the end-of-file string which begins with **FF**. For the EPSON/IBM printer, the reset code is **12**. Each control string is terminated with a **00 00** sequence.

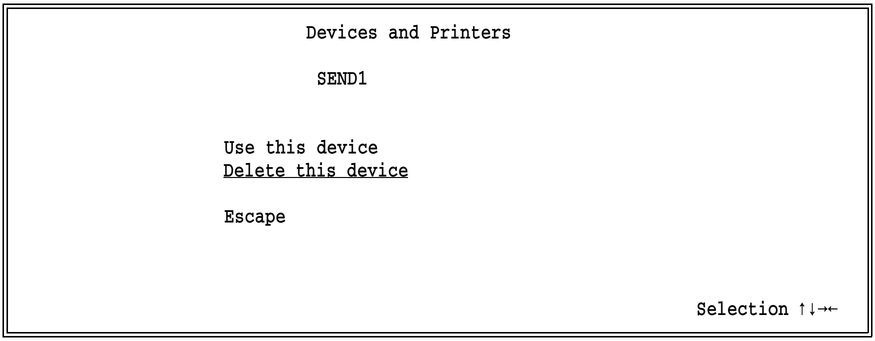


```
HEX: 0F 00 00 FF 12 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

4.9 SEND1-SEND2 Devices

The SEND devices allow you to route files from the PC to a selected destination device. The SEND devices are enabled or disabled from the **Devices and Printers** menu. Once they are enabled, the SEND devices display on the **Assign Devices** menu. For example, to send files to the printer **LPT1** you would assign **SEND1→LPT1**. Refer to Chapter 6, *Assign Devices*, and Chapter 13, *BARR/SPOOL Operation*, for more information about using the SEND devices.

When you select a SEND device on the **Devices and Printers** menu, the corresponding screen displays:



```
                    Devices and Printers

                     SEND1


               Use this device
               Delete this device

               Escape



                                              Selection ↑↓→←
```

Delete this device

Default. The SEND device is disabled and does not display on the **Assign Devices** menu. The status **(deleted)** displays next to the device name at the top of the screen. The **Assign Devices** menu is easier to read if unused devices are disabled. Additionally, the **Send Files** command is omitted from the **Operation** menu.

`Use this device`

Select this option to enable the SEND device. You must enable the device before you can use it. The selected SEND device displays as a source device on the **`Assign Devices`** menu. It becomes active as soon it is assigned to a destination other than **`SUSPEND`**. Additionally, the **`Send Files`** command displays on the **`Operation`** menu.

4.10 LAN1-LAN4 Devices

The Barr LAN devices allow users on the network to use features of the Barr software. Because this option functions as if network users were connected to the PC, it is also referred to as LAN Connections. Specifically, users on the network can route files from the network to any BARR/SPOOL destination device.

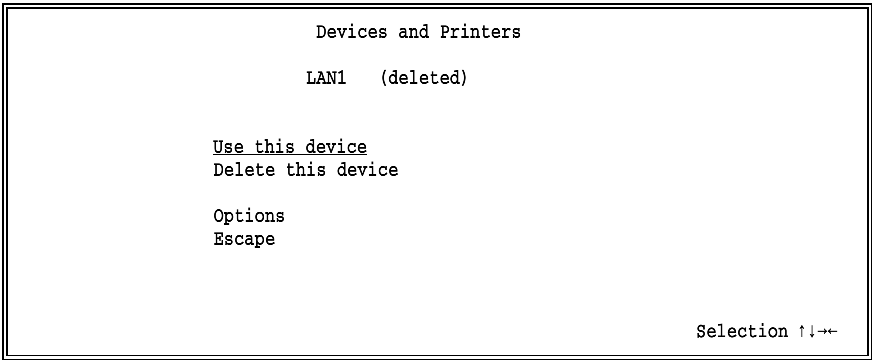
A LAN device is simply a network directory that the Barr software checks at regular intervals. When a file is found in the directory, the software routes it to the destination specified on the **`Assign Devices`** menu. Up to four **`LAN`** devices can be specified, and each device may be assigned a different directory and a different destination.

Using LAN Connections

The LAN Connections options must be defined in the software, as described below. Then users can copy files into the designated Read Directory using the DOS **`copy`** command, or they can use the **`MOVE`** utility. The **`MOVE`** utility is faster than copying the file and is discussed later in this section.

The software also lets you specify whether files are to be deleted or saved to another directory once they have been sent from the LAN Connections directory.

After selecting a LAN device on the **Devices and Printers** menu, the following screen displays:



```
                              Devices and Printers

                             LAN1   (deleted)


                    Use this device
                    Delete this device

                    Options
                    Escape



                                                          Selection ↑↓→←
```

Use this device

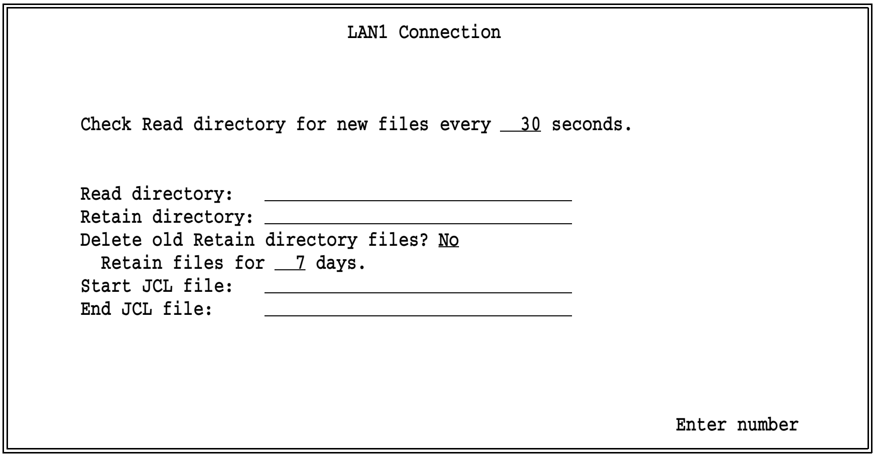
Select this option to enable the LAN device. You must enable the device before you can use it. The selected LAN device displays as a source device on the **Assign Devices** menu. Next, select **Options** and specify the LAN Connection directory.

Delete this device

Default. The LAN device is disabled and does not display on the **Assign Devices** menu. The status **(deleted)** displays next to the device name at the top of the screen. The **Assign Devices** menu is easier to read if unused devices are disabled.

LAN Connection Options

From the **`LAN Connection`** screen for the selected LAN device, select **`Options`** to display the following screen:



```
                               LAN1 Connection



   Check Read directory for new files every  30 seconds.


   Read directory:      ______________________________
   Retain directory:    ______________________________
   Delete old Retain directory files? No
     Retain files for  7 days.
   Start JCL file:      ______________________________
   End JCL file:        ______________________________




                                                            Enter number
```

These options must be specified before you can use the device.

`Check Read directory for new files every ___ seconds:`

Specify how often BARR/SPOOL checks the LAN Connections directories for files. The default interval is **`30`** seconds. This value may be adjusted from any one of the **`LAN1-LAN4`** screens, and the change is reflected on all four screens.

`Read directory:`

Specify the name of the directory containing the files to be routed. Include the drive letter and the full directory path. A different directory may be specified for each **`LAN`** device. Files are removed from this directory once they are routed. The directory name can be followed by a forward slash (**/**) and any of the Send Modes described in Chapter 13, *BARR/SPOOL Operation.*

Retain directory:

Optional. The name of the directory, including the drive letter, where files will be moved after they are routed. If no **Retain** directory name is given, the files are deleted after routing. The **Retain** directory must be on the same disk drive as the **Read** directory. If a file of the same name already exists in the **Retain** directory, a unique numeric file name extension will be added to the new file so it does not overwrite the existing file.

Delete old Retain directory files?

If you are using the Retain directory feature, choose whether old retain files will be automatically deleted. This feature may be used to free disk space when many files are being retained.

No	Retain files must be deleted manually. When retaining a large number of files, it is advisable to periodically delete the files from disk so the hard drive does not become full.
Yes	Retain files are deleted automatically after the specified retain period has expired.

Retain files for __ days.

Specify the number of days that files will be retained before they are automatically deleted. The default retain period is **7** days. When files are moved to the **Retain directory**, the date and time are changed to the current PC date and time to enable tracking of the retain period. The software deletes the expired retain files each time the program is started and at midnight when the PC system date changes.

This option is valid only if **Delete old Retain directory files?** is set to **Yes**.

Start JCL file:

This option does not apply to BARR/SPOOL.

End JCL file:

This option does not apply to BARR/SPOOL.

Error Handling for LAN Connections

Once a file is sent from the LAN connections directory, the software either deletes or renames the file. If an error occurs during the delete or rename attempt, the **LAN** device will be suspended (**LAN1→SUSPEND**) on the **Assign Devices** menu. To re-enable the LAN device, you must correct the error then re-assign the device to its original destination from **Assign Devices**.

Using the Barr MOVE Command

The Barr **MOVE** command changes the location of a file by renaming the directory portion of the file name. This is faster than copying the file to a new location, then deleting the original file. MS-DOS version 6.0 has a MOVE command that automatically overwrites existing files. The Barr **MOVE** command does not overwrite existing files unless you explicitly specify the overwrite option.

The file **MOVE.EXE** is provided with the Barr Reference files.

Tips for using the MOVE command

- The form of the command is:

  ```
  MOVE F:\PATH1\FILE F:\PATH2\FILE
  ```

  where **F:** is the drive letter, **PATH1** is the directory where the original file is located, **FILE** is the file name, and **PATH2** is the new directory for the file.

- A file can only be moved to a new location on the same drive. (The new location for the file must have the same drive letter as the original location of file.) For example,

  ```
  MOVE F:\JOBS\PAYROLL F:\LAN1\PAYROLL
  ```

  The MOVE command supports moving multiple files using the DOS wildcard characters ***** and **?**. For example,

  ```
  MOVE F:\JOBS\PAY*.* F:\LAN1\*.*
  ```

- You can rename the file when moving it. For example:

  ```
  MOVE F:\JOBS\PAYROLL F:\LAN1\CHECKS
  ```

- If a file of the same name already exists in the destination directory, the MOVE command does not overwrite the file and displays an error message.
- To overwrite a file with the same name, use the **`/d`** switch. For example,

```
MOVE/D F:\PATH1\FILE F:\PATH2\*.*
```

- For online help with the MOVE command, type **`MOVE`** at the DOS prompt and press ENTER.

4.11 NOVELL Queue Devices

This section describes the parameters you set when receiving data from Novell job or print queues.

Network Queues and Servers

On the network, files are stored in *queues* while they wait to be routed. Queues reside on network *file servers*. The Barr software must access the network queues to receive the waiting files. To do this, BARR/SPOOL performs the function of a network *queue server*. It services the queues by logging onto the file servers and retrieving the files. Data received from the Novell queues can be directed to printers or routed on the LAN.

Network Connections

The Novell network allows a PC to connect to a maximum of eight different file servers at a time.

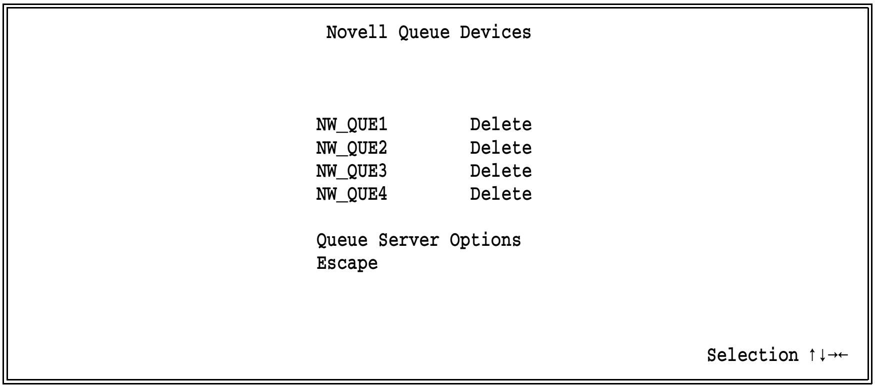
If the Barr **`NOVELL Queues`** option is used, the software will log onto one file server as a Print Server. This type of connection is different than the user connection made by the NET devices to access Novell print queues. The software will not log out of the Print Server connection during program operation.

Because Novell does not allow a PC to log in to the same file server as both a user and a Print Server, the NET devices cannot access the same server used by the NOVELL Queues.

Of the eight possible server connections, the number available for use by the Barr software depends on how many server connections are used for other purposes. The PC may log into file servers when it is powered on, before the Barr software is run. These server connections are used to access network drives and cannot be logged out by the Barr software. However, these connections can be used by the Barr **`LAN Connections`** feature. If the Barr NET devices are used to access Novell print queues, the software will log in to and out of file servers as needed.

Novell Queue Devices Menu

From the **`Devices and Printers`** menu, select **`NOVELL Queues`**. The following menu displays:



```
                          Novell Queue Devices



                         NW_QUE1        Delete
                         NW_QUE2        Delete
                         NW_QUE3        Delete
                         NW_QUE4        Delete

                         Queue Server Options
                         Escape



                                                          Selection ↑↓→←
```

Choose from the following options:

`NW_QUE1-NW_QUE4`

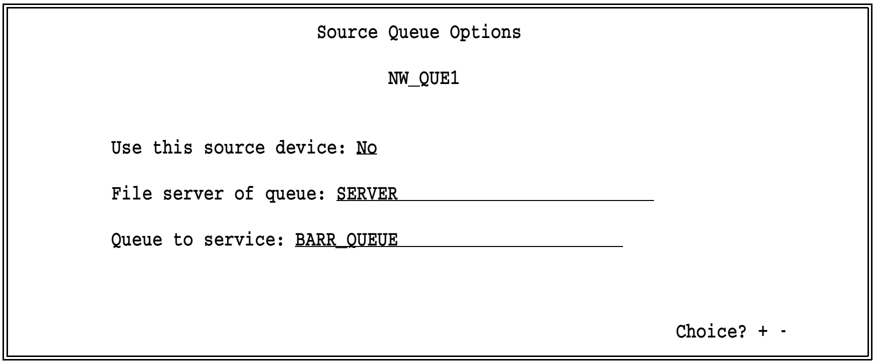
Select the Novell NetWare queue to use. When you press ENTER, another screen displays. Refer to the following section, *NW_QUE Parameters*, for a description of the parameters to specify.

`Queue Server Options`

The Barr software acts as a network queue server. When you press ENTER, another screen displays. Refer to the section *Queue Server Options* for a description of the parameters to specify.

NW_QUE Parameters

When you select an **NW_QUE** device from the menu, the **Source Queue Options** screen displays. The same set of parameters must be specified for each NW_QUE device you select. For example, the following screen displays if you select **NW_QUE1**:



```
                     Source Queue Options

                           NW_QUE1


        Use this source device: No

        File server of queue: SERVER

        Queue to service: BARR_QUEUE



                                                  Choice? + -
```

Specify these options:

Use this source device:

Select whether to enable the device.

No Default. The device is disabled and does not display on the **Assign Devices** menu. The status **Delete** displays next to the queue name on the **Novell Queue Devices** screen.

Yes The device is enabled and displays on the **Assign Devices** menu.

File server of queue:

Name the file server on which the queue is located. The queues may be located on the same file server or different file servers.

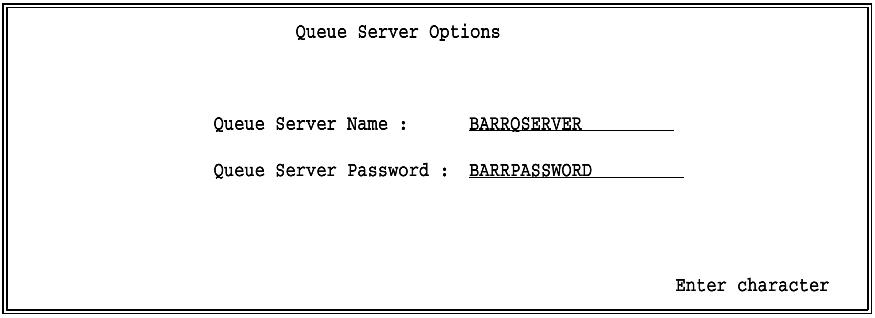
Queue to service:

Name the queue to be serviced by the Barr software.

Queue Server Options

The Barr software acts as a queue server on the network to access the Novell queues. A server name and password must be specified so the software can log on to the necessary file servers.

When you select **`Queue Server Options`**, the following screen displays:



```
                         Queue Server Options



                  Queue Server Name :      BARRQSERVER

                  Queue Server Password :  BARRPASSWORD




                                                     Enter character
```

Specify these options:

`Queue Server Name:`

Enter the server name assigned to the BARR/SPOOL software. This name is used to access the Novell queues.

`Queue Server Password:`

Enter the server password. BARR/SPOOL software uses the password to access the Novell queues.

Support for Forms and Multiple Copies

BARR/SPOOL supports printing multiple copies of files received from Novell NetWare queues when files are received to disk or to the print spool. Their Novell job information is copied to the Barr file header. The Novell form name and copy count is stored in the corresponding fields of the Barr file header, and the Novell banner name is stored as the job name in the Barr file header.

Notes:

Chapter

5 Print Spool Description

Initialize the print spooling function of BARR/SPOOL.

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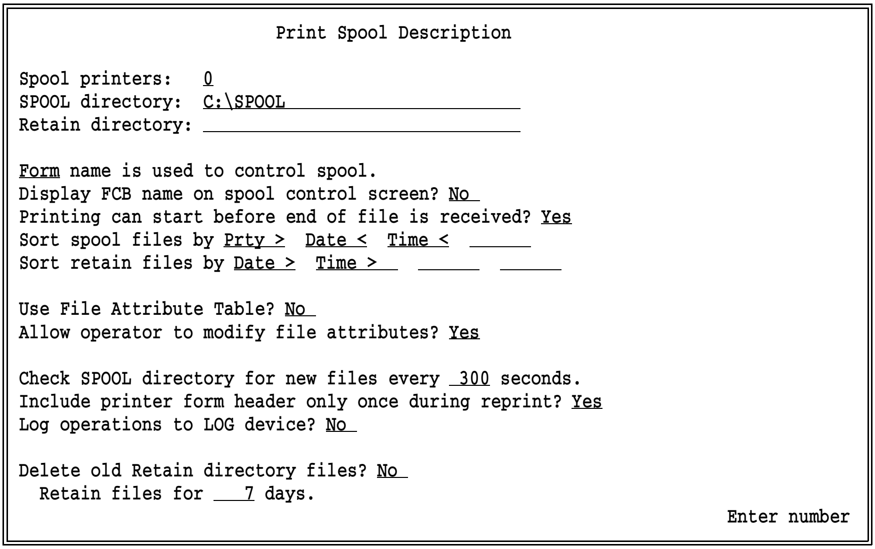
Chapter 5 Print Spool Description

This chapter describes the installation parameters you specify to set up the print spool.

5.1 Print Spool Description Screen

From the **`Installation Description`** menu, select **`Print Spool Description`** to display this screen:



```
                         Print Spool Description

Spool printers:   0
SPOOL directory:  C:\SPOOL______________________
Retain directory: ______________________________

Form name is used to control spool.
Display FCB name on spool control screen? No
Printing can start before end of file is received? Yes
Sort spool files by Prty >  Date <  Time <  ______
Sort retain files by Date >  Time >    ______  ______

Use File Attribute Table? No
Allow operator to modify file attributes? Yes

Check SPOOL directory for new files every  300 seconds.
Include printer form header only once during reprint? Yes
Log operations to LOG device? No

Delete old Retain directory files? No
  Retain files for    7 days.
                                                          Enter number
```

Specify the following options:

`Spool printers:`

Specify the number of printers serviced by the print spool. From **`0-8`** printers may be specified. These printers display at the top of the **`Print Spool`** screen during operation.

The default number of Spool printers is **0**, meaning the spool feature is not used. You must define at least **1** Spool printer in order to use the print spool.

Spool printers act as filters. They route files from the spool directory to PC printers based on preset selection criteria. On the **Assign Devices** menu, Spool printers are named **SPOOL1** through **SPOOL8**. Assignment of Spool printers to destination devices is discussed in a later step.

> ***Performance Tuning:*** If you are not using the print spool function, leave the number of Spool printers at **0**. This frees memory buffers which can be used by other program features.

SPOOL directory:

A DOS directory is used as the print queue for spooling. This directory is automatically created the first time you run the software. The spool directory name displays as **SPOOL** in the list of Destination choices under **Assign Devices**, regardless of what name you assign the directory.

Retain directory:

This is an optional directory used to automatically store files after they print from the spool. In some applications it is useful to save, or *retain*, a file after printing so that you can print another copy at a later time.

The **Retain directory** must be on the same disk drive as the **SPOOL directory**. If the directory does not already exist, it is automatically created the first time you run the software. If a **Retain directory** is not specified but a file is set for a **Disposition** of **Retain**, the file will be saved to the root directory on the print spool drive, usually **C:\** .

In the software, the **Disposition** attribute is used to select which files to save. The default is for all files to be retained, meaning the file **Disposition** is set to **Retain** or is blank. The Disposition field can be changed either on the **Print Spool** screen during program operation or on the **File Attribute Table** in the Installation Description. On the **Print Spool** screen, you can change the Disposition for individual files interactively. The File Attribute Table allows you to preset the Disposition for individual files, groups of files, or all files.

When a file is retained, the file date and time are changed to the current PC date and time. (This allows use of the feature that automatically deletes old retain files after a specified period.)

A separate **Restore** screen is provided for managing the files stored in the Retain directory. The **Restore** screen is described in Chapter 14.

Form|FCB name is used to control spool.

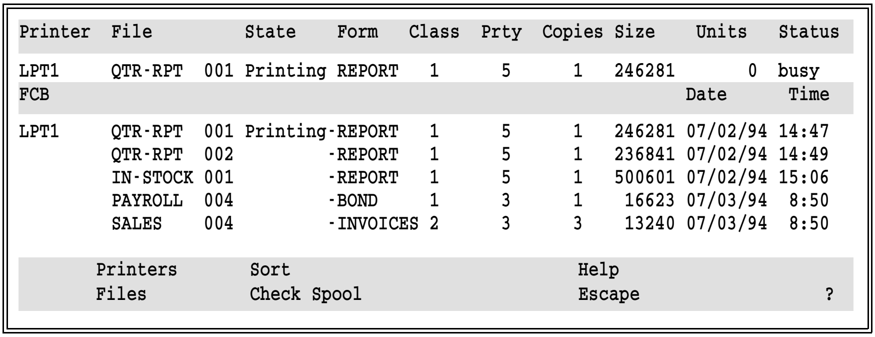
This option lets you choose whether the **Form** name or **FCB** name is used to control the printing of spool files. The control name displays on the **Print Spool** screen to the right of the file name, after the file **State** and **Disposition**. This location is also referred to as the *control* column. The heading for the control column on the **Print Spool** screen will match your selection.

Form

Default. On the **Print Spool** screen, the control column heading is set to **Form** and the form name for each file displays in this column. When the form name on the Spool printer matches the form name of a file and other print spool criteria match, the job prints.

FCB On the Print Spool screen, the control column heading is set to **FCB** and the FCB name for each file displays in this column. When the FCB name on the Spool printer matches the FCB name of a file and other print spool criteria match, the job prints.

The following screen shows what the Print Spool screen looks like if you choose **Form** to control spool printing:



```
Printer  File         State    Form   Class  Prty  Copies Size    Units   Status

LPT1     QTR-RPT  001 Printing REPORT   1      5      1   246281       0  busy
FCB                                                              Date      Time

LPT1     QTR-RPT  001 Printing-REPORT   1      5      1   246281 07/02/94 14:47
         QTR-RPT  002         -REPORT   1      5      1   236841 07/02/94 14:49
         IN-STOCK 001         -REPORT   1      5      1   500601 07/02/94 15:06
         PAYROLL  004         -BOND     1      3      1    16623 07/03/94  8:50
         SALES    004         -INVOICES 2      3      3    13240 07/03/94  8:50

        Printers       Sort                            Help
        Files          Check Spool                     Escape                  ?
```

If you choose **FCB** to control spool printing, **FCB** displays instead of **Form**.

Display FCB|Form name on spool control screen?

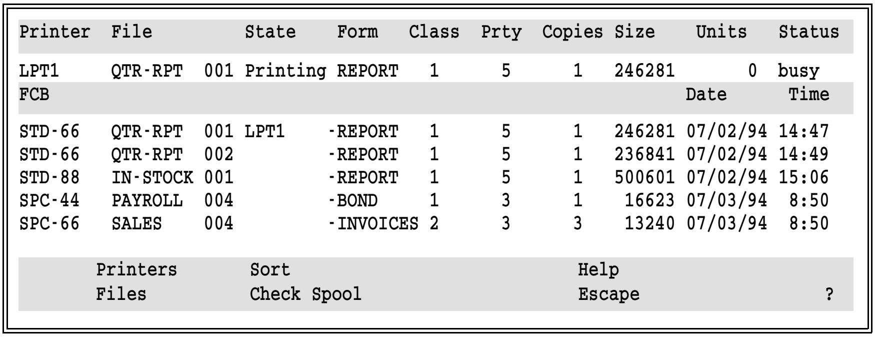
This option allows you to display both the **Form** name and **FCB** name on the **Print Spool** screen. The PC operator may find it useful to see both names. However, only the name specified by the previous option, **FCB/Form name is used to control spool**, controls printing.

The display name appears on the **Print Spool** screen in the first column, immediately before the file name. This location is also referred to as the *display* column. The heading for the display column will match your selection.

No Default. Only the name specified with the option **FCB|Form name is used to control spool** displays on the Print Spool screen.

Yes Both the **Form** name and **FCB** name display on the Print Spool screen. If you select **Form name is used to control spool**, then **FCB** is used for the display column. If you select **FCB name is used to control spool**, then **Form** is used for the display column.

For example, if you select **Form name is used to control spool** and set **Display FCB name on spool control screen?** to **Yes**, the Print Spool screen looks like this:



```
Printer  File        State    Form     Class  Prty  Copies Size     Units   Status

LPT1     QTR-RPT  001 Printing REPORT    1      5       1   246281       0  busy
FCB                                                                Date      Time

STD-66   QTR-RPT  001 LPT1    -REPORT    1      5       1   246281 07/02/94 14:47
STD-66   QTR-RPT  002         -REPORT    1      5       1   236841 07/02/94 14:49
STD-88   IN-STOCK 001         -REPORT    1      5       1   500601 07/02/94 15:06
SPC-44   PAYROLL  004         -BOND      1      3       1    16623 07/03/94  8:50
SPC-66   SALES    004         -INVOICES  2      3       3    13240 07/03/94  8:50

       Printers       Sort                        Help
       Files          Check Spool                 Escape                      ?
```

The **FCB** name appears in the display column. When the job begins to print, the Spool printer name displays in place of the file State.

If you select **FCB name is used to control spool** and set **Display Form name on spool control screen?** to **Yes**, the columns on the Print Spool screen will be reversed.

Printing can start before end of file is received?

Specify whether the entire file must be received before it can start printing, or if a file can begin printing while it is in the process of being received.

Yes Default. Printing starts without waiting for the end of the file to be received. This feature is especially useful for very large files which take a long time to receive, because the files will print much sooner.

No Printing starts after the end of file is received. This method is recommended if the speed of the communications line is not fast enough to drive your printer at full speed. BARR/SPOOL can drive the printer at rated speed and prevents the printer from pausing to wait for more data from the communications line.

Sort spool files by

Four sort criteria may be specified for setting the order in which files display during print spooling. Files print in the same order that they are displayed. Up to four sort variables may be specified. Print spool files are sorted by the first variable, then subsorted by the remaining three variables.

Tips for entering sort criteria

- Use the RIGHT ARROW key to move between the sort variables.
- Use the PLUS SIGN on the keypad to select one of the following attributes: **Prty**, **Class**, **File**, **Size**, **Form**, **Date**, or **Time**.
- Set any unused variables to blank.

The default **`Prty >`**, **`Date <`**, and **`Time`** causes files to be sorted by the highest priority, oldest date, and oldest time. In the sort criteria, **`>`** indicates ascending order and **`<`** indicates descending order.

Variable Name	Means Sort by	Sort Order
`Prty>`	Priority	highest to lowest
`Prty<`	Priority	lowest to highest
`Class`	File class	lowest to highest
`File`	File name	alpha-numerically
`Size>`	File size	largest to smallest
`Size<`	File size	smallest to largest
`Form`	Form name	alpha-numerically
`Date<`	Date	oldest to newest
`Time<`	Time	oldest to newest
`Date>`	Date	newest to oldest
`Time>`	Time	newest to oldest
`(blank)`	Variable not used	—

`Sort retain files by`

Four sort criteria may be specified for setting the order in which retained files display on the **`Restore`** screen. The default is to sort by **`Date >`** and **`Time >`**, the newest date and time. Sort criteria choices are the same as for the **`Sort spool files by`** option.

`Use File Attribute Table?`

A table of file attributes may be used to automatically assign criteria to files or to override existing criteria.

`No` Default. The File Attribute Table is not used.

`Yes` Use the File Attribute Table to override spooling attributes as files are placed in the print spool directory. The table displays after the **`Printer Initialization`** screen.

`Allow operator to modify file attributes?`

Choose whether the PC operator may alter the attributes of print spool files from the **`Print Spool`** screen.

Yes Default. The operator is allowed to modify file attributes on the **Print Spool** screen to control which jobs print. Attributes which can be modified using the **File** command include **Form**, **State**, **Class**, **Priority**, and **Copies**.

No Operators are not allowed to alter the file attributes that control which jobs print. The **File** command does not display on the **Print Spool** screen. This option ensures that the same criteria are always used to control print jobs.

Check SPOOL directory for new files every ___ seconds.

Specify how often the software should check for new files in the print spool directory and update the list of files on the **Print Spool** screen. This parameter applies only to files copied into the print spool directory from DOS or the LAN. Files received from a host computer display immediately. The default check interval is **300** seconds. Use of a very small interval, such as 5 seconds, is not recommended because it will reduce program performance.

Include printer form header only once during reprint?

This option is useful during **Reprint** of spool files and controls whether form information is sent to the printer only once.

Yes Default. During Reprint of a file, the form header information is included only in the first portion of output sent to the printer. For example, if the operator selects **Print Test Page** then starts the job, the form information is sent only with the test page. It is not sent again when the file begins to print. Sending the form information twice causes problems for some printers.

No During Reprint of a file, the form header is included in each portion of the output sent to the printer.

Log operations to LOG device?

Specify whether messages are written to the console log file to help you track print spool activity. To use this feature, you must set up the log device by specifying **LOG→(FILE)** in **Assign Devices**.

No Default. Messages about print spool activity do not display.

Yes Messages are written to the console log file when print spool files are printed, reprinted, deleted, or restored. Print messages display in this format:

```
START SPOOL1: STOCKUPD.RPT to LPT1
  END SPOOL1: STOCKUPD.RPT to LPT1
```

If a file is printed using the **Reprint** option, messages display in this format:

```
  START SPOOL1: PAYROLL.RPT to LPT1
REPRINT SPOOL1: PAYROLL.RPT to LPT1
    END SPOOL1: PAYROLL.RPT to LPT1
```

When files are deleted or restored, messages display in this format:

```
 DELETED: DAILY.RPT
RESTORED: LABELS.JOB
```

When a file is manually deleted and a retain directory is specified, a message indicates that the file has been retained:

```
RETAINED: DAILY.RPT
```

Delete old Retain directory files?

If you are using the Retain directory feature, choose whether old retain files are automatically deleted. This feature may be used to free disk space when many files are being retained.

No Retain files must be deleted manually. When retaining a large number of files, it is advisable to periodically delete the files from disk so the hard drive does not become full.

Yes Retain files are deleted automatically after the specified retain period has expired.

Retain files for __ days.

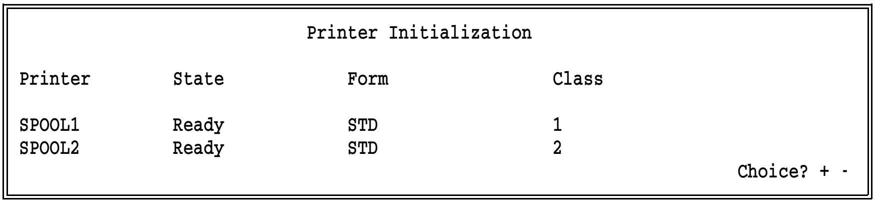
Specify the number of days for which files are retained before being automatically deleted. The default retain period is **7** days. When files are moved to the **Retain directory**, the date and time are changed to the current PC date and time to enable tracking of the retain period. The software deletes the expired retain files each time the program is started and at midnight when the PC system date changes.

This option is valid only if **Delete old Retain directory files?** is set to **Yes**.

5.2 Printer Initialization

After the print spool parameters are specified on the **Print Spool Description** screen, press ENTER to display the **Printer Initialization** criteria. The three fields **State**, **Form**, and **Class** control how the Spool printers select files to route at program startup. The values for these fields must match the attributes for a file in order for the file to print.

These fields may be changed during print spool operation. However, each time the program is run the criteria will be reset to the initial values specified under **Printer Initialization**.



```
                          Printer Initialization

Printer        State           Form              Class

SPOOL1         Ready           STD               1
SPOOL2         Ready           STD               2
                                                                  Choice? + -
```

Note: The value for **Spool printers** must be set to at least **1** for this screen to display.

Assign the following startup values:

Printer

The name of the Spool printer displays in this column. The number of printers which display depends on the number of **Spool printers** specified on the **Print Spool Description** screen.

State

This parameter indicates the initial state of the printer at program startup. A different state may be specified for each printer.

Ready

Default. Files begin printing immediately, if the attributes of the files match the criteria of the Spool printer.

Reprint

Files are placed in the **Reprint** state if the attributes of the files match the criteria of the Spool printer. Operator action is required to position the file at the location where reprinting will start.

Disabled

The Spool printer is disabled. Files will not print until the operator changes the printer state on the Print Spool screen.

Form

If you want to route files based on a specific form name, enter a form name. The form name may contain up to 8 characters. DOS wildcards ***** and **?** may be used in the form name to select groups of forms. If this field is left blank, the form name will not be used in the print selection criteria.

Class

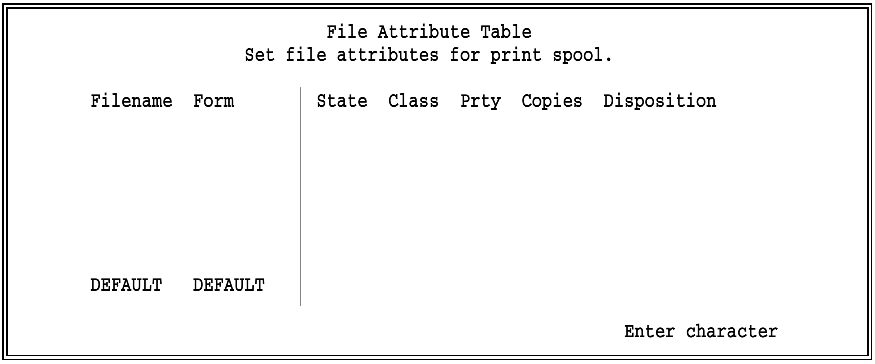
Enter one-character class names. Either a number or a letter may be used for the file class. Files copied into the Spool directory from DOS are automatically assigned a class of **Z**.

Up to five classes can be entered for each printer. If this field is left blank, class will not be used in the print selection criteria.

5.3 File Attribute Table

The File Attribute Table is used for automatic assignment of file attributes and is especially useful for unattended print spool operation. As files are received to the **SPOOL directory**, their spooling attributes can automatically be assigned or overridden by the definitions in the File Attribute Table. In most cases, no changes are made to the attributes within the files. The override values simply display on the **Print Spool** screen and are used when the files print. (Values from the **File Attribute Table** are written to the file only if you change the file **State** from the **Print Spool** screen.)

The File Attribute Table is enabled by setting **Use File Attribute Table?** to **Yes** on the **Print Spool Description** screen. It displays after the **Printer Initialization** screen.



```
                         File Attribute Table
                  Set file attributes for print spool.

        Filename  Form       | State  Class  Prty  Copies  Disposition
                             |
                             |
                             |
                             |
                             |
        DEFAULT   DEFAULT    |
                                                      Enter character
```

How the Table Works

Each line in the table is a separate entry, and each entry has two parts: file *match criteria* and file *override values*. **`Filename`** and **`Form`** are the match criteria. **`State`**, **`Class`**, **`Prty`**, **`Copies`**, and **`Disposition`** are the override values.

Files received to the print spool are checked against the match criteria of each entry in the table. The override values in the table are used only if the **`Filename`** or **`Form`** of the file matches an entry in the table. Override values for the file display on the Print Spool screen.

If both **`Filename`** and **`Form`** are specified in a single table entry, then both the **`Filename`** and **`Form`** from the file must match the table in order for the override values to be used. If a table entry contains only the **`Filename`** (the **`Form`** is blank), only the **`Filename`** must match. If only the **`Form`** is specified in the table (the **`Filename`** is blank), then only the **`Form`** must match.

If more than one table entry matches the file, the program applies each matching entry in a cumulative manner, beginning with the first entry of the table. For example, if there are two matching table entries, the attribute changes from the first matching entry are applied, then the attribute changes from the second matching entry are applied. If the first and second matching entries both change the same attribute, the second matching entry replaces the value from the first matching entry.

The **DEFAULT** line at the bottom of the table is used to provide default attributes for any files whose **Filename** or **Form** do not appear in the table. The **DEFAULT** line is useful for providing values for most files, and individual table entries can be used to specify exceptions for a few files.

When specifying the attribute override values, only attributes with specified values are used. Blank attributes in the table indicate that the value from the file, if any, is used.

Table Entries

Up to 20 table entries may be made. If more table entries are needed, a version of the software which supports 100 entries is available. The fields for each table entry — file *match criteria* and file *override values* — are described below.

Match Criteria

The first two fields in the table are file match criteria. You may specify one field or both fields.

Filename

The file name in the table must be an exact match of the full name of the file, including the file extension. This means that a table **Filename** without an extension (i.e., **DATA**) can only match a file that has no extension, and a table **Filename** with an extension (i.e., **DATA.001**) can only match a file that has an extension. DOS wildcards may also be used in the table **Filename**. For example, names like **DATA*.*** or **TAX??JUN** may be specified.

Form

The form name in the table must be an exact match of the form name for the file. DOS wildcards also may be used in the form name, for example **STD*** or **CHECKS??**.

Override Values

The next five fields are file override values. Override values are assigned if a matching entry is found in the table. The values you specify will display on the **Print Spool** screen. Specify only those values you want to override.

State

Specify the initial State assigned to the file when it is placed in the print spool. Choices include **Ready** and **Hold**. Other states may be set from the **Print Spool** screen.

Ready

Default. Files begin printing immediately if their attributes match the criteria of the Spool printer. Blank also indicates **Ready**.

Hold

Files cannot print until the operator sets the file State to **Ready**. This choice is useful for files which may require the operator to load special forms paper in the printer.

Class

Specify the file Class. The Class may be used as part of the criteria which determines on which Spool printer the file prints. Either a number or a letter may be used for the file Class. Files copied into the print spool directory from DOS are automatically assigned a class of **Z**.

Prty

Specify the file Priority number. The Priority may be used as criteria for the Spool printer to determine on which printer the file prints. The highest Priority is **9**; the lowest Priority is **1**.

Copies

Specify the number of Copies to print. If Copies is not specified in the file and the number in the **File Attribute Table** is left blank, the default value is **1** copy.

Disposition

The Disposition attribute allows you to selectively Retain or Delete individual files. When specified on the **DEFAULT** entry line, the Disposition applies to all files not listed in the table.

Retain

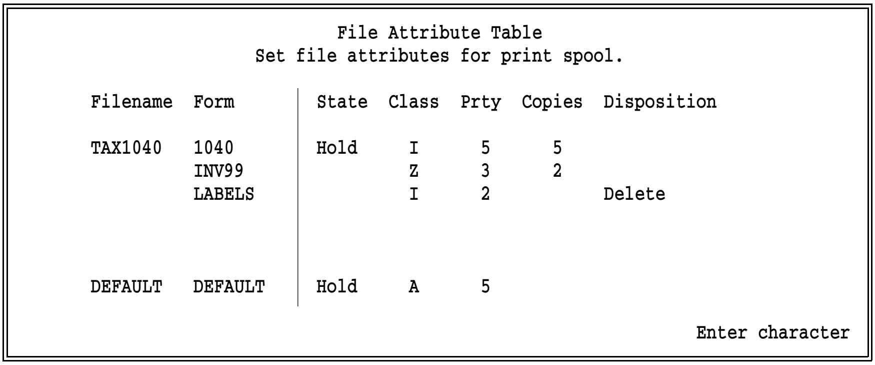
Default. Files are written to the **Retain directory** after they print. Retain is indicated by **Retain** or blank in the **File Attribute Table**, or blank in front of the form name on the **Print Spool** screen.

`Delete`

If you define a **`Retain directory`** on the **`Print Spool Description`** screen, all files will be retained by default. Individual files may be assigned a Disposition of **`Delete`** in the **`File Attribute Table`** or on the **`Print Spool`** screen. If a **`Retain directory`** is not specified, files are deleted by default.

Sample Attribute Table

A sample table entry is shown below.



```
                        File Attribute Table
                   Set file attributes for print spool.

   Filename  Form      │ State  Class  Prty  Copies  Disposition
                       │
   TAX1040   1040      │ Hold     I      5      5
             INV99     │          Z      3      2
             LABELS    │          I      2             Delete
                       │
                       │
                       │
   DEFAULT   DEFAULT   │ Hold     A      5

                                                        Enter character
```

According to this table:

- Files named **`TAX1040`** with a form of **`1040`** will be placed on hold and will be assigned Class=I, Priority=5, and Copies=5. The files will be retained after printing.
- Any file with the form **`INV99`** will be ready for printing and will be assigned Class=Z, Priority=3, and Copies=2. Files will be retained after printing.
- Any file with a form name of **`LABELS`** will be ready for printing and will be assigned Class=I and Priority=2. The copy count will be taken from the file. If the file copy count is blank, a default copy count of 1 is assigned. After printing, the file will be deleted.
- Any files not listed in the table will be put on hold and will be assigned Class=A and Priority=5. The files will be retained after printing.

When you finish making table entries, press ENTER to return to the **`Installation Description`** menu.

Chapter

6

Assign Devices

Direct the flow of data into and out of the PC. This feature is central to program operation.

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Chapter 6 Assign Devices

The **`Assign Devices`** menu displays the source and destination devices you have defined in BARR/SPOOL, including the devices specified under **`Devices and Printers`** and the **`Print Spool Description`**. If you have purchased any option software, such as PRINT370, devices corresponding to the options also display.

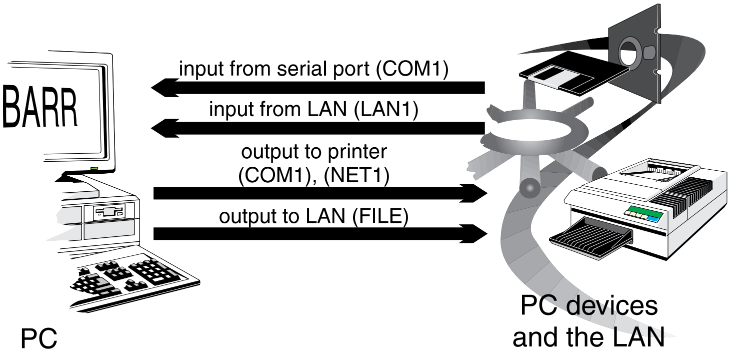
From **`Assign Devices`**, data received from source devices is directed to the destination devices of your choice. This directing of data is referred to as *device assignment.*

Default device assignments for program startup are defined in the **`Installation Description`**. Each time the software is started, the default assignments take effect. However, temporary changes to the assignments may be made during program operation and are used until the software is restarted.

This chapter explains data flow to and from the PC, introduces you to the device assignment screen, and describes the available source and destination devices. Each section includes several step-by-step examples.

6.1 Data Flow to and from the PC

To better understand source devices, destination devices, and device assignment, you need to understand how data flows into and out of the PC running BARR/SPOOL. Data can be received to the PC from LAN or PC input devices such as a LAN directory or a card reader. Data on the PC can be sent to LAN or PC output devices such as a PC printer, a network directory, or a network printer.



Data can be sent from the PC to other PC devices or to the network, and data can be received to the PC from the network or from PC devices.

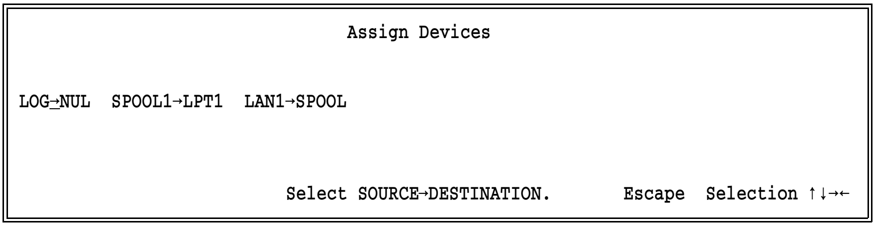
BARR/SPOOL allows destination devices, such as printers, to be shared. This means that several source devices can write to the same destination device. Destinations which are often shared include **SPOOL**, **LPT1-LPT3**, and **COM1-COM4**.

When several sources are assigned to the same destination, the software alternates between source devices, allowing each source to write to the destination in turn. For example, if the source **LAN1** is ready to write a file to the destination **LPT1**, the software first checks to see if the destination **LPT1** is busy. If the destination device is available, the software writes the file to **LPT1** then automatically searches for another source device that is directed to the same destination. At the same time, the software may be directing other print streams to other destinations.

6.2 Assignment Screen

To reach the device assignment screen, from the **Installation Description** menu, select **Assign Devices**.

Example device assignments are shown on the screen below. Your screen reflects the devices you have defined.



```
                              Assign Devices


LOG→NUL  SPOOL1→LPT1  LAN1→SPOOL



                         Select SOURCE→DESTINATION.      Escape  Selection ↑↓→←
```

The devices are displayed in **`SOURCE`** and **`DESTINATION`** pairs separated by an arrow. The arrow shows the direction of the data flow. For example, in the pair **`LAN1→SPOOL`**, **`LAN1`** is the source device and **`SPOOL`** is its destination.

Device assignment is performed by selecting a source device with the cursor. Note that the arrow blinks when the cursor rests under it. When you press ENTER, a list of destination devices displays. Once a destination is selected from the list, a menu line at the bottom of the screen displays additional options.

6.3 Source and Destination Devices

Data sources and destinations are relative to the Barr software. Data flows into the software from *source* devices. Data flows out of the software to *destination* devices. Up to 40 devices may be defined in the software, and only those devices you enable display on the **`Assign Devices`** menu.

Available source and destination devices are listed below and are described on the following pages. Devices you enable from option software are described in the corresponding option manual.

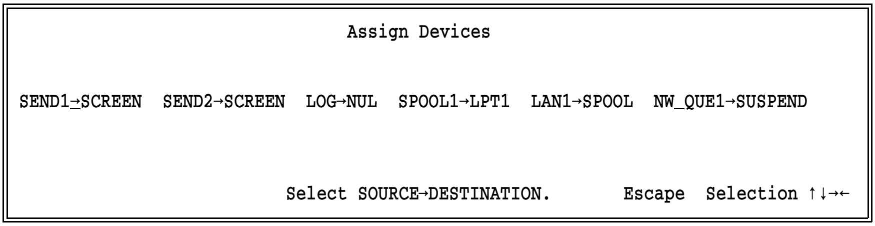
Data Source	**Source Device Name**
PC file	**`SEND1-SEND2`**
PC serial port	**`COM1-COM4`**
Console log file	**`LOG`**
Spool printers	**`SPOOL1-SPOOL8`**
File from LAN directory	**`LAN1-LAN4`**
File from Novell queue	**`NW_QUE1-NW_QUE4`**

Data Destination	**Destination Device**
PC file	**`(FILE)`**
PC screen	**`SCREEN`**
Discard	**`NUL`**
Suspend flow	**`SUSPEND`**

PC parallel port	**LPT1-LPT3**
PC serial port	**COM1-COM4**
Spool directory	**SPOOL**
Network printer	**NET1-NET12**

Sources

Source devices display on the **Assign Devices** screen. Each source displays before an arrow. Source devices include devices you have enabled and devices that the software automatically provides.



```
                                Assign Devices


SEND1→SCREEN  SEND2→SCREEN  LOG→NUL  SPOOL1→LPT1  LAN1→SPOOL  NW_QUE1→SUSPEND



                          Select SOURCE→DESTINATION.      Escape  Selection ↑↓→←
```

Available source devices include:

SEND1-SEND2

Files on disk may be directed to a destination using one of the **SEND** devices. Data is not routed until the **Send Files** command is issued from the **Operation** screen.

The SEND devices are enabled from the **Devices and Printers** menu, as described in Chapter 4.

COM1-COM4

Files may be input on a PC serial port. Data will be input automatically as files are detected. For example, you can attach a card reader to the PC COM1 port to input files, or you can connect to a VAX computer to input files. (Serial ports also may be used as destinations.)

The COM devices are enabled from the **Devices and Printers** menu, as described in section 4.4.

LOG

The console log is a copy of the messages written to the PC console. Usually these messages are written to a file using **LOG→(CONSOLE.LOG)** to provide a record of files that have been processed. If the message copy is assigned to screen using **LOG→SCREEN**, the log data will be deleted to prevent duplicate messages from displaying on the screen. The log may be browsed while it is being updated by the software. Refer to section 6.6, *Logging Console Messages.*

The **LOG** device is enabled automatically. It can be disabled by setting **LOG→NUL** but cannot be removed from the screen.

SPOOL1-SPOOL8

Spool printers are used to route data from the print spool queue to destination devices, for example **SPOOL1→LPT1**. (Files must first be routed to the print spool directory, for example **LAN1→SPOOL**.) Each Spool printer is assigned criteria for routing files. Files can be routed automatically or the software can be configured to require operator action.

The SPOOL devices are enabled from the **Print Spool Description** screen.

LAN1-LAN4

The LAN devices are used to route files from a directory on the local area network. For example, files in a network directory can be sent to a PC printer by setting **LAN1→LPT1**.

The LAN devices are enabled from the **Devices and Printers** menu, as described in section 4.10.

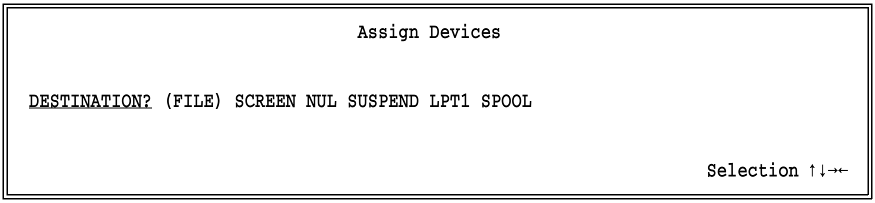
NW_QUE1-NW_QUE4

Data can be received to the PC from up to four Novell job queues. These files may be routed directly to a PC-attached printer, such as **NW_QUE1→LPT1**. Or they can be routed to a spool filter, for instance **NW_QUE1→SPOOL**.

The NW_QUE devices are enabled from the **Devices and Printers** menu, as described in section 4.11.

Destinations

A list of destination choices displays when you select a source on the **`Assign Devices`** menu. The screen below shows the default list of destinations. The destination choices on your screen include devices you have enabled and devices that the software automatically provides.



```
                         Assign Devices


DESTINATION? (FILE) SCREEN NUL SUSPEND LPT1 SPOOL


                                                  Selection ↑↓→←
```

Once you choose a destination from the list, your selection displays on the **`Assign Devices`** screen after the arrow, for example **`SPOOL1→LPT1`**.

Available destination devices include:

`(FILE)`

Data can be routed to a file anywhere within the DOS file system, including to a floppy disk, hard disk, or local area network (LAN). When **`(FILE)`** is selected as the destination, you are prompted to enter a file name and to specify other options. Refer to section 6.5, *Assigning (FILE) as a Destination.*

The **`(FILE)`** selection is enabled automatically and cannot be removed from the list of destinations.

`SCREEN`

Data can be displayed on the console portion of the PC screen. The screen scrolls at four lines-per-second. To pause the screen display, press SCROLL LOCK. For fast screen scrolling, press SCROLL LOCK and 1. To slow the scrolling speed, press SCROL LOCK and 0.

The **`SCREEN`** destination is enabled automatically and cannot be removed from the list of destinations.

`NUL`

Data sent to **`NUL`** is discarded. For example, if you do not plan to use the console **`LOG`** device, set **`LOG→NUL`**. Any data received from the **`LOG`** source device is then discarded.

The **NUL** destination is enabled automatically and cannot be removed from the list of destinations.

SUSPEND

When a device is set to **SUSPEND** the device is temporarily disabled. This is useful if you want to disable the data flow for a short time while you service a device. Additionally, the software may automatically set a source device to **SUSPEND** on certain error conditions.

Active devices should not be set to **SUSPEND** for long periods of time. While a device is suspended, data continues to flow into the program. Because the data is not directed to a destination, it fills memory space needed by other program features which results in reduced program performance. If you wish to disable a device permanently, disconnect it from the PC or disable it from the corresponding installation screen.

The **SUSPEND** destination is enabled automatically and cannot be removed from the list of destinations.

LPT1-LPT3

Data can be routed to a parallel printer attached to the LPT1, LPT2, or LPT3 port. For example, **SPOOL2→LPT1** indicates that data from the SPOOL2 filter writes to the printer attached to the PC's LPT1 port.

The LPT devices are enabled from the **Devices and Printers** screen, as described in section 4.3.

COM1-COM4

Data can be routed to a serial device. For example, you can attach a serial printer to COM1 and assign **SPOOL1→COM1**. (Serial ports also can be used as sources.)

The COM devices are enabled from the **Devices and Printers** screen, as described in section 4.4.

SPOOL

Files may be routed to the print spool directory, for example **COM1→SPOOL**. Once files are in the print spool, they are directed to printers using the source devices **SPOOL1-SPOOL8**. An example for using the SPOOL destination is given in section 6.7, *Assigning SPOOL as a Destination.*

NET1-12

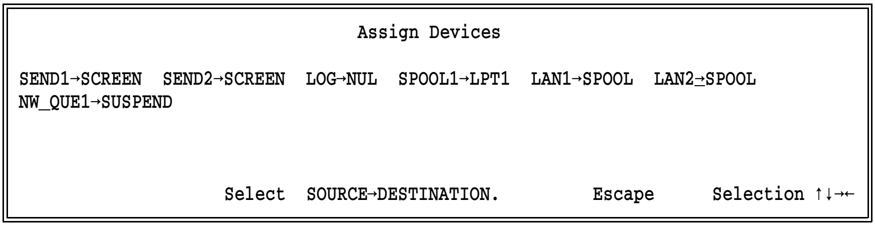
Files may be sent to printers on a local area network using a Barr NET device. NET devices support three different types of network printing. Most networks support redirection of LPT1, LPT2, and LPT3 using device drivers, although some networks support redirection of LPT1-LPT12. On the Novell network, NET devices can be used to route files to Novell Print Queues. On the TCP/IP network, NET devices can be used to route files to UNIX Print Queues.

The NET devices are enabled from the **Devices and Printers** screen, as described in section 4.5.

6.4 Assigning a Printer as a Destination

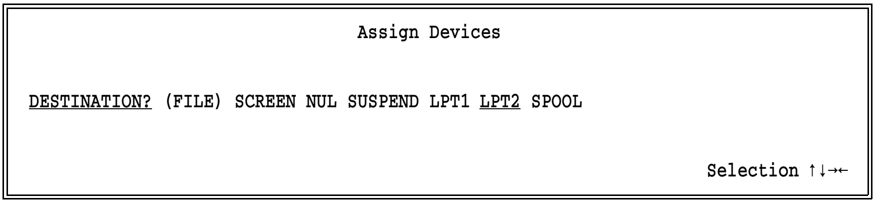
For some applications, you may want all data from a given source to write to a single printer. To accomplish this you can dedicate the source device to a printer. For example, you can direct all the output from LAN directory 2 (**LAN2**) to a PC printer connected to **LPT2** by assigning **LAN2→LPT2**.

Follow the steps below to make this type of assignment.



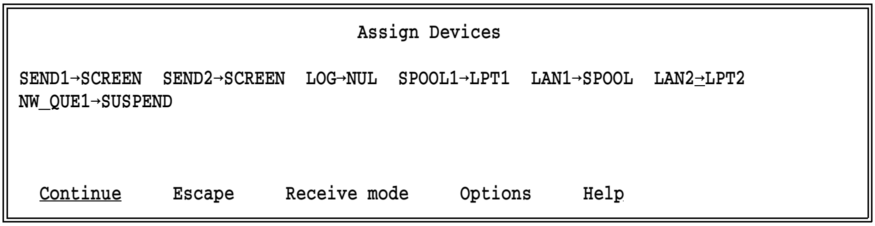
```
                               Assign Devices

SEND1→SCREEN  SEND2→SCREEN  LOG→NUL  SPOOL1→LPT1  LAN1→SPOOL  LAN2→SPOOL
NW_QUE1→SUSPEND



                   Select  SOURCE→DESTINATION.        Escape     Selection ↑↓→←
```

➤ Select the source, in this example **LAN2**, and press ENTER. A list of destinations displays.



```
                              Assign Devices


 DESTINATION? (FILE) SCREEN NUL SUSPEND LPT1 LPT2 SPOOL


                                                          Selection ↑↓→←
```

➤ Select the destination, in this example **LPT2**. When you press ENTER, the screen changes to reflect your selection.



```
                              Assign Devices

SEND1→SCREEN  SEND2→SCREEN  LOG→NUL  SPOOL1→LPT1  LAN1→SPOOL  LAN2→LPT2
NW_QUE1→SUSPEND




  Continue     Escape     Receive mode     Options     Help
```

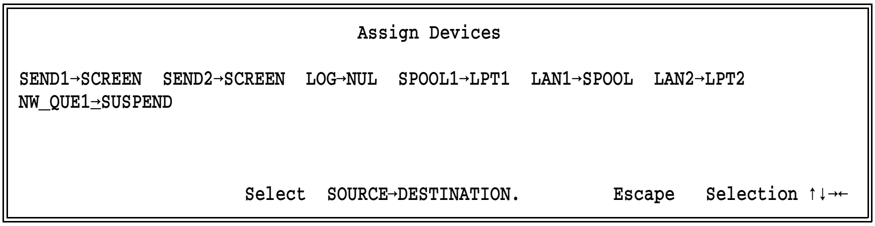
➤ Select **Continue** to make another assignment, or press ESC to return to the **Installation Description** menu.

The menu choices **Receive Mode** and **Options** at the bottom of the screen are explained later in this chapter.

6.5 Assigning (FILE) as a Destination

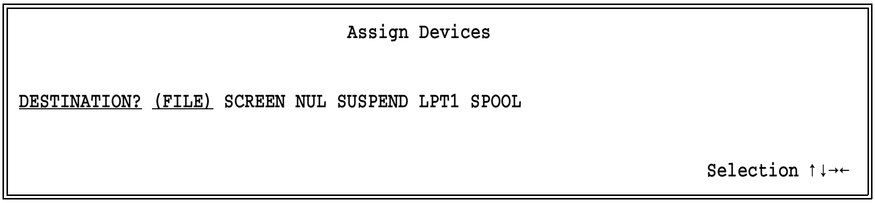
Data can be directed to a DOS file on a disk or on a LAN. A common application is to direct data that will not be printed to a disk file. Often this data will be processed by programs on the PC or the LAN.

Follow the steps below to assign **(FILE)** as a destination:



```
                              Assign Devices

SEND1→SCREEN  SEND2→SCREEN  LOG→NUL  SPOOL1→LPT1  LAN1→SPOOL  LAN2→LPT2
NW_QUE1→SUSPEND




                    Select  SOURCE→DESTINATION.        Escape   Selection ↑↓→←
```

➤ Select the source, for example **NW_QUE1**, and press ENTER. A list of destinations displays.

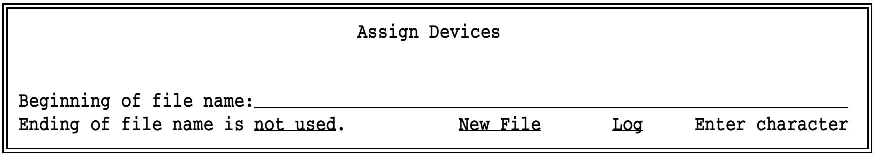


```
                              Assign Devices


DESTINATION? (FILE) SCREEN NUL SUSPEND LPT1 SPOOL


                                                       Selection ↑↓→←
```

➤ Select **(FILE)** as the destination and press ENTER.

(FILE) Parameters

When **(FILE)** is selected as a destination, the following screen displays:



```
                              Assign Devices


Beginning of file name:_______________________________________________
Ending of file name is not used.        New File      Log    Enter character
```

Specify these parameters:

Beginning of file name:

Specify the name for the received file, including the drive letter and full directory path. A file name may consist of a beginning, an ending, or both. At least one part of the name must be specified. Choices for the ending are described under **Ending of file name**. Barr software follows the DOS conventions for naming files.

- If *only* the **Beginning of file name** is specified, include the drive letter, full directory path, and file name. If the path is not included, the file is written to the current DOS directory.

  > ***Note:*** The current directory is the directory you are in when you start BARR/SPOOL, or the directory you change to using the hot-key to DOS function after BARR/SPOOL is started.

  It is best to include the complete file path in the file name so there is no doubt about where the received files are located. For example, suppose you omit the directory path from the **Beginning of file name**. Assume the software was installed in the directory **C:\BARR**. According to the DOS convention, if you are in the directory **C:\BARR** when a file is received the file is written to the **C:\BARR** directory. However, if you are in the **C:\**

root directory when a file arrives, the file is written to the directory **C:\**.

- If *only* the **Ending of file name** is specified, the file path depends on your selection. Some choices for the ending name have no file path and others include a portion of the file path. Each of these selections is described under **Ending of file name**. When no path is specified, files are written to the current DOS directory.

- If *both* parts of the file name are specified, the complete file name is the combination of the two parts: **Beginning of file name** contains the drive letter and directory path, and **Ending of file name** specifies the file name. Some **Ending of file name** selections include a portion of the file path.

  If the **Beginning of file name** includes a directory name, you must end the directory name with a backslash (\). If you want to combine the beginning and ending portions into an 8-character name, omit the backslash.

If a **Beginning of file name** is specified, it must be in the correct DOS format. A file extension is optional. See *File Name Extensions* later in this section for a complete discussion about file extensions. Examples for naming files are given at the end of this section.

If a DOS error occurs while naming the file, BARR/SPOOL suspends the source device and displays an error message on the console.

Ending of file name is

The eight selections for **Ending of file name** are described below.

If **from file**, **jobname**, **formname**, or **source filename** is selected, the file path is taken from **Beginning of file name**. If the beginning portion of the file name is blank, the file is written to the current DOS directory.

If **formname\jobname** is selected for the ending, **formname** is included in the file path. If **jobname\formname** is selected, **jobname** is included in the path.

You may want to refer to other sections in this manual when choosing an **Ending of file name**. For a description of the Barr file header, refer to section 1.2, *Barr File Header*. For a description of **Spool header from data?** option, see section 6.9, *Options for Assign Devices.*

If a DOS error occurs while naming the file, BARR/SPOOL assigns the file name **ERROR** and displays an error message on the console.

Examples for naming files are given later in this section.

Choices for **Ending of filename** are:

not used

Default. Only the **Beginning of file name** is used. The **Beginning of file name** must include the full path and file name. The choice **not used** should be selected when writing to device drivers.

from file

The file name is obtained from a text line within the file. When you select this option and press ENTER, you are prompted to specify the location of the name within the file.

jobname

The job name included in the file header is used as the file name. To obtain the job name, you must enable the Barr **OUTPUT statement** or the Barr **Spool header from data?** option.

formname

The form name included in the file header is used as the file name. To obtain the form name, enable the Barr **OUTPUT statement** or the Barr **Spool header from data?** option.

formname\jobname
jobname\formname

Both the form name and job name can be included in the file name. The first option specified becomes part of the file path and allows you to group files. The second option is the file name. If you select **formname\jobname**, for example, the form name is included in the file path, and the job name is used as the file name. Refer to the individual parameter descriptions above.

fcbname

The FCB name included in the file header is used as the file name. Usually this option is used only with files received from an IBM mainframe.

source filename

When assigning **SENDn→(FILE)**, **SENDn→SPOOL**, **SPOOLn→(FILE)**, or **LANn→SPOOL**, the original file name may be preserved using this option. Specify the destination file path under **Beginning of file name**.

New File, Append, Replace, Replace Cond.

If a duplicate file name is encountered when writing to a file, you have the option to create a new file, append to the existing file, or replace the existing file. This selection displays to the right of **Ending of file name.**

New File

Default. If a new file does not have an extension or if a file of the same name exists, a numeric file extension is generated by the software and added to the name of the new file. In the case of a duplicate file name, this preserves the existing file. Refer to *File Name Extensions* below for an example of the file naming sequence.

Append

The new file is added to the end of the existing file of the same name. This option is not recommended when receiving files to **SPOOL**.

`Replace`

The new file overwrites the existing file. This option is useful if each day you receive a file with the same name and you do not want a lot of files to accumulate on the PC disk. It saves you the work of manually deleting the old files.

`Replace Cond.`

Replace Conditional. The method used for naming the file determines whether the file is replaced or the file is assigned a unique extension.

- If a new file does not have an extension or if a file of the same name exists, a numeric file extension is generated by the software and added to the name of the new file. In the case of duplicate file names, this method preserves the existing file. Refer to *File Name Extensions* below for an example of the file naming sequence.
- If the name of the new file includes an extension or ends in a period (`.`), the new file will replace the existing file. For example, a file named **`DAILYRPT.`** or **`DAILYRPT.MON`** would replace a file that has the same name.

`Log/No Log`

This option controls whether informational messages display on the console when files are written to disk.

`Log` Default. Each time a file is written to disk, messages display on the console indicating the start and end of the file, for example:

```
WRITING: DAILYRPT
  CLOSE: DAILYRPT
```

These messages are included in the console log file if the log file is enabled by directing **`LOG→(FILE)`** on the Assign Devices menu.

`No Log`

Messages are not written to the screen or the console log file. This option reduces the number of messages that display on the screen and are written to the console log file.

File Name Extensions

File extensions allow greater flexibility for naming files. A file extension consists of a period (`.`) or a period followed by up to three characters (**`.abc`**). The file extension can be specified by you when assigning the file name, or BARR/SPOOL can automatically generate a numeric file extension.

When the destination is **`(FILE)`**, you may include a file extension in the **`Beginning of file name`** or **`Ending of file name`**. Additionally, if the destination is **`(FILE)`** the software generates a file extension when *both* these conditions are met:

- You select **`New File`** or **`Replace Conditional`** on the file name assignment screen.
- The new file has no extension or a duplicate file name was found.

The software also generates file extensions for duplicate files for the LAN Retain Directory, Spool Retain Directory, and NET Device Driver features.

Automatic Naming Sequence

The automatic generation of file extensions prevents the software from overwriting files that have the same name. In some cases, the software assigns an extension to any file that does not already have one. In other cases, an extension is assigned only if a duplicate name is encountered. The process for assigning file extensions is similar for both cases.

The software searches the destination directory to determine if any files have the same name as the new file. If a duplicate name is found, the numeric extension **`n + 1`** is assigned to the new file, where **`n`** is the highest extension found for that file name. For example, the first extension assigned is **`.001`**, the next file with the same name is assigned **`.002`**, and so on.

If the same file name occurs thousands of times, additional renaming is performed. If extension **`.999`** is reached, a **`#1`** is placed at the end of the file name and the extension sequence starts again, continuing until **`#10.999`** is reached. Note that when **`#1`** is added, the sequence numbers start at **`000`**. For example, if the original file name is **`taxdata`**, a series of files with the same name would be renamed as follows:

```
taxdata.001,  taxdata.002,  ... taxdata.999
taxdat#1.000, taxdat#1.001, ... taxdat#1.999
```

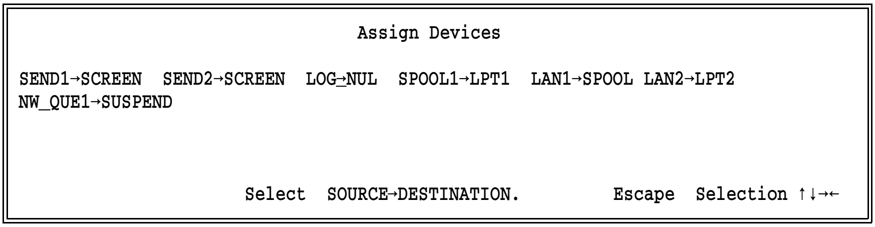
```
taxdat#2.000, taxdat#2.001, ... taxdat#2.999
...
taxda#10.000, taxda#10.001, ... taxda#10.999
```

6.6 Logging Console Messages

It is helpful to see console messages on the screen during interactive use and to have a log file of the messages for later reference. To create a log file, assign **`LOG→(FILE)`** on the **`Assign Devices`** menu. The log file can be named anything you like, but we suggest naming it **`CONSOLE.LOG`** for easy identification.

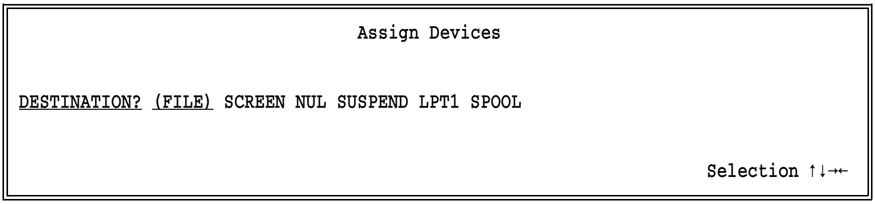
Assignment Steps

To enable the console log, from the **`Assign Devices`** menu:



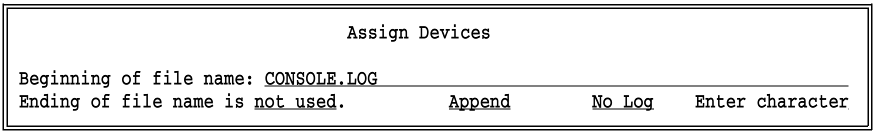
```
                                 Assign Devices

SEND1→SCREEN  SEND2→SCREEN  LOG→NUL  SPOOL1→LPT1  LAN1→SPOOL LAN2→LPT2
NW_QUE1→SUSPEND



                      Select  SOURCE→DESTINATION.        Escape  Selection ↑↓→←
```

- ➤ Select **`LOG`** as the source.



```
                                 Assign Devices


DESTINATION? (FILE) SCREEN NUL SUSPEND LPT1 SPOOL


                                                                 Selection ↑↓→←
```

- ➤ Select **`(FILE)`** as the destination.



```
                                Assign Devices

Beginning of file name: CONSOLE.LOG
Ending of file name is not used.        Append        No Log    Enter character
```

- ➤ Enter **`CONSOLE.LOG`** as the **`Beginning of file name`**.
- ➤ Use the default selection **`not used`** for **`Ending of file name`**.

- Select the **`Append`** option to append each message to the log file. (If **`Append`** is not selected, a new file will be created each time a message is written.)
- Select **`No Log`** to prevent the message **`WRITING: CONSOLE.LOG`** from displaying on the screen each time a message is written to the log file.

Console Messages

Messages that display on the PC console include a time stamp with hours, minutes, and seconds. The time stamp is useful for tracking file activity and is included in the log file. If messages are longer than 80 columns, they wrap to the next line.

File viewing utilities allow you to view the console log file from a DOS session or from another node on the LAN while the software is running. The LIST program from Buerg Software allows you to view the log file even while it is being updated. A shareware version of LIST may be downloaded from the Barr Bulletin Board. LIST is described in the *Systems Integration Notes* booklet included with your BARR/SPOOL package.

The console log file includes diagnostic messages from the Barr software and other program activity as described below.

Startup Date and Date Change

When the software is started, and at midnight when the PC date changes, the following message on the console indicates the date:

```
BARR/SPOOL (C) Barr Systems, Inc. 1994   Version 94A1 01/31/1994
```

This message is useful for tracking the date of file activity in the console log file.

Send and Receive Activity

Messages on the console indicate when files are directed from a SEND device to a destination. For example:

```
SENDING: C:\JOB1 TO SPOOL
  CLOSE: C:\JOB1
```

Messages on the console indicate when data is received to a destination of **`(FILE)`**. For example:

```
WRITING: C:\DATA.001
  CLOSE: C:\DATA.001
```

When you exit the software, the console log ends with the total lines sent and received:

```
Lines received nnnnnnnnn   Lines sent nnnnnnnnn                      15:32:47
```

This is the same information that displays on the Status Line of the **Operation** screen. The console message allows you to keep a record in the console log file of the total send and receive activity. The maximum value for the counter is 999,999,999. If this number is reached, the counter will roll over to 0.

Printer Activity

Messages indicating printer activity are sent to the **LOG** destination. This feature is useful for sites that want to charge printing costs to customers.

Information is logged only for jobs which have a Barr file header. Jobs without a Barr file header are not logged. At completion of each print job, the destination device name, job name, and number of lines or pages printed is logged:

```
PRINTER LOG FOR LPT1      J=jobname   F=formname  f=fcbname            15:30:21
           0 LINES PRINTED AND                0 PAGES PRINTED.
```

The printer activity information displays in a fixed position on the message line and all numbers are right justified. The fixed location allows easy file searches for this information when using interactive editors or application programs.

If 0 lines are printed for a file, meaning the file is empty, a message is not included in the log.

Spool Activity

Spool activity can be included in the console log file. The option **Log operations to LOG device?** must be enabled on the **Print Spool Description** screen.

When files are printing from the print spool, print START and END messages, and REPRINT, DELETED, and RESTORED messages are displayed. If a file is deleted using the **`Print Spool`** screen and a retain directory is specified, a RETAINED message also is displayed. For example:

```
START SPOOL1: STOCKUPD.RPT to LPT1                                 15:35:09
  END SPOOL1: STOCKUPD.RPT to LPT1                                 15:38:23
```

NET Device Activity

When output is routed to a NET device destination, such as **`NET1`**, messages on the console indicate the source device and the actual print queue or device driver destination. For example, if you set **`SEND1→NET1`**, and you define **`NET1`** to write to the print queue **`PUBLISH`**, a message in this format will display:

```
START NET1: SEND1 output to PUBLISH
  END NET1
```

LAN Connection Device Activity

Messages on the console indicate when files are routed from a LAN Connection device, such as LAN1. For example:

```
SENDING: C:\LAN1DIR\JOB1.001 to LPT1
  CLOSE: C:\LAN1DIR\JOB1.001
```

If the LAN Connection retain feature is not used, a message will indicate that the file has been deleted:

```
ERASED: C:\LAN1DIR\JOB1.001
```

Buffer Shortages

When the number of DOS buffers available to BARR/SPOOL falls below 20, the following message displays:

```
Warning: less than 20 free buffers remain
```

This message indicates that you need to increase the value of **`Memory allocated for buffers`** under **`Tuning Data`**, **`Additional Parameters`**.

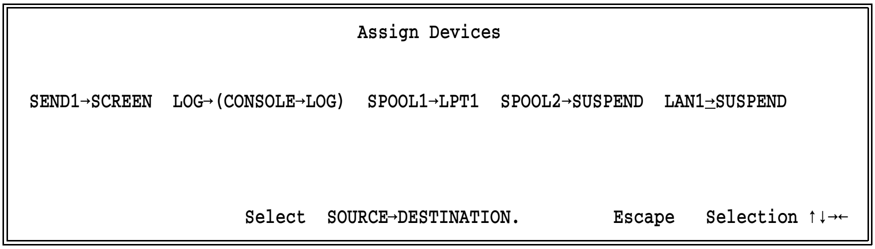
6.7 Assigning SPOOL as a Destination

Assign Devices is used to route files to the print spool directory and to route the print spool files to printers. This section tells you how to perform the two assignment steps. You must enter the **Print Spool Description** parameters before you can perform these steps.

On the **Assign Devices** menu, the destination device **SPOOL** represents the print spool directory and the source devices **SPOOL1-SPOOL8** are the Spool printers or filters.

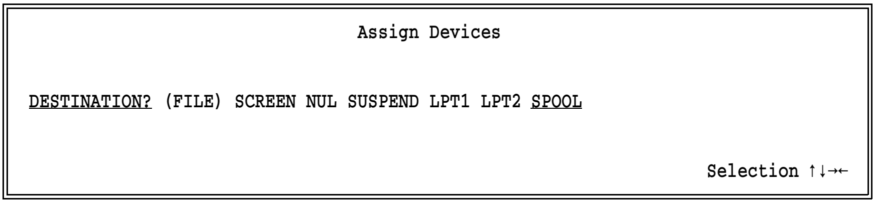
Direct Files to Spool

First, assign source devices to write to the destination **SPOOL**. The procedure for assigning **SPOOL** as a destination is similar to assigning **(FILE)** as a destination. From the **Assign Devices** menu:



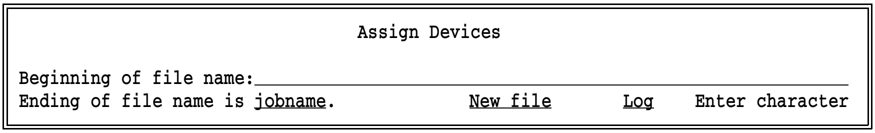
```
                              Assign Devices

 SEND1→SCREEN  LOG→(CONSOLE→LOG)  SPOOL1→LPT1  SPOOL2→SUSPEND  LAN1→SUSPEND



                Select  SOURCE→DESTINATION.       Escape   Selection ↑↓→←
```

➤ Select the source device, for example **LAN1**.



```
                              Assign Devices

 DESTINATION? (FILE) SCREEN NUL SUSPEND LPT1 LPT2 SPOOL

                                                         Selection ↑↓→←
```

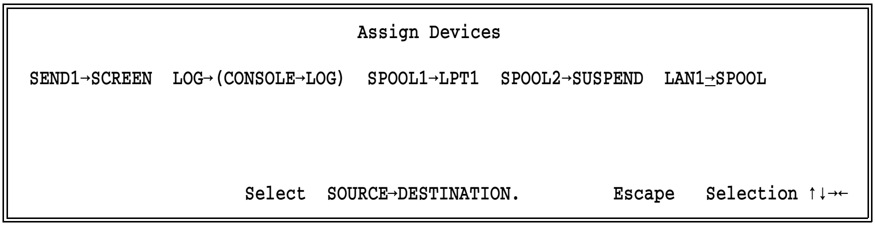
➤ Assign the source device to the destination **SPOOL**.



```
                              Assign Devices
Beginning of file name:___________________________________________________
Ending of file name is jobname.           New file      Log    Enter character
```

➤ Specify the file name and options. In this example, the **Beginning of file name** is blank and the **Ending of file name** selection is **jobname**.

When the destination is **SPOOL**, it is not necessary to include the file path in the **Beginning of file name**, because the path for the print spool directory is specified on the **Print Spool Description** screen. Refer to **Assigning (FILE) as a destination** for a description of the file name parameters.



```
                              Assign Devices

SEND1→SCREEN  LOG→(CONSOLE→LOG)  SPOOL1→LPT1  SPOOL2→SUSPEND  LAN1→SPOOL




                  Select  SOURCE→DESTINATION.        Escape   Selection ↑↓→←
```

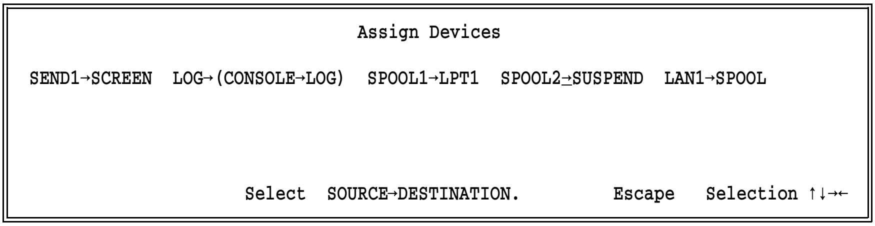
➤ When you press ENTER the screen reflects the assignment of **LAN1→SPOOL**.

Direct Spool Files to Printers

Next, assign the Spool printers to write to PC printers. The Spool printers are used as filters for routing files from the print spool directory to the desired printers.

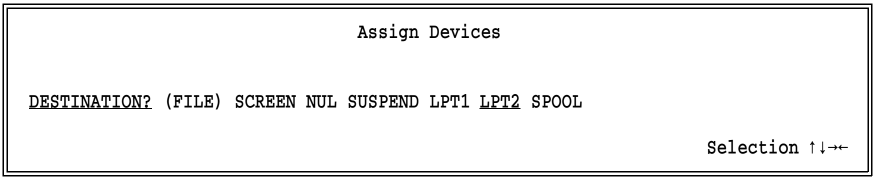
In this example, two Spool printers have been defined: **SPOOL1** and **SPOOL2**. The **SPOOL1** device is already defined to **LPT1**. Follow these steps to assign **SPOOL2** to **LPT2**.

➤ Select **Continue** to return the cursor to the assignment area.



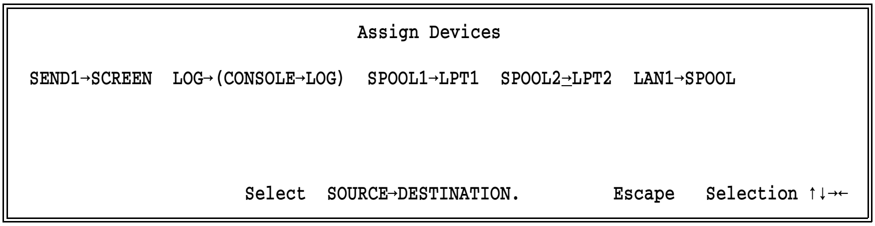
```
                              Assign Devices

SEND1→SCREEN  LOG→(CONSOLE→LOG)  SPOOL1→LPT1  SPOOL2→SUSPEND  LAN1→SPOOL




                  Select  SOURCE→DESTINATION.        Escape   Selection ↑↓→←
```

➤ Select **SPOOL2**.



```
                              Assign Devices


DESTINATION? (FILE) SCREEN NUL SUSPEND LPT1 LPT2 SPOOL

                                                            Selection ↑↓→←
```

- ➤ Select **LPT2**.



```
                              Assign Devices

SEND1→SCREEN  LOG→(CONSOLE→LOG)  SPOOL1→LPT1  SPOOL2→LPT2  LAN1→SPOOL



                     Select  SOURCE→DESTINATION.        Escape   Selection ↑↓→←
```

- ➤ When you press ENTER the screen reflects the new assignment.
- ➤ When you are finished making assignments, press ESC to return the **Installation Description** screen.

> ***Note:*** Avoid setting **Receive mode** on the source devices **SPOOL1-SPOOL8**, unless the destination is **TAPE**.

6.8 Receive Mode

Receive modes alter the format of the files received to the Barr PC from the data source. Only files which are *received* from a host (using option software) can be altered by a receive mode. Your choice for receive mode depends on how the data will be used after it is received to the PC. Some of the same options are available for both receive mode and send mode.

When assigning a receive mode, keep these points in mind:

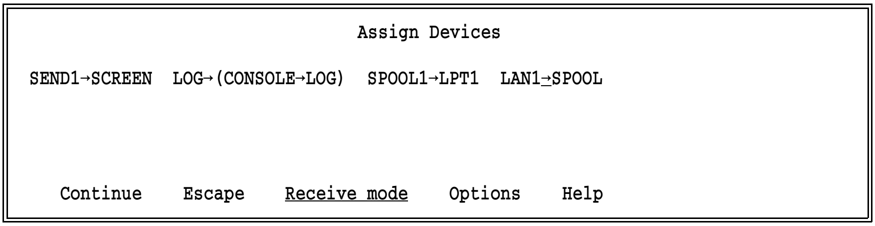
- Only the **Fixed Length** receive modes may be used for the **SEND**, **LAN**, and **SPOOL1-SPOOL8** source devices. Fixed length is useful for these sources only when the destination is **TAPE** (requires the BARR/TAPE option).
- None of the receive modes are valid with the **LOG** device.

The selected receive mode affects all files received on the source device. The receive mode may be changed during program operation.

Receive Mode Menu

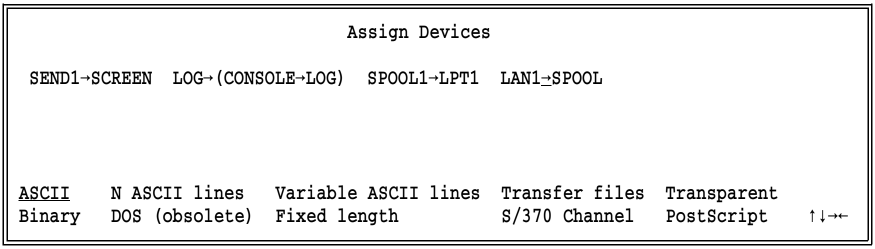
To reach the **Receive mode** menu:

- ➤ On the **Assign Devices** menu, assign the source device to a destination. A menu line displays at the bottom of the screen.



```
                          Assign Devices

SEND1→SCREEN  LOG→(CONSOLE→LOG)  SPOOL1→LPT1  LAN1→SPOOL



   Continue    Escape    Receive mode    Options    Help
```

➤ Select **Receive mode** from the menu line.



```
                          Assign Devices

SEND1→SCREEN  LOG→(CONSOLE→LOG)  SPOOL1→LPT1  LAN1→SPOOL



ASCII    N ASCII lines   Variable ASCII lines  Transfer files  Transparent
Binary   DOS (obsolete)  Fixed length          S/370 Channel   PostScript   ↑↓→←
```

➤ Select a receive mode from the list of choices on the lower portion of the screen. For example, select **ASCII**.

On the **Assign Devices** menu, an asterisk (*) displays next to the destination device when you select a receive mode other than **ASCII**. ASCII is the format used by most PC applications.

Receive Mode Choices

The **Receive mode** choices are described below.

ASCII

Default. Used for most PC applications. Required format for files printed on an ASCII printer. If the original file is in EBCDIC format, it is converted to ASCII format with ASCII carriage control codes (**CR**, **LF**, **FF**). The EBCDIC format is used by host computers. Refer to Appendix B, *ASCII and EBCDIC Standards*, for more information about these formats.

Binary

Data is in EBCDIC format. BARR/SPOOL discards carriage control. Most often **Binary** receive mode is used when the received data will not be printed. This type of data usually is received from a mainframe or an AS/400.

N ASCII lines

This receive mode is useful for receiving files with fixed-length records longer than 80 characters. (Fixed-length records are records of the same length.) Some host systems can transfer only 80-character records, and **N ASCII lines** allows you to work around this limitation. For records which are *not* an even multiple of 80 characters (160, 240, etc.) or have a length greater than 720 characters, **Variable ASCII lines** may be a better option.

Use of **N ASCII lines** requires writing a host program to divide each data set record into groups of 80-character lines. Each record must be divided into the same number (from 1-9) of lines, so that all records have the same length. Once the 80-character lines are received to the PC, the software rebuilds each record by combining the specified number of lines. The EBCDIC data from the host is converted to ASCII format with carriage return and line feed (**CR LF**) to indicate the end of each record but no form feeds (**FF**) to indicate page boundaries.

When you select **N ASCII lines**, you are prompted to specify the number of 80-character lines which should be combined into one record. Choices are **1-9**, where **9** allows a maximum record length of 720 characters.

DOS (obsolete)

The **DOS** format is an obsolete selection. It has been replaced by the **Transfer files** receive mode.

Variable ASCII lines

When receiving variable-length or fixed-length records which are shorter or longer than 80 characters, this receive mode may be useful. (Variable-length records are records of different lengths, while fixed-length records have the same length.) Some host systems can transfer only 80-character records. If you need to transfer records with a different length, the **Variable ASCII lines** selection allows you to work around this limitation. If records are an even multiple of 80 characters (160, 240, etc.), **N ASCII lines** may be a better option.

With the **Variable ASCII lines** selection, the software receives 80-character records from the host and rebuilds them to their original lengths. The EBCDIC data from the host is converted to ASCII format with carriage return and line feed (**CR LF**) to indicate the end of each record but no form feeds (**FF**) to indicate page boundaries.

Use of this feature requires writing a host program to divide all records into 80-character lines. The last portion of the record may have less than 80 characters if the record length is not an even multiple of 80. The host program must insert an EBCDIC vertical bar (**|**), or hexadecimal **4F**, at the end of each record.

For example, a 120-character record would be divided into two parts: an 80-character line, and a 40-character line which ends in a vertical bar. Once the data is received to the PC, the software rebuilds each record by combining lines until a vertical bar is encountered. The vertical bar is discarded along with any blanks that were added to pad the last portion of the record to 80 bytes.

Fixed length

This option is used for special applications, usually situations requiring that the received data contains records of a fixed-length. (Fixed-length records are records of the same length.) Applications for the **Fixed length** option include receiving data to magnetic tape and receiving data that will be processed by a PC program.

For the **SEND1-SEND2**, **LAN1-LAN4**, and **SPOOL1-SPOOL8** source devices **Fixed length** is the only receive mode that is supported. It is used for these devices only when writing to magnetic tape.

When you select **Fixed Length**, additional options display at the bottom of the screen. Refer to the section *Fixed Length Receive Mode* for a description of these options.

Transfer files

This receive mode is an internal, intermediate format that is used for general file transfer from PC-to-PC. Disregard this option for BARR/SPOOL.

S/370 Channel

When printing to an S/370 channel printer this receive mode is required. It is used only with the PRINT370 option (purchased separately) and is not valid for the Xerox 4235 printer. Data is converted to varying length binary records using the Realia COBOL format. This is different from the **Binary** receive mode. Binary in this context means data can contain any character from **00** to **FF**.

Carriage control

After selecting the **S/370 Channel** receive mode, you are prompted to select the type of **Carriage control**.

normal

Default. The carriage control received from the mainframe is used. This is the recommended option.

Machine

This option applies to data which has been formatted using a **RECFM=FB** or **RECFM=VB** in mainframe JCL. It is used when *all* jobs have a record format of **FBM** or **VBM** and the jobs do not print correctly using **Carriage control: normal**.

Refer to the *PRINT370* manual for additional information on **S/370 Channel** receive mode, especially for details on replacing a Xerox 871CM with the PRINT370 product.

Transparent

Data received to the PC is unaltered. Some applications require unaltered data.

Transparent format is valid only for SCS type data streams, namely data from 5250 printers (PRINT/TWINAX) and XPAF print streams. For example, **Transparent** receive mode allows you to use the **SCS Enabler** option on the Xerox 3700 printer and the **EBCDIC Parallel Meta/GHO Enabler-IB** option on the Xerox 4235 printer.

`PostScript`

This receive mode converts EBCDIC files to the PostScript format required for printing to PostScript printers. The form overlay files **`PORTRAIT`**, **`LAND`**, and **`2UP`** provided in the directory **`C:\BARR\REF\PSOVL\`** must be used with PostScript receive mode. The overlay files are used to set the printer in the desired mode and to define macros used by PostScript. Data converted to PostScript format is enclosed in parentheses. Carriage control such as **`CR`**, **`LF`**, and **`FF`** is converted to macro calls that are controlled by the overlay file. Carriage control is placed between data lines.

PostScript receive mode may be used only with source devices which support receive modes, such as **`LANn`**, and with destination devices that support form overlays, including **`LPTn`**, **`COMn`**, and **`NETn`**.

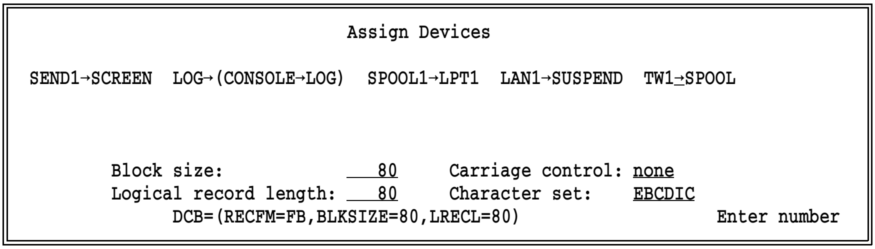
The overlay files contain some user-selectable options which may be changed by editing the overlay file. After making edit changes with a program editor, the overlay files should be placed in the forms overlay directory defined in **`Devices and Printers`**, **`Miscellaneous Printer Options`**. To activate the overlay, the name of the overlay file must be included in the file header.

> ***Note:*** Files received from destinations other than a host cannot be processed by **`PostScript`** receive mode. If you want to print files from other sources in PostScript format, the files must already be in PostScript format before they are received to the PC.

Fixed Length Receive Mode

The **`Fixed length`** receive mode is useful for special applications or situations which require data records to have a fixed length. You will most likely use this receive mode only with the BARR/TAPE option.

When you select **`Fixed length`** from the list of receive modes, the following options display at the bottom of the screen:



```
                               Assign Devices

SEND1→SCREEN  LOG→(CONSOLE→LOG)  SPOOL1→LPT1  LAN1→SUSPEND  TW1→SPOOL



       Block size:            __80     Carriage control: none
       Logical record length: __80     Character set:    EBCDIC
            DCB=(RECFM=FB,BLKSIZE=80,LRECL=80)                 Enter number
```

- ➤ Edit the parameters. Use the arrow keys to move around the screen.
- ➤ Press ENTER to keep your changes and ESC to return to the **Assign Devices** menu.

> ***Note:*** The last line on the screen beginning with **DCB=** contains the IBM JCL Data Control Block (DCB) description that would match your parameter selections.

Specify these **Fixed length** parameters:

Block size:

Specify the maximum length of blocks written to tape. The block size is ignored unless the destination is **TAPE**.

Logical record length:

Specify the total length of the fixed-length records including the ASA carriage control character, if any. The maximum value is 255.

If the **Character set** option is set to **ASCII variable** or **EBCDIC variable**, records will have a variable length. Set this option to the maximum value to prevent truncation of the variable-length records.

Carriage Control:

Specify the type of carriage control.

none

BARR/SPOOL discards carriage control characters.

ASA BARR/SPOOL converts SCS carriage control to ASA carriage control.

Character set:

Specify the character set to be used for the data.

EBCDIC

Data remains in EBCDIC format and is padded or truncated to fit the specified record length. Control characters included within transparent strings (**TRN**) are kept. Control characters outside of transparent strings are converted to carriage control or are discarded, including **CR**, **LF**, **FF**, **IRS**, **NL**, **VT**, **TRN**, **SEL**, **HT**, **BS**, and **CSP**. These characters are documented in Appendix B.

Data received in this format usually is written to magnetic tape or is processed by an application program. It is not usually printed.

ASCII

Data is converted from EBCDIC to ASCII, and records are padded or truncated to fit the specified record length. The ASCII data does not contain carriage return and line feed (**CR LF**) to indicate record boundaries or form feed (**FF**) to indicate page boundaries. Usually, this type of data will not be printed.

ASCII with CR LF

Data is converted from EBCDIC to ASCII, and records are padded or truncated to fit the specified record length. The ASCII data includes carriage return and line feed (**CR LF**) to indicate record boundaries but does not include form feed (**FF**) to indicate page boundaries. The record length should include two bytes for the **CR LF**. Usually, this type of data will not be printed.

ASCII variable

Data is converted from EBCDIC to ASCII. Records may have a variable length. Although records are not padded, any trailing blanks at the end of a record are deleted. The ASCII data includes carriage return and line feed (**CR LF**) to indicate record boundaries but does not include form feed (**FF**) to indicate page boundaries. Usually, this type of data will not be printed.

Retired mode

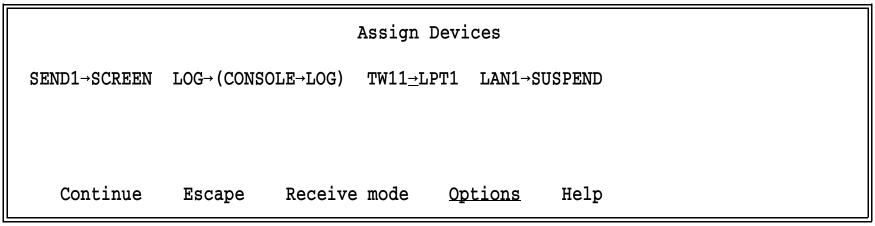
Not used. The receive mode at this location was removed. This option is used as a place holder, enabling older Barr configuration files to remain compatible.

EBCDIC variable

Data is received as variable-length EBCDIC records. Use of this mode prevents binary data from being padded with blanks when records shorter than 80 characters are received on the punch stream.

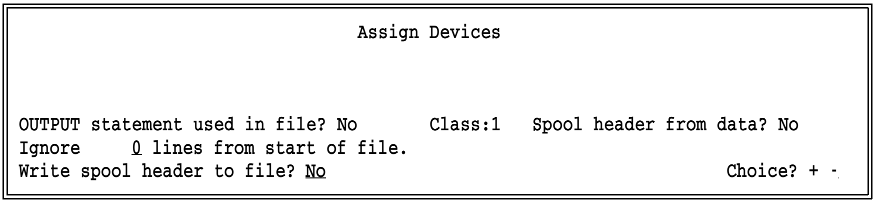
6.9 Options for Assign Devices

With the BARR/PRINT for LAT, PRINT/TWINAX, and BARR/PRINT for TCP/IP software options, several options may be used when making device assignments. The available options display when you select **Options** from the menu line at the bottom of the **Assign Devices** menu.



```
                              Assign Devices

 SEND1→SCREEN  LOG→(CONSOLE→LOG)  TW11→LPT1  LAN1→SUSPEND




    Continue    Escape    Receive mode    Options    Help
```

➤ Select **Options**.



```
                               Assign Devices



OUTPUT statement used in file? No      Class:1   Spool header from data? No
Ignore     0 lines from start of file.
Write spool header to file? No                                  Choice? + -
```

The available options are shown on the screen above. However, not all options may be used with all devices or all **Receive modes**. Additionally, some options which display are not valid in all cases, and some options cannot be used together in certain cases. The supported options may be set differently for each source device. In particular, options are not valid for the **LOG** and **SPOOL1-SPOOL8** source devices.

The selected options affect all files received on the source device. The options you select in the **Installation Description** are used each time the program is started. However, the options can be changed from **Assign Devices** during program operation.

OUTPUT statement used in file?

The Barr **OUTPUT statement** is used to provide information typically used for printing a file, including: JOBNAME, FORMNAME, FILENAME, COPIES, PRIORITY, and CLASS. This information is extracted from the file and placed in the file header. The OUTPUT statement is useful when other methods for obtaining file attribute information are not available.

Use of this feature requires altering the application program that produces the data to include the OUTPUT statement in the data file.

The OUTPUT statement is valid only for the following devices:

PORT_1	through	**PORT_8**	(BARR/PRINT for LAT)
PRT01	through	**PRT12**	(PRINT/TWINAX)
BARRTCP1	through	**BARRTCP12**	(BARR/PRINT for TCP/IP)

For additional details on the format of the file header, refer to section 1.2, *Barr File Header*.

No Default. The OUTPUT statement is not used.

Yes The information from the OUTPUT statement is extracted from the file and placed in the file header. Remember to include the OUTPUT statement in the file before the file is received to the PC.

- When the OUTPUT statement is enabled, all lines up to and including the OUTPUT statement are deleted from the file. To prevent deletion of data, put the OUTPUT statement at the beginning of the file, before the data.

> ***Note:*** If the OUTPUT statement is omitted from the file, all data from the file is deleted and a warning message displays on the console.

- In the OUTPUT statement, the word **OUTPUT** must begin in column 1, column 7 must be blank, and the parameters must be specified beginning in column 8. The statement must fit on one line in the file it cannot wrap to the next line. If the line length of the file is limited to 80 characters, you may not be able to specify all six of the parameters. The OUTPUT statement format is listed below:

```
OUTPUT JOBNAME=n FORMNAME=n FILENAME=n COPIES=n PRIORITY=n CLASS=n
```

- Specify only the parameters that you need. The parameters may be listed in any order. For example,

```
OUTPUT  FILENAME=taxdata  FORMNAME=taxes
```

- If **FILENAME** is specified, it will be used as the **Ending of file name**.

- Both the **Ending of file name is from file** feature and the **Assign Devices** option **Ignore n lines from start of file** can be used with the OUTPUT statement. For example, you may use **Ending of file name is from file** to extract the file name from the banner page and use the **OUTPUT** statement to assign a form name.

Class:

Use this option to assign a new default output Class to a file received on a given source device. A default Class assigned by the software displays in this field, but the default value may be changed. The Class can be a letter or number.

The selected **Class** value appears as an attribute for the file on the **Print Spool** screen and may be used as part of the criteria for routing Spool files to printers.

The Spool **File Attribute Table** described in section 5.3 also can be used to specify the file class.

Spool header from data?

This option allows you to extract a file's job name or form name from a text line in the file and include it in the file header. The **Spool header from data?** option is useful if other methods for obtaining file attribute information are not available, although it is not as reliable or flexible as the Barr **OUTPUT statement**.

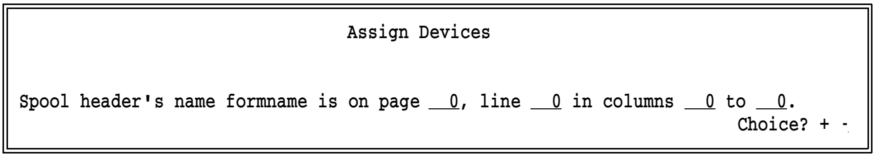
A file header can be placed on files input through any source device (except **LOG** or **SPOOL1-SPOOL8**) if the **Receive mode** is **ASCII**, **S/370 Channel**, **Transparent**, or **PostScript**. However, the information to be extracted must occur at the same location in every file.

For additional details on the format of the file header, refer to section 1.2, *Barr File Header*.

No	Default. Neither job name nor form name information is extracted from the file for use in the file header.
Yes	The form name or job name is extracted from a specified location in the received files and is placed in each file's header.

When you press ENTER, you are prompted to select **`formname`** or **`jobname`** and to specify the **`page`**, **`line`**, and **`column`** numbers where this information appears in the file text.

> ***Note:*** If a file contains no form feeds (**`FF`**), the software will search only the first 200 lines in the file for the specified file header information.



```
                                  Assign Devices


Spool header's name formname is on page __0, line __0 in columns __0 to __0.
                                                                Choice? + -
```

When the name is extracted from the specified location:

- Leading blanks are skipped.
- The file name is terminated if a blank is detected after a valid character within the column range. For example, if **`DAILY RPT`** is at the specified location, the file name will be **`DAILY`**.

In the file header, **`formname`** or **`jobname`** originates from the text, class is set from the **`Class`** option, and other fields have default values.

> ***Special Use:*** In exceptional cases, a form name or job name may not be obtainable by any of the usual options. For example, if files are received on the COM port the only available option is to obtain the form name from the data. However, you may not be able to alter the application program to include the **`OUTPUT statement`**. Also, if the form name is not in the same position in each of the received files **`Spool header from data?`** is not reliable.
>
> When no other alternatives are available, **`Spool header from data?`** can be used with the **`Class`** option to assign a one-character form name. To do this, set **`Class`** to a unique value and set **`Spool header from data?`** to **`Yes`** with a **`page`** number of **`0`**. The one-character **`Class`** value is then used as the form name and displays on the Print Spool screen as the form name for the file. The one-character form name can be used as criteria for printing the files, or it can be used to load a form overlay file containing printer control data. Many other header options are available, so this special feature should be used only as a last resort.

Ignore ___ lines from start of file.

This option allows you to delete a specified number of lines from the beginning of the file. The maximum value is **32767**. A common application for this option is to delete the first two records of a punch file: the blank card and the file separator card.

This option is valid only for the following source devices.

PORT_1	through	**PORT_8**	(BARR/PRINT for LAT)
PRT01	through	**PRT12**	(PRINT/TWINAX)
BARRTCP1	through	**BARRTCP12**	(BARR/PRINT for TCP/IP)

Write spool header to file?

When receiving data from a host to a destination of **(FILE)**, you can choose whether or not to include the file header in the file. The spool header contains information that is used for printing.

This option is valid only for the destination **(FILE)** and can be set independently for each source device. **Write spool header to file?** does not apply to print spool files, because spool headers are automatically included when the destination is **SPOOL**. The Barr file header is documented in section 1.2.

No Default. The file header is not included when the destination is **(FILE)**. This option is recommended if the data will not be printed.

Yes The file header is written to all files. The header information is used only with a receive mode of **ASCII**, **S/370 Channel**, **Transparent**, or **PostScript**.

Chapter

7

Monitor and Adapter

Specify parameters which affect how Barr software screens display on your PC monitor.

Contents

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Monitor and Adapter

BARR/SPOOL offers complete support for popular PC monitors and adapters. From the **Monitor and Adapter** screen you specify the type of monitor and monitor adapter installed in your PC. Additionally, you select the screen sizes for the OPER, DOS, SPOOL, and TAPE sessions used during software operation.

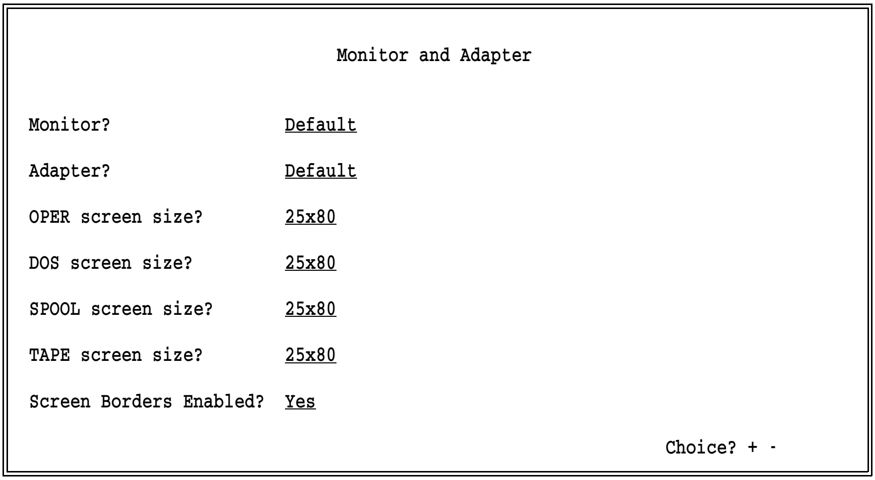
Supported Screen Sizes

With many adapters you can specify a screen display size larger than the 25 rows by 80 characters normally used on the PC. BARR/SPOOL supports screen sizes of 43 x 80, 50 x 80, and 44 x 132. Additional choices are available for some adapters.

For a 132-character display, a VGA adapter and a VGA monitor are required. PS/2 machines with built-in VGA adapters require a multiscan monitor in order to display 132 characters.

Monitor and Adapter Screen

From the **Installation Description** menu, select **Monitor and Adapter**. The following screen displays:



```
                          Monitor and Adapter


Monitor?                Default

Adapter?                Default

OPER screen size?       25x80

DOS screen size?        25x80

SPOOL screen size?      25x80

TAPE screen size?       25x80

Screen Borders Enabled? Yes

                                                     Choice? + -
```

Specify the following options:

Monitor?

Specify the type of monitor that is connected to your PC.

Default

The program automatically determines whether the monitor display is color or monochrome (black and white) from the current DOS **MODE** setting.

CGA Monitor compatible with the IBM Color Graphics Adapter (CGA), which has a low-resolution color screen with 320 x 200 lines.

EGA Monitor compatible with the IBM Enhanced Graphics Adapter (EGA), which has a resolution of 640 x 350 lines.

VGA Monitor compatible with the IBM Video Graphics Array Adapter (VGA), which has a resolution of 640 x 480 lines. Required for 132-column display.

Monochrome

Monitor that has only a two-color display, usually black and white.

Multiscan

Monitor with multiple scan rates that automatically adjusts to the adapter scan rate. PS/2 machines with built-in VGA adapters require a multiscan monitor in order to display 132 characters.

Adapter?

Specify which type of PC video adapter is used with the monitor.

Default

The default choice causes the program to determine the adapter type. The program automatically determines if the adapter is the IBM Monochrome Display Adapter, IBM Color Graphics Adapter (CGA), IBM Enhanced Graphics Adapter (EGA), or the IBM Video Graphics Array Adapter (VGA). Default is always a valid selection.

To take advantage of a larger screen size, select the adapter type that matches your adapter from the list of other choices:

```
Everex/EV-659
Paradise/VGA
Tseng EVA/480
VGA Wonder
Genoa SVGA/6300
US Video VGA
STB VGA EM-16
Tecmar VGA
PowerGraph VGA
PowerView VGA
VgaWonder 1024
Trident SVGA
Paradise 1024
```

`OPER screen size?`

Specify the size of the **`Operation`** screen. The Communication Scope, Status Line, console messages, and Operation menu display on this screen.

`DOS screen size?`

Specify the size of the screen used for the DOS session. The DOS session displays the DOS prompt.

`SPOOL screen size?`

Specify the size of the **`Spool`** screen, if you enabled the Print Spool feature. Files in the Spool queue are displayed and managed on this screen.

`TAPE screen size?`

Specify the size of the **`Tape`** session screen. The tape session is used to manage reading and writing of magnetic tapes and is available only with the BARR/TAPE option.

> ***Screen Size Selections:*** Screen size choices depend on your selections for **`Monitor`** and **`Adapter`**. If the selected screen size is incompatible with the actual monitor or adapter, the program will use a smaller screen size.

`Screen Borders Enabled?`

Specify whether to use screen borders.

`Yes`	Default. Borders display around the edge of the screen.
`No`	Screen borders do not display. This option may be required with some external screen saver programs to ensure that the screen goes blank. If borders are enabled, some screen savers change the entire screen to the color of the border.

Chapter

8

Startup Screen Notes

Enter optional user notes that display on the PC screen each time the program is started.

Contents

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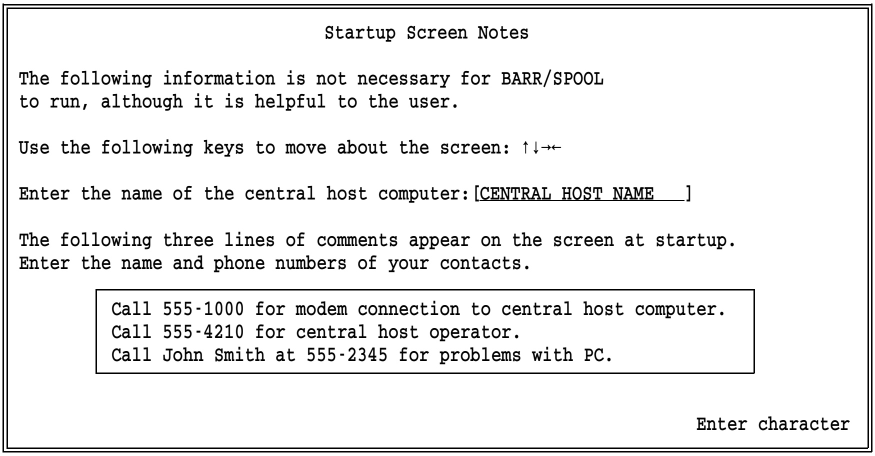
Chapter

8

Startup Screen Notes

This screen allows you to display optional information about a host computer. It is designed for you to include the name of any host computer with which you are communicating and the telephone numbers to call if you need assistance. The host name and phone numbers entered here display on the PC screen at program startup, before the host connection is made.



```
                              Startup Screen Notes

The following information is not necessary for BARR/SPOOL
to run, although it is helpful to the user.

Use the following keys to move about the screen: ↑↓→←

Enter the name of the central host computer:[CENTRAL HOST NAME    ]

The following three lines of comments appear on the screen at startup.
Enter the name and phone numbers of your contacts.

         Call 555-1000 for modem connection to central host computer.
         Call 555-4210 for central host operator.
         Call John Smith at 555-2345 for problems with PC.


                                                         Enter character
```

Data Entry Instructions

The first two sentences on the screen contain hints for entering the startup information.

Host Computer Name

The third line on the screen contains an entry blank for entering a host computer's name. If you are not using a host computer with BARR/SPOOL, you could enter a name for the PC, such as **`Barr PC`**. The name you enter here displays on the first line of the **`Operation`** screen when the program is started, and will continue to display during program operation. For more information about the Operation screen, refer to Chapter 13.

➤ Enter the name of your host within the brackets.

Help Desk Phone Numbers

Next, enter phone numbers for the appropriate help desks. If any communication problems are encountered, these numbers tell the PC operator whom to contact for assistance. You may want to include the phone number for the help desk at the host computer as well as the phone number for PC support. These numbers display at the top of the BARR/SPOOL console, below the Communication Scope and Status Line, when the program is started. The information displays on the screen until the host connection is made.

- ➤ In the box at the bottom of the screen, enter the names of contact persons and their phone numbers.
- ➤ Press ENTER when you are done to store your changes and return to the `Installation Description` screen.

If you do not plan to enter this information for your site, blank out the default information, because it is fictitious.

Chapter

9

Tuning Data

Adjust tuning parameters affecting data format, printer forms, and program performance.

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Chapter

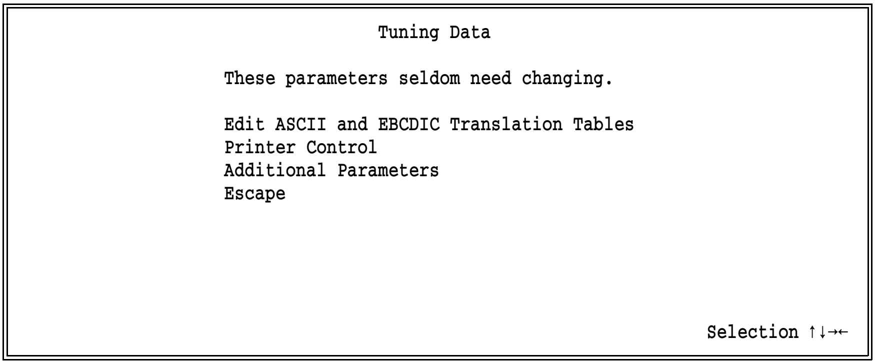
9

Tuning Data

The default values for the Tuning Data parameters work for many customers. However, if you have sophisticated applications or are experiencing problems, review this chapter to learn about the variety of tuning parameters available.

Tuning Data Menu

To reach the tuning parameters, from the **`Installation Description`** menu select **`Tuning Data`**. The following menu displays:



```
                           Tuning Data

                These parameters seldom need changing.

                Edit ASCII and EBCDIC Translation Tables
                Printer Control
                Additional Parameters
                Escape







                                                   Selection ↑↓→←
```

A brief description of each menu choice is given below. Detailed instructions for each option are presented in the sections which follow.

`Edit ASCII and EBCDIC Translation Tables`

Change the translation of characters from ASCII to EBCDIC format, and vice versa. This feature also allows you to change the language for the character set from English to one of several other languages.

`Printer Control`

Select options which control printer forms and form overlays and adjust parameters which affect the print data.

Additional Parameters

Adjust other options that affect BARR/SPOOL operation, including the amount of PC memory allocated. Additionally, certain program features may be disabled from this screen.

9.1 Edit ASCII and EBCDIC Translation Tables

On the PC, characters are coded using the ASCII coding system. However, the IBM mainframe (or host) computer and devices designed for the mainframe (such as the AS/400) use the EBCDIC coding system. When files are sent from the PC to the host device, the characters must be translated from the ASCII coding system to the EBCDIC coding system. When files are received to the PC from the host device, characters must be translated from EBCDIC to ASCII.

The Barr software performs these translations using the ASCII and EBCDIC translation tables discussed in this section. These tables may be altered to customize data translation for your application. Most users do not need to change the data translation. Usually the translation tables are altered to change the language character set or to process special characters for print applications.

See Appendix B for a complete description of the ASCII and EBCDIC character sets and their standard translations.

Restrictions for Using Translation Tables

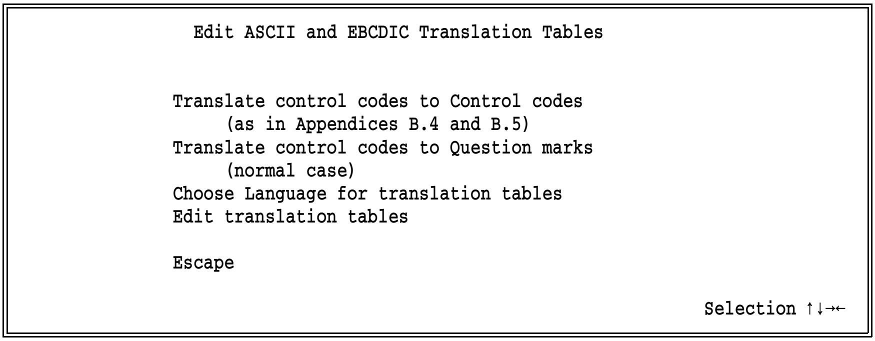
The translation tables do not affect all data processed by the Barr software. The following restrictions apply:

- Carriage control characters are not translated by the translation tables. These characters are processed separately, based on the Receive mode selected under Assign Devices.
- Data will not be translated by the translation tables if any of the following Receive modes is selected:

  Binary
  Fixed Length EBCDIC
  S/370 Channel
  Transparent

Translation Table Menu

To reach the translation tables in the software, from the **Tuning Data** menu, select **Edit ASCII and EBCDIC Translation Tables**.



```
              Edit ASCII and EBCDIC Translation Tables


            Translate control codes to Control codes
                 (as in Appendices B.4 and B.5)
            Translate control codes to Question marks
                 (normal case)
            Choose Language for translation tables
            Edit translation tables

            Escape

                                                Selection ↑↓→←
```

Select from the following options:

Translate control codes to Control codes

If you include control characters in the data to use special features of your printer, select **Translate control codes to Control codes**. This selection allows control codes which are embedded in the data to be translated. (Do not confuse control codes that are embedded in the data with control codes that precede data records. Control codes which precede data records are processed differently and do not go through the translation tables.)

For example, the HP LaserJet printer uses escape sequences to print boldface text or use different fonts. If you embed these types of codes in the data, the codes will be translated according to the translation tables in the software.

When transferring data from the PC to the host device, ASCII control characters **00-1F** are converted to EBCDIC control characters, as documented in section B.4. When data is received to the PC from the host device, EBCDIC control characters **00-3F** are converted to ASCII control characters as documented in section B.5. The translation tables in the software are altered if you select this option.

A message indicating your selection displays on the lower half of the screen:

```
The translation tables have been modified
to translate control codes to control codes.

You can select 'Edit translation tables' to see
these changes or to make additional changes.
```

Translate control codes to Question marks

Use this selection if you do not want control codes which are embedded in the data to be converted from ASCII to EBCDIC or vice versa. This is the default choice. Normally, control codes are not embedded in the data records. This option is useful if you want to flag any control codes that occur in the data. (Do not confuse control codes that are embedded in the data with control codes that precede data records. Control codes which precede data records are processed differently and do not go through the translation tables.)

Translate control codes to Question marks converts all control codes embedded in the data to question marks (**?**). In the software, entries `00-1F` of the ASCII-to-EBCDIC table and entries `00-3F` of the EBCDIC-to-ASCII table are altered if you select this option.

Select **Translate control codes to Question marks** before using the **Edit translation tables** option.

A message indicating your selection displays on the lower half of the screen.

```
The translation tables have been modified
to translate control codes to question marks.

You can select 'Edit translation tables' to see
these changes or to make additional changes.
```

Choose Language for translation tables

This feature allows you to modify the ASCII-to-EBCDIC and EBCDIC-to-ASCII translation tables for use with native language character sets. This feature is described later in this section.

`Edit translation tables`

This feature allows you to manually modify entries in the ASCII-to-EBCDIC and EBCDIC-to-ASCII translation tables. It is described later in this section.

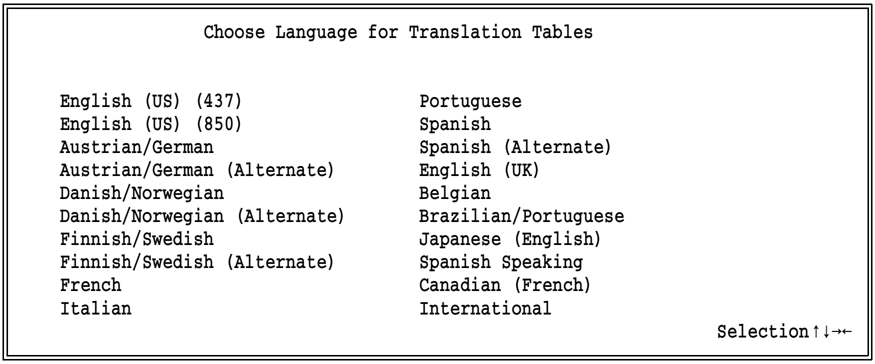
Choose Language for Translation Tables

This feature allows you to select the ASCII-to-EBCDIC and EBCDIC-to-ASCII translation tables for use with native language character sets.

IBM has defined various *code pages* which are variations of either ASCII or EBCDIC and contain extra symbols for particular languages or nationalities. The extra symbols are different for each language, so a different code page is used for each language.

Follow the steps below to install the correct code page on your PC and to select the corresponding character set in the Barr software.

1. Determine which ASCII code page to use on your PC. Barr software supports code pages 437 (US) and 850 (multilingual). Code page 850 contains the symbols from all other non-US ASCII code pages and was designed to replace the other non-US code pages. Code page 437 is the default for most PCs.
2. Install the selected ASCII code page on your PC using DOS version 3.3 or later. Consult the chapter in your DOS manual that discusses Code Page Switching. For the U.S. English character set, use ASCII code pages 437 (US) or 850 (multilingual). At this time you may also want to install support for a non-U.S. keyboard. Keyboard installation instructions are described in your DOS manual.
3. In the Barr software indicate which EBCDIC code page you are using. From the **`Edit ASCII and EBCDIC Translation Tables`** menu, select **`Choose Language for translation tables`**. The following screen displays:



```
                 Choose Language for Translation Tables


     English (US) (437)                 Portuguese
     English (US) (850)                 Spanish
     Austrian/German                    Spanish (Alternate)
     Austrian/German (Alternate)        English (UK)
     Danish/Norwegian                   Belgian
     Danish/Norwegian (Alternate)       Brazilian/Portuguese
     Finnish/Swedish                    Japanese (English)
     Finnish/Swedish (Alternate)        Spanish Speaking
     French                             Canadian (French)
     Italian                            International
                                                         Selection↑↓→←
```

The choices listed on this screen correspond to EBCDIC code pages documented in the IBM publication GA23-0061, *IBM 3270 Information Display System 3274 Control Unit Description and Programmer's Guide, Appendix D: APL/Text Feature.* The list of languages and translation standards in the Barr software are updated as new international standards emerge.

5. Select the language used by your application and press ENTER. For English, there are two selections; choose the one that matches the ASCII code page installed on your PC. All other languages require ASCII code page 850.
6. After you make a selection, a message displays indicating the selected language. For example, if you select **Austrian/German(Alternate)**, the following message displays:

```
The translation tables have been modified
for language 'Austrian/German(Alternate)'.

You can select 'Edit translation tables' to see
these changes or to make additional changes.
```

Edit Translation Tables

Typically, you do not need to edit the translation tables. Table changes are needed only for special applications or printing needs. For example, if your printer does not print lowercase letters, you can change the translation tables to convert lowercase letters to uppercase letters.

When you select the **Edit translation tables** option, the translation tables display and can be edited. One ASCII-to-EBCDIC table and two EBCDIC-to-ASCII tables are available for editing. **ASCII to EBCDIC table one** is used when printing ASCII data on a S/370 printer using the PRINT370 option. **EBCDIC to ASCII table one** and **EBCDIC to ASCII table two** may be used when receiving data from an AS/400 using the PRINT/TWINAX option.

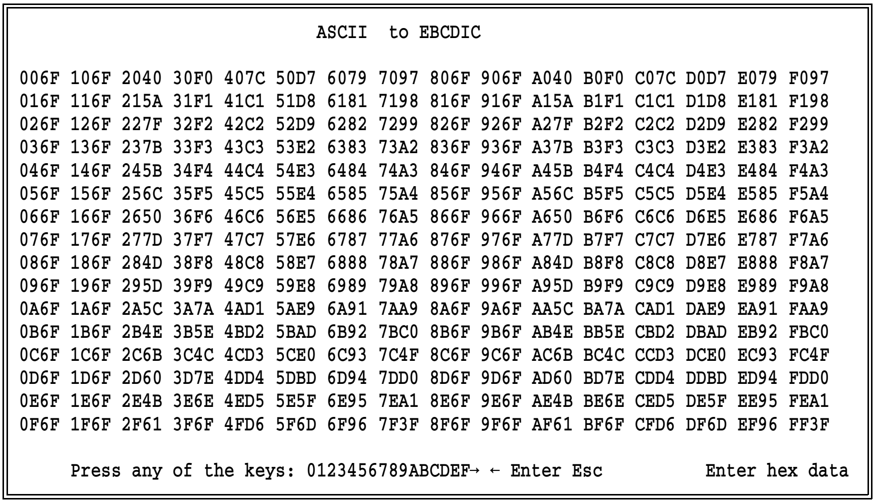
> ***Note:*** The two EBCDIC-to-ASCII tables are not identical. Refer to section B.5 for a list of the differences between table one and table two.

> ***Note:*** If you need to use one of the first three options (**Translate control codes to Control codes**, **Translate control codes to Question marks**, or **Choose Language for translation tables**), you must do so before modifying the translation tables. If you select **Edit translation tables** then select one of the other options, changes you made to the translation tables may be overridden.

Accessing the Translation Tables

Follow these steps to reach the translation tables:

- ➤ Select **Edit translation tables**. The **ASCII to EBCDIC** translation table displays.



```
                               ASCII  to EBCDIC

006F 106F 2040 30F0 407C 50D7 6079 7097 806F 906F A040 B0F0 C07C D0D7 E079 F097
016F 116F 215A 31F1 41C1 51D8 6181 7198 816F 916F A15A B1F1 C1C1 D1D8 E181 F198
026F 126F 227F 32F2 42C2 52D9 6282 7299 826F 926F A27F B2F2 C2C2 D2D9 E282 F299
036F 136F 237B 33F3 43C3 53E2 6383 73A2 836F 936F A37B B3F3 C3C3 D3E2 E383 F3A2
046F 146F 245B 34F4 44C4 54E3 6484 74A3 846F 946F A45B B4F4 C4C4 D4E3 E484 F4A3
056F 156F 256C 35F5 45C5 55E4 6585 75A4 856F 956F A56C B5F5 C5C5 D5E4 E585 F5A4
066F 166F 2650 36F6 46C6 56E5 6686 76A5 866F 966F A650 B6F6 C6C6 D6E5 E686 F6A5
076F 176F 277D 37F7 47C7 57E6 6787 77A6 876F 976F A77D B7F7 C7C7 D7E6 E787 F7A6
086F 186F 284D 38F8 48C8 58E7 6888 78A7 886F 986F A84D B8F8 C8C8 D8E7 E888 F8A7
096F 196F 295D 39F9 49C9 59E8 6989 79A8 896F 996F A95D B9F9 C9C9 D9E8 E989 F9A8
0A6F 1A6F 2A5C 3A7A 4AD1 5AE9 6A91 7AA9 8A6F 9A6F AA5C BA7A CAD1 DAE9 EA91 FAA9
0B6F 1B6F 2B4E 3B5E 4BD2 5BAD 6B92 7BC0 8B6F 9B6F AB4E BB5E CBD2 DBAD EB92 FBC0
0C6F 1C6F 2C6B 3C4C 4CD3 5CE0 6C93 7C4F 8C6F 9C6F AC6B BC4C CCD3 DCE0 EC93 FC4F
0D6F 1D6F 2D60 3D7E 4DD4 5DBD 6D94 7DD0 8D6F 9D6F AD60 BD7E CDD4 DDBD ED94 FDD0
0E6F 1E6F 2E4B 3E6E 4ED5 5E5F 6E95 7EA1 8E6F 9E6F AE4B BE6E CED5 DE5F EE95 FEA1
0F6F 1F6F 2F61 3F6F 4FD6 5F6D 6F96 7F3F 8F6F 9F6F AF61 BF6F CFD6 DF6D EF96 FF3F

     Press any of the keys: 0123456789ABCDEF→ ← Enter Esc         Enter hex data
```

- ➤ Edit the table entries, or press ENTER to advance to the **EBCDIC to ASCII** translation tables.

Tips for Modifying Translation Table Entries

Follow these guidelines when making entries in the Translation Tables:

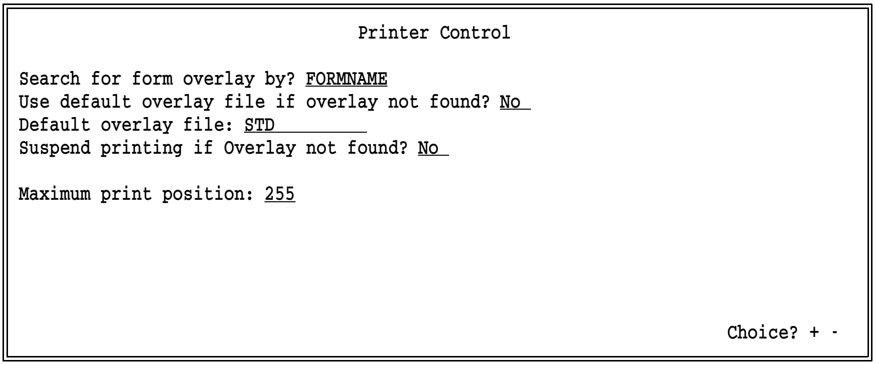
- The translation codes are arranged in columns. The current hexadecimal representation for a character is shown on the left side of each column. The translation for a character is shown on the right side of each column. The characters on the right side are the ones which can be modified.
- Use the UP ARROW and DOWN ARROW keys to move up and down the columns on the screen.
- To edit an entry, place the cursor on the entry and type over the translation.
- When you have finished making entries to a table, press ENTER to store your changes and advance to the next screen.
- If you want to abandon your changes for a table, press ESC. You are returned to the **`Edit ASCII and EBCDIC Translation Tables`** menu.

9.2 Printer Control

Printer Control parameters are used to specify additional features which affect print output, including form overlays and the maximum print line.

The options on this screen affect output files received on source devices.

To reach the Printer Control screen, from the **`Tuning Data`** menu select **`Printer Control`**:



```
                                Printer Control

Search for form overlay by? FORMNAME
Use default overlay file if overlay not found? No
Default overlay file: STD
Suspend printing if Overlay not found? No

Maximum print position: 255





                                                                Choice? + -
```

Options for Forms Overlay

A forms overlay directory may be specified for each LPT, COM, or NET Destination device. The directory is specified on the individual **Miscellaneous Printer Options** screen for each device. The overlay options described below, however, affect all of the devices for which an overlay directory is enabled.

Search for form overlay by?

This option controls the method used to search the forms overlay directory for an overlay file. The overlay file contains either an electronic printer form or other printer commands. When the print file is ready to be sent to the printer, the software searches the forms overlay directory for an overlay file. If an overlay file with the specified name is found it is automatically sent to the printer before the print file.

Overlay files must be named for the selected search method. In most cases, overlay files must *not* have a file extension.

The selected search name is included in a file using one of three methods:

- Use the Barr OUTPUT statement and enable **OUTPUT statement used in file?** (job name, form name, FCB name) under Assign Devices Options.
- Enable **Spool header from data?** (form name, job name) under Assign Devices Options.
- The PRT file header when submitting network files to Spool using the PRT program.

For example, if **Search for form overlay by?** is set to **FORMNAME**, you will create overlay files named for the form names of the print files. When a print file is received to the PC, the software obtains the form name from the file and stores it in the file header. When the file is ready to be sent to the printer, the software searches the forms overlay directory for an overlay file name that matches the form name.

`FORMNAME`
The form name for the file is used as the overlay search name.

`FCBNAME`
The FCB name for the file is used as the overlay search name. Usually this option is used only with files received from an IBM mainframe.

`FCB+UCS`
The FCB and UCS names, usually consisting of four characters each, are combined to create the search name. Usually this option is used only with files received from an IBM mainframe.

`UCSNAME`
The UCS print train name from the host PDIR record is used as the overlay search name. Usually this option is used only with files received from an IBM mainframe.

`UCS FCB`
This selection causes the software to load two form overlay files. Usually this option is used only with files received from an IBM mainframe.

`JOBNAME`
The job name for the file is used as the overlay search name.

`Use default overlay file if overlay not found?`
Specify whether to use a default overlay file if the specified overlay file is not found in the forms overlay directory.

`No` Default. Use this option if overlay files are not required for all print files or if you prefer to suspend printing by using the option **`Suspend printing if Overlay not found?`**

`Yes` If you want each print file to use an overlay file, specify this option. Use the next option, **`Default overlay file`**, to specify the name of the default overlay file. If the default overlay file can be used for most files, you can define fewer overlay files. Otherwise, the default overlay file can be used to supply default information in case an overlay definition is accidentally omitted.

Default overlay file:

If the previous option, **Use default overlay file if overlay not found?**, is set to **Yes** specify the name of the default overlay file. Remember to create the default overlay file and put it in the overlay directory. **STD** (standard) is a good choice for the default overlay name.

Suspend printing if Overlay not found?

Choose whether to suspend the source device if an overlay file is not found.

No Default. Select this option if:

- Overlay files are not required for all print files, or
- You have enabled the option **Use default overlay file if overlay not found?** and defined a default overlay file.

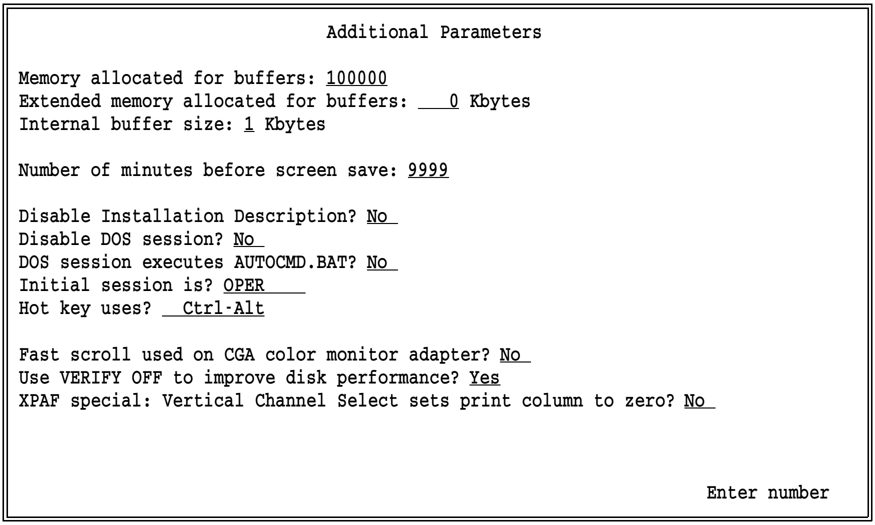
Yes If an overlay file is not found, the source device is set to **SUSPEND**. Operator intervention is required before any print files can be sent to the printer using the specified source device.

Maximum print position:

Specify the maximum print position on a line. As a file is received to the PC, if characters on a line exceed the specified maximum the software will wrap the extra characters to the next line. The maximum length is **255** print characters, but you can lower this value for your application. For example, if data lines contain 255 characters but your printers support a maximum of 132 characters per line, set this value to **132**.

9.3 Additional Parameters

The **Additional Parameters** screen contains a variety of parameters that affect program operation. The first two parameters on this screen are used for allocating PC memory and are the most significant parameters. Several other parameters may be used to disable operator access to certain program features. The remaining parameters are used to adjust other program features.



```
                         Additional Parameters

Memory allocated for buffers: 100000
Extended memory allocated for buffers:    0 Kbytes
Internal buffer size: 1 Kbytes

Number of minutes before screen save: 9999

Disable Installation Description? No
Disable DOS session? No
DOS session executes AUTOCMD.BAT? No
Initial session is? OPER
Hot key uses?   Ctrl-Alt

Fast scroll used on CGA color monitor adapter? No
Use VERIFY OFF to improve disk performance? Yes
XPAF special: Vertical Channel Select sets print column to zero? No



                                                        Enter number
```

`Memory allocated for buffers:`

Specify the amount of PC conventional memory, measured in bytes, that BARR/SPOOL may allocate for buffers. Memory buffers are used for temporary storage of data during software operation. Each software feature has individual memory requirements, so the amount of memory required for operating BARR/SPOOL depends on the features you enable during software installation. (This value does not include the amount of memory required to load the software, or the amount of memory needed for the BARR/SPOOL DOS session.) The default value which displays depends on the software options you purchased. This value seldom needs changing. Try using the software before adjusting this value.

If it is necessary to increase or decrease the amount of **`Memory allocated for buffers`**, change the value a little at a time on a trial-and-error basis and test that the software still operates after each change. The software has a minimum requirement for conventional memory buffers and will not operate if this allocation is too low. However, the minimum value is impossible to calculate.

If the value for conventional memory buffers is larger than the amount of memory available on your PC when BARR/SPOOL is loaded, the software will use all of the available memory. Low memory conditions such as this may result in too little memory to use the BARR/SPOOL DOS session.

`Extended memory allocated for buffers:`

This option allows you to use memory past the one megabyte range normally defined for DOS. To use extended memory support with the Barr software, a device driver must be loaded which supports the *Microsoft, Lotus, Intel, and AST Research Extended Memory Specification (XMS), version 2.0 1988.* HIMEM and QEMM386 are two memory managers which support this specification.

Use of extended memory is especially helpful if your Barr software configuration requires more than 100,000 bytes of conventional memory buffers (specified with the **`Memory allocated for buffers`** parameter). For example, if you are driving several printers simultaneously or are using the BARR/TAPE software option you may need to allocate extended memory. Extended memory also is useful if there is not enough conventional memory available to use the DOS session.

The default amount of extended memory buffers is **`0`**. Increase this amount as needed. If you increase **`Extended memory allocated for buffers`** you may want to decrease **`Memory allocated for buffers`** to free up conventional memory for the DOS session. Other software features can use extended memory buffers, but the DOS session requires conventional memory.

When lowering the amount of **`Memory allocated for buffers`**, decrease the value a little at a time on a trial-and-error basis and test that the software still operates after each decrease. The software has a minimum requirement for conventional memory buffers and will not operate if the allocation is too low. However, the minimum value is not possible to calculate.

Note that in the software, conventional memory (**`Memory allocated for buffers`**) is measured in *bytes*, while extended memory allocated for buffers is measured in *K bytes* (1024 bytes).

As a rule, the increase in extended memory buffers should be greater than the decrease in conventional memory buffers, because extended memory buffers use some conventional memory buffers as overhead. However, the value for extended memory buffers does not need to exceed the original value for conventional buffers (the value before extended memory buffers were added and conventional memory buffers were decreased). The amount of extended memory buffers should be kept within 50-100 K bytes of the original amount of conventional memory. For example, if you were using 200,000 bytes of conventional memory, try setting the amount for extended memory buffers to 100-150 K bytes and the value for conventional memory buffers to 100,000 bytes.

Do not set the amount of **Extended memory allocated for buffers** to values of **500** K bytes or greater, even if that much extended memory is available. This would be an excessive amount and could use between 100-300 conventional memory buffers as overhead. Additionally, **100000** is the minimum value recommended for **Memory allocated for buffers** even when using extended memory buffers.

If you allocate more extended memory buffers than are available, you will see the following message at program startup, indicating the actual number of extended memory buffers available:

```
Only nnnn K bytes of extended memory is available for use
```

If you over-allocate extended memory buffers, meaning the overhead required for the extended memory buffers exhausts the amount of conventional memory, you will see this message:

```
XMS Buffers Not Allocated - Not Enough Real Memory
```

Internal buffer size:

This option allows users to increase the internal buffer size in BARR/SPOOL. The possible values are **1**, **2**, and **4** kilobytes. Increasing this value allows faster performance when using LAN Connections, especially when using the BARR/400 option, driving multiple high-speed printers, or running on a slow network. Memory allocated for buffers is increased automatically with this value, leaving less memory available for the DOS session.

Number of minutes before screen save:

Specify the number of minutes the screen may display before the display is cleared. The screen save feature is useful for increasing the screen life of the PC monitor. The screen life may be shortened if the screen display is constant, especially in cases where the software runs 24-hours a day.

After the specified time has elapsed, the screen clears. However, the screen can be re-displayed at any time by pressing any key on the keyboard. For example, if you specify a period of **10** minutes, after displaying for 10 minutes the screen will blank. Clearing the screen does not interfere with normal operation of the program.

If the number of minutes before screen save is set to **0**, the screen will blank after displaying for only one second. In this case, to view the software screens for more than one second you must hold the SHIFT, CTRL, or ALT key. The screen displays until you release the key.

This feature may not work with all display adapters. Supported adapters include IBM monochrome, IBM CGA, and IBM PS/2 VGA. The IBM EGA adapter does not support this feature.

Disable Installation Description?

Choose whether to disable the Installation Description. This prevents PC users from viewing or changing the installation parameters.

No The Installation Description is not disabled. PC users may access the installation screens.

Yes Disable access to the Installation Description screens to prevent users from viewing or changing the software configuration. Make a backup copy of the BARR/SPOOL software before disabling the Installation Description, because you will not be able to view or modify the installation parameters in the copy of software in which the Installation Description is disabled.

Disable DOS session?

Choose whether to disable the BARR/SPOOL DOS session. This feature can be used to save PC memory and to prevent PC users from accessing DOS.

No Default. The DOS session can be accessed, providing enough PC memory is available.

Yes The DOS session is disabled. This is useful if you need to free up memory for other program features or to prevent operators from reaching DOS while the Barr software is running. Unless you also set **Disable Installation Description** to **Yes**, the operator can re-enable the DOS session from the **Additional Parameters** screen.

DOS session executes AUTOCMD.BAT?

Select whether BARR/SPOOL will automatically run a batch process each time you change to the DOS session. This feature can be used to automatically run an applications program in background DOS.

No Default. A batch process is not automatically run from the DOS session.

Yes The batch file **AUTOCMD.BAT** is immediately executed if BARR/SPOOL is started in the DOS session or if you switch to the DOS session during operation. You must create a file named **AUTOCMD.BAT** that contains the desired DOS commands. The file must be placed in the same directory as the **SPOOL.EXE** program file.

Initial session is?

Select which session displays as the initial session when BARR/SPOOL is started. Sessions can be changed using the **Sessions** command on the **Advanced** menu or by using hot-keys. Refer to Chapter 13, *BARR/SPOOL Operation*, for more information about changing sessions.

OPER

Default. When BARR/SPOOL is started, it begins in the Operation session. The **Operation** screen displays.

DOS

BARR/SPOOL starts in the DOS session. The DOS prompt displays.

PRINT

BARR/SPOOL starts in the Print Spool session. The **Print Spool** screen displays.

Session1-Session4

Sessions 1 - 4 are 3270 sessions. These selections are valid only if you have 3270 software.

GATE

The GATE session is valid only for BARR GATEWAY software. Ignore this selection for BARR/SPOOL.

TAPE

The TAPE session for the BARR/TAPE option has not yet been implemented.

Hot key uses?

This option allows you to use an alternate hot-key to change sessions. Choices are:

Ctrl-Alt (Default)
Ctrl-Shift
Alt-Shift

Fast scroll used on CGA color monitor adapter?

Choose whether to use fast screen scrolling for CGA color display adapters.

No Default. The screen blinks each time new data scrolls onto the screen. This slows the rate that data scrolls across the screen.

Yes The screen scrolls fast without blinking. Use of this selection with some IBM color adapters will cause snow to display on the screen.

Use VERIFY OFF to improve disk performance?

This option can be used to enhance disk performance by as much as 60%.

Yes Default. The DOS **verify** function is disabled while BARR/SPOOL is running. When the software writes data to the PC disk it does not read back the data to verify that it was written correctly. Disabling **verify** results in increased disk performance.

No The DOS **verify** function is enabled for disk write operations. When the Barr software writes to the PC disk it immediately reads back the data to verify it.

XPAF special: Vertical Channel Select sets print column to zero?

This parameter does not apply to BARR/SPOOL.

Notes:

Chapter

10 Exit and Save Changes

Exit the Installation Description. You have the option to save the installation parameters to the program file or to a configuration file.

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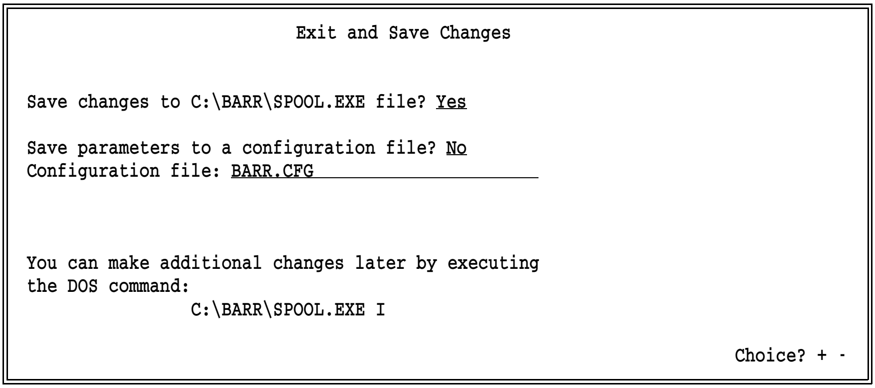
Chapter

10 Exit and Save Changes

When you finish entering the BARR/SPOOL configuration parameters, select **`Exit and Save Changes`** from the **`Installation Description`** menu. This option is used to write your configuration changes to the program file or to a separate configuration file. The installation changes will be lost unless you use this option.

10.1 Exit Parameters

When you select **`Exit and Save Changes`**, the following screen displays:



```
                              Exit and Save Changes


 Save changes to C:\BARR\SPOOL.EXE file? Yes

 Save parameters to a configuration file? No
 Configuration file: BARR.CFG______________________



 You can make additional changes later by executing
 the DOS command:
                C:\BARR\SPOOL.EXE I

                                                                Choice? + -
```

After you enable one of the options on this screen and press ENTER, your changes to the Installation Description are saved. The options on this screen are described below.

`Save changes to C:\BARR\SPOOL.EXE file?`

Select whether to save your configuration changes to the program file. Your changes must be saved either to the program file or to a configuration file, or they will be lost. Note that the option displays the directory path where the program file is located.

`Yes` Default. Save your changes to the program (**`.EXE`**) file.

`No` Do not save your changes to the program file.

`Save parameters to a configuration file?`

Select whether to save the configuration parameters to a separate file.

`No` Default. Changes are not written to a separate configuration file.

`Yes` Configuration changes are saved to a file. Enter the name of the configuration file below.

When you start the BARR/SPOOL program, you may specify the name of a configuration file which contains the desired installation parameters. The program will use the parameters in the configuration file instead of any parameters you saved to the program file. Additional information about configuration files is given in section 10.4, *Using Configuration Files.*

Configuration files have several possible applications:

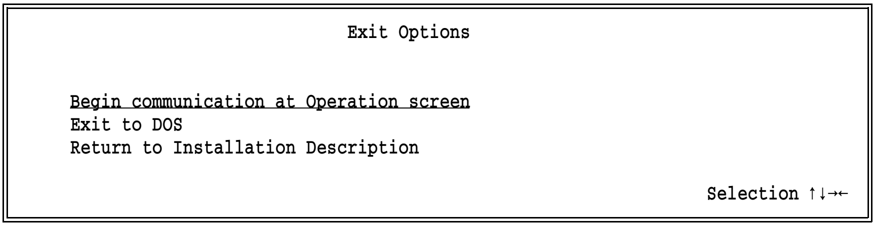
- A configuration file may be used to move your configuration settings to a new version of the program.
- Configuration files can be used to change the way the software functions during different times of the day. For example, you may want the software to operate differently during the day shift than it does during the night shift.

`Configuration file:`

Specify the name for the configuration file. **`BARR.CFG`** is the default name for the file. We suggest you use **`.CFG`** as the file extension for your configuration files to make the files easy to identify. If you are not using configuration files, leave this field blank.

10.2 Exit Options Menu

After you complete the parameters on the **`Exit and Save Changes`** screen and press ENTER, the **`Exit Options`** menu displays.



```
                              Exit Options


   Begin communication at Operation screen
   Exit to DOS
   Return to Installation Description

                                                          Selection ↑↓→←
```

Choose one of the three options.

`Begin communication at Operation screen`

Start the program. Refer to Chapter 12, *Startup Instructions*, for a discussion of program startup.

`Exit to DOS`

Exit the software and return to the DOS prompt.

`Return to Installation Description`

Go back to the **`Installation Description`** screens to make additional changes.

10.3 Make a Backup Copy of the Production Software

When you have finished saving your configuration changes, it is advisable to make a backup copy of the configured software to a diskette, a directory on the network, or a directory on another PC. In the event that your PC hard disk fails or becomes corrupted, it will be faster to put a configured copy of software into production than it will be to re-install and re-configure the software from scratch.

To distinguish the configured backup copy from an unconfigured backup copy, you may want to rename the file. For example, from the DOS prompt type:

```
COPY C:\BARR\SPOOL.EXE A:\BARRSAVE.EXE
```

Note where you have stored the backup copy so it can be located in the future.

10.4 Using Configuration Files

Configuration files may be used at program startup. Instructions for using the configuration files you have created are given below. Program startup is discussed in Chapter 12.

- To use a configuration file at program startup, at the DOS prompt specify the startup command followed by an **`@`** character and the configuration file name. For example:

```
SPOOL @DAILY.CFG
```

- If you are using the default configuration file name, **BARR.CFG**, include just the **@** in the startup command — the file name can be omitted. For example, these two commands produce the same results:

  ```
  SPOOL @BARR.CFG
  SPOOL @
  ```

- To modify a configuration file you created earlier, at the DOS prompt specify the installation startup command followed by the **@** character and the configuration file name. For example:

  ```
  SPOOL i @DAILY.CFG
  ```

  When you select **Exit and Save Changes**, remember to set **Save parameters to a configuration file?** to **Yes**.

- Parameters stored in the configuration file can be saved to the program file at a later time. You accomplish this by loading the configuration parameters into the Installation Description then saving your changes to the program file.

  First, specify the installation startup command, including the configuration file name. For example:

  ```
  SPOOL i @DAILY.CFG
  ```

  Next, from the **Installation Description** menu, select **Exit and Save Changes**. The default for **Save Changes to C:\BARR\SPOOL.EXE file?** is **Yes**, so you simply need to press ENTER. The configuration parameters are written to the **SPOOL.EXE** program file.

Chapter

11 PRT Operation

Using the PRT utility to add PC and LAN files to the print spool.

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Chapter

11 PRT Operation

In addition to receiving files from devices, there are two ways to add PC and LAN files to the print spool: the Barr **MOVE** command and the Barr PRT utility. The preferred method is the PRT utility because it builds attributes for the file. The **MOVE** command does not build file attributes, but is a faster process.

The Barr **MOVE** command changes the location of a file by renaming the directory portion of the file name. The Barr **MOVE** command is similar to the DOS **MOVE** command but restricts the source and destination directories to residing on the same drive. If the file name already exists in the directory, you receive an error message. The Barr **MOVE** utility is found on the BARR/SPOOL software disk. The command to run the utility is executed from a DOS prompt as a DOS command.

The Barr PRT utility is included with the Barr software files. PRT can be run either in a menu-driven, interactive mode or in a batch mode. PRT allows you control over spooling criteria, such as Form, Class, and Priority. With these spooling criteria, you control the selection and routing of files to be printed.

Refer to Chapter 3, *Installation*, for instructions to install the PRT utility. Directions for configuring and operating the PRT utility follow.

> ***Note:*** The PRT utility is too large to run interactively in the DOS session of BARR/SPOOL. Instead, in the DOS session, you can run the batch mode.

11.1 PRT Configuration

The **PRT** utility uses control files to provide the BARR/SPOOL software with print instructions. The control file holds instructions such as the disposition of the file after printing, the form name to assign to the files, and printer commands such as lines-per-inch, lines-per-form, and print lines-per-form. A default control file, **SPOOL.CTR**, was included with the Barr software files. You can modify the default control file or create additional control files as needed. When creating additional control files, a good practice is to use **.CTR** as the extension of all control file names. Control files can be created and modified interactively or with an ASCII editor.

Interactively Modify Control Files

To use the **PRT** utility to interactively modify control files, take the following steps:

Step 1 Run the **PRT** utility.

Step 2 From the **PRT** screen, select **Controls**.

Step 3 From the **Controls** menu, select **Modify Controls**.

Step 4 The **Spool Control** screen appears, showing the current control file parameters. Modify the parameters as needed.

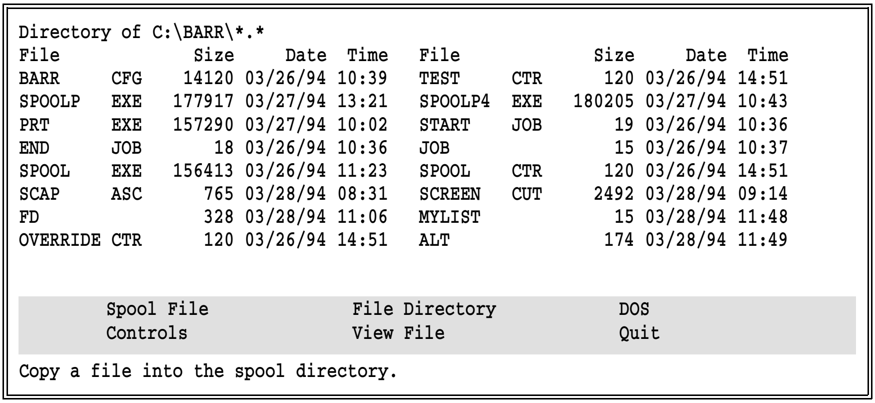
Step 5 Exit and save your changes.

Step 1

To run the **PRT** utility, enter **PRT** at a DOS prompt. For example:

```
c:\BARR>  PRT
```

Then, a listing of the current directory displays in a two-column format:



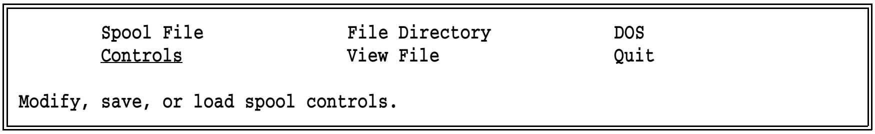
```
Directory of C:\BARR\*.*
File              Size     Date  Time   File              Size     Date  Time
BARR     CFG     14120 03/26/94 10:39   TEST     CTR       120 03/26/94 14:51
SPOOLP   EXE    177917 03/27/94 13:21   SPOOLP4  EXE    180205 03/27/94 10:43
PRT      EXE    157290 03/27/94 10:02   START    JOB        19 03/26/94 10:36
END      JOB        18 03/26/94 10:36   JOB                 15 03/26/94 10:37
SPOOL    EXE    156413 03/26/94 11:23   SPOOL    CTR       120 03/26/94 14:51
SCAP     ASC       765 03/28/94 08:31   SCREEN   CUT      2492 03/28/94 09:14
FD                 328 03/28/94 11:06   MYLIST              15 03/28/94 11:48
OVERRIDE CTR       120 03/26/94 14:51   ALT                174 03/28/94 11:49
```

```
Copy a file into the spool directory.
```

- If the words **Spool File** near the bottom left of the screen are unreadable, you need to exit **PRT** and enter the **MODE BW80** command from DOS before proceeding.

- The message in the bottom left corner of the screen describes the action that **PRT** will take if ENTER is pressed while the command is highlighted. To select a command, use the arrow keys to highlight it, or type the first character of the command name.

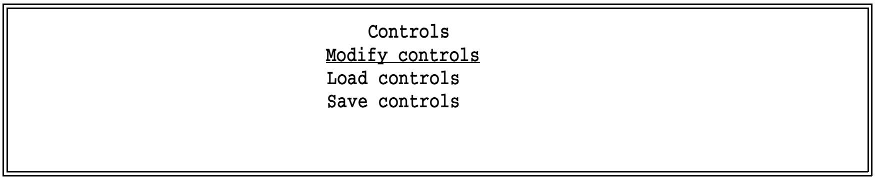
Step 2



```
        Spool File                File Directory            DOS
        Controls                  View File                 Quit

Modify, save, or load spool controls.
```

➤ Select **`Controls`**.

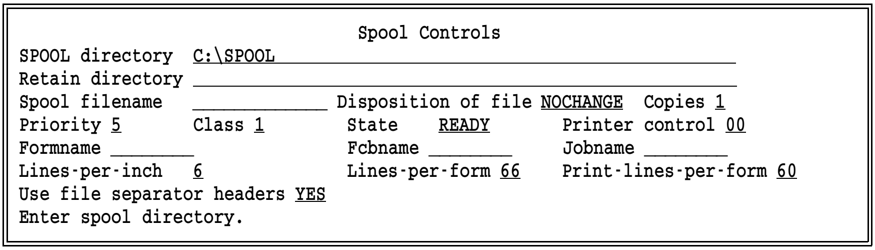
Step 3



```
                                  Controls
                              Modify controls
                              Load controls
                              Save controls
```

➤ Select **`Modify Controls`**.

Step 4



```
                                 Spool Controls
SPOOL directory  C:\SPOOL_____________________________________________________
Retain directory _____________________________________________________________
Spool filename   _____________ Disposition of file NOCHANGE  Copies 1
Priority 5       Class 1        State    READY      Printer control 00
Formname ________               Fcbname ________    Jobname ________
Lines-per-inch   6              Lines-per-form 66   Print-lines-per-form 60
Use file separator headers YES
Enter spool directory.
```

`SPOOL directory`

Directory in which the spool files are located. Include the drive name and full directory path. In most instances, this directory should be identical to the SPOOL directory defined in BARR/SPOOL.

`Retain directory`

Optional directory in which a copy of the file is retained after the file is copied to the print spool directory. Include the drive name and full directory path. When a **`Retain directory`** is specified (and Disposition is **`RENAME`**), a copy of the original file is placed there after copying to the print spool, and the file is deleted from its original directory.

> ***Note:*** This is *not* the same directory as the **`SPOOL Retain directory`**, discussed in Chapter 5, *Print Spool Description*. The difference is that a file is written to the PRT Retain directory upon copying to the spool directory. A file is written to the **`SPOOL Retain directory`** after the file prints.

`Spool filename`

File name to use in the destination **`SPOOL directory`**. If no name is specified, the source file name is used. The **`SPOOL directory`** path is added as a prefix before the **`Spool filename`** to form the complete path name.

The extension to the file name is a period followed by up to three characters. If the file name is followed by a period (`.`) alone, a blank extension is implied. If no period follows the filename, then a numeric extension is assigned. The software searches for that file name with a numeric extension and assigns the extension ***n*`+1`**, where ***n*** is the highest extension found. If no numeric extension is found in the directory, then extension `.001` is assigned.

For an example of the automatic naming sequence, refer to *File Name Extensions, Automatic Naming Sequence* in section 6.5.

`Disposition of file`

Disposition of original file after copying into the **`SPOOL directory`**. Possible values are **`NOCHANGE`**, **`DELETE`**, and **`RENAME`**.

`NOCHANGE`

File remains in its original directory after copying to **`Spool`**.

`DELETE`

File is deleted from its original directory after copying to **`Spool`**.

RENAME

File is copied into the **`PRT Retain directory`** and deleted from its original directory after copying to the print spool directory.

The same rule used for the **`SPOOL`** directory applies to automatic generation of numeric file extensions in the Retain directory to prevent duplicate file names.

Copies

Number of copies of the file to print.

Priority

Indicates the priority in which BARR/SPOOL prints files. Values range from 1 - 9, with 9 as the highest priority.

Class

Spooling class. Provides for grouping of similar files. BARR/SPOOL printers can process from one to five classes at once. Files can be directed to a particular printer by setting each file class to one being processed by only one printer.

State

Spooling state. Choices are READY and HOLD. If the file state is READY, the file is printed by BARR/SPOOL with no operator intervention. Files with a HOLD state will not be printed until the state is changed. Setting the state to HOLD allows time for preparation, such as changing the paper on the printer before the file prints.

Printer control

BARR/SPOOL printer control string selector. Each printer has a table of control strings. This hexadecimal field is an index to the Printer Control Data table discussed in section 4.8. The control string associated with the index code is sent with the file to the printer. Control strings are commonly used to set printer lines-per-inch and fonts.

Formname

An 8-character form name. This often indicates pre-printed forms that must be mounted in the printer.

Fcbname

An 8-character **FCBNAME**.

Jobname

An 8-character **JOBNAME**.

Lines-per-inch

Number of print lines-per-inch. Commonly either **6** or **8**.

Lines-per-form

Number of actual lines on the printer form. Includes top and bottom margins. For example, if the length of the printer form is 11 inches and line spacing is set to 6 lines-per-inch, the number of lines-per-form is **66**.

Print-lines-per-form

Number of lines used for printing the form. Excludes top and bottom margins. **Print-lines-per-form** should always be less than or equal to **Lines-per-form**.

For example, if **Lines-per-form** is 66 and **Print-lines-per-form** is 60, then the printer skips over the last 6 lines as a page margin. A common use of the page margin is to leave 3 lines on each side of the paper perforation when using perforated paper.

Use file separator headers

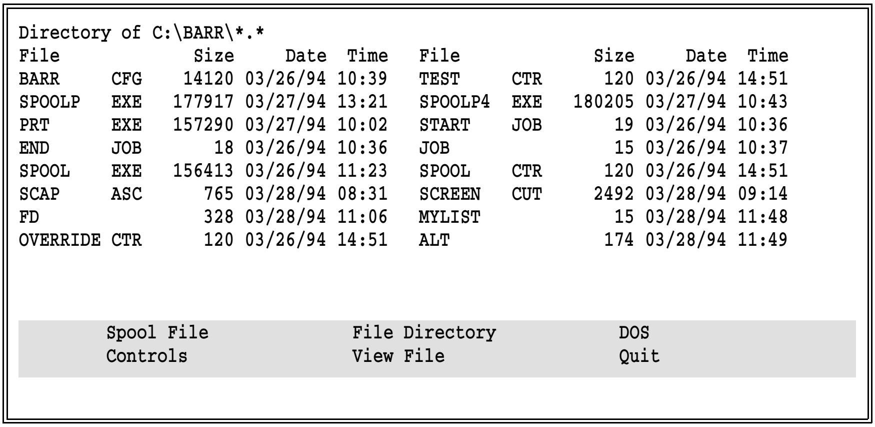
Yes Generate file separator pages.

A file separator header page can be used to identify printed files. The jobname can be included on the header page by entering an appropriate identifier in the **JOBNAME** field.

No File separator headers are not generated.

Step 5

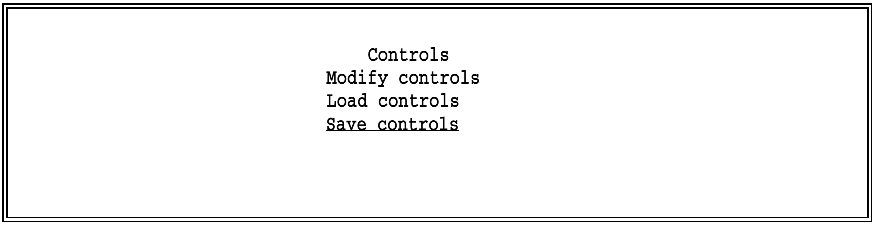
To exit the Spool Controls window, press ESC at any time or press ENTER while the last field is selected. This brings you back into interactive **PRT** with your changes to the parameters active. Now you can save the active parameters to a control file.



```
Directory of C:\BARR\*.*
File              Size     Date  Time   File              Size     Date  Time
BARR     CFG     14120 03/26/94 10:39   TEST     CTR       120 03/26/94 14:51
SPOOLP   EXE    177917 03/27/94 13:21   SPOOLP4  EXE    180205 03/27/94 10:43
PRT      EXE    157290 03/27/94 10:02   START    JOB        19 03/26/94 10:36
END      JOB        18 03/26/94 10:36   JOB                 15 03/26/94 10:37
SPOOL    EXE    156413 03/26/94 11:23   SPOOL    CTR       120 03/26/94 14:51
SCAP     ASC       765 03/28/94 08:31   SCREEN   CUT      2492 03/28/94 09:14
FD                 328 03/28/94 11:06   MYLIST              15 03/28/94 11:48
OVERRIDE CTR       120 03/26/94 14:51   ALT                174 03/28/94 11:49
```

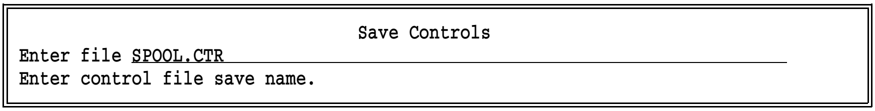
Spool File
Controls
File Directory
View File
DOS
Quit

➤ Select **Controls.**



Controls
Modify controls
Load controls
Save controls

➤ Select **Save Controls.**



```
                              Save Controls
Enter file SPOOL.CTR
Enter control file save name.
```

➤ Enter the file name for the control file or accept the displayed name by pressing ENTER.

For this file to become the default control file, it must be named **SPOOL.CTR** and it must reside in the same directory as the **PRT** program files (**PRT.EXE** and **PRTMENU.EXE**). Upon startup, **PRT** searches for **SPOOL.CTR** in the current directory first, followed by the directory containing the **PRT** program file. This allows each user to set their own defaults if desired.

Modify Control Files with an ASCII Editor

Spool control files also can be generated and maintained manually. However, you should not attempt this method unless you are proficient with an ASCII program editor.

A sample control file generated using an ASCII editor follows:

```
Class 1
Control 0
copies 1
disposition NOCHANGE
formname LANSTD
lpf 66
lpi 6
plpf 60
priority 5
spooldir C:\SPOOL
state READY
```

Specify only those parameters you want to change from the default values in **SPOOL.CTR**.

The format of each parameter is:

Keyword Value

Separate the values from the keywords with one or more spaces or tabs. Only one keyword and its associated value can be entered on each line. Each line is read for a keyword first, then the value.

The order of the parameters in the control file is not important. Lowercase letters are converted to uppercase, so mixed case has no effect.

If there is no legal keyword on a line, or the line contains an invalid value, the line is ignored and an error message is displayed when you run the control file.

> ***Note:*** When creating additional control files, a good practice is to use **.CTR** as the extension of all control file names.

11.2 Batch Mode

The PRT utility has a batch mode which allows you to spool files with command line options for the control parameters. You can spool a file using the default **SPOOL.CTR** parameters, using an alternate control file, or overriding individual parameters in a control file.

The command to run PRT in batch mode is entered at a DOS prompt. The syntax of the command is:

```
PRT myfile.txt @controlfile parameter=value
```

where

myfile.txt
File to add to the print spool.

controlfile
Optional. Control file to use. If no control file is specified the default **SPOOL.CTR** parameters are used.

parameter
Optional. Parameter to override. You can override as many control file parameters as needed. Refer to Table 11-1 for a list of control file parameters that can be overridden. Only the first three characters of each parameter are required.

Table 11-1. Spool Control Parameters

Parameter	Description	Maximum Length	Valid Values
SPOOLDIR	Spool directory	64	DOS directory
RETAINDIR	Retain directory, if file is to be retained after printing	64	DOS directory
DESTNAME	File name to use in spool directory	12	DOS filename
DISPOSITION	Disposition of file after printing	8	Nochange, Delete, Rename
COPIES	Number of copies to print	4	1 - 9999
PRIORITY	Priority to be assigned to file	1	1 - 9
CLASS	Class to be assigned to file	1	A-Z, 1 - 9
STATE	State to be assigned to file	5	Ready, Hold
CONTROL	Printer Control string to be sent with file	2	Hex code
FORMNAME	Form to be used to print file	8	DOS filename with no extension
FCBNAME	FCB name associated with the file	8	Valid FCB name
JOBNAME	Job name associated with the file	8	Valid job name
LPI	Lines-per-inch setting for printer	1	1 - 9
LPF	Lines-per-form setting for printer	3	1 - 999
PLPF	Print-lines-per-form setting for printer	3	1 - 999
HEADERS	Use file separator header page to identify printed files	3	Yes, No

Example Batch Mode Commands

- To add the file **REPT5.TXT** to the print spool using the default control file **SPOOL.CTR**:

  ```
  PRT REPT5.TXT
  ```

- To add the file **SEPT.001** to the print spool, with the number of copies set to **5** and the formname set to **CHECK**. The default parameters from **SPOOL.CTR** are used for all parameters other than **COPIES** and **CHECK**:

  ```
  PRT SEPT.001 COP=5 FORM=CHECK
  ```

- To add the file **MYLIST** to the print spool, with the number of copies set to **10** and using the parameters from the control file, **LISTING.CTR**, for all parameters other than **COPIES**:

  ```
  PRT MYLIST @LISTING.CTR COPIES=10
  ```

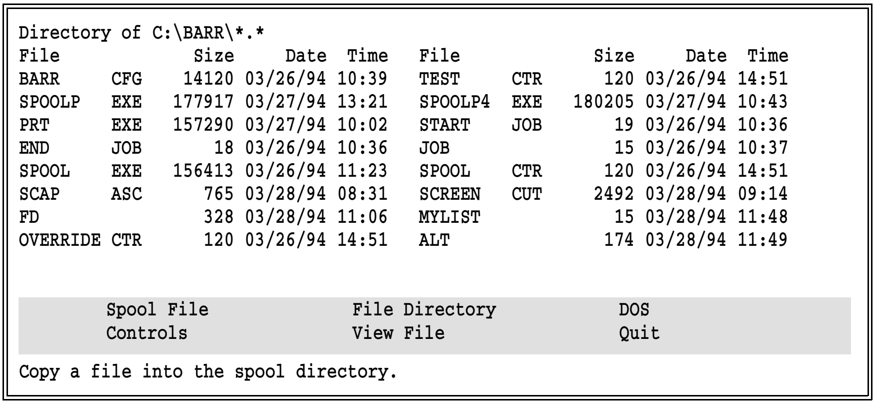
11.3 Interactive Mode

When run interactively, PRT lists the current directory on screen, allowing you to view files and move among directories before printing.

To access the PRT utility in interactive mode, enter the command **PRT** at a DOS prompt. For example:

```
C:\BARR> PRT
```

The **PRT** screen displays:



```
Directory of C:\BARR\*.*
File            Size     Date  Time   File            Size     Date  Time
BARR     CFG   14120 03/26/94 10:39   TEST     CTR      120 03/26/94 14:51
SPOOLP   EXE  177917 03/27/94 13:21   SPOOLP4  EXE   180205 03/27/94 10:43
PRT      EXE  157290 03/27/94 10:02   START    JOB       19 03/26/94 10:36
END      JOB      18 03/26/94 10:36   JOB                15 03/26/94 10:37
SPOOL    EXE  156413 03/26/94 11:23   SPOOL    CTR      120 03/26/94 14:51
SCAP     ASC     765 03/28/94 08:31   SCREEN   CUT     2492 03/28/94 09:14
FD               328 03/28/94 11:06   MYLIST             15 03/28/94 11:48
OVERRIDE CTR     120 03/26/94 14:51   ALT               174 03/28/94 11:49
```

Copy a file into the spool directory.

You can use the following commands to drive the PRT utility:

`Spool File`

Submit a file to the print spool. There are two options. You can select a file from the list on the screen with the **`Select file from list`** option. Or, you can enter the file name through a dialog box with the **`Enter filename`** option. The file name entry screen accepts the DOS wildcard characters **`*`** and **`?`**.

`Controls`

Modify the spool control parameters. You can load an alternate set of parameters from a file or save modified parameters to a file.

`File Directory`

Change the file directory you are viewing. The current directory is displayed at the top of the screen.

`View File`

Display a file on the screen. You can select a file from the list or enter the file name. The file name entry screen accepts the DOS wildcard characters **`*`** and **`?`**.

`DOS`

Leave the **`PRT`** screen temporarily to go to the DOS session. You can return to PRT by typing **`EXIT`** at the DOS prompt.

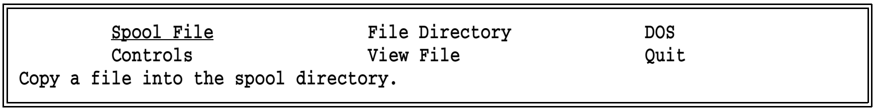
`Quit`

Exit the PRT utility. When you highlight **`Quit`**, the version of the program displays in the lower right corner. Then, you can press ENTER to exit the PRT utility.

Example Interactive Commands

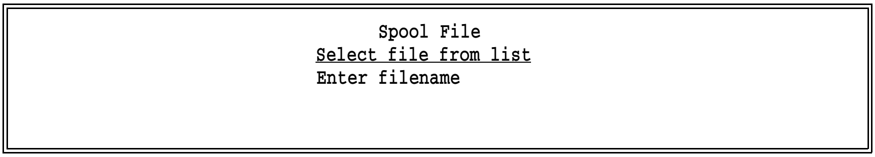
Spool Command

The Spool File command places a file in the **SPOOL directory** where BARR/SPOOL finds it and prints it on the appropriate printer.



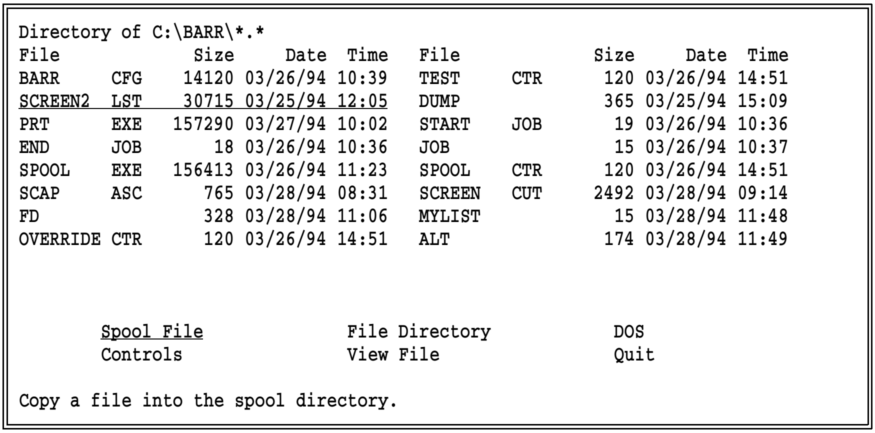
```
        Spool File              File Directory           DOS
        Controls                View File                Quit
Copy a file into the spool directory.
```

➤ Select **Spool File**.



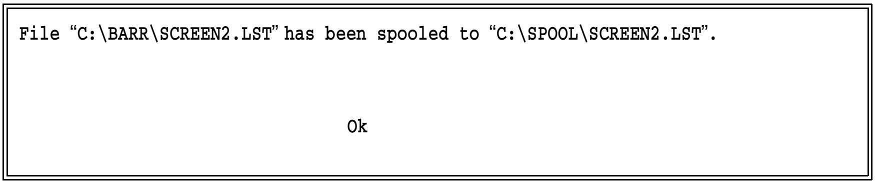
```
                                  Spool File
                            Select file from list
                            Enter filename
```

➤ Choose **Select file from list**.



```
Directory of C:\BARR\*.*
File              Size     Date  Time   File             Size     Date  Time
BARR     CFG     14120 03/26/94 10:39   TEST     CTR      120 03/26/94 14:51
SCREEN2  LST     30715 03/25/94 12:05   DUMP              365 03/25/94 15:09
PRT      EXE    157290 03/27/94 10:02   START    JOB       19 03/26/94 10:36
END      JOB        18 03/26/94 10:36   JOB                15 03/26/94 10:37
SPOOL    EXE    156413 03/26/94 11:23   SPOOL    CTR      120 03/26/94 14:51
SCAP     ASC       765 03/28/94 08:31   SCREEN   CUT     2492 03/28/94 09:14
FD                 328 03/28/94 11:06   MYLIST             15 03/28/94 11:48
OVERRIDE CTR       120 03/26/94 14:51   ALT               174 03/28/94 11:49



        Spool File              File Directory           DOS
        Controls                View File                Quit

Copy a file into the spool directory.
```

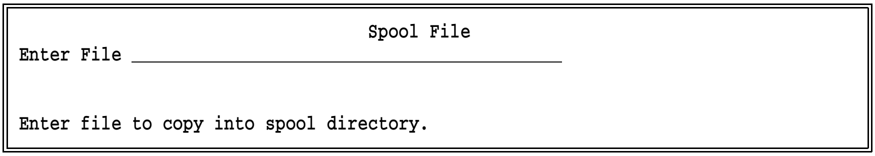
➤ Select the desired file, in this example **SCREEN2.LST**.



```
File "C:\BARR\SCREEN2.LST" has been spooled to "C:\SPOOL\SCREEN2.LST".



                                Ok
```

➤ Press ENTER or ESC.

If you select **`Enter filename`** from the **`Spool File`** menu, you are prompted to enter the file name.

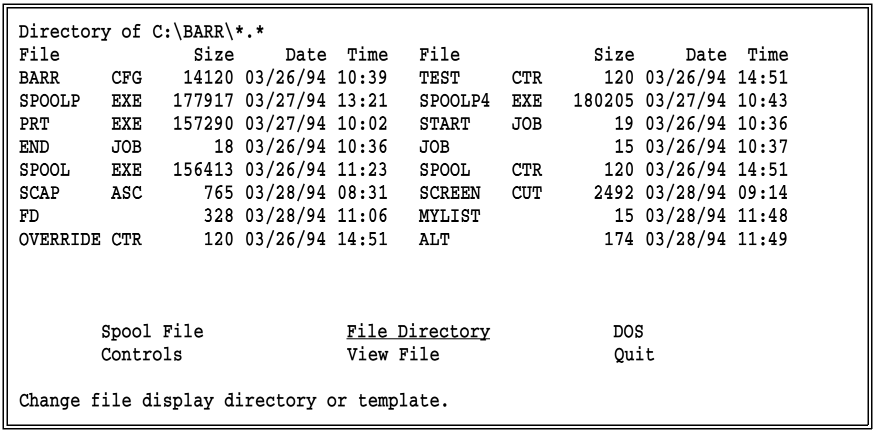


```
                                  Spool File
Enter File __________________________________________


Enter file to copy into spool directory.
```

➤ Enter the name of the desired file.

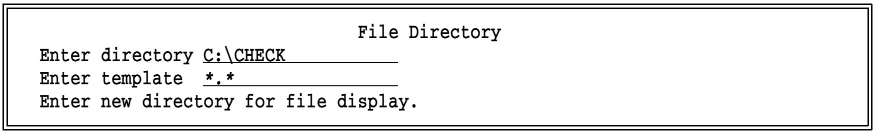
File Directory Command

This selection allows you to change the directory you are viewing. The current directory name is displayed at the top of the screen.



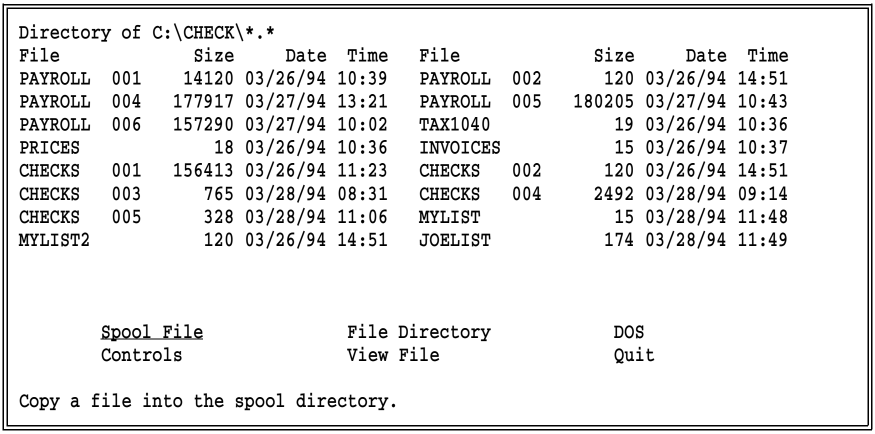
```
Directory of C:\BARR\*.*
File              Size     Date  Time   File              Size     Date  Time
BARR     CFG     14120 03/26/94 10:39   TEST     CTR       120 03/26/94 14:51
SPOOLP   EXE    177917 03/27/94 13:21   SPOOLP4  EXE    180205 03/27/94 10:43
PRT      EXE    157290 03/27/94 10:02   START    JOB        19 03/26/94 10:36
END      JOB        18 03/26/94 10:36   JOB                 15 03/26/94 10:37
SPOOL    EXE    156413 03/26/94 11:23   SPOOL    CTR       120 03/26/94 14:51
SCAP     ASC       765 03/28/94 08:31   SCREEN   CUT      2492 03/28/94 09:14
FD                 328 03/28/94 11:06   MYLIST              15 03/28/94 11:48
OVERRIDE CTR       120 03/26/94 14:51   ALT                174 03/28/94 11:49




        Spool File              File Directory            DOS
        Controls                View File                 Quit

Change file display directory or template.
```

➤ Select **`File Directory`**.



```
                              File Directory
Enter directory C:\CHECK
Enter template  *.*
Enter new directory for file display.
```

- ➤ Enter the drive and name of the new directory (in this case, **`C:\CHECK`**).
- ➤ Enter a filename template for restricting the display to certain files. The default is **`*.*`** to display all files.

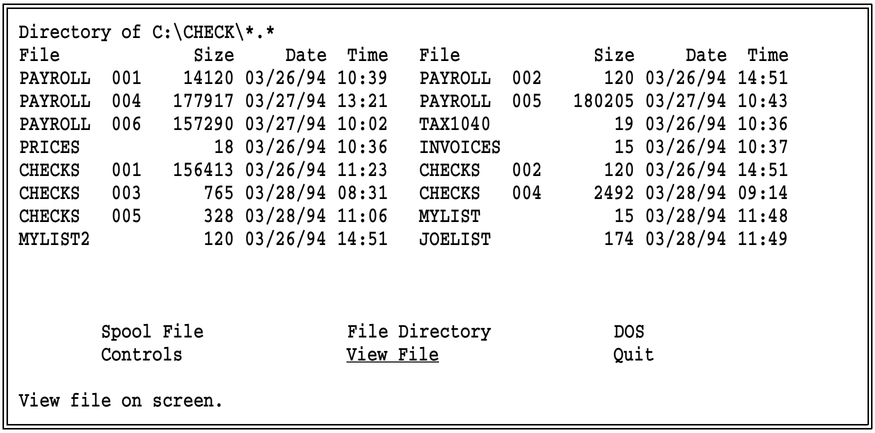


```
Directory of C:\CHECK\*.*
File             Size     Date  Time   File             Size     Date  Time
PAYROLL  001    14120 03/26/94 10:39   PAYROLL  002      120 03/26/94 14:51
PAYROLL  004   177917 03/27/94 13:21   PAYROLL  005   180205 03/27/94 10:43
PAYROLL  006   157290 03/27/94 10:02   TAX1040            19 03/26/94 10:36
PRICES             18 03/26/94 10:36   INVOICES           15 03/26/94 10:37
CHECKS   001   156413 03/26/94 11:23   CHECKS   002      120 03/26/94 14:51
CHECKS   003      765 03/28/94 08:31   CHECKS   004     2492 03/28/94 09:14
CHECKS   005      328 03/28/94 11:06   MYLIST             15 03/28/94 11:48
MYLIST2           120 03/26/94 14:51   JOELIST           174 03/28/94 11:49



        Spool File               File Directory            DOS
        Controls                 View File                 Quit

Copy a file into the spool directory.
```

- ■ The top of the screen indicates the new directory.
- ■ The list of files in the new directory displays.

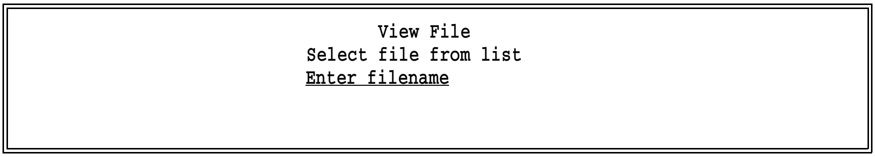
View File Command

This selection allows you to examine a file on screen before printing. This is convenient for verifying that the file is correct before printing.



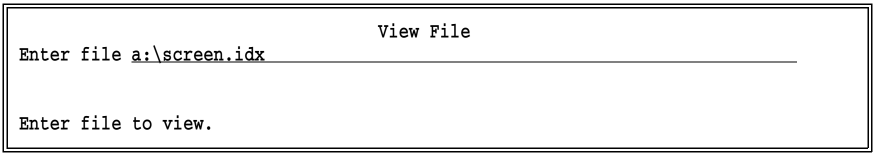
```
Directory of C:\CHECK\*.*
File             Size     Date  Time   File             Size     Date  Time
PAYROLL  001    14120 03/26/94 10:39   PAYROLL  002      120 03/26/94 14:51
PAYROLL  004   177917 03/27/94 13:21   PAYROLL  005   180205 03/27/94 10:43
PAYROLL  006   157290 03/27/94 10:02   TAX1040            19 03/26/94 10:36
PRICES             18 03/26/94 10:36   INVOICES           15 03/26/94 10:37
CHECKS   001   156413 03/26/94 11:23   CHECKS   002      120 03/26/94 14:51
CHECKS   003      765 03/28/94 08:31   CHECKS   004     2492 03/28/94 09:14
CHECKS   005      328 03/28/94 11:06   MYLIST             15 03/28/94 11:48
MYLIST2           120 03/26/94 14:51   JOELIST           174 03/28/94 11:49



        Spool File                File Directory           DOS
        Controls                  View File                Quit

View file on screen.
```

- ➤ Select **`View File`**.



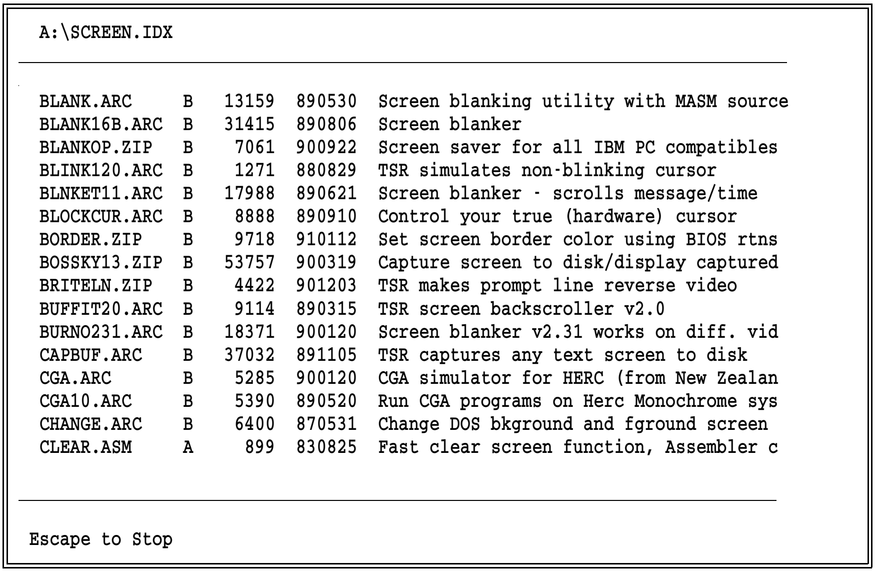
```
                                   View File
                            Select file from list
                            Enter filename
```

- ➤ To specify the file name manually, select **`Enter filename`**.



```
                                   View File
Enter file a:\screen.idx


Enter file to view.
```

- ➤ Enter the name of the file you wish to view (in this case **`a:\screen.idx`**).



```
A:\SCREEN.IDX

BLANK.ARC     B   13159  890530  Screen blanking utility with MASM source
BLANK16B.ARC  B   31415  890806  Screen blanker
BLANKOP.ZIP   B    7061  900922  Screen saver for all IBM PC compatibles
BLINK120.ARC  B    1271  880829  TSR simulates non-blinking cursor
BLNKET11.ARC  B   17988  890621  Screen blanker - scrolls message/time
BLOCKCUR.ARC  B    8888  890910  Control your true (hardware) cursor
BORDER.ZIP    B    9718  910112  Set screen border color using BIOS rtns
BOSSKY13.ZIP  B   53757  900319  Capture screen to disk/display captured
BRITELN.ZIP   B    4422  901203  TSR makes prompt line reverse video
BUFFIT20.ARC  B    9114  890315  TSR screen backscroller v2.0
BURNO231.ARC  B   18371  900120  Screen blanker v2.31 works on diff. vid
CAPBUF.ARC    B   37032  891105  TSR captures any text screen to disk
CGA.ARC       B    5285  900120  CGA simulator for HERC (from New Zealan
CGA10.ARC     B    5390  890520  Run CGA programs on Herc Monochrome sys
CHANGE.ARC    B    6400  870531  Change DOS bkground and fground screen
CLEAR.ASM     A     899  830825  Fast clear screen function, Assembler c

Escape to Stop
```

- ➤ Use the HOME, END, PAGE UP, and PAGE DOWN keys to examine the contents of the file. The HOME and END keys move you to the beginning of the file and the end of the file, respectively.
- ➤ Press ESC to return to the **PRT** screen.

Notes:

Chapter

12 Startup Instructions

Start the BARR/SPOOL software.

Contents

Startup from the Installation Description Screen. 206
Startup from a DOS Prompt. 206
Startup at Power-On of the PC. 207
Startup with Different Configuration Files 207

Chapter

12 Startup Instructions

Once you have installed and configured the BARR/SPOOL software, you are ready to start BARR/SPOOL. You will go through this startup process each time you use BARR/SPOOL. Whether you are running BARR/SPOOL for the first time or the hundredth time, your steps are the same.

BARR/SPOOL can be started in any of the following ways:

- From the **`Installation Description`** screen
- From a DOS prompt
- At power-on of the PC
- With different configuration files

> ***Note:*** If you are using Print Spooling or LAN Connections, before starting BARR/SPOOL, execute the DOS **`SHARE`** command to load support for file sharing.

Startup from the Installation Description Screen

This method of starting BARR/SPOOL gives you an opportunity to change the configuration of the software.

Step 1	If you are not already on the Installation Description screen, enter the following command at a DOS prompt: `SPOOL i`
Step 2	Change your BARR/SPOOL configuration as needed. Refer to Chapters 4 - 9 for instructions to change your BARR/SPOOL configuration.
Step 3	Exit the installation screens and save your changes. From the Installation Description screen: Select **`Exit and Save Changes`**.
Step 4	To run BARR/SPOOL, from the Exit Options screen: Select **`Begin Communication at the Operation screen.`**

Startup from a DOS Prompt

This method of starting BARR/SPOOL uses the existing configuration.

Step 1	From a DOS prompt, enter: `SPOOL`

Startup at Power-On of the PC

This method of starting BARR/SPOOL uses the existing configuration.

Step 1	Edit your **`AUTOEXEC`** or **`AUTOEXEC.BAT`** file, which contains the commands to be executed at power-on (or boot-up) of the PC. Add the startup command **`C:\BARR\SPOOL`**.

Startup with Different Configuration Files

When starting BARR/SPOOL, you can specify a configuration file that contains different configuration parameters. The applications for configuration files include moving your configuration settings to a new version of the program, communicating with more than one host computer, and changing the way BARR/SPOOL functions during different times of the day.

Step 1	Create additional configuration files. Refer to Chapter 10 for instructions about creating configuration files.
Step 2	From a DOS prompt, run BARR/SPOOL with a parameter to specify a configuration file: **`SPOOL @filename`** For example, to run BARR/SPOOL using the configuration file NIGHT.CFG, you would enter **`SPOOL @NIGHT.CFG`**.

Notes:

Chapter

13 BARR/SPOOL Operation

Manage printing of files on one or more printers.

Contents

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  Operation Screen Commands. 215

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  Spooling Commands 223

13.3 DOS Session 228

13.4 File Attributes 229

13.5 Printer Attributes 231

Chapter

13 BARR/SPOOL Operation

BARR/SPOOL operation includes operating not only the print spool, but also the operation of two BARR/SPOOL features — the DOS session and the Operation session. The DOS session enables you to work in DOS without exiting BARR/SPOOL. You also can run small programs that use standard DOS functions. The Operation session enables you to perform operations tasks, such as manually sending files to a device or changing the assignment of devices. The Operation session and the DOS session, together with the Print Spool session, make up the three sessions of BARR/SPOOL.

When you start BARR/SPOOL, you begin from the session selected in the **`Installation Description`**. (Refer to Chapter 9, *Tuning Data*, for more information about selecting the initial session.) From there, you can easily move from session to session using hot-keys. The keys which enable you to toggle from session to session are:

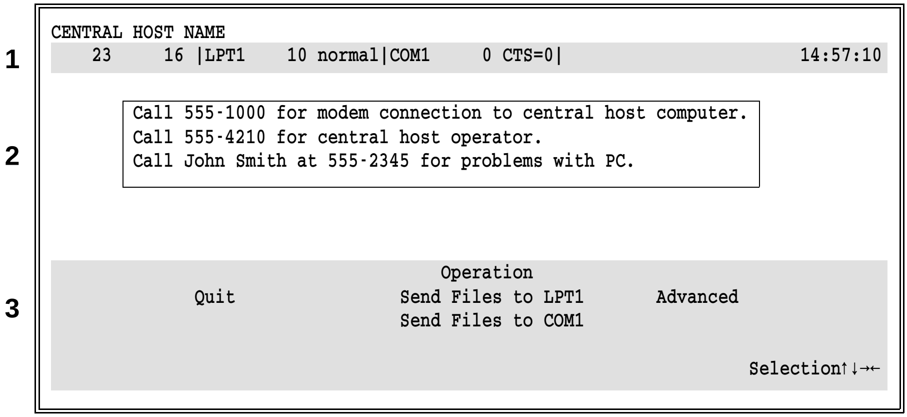
CTRL+ALT+SPACEBAR	Move to the next session.
CTRL+ALT+X	Move to the last active session.
CTRL+ALT+O	Operation Session.
CTRL+ALT+D	DOS Session.
CTRL+ALT+P	Print Spool Session.

> ***Note:*** Hot-keys can be changed during BARR/SPOOL configuration. Refer to section 9.3, *Additional Parameters* for more information.

> ***Note:*** To move between sessions using a menu, use the Advanced screen explained in the section 13.1, *Operation Session.*

13.1 Operation Session

The **Operation** screen displays in the Operation session. It provides information about the status of devices and program operation. This screen is divided into three parts:



```
CENTRAL HOST NAME
    23     16 |LPT1    10 normal|COM1     0 CTS=0|                     14:57:10

       Call 555-1000 for modem connection to central host computer.
       Call 555-4210 for central host operator.
       Call John Smith at 555-2345 for problems with PC.
```

1 **Status Line -** Displays the status of printers and other PC devices.

2 **Console -** Displays both diagnostic and status messages.

3 **Command Menu -** Lists the available commands.

Status Line

The second line of the **Operation** screen is the Status Line. It displays the status of devices and the time of day. Device status information includes the number of lines received, number of lines sent, parallel printer status, and serial printer status. A vertical line separates the device fields.

Line Status fields

`23     16`

`23`	Number of lines received from all devices.
`16`	Number of lines sent to all devices.

Parallel Printer Status fields

`LPT1 10 normal`

`LPT1`
Printer for which information is displayed; e.g. **`LPT1`**, **`LPT2`**, **`LPT3`**.

`10` Line of the file the printer is currently printing.

`normal`
Current status of the printer; the printer status can be:

`normal`
Printer is functional.

`busy`
Printer is too busy to accept any input.

`off`
Printer is offline. Or, the power is off.

`error`
Printer is in an error state.

`paper`
Printer is out of paper. Or, the cable is not connected.

The parallel printer status is more precisely defined by the electrical signals found on the printer cable. Table 13-1 shows the electrical signals that correspond to the printer status.

Table 13-1. Parallel Printer Status

Status Displayed	Error	Busy	Paper
`normal`	0	0	0 or 1
`busy`	0	1	0 or 1
`off`	1	0	0 or 1
`error`	1	1	0
`paper`	1	1	1

Serial Printer Status fields

COM1 0 CTS=0

COM1
Serial printer for which information is displayed; e.g. **COM1**, **COM2**, **COM3**, **COM4**.

0 Line of the file the printer is currently printing.

CTS=0
Current status of the printer. The printer status can be:

normal
Printer is functional.

CTS=0
Clear-To-Send signal is off. No data will be sent to this device.

DSR=0
Data-Set-Ready signal is off. No data will be sent to this device.

XOFF
XOFF flow control character has been received. No data will be sent to this device. Receipt of **XON** flow control character will clear this condition.

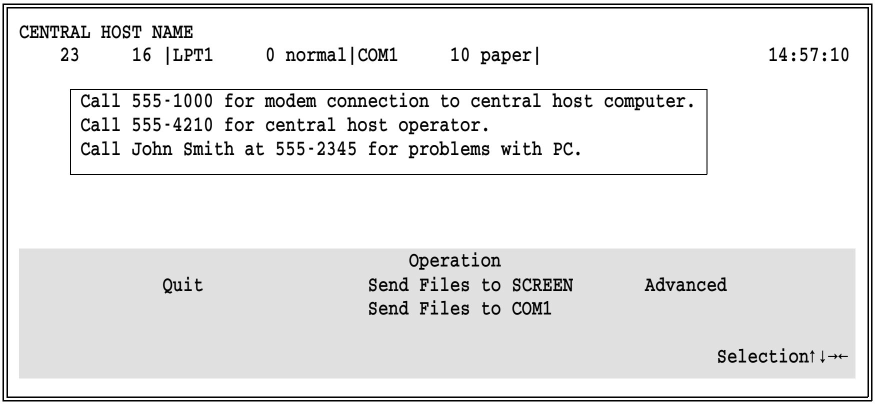
Console

The console appears on lines 3 - 20 of the **Operation** screen. It displays status and diagnostic messages. A log file of console messages also can be saved in a file on disk. Refer to Chapter 6 for more information about recording console messages in a disk file.

Initially the console displays the **Startup Screen Notes** entered in the BARR/SPOOL configuration. The name and phone numbers shown in the screen example (i.e. **John Smith**) are replaced by the name and phone numbers of your contacts. Refer to Chapter 8 for more information about **Startup Screen Notes**.

Operation Screen Commands

The command menu of the **Operation** screen enables you to perform operations tasks:



```
CENTRAL HOST NAME
    23     16 |LPT1     0 normal|COM1     10 paper|                   14:57:10

      Call 555-1000 for modem connection to central host computer.
      Call 555-4210 for central host operator.
      Call John Smith at 555-2345 for problems with PC.
```

Quit

Exit BARR/SPOOL.

Send Files

Transfer PC files to another device. Two commands allow you to transfer files — **Send Files to SCREEN** and **Send Files to COM1**.

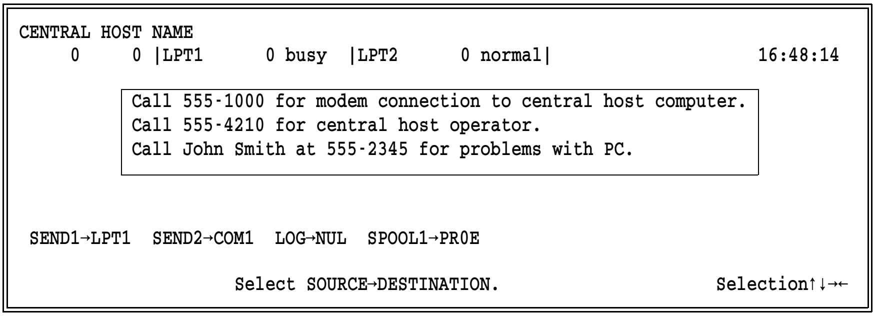
Advanced

Move between BARR/SPOOL sessions or assign devices.

Send Files

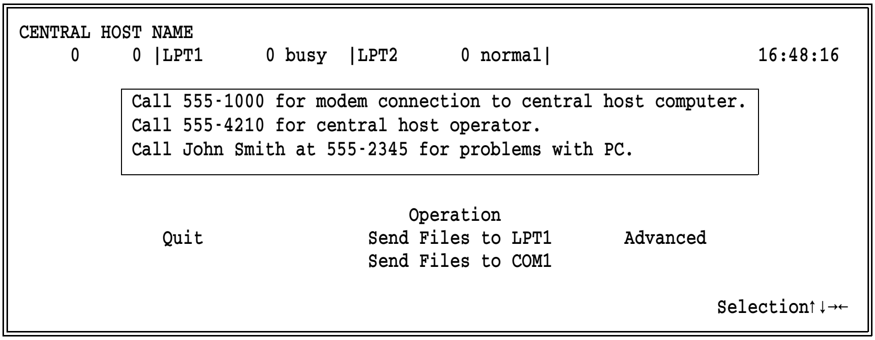
Two commands, **Send Files to SCREEN** and **Send Files to COM1**, allow you to transfer files from your PC to another device. These commands display the destinations to which files are sent. Files are sent to the destinations assigned to **SEND1** and **SEND2** in **Assign Devices**. The default destination for **SEND1** and **SEND2** is **SCREEN**. However, you can change the destination to any other device (as described in section 6.3.)

For example, from the **`Assign Devices`** screen, you can change the **`SEND1`** and **`SEND2`** destinations to **`LPT1`** and **`COM1`**:



```
CENTRAL HOST NAME
     0     0 |LPT1      0 busy  |LPT2      0 normal|                    16:48:14

          Call 555-1000 for modem connection to central host computer.
          Call 555-4210 for central host operator.
          Call John Smith at 555-2345 for problems with PC.


 SEND1→LPT1  SEND2→COM1  LOG→NUL  SPOOL1→PR0E

                     Select SOURCE→DESTINATION.                    Selection↑↓→←
```

BARR/SPOOL updates the commands on the **`Operation`** screen to reflect the new Destinations:



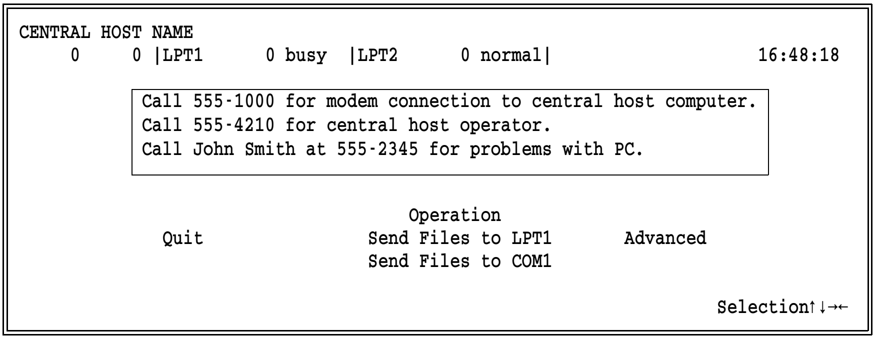
```
CENTRAL HOST NAME
     0     0 |LPT1      0 busy  |LPT2      0 normal|                    16:48:16

          Call 555-1000 for modem connection to central host computer.
          Call 555-4210 for central host operator.
          Call John Smith at 555-2345 for problems with PC.

                                   Operation
              Quit               Send Files to LPT1       Advanced
                                 Send Files to COM1

                                                                   Selection↑↓→←
```

- The first Send Files command will send files to **`LPT1`**.
- The second Send Files command will send files to **`COM1`**.

File Entry

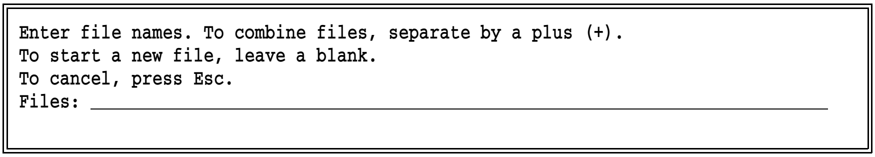
To send a file from your PC to another device, first assign the **`SEND1`** or **`SEND2`** device to the desired destination. Refer to Chapter 6 for more information about **`Assign Devices`**.

Then, select the **`Send Files`** command with the desired destination:



```
CENTRAL HOST NAME
     0     0 |LPT1      0 busy  |LPT2      0 normal|                 16:48:18

            Call 555-1000 for modem connection to central host computer.
            Call 555-4210 for central host operator.
            Call John Smith at 555-2345 for problems with PC.


                                Operation
              Quit            Send Files to LPT1      Advanced
                              Send Files to COM1

                                                            Selection↑↓→←
```

- ➤ Select **`Send Files to LPT1`** to send files to the parallel printer **`LPT1`**.
- ➤ Or, select **`Send Files to COM1`** to send files to the serial printer **`COM1`**.

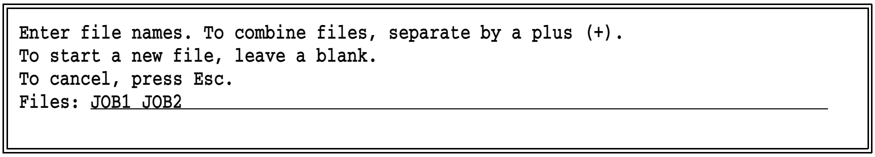


```
Enter file names. To combine files, separate by a plus (+).
To start a new file, leave a blank.
To cancel, press Esc.
Files: ________________________________________________________________________
```

- ➤ Type the name(s) of the file(s) to be transferred.
- ➤ When sending multiple, individual files, separate file names with spaces.
- ➤ When sending files to a host, you can concatenate multiple files by connecting the file names with a plus sign.
- ➤ Use the **`*`** and **`?`** characters according to the DOS wildcard convention.

Example 1: Multiple Files

To send two separate files named **`JOB1`** and **`JOB2`**:



```
Enter file names. To combine files, separate by a plus (+).
To start a new file, leave a blank.
To cancel, press Esc.
Files: JOB1 JOB2_______________________________________________________________
```

Example 2: Concatenated Files

To send to a host the files **TEXT**, **DATA1**, **DATA2**, and **TRAILER** joined together into one file:

```
Enter file names. To combine files, separate by a plus (+).
To start a new file, leave a blank.
To cancel, press Esc.
Files: TEXT+DATA1+DATA2+TRAILER
```

Example 3: Multiple Files Using DOS Wildcard

To send all files which end with the extension **.JOB**:

```
Enter file names. To combine files, separate by a plus (+).
To start a new file, leave a blank.
To cancel, press Esc.
Files: *.JOB
```

Example 4: Concatenated Files Using DOS Wildcard

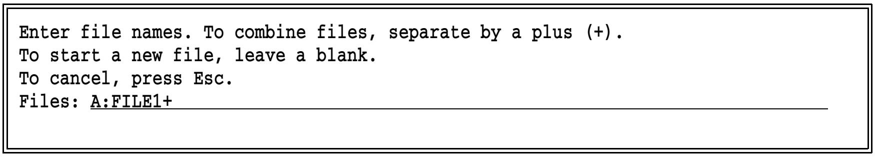
To send to a host the file **INTRO** and all files with the name **DATA** (and any extension), joined together into one file:

```
Enter file names. To combine files, separate by a plus (+).
To start a new file, leave a blank.
To cancel, press Esc.
Files:  INTRO+DATA.*
```

Example 5: Files from Software Disks

If you need to send to a host multiple files from multiple software disks as one file, place a plus (**+**) sign after each file. The plus sign indicates to BARR/SPOOL that more files will be sent. BARR/SPOOL delays sending the end of the file so that you can exchange disks and continue sending files.

For example, to send files from two disks as one job:



```
Enter file names. To combine files, separate by a plus (+).
To start a new file, leave a blank.
To cancel, press Esc.
Files: A:FILE1+
```

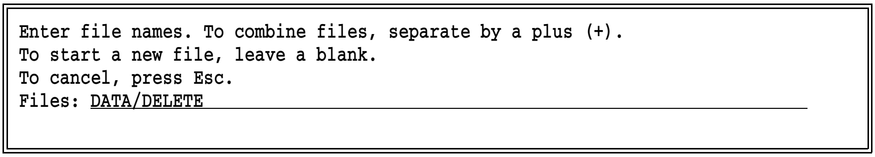
- ➤ Wait until the disk drive is free (i.e., the last line of the transmission says **`CLOSE: A:FILE1`** and the disk drive light is off).
- ➤ Remove the first disk and insert the second disk.
- ➤ Select **`Send Files`**. Enter the names of files to be sent.
- ➤ Do NOT enter a plus (**+**) sign after the last file name.

Tips for Sending Files

Automatically Delete Files After Sending

You can automatically delete files from disk after sending them to an assigned destination. Simply append **`/delete`** to the **`Send File`** command.

For example, to send the file **`DATA`** and delete it from disk after sending, you would enter:

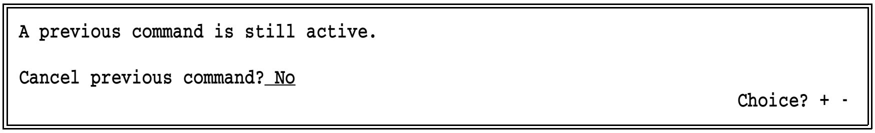


```
Enter file names. To combine files, separate by a plus (+).
To start a new file, leave a blank.
To cancel, press Esc.
Files: DATA/DELETE
```

Cancel a Send Files Command

You can cancel a **`Send Files`** command if BARR/SPOOL has not completed executing the command.

To do so, enter a second **`Send Files`** command. If the previous **`Send Files`** command has not been completed, the following screen appears:



```
A previous command is still active.

Cancel previous command? No
                                                     Choice? + -
```

`Cancel previous command?`

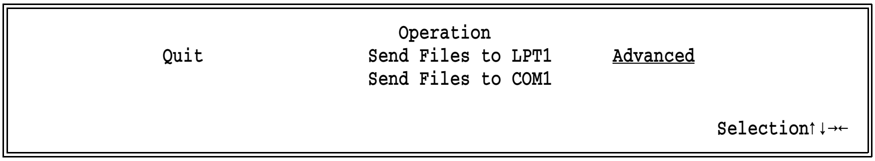
`No` Return to the **`Operation`** screen. Files continue to be sent.

`Yes` Cancel the previous **`Send Files`** command.

Advanced

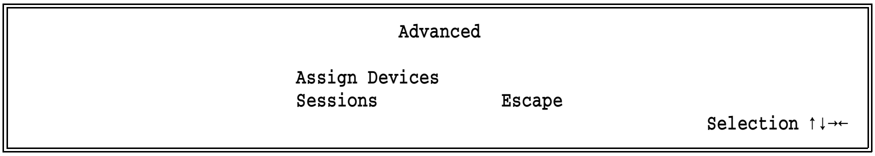
Use the **`Advanced`** option to assign devices or to move between sessions.

To access the **`Advanced`** menu, from the **`Operation`** screen:



```
                          Operation
      Quit              Send Files to LPT1     Advanced
                        Send Files to COM1

                                                     Selection↑↓→←
```

➤ Select **`Advanced`**.



```
                           Advanced

                    Assign Devices
                    Sessions            Escape
                                                    Selection ↑↓→←
```

Each option of the **`Advanced`** screen is described in this section.

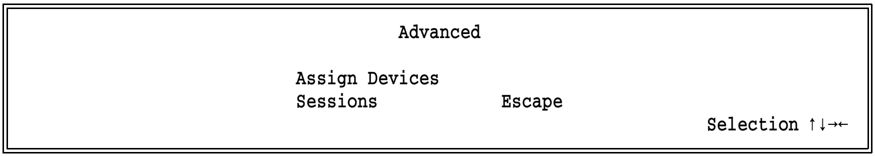
Assign Devices

This option allows you to change the assignment of source devices to destination devices. You can use this option at any time during BARR/SPOOL operation. Changes to device assignment remain in effect until you exit BARR/SPOOL. To permanently change device assignment, change your **`Installation Description`** parameters.

Refer to Chapter 6 for more information about assigning devices.

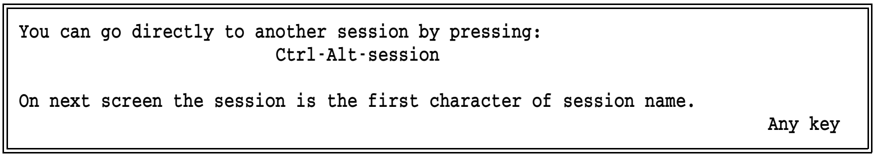
Sessions

To use a menu for moving from session to session, from the **`Advanced`** menu:



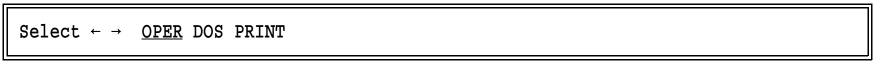
```
                         Advanced

              Assign Devices
              Sessions          Escape
                                            Selection ↑↓→←
```

➤ Select **Sessions**.



```
You can go directly to another session by pressing:
                         Ctrl-Alt-session

On next screen the session is the first character of session name.
                                                           Any key
```

➤ Press any key to display session choices.

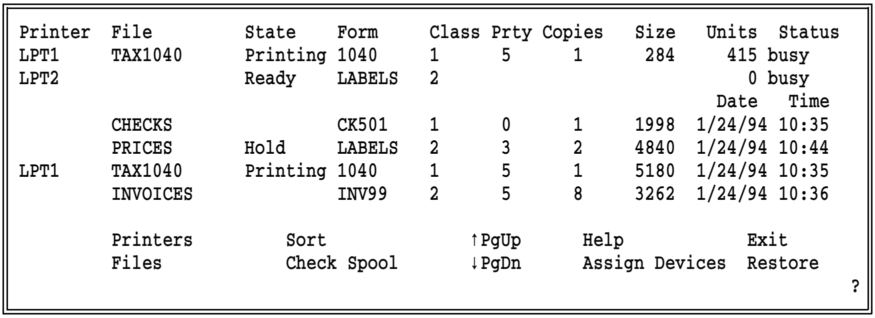


```
Select ← →  OPER DOS PRINT
```

➤ Select a session.

13.2 Print Spool Session

The **Print Spool** screen displays in the Print Spool session. This screen lists the files in the print spool, displays information about those files, and provides information about printers assigned to the spool. Most importantly, it gives you the power to control the printing of files.



```
Printer  File         State    Form     Class Prty Copies   Size   Units  Status
LPT1     TAX1040      Printing 1040     1      5      1      284     415 busy
LPT2                  Ready    LABELS   2                              0 busy
                                                                  Date   Time
         CHECKS                CK501    1      0      1     1998  1/24/94 10:35
         PRICES       Hold     LABELS   2      3      2     4840  1/24/94 10:44
LPT1     TAX1040      Printing 1040     1      5      1     5180  1/24/94 10:35
         INVOICES              INV99    2      5      8     3262  1/24/94 10:36

         Printers         Sort              ↑PgUp      Help           Exit
         Files            Check Spool       ↓PgDn      Assign Devices Restore
                                                                               ?
```

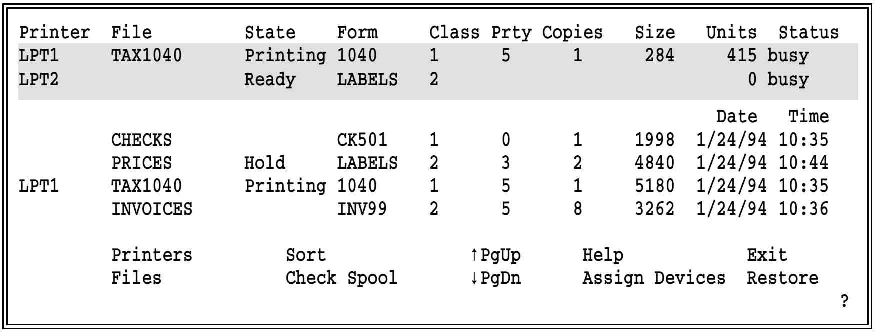
- The **Printer** column lists the printers assigned to the print spool.
- The **File** column lists the files to be printed.
- The remaining columns display file and printer attributes.

- Files are displayed in the same order that they are printed.
- The spooling commands appear on the bottom two lines of the screen.

When a printer is available, a file is selected by its attributes. A file is eligible for selection if its:

- **`State`** is **`Ready`**.
- **`Form`** is on the printer.
- **`Class`** matches the printer **`Class`**.

When these conditions have been met, the file with the highest priority is selected. A file that has already been received is selected before a file that is still being received.

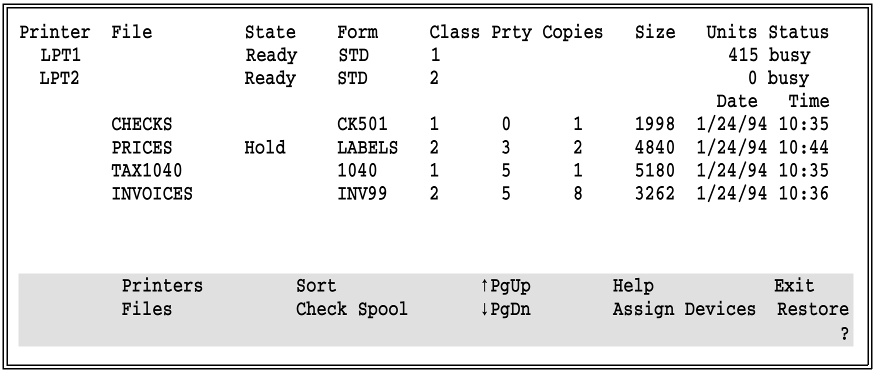


```
Printer  File         State    Form     Class Prty Copies   Size   Units  Status
LPT1     TAX1040      Printing 1040     1       5      1      284      415 busy
LPT2                  Ready    LABELS   2                                0 busy
                                                                    Date   Time
         CHECKS                CK501    1       0      1     1998  1/24/94 10:35
         PRICES       Hold     LABELS   2       3      2     4840  1/24/94 10:44
LPT1     TAX1040      Printing 1040     1       5      1     5180  1/24/94 10:35
         INVOICES              INV99    2       5      8     3262  1/24/94 10:36

         Printers         Sort              ↑PgUp     Help            Exit
         Files            Check Spool       ↓PgDn     Assign Devices  Restore
                                                                             ?
```

After a file is selected, printing automatically begins. When a file is printing, the file name is displayed at the top of the screen next to the printer on which it prints.

Spooling Commands

To change file and printer attributes, use the spooling commands at the bottom of the **`Print Spool`** screen:



```
Printer  File         State    Form     Class Prty Copies   Size   Units Status
  LPT1                Ready    STD      1                             415 busy
  LPT2                Ready    STD      2                               0 busy
                                                                    Date   Time
         CHECKS                CK501    1      0      1     1998  1/24/94 10:35
         PRICES       Hold     LABELS   2      3      2     4840  1/24/94 10:44
         TAX1040               1040     1      5      1     5180  1/24/94 10:35
         INVOICES              INV99    2      5      8     3262  1/24/94 10:36
```

`Printers`

Change printer attributes.

`Files`

Change file attributes.

`Sort`

Control the display order and print order of files.

`Check Spool`

Update the print spool display with files added using a DOS command or the PRT utility.

`Assign Devices`

Change the assignment of source devices to destination devices. You can use this option at any time during BARR/SPOOL operation. Changes to device assignment remain in effect until you exit BARR/SPOOL. Refer to Chapter 6 for more information about assigning devices.

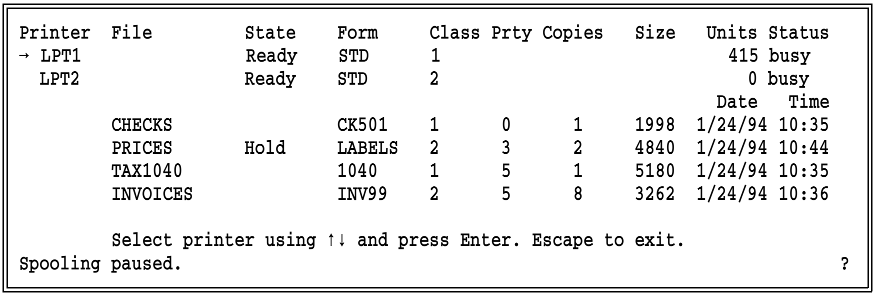
`Restore`

Reprint a file from the **`Retain`** directory.

Step-by-step instructions for using each spooling command follow.

Printers

To make changes to printer attributes, select P for the **Printers** command:



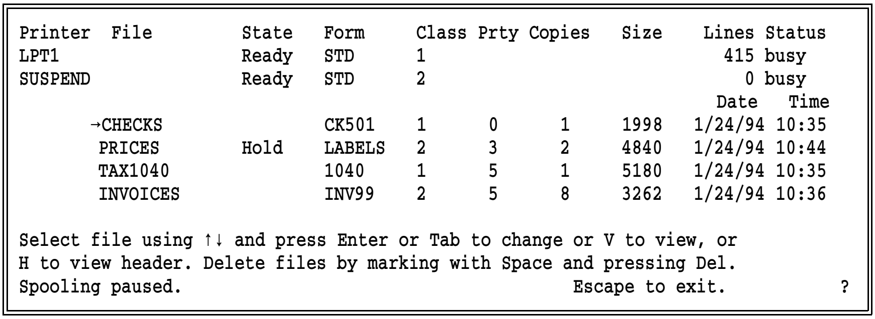
```
Printer  File         State    Form     Class Prty Copies   Size   Units Status
→ LPT1                Ready    STD      1                             415 busy
  LPT2                Ready    STD      2                               0 busy
                                                                  Date   Time
         CHECKS                CK501    1      0      1     1998  1/24/94 10:35
         PRICES       Hold     LABELS   2      3      2     4840  1/24/94 10:44
         TAX1040               1040     1      5      1     5180  1/24/94 10:35
         INVOICES              INV99    2      5      8     3262  1/24/94 10:36

         Select printer using ↑↓ and press Enter. Escape to exit.
Spooling paused.                                                                 ?
```

You can change the **State**, **Form**, and **Class** of printers.

- ➤ Select a printer using the UP ARROW and DOWN ARROW keys. The current printer is indicated by a blinking arrow.
- ➤ If more than one printer is listed, press ENTER before making changes.
- ➤ Move between printer attributes using LEFT ARROW, RIGHT ARROW or TAB.
- ➤ Make any necessary changes to the printer attributes.
- ➤ Press ENTER after changes are made.

Files

To make changes to file attributes, select F for the **Files** command:



```
Printer  File         State    Form     Class Prty Copies   Size    Lines Status
LPT1                  Ready    STD      1                             415 busy
SUSPEND               Ready    STD      2                               0 busy
                                                                  Date   Time
       →CHECKS                 CK501    1      0      1     1998  1/24/94 10:35
        PRICES        Hold     LABELS   2      3      2     4840  1/24/94 10:44
        TAX1040                1040     1      5      1     5180  1/24/94 10:35
        INVOICES               INV99    2      5      8     3262  1/24/94 10:36

Select file using ↑↓ and press Enter or Tab to change or V to view, or
H to view header. Delete files by marking with Space and pressing Del.
Spooling paused.                                     Escape to exit.          ?
```

- ➤ Select V to view a file.
- ➤ Select H to view the header of a file. Refer to section 1.2 for more information about the file header.

To Change the Attributes of a File

- ➤ Select a file using the UP ARROW and DOWN ARROW keys. The current file is indicated by a blinking arrow.
- ➤ Move between file attributes using LEFT ARROW, RIGHT ARROW or TAB.
- ➤ Make any necessary changes to the file attributes.
- ➤ Press ENTER after changes are made.

To Change the Attributes of a Group of Files

- ➤ Select the file using the UP ARROW and DOWN ARROW keys. The current file is indicated by a blinking arrow.
- ➤ Press SPACEBAR to mark the files.
- ➤ Change the attributes of one of the files.
- ➤ Press ENTER.
- ➤ Respond **`Yes`** to the **`Apply changes to all marked files?`** prompt.

To Delete a File

Files are automatically deleted from the print spool directory after printing. However, you can delete a file before it is printed. First, mark the file, then delete it:

- ➤ Select the file using the UP ARROW and DOWN ARROW keys. The current file is indicated by a blinking arrow.
- ➤ Press SPACEBAR to mark the file. A marked file is indicated by a checkmark.
- ➤ Press DELETE to delete the file.
- ➤ Specify whether the **`Marked`** or **`Unmarked`** files are to be deleted.

> ***Note:*** You also can mark more than one file, and delete the files.

Sort

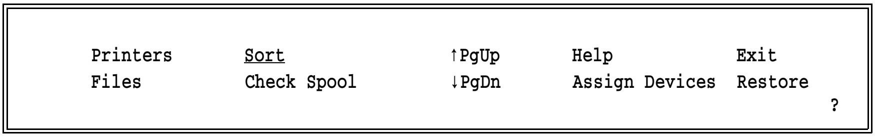
The **`Sort`** command enables you to control the print order of files. When you change the sort of files, the **`Print Spoo`**l screen is updated. Additionally, to help you better maintain PC disk space, the **`Sort`** command gives you a different view of files in the print spool. It displays the number of files in the print spool directory, the amount of space used by those files, and the amount of available space.

Four sort variables set the order in which files are displayed and printed. Files are sorted by the first variable, then subsorted by the remaining three variables. By default, files are sorted by the sort criteria specified in the **Print Spool Description** parameters.

Sort variables are described in detail in Chapter 5. Sort variables include **Prty**, **Class**, **File**, **Size**, **Form**, **Date**, and **Time**.

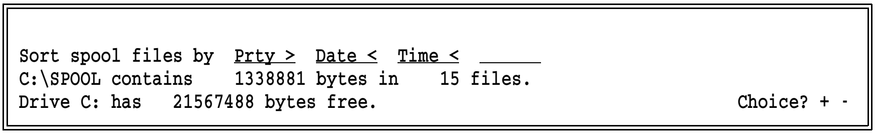
One application for this feature is printing all short files before longer files by specifying ascending size (**Size >**) as the first criteria of the sort order. To specify descending size, you would select **Size <**.

To use the **Sort** command, from the **Print Spool** screen:



```
      Printers       Sort                ↑PgUp       Help            Exit
      Files          Check Spool         ↓PgDn       Assign Devices  Restore
                                                                              ?
```

➤ Select **Sort**.



```
Sort spool files by  Prty >  Date <  Time <  ______
C:\SPOOL contains    1338881 bytes in    15 files.
Drive C: has   21567488 bytes free.                                 Choice? + -
```

➤ Move between sort variables using the RIGHT ARROW key.

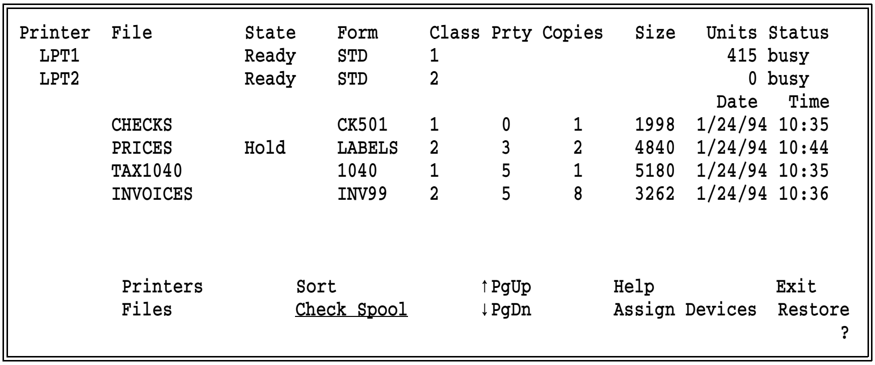
➤ Select a variable using the PLUS or MINUS key.

➤ Set any unused criteria to blank.

➤ Press ENTER when finished.

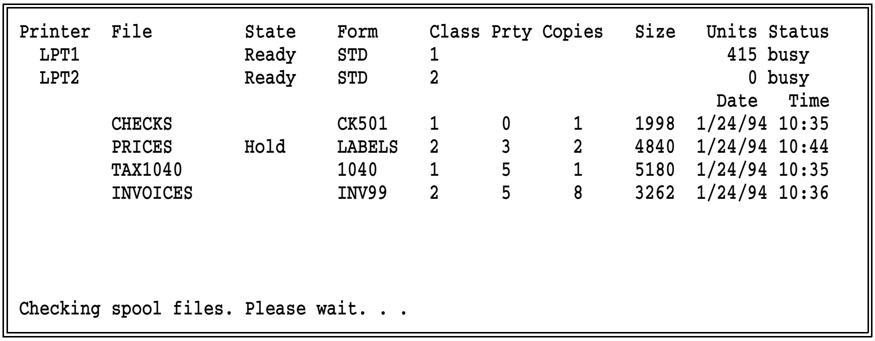
Check Spool

The **Check Spool** directory command allows you to update the print spool display with files copied in from DOS or a LAN. BARR/SPOOL automatically checks the print spool directory for new files every **300** seconds (or the time limit you specify in the **Print Spool Description** parameters). So, it is necessary to manually update the print spool display *only* when you cannot wait for the automatic update. Refer to Chapter 5 for more information about **Print Spool Description** parameters.



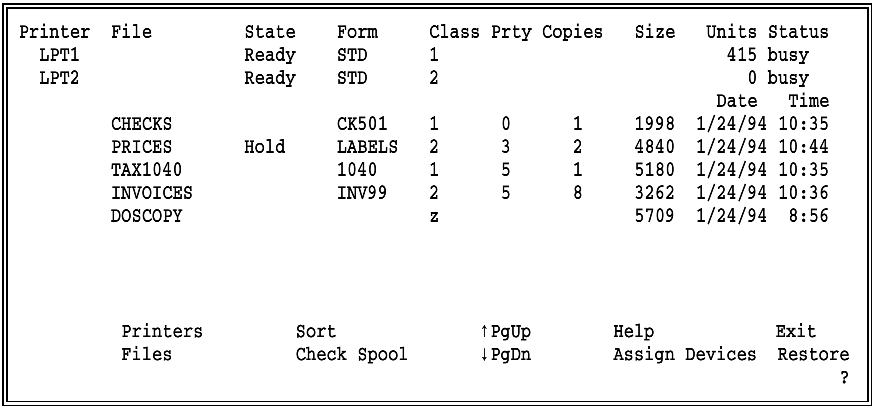
```
Printer  File         State    Form     Class Prty Copies   Size   Units Status
  LPT1                Ready    STD      1                            415 busy
  LPT2                Ready    STD      2                              0 busy
                                                                   Date   Time
         CHECKS                CK501    1      0      1     1998  1/24/94 10:35
         PRICES       Hold     LABELS   2      3      2     4840  1/24/94 10:44
         TAX1040               1040     1      5      1     5180  1/24/94 10:35
         INVOICES              INV99    2      5      8     3262  1/24/94 10:36
```

➤ Select C for the **Check Spool** command.



```
Printer  File         State    Form     Class Prty Copies   Size   Units Status
  LPT1                Ready    STD      1                            415 busy
  LPT2                Ready    STD      2                              0 busy
                                                                   Date   Time
         CHECKS                CK501    1      0      1     1998  1/24/94 10:35
         PRICES       Hold     LABELS   2      3      2     4840  1/24/94 10:44
         TAX1040               1040     1      5      1     5180  1/24/94 10:35
         INVOICES              INV99    2      5      8     3262  1/24/94 10:36




Checking spool files. Please wait. . .
```

BARR/SPOOL checks for any files copied into the print spool.

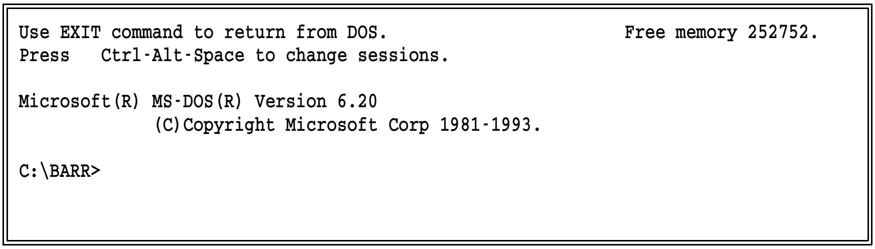


```
Printer  File         State    Form     Class Prty Copies   Size   Units Status
  LPT1                Ready    STD      1                            415 busy
  LPT2                Ready    STD      2                              0 busy
                                                                    Date   Time
         CHECKS                CK501    1      0      1     1998  1/24/94 10:35
         PRICES       Hold     LABELS   2      3      2     4840  1/24/94 10:44
         TAX1040               1040     1      5      1     5180  1/24/94 10:35
         INVOICES              INV99    2      5      8     3262  1/24/94 10:36
         DOSCOPY                        z                   5709  1/24/94  8:56




          Printers         Sort              ↑PgUp        Help            Exit
          Files            Check Spool       ↓PgDn        Assign Devices  Restore
                                                                                ?
```

BARR/SPOOL updates the print spool with any files copied into the print spool directory.

13.3 DOS Session

The DOS session takes you to a DOS prompt where you can work in DOS without exiting BARR/SPOOL.



```
Use EXIT command to return from DOS.                       Free memory 252752.
Press   Ctrl-Alt-Space to change sessions.

Microsoft(R) MS-DOS(R) Version 6.20
             (C)Copyright Microsoft Corp 1981-1993.

C:\BARR>
```

Most programs that use standard DOS functions work in the DOS session. However, programs that turn off interrupts for extended periods of time and programs that use the same interrupts as BARR/SPOOL may interfere with operation. Also, large programs may fail to load due to a lack of available memory. To exit the DOS session, hot-key to another session or type `exit` at the DOS prompt.

Note: This session is available only with DOS 3.0 and later versions.

Note: The PRT utility is too large to run interactively in the DOS session. Instead, use the batch mode of PRT.

13.4 File Attributes

Maintained with each file in the print spool are attributes that describe the file and specify how it is to be printed. You can alter the **State**, **Form**, **Disposition**, **Class**, **Prty**, and **Copies** attributes. Changes are written to the file header so, if necessary, you can exit the software before your files have printed. The only exception is the **Disposition** attribute. Changes to **Disposition** are not saved. Note, also, that attribute values from the File Attribute Table are written to a file *only* if the **State** of the file is altered on the **Print Spool** screen.

When changing the **Form** attribute, there are several considerations. Modifying the form attribute only changes the form name in the header. However, form information included at the time a file is *received* from a host consists of more than just the form name. Thus, if a file is received from a host with an incorrect form, it must be received again with the correct form to ensure that all the form information is correct. There are, however, two cases when changing the **Form** attribute on the **Print Spool** screen is helpful:

- When using form overlay files, the form name is used to trigger the overlay file. If you need only an overlay file and not a form definition, changing the **Form** attribute has the desired results.
- If form information is stored in the printer and the **Form** attribute in the file is used to trigger the form name in the printer, changing the **Form** attribute on the **Print Spool** screen results in the use of the correct form definition from the printer. An example of this situation is the use of Xerox laser printers which store forms in the printer.

An explanation of each file attribute follows:

State

Current status of the file.

Ready

File is ready to be printed.

Hold

File is held and will not be selected for printing.

Delete

File will be deleted.

Error

An error occurred while writing to the **Retain** directory. Check your **Spool** and **Retain** directories. Are they on the same drive?

Disposition

Indicates disposition, deleted or retained, of file *after* printing. If the file is to be deleted, a hyphen (**-**) character appears to the right of the file **State**. If the file is to be retained, no character appears to the right of the **State**. Files are retained in the directory specified in the **Print Spool Description** parameters or, if no directory was specified, in the root directory. You can preset **Disposition** using the **File Attribute Table**.

Form

An 8-character form name. This often indicates pre-printed paper forms that must be mounted on the printer.

Class

A one-character, alphanumeric printer class useful for controlling which printer is selected. Files received from a host initially are assigned a class from **Assign Devices** or the **File Attribute Table**. Files copied into the print spool directory from DOS initially are assigned Class **Z**.

Prty

Indicates the priority in which files are selected. Values range from **0-9**, with **9** as the highest priority.

Copies

Number of copies to be printed.

When printing multiple copies, the **Copies** field decreases by 1 as each copy is printed. For example, if you are printing 5 copies, the **Copies** field will display **4** after the first copy has printed.

Size

Length of the file in bytes. When printing a file, the **Size** field decreases as the file is printed.

Date
Time

Date and time the PC file was created.

13.5 Printer Attributes

Printer attributes maintain the status of the printer and determine which files are selected for printing. You can alter the printer attributes of **State**, **Form**, and **Class**.

State

Current status of the printer.

Ready

Printer is ready but no files can be selected because printer **Form** and **Class** do not match any file's **Form** and **Class**.

Printing

Printer is ready and a file is being printed.

Draining

Printer is printing a file. When finished, the printer **State** becomes **Disabled**.

Disabled

Printing has been stopped or the printer is not ready. No files will be selected.

Reprint

When the printer is in the **Reprint** state and a file is selected, the **Reprint** screen shows the contents of the file, beginning at the last line printed. You can position the file by forward and backward scrolling or by page number. On the **Reprint** screen, commands can be used to restart printing at the new position or to disable the printer. Refer to Chapter 14 for more information about the **Reprint** screen.

Form

The 8-character name of the form mounted on the printer. When specifying a form, you can use the DOS wildcard characters ***** and **?**. A **?** in a file name allows any character to occupy that position. For example, **FORM=JUN??9?** matches any characters in the **?** positions. An ***** in a file name allows any character to occupy that position and all remaining positions in the name or extension. For example, **FORM=MAY*** matches all form names starting with **MAY**. For more information about wildcard characters, see *Global File Name Characters* in your DOS manual.

An asterisk (*****) in the **Form** attribute allows all files to print regardless of **Form**.

Class

A one-character, alphanumeric printer class useful for controlling the selection of files. Up to 5 classes can be entered for each printer (each of the 5 characters represents a separate class). If no printer class is given, **Class** is not used in the selection of files.

Units

Cumulative total number of lines/pages printed. The choice to display the number of lines versus the number of pages is entered on the **Miscellaneous Printer Options** screen.

Status

Physical printer status.

Chapter

14 Reprinting Files

Reprinting print spool files.

Contents

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Restore Command 240

Chapter

14 Reprinting Files

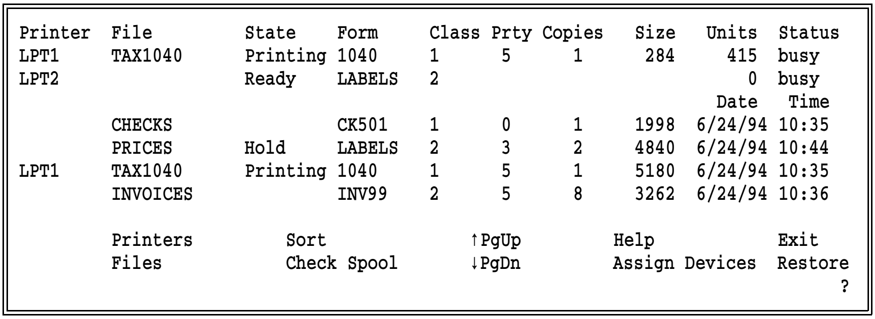
When you need to reprint a file, there are two situations you can encounter. You can reprint a file that is currently in the print spool or you can reprint a file from the retain directory. A file that is neither in the print spool nor in the retain directory was deleted and cannot be reprinted. It must be re-sent to the BARR/SPOOL directory from the original source or, if a backup file exists, it can be copied into the print spool directory using the PRT utility.

Detailed instructions for reprinting a file from the Print Spool session and from the retain directory follow.

14.1 Reprint a File Currently in the Spool

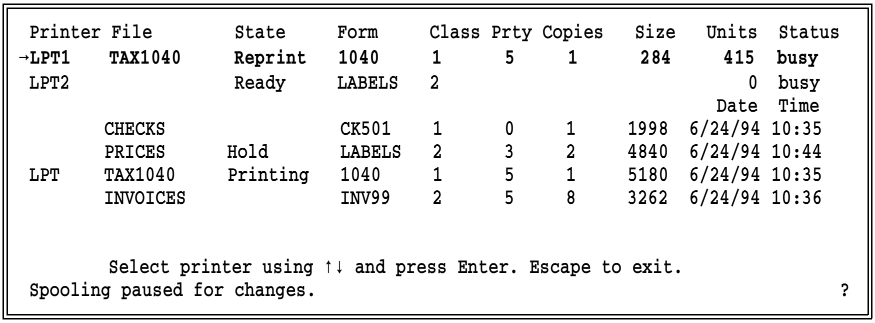
You may need to reprint a file currently in the print spool when the printer jams, when the wrong paper was on the printer and you stopped printing, etc. You will use the **`Print Spool`** screen and a special **`Reprint`** screen to view or reposition the file before printing resumes. For example, if the printer jammed on the third page of the print-out, you can begin the reprint from the third page.

To reprint a file currently in the print spool, from the **`Print Spool`** screen:



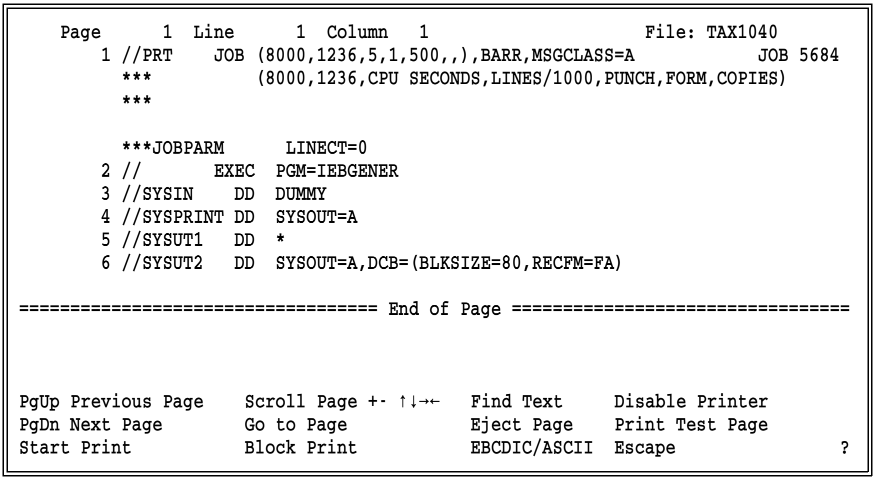
```
Printer  File         State    Form     Class Prty Copies   Size   Units  Status
LPT1     TAX1040      Printing 1040     1       5      1     284     415  busy
LPT2                  Ready    LABELS   2                              0  busy
                                                                    Date   Time
         CHECKS                CK501    1       0      1    1998  6/24/94 10:35
         PRICES       Hold     LABELS   2       3      2    4840  6/24/94 10:44
LPT1     TAX1040      Printing 1040     1       5      1    5180  6/24/94 10:35
         INVOICES              INV99    2       5      8    3262  6/24/94 10:36

         Printers         Sort             ↑PgUp        Help            Exit
         Files            Check Spool      ↓PgDn        Assign Devices  Restore
                                                                              ?
```

➤ Press P to indicate that you want to change a printer attribute.



```
 Printer File        State     Form     Class Prty Copies   Size   Units  Status
→LPT1    TAX1040     Reprint   1040     1      5     1      284     415  busy
 LPT2                Ready     LABELS   2                               0  busy
                                                                     Date  Time
        CHECKS                 CK501    1      0     1     1998  6/24/94 10:35
        PRICES      Hold       LABELS   2      3     2     4840  6/24/94 10:44
 LPT    TAX1040     Printing   1040     1      5     1     5180  6/24/94 10:35
        INVOICES               INV99    2      5     8     3262  6/24/94 10:36


        Select printer using ↑↓ and press Enter. Escape to exit.
 Spooling paused for changes.                                                 ?
```

- ➤ Select a printer using the UP ARROW and DOWN ARROW keys. Note the arrow indicating the current line.
- ➤ Select the **`State`** field. Change the **`State`** to **`Reprint`**.
- ➤ Change the printer's attributes of **`Form`** and **`Class`** to match the **`Form`** and **`Class`** of the file you want to **`Reprint`**.
- ➤ Press ENTER to print the current file on the selected printer.

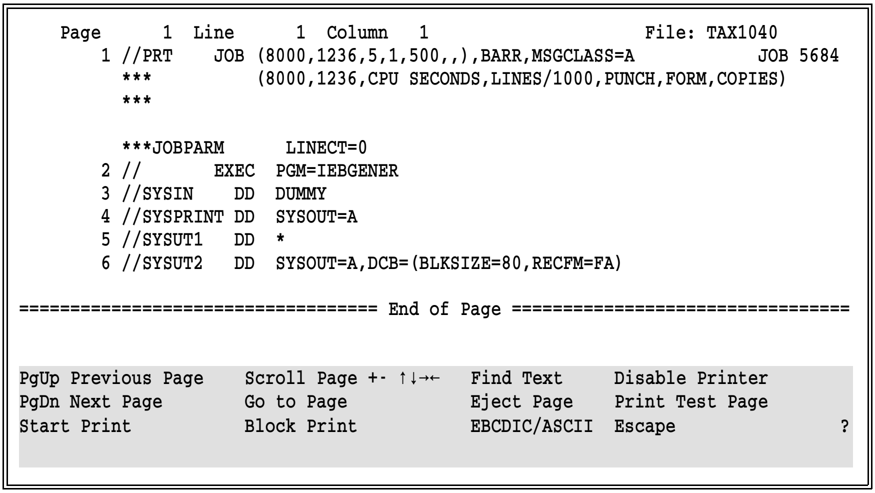


```
   Page      1  Line      1  Column   1                     File: TAX1040
       1 //PRT    JOB (8000,1236,5,1,500,,),BARR,MSGCLASS=A           JOB 5684
         ***         (8000,1236,CPU SECONDS,LINES/1000,PUNCH,FORM,COPIES)
         ***

         ***JOBPARM      LINECT=0
       2 //       EXEC  PGM=IEBGENER
       3 //SYSIN    DD  DUMMY
       4 //SYSPRINT DD  SYSOUT=A
       5 //SYSUT1   DD  *
       6 //SYSUT2   DD  SYSOUT=A,DCB=(BLKSIZE=80,RECFM=FA)

=================================== End of Page =================================



PgUp Previous Page    Scroll Page +- ↑↓→←   Find Text     Disable Printer
PgDn Next Page        Go to Page            Eject Page    Print Test Page
Start Print           Block Print           EBCDIC/ASCII  Escape               ?
```

- ➤ You automatically enter the **`Reprint`** screen. The **`Reprint`** screen displays the contents of the file you have selected. An example file is shown above.
- ➤ When a file has been partially printed then put on hold, the **`Reprint`** screen displays the last page printed.
- ➤ Use reprint commands to select the point from which the file should be printed, and then to print the file.

Reprint Commands

Reprint commands display at the bottom of the **`Reprint`** screen:



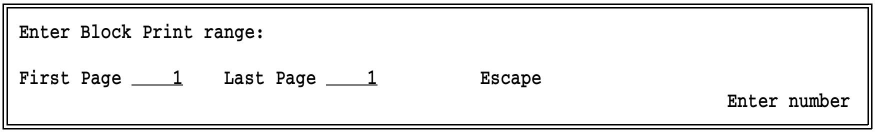
```
    Page      1  Line      1  Column   1                     File: TAX1040
        1 //PRT    JOB (8000,1236,5,1,500,,),BARR,MSGCLASS=A           JOB 5684
          ***         (8000,1236,CPU SECONDS,LINES/1000,PUNCH,FORM,COPIES)
          ***

          ***JOBPARM      LINECT=0
        2 //       EXEC  PGM=IEBGENER
        3 //SYSIN    DD  DUMMY
        4 //SYSPRINT DD  SYSOUT=A
        5 //SYSUT1   DD  *
        6 //SYSUT2   DD  SYSOUT=A,DCB=(BLKSIZE=80,RECFM=FA)

=================================== End of Page ================================


PgUp Previous Page    Scroll Page +- ↑↓→←   Find Text     Disable Printer
PgDn Next Page        Go to Page            Eject Page    Print Test Page
Start Print           Block Print           EBCDIC/ASCII  Escape              ?
```

`PgUp Previous Page`
Display the previous page.

`PgDn Next Page`
Display the next page.

`Start Print`
Reprint the file.

`Block Print`
Specify the first page and last page to print within the file. If you do not specify a **`Last Page`**, the **`Last Page`** defaults to the **`First Page`**. So only one page is printed.



```
Enter Block Print range:

First Page ____1    Last Page ____1          Escape
                                                                  Enter number
```

If the file contains no form feed characters, specify the first line and last line to print within the file. If you do not specify a **`Last Line`**, the **`Last Line`** defaults to the value in **`First Line`**. So only one line is printed.

```
Enter Block Print range:

First Line ____1    Last Line ____1          Escape
                                                        Enter number
```

`Scroll Page` (PLUS SIGN, MINUS SIGN, and arrow keys)

The leftmost columns of the current page are displayed on the screen. To see the complete page, use the arrow scrolling keys. The PLUS SIGN and MINUS SIGN keys scroll a screen at a time. Arrows scroll one line or column at a time.

`Go to Page`

Move to a specific page number. You are prompted to enter the number of the page you want to view.

```

                                    New page      _1

                                                        Enter number
```

If the file contains no form feed characters, you are prompted to enter the number of the line you want to view.

```
A specific page cannot be located. The file has no form feed character
defining pages.

                                    New line      _1

                                                        Enter number
```

Find Text

Search for text. You can enter a search string of up to 25 characters.

```
Enter text to find:_________________________
Only search text starting in column __1? No

                                                       Enter character
```

Eject Page

Send the printer to a new page.

EBCDIC/ASCII

View file contents in either EBCDIC or ASCII. This option enables you to view files in the S/370 channel format.

Press B to view contents in EBCDIC (S/370 files).

Press A to view contents in ASCII.

Disable Printer

Change the printer **State** to **Disabled** and the file **State** to **Hold**. You return to the **Print Spool** screen to view the updated printer and file **State**.

Print Test Page

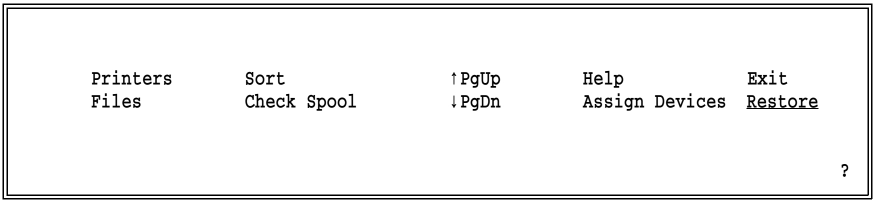
Print the current page and advance to the next page. You can use this option to verify that data is printing correctly on a form. If incorrect, you can change the form alignment and print another test page. If correct, you can proceed with printing the rest of the file.

14.2 Reprint a File from the Retain Directory

If you set the parameters in the **Print Spool Description** screen to retain files, you can use the **Restore** command to restore a file from the retain directory to the print spool. Then, you can print the file as you normally would using spooling commands.

Restore Command

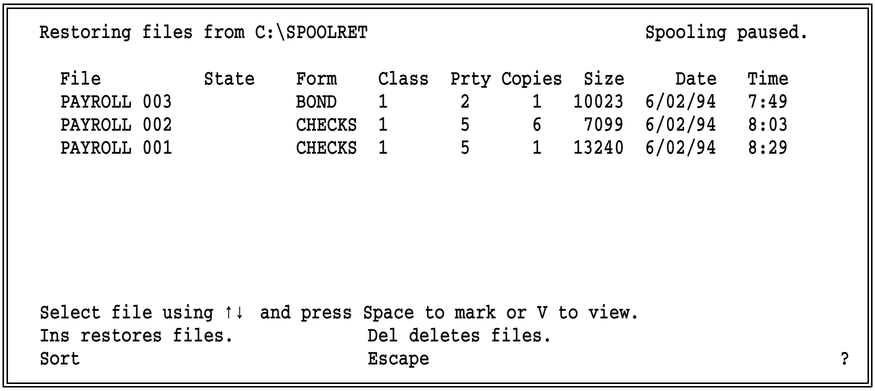
The **Restore** command allows you to manage files in the **Retain** directory. You can view, mark, sort, select, and delete files. To restore files:



```
     Printers       Sort              ↑PgUp        Help            Exit
     Files          Check Spool       ↓PgDn        Assign Devices  Restore

                                                                           ?
```

➤ From the **Print Spool** screen, select **Restore**

> ***Note:*** If **Restore** is not one of the options on your screen, verify that a **Retain** directory is assigned on the **Print Spool Description** screen. **Restore** will appear on the screen only if a **Retain** directory is specified.



```
Restoring files from C:\SPOOLRET                           Spooling paused.

  File          State    Form    Class  Prty Copies  Size     Date    Time
  PAYROLL 003            BOND    1       2      1   10023  6/02/94   7:49
  PAYROLL 002            CHECKS  1       5      6    7099  6/02/94   8:03
  PAYROLL 001            CHECKS  1       5      1   13240  6/02/94   8:29







Select file using ↑↓  and press Space to mark or V to view.
Ins restores files.            Del deletes files.
Sort                           Escape                                     ?
```

- ➤ Move from file to file using UP ARROW and DOWN ARROW keys.
- ➤ Press the SPACEBAR to mark files to be restored.
- ➤ Press I to begin restoring files.

Files are restored to the print spool. To print restored files, proceed to the **Print Spool** session and print the files as you normally would.

Appendix

A Serial Port Interface

Specifications for the PC serial ports (COM1-COM4).

Contents

A.1 Signals for 25-Pin Serial Ports 243
A.2 Signals for 9-Pin Serial Ports 244
A.3 Printer Cable Specifications for 25-Pin Serial Ports. 245
A.4 Printer Cable Specifications for 9-Pin Serial Ports. 246

Appendix

A Serial Port Interface

BARR/SPOOL conforms to the IBM standard for sending data to and receiving data from the PC asynchronous serial ports COM1-COM4. The following sections document the definitions for the serial port signals. The serial port can be used for driving printers or reading data from other devices.

A.1 Signals for 25-Pin Serial Ports

Signals for the 25-pin serial port connector on the PC:

Pin Number	Name	Direction	Description
1	PRO-GND	—	Protective Chassis Ground.
2	TXD	out	Transmit Data.
3	RXD	in	Receive Data. Used for XON/XOFF flow control and receive data.
4	RTS	out	Request-To-Send. Always set by BARR/SPOOL to 1.
5	CTS	in	Clear-To-Send. Used for flow control. If CTS=0 then no data will be sent. This line can be jumpered to RTS to force CTS=1.
6	DSR	in	Data-Set-Ready. Used for flow control by DOS. May be used for flow control by BARR/SPOOL. To be compatible with DOS, pin 6 should be tied to pin 5.
7	SIG-GND	—	Signal Ground.
20	DTR	out	Data-Terminal-Ready. Used for flow control when receiving on a COM port. BARR/SPOOL will set this to 0 to signal the remote device to temporarily suspend data transmission.

> ***Note:*** The terms 0 and 1 for electrical signals are used for LOW and HIGH signals.

A.2 Signals for 9-Pin Serial Ports

Signals for the 9-pin serial port connector on the PC:

Pin Number	Name	Direction	Description
3	TXD	out	Transmit Data.
2	RXD	in	Receive Data. Used for XON/XOFF flow control and receive data.
7	RTS	out	Request-To-Send. Always set by BARR/SPOOL to 1.
8	CTS	in	Clear-To-Send. Used for flow control. If CTS=0 then no data will be sent. This line can be jumpered to RTS to force CTS=1.
6	DSR	in	Data-Set-Ready. Used for flow control by DOS. May be used for flow control by BARR/SPOOL. To be compatible with DOS, pin 6 should be tied to pin 8.
5	SIG-GND	—	Signal Ground.
4	DTR	out	Data-Terminal-Ready. Used for flow control when receiving on a COM port. BARR/SPOOL will set this to 0 to signal the remote device to temporarily suspend data transmission.

> ***Note:*** The terms 0 and 1 for electrical signals are used for LOW and HIGH signals.

A.3 Printer Cable Specifications for 25-Pin Serial Ports

This type of printer cable is also called a null-modem cable. It has a D25 male connector that plugs into the printer, and a D25 female connector that plugs into the PC serial port.

Printer (D25 Male)			**PC Serial Port (D25 Female)**	
Name	**Pin**		**Pin**	**Name**
PRO-GND	1	—	1	PRO-GND
RXD	3	←	2	TXD
TXD	2	→	3	RXD
SIG-GND	7	—	7	SIG-GND
		→	5	CTS
DTR	20	→	6	DSR
		→	8	DCD
CTS	5	←		
DSR	6	←	20	DTR
DCD	8	←		

A.4 Printer Cable Specifications for 9-Pin Serial Ports

This type of printer cable is also called a null-modem cable. It has a D25 male connector that plugs into the printer, and a D9 female connector that plugs into the PC serial port.

Printer (D25 Male)			**PC Serial Port (D9 Female)**	
Name	**Pin**		**Pin**	**Name**
RXD	3	←	3	TXD
TXD	2	→	2	RXD
SIG-GND	7	—	5	SIG-GND
		→	8	CTS
DTR	20	→	6	DSR
		→	1	DCD
CTS	5	←		
DSR	6	←	4	DTR
DCD	8	←		

Appendix

B

ASCII and EBCDIC Standards

These tables and standards provide information for ASCII-to-EBCDIC and EBCDIC-to-ASCII translation of files.

Contents

B.1 Printing ASCII Files on EBCDIC Printers 250
B.2 Printing EBCDIC Files on ASCII Printers 250
B.3 EBCDIC and ASCII Translation 251
B.4 ASCII-to-EBCDIC Translation Table 252
B.5 EBCDIC-to-ASCII Translation Table 253
B.6 Legend of Characters 254

Appendix

B ASCII and EBCDIC Standards

The PC uses the ASCII (American Standard Code for Information Interchange) coding system to define the correspondence between the graphic symbols we see on paper and on screen to the hexadecimal codes manipulated in the computer. By comparison, a mainframe or AS/400 assumes the EBCDIC (Extended Binary-Coded Decimal Interchange Code) coding system between the graphic symbols and the hexadecimal codes used in the computer.

Both the ASCII and EBCDIC standards include *control codes* that do not have a graphic representation. These codes are used for control functions by printers and communication protocols. The control codes are represented symbolically by two- and three-character abbreviations. For example, the control code for End of Transmission is represented as **`EOT`**.

When printing ASCII files on EBCDIC printers, BARR/SPOOL must translate the codes from ASCII to EBCDIC. When printing EBCDIC files on ASCII printers, BARR/SPOOL must translate the files from EBCDIC to ASCII.

The tables in sections B.5 and B.6 show the standard ASCII-to-EBCDIC and EBCDIC-to-ASCII translations. Section 9.1 describes how to modify the standard translation tables.

B.1 Printing ASCII Files on EBCDIC Printers

BARR/SPOOL translates ASCII files to EBCDIC files when printing to S/370 channel attached printers.

Each ASCII line ends with the carriage return character. Line Feed (**LF**), Form Feed (**FF**), and Delete (**7F**) characters are discarded. Horizontal Tab (**HT**) characters produce the standard spacing assumed by the IBM PC.

BARR/SPOOL translates from the ASCII character set to the EBCDIC character set. See Section B.4 for a description of the ASCII-to-EBCDIC Translation Table.

B.2 Printing EBCDIC Files on ASCII Printers

A mainframe or AS/400 uses the EBCDIC coding system. The data in each line is translated from EBCDIC to ASCII as described in Section B.5, *EBCDIC-to-ASCII Translation Table.*

Each line received from the host computer provides line feed and carriage control information as described in the following table:

Spacing information received	ASCII codes produced
Space 0 lines	CR (overprint)
Space 1 line	CR LF
Space 2 lines	CR LF CR LF
Space 3 lines	CR LF CR LF CR LF
Skip to stop 1	FF to start new page
Skip to stop 2-9, A, B, C	CR LF to advance to line indicated

B.3 EBCDIC and ASCII Translation

During data translation, the representation for a symbol in one coding system is converted to the representation for that symbol in the other coding system. In many cases, an identical symbol exists in both coding systems so translation is straightforward. For example, the letter **A** is represented as hexadecimal **41** in ASCII and **C1** in EBCDIC.

In a few cases, an identical symbol does not exist in both coding systems but an equivalent character can be substituted. For example, the EBCDIC Logical Not (¬) symbol is represented by the ASCII circumflex (**^**), the alternate representation for this symbol.

In other cases, an equivalent symbol does not exist because all graphic symbols do not appear in both the ASCII and EBCDIC coding systems. In these cases, the software substitutes a question mark (**?**) for the symbols. For example, when converting from EBCDIC to ASCII, the EBCDIC hexadecimal **62** does not have an equivalent representation in ASCII.

The default tables in the BARR/SPOOL program do not translate any control codes. Instead, question marks (?) are substituted for control codes. **Translate control codes to Control codes** is the default option. The default tables are shown in this appendix. You can alter the translation tables to meet your application's requirements. Refer to section 9.1 for more information about modifying the translation tables.

> ***Extended ASCII Codes:*** The translation tables allow you to use extended ASCII codes for **80-FF**. On the PC keyboard, extended ASCII characters can be displayed by pressing ALT and the decimal code for the symbol. Refer to the ASCII code pages in your DOS manual for a list of ASCII symbols and their decimal codes.

B.4 ASCII-to-EBCDIC Translation Table

ASCII	EBCDIC	Graphic	ASCII	EBCDIC	Graphic	ASCII	EBCDIC	Graphic	ASCII	EBCDIC	Graphic	ASCII	EBCDIC	Graphic	ASCII	EBCDIC	Graphic	ASCII	EBCDIC	Graphic	ASCII	EBCDIC	Graphic
00	00	NUL	20	40	SP	40	7C	@	60	79	‘	80	00	NUL	A0	40	SP	C0	7C	@	E0	79	‘
01	01	SOH	21	5A	!	41	C1	A	61	81	a	81	01	SOH	A1	5A	!	C1	C1	A	E1	81	a
02	02	STX	22	7F	“	42	C2	B	62	82	b	82	02	STX	A2	7F	”	C2	C2	B	E2	82	b
03	03	ETX	23	7B	#	43	C3	C	63	83	c	83	03	ETX	A3	7B	#	C3	C3	C	E3	83	c
04	37	EOT	24	5B	$	44	C4	D	64	84	d	84	37	EOT	A4	5B	$	C4	C4	D	E4	84	d
05	2D	ENQ	25	6C	%	45	C5	E	65	85	e	85	2D	ENQ	A5	6C	%	C5	C5	E	E5	85	e
06	2E	ACK	26	50	&	46	C6	F	66	86	f	86	2E	ACK	A6	50	&	C6	C6	F	E6	86	f
07	2F	BEL	27	7D	’	47	C7	G	67	87	g	87	2F	BEL	A7	7D	'	C7	C7	G	E7	87	g
08	16	BS	28	4D	(	48	C8	H	68	88	h	88	16	BS	A8	4D	(	C8	C8	H	E8	88	h
09	05	HT	29	5D	)	49	C9	I	69	89	i	89	05	HT	A9	5D	)	C9	C9	I	E9	89	i
0A	25	LF	2A	5C	*	4A	D1	J	6A	91	j	8A	25	LF	AA	5C	*	CA	D1	J	EA	91	j
0B	0B	VT	2B	4E	+	4B	D2	K	6B	92	k	8B	0B	VT	AB	4E	+	CB	D2	K	EB	92	k
0C	0C	FF	2C	6B	,	4C	D3	L	6C	93	l	8C	0C	FF	AC	6B	,	CC	D3	L	EC	93	l
0D	0D	CR	2D	60	—	4D	D4	M	6D	94	m	8D	0D	CR	AD	60	—	CD	D4	M	ED	94	m
0E	0E	SO	2E	4B	.	4E	D5	N	6E	95	n	8E	0E	SO	AE	4B	.	CE	D5	N	EE	95	n
0F	0F	SI	2F	61	/	4F	D6	O	6F	96	o	8F	0F	SI	AF	61	/	CF	D6	O	EF	96	o
10	10	DLE	30	F0	0	50	D7	P	70	97	p	90	10	DLE	B0	F0	0	D0	D7	P	F0	97	p
11	11	DC1	31	F1	1	51	D8	Q	71	98	q	91	11	DC1	B1	F1	1	D1	D8	Q	F1	98	q
12	12	DC2	32	F2	2	52	D9	R	72	99	r	92	12	DC2	B2	F2	2	D2	D9	R	F2	99	r
13	13	DC3	33	F3	3	53	E2	S	73	A2	s	93	13	DC3	B3	F3	3	D3	E2	S	F3	A2	s
14	3C	DC4	34	F4	4	54	E3	T	74	A3	t	94	3C	DC4	B4	F4	4	D4	E3	T	F4	A3	t
15	3D	NAK	35	F5	5	55	E4	U	75	A4	u	95	3D	NAK	B5	F5	5	D5	E4	U	F5	A4	u
16	32	SYN	36	F6	6	56	E5	V	76	A5	v	96	32	SYN	B6	F6	6	D6	E5	V	F6	A5	v
17	26	ETB	37	F7	7	57	E6	W	77	A6	w	97	26	ETB	B7	F7	7	D7	E6	W	F7	A6	w
18	18	CAN	38	F8	8	58	E7	X	78	A7	x	98	18	CAN	B8	F8	8	D8	E7	X	F8	A7	x
19	19	EM	39	F9	9	59	E8	Y	79	A8	y	99	19	EM	B9	F9	9	D9	E8	Y	F9	A8	y
1A	3F	SUB	3A	7A	:	5A	E9	Z	7A	A9	z	9A	3F	SUB	BA	7A	:	DA	E9	Z	FA	A9	z
1B	27	ESC	3B	5E	;	5B	AD	[	7B	C0	{	9B	27	ESC	BB	5E	;	DB	AD	[	FB	C0	{
1C	1C	FS	3C	4C	<	5C	E0	\	7C	4F	¦	9C	1C	FS	BC	4C	<	DC	E0	\	FC	4F	¦
1D	1D	GS	3D	7E	=	5D	BD	]	7D	D0	}	9D	1D	GS	BD	7E	=	DD	BD	]	FD	D0	}
1E	1E	RS	3E	6E	>	5E	5F	^	7E	A1	~	9E	1E	RS	BE	6E	>	DE	5F	^	FE	A1	~
1F	1F	US	3F	6F	?	5F	6D	_	7F	3F	DEL	9F	1F	US	BF	6F	?	DF	6D	_	FF	3F	DEL

The ASCII codes are defined in the American Standard Code for Information Interchange publication *ANSI X3.4-1986* from the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.

In the table above, the first column contains ASCII hexadecimal codes that are associated with a graphic or control symbol given in the third column. EBCDIC codes are obtained by matching for the same graphic in the IBM EBCDIC standard. The right half of the table (**`80-FF`**) is a copy of the left half (**`00-7F`**), which causes the parity bit to be ignored in translation between ASCII and EBCDIC.

B.5 EBCDIC-to-ASCII Translation Table

EBCDIC	ASCII	Graphic	EBCDIC	ASCII	Graphic	EBCDIC	ASCII	Graphic	EBCDIC	ASCII	Graphic	EBCDIC	ASCII	Graphic	EBCDIC	ASCII	Graphic	EBCDIC	ASCII	Graphic	EBCDIC	ASCII	Graphic
00	20	SP	20	??	DS	40	20	SP	60	2D	—	80	??		A0	??		C0	7B	{	E0	5C	\
01	01	SOH	21	??	SOS	41	??		61	2F	/	81	61	a	A1	7E	~	C1	41	A	E1	??	
02	02	STX	22	??	FS	42	??		62	??		82	62	b	A2	73	s	C2	42	B	E2	53	S
03	03	ETX	23	??	WUS	43	??		63	??		83	63	c	A3	74	t	C3	43	C	E3	54	T
04	??	SEL	24	??	BYP	44	??		64	??		84	64	d	A4	75	u	C4	44	D	E4	55	U
05	09	HT	25	0A	LF	45	??		65	??		85	65	e	A5	76	v	C5	45	E	E5	56	V
06	??	RNL	26	17	ETB	46	??		66	??		86	66	f	A6	77	w	C6	46	F	E6	57	W
07	7F	DEL	27	1B	ESC	47	??		67	??		87	67	g	A7	78	x	C7	47	G	E7	58	X
08	??	GE	28	??	SA	48	??		68	??		88	68	h	A8	79	y	C8	48	H	E8	59	Y
09	??	SPS	29	??	SFE	49	??		69	??		89	69	i	A9	7A	z	C9	49	I	E9	5A	Z
0A	??	RPT	2A	??	SM	4A	??	¢	6A	??	|	8A	??		AA	??		CA	??		EA	??	
0B	0B	VT	2B	??	CSP	4B	2E	.	6B	2C	,	8B	??		AB	??		CB	??		EB	??	
0C	0C	FF	2C	??	MFA	4C	3C	<	6C	25	%	8C	??		AC	??		CC	??		EC	??	
0D	0D	CR	2D	05	ENQ	4D	28	(	6D	5F	_	8D	??		AD	5B	[	CD	??		ED	??	
0E	0E	SO	2E	06	ACK	4E	2B	+	6E	3E	>	8E	??		AE	??		CE	??		EE	??	
0F	0F	SI	2F	07	BEL	4F	7C	|	6F	3F	?	8F	??		AF	??		CF	??		EF	??	
10	10	DLE	30	??		50	26	&	70	??		90	??		B0	??		D0	7D	}	F0	30	0
11	11	DC1	31	??		51	??		71	??		91	6A	j	B1	??		D1	4A	J	F1	31	1
12	12	DC2	32	16	SYN	52	??		72	??		92	6B	k	B2	??		D2	4B	K	F2	32	2
13	13	DC3	33	??	IR	53	??		73	??		93	6C	l	B3	??		D3	4C	L	F3	33	3
14	??	RES	34	??	PP	54	??		74	??		94	6D	m	B4	??		D4	4D	M	F4	34	4
15	??	NL	35	??	TRN	55	??		75	??		95	6E	n	B5	??		D5	4E	N	F5	35	5
16	08	BS	36	??	NBS	56	??		76	??		96	6F	o	B6	??		D6	4F	O	F6	36	6
17	??	POC	37	04	EOT	57	??		77	??		97	70	p	B7	??		D7	50	P	F7	37	7
18	18	CAN	38	??	SBS	58	??		78	??		98	71	q	B8	??		D8	51	Q	F8	38	8
19	19	EM	39	??	IT	59	??		79	60	‘	99	72	r	B9	??		D9	52	R	F9	39	9
1A	??	UBS	3A	??	RFF	5A	21	!	7A	3A	:	9A	??		BA	??		DA	??		FA	??	
1B	??	CU1	3B	??	CU3	5B	24	$	7B	23	#	9B	??		BB	??		DB	??		FB	??	
1C	1C	FS	3C	14	DC4	5C	2A	*	7C	40	@	9C	??		BC	??		DC	??		FC	??	
1D	1D	GS	3D	15	NAK	5D	29	)	7D	27	’	9D	??		BD	5D	]	DD	??		FD	??	
1E	1E	RS	3E	??		5E	3B	;	7E	3D	=	9E	??		BE	??		DE	??		FE	??	
1F	1F	US	3F	1A	SUB	5F	5E	¬	7F	22	“	9F	??		BF	??		DF	??		FF	??	EO

The EBCDIC codes are defined in the IBM publication, System 370 Reference Summary, *GX20-1850.*

In the table above, the first column contains EBCDIC hexadecimal codes that are associated with a graphic or control symbol given in the third column. ASCII codes are obtained by matching for the same graphic in the ASCII standard. The double question marks (**??**) indicate characters which are not available in ASCII. These characters will be translated to an ASCII question mark (**?**). Two EBCDIC-to-ASCII Tables can control EBCDIC-to-ASCII translation on printer and punch streams. The following list shows how Table 2 differs from Table 1.

Legend	**EBCDIC Graphic**	**EBCDIC-to-ASCII**
Cent sign	¢	4A→B
Vertical Line	|	4F→B3
Logical Not	¬	5F→AA
Broken Vertical Line	¦	6A→7C

If your printer supports these symbols, using Table 2 makes the symbols print on the PC the same way as on a mainframe. Most PC printers support printing these characters.

B.6 Legend of Characters

Characters and symbols which display in the translation tables (B.4 and B.5) are listed below.

Control	Characters
ACK	Acknowledge
BEL	Bell
BS	Backspace
BYP	Bypass
CAN	Cancel
CR	Carriage Return
CSP	Control Sequence Prefix
CU1	Customer Use 1
CU3	Customer Use 3
DC1	Device Control 1
DC2	Device Control 2
DC3	Device Control 3
DC4	Device Control 4
DEL	Delete
DLE	Data Link Escape
DS	Digit Select
EM	End of Medium
ENQ	Enquiry
EO	Eight Ones
EOT	End of Transmission
ESC	Escape
ETB	End of Transmission Block
ETX	End of Text
FF	Form Feed
FS	File Separator
GE	Graphic Escape
GS	Group Separator
HT	Horizontal Tabulation
IR	Index Return
IT	Indent Tab
LF	Line Feed

Control	Characters
MFA	Modify Field Attribute
NAK	Negative Acknowledge
NBS	Numeric Backspace
NL	New Line
NUL	Null
POC	Program-Operator Communication
PP	Presentation Position
RES	Restore
RFF	Required Form Feed
RNL	Required New Line
RPT	Repeat
RS	Record Separator
SA	Set Attribute
SBS	Subscript
SEL	Select
SFE	Start Field Extended
SI	Shift In
SM	Set Mode
SO	Shift Out
SOH	Start of Heading
SOS	Start of Significance
SPS	Superscript
STX	Start of Text
SUB	Substitute
SYN	Synchronous Idle
TRN	Transparent
UBS	Unit Backspace
US	Unit Separator
VT	Vertical Tabulation
WUS	Word Underscore

Graphic Characters	
SP	Space (Normally Nonprinting)
!	Exclamation Point
“	Quotation Marks (Diaeresis)
#	Number Sign
$	Dollar Sign
%	Percent Sign
&	Ampersand
’	Apostrophe (Closing Single Quotation Mark; Acute Accent)
(	Opening Parenthesis
)	Closing Parenthesis
*	Asterisk
+	Plus
,	Comma (Cedilla)
–	Hyphen (Minus)
.	Period (Decimal Point)
/	Slant
0...9	Digits 0 through 9
:	Colon
;	Semicolon

Graphic Characters	
<	Less Than
=	Equals
>	Greater Than
?	Question Mark
@	Commercial At
A...Z	Uppercase Latin Letters
[ ]	Opening, Closing Bracket
\	Reverse Slant
^	Circumflex
_	Underline
‘	Opening Single Quotation Mark (Grave Accent)
a...z	Lowercase Latin Letters
{ }	Opening, Closing Braces
¦	Broken Vertical Line
~	Tilde
¢	Cent (IBM Extension)
¬	Logical Not (IBM Extension)
|	Vertical Line (IBM Extension)

Notes:

Appendix

C Printer Test

Use the printer test procedure to verify that the printer is correctly connected to the PC.

Contents

C.1 Test Printer from DOS 259

C.2 Test Printer from BARR/SPOOL 260

Appendix

C Printer Test

A printer test file is included with the BARR/SPOOL Reference files (usually installed in **`C:\BARR\REF`**). This file can be sent to the printer to verify that the printer is correctly connected to the PC and that the printer and PC are functioning together. The printer test file is helpful for diagnosing the following problems:

- Printer DIP switches or configuration data in the printer set incorrectly
- Printer cable incorrectly wired
- Serial port baud rate inconsistent
- Printer hardware error
- Incorrect settings in the Barr software

Several test patterns are included in the test file to verify various printer features. The printout of the printer test includes a description of the individual printer test patterns to help you evaluate the test results.

C.1 Test Printer from DOS

Run the first test from DOS to confirm that the PC and the printer are communicating properly. You can compare these test results to a second printer test from BARR/SPOOL.

Determine to which PC port the printer is attached. Then follow the directions which correspond to your printer port:

Test Printer on Parallel Port (LPT1)

This example uses **`LPT1`**. If testing on a parallel port other than **`LPT1`**, replace **`LPT1`** with the number of the port you are using.

➤ From the DOS prompt, copy the file **`PRINTER.TST`** to the PC parallel port using the DOS **`copy`** command. For example:

```
COPY C:\BARR\REF\PRINTER.TST LPT1
```

- ➤ Review the printout of the printer test. Compare the printed test patterns with the descriptions of how they should print to determine whether the printer is functioning properly.

Test Printer on Serial Port (COM1)

This example uses **`COM1`**. If testing on a serial port other than **`COM1`**, replace **`COM1`** with the number of the port you are using.

- ➤ Use the DOS **`mode`** command to configure the serial port, then copy the file **`PRINTER.TST`** to the serial port using the DOS **`copy`** command. For example:

```
MODE COM1:9600,N,8,1
COPY C:\BARR\REF\PRINTER.TST COM1
```

> ***Note:*** BARR/SPOOL supports XON/XOFF flow control. This prevents loss of characters that may occur during this test.

- ➤ Review the printout of the printer test. Compare the printed test patterns with the descriptions of how they should print to determine whether the printer is functioning properly.

If any errors are indicated, resolve them before proceeding to the next step described in section C.2.

C.2 Test Printer from BARR/SPOOL

Run the test from BARR/SPOOL to verify that BARR/SPOOL is correctly configured to drive the printer. The performance of the printer test is dramatically greater from BARR/SPOOL than directly from DOS. The Barr software drives the printer more efficiently than DOS and takes advantage of printer features that DOS does not support.

- ➤ Use the DOS **`copy`** command or the **`PRT`** utility to add the **`PRINTER.TST`** file to the print spool. Refer to Chapter 11 for more information about using the DOS **`copy`** command and the **`PRT`** utility.
- ➤ Use Spooling commands to print the **`PRINTER.TST`** file. Refer to Chapter 13 if you need more information about using Spooling commands.
- ➤ Review the printout of the printer test. Compare the printed test patterns with the descriptions of how they should print to determine whether the software is properly configured for use with your printer. Also compare the results of this test with the results of the test described in section C.1.

If any problems are indicated in the results of the printer test, check the following settings for the printer port under **Devices and Printers** in the **Installation Description**, then repeat the test:

- Select **Choose printer type** and verify that the correct printer type is selected.
- Select **Miscellaneous Printer Options**, and set **Printer performance optimized?** to **No**.
- If characters are being dropped, adjust the setting for **Printer timing delay:** under **Miscellaneous Printer Options**.

If the **Printer Type** is set to **Generic** and **Printer performance optimized?** is set to **No** in the software, the test results from BARR/SPOOL should be identical to the test results from DOS.

Notes:

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Glossary

Analog
Refers to data represented by a physical variable that varies in a continuous rather than discrete manner and is usually represented by an electrical signal.

ANSI
American National Standards Institute, Inc. ANSI establishes standards for transmission codes and protocols.

Applications Program
Software that performs a specific application or task, such as word processing, accounting, or financial planning in contrast to a utility or system program that is used to carry out file management and housekeeping functions during or in conjunction with application software tasks.

ASCII
American Standard Code for Information Interchange. The standard specifies the correspondence between 128 graphic and control symbols to a 7-bit code.

Attributes
Parameters that describe files and printers.

Backup
A procedure for making a duplicate copy of data for use if the primary data are lost or destroyed.

Batch File
A PC DOS file that contains a sequence of DOS commands. You enter the name of the batch file on the keyboard; PC DOS then executes all the commands stored in the batch file as if they were typed from the keyboard.

Bit
The name of an elementary unit of information that has two states. Usually the two states are called 0 and 1.

Blocks
A contiguous vector of bits that is read or written as a unit.

Bootstrap
At start-up of a computer system, the first record read from disk contains a program used to read the remainder of the operating system into memory. The first record read is called the bootstrap program.

Buffer
An area of computer memory that is used for performing input or output operations. Data are read into a buffer or written from a buffer.

Byte
The name of an 8-bit group.

Card
80 consecutive characters of information, or one line.

Carriage Control
Characters used to control vertical spacing of print lines.

Centronics Printer Interface
A common parallel interface for printers. Developed by Centronics Corporation.

Channel Attached
Direct method of attaching printers to S/370 mainframes.

Character
A single letter, digit, symbol, space, or punctuation mark.

COM1, COM2, COM3, COM4
Asynchronous serial ports 1, 2, 3, and 4 on the PC.

Command
Something you instruct the computer to do, such as run a program.

Compiler
Programs that convert instructions written in high-level languages to the machine language that the computer can interpret.

Configuration
A specific combination of hardware that forms a system. When talking about the IBM PC, the term *configuration* describes characteristics such as the type of monitor adapter, the number and description of printers, the amount of memory, and description of serial ports.

Console
The device used to control the operation of a computer, including a keyboard and display or printers.

CPU
Abbreviation for Central Processing Unit. The component of a computer system that performs instruction sequencing, logic and arithmetic, and controls input/output. In a microcomputer, this is a single chip.

Data
A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by human or automatic means.

Dataproducts Interface (DPI)
The Dataproducts interface, which originated with the Dataproducts Corporation, is used for driving high-speed printers and typesetting equipment.

DAVFU
Direct Access Vertical Forms Unit. A control sequence of characters used to define a vertical print form. The DAVFU convention was first established by Dataproducts Corporation.

Device
The input and output unit connected to the computer such as printer, plotter, and monitor.

Device Address
A number that uniquely names a device.

DOS
IBM Personal Computer *Disk Operating System*. (See PC DOS).

EBCDIC
Extended Binary-Coded Decimal Interchange Code. The standard specifies the correspondence between 256 graphic and control symbols to an 8-bit code. The code was first used with the IBM System/360.

Encrypt
Systematic alteration of data which prevents unauthorized persons from viewing and using the data.

Extension
One to three characters following the file name after the period. Example: STUDY5.JOB

FCBLOAD
Forms Control Buffer Load. A record sent from a host to a remote to specify vertical forms control.

FCC
Federal Communications Commission.

Flow Control
Mechanism used to meter output to devices (printers) so that data are not sent faster than they can be accepted.

Function Keys
The 40 key options — F1-F10, SHIFT+F1-SHIFT+F10, CTRL+F1-CTRL+F10, and ALT+F1 - ALT+F10 — on the left or top of the keyboard.

Gateway
A device that uses protocol conversion to connect dissimilar communications systems. BARR/RJE and BARR/HASP each serve as a gateway between a local area network and a mainframe.

Graphic Symbols
Symbols that are represented by a picture in contrast to ones with an alphabetic name such as *carriage return.*

Hardware
The physical components in a computer system. Examples: processor, memory, display, and printer. These are the *hard* components of a computing environment as opposed to the *soft* information components that include programs and data processed by the computer.

Header
Data at the start of a file. Describes the file and how it is to be printed.

Hexadecimal
A notation for writing numbers that employs base 16. The digits in this notation are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F.

Host
The large computer that has databases, communications networking control, and large computing and memory capacity.

IBM
International Business Machines Corporation.

IBM PC
International Business Machines Personal Computer.

IBM PS/2
International Business Machines Personal System/2.

Input
Information that is read into a computer.

Installation Description
Process in which the BARR/SPOOL description of the PC is specified.

Interface
The connection between any two components in a system. The term is used for the connection between both software and hardware components.

Interrupt
Mechanism used to stop a program for an event needing immediate attention.

JCL
Job Control Language. A language interpreted by the operating system.

JES2 and JES3
Job Entry Subsystems of the IBM MVS Operating System. These subsystems are used for entering jobs into the MVS Operating System and dispensing the output from the jobs.

K Abbreviation for Kilobyte.

Kilobyte
A unit of computer memory that is 1024 bytes. Each byte is eight bits long. 1024 in decimal notation is the same as 10000000000 in binary notation. The Kilo prefix means *times 1024* in computer literature.

LAN
See Local Area Network.

Language
A language consists of a set of symbols, the rules that define what sequences of symbols are syntactically correct, and the meanings attached to various parts of the language. Some languages include FORTRAN, C, COBOL, ALGOL, English, and French.

Local Area Network
A high-speed communications network. Typically several PCs are linked together, and the network is usually restricted to a single building or campus.

LPT1, LPT2, LPT3
Parallel printers 1, 2, and 3 of the PC.

Macro
An instruction in a source language that points to a sequence of instructions in the same language to replace it. The macro can also specify values for parameters in the replacement instructions.

Mainframe
Term used for a large central computer that offers a full set of computing services. The term originated in the days when the central processor, memory, and input/output channels were located in one central housing called the mainframe.

Modem
(*Mo*dulate/*Dem*odulate) A device designed to interface between a digital communication link and an analog communication link. Usually the digital communication link is a computer or terminal. The analog communication link is usually a telephone line. Modulate is to convert a digital signal from the computer into an analog signal capable of being transmitted by the telephone system. Demodulate is the opposite of modulate.

MVS
Multiple Virtual Storage operating system. A large IBM Operating System that operates on System/370, 3081, and 3091 processors.

NetBIOS
Network Basic Input/Output System is a standard interface between PC software and LAN adapters such as Token Ring, Ethernet, or ARCNET adapters.

NUL
Device that deletes output.

Offline
Disconnected from system. Processing that is performed in isolation.

Online
Connected to system. Processing that is performed during direct communications between a workstation and a computer.

Operating System
A master program that manages the resources of the computer. The operating system provides a set of services to all programs for input/output, data management, program loading, memory allocation, and communication facilities for job entry and output dispatching.

OS
Operating System.

Output
Written information from the computer.

Parallel Interface Port
A device interface to the computer that reads and writes groups of bits at the same time. A common way for printers to be connected to the IBM PC.

Parameter
A variable that is given a constant value for a specified application.

PC DOS
The operating system supported by IBM on the IBM PC.

Peripheral Devices
Appendages to the computer that serve as memory, sources of information, or are controlled by the computer. Peripheral devices include disk drives, printers, and communications devices such as modems.

Plot Output
Output from host that is to be written to a graphics plotter device.

Printer Control Data
Data used to specify the operating mode of the printer.

Print Server
A program or processor attached to a local area network that manages file printing.

Print Spool
Logical organization of files to be printed. With BARR/SPOOL, physically the files reside in the assigned spool directory. The logical order in which the files print is reflected on the Print Spool screen.

Print Spooling
Capability for managing the printing of files on one or more printers.

Production Disk
A disk used in daily operation of the PC.

Programs
A set of instructions that gives step-by-step details of how to complete a task. For a computer, the instructions can be written in a high-level language like FORTRAN, BASIC, or PASCAL. Instructions in a form directly usable by the computer are called *machine language instructions*.

Queue
A list of items waiting for service in a system.

Receive
To obtain data from a communications line.

Receive Mode
Options that control the manner in which files are received.

S/370
IBM mainframe machine architecture. See also Channel Attached.

Serial Interface Port
Interface ports that send and receive data one bit at a time using the RS232 standard.

Serial Port Input
Files read from a serial port (e.g. COM1).

Session
Screen or group of screens devoted to a particular activity.

Software
Refers to the programmable instructions for operating the physical machinery of a computer system. Examples: programs, data bases, and files (in contrast to the hardware components such as the processor, printer, and disk drive).

Software Disk
A flexible magnetic-coated mylar disk used to record information. Synonymous with diskette, flexible disk, or floppy disk.

Spool Directory
Installation Description parameter which specifies the location of files to be printed by BARR/SPOOL.

Spooling
Simultaneous Peripheral Operations On-Line. Spooling denotes a system that allows several independent flows of data to proceed concurrently. See also Print Spool and Print Spooling.

Standard
A set of rules established by an industry or governmental organization. Usually implies an extensive review process.

Tab Character
A character that causes advancement of the printer to a tab stop.

Terminal
The end of a communication line. A simple terminal is a keyboard and a TV-like display. More powerful terminals include disk storage, a computer, printers, and plotters.

Token Ring Interface Coupler (TIC)
An interface adapter installed in the 3745 or 3725 to connect to a Token Ring Network.

Token Ring Network
High-speed communication network that consists of physical equipment and architecture. This is the IBM architecture for Local Area Networks. The network is characterized by ring structure with a single token continuously circling the ring.

Translation
Process of converting from one coding convention to another.

Tuning Data
Parameters that assist in easy operation of BARR/SPOOL.

UCS
Universal Character Set. Some printers require loading a UCS buffer to match the

print train or band installed. Example printers: IBM 3203 and IBM 3211.

VAX

A super-minicomputer made by Digital Equipment Corporation.

Vertical Forms Control

Specification for spacing of lines on print form.

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