

**RSX-11M/M-PLUS
Batch and Queue
Operations Manual**

Order No. AA-L671A-TC

digital
software

RSX-11M/M-PLUS Batch and Queue Operations Manual

Order No. AA-L671A-TC

RSX-11M Version 4.0

RSX-11M-PLUS Version 2.0

First Printing, November 1981

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

The software described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license.

No responsibility is assumed for the use or reliability of software on equipment that is not supplied by DIGITAL or its affiliated companies.

Copyright © 1981 Digital Equipment Corporation
All Rights Reserved.

Printed in U.S.A.

The postage-paid READER'S COMMENTS form on the last page of this document requests the user's critical evaluation to assist in preparing future documentation.

The following are trademarks of Digital Equipment Corporation:

| | | |
|---------|--------------|----------------|
| DEC | DECsystem-10 | PDT |
| DECUS | DECSYSTEM-20 | RSTS |
| DIGITAL | DECwriter | RSX |
| PDP | DIBOL | VMS |
| UNIBUS | Edusystem | VT |
| VAX | IAS | digital |
| DECnet | MASSBUS | |

ZK2052

CONTENTS

| | Page |
|------------------------------|--|
| PREFACE | vii |
| SUMMARY OF TECHNICAL CHANGES | xi |
| CHAPTER 1 | INTRODUCTION TO THE QUEUE MANAGER |
| 1.1 | QUEUE MANAGER 1-1 |
| 1.2 | QUEUE ASSIGNMENTS 1-2 |
| 1.3 | PRINT COMMAND 1-3 |
| 1.4 | BATCH PROCESSING 1-7 |
| 1.4.1 | SUBMIT Command Example 1-7 |
| 1.4.2 | User Batch Job Example 1-8 |
| 1.5 | SHOW QUEUE (QUE /LIST) COMMAND 1-9 |
| 1.5.1 | SHOW QUEUE - QUE /LI 1-9 |
| CHAPTER 2 | QUEUING JOBS |
| 2.1 | SPOOLING OUTPUT 2-1 |
| 2.2 | PRINT COMMAND 2-2 |
| 2.3 | DELETE COMMAND 2-10 |
| 2.4 | PRINT JOBS QUEUED BY SYSTEM TASKS 2-12 |
| 2.4.1 | Maps, Logs, and Listings 2-12 |
| 2.4.2 | PIP, CLIs, and Output Files 2-12 |
| 2.5 | PRINT JOBS QUEUED BY USER TASKS 2-13 |
| 2.5.1 | Opening a File on Disk and Using .PRINT 2-13 |
| 2.5.2 | Opening a File on Disk and Using the PRINT Command 2-13 |
| 2.5.3 | Opening a File on LPn: (RSX-11M-PLUS) 2-14 |
| 2.6 | SHOW QUEUE AND SHOW PROCESSOR 2-14 |
| 2.6.1 | SHOW QUEUE (QUE /LI) 2-14 |
| 2.6.2 | SHOW PROCESSOR (QUE /LI:DEV) 2-18 |
| 2.7 | SET QUEUE (QUE/MOD) 2-19 |
| 2.8 | HOLDING AND RELEASING JOBS 2-22 |
| 2.8.1 | HOLD (QUE/HO) 2-22 |
| 2.8.2 | RELEASE (QUE/REL) 2-23 |
| CHAPTER 3 | PREPARING A USER BATCH JOB |
| 3.1 | THE VIRTUAL TERMINAL 3-1 |
| 3.2 | A USER BATCH JOB 3-1 |
| 3.3 | THE BATCH COMMAND LINE 3-2 |
| 3.3.1 | Line Continuation 3-2 |
| 3.4 | BATCH-SPECIFIC COMMAND DESCRIPTIONS 3-3 |
| 3.4.1 | JOB 3-3 |
| 3.4.2 | EOJ 3-5 |
| 3.4.3 | DATA 3-5 |
| 3.4.4 | EOD 3-7 |

CONTENTS

Page

| | | |
|---------|--|------|
| 3.4.5 | STOP | 3-8 |
| 3.4.6 | CONTINUE | 3-8 |
| 3.4.7 | GOTO | 3-8 |
| 3.4.8 | ON | 3-9 |
| 3.4.9 | SET | 3-11 |
| 3.4.10 | IF | 3-11 |
| 3.4.11 | Comments (!) | 3-12 |
| 3.5 | INDIRECT COMMAND FILES | 3-13 |
| 3.6 | ALLOCATING DEVICES AND MOUNTING VOLUMES FROM BATCH JOBS | 3-13 |
| 3.7 | QUEUING BATCH JOBS | 3-14 |
| 3.8 | THE BATCH LOG | 3-19 |
| 3.9 | CARD READER INPUT SPOOLING | 3-23 |
| 3.9.1 | Card Deck Format | 3-24 |
| 3.9.1.1 | The \$SUBMIT Card | 3-25 |
| 3.9.1.2 | The \$PRINT Card | 3-26 |
| 3.9.1.3 | The \$PASSWORD Card | 3-27 |
| 3.9.2 | Card Reader Processor Operation | 3-27 |

CHAPTER 4 AT-A-GLANCE GUIDE

| | | |
|-------|--|-----|
| 4.1 | PRINT (PRI) COMMAND | 4-1 |
| 4.2 | BATCH-SPECIFIC COMMAND SUMMARY (RSX-11M-PLUS) | 4-2 |
| 4.2.1 | Opening and Closing Batch Jobs | 4-2 |
| 4.2.2 | Data in Batch Jobs | 4-3 |
| 4.2.3 | Sequence Control Commands | 4-3 |
| 4.3 | SUBMIT (SUB) COMMAND (RSX-11M-PLUS) | 4-5 |
| 4.4 | SHOW QUEUE (QUE/LI) COMMAND | 4-6 |
| 4.5 | SHOW PROCESSOR (QUE /LI:DEV) COMMAND | 4-7 |
| 4.6 | SET QUEUE (QUE /MOD) COMMAND | 4-7 |
| 4.7 | HOLD (QUE /HO) AND RELEASE (QUE /REL) COMMANDS | 4-8 |
| 4.7.1 | HOLD (QUE /HO) | 4-8 |
| 4.7.2 | RELEASE (QUE /RE) | 4-9 |
| 4.8 | DELETE (QUE /DEL) COMMAND | 4-9 |

APPENDIX A ERROR MESSAGES

| | | |
|-------|---|------|
| A.1 | BATCH PROCESSING ERROR MESSAGES | A-1 |
| A.1.1 | Error Messages in Batch Logs | A-1 |
| A.1.2 | Error Messages to the Operator's Console | A-4 |
| A.1.3 | Error Messages from the Card Reader Processor | A-5 |
| A.2 | OUTPUT DESPOOLER ERROR MESSAGES | A-9 |
| A.3 | DCL AND MCR ERROR MESSAGES FROM QUEUE MANAGER COMMANDS | A-11 |

GLOSSARY

INDEX

CONTENTS

Page

EXAMPLES

| | | |
|-------------|---|------|
| EXAMPLE 1-1 | SHOW QUEUE Display | 1-10 |
| 3-1 | User Batch Job Orwell | 3-20 |
| 3-2 | Log File for User Batch Job Orwell | 3-21 |
| 3-3 | User Batch Job Friend | 3-22 |
| 3-4 | Log File for User Batch Job Friend | 3-22 |
| 3-5 | User Batch Job to be Submitted by CRP | 3-24 |

FIGURES

| | | |
|------------|---|-----|
| FIGURE 1-1 | Queue Assignments to Output Devices | 1-2 |
| 1-2 | How the PRINT Command is Processed | 1-4 |

TABLES

| | | |
|-----------|-----------------------------------|-----|
| TABLE 3-1 | Batch-Specific Commands | 3-3 |
|-----------|-----------------------------------|-----|

PREFACE

MANUAL OBJECTIVES

The RSX-11M/M-PLUS Batch and Queue Operations Manual explains the Queue Manager (QMG).

On RSX-11M/RSX-11M-PLUS systems, the QMG provides for the orderly queueing and dequeuing of print jobs to line printers or other output devices. The QMG commands that control these print queue functions are explained in detail in this manual.

QMG print processor operations are controlled through PRINT commands and command qualifiers and switches. Files are printed as the result of a PRINT command or as the result of a request for a listing or map from some system task.

RSX-11M-PLUS systems also offer batch processing. Batch processing provides a way to pass commands to the operating system without direct user intervention. The SUBMIT command enters QMG batch jobs.

Each RSX-11M/M-PLUS system is tailored for a particular set of software applications that must work within the confines of your installation's hardware system. This manual is a general description of how batch and queue operations should proceed, but your system manager may have special information on these processes in your installation.

INTENDED AUDIENCE

This manual is intended for all RSX-11M/M-PLUS users. The manual has been particularly designed to meet the needs of users new to operating systems.

System managers should consult the RSX-11M/M-PLUS System Management Guide for information on setting up and running QMG.

STRUCTURE OF THIS DOCUMENT

The manual is organized as follows:

- Chapter 1 Introductory material, examples of how to queue print jobs and batch jobs, and how to get information on queue contents.

- Chapter 2 Details on the PRINT command, information on displaying and modifying both print and batch jobs in a queue, and writing applications tasks that spool output.

PREFACE

| | |
|------------|--|
| Chapter 3 | Batch job preparation and SUBMIT commands. |
| Chapter 4 | At-a-glance summaries of chapter material. |
| Appendix A | Explanations of all error messages and suggestions for appropriate user actions. |
| Glossary | Definitions of terms used in batch and queue operations. |

ASSOCIATED DOCUMENTS

RSX-11M/M-PLUS Command Language Manual

RSX-11M/M-PLUS MCR Operations Manual

RSX11M/M-PLUS System Management Guide

CONVENTIONS USED IN THIS DOCUMENT

DCL and MCR are the two Command Line Interpreters (CLIs) used in the manual examples.

DCL QMG commands are generally in the following format:

```
DCL>command/commandqualifier file/filequalifier
```

The DCL qualifiers either define the operation (command) or modify that operation for a file.

MCR commands, unlike DCL, do not follow one general command format. The position of command elements and parameters may vary from one command to another.

DCL is presented as the primary CLI in this manual. When specific DCL commands or qualifiers are discussed in manual text, they are always followed by the MCR equivalents.

The RETURN symbol has been omitted from the examples. You can assume that every command is terminated by pressing the RETURN key.

A number of conventions are used in the command descriptions in this manual. With the exception of /qualifier (DCL) and /switch (MCR), the terms and conventions are the same for both DCL and MCR.

. . . The ellipsis (. . .) denotes batch-stream elements without significance to the point being discussed.

[. . .] Any command field enclosed in brackets is optional.

{ element 1
.
.
.
element n } Two or more command elements enclosed in braces indicate that you must choose one of the elements when you issue the command.

PREFACE

| | |
|---------------------|--|
| lowercase | Any command field in lowercase must have a substitute. Usually the lowercase word will identify what kinds of substitutions are expected. |
| /qualifier (DCL) | Any command element preceded by a slash (/) is a DCL qualifier. Command qualifiers alter the action of a command they follow. File qualifiers modify the action of the command as it affects that file. If a file qualifier is used as a command qualifier, it affects all files in the command line. |
| /switch (MCR) | Any command element preceded by a slash (/) is an MCR switch. Job switches alter the action of a command. You can apply a switch directly to the command or to a command parameter. If a switch follows the file, it modifies the attributes of that file and all other files that follow in the command line. |
| parameter | Any required field for a command is called a parameter. The most common parameters are file specifications. Parameters are preceded by blanks. |
| filespec | A full file specification includes device, UFD, file name, file type, and version number, as in this example: |

```
DB1:[303,5]MORAN.TXT;2
```

Full file specifications are rarely needed. If you do not give a version number the highest numbered version will be used. Some files may not have a file type. Many commands will accept a wildcard (*) in place of the file type. See the command descriptions in the RSX-11M/RSX-11M-PLUS Command Language Manual.

| | |
|---------|---|
| Red ink | In command examples, commands or other input that the user types at the terminal are printed in red. System output is printed in black. |
|---------|---|

| | |
|---------------------|---|
| <code>CTRL/N</code> | The symbol <code>CTRL/N</code> indicates that you must press the key labeled CTRL while you simultaneously press another key, for example CTRL/C, CTRL/Z, CTRL/O. |
|---------------------|---|

| | |
|---------|--|
| Shading | Shaded portions of text describe only one operating system. Gray shading indicates that the text describes only RSX-11M-PLUS operating systems. Pink shading indicates that the text describes only RSX-11M operating systems. The smallest shaded portion of text is a paragraph. Portions of text that are not shaded describe both operating systems. |
|---------|--|

SUMMARY OF TECHNICAL CHANGES

This manual reflects changes and additions to RSX-11M Version 4.0 and RSX-11M-PLUS Version 2.0.

The following technical changes described in this manual have been made to both RSX-11M and RSX-11M-PLUS:

1. QMG notifies the user when a job has been successfully queued.
2. Job names can be nine characters.
3. A new 3-digit job number format replaces the up to 10-digit job number format.
4. Processors and queues are now named directly for the device. For example:

Processor LP0 for device LP0

Queue LP0 for device LP0

5. Two new qualifiers (switches) have been added to the PRINT (PRI) command:

/JOB COUNT:n (/CO:n)

/[NO]JOB_PAGE (/[NO]JO)

6. Four new qualifiers (switches) have been added to the SHOW QUEUE (QUE/LI) command:

/BRIEF (/BR)

/FILE (/LI)

/FULL (/FU)

/DEVICE (/LI:DEV)

7. Three new qualifiers (switches) have been added to the SHOW PROCESSOR (QUE /LI:DEV) command:

/DEVICE (/LI:P)

/INPUT (/LI:I)

/PRINT (/LI:P)

SUMMARY OF TECHNICAL CHANGES

8. Three new qualifiers (switches) have been added to the SET QUEUE (QUE /MOD) command:

/COPIES:n (/CO:n)
/[NO]DELETE (/[NO]DE)
/FILE_POSITION (/FI:n)

9. Two new qualifiers (switches) have been added to the DELETE (QUE /DEL) command:

/ENTRY:nnn (/EN:nnn)
/File_POSITION (/FI:n)

The following technical changes have been made to RSX-11M-PLUS only:

1. Three new MCR commands have been added:

PRI
SUB
QUE

2. A new qualifier (switch) has been added to the SUBMIT (SUB) command:

/[NO]LOGFILE (/[NO]LO)

3. The /TRANSFER (TR) qualifier replaces /NOORIGINAL and the /NOTTRANSFER (NOTR) qualifier replaces /ORIGINAL.
4. The /NOPRINT (/NOPRIN) qualifier no longer spools the logfile.
5. Card reader input spooling is available for submitting a deck of cards to a batch queue.

CHAPTER 1

INTRODUCTION TO THE QUEUE MANAGER

This chapter briefly introduces features of the Queue Manager (QMG).

The chapter begins with an explanation of the queue assignments. Queues are assigned by system managers. You should consult with your system manager for information on queue assignments at your installation.

The chapter also gives examples for queueing print jobs and displaying the contents of queues. DCL is presented as the primary CLI in all examples, followed by the MCR equivalents.

Finally, there is a brief introduction to batch processing on RSX-11M-PLUS.

1.1 QUEUE MANAGER

The Queue Manager is a system program that provides for the orderly processing of print and (on RSX-11M-PLUS only) batch jobs. Most functions of the QMG are transparent. Every PRINT command, every SUBMIT command (RSX-11M-PLUS only), and every request for a spooled listing or map from a system program is passed automatically to the QMG. The QMG then places these requests in the appropriate "queues." A queue is a waiting line of jobs that are scheduled or processed according to system or user priorities.

The Queue Manager distributes these jobs out to batch processors, line printers, or other output devices as the processors become available. You can check the progress of your job with the SHOW QUEUE commands. You can delete a job from a queue if you wish, or you can hold the job in a queue for later processing.

The RSX-11M-PLUS Queue Manager records all its queues in the file SP0:[1,7]QUEUE.SYS, which is kept on a mass storage disk. This means that your job will not be lost if the system should be out of operation for any reason.

Likewise the RSX-11M Queue Manager records its queues in the disk file LB0:[1,7]QUEUE.SYS.

On RSX-11M-PLUS, you can substitute the device name of an output device controlled by the Queue Manager for a file specification in any system task that creates an output file. This is called "transparent spooling."

INTRODUCTION TO THE QUEUE MANAGER

1.2 QUEUE ASSIGNMENTS

You should consult your system manager for information pertaining to special applications of the Queue Manager at your installation. Depending upon the needs of your installation, the system manager chooses the number of queues to be set up and where the output of these queues will be directed.

Your installation may have certain printers designated to receive output for special hardcopy forms (such as numbered invoices or inventory forms). A listing of these forms and their designated output devices will be helpful to you in your understanding of the information contained in this manual. Your system manager can supply you with a list of these special forms and their corresponding devices.

A single queue can be assigned to one or more devices or to no devices. A single device may have one or more queues assigned to it or no queues. Figure 1-1 shows some of the possible assignments of queues to devices.

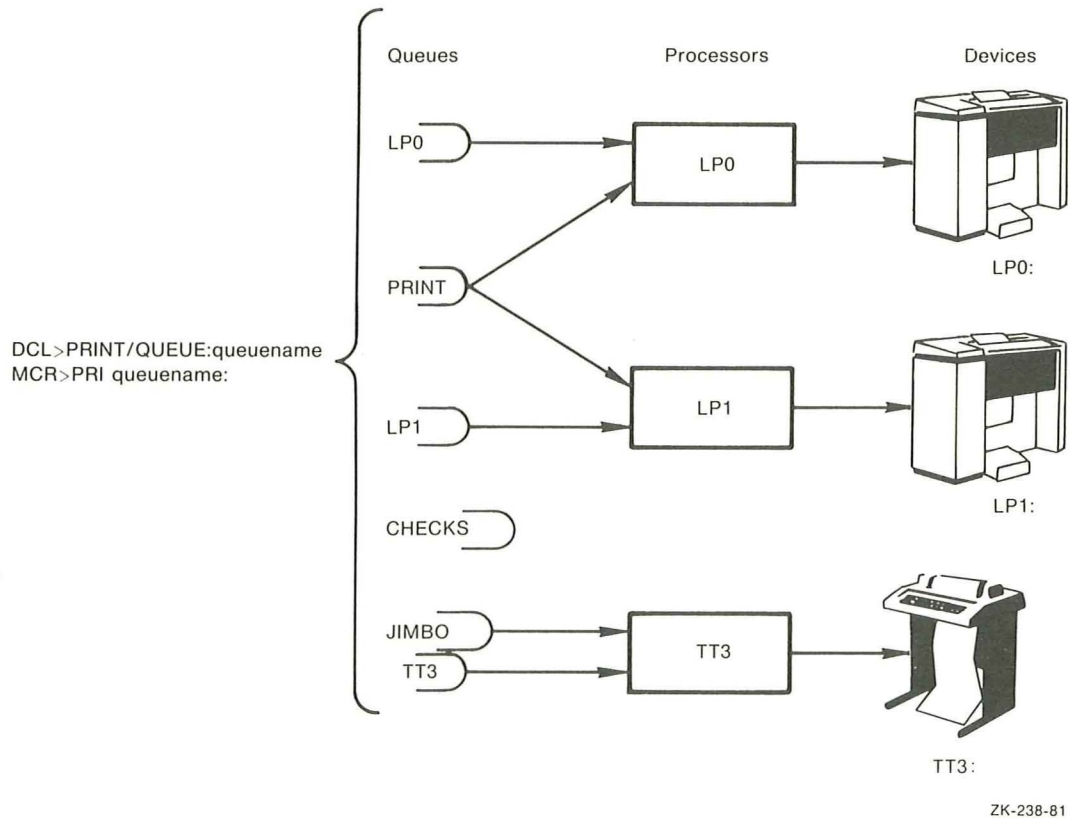


Figure 1-1 Queue Assignments to Output Devices

The /QUEUE:queuename qualifier (queuename:=) to the PRINT command directs output to the designated queue. When you do not specify a particular queue in the PRINT command, output goes into the default queue PRINT. In Figure 1-1 the PRINT queue sends output to one of two printers. The printers are also served by their device-specific queues. The queue CHECKS has not been assigned to any output device. Jobs can be placed in this queue, but they will not be taken out of

INTRODUCTION TO THE QUEUE MANAGER

the queue until it is assigned to an output device by the system manager. The queue JIMBO and TT3 are both assigned to the same output device.

The same functionality applies for batch queues and batch processors on RSX-11M-PLUS systems. In this case, the default queue is BATCH.

When a line printer or other output device is under control of the Queue Manager, it is said to be a spooled device. Spooled devices have been initialized with certain attributes. These attributes are defined by the PRINT command qualifiers. Figure 1-2 illustrates the way the Queue Manager handles PRINT commands specifying printers with certain attributes.

1.3 PRINT COMMAND

The Queue Manager handles the orderly printing of files for an RSX-11M/RSX-11M-PLUS system through software tasks called despoolers or print processors. There is a print processor for every spooled line printer on the system. Even if the system does not have a line printer, it will have some device designated as the system output device. Your system may have as many as 15 output devices to which the Queue Manager directs output.

This output includes all requests to system tasks for maps or listings and print jobs entered through the PRINT command, as well as output from applications tasks unique to your installation.

On RSX-11M-PLUS, the output could also include logs from batch jobs.

A line printer and its associated processor are usually referred to simply as a "printer."

The PRINT command supplies most entries to the PRINT queue. For example:

```
DCL>PRINT/LOWER/AFTER:(14:00) ERIKA.TXT/COPIES:3
```

```
MCR>PRI /LOWER/AF:14:00=ERIK.A.TXT/COP:3
```

This command queues a QMG print job that prints three copies of the file ERIKA.TXT on a line printer with lowercase characters after 2 P.M. today. The QMG print job has the name ERIKA, which is also the name of the first file in the job.

Here is an example of a PRINT command naming several files:

```
DCL>PRINT/NAME:MORAN/FLAG_PAGE KIRSTEN.TXT JOHANNA,ERIK.A
```

```
MCR>PRI MORAN/FL=KIRSTEN.TXT JOHANNA,ERIK.A
```

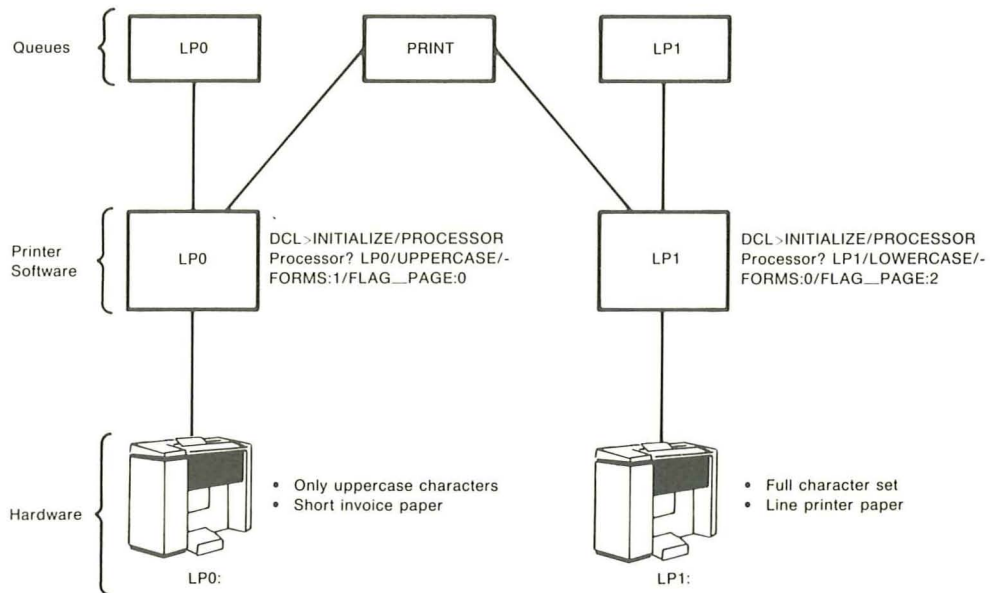
These files are queued together as one QMG print job. The /NAME:jobname qualifier (jobname) gives the print job the name MORAN. The QMG accepts jobnames up to nine characters in length (the limit for filenames). The files are printed in the order listed, on the same line printer, and without interruption. The /FLAG_PAGE qualifier (/FL) means that each file is separated by a flag page bearing the name of the file. These file flag pages are in addition to the job flag pages that bear the name of the job and that appear at the beginning of the job output.

INTRODUCTION TO THE QUEUE MANAGER

The Queue Manager controls line printers through output processor tasks which "own" the devices. Often the line printer and its associated processor are referred to collectively as "the printer." The printer hardware and software were brought together in the Queue Manager, when your system manager "initialized" the queues.

Initialization established the characteristics of the printer. You can then specify printers with those characteristics using the PRINT command.

Default qualifiers to the PRINT command also determine which printer will handle a print job. The following examples illustrate the interaction between the PRINT command and the printers.



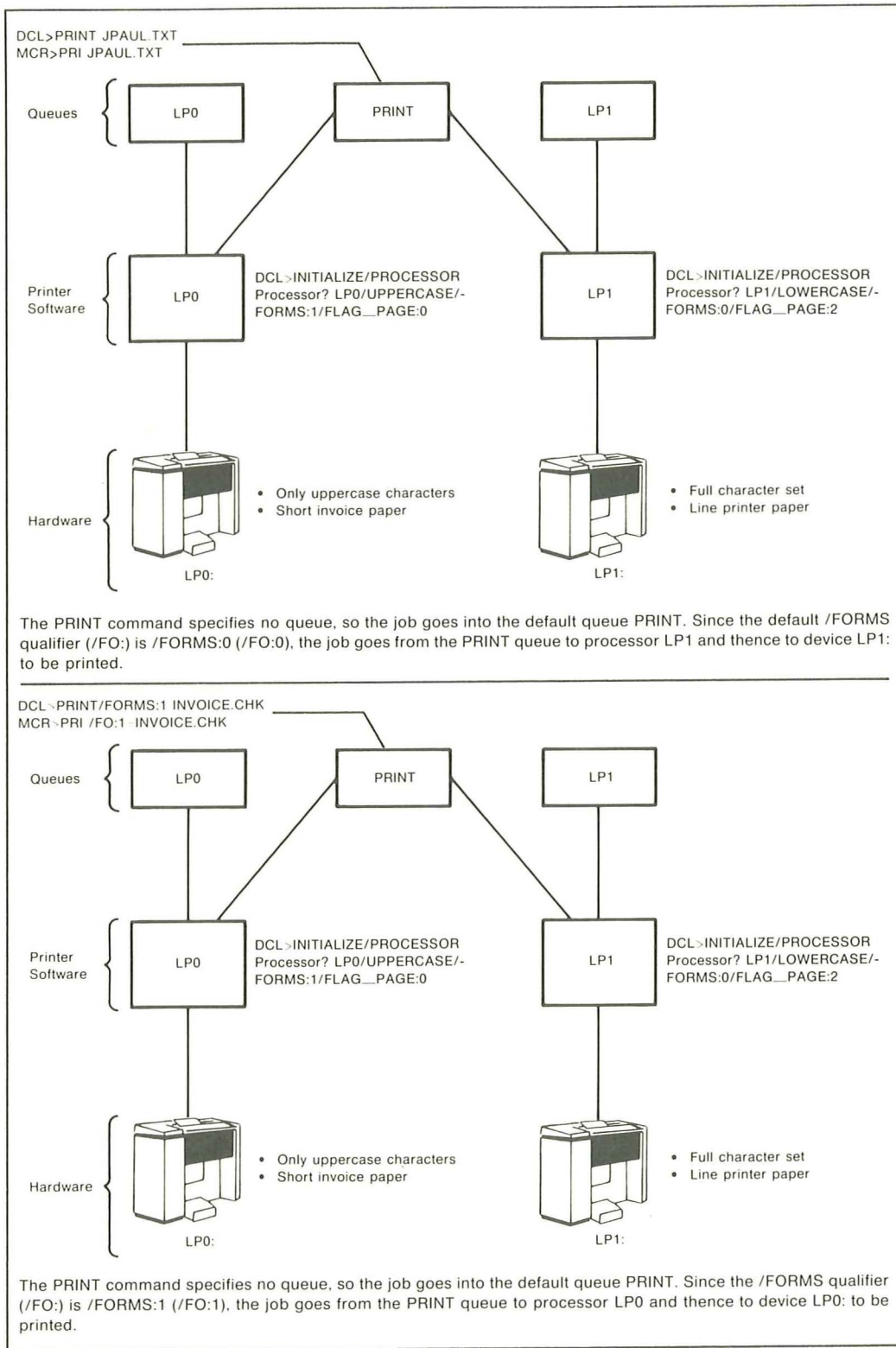
The printer software is set up through the INITIALIZE/PROCESSOR command. Printer LP0: has no lowercase characters; it is initialized with the /UPPERCASE qualifier. The printer is loaded with a special form used in the installation, short invoice paper. The printer is initialized with the /FORMS:1 qualifier. The system manager has previously defined FORMS:1 for the width and length of the invoice paper. The printer is initialized /FLAG_PAGE:0 because the invoices are numbered. Print jobs are printed on the invoice forms. Therefore, no flag pages should be printed on the invoice forms.

Printer LP1: has the full character set and is loaded with standard line-printer paper. Since system output and text files go to this printer, the printer is initialized with the /FLAG_PAGE:2 qualifier, so that any file printed on the printer will be identified by a flag page.

ZK-239/1-81

Figure 1-2 How the PRINT Command Is Processed

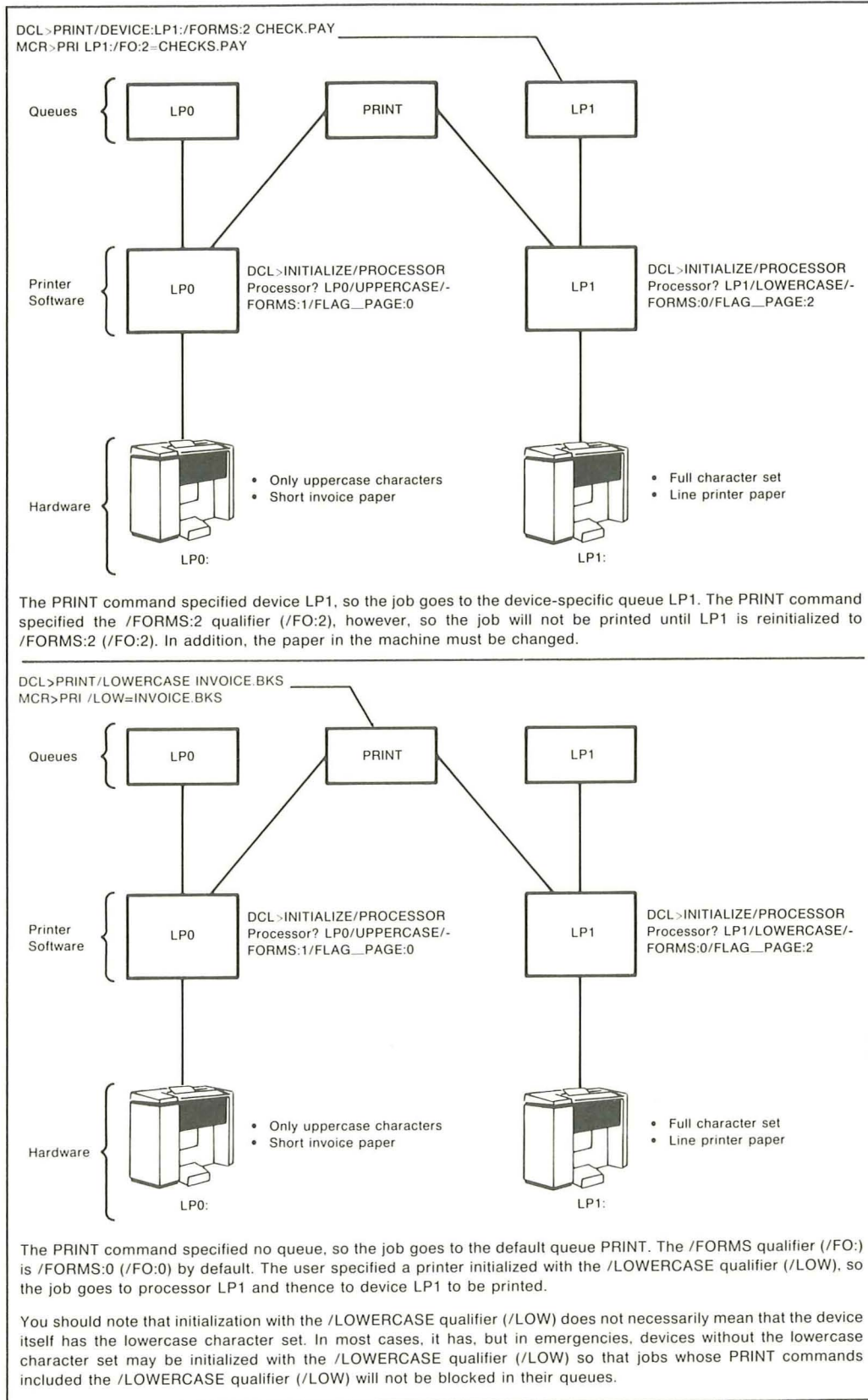
INTRODUCTION TO THE QUEUE MANAGER



ZK-239/2-81

Figure 1-2 (Cont.) How the PRINT Command Is Processed

INTRODUCTION TO THE QUEUE MANAGER



ZK-239/3-81

Figure 1-2 (Cont.) How the PRINT Command Is Processed

INTRODUCTION TO THE QUEUE MANAGER

1.4 BATCH PROCESSING

Batch processing is an exclusive RSX-11M-PLUS system feature.

A batch job duplicates an interactive terminal session on a virtual (software) terminal, without the need for user intervention.

You do not have to be present or logged on to a terminal to use the batch processor. You need only an account on the operating system to use the batch processor.

There are two types of batch jobs:

1. User batch jobs
2. QMG batch jobs

A user batch job is created by you and consists of batch-specific commands, CLI commands, and data entered into a file with a text editor. The information contained in the user batch job must duplicate a complete interactive terminal session. The batch job must log itself into the system, control operations, and log itself off the system.

A user batch job can do almost anything from a virtual terminal that you can do from an interactive terminal, including compiling or assembling, task building, or running tasks.

When you submit the user batch jobs to the QMG for batch processing, the user batch jobs become a QMG batch job.

The SUBMIT command is to batch processing, what the PRINT command is to printing files.

You may submit more than one user batch job for batch processing in a single SUBMIT command line. More than one user batch job thus submitted is called a batch chain.

You can submit batch jobs at any time the Queue Manager is active and they can usually run at any time as well. Each installation will have its own policies on the availability of batch processing.

There is always complete information available on the progress of your batch job. Within specified limits, you can run it when you wish (for example, during evening hours when demands on the system are less), you can hold it in a queue, release it, or delete it from its queue.

The commands in the batch jobs are passed to the operating system by tasks called batch processors. There can be as many as 16 batch processors on a system and as many as 16 batch queues. All systems with batch processing will have a default queue named BATCH.

1.4.1 SUBMIT Command Example

Batch jobs are entered in batch queues through the SUBMIT command. Each SUBMIT command defines a QMG batch job consisting of one or more user batch jobs.

INTRODUCTION TO THE QUEUE MANAGER

Here is an example of a SUBMIT command:

```
DCL>SUBMIT/PRIORITY:150 ERIKA.BAT
MCR>SUB /PRIO:150=ERIK.A.BAT
```

This command enters the batch job named ERIKA in the default batch queue BATCH at a queue priority of 150. (The queue priority setting has no effect on the running priority of any tasks run by the batch job. It only affects the job's position in the queue.) In this case, the user batch job and the QMG batch job are one and the same.

The following example illustrates the distinction between a user batch job and a QMG batch job:

```
DCL>SUBMIT/NAME:MORAN MIK.BAT, ERIKA.BAT
MCR>SUB MORAN=MIK.BAT, ERIKA.BAT
```

The QMG batch job is given the name MORAN and is composed of the user batch jobs MIK.BAT and ERIKA.BAT.

1.4.2 User Batch Job Example

A dollar sign (\$) in the first position on a command line identifies what follows as a command to be passed by the batch processor. The dollar sign (\$) is not part of the command. Lines without the dollar sign (\$) in the first position are taken as data if the previous command called for data. Data in batch jobs is anything other than a command that would have to be typed by the user in an interactive session.

A user batch job must log itself in, issue commands, and log itself out. However, LOGIN (HELLO) and LOGOUT (BYE) are replaced in batch jobs by JOB and EOJ, respectively.

The exclamation point (!) starts a comment. The exclamation point (!) and whatever follows it are not processed but will appear in the batch log.

```
$JOB
$!
$! example job
$!
$ON ERROR THEN STOP
$RUN ATASK
$DATA
Alan
Jane
Jim
Tom
$EOD
$EOJ
```

INTRODUCTION TO THE QUEUE MANAGER

1.5 SHOW QUEUE (QUE /LIST) COMMAND

The SHOW QUEUE command displays information about print and (in the case of RSX-11M-PLUS systems) batch queues. These commands are discussed in detail in Section 3.4.1. However, the most useful form of the command, and its output, are described briefly in the following sections.

1.5.1 SHOW QUEUE - QUE /LI

The SHOW QUEUE (QUE /List) command lists all jobs in all queues.

On RSX-11M systems this command lists the print queues.

On RSX-11M-PLUS systems this command lists both print and batch queues.

Type one of the following commands on your terminal, and press the RETURN key.

```
DCL> SHOW QUEUE
```

```
MCR> QUE /LI
```

The information you see on your terminal will be similar to the information in Example 1-1.

INTRODUCTION TO THE QUEUE MANAGER

Example 1-1 SHOW QUEUE Display

```

1
** PRINT QUEUES **
PRINT => LPO 2
  C7,40J 4 ERIKA ENTRY:1 5 7 ACTIVE ON LPO
3 1 DB7:C7,40JJOHANNA.ASD:1 COP:3
  C7,40J HEAD ENTRY:8
  1 DB7:C7,40JHEAD.AKE:1
LPO => LPO
  C7,40J JOB1 ENTRY:3 6 FORM:2
  1 DB7:C7,40JMOUTH.WSH:1
  C7,40J JOB2 ENTRY:4
  1 DB7:C7,40JMOUTH.WSH:1
  C7,40J JOB3 ENTRY:5 HELD
  1 DB7:C7,40JMOUTH.WSH:1
  C7,40J JOB4 ENTRY:6 PRINT AFTER 23-FEB-83 22:00
  1 DB7:C7,40JMOUTH.WSH:1
LP1 => LP1
  C7,40J HEARTBURN ENTRY:2 8 9 ACTIVE ON LP1
  1 DB7:C7,40JLIT.MAC:1
  2 DB7:C7,40JFRENCH.FRY:1 COP:2
  3 DB7:C7,40JAPPLE.PIE:1
  C7,40J Y ENTRY:7
  1 DB7:C7,40JY.ME:1
** BATCH QUEUES **
BATCH => BAP0
>

```

ZK-240-81

The circled numbers identify those elements that appear on your terminal as a result of a SHOW QUEUE (QUE /LI) command. The elements are interpreted as follows:

- 1** Shows a print queue or (for RSX-11M-PLUS systems) a batch queue header. This header indicates that the information it precedes is either for a print queue or batch queue.
- 2** Shows the queue and the spooled devices or batch processors assigned to it.
- 3** Shows the UIC of the job. A privileged user may have a different UIC from the login UIC.
- 4** Shows the QMG print job name. The name may be composed of one to nine alphanumeric characters.
- 5** Shows the job entry number (the range is 1 through 999). The QMG assigned this number when it placed the job in queue.
- 6** Shows the form number for the printer on which the job is to be printed.
- 7** Shows the queue status of a job. A job may be ACTIVE, HELD, or BLOCKED UNTIL (time blocked).
- 8** Shows the entry order of the file in a job and its full file specification.
- 9** Shows the number of copies of a file to be printed within a particular job.

CHAPTER 2

QUEUING JOBS

The Queue Manager (QMG) is a system task that distributes jobs to output devices or batch processors. Passing jobs to the Queue Manager is called "queuing jobs." When the Queue Manager releases jobs for processing, it is called "dequeuing jobs."

The Queue Manager distributes jobs queued by user tasks, by system tasks that output listings such as MACRO listings or task builder maps, and jobs queued by the PRINT command.

On RSX-11M-PLUS systems, the Queue Manager also distributes jobs to batch processors. These user batch jobs are queued by the SUBMIT command and are called QMG batch jobs. A QMG batch job is a chain of one or more user batch jobs to be processed. The SUBMIT command specifies a QMG batch job (See Chapter 3).

Once jobs are in queues, you can display queue information with the SHOW QUEUE (QUE /LI) command. You can alter the status of jobs in queues with the SET QUEUE (QUE /MOD) command. You can hold jobs in queues with the HOLD/JOB (QUE /HO) command or release them from queues with the RELEASE/JOB (QUE/REL) command.

All these aspects of using the Queue Manager, including writing tasks that spool output, are discussed in this chapter.

2.1 SPOOLING OUTPUT

A spooled output device is the hardware device plus its processor.

Spool is an acronym for Shared Peripheral Operations On Line. Spooling refers to the process of sending output to a peripheral device, such as a line printer, in an orderly fashion. Output requests are gathered into queues and then these requests are "dequeued" in a serial manner. The spooled device services only one request at a time.

The most common output device for the Queue Manager is a line printer. Most RSX-11M/11M-PLUS systems will have a line printer or some other device designated as the system output device that assumes the role of the line printer.

On RSX-11M-PLUS, you can substitute the device name of a spooled output device for the output file specification in any system task or user-written task that creates an output file. This is called transparent spooling. Thus, the following commands are legal and will queue files to an output device:

```
DCL>COPY MORAN.MAC LP0:
```

```
MCR>PIP LP0:=-MORAN.MAC
```

QUEUING JOBS

On RSX-11M-PLUS, you can also send output to a spooled device using the EDT WRITE or PRINT commands and substituting the device name for the output file specification.

When you successfully submit a job for queuing with either the QMG PRINT or SUBMIT command, you will receive a submission notification message on your terminal. For example:

```
DCL>PRINT MORAN.DMP
```

```
MCR>PRI MORAN.DMP
```

The following message will appear:

```
PRI-JOB 123, name "MORAN " submitted to queue "PRINT "
```

PRI Indicates that the job was submitted by the PRINT command. If you use the SUBMIT command, SUB will take the place of PRI.

123 The unique job entry number given to the job (1 through 999).

MORAN The name of your job. Jobnames can be up to nine characters in length. If you do not specify a jobname, the jobname will be derived from the first file name in your job.

PRINT The queue into which the job is submitted.

2.2 PRINT COMMAND

The PRINT (PRI) command queues files for printing on a line printer. More specifically, the output you desire to be printed on a line printer is first placed into a waiting line by the Queue Manager (QMG). QMG places the print job into the waiting line according to the job's print status. Status is determined by PRINT command qualifiers and switches described in this section.

The PRINT command can also be used to queue jobs for other output devices and applications processors. These jobs are referred to as "print" jobs even if they do not involve any hardware printing.

The PRINT command gives you control over how, when, and where your job will be printed through the use of PRINT command qualifiers and switches.

QUEUING JOBS

Format

```
DCL>PRINT[/commandqualifier[s]] filespec[s] [/filequalifier[s]]
MCR>PRI[[queue name:][jobname] [/jobswitch]=] filespec[s] [/fileswitch[s]]
```

DCL Command Qualifiers

```
/JOB COUNT:n
/QUEUE:queue name
/UPPERCASE
/LOWERCASE
/[NO] HOLD
/PAGE_COUNT:n
/NAME:jobname
/PRIORITY:n
/FORM:n
/LENGTH:n
/[NO] RESTART
/[NO] FLAG_PAGE
/AFTER:(dd-mm-yy hh:mm)
/DEVICE:ddnn:
/[NO] JOBPAGE
```

MCR Job Switches

```
/CO:n
queue name:
/NOLOW
/LOW
/[NO] HO
/PA:n
jobname=
/PRIO:n
/FO:n
/LE:n
/[NO] RES
/[NO] FL
/AF:hh:mm:dd-yyy
queue name:
/NOJO
```

DCL File Qualifiers

```
/[NO] DELETE
/COPIES:n
/[NO] TRANSFER (RSX-11M-PLUS Only)
```

MCR File Switches

```
/[NO] DE
/CO:n
/[NO] TR (RSX-11M-PLUS Only)
```

Parameter

filespec[s]

Specifies the file(s) to be printed.

Separate multiple filespecs with commas. You can use wildcards (*) in the UFD and file name, type, and version fields of the filespec.

If your filespec includes no file type, the default file type is .LST.

QUEUING JOBS

Command Qualifiers (DCL) and Job Switches (MCR)

/JOBCOUNT:n
/CO:n

Specifies the number of copies (n) of the print job. A QMG print job is made up of one or more files that are printed in the order they were listed.

NOTE

/JOBCOUNT:n (/CO:n) is a qualifier to the QMG PRINT command. Do not confuse it with the /COPIES:n qualifier, (/CO:n) which is a qualifier to the file(s) contained inside a QMG print job.

/QUEUE:queuename
queuename:=

Specifies the name of the print queue in which the job is to be placed. The default is the PRINT queue.

/UPPERCASE
/NOLOW

Specifies that the print job can be sent to a line printer initialized without the lowercase character set. This is the default.

/LOWERCASE
/LOW

Specifies that the print job must be sent to a line printer initialized with the lowercase character set.

/[NO]HOLD
/[NO]HO

Specifies that the job be held in its queue and is therefore not eligible for printing. You can release the job with RELEASE/JOB (QUE/RE). See Section 2.8.2.

/PAGE COUNT:n
/PA:n

Sets the limit on the number of pages a job may produce. The range is 1 through 65535.

Without this qualifier, the number of pages is unlimited (n=0).

/NAME:jobname
jobname=

Specifies a job name for the print job. The job name can be up to nine alphanumeric characters.

If you specify a job name, that name appears on the flag page at the beginning of the printed output. Otherwise, the name of the first file in the job is the job name.

QUEUING JOBS

`/PRIORITY:n`
`/PRIO:n`

Sets the queue priority of the print job. For nonprivileged users, `n` can be from 0 through 150. Privileged users can set `n` up through 250. The default is 50.

The Queue Manager runs the highest-priority job first. If two jobs have the same priority, the job that has been waiting longer runs first.

`/FORMS:n`
`/FO:n`

Specifies the type of form that the job is to be printed on. The value of `n` can be from 0 through 255. Default is 0. See your system manager for details on how to specify the particular forms used at your installation.

`/LENGTH:n`
`/LE:n`

Sets the length of a logical page; `n` can be any number from 0 to 255. The default is 0. If you set a length, a form feed will be automatically generated if one is not found within `n` lines.

This qualifier has no effect on how the printer handles form-feed characters. A form feed still moves the printer to the top of the next physical form, such as the perforation in a sheet of line-printer paper. This qualifier simply adds the requirement that the printer move to the top of the next physical page if no form-feed character is encountered within `n` lines.

When you set the length at 0 (the default), no form feeds will be inserted.

`/[NO]RESTART`
`/[NO]RES`

Controls requeuing of your job if it is stopped or aborted while being processed.

If `/RESTART` (`/RES`) is specified, your job will start again from the beginning if it is stopped or aborted.

`/NORESTART` (`/NORES`) is the default. If the printer is stopped while your job is active, the job will pick up where it left off when the printer is started.

In neither case will you be missing any of your job, but with `/RESTART` (`/RES`) your job will be all in one piece.

`/[NO]FLAG_PAGE`
`/[NO]FL`

Adds flag pages before each file in your print job. The default is `/NOFLAG_PAGE` (`/NOFL`).

With `/NOFLAG_PAGE` (`/NOFL`), your job is still preceded by a job flag page, but the files in the job are printed without any file flag page. (See `/[NO]JOB_PAGE`.)

QUEUING JOBS

/AFTER: (dd-mmm-yy hh:mm)
 (mm/dd/yy hh:mm)
/AF:hh:mm:dd-mmm-yy

Blocks the job until after the specified time. Depending on the print queues at that time, your job may be run immediately or later when its turn comes up in the queue.

The time and date are in the same format as the format generated by the SET TIME (DCL) and TIM (MCR) commands.

If you do not specify /AFTER (/AF), your job is immediately eligible for printing.

/DEVICE:ddnn:
queuename:

Specifies the device on which you want your output to appear. The default is the device or devices served by the PRINT queue. (/DEVICE is a DCL synonym for /QUEUE.)

/[NO]JOB_PAGE
/[NO]JO

Controls the printing of a job flag page before the job. The default is /JOB_PAGE (/JO). (See /[NO]FLAG_PAGE.)

File Qualifiers (DCL) and File Switches (MCR)

If you specify a file qualifier as a command qualifier in DCL, that attribute applies to all files. You can, however, override that attribute for a specific file by using the qualifier as a file qualifier.

On systems using MCR, any file specifications that follow a file specification that is altered by a switch will (by default) be altered as well. In the following example, you would have to use the /CO:1 switch after JPAUL if you did not want four copies printed:

```
DCL>PRINT JOHANNA.TXT,KIRSTEN/COPIES:4,JPAUL,DAD.MEE
```

```
MCR>PRI =JOHANNA.TXT,KIRSTEN/CO:4,JPAUL/CO:1,DAD.MEE
```

/COPIES:n
/CO:n

Sets the number of copies for a particular file in a job. The default is one copy.

/[NO]DELETE
/[NO]DE

Deletes the files after they are printed. The default is /NODELETE.

/[NO]TRANSFER (RSX-11M-PLUS only)
/[NO]TR (RSX-11M-PLUS only)

Allows the copying of a file from a private device. The default is /TRANSFER.

QUEUING JOBS

Examples

The following PRINT command examples appear in both DCL and MCR syntax:

1. DCL>PRINT JOHANNA.TXT

MCR>PRI JOHANNA.TXT

This example prints the most recent version of JOHANNA.TXT on the line printer.

2. DCL>PRINT/NOJOB_PAGE KIRSTEN.TXT

MCR>PRI /NOJO=KIRSTEN.TXT

This example prints KIRSTEN.TXT without a job-flag page.

3. DCL>PRINT/JOBCOUNT:4 JOHANNA.TXT

MCR>PRI /CO:4=JOHANNA.TXT

This example prints four copies of the print job JOHANNA, each containing one copy of the file JOHANNA.TXT. They are printed end-to-end with a job flag page preceding each printed copy.

4. DCL>PRINT/JOBCOUNT:4/FLAG_PAGE KIRSTEN.TXT

MCR>PRI /CO:4/FL=KIRSTEN.TXT

This example prints four copies of the print job KIRSTEN, each containing one copy of the file KIRSTEN.TXT preceded by a job flag page and a file flag page.

5. DCL>PRINT/FLAG_PAGE JOHANNA.TXT,KIRSTEN.TXT,JIMBO.TXT

MCR>PRI /FL=JOHANNA.TXT,KIRSTEN.TXT,JIMBO.TXT

This example prints one copy of each file, each preceded by a file flag page.

6. DCL>PRINT/NAME:FATHER/FLAG_PAGE JOHANNA.TXT,KIRSTEN.TXT,JPAUL.TXT,ERIKA.TXT

MCR>PRI FATHER=JOHANNA.TXT,KIRSTEN.TXT,JPAUL.TXT,ERIKA.TXT

This example prints one copy of each file preceded by a file flag page and gives the name FATHER to the job as a whole. The name FATHER appears on the job flag page.

7. DCL>PRINT/LENGTH:55 DAD.MAC

MCR>PRI /LE:55=DAD.MAC

This example prints a single copy of the source program file DAD.MAC. This source program file does not contain form-feed characters. To avoid printing over the perforations, the user has specified a logical printed page length of 55 lines. Each time 55 lines are printed, the logical page is complete and the printer moves to the top of the next physical page.

If you specify a file with form feeds in it, the printer would move to the top of a physical page each time it encountered a form feed and each time it printed 55 lines before encountering a form feed.

QUEUING JOBS

8. DCL>PRINT/JOB COUNT:4 JIMBO.DOC,MOUTH.DOC,QUACK.DOC

MCR>PRI /CO:4=JIMBO.DOC,MOUTH.DOC,QUACK.DOC

This example prints the QMG print job four times. Each copy of the print job contains one copy of the file JIMBO.DOC, one copy of the file MOUTH.DOC, and one copy of the file QUACK.DOC.

9. DCL>PRINT/JOB COUNT:3 LIT.MAC,FRENCH.FRY,APPLE.PIE/COPIES:2,MOUTH.WSH

MCR>PRI /CO:3=LIT.MAC,FRENCH.FRY,APPLE.PIE/CO:2,MOUTH.WSH/CO:1

This example prints three copies of the print job named LIT. Each copy of the print job contains one copy of the file LIT.MAC and FRENCH.FRY, two copies of the file APPLE.PIE, and one copy of the file MOUTH.WSH.

Note the difference between the /JOB COUNT:3 qualifier (/CO:3) to the print command and the /COPIES:2 qualifier (/CO:2) to the file APPLE.PIE. If you are using DCL as your command line interpreter, the difference between /JOB COUNT:n and /COPIES:n is easy to see.

If you are using MCR as your command line interpreter the differences between the two /CO:n switches may not appear so distinct to you. When you use /CO:n as a switch to the PRINT command, you are instructing the Queue Manager to print n copies of the print job as separate print jobs. When you use /CO:n as a switch to a filespec, contained within a print job, you are instructing the Queue Manager to print n copies of that file end-to-end within that print job.

10. DCL>PRINT/NAME:SAILOR/JOB COUNT:2/DELETE JIMBO.DOC,MOUTH/COPIES:3,QUACK

MCR>PRI SAILOR/CO:2=JIMBO.DOC/DE,MOUTH/CO:3,QUACK/CO:1

The QMG print job has the name SAILOR and is printed two times. Each of the two printed listings contains one copy of the file JIMBO.DOC, three copies of the file MOUTH.DOC, and one copy of the file QUACK.DOC. All the files are deleted after they are printed.

Again note the difference between the /JOB COUNT:2 qualifier (/CO:2) to the PRINT command and the /COPIES:3 qualifier (/CO:3) to the file MOUTH.DOC.

11. DCL>PRINT/AFTER:(12:15 10-AUG-83) JIMBO.TXT

MCR>PRI /AF:12:15:10-AUG-83=JIMBO.TXT

This example blocks the job in queue until the specified date and time.

12. DCL>PRINT/AFTER:(10:30) KIRSTEN.TXT

MCR>PRI /AF:10:30=KIRSTEN.TXT

This example blocks the job in queue until 10:30 on the date the PRINT command was entered. If you entered this command at any time after 10:30, the job KIRSTEN would have been immediately eligible for printing.

QUEUING JOBS

13. DCL>PRINT DX0:[303,14]KIRSTEN.TXT

MCR>PRI DX0:[303,14]KIRSTEN.TXT

On RSX-11M-PLUS, you can print jobs from a private device using the /TRANSFER switch.

The /TRANSFER qualifier (/TR) does not have to be specified because it is the default. The privately allocated device DX0: is mounted with a volume containing the file KIRSTEN.TXT. Before this file is printed on a line printer, it is copied to the pseudo device SP:. Therefore, the volume may be dismounted and the device deallocated before the file is printed on the line printer. The file will remain on the dismounted volume but will automatically be deleted from SP:[1,7] after printing.

14. DCL>PRINT/NOTTRANSFER DX0:[303,14]KIRSTEN.TXT

MCR>PRI=DX0:[303,14]KIRSTEN.TXT/NOTR

In this example, the file is not copied to a pseudo device, therefore the volume must remain mounted until the print job is completed.

Notes

Once your job is in a queue, you can modify some job attributes with SET QUEUE (QUEUE /MOD). See Section 2.7.

The /LOWERCASE (/LOW) and /UPPERCASE (/NOLOW) qualifiers have no effect on the nature of your output. They do not cause your job to be printed in uppercase or lowercase. Specifying /LOWERCASE (/LOW) means that a printer with the lowercase attribute must be used. Specifying /UPPERCASE (NOLOW) means that the printer need not (but may) have the lowercase attribute.

Despite your setting of the /[NO]RESTART qualifier (/[NO]RES) your system manager may restart your job by commands to the Queue Manager over which you have no control. See the RSX-11M/M-PLUS System Management Guide.

The job flag pages and the file flag pages have different formats. The job flag page shows the UIC the PRINT command was issued under on the first line (or the user name on RSX-11M-PLUS systems with CPU accounting) and a nine-character job name derived from an explicit job name or the file name of the first file in the job. The file flag page shows the file name on the first line and the file type and version number on the second line.

QUEUEING JOBS

The /JOB COUNT:n qualifier (/CO:n) to the QMG PRINT command specifies the number of copies of the job to be printed. You should not confuse this job qualifier with the /COPIES:n file qualifier (/CO:n). A QMG print job is made up of one or more files. If you desire to print two or more copies of a file contained in a single QMG print job, you would use the /COPIES:n file qualifier (/CO:n).

If you use the /NOTTRANSFER qualifier (/NOTR), you must leave the volume mounted until the print job is finished. Under the default /TRANSFER (/TR), your files are copied to another location and the volume can be dismounted. If you do not wish your files to be accessible to other system users or if there is no space on SP:, use the /NOTTRANSFER (/NOTR) qualifier.

You may prefer not to use the /NOTTRANSFER (/NOTR) qualifier with slower devices, such as cassettes, DECTapes, or floppy disks.

2.3 DELETE COMMAND

The DELETE command is used to delete jobs from a queue or files from a job.

Formats

```
DCL>DELETE/ENTRY:nnn[/FILE_POSITION:n]
```

```
DCL>DELETE/JOB queue name, job name[/FILE_POSITION:n]
```

```
MCR>QUE /EN:nnn[/FI:n]/DEL
```

```
MCR>QUE queue name:job name[/FI:n]/DEL
```

These commands allow the deletion of a job in queue by specifying either the job's entry number or job name. You can also delete a single file in a job by specifying the /FILE_POSITION:n qualifier (/FI:n).

Parameters

queue name

Specifies the name of the queue containing the job you wish to delete.

job name

Identifies a job to be deleted from the specified queue.

The same job name may appear in a queue more than once. HELD or ACTIVE jobs will be deleted before WAITING jobs.

```
/ENTRY:nnn
```

```
/EN:nnn
```

Deletes a queue entry by number. The number is unique. The entry number replaces both the queue name and the job name.

QUEUING JOBS

/FILE_POSITION:n
/FI:n

Identifies the file by the file's position in the job.

Examples

1. DCL>DELETE/ENTRY:301

MCR>QUE /EN:301/DEL

This command deletes the job from queue by referencing the job's unique entry number (in this example, job number 301). Jobs may share the same job name but never the same job entry number. When you delete a job by its entry number, you are deleting that particular job with greater confidence. It is possible to delete the wrong job when a job is referenced by its jobname. Deleting a job by its unique entry number protects you from such mistakes.

2. DCL>DELETE/JOB LP0 KIRSTEN

MCR>QUE LP0:KIRSTEN/DEL

This command deletes the job KIRSTEN by first referencing the job's queue, LP0, and then deleting the job KIRSTEN from LP0.

3. DCL>DELETE/ENTRY:301/FILE_POSITION:2

MCR>QUE /EN:301/FI:2/DEL

This example deletes only the second file appearing in job 301. You may only refer to the file you wish to delete by the file's position in the print job (the numbered order in which you entered the file specification). You cannot specify the file you wish to delete by referring to its file specification.

Notes

Associating a particular file specification with the numbered order in which it was entered into a queue can be accomplished by entering a SHOW QUEUE command (QUE /LI), and examining the output on your terminal. See Figure 1-1 for an example of the entry order of file specifications.

Using the /ENTRY:nnn qualifier to delete a job saves keystrokes. You are also deleting a job with greater confidence. Remember a job may share a job name but never a job entry number. If, for example, you decided to delete a job by referring to the job name, and you have several jobs sharing the job name, you would succeed in deleting only the first occurrence of the job and not necessarily the job that you wanted to delete.

DELETE/QUEUE (QUE /DEL) works on all categories of jobs in any queue. You can delete ACTIVE jobs, WAITING jobs, TIME-BLOCKED jobs, or HELD jobs.

There can be more than one job with the same name from the same UIC. The DELETE/QUEUE (QUE /DEL) command will delete the first job of a given name in the queue.

QUEUING JOBS

2.4 PRINT JOBS QUEUED BY SYSTEM TASKS

A number of system tasks can also pass print jobs to the Queue Manager. These jobs include listings from language compilers and the MACRO-11 Assembler and maps from the Task Builder. Print jobs can also pass to the Queue Manager through CLI commands or PIP.

On RSX-11M-PLUS, print job can pass to the Queue Manager wherever an output file can be specified.

2.4.1 Maps, Logs, and Listings

A number of system tasks can create printable output. Examples of these are Task Builder maps, MACRO-11 assembly listings, batch-processing logs (RSX-11M-PLUS only), and listings from the high-level language compilers. These tasks are accessible directly from MCR or through DCL commands. These tasks follow their own rules for spooling output, but when you request that such output be spooled, the request will be handled by the Queue Manager.

You cannot control the printing of such output directly, as you can through the PRINT command. Once the jobs appear in a queue, however, you can alter their attributes through the SET QUEUE (QUE/MOD) commands. See Section 2.7.

2.4.2 PIP, CLIs, and Output Files

On RSX-11M/11M-PLUS you can use PIP, the Peripheral Interchange Program, to queue print jobs.

The following PIP command:

```
PIP>NAME.TYP/SP
```

causes the file NAME.TYP to be queued for printing. The print job will have a name derived from the name of the file (in this case, NAME), and the SHOW QUEUE (QUE /LI) display will give the file specification.

On RSX-11M-PLUS systems, you can also send files directly to a line printer via PIP, as shown in the command:

```
PIP>LP1:=NAME.TYP
```

The print job will have a name derived from the name of the task, such as PIPT10, and the SHOW QUEUE (QUE /LI) display will not give the file specification, but only the file ID number, labeled FID. The job will appear in the device-specific queue corresponding to the device you specify (in this case, LP1).

With the Queue Manager present, your files will not be interspersed with someone else's files.

On RSX-11M-PLUS systems, you can use the DCL COPY command to send files to the line printer.

```
DCL>COPY  
From? NAME.TYP  
To? LP1:
```

QUEUING JOBS

The print job will have a name derived from the command and the terminal, such as COPT32, and only the file ID number, labeled FID, and not the file specification, will appear in the display from SHOW QUEUE (QUE /LI).

On RSX-11M-PLUS system, any system or applications task that creates an output file can send that file to a printer or other spooled output device, rather than writing it to the disk. Simply replace the output file specification with the name of the device to which you wish to send the output. This is called transparent spooling.

```
*WRITE filespec [range]
```

To send an output file to the line printer from within EDT, issue a command such as the following:

```
*WRITE LP0: 200:400
```

This example creates a file consisting of the text between lines 200 and 400 and queues it for printing on LP0:, all without your leaving the editor. No file is written to the disk.

2.5 PRINT JOBS QUEUED BY USER TASKS

There are several methods for spooling output from user-written tasks. When you spool output from within a task, you cannot control the printing directly as you can through the PRINT command. Once the print job appears in queue, however, you can alter its attributes through the SET QUEUE (QUE/MOD) command. See Section 2.7.

2.5.1 Opening a File on Disk and Using .PRINT

Your task can open a file on disk, output to it, and close it using the PRINT\$ macro call or call the .PRINT subroutine to spool the output. (Refer to the IAS/RSX-11M I/O Operations Manual.)

The file will be placed in the default queue PRINT.

In FORTRAN IV, FORTRAN IV-PLUS, and FORTRAN-77 on RSX-11M/RSX-11M-PLUS, the equivalent is to use the DISP= 'PRINT' in your OPEN or CLOSE statement.

2.5.2 Opening a File on Disk and Using the PRINT Command

Your task can open a file on disk, output to it, and close it. Once your task exits, print the file with the PRINT command.

While this is not the simplest method of spooling, it is the only method that gives you access to the PRINT command qualifier. You can accomplish much the same thing using the two methods described in Section 2.5.1 by waiting until the job is in the queue and then altering its attributes with the SET QUEUE command.

QUEUING JOBS

If you run your task from an indirect command file or batch job that includes a PRINT command after task exit, the difference between spooling from within the task or from outside it will probably not be noticeable.

You can also have the task issue the PRINT command by using the SPWN\$ directive. (Refer to RSX-11M/M-PLUS Executive Reference Manual.)

2.5.3 Opening a File on LPn: (RSX-11M-PLUS)

Your task can use an OPEN\$ macro and name the output device. FCS will open the file on pseudo device SP0:. When your task has finished writing to this file, close it with a CLOSE\$ macro.

The file will be placed in the device-specific queue for the device you named. The file will be deleted after it is printed. This file is not in any directory but is identified only by a file-ID number, which will be labeled FID in the SHOW QUEUE display.

In FORTRAN IV, FORTRAN IV-PLUS and FORTRAN-77 on RSX-11M/RSX-11M-PLUS systems, the equivalent is to use CALL ASSIGN and CALL CLOSE or the OPEN and CLOSE statements, using a file specification of LPn:.

2.6 SHOW QUEUE AND SHOW PROCESSOR

You may use the commands described in this section to display information about queues, the jobs in the queues, spooled devices and (in the case of RSX-11M-PLUS systems) batch processors.

The commands described in Section 2.6.1 allow you to access information about QMG print jobs (and for RSX-11M-PLUS systems, batch jobs).

A SHOW QUEUE (QUE/LI) command will show all jobs in all queues. Qualifiers (switches) can be used to limit the display to specific queues, specific jobs, and the like.

You may examine the contents of your system's queues (in decreasing degree of detail) by entering one of the following command qualifiers (switches).

/FULL (/FU)

/FILES (/LI)

/BRIEF (/BRIEF)

The commands described in Section 2.6.2 display information about spooled devices and batch processors under the control of the Queue Manager.

2.6.1 SHOW QUEUE (QUE /LI)

SHOW QUEUE (QUE /LI) displays information about QMG print jobs and RSX-11M-PLUS batch jobs.

QUEUING JOBS

Format

```
DCL>SHOW QUEUE [queuename] [/qualifier[s]]
MCR>QUE [queuename:][[uic]][jobname]/switch[es]
```

| DCL Qualifiers | MCR Switches |
|-----------------------|----------------------|
| /FULL | /FU |
| /FILES | /LI |
| /BRIEF | /BR |
| /DEVICE | /LI:P |
| /ENTRY:nnn | /EN:nnn |
| /FORMS[:n] | /FO[:n] |
| /NAME:jobname | jobname |
| /OWNER_UIC:uic | [uic] |
| /PRINT | /LI:P |
| /BATCH (RSX-11M-PLUS) | /LI:B (RSX-11M-PLUS) |

Command Qualifiers (DCL) and Job Switches (MCR)

```
/FULL
/FU
```

Displays detailed information about queues, queue assignments, jobs, the attributes of jobs in queues, and files that compose jobs in queues.

```
/FILES
/LI
```

Displays information about queues, queue assignments, jobs in queues, and files that compose jobs in queues. The attributes of the jobs are not displayed. This display format is the default of SHOW QUEUE (QUE/LI).

```
/BRIEF
/BR
```

Displays only queues, queue assignments, and jobs in queues.

You may examine specific attributes of queues by entering one of the following qualifiers (switches).

```
SHOW QUEUE queuename
QUE queuename:/LI
```

Displays QMG information for a single queue. The information displayed may be for either print queues or (in the case of RSX-11M-PLUS systems) batch queues.

```
/DEVICE
/LI:P
```

Limits information to print queues.

QUEUING JOBS

/ENTRY:nnn
/EN:nnn

Limits information to a particular job entry referenced by the job's unique entry number.

/NAME:jobname
jobname

Limits information to jobs with the specified jobname.

/OWNER_UIC:uic
[uic]

Limits information to jobs owned by the specified uic.

/PRINT
/LI:P

Limits information to Print queues. This qualifier produces the same information as the /DEVICE qualifier (DCL).

/BATCH
/LI:B

On RSX-11M-PLUS systems, limits information to batch queues.

/FORMS[:n]
/FO[:n]

Limits information to jobs that are to be printed on a specified form. If n is omitted, the display shows all jobs that are other than Form 0.

Examples

The following examples show the three different output displays (FULL, FILE, BRIEF). (In order to include information pertaining to batch queues, the examples were done on an RSX-11M-PLUS system.)

1. DCL>SHOW QUEUE/FULL

MCR>QUE /FU

** PRINT QUEUES **

PRINT => LP0 (LP1)

[7,25] DRGCL ENTRY:22 FORM:0 ACTIVE ON LP0
PRI:50 LEN:0 PAGE:0 NORESTART FLAG:JOB NOLOWER COP:1
> 1 DB0:[11,34]DRGCL.LST;1 COP:1 NODELETE

[7,40] LOGIN ENTRY:24 FORM:0
PRI:50 LEN:0 PAGE:0 NORESTART FLAG:JOB NOLOWER COP:1
1 DB7:[7,40]LOGIN.CMD;120 COP:1 NODELETE

LP0 => LP0

LP1 => (LP1)

** BATCH QUEUES **

BATCH => BAP0

[7,40] X ENTRY:23 ACTIVE ON BAP0
PRI:50 NORESTART LOG PRINT:PRINT
> 1 DB7:[7,40]X.BAT;1 NODELETE

>

QUEUING JOBS

This display shows all information about the queues and jobs in queues. In this example, the Queue PRINT can send jobs to LP0 or LP1. LP1 has been stopped by the System Manager and is therefore not eligible to accept jobs. (This is indicated by the processor name enclosed in parentheses.)

There are two print jobs in the Queue PRINT:

- o [7,25]DRGCL, entry number 22, which is currently being printed on LP0
- o [7,40]LOGIN, entry number 24, which is waiting to be printed.

The batch job [7,40]X, entry number 23, is running on batch processor BAP0.

The attributes of the job are indicated in the display, and the files that make up each job are also listed. The angle bracket (>) indicates which file of a job is currently being processed.

2. DCL>SHOW QUEUE [/FILE]

MCR>QUEE /LI

```
** PRINT QUEUES **
PRINT => LP0 (LP1)
  [7,25] DRGCL      ENTRY:22          ACTIVE ON LP0
        > 1 DB0:[11,34]DRGCL.LST;1
  [7,40] LOGIN     ENTRY:24
        1 DB7:[7,40]LOGIN.CMD;120
LP0    => LP0
LP1    => (LP1)
** BATCH QUEUES **
BATCH => BAP0
  [7,40] X         ENTRY:23          ACTIVE ON BAP0
        > 1 DB7:[7,40]X.BAT;1
```

This display, the default format, shows the queues in the same state. It does not show the attributes of the job. It only shows the form number of the job and the attributes of the files if other than the default values were specified.

3. DCL>SHOW QUEUE/BRIEF

MCR>QUEE /BR

```
** PRINT QUEUES **
PRINT => LP0 (LP1)
  [7,25] DRGCL      ENTRY:22          ACTIVE ON LP0
  [7,40] LOGIN     ENTRY:24
LP0    => LP0
LP1    => (LP1)
** BATCH QUEUES **
BATCH => BAP0
  [7,40] X         ENTRY:23          ACTIVE ON BAP0
```

This display only shows the names, entry numbers, and status of the jobs in the queues. Also, if a form other than Form 0 is specified for a print job, the form will appear in the display.

QUEUING JOBS

2.6.2 SHOW PROCESSOR (QUE /LI:DEV)

SHOW PROCESSOR (QUE /LI:DEV) displays information about the initialized characteristics of spooled devices and (on RSX-11M-PLUS systems) batch processors, printers, and other output devices under control of the Queue Manager.

Format

```
DCL>SHOW PROCESSOR [processorname]
```

```
MCR>QUE [processorname:]/LI:DEV
```

Displays information about all processors.

On RSX-11M-PLUS systems, this includes batch processors and spooled input devices.

```
DCL>SHOW PROCESSOR/BATCH
```

```
MCR>QUE /LI:DEV:B
```

On RSX-11M-PLUS systems, shows all batch processors.

```
DCL>SHOW PROCESSOR/PRINT or SHOW PROCESSOR/DEVICE
```

```
MCR>QUE /LI:DEV:P
```

On RSX-11M/11M-PLUS Systems, shows all Print processors.

```
DCL>SHOW PROCESSOR/INPUT or SHOW PROCESSOR/CARD_READER
```

```
MCR>QUE /LI:DEV:I
```

On RSX-11M-PLUS systems, shows spooled card reader devices. (Refer to Section 3.9.)

Example

Enter one of the following commands on your terminal:

```
DCL>SHOW PROCESSOR
```

```
MCR>QUE /LI:DEV
```

Information about print processors and (on RSX-11M-PLUS systems) batch processors and spooled input devices will be displayed at your terminal as shown in the following RSX-11M-PLUS example.

```
** SPOOLED DEVICES **
LP0    <= PRINT LP0
        LOWER      FORM:0   FLAG:2
        CURRENT JOB: [301,31]CAESAR   ENTRY:59
LP1    (STOPPED) <= LP1
        NOLOWER    FORM:1   FLAG:1
**BATCH PROCESSORS **
BAPO   <= BATCH
```

This display shows all information about spooled devices and batch processors. In this example, spooled device LP0 can receive jobs from queues PRINT and LP0.

QUEUING JOBS

Spooled device LPl has been stopped by the System Manager and is therefore not eligible for receiving jobs for printing.

The only batch processor, BAP0, can only receive jobs from the Queue BATCH.

LP0 is currently printing job [301,31]CAESAR, entry number 59.

2.7 SET QUEUE (QUE/MOD)

SET QUEUE (QUE /MOD) modifies attributes given to either print jobs, batch jobs, or files that compose jobs in queues. Such jobs and files have been entered in queues by either the PRINT command or (on RSX-11M-PLUS systems) SUBMIT command. You cannot change the attributes of an active job.

Job Formats

```
DCL>SET QUEUE queuname jobname/qualifier[/qualifier[s]]
```

```
DCL>SET QUEUE/ENTRY:nnn/qualifier[/qualifier[s]]
```

```
MCR>QUE queuname:jobname/MOD/switch[/switch[es]]
```

```
MCR>QUE /EN:nnn/MOD/switch[/switch[es]]
```

DCL Qualifiers

```
/AFTER:(hh:mm dd-mmm-yy)
```

```
/JOB_COUNT:n
```

```
/FORMS:n
```

```
/LENGTH:n
```

```
/LOWERCASE
```

```
/PAGE_COUNT:n
```

```
/PRIORITY:n
```

```
/[NO]RESTART
```

```
/UPPERCASE
```

MCR Switches

```
/AF:hh:mm:dd-mmm-yy
```

```
/CO:n
```

```
/FO:n
```

```
/LE:n
```

```
/LOW
```

```
/PA:n
```

```
/PRIO:n
```

```
/[NO]RE
```

```
/NOLOW
```

File Formats

```
DCL>SET QUEUE queuname jobname/FILE_POSITION:n/qualifier[/qualifier[s]]
```

```
DCL>SET QUEUE/ENTRY:nnn/FILE_POSITION:n/qualifier[/qualifier[s]]
```

```
MCR>QUE queuname:jobname/MOD/FI:n/switch[/switch[es]]
```

```
MCR>QUE /EN:nnn/MOD/FI:n/switch[/switch[es]]
```

DCL Qualifiers

```
/COPIES:n
```

```
/[NO]DELETE
```

MCR Switches

```
/CO:n
```

```
/[NO]DEL
```

QUEUING JOBS

Job Qualifiers and Switches

/AFTER:(dd-mmm-yy hh:mm)
/AF:hh:mm:dd-mmm-yy

Changes the time after which your job will be printed. The job will be BLOCKED until the time and date you specify. The job will not necessarily be printed at exactly the time you state but will be eligible after the time you state.

If you do not supply the calendar field, the default is the current date. If you do not supply the clock field, the default is midnight on the date given in the calendar field.

If you supply both the clock and calendar fields, you must separate them with a space (DCL) or a colon (MCR).

/JOBCOUNT:n
/CO:n

Changes the number of copies of a job you wish to have printed. See File Qualifiers for an explanation of how to modify the number of copies of a file contained inside of a job. See Section 2.2 for an explanation of the COPIES attribute as it applies to print jobs.

/FORMS:n
/FO:n

Changes the FORMS attribute of your print job. See Section 2.2 for an explanation of the FORMS attribute as it applies to print jobs.

/LENGTH:n
/LE:n

Changes the length of a logical page (number of lines per printed page) of your print job. A line printer will move to the top of a physical page every time n lines have been printed on a page. See Section 2.2 for an explanation of the LENGTH attribute as it applies to print jobs.

/LOWERCASE
/LO

Prints your job on a line printer initialized /LOWERCASE by your system manager.

/PAGE_COUNT
/PA:n

Changes the limit on the number of pages your job may produce. See Section 2.2 for an explanation of the PAGE_COUNT attribute as it applies to print jobs.

/PRIORITY:n
/PRIO:n

Changes the queue priority of a print job. Nonprivileged users may set priorities up through 150. Privileged users may set priorities up through 250. See Section 2.2 for an explanation of the PRIORITY attribute as it applies to print jobs.

QUEUING JOBS

/[NO]RESTART
/[NO]RE

Changes the restartability of your job. If you specify /RESTART (/RE), your job will start again from the beginning if it is interrupted while ACTIVE. If you specify /NORESTART (/NORE), the default, your job will pick up where it left off, if it is interrupted while ACTIVE.

/UPPERCASE
/NOLO

Changes the attribute of the job from lower- to uppercase.

File Qualifiers and Switches

/FILE_POSITION:n
/FI:n

Changes the operation of /COPIES:n (/CO:) or /[NO]DELETE (/NO]DEL) as they apply to a file contained in a job in queue. The number n refers to the file position in the job. Use SHOW QUEUE to determine its position.

/COPIES:n
/CO:n

Changes the number of copies of a file you wish to have printed within a single printing of a print job.

/[NO]DELETE
/[NO]DEL

Changes the delete status of a single file contained in a print job.

Example

```
DCL>PRINT/JOBCOUNT:2 KIRSTEN.TXT,JPAUL.TXT/COPIES:3
```

```
MCR>PRINT/CO:2=KIRSTEN.TXT,JPAUL.TXT/CO:3
```

The SHOW QUEUE/FULL (QUE/FU) command output might look like this:

```
** PRINT QUEUES **  
PRINT => (LP0)  
  [303,5] KIRSTEN  ENTRY:696  FORM:0  
        PRI:50  LEN:0  PAGE:0  NORESTART  FLAG:JOB  NOLOWER  COP:2  
        1 DB7:[303,5]KIRSTEN.TXT;1  COP:1      NODELETE  
        2 DB7:[303,5]JPAUL.TXT;1  COP:3      NODELETE  
LP0  => LP0  
LP1  => LP1
```

To print two copies of the file JPAUL.TXT instead of the three copies specified in the initial print command, you would type one of the following SETQUEUE (QUE /MOD) commands on your terminal and enter it:

```
DCL>SET QUEUE/ENTRY:696/FILE_POSITION:2/CO:2
```

```
MCR>QUE /EN:696/MOD/FI:2/CO:2
```

QUEUING JOBS

The SHOW QUEUE/FULL (QUE /FU) command output on your terminal would look like this:

```
** PRINT QUEUES **
PRINT => (LP0)
  [303,5]  KIRSTEN  ENTRY:696  FORM:0
          PRI:50  LEN:0  PAGE:0  NORESTART  FLAG:JOB  NOLOWER  COP:2
          1 DB7:[303,5]KIRSTEN.TXT;1  COP:1  NODELETE
          2 DB7:[303,5]JPAUL.TXT;1  COP:2  NODELETE
LP0      => LP0
LP1      => LP1
```

Note that the file in position 2, JPAUL.TXT, will now have 2 copies instead of 3 printed.

Notes

When you issue the PRINT command (or the SUBMIT command for RSX-11M-PLUS batch processing), you specify attributes of the QMG job through command qualifiers (switches). SET QUEUE (QUE /MOD) command qualifiers (switches) change the matching attributes.

You cannot change the attributes of an active job.

You can delete files or change the number of copies to be printed by specifying /FILE_POSITION:n (/FI:n) in your SET QUEUE command line.

2.8 HOLDING AND RELEASING JOBS

You can specify that a print job be HELD in queue when you issue the PRINT command.

You can release such jobs with the RELEASE (QUE /REL) command.

2.8.1 HOLD (QUE/HO)

HOLD (QUE /HO) blocks a job in its queue until it is explicitly released.

Format

```
DCL>HOLD/JOB queueName jobName
```

```
DCL>HOLD/ENTRY:nnn
```

```
MCR>QUE queueName:jobName/HO
```

```
MCR>QUE /EN:nnn/HO
```

Specifying the job's entry number saves you keystrokes. When you reference a job by its unique job entry number, you are avoiding ambiguity between job names. The entry number identifies both the queue the job is in and its name. If you supply the entry number, do not name the queue or the job.

Remember, jobs may share the same name but never the same entry number.

If you name the queue and job, do not supply the entry number.

QUEUING JOBS

2.8.2 RELEASE (QUE/REL)

RELEASE (QUE /REL) unblocks a job that has been held in queue.

Format

```
DCL>RELEASE/JOB queueName jobName
```

```
DCL>RELEASE/ENTRY:nnn
```

```
MCR>QUE queueName:jobName/REL
```

```
DCL>QUE /EN:nnn/REL
```

Example

```
DCL>PRINT/HOLD/NAME:KIRSTEN JPAUL.TXT
```

```
MCR>PRI KIRSTEN/HO=JPAUL.TXT
```

The SHOW QUEUE/FULL (QUE /FU) command output might look like this:

```
** PRINT QUEUES **
PRINT => LP0
  [303,5] KIRSTEN ENTRY:698 FORM:0 HELD
        PRI:50 LEN:0 PAGE:0 NORESTART FLAG:JOB NOLOWER COP:1
        > 1 DB7:[303,5]JPAUL.TXT;1 COP:1 NODELETE
LP0     => LP0
LP1     => LP1
```

To unblock KIRSTEN.TXT, you would type one of the following RELEASE (QUE /REL) commands on your terminal:

```
DCL>RELEASE/ENTRY:698
```

```
DCL>RELEASE/JOB PRINT KIRSTEN
```

```
MCR>QUE /EN:698/REL
```

```
MCR>QUE PRINT:KIRSTEN/REL
```

The SHOW QUEUE /FULL (QUE /FU) command output would look like this:

```
** PRINT QUEUES **
PRINT => LP0
  [303,5] KIRSTEN ENTRY:698 FORM:0 ACTIVE ON LP0
        PRI:50 LEN:0 PAGE:0 NORESTART FLAG:JOB NOLOWER COP:1
        > 1 DB7:[303,5]JPAUL.TXT;1 COP:1 NODELETE
LP0     => LP0
LP1     => LP1
```

Note, the HELD status of the job in the previous example was first changed to WAITING, and then, since there were no jobs in queue, became ACTIVE.

CHAPTER 3

PREPARING A USER BATCH JOB

A batch processor is a task that uses a software terminal called a "virtual terminal" to pass commands and data to CLIs and other tasks. The commands and data are contained in a user batch job. They must duplicate a complete interactive terminal session. This is the most important rule to remember when preparing a batch job. The batch job must fulfill the role of a user at a terminal. In other words, the batch job must perform the following functions:

- Log itself in
- Issue commands
- Supply data for tasks
- Respond to exit status codes returned by tasks
- Log itself out

One or more user batch jobs queued with a single SUBMIT command are called a batch chain or QMG batch job.

3.1 THE VIRTUAL TERMINAL

The virtual terminal created by the batch processor to run your job has the same UIC as the terminal from which the SUBMIT command was entered.

NOTE

If you are a privileged user, you can run a batch job under a UIC different from your login UIC.

The same default login UIC that is created for you when you log into an interactive terminal is created for you when your batch job is logged into a virtual terminal.

3.2 A USER BATCH JOB

A user batch job must duplicate a complete interactive terminal session. It must issue commands and supply data to any tasks that run from the virtual terminal. Labels and sequence control commands make it possible for you to program responses to errors from within your user batch job.

PREPARING A USER BATCH JOB

The commands and data in the user batch job may be either CLI commands, such as DCL or MCR commands, or the batch-specific commands described in Section 3.3. All commands must be preceded by a dollar sign (\$). The batch processor interprets all lines beginning with a dollar sign (\$) as commands and, generally, any lines without a dollar sign (\$) in the first position as data.

The term "data" includes not only data in the conventional sense of information to be processed by a program but also responses to prompts from CLI commands or from indirect command files. In fact, anything -- except commands -- that you would have to type during an interactive session is called data.

All user batch jobs must begin with \$JOB command and end with \$EOJ command. Once you have prepared the batch job, submit it to a batch queue using the SUBMIT command. One or more user batch jobs queued with a single SUBMIT command are called a batch chain or QMG batch job. If you submit a group of user jobs, they will be run in the order submitted.

All user batch jobs in the QMG batch job will share the same log file. The log file is a record of the activity of the virtual terminal session.

3.3 THE BATCH COMMAND LINE

The general format of the batch command line is:

```
$(label:) [command]
```

All commands in batch jobs must be preceded by a dollar sign (\$). The dollar sign (\$) informs the batch processor that the line is to be interpreted as a command, and not as data. The dollar sign (\$) is not part of the command.

Commands may be batch-specific commands, designed exclusively for batch processing, or CLI commands like DCL and MCR commands. Batch-specific commands work with CLIs, not as replacements for CLIs.

There are certain DCL and MCR commands that should not be used in batch jobs. The DCL commands LOGIN and LOGOUT and their MCR equivalents HEL and BYE are not necessary. The batch commands \$JOB and \$EOJ perform the login and logout functions of a CLI.

Any line can have a label consisting of from one to six characters terminated by a colon (:). The label may be referenced by a GOTO command appearing elsewhere in the batch file. Space and tab characters between the colon and the command string are ignored.

3.3.1 Line Continuation

DCL or MCR commands that do not fit on one line can be continued by placing a hyphen (-) in the last character position on the line. Continued lines do not start with the dollar sign and cannot be labeled.

PREPARING A USER BATCH JOB

Batch-specific commands cannot be continued with hyphens.

Here is an example of a continued line:

```
$DELETE JPAUL.MAC;3,-  
NEWKID.MAC;5
```

This command line will execute as if it were all on one line. Notice that the second line does not begin with a dollar sign (\$). The second line should not begin with a space or tab character, if the continuation occurs in the middle of a command line element.

3.4 BATCH-SPECIFIC COMMAND DESCRIPTIONS

You should not confuse batch-specific commands with DCL, MCR, or any other CLI commands. The commands described in this section are designed exclusively for batch processing.

The command syntax rules are the same in batch jobs as they are in interactive terminal sessions. The full CLI command, although not always necessary, is self-documenting. Since these commands will be reproduced in the batch log, you may prefer to use the full forms for batch jobs where the readability of the log or job is a factor.

Batch-specific commands must contain at least three letters. The only exceptions to this rule are the batch-specific commands ON and IF, which must be specified in full.

Table 3-1 provides a categorized list of the batch-specific commands presented in the order they are described in the following sections.

Table 3-1
Batch-Specific Commands

| Function | Command |
|-----------------------------------|---|
| Login and logout commands | JOB EOJ |
| Data commands | DATA EOD |
| Sequence Control (error handling) | STOP CONTINUE GOTO ON SET IF |
| Comment | ! |

3.4.1 JOB

The JOB command marks the beginning of a user batch job and must appear first in each file in a QMG batch job.

PREPARING A USER BATCH JOB

Format

```
$JOB[/qualifier] [loglabel] [[uic]]
```

Command Qualifier

```
/TIME:(hh:mm)
```

or

```
/TIME:m
```

Parameters

loglabel

The label can be up to six alphanumeric characters. This label will appear in the batch log.

If no label is entered, the corresponding spaces in the batch log will be left blank.

Entries in this field affect the batch log only. See Notes at the end of this section.

[uic]

You need not include a UIC, but if you do, you must use the brackets. The UIC is the UIC under which the Submit command was entered.

If you do not include a UIC, then any user who has read access to the file can submit the job.

If you include a UIC and you are non-privileged, the UIC must be the same UIC that the SUBMIT command will be issued under. It need not be the same number as that of the UFD where the batch job file is kept.

Privileged users can have their batch jobs log in under any UIC.

If you use the slash format for the UIC [g/m], you can suppress most login messages. If you do not specify a UIC, login messages will not be suppressed.

Command Qualifiers

```
/TIME:(hh:mm)
```

or

```
/TIME:m
```

Limits the job to hours (hh) and minutes (mm) of CPU time. The default is three minutes.

Examples

1. \$JOB

This is the simplest form of the JOB command. It logs the user onto a terminal. The UIC is the same as the UIC the SUBMIT command was issued under. Informational system messages are included in the batch log.

2. \$JOB [20/20]

This example logs the user in under [20,20] and suppresses login messages.

PREPARING A USER BATCH JOB

3. \$JOB KEMJOB

In this example, the label KEMJOB appears in the user job heading in the logfile.

4. \$JOB/TIME:5

This example specifies that the job must not exceed five minutes of CPU time. The job is ended automatically after five minutes of CPU time have elapsed.

5. \$JOB/TIME:(1:25)

This example specifies that the job must not exceed one hour and 25 minutes of CPU time.

Notes

Including the UIC after the JOB command keeps unauthorized users from submitting your batch jobs and enables you to suppress most login messages. If you leave the UIC out, anyone can submit the job.

The loglabel field affects only the batch log. If you include a log label, it is displayed in the batch log. This label does not appear in the display from the SHOW QUEUE (QUE /LI) command.

If you are submitting several user batch jobs, you will probably want to supply a log label for each job, so that you can differentiate the jobs in the log.

The /TIME qualifier pertains only to CPU time and not to the actual duration of the batch job.

3.4.2 EOJ

The EOJ command marks the logical end of a user batch job.

Format

```
$EOJ
```

Notes

If an end-of-file is encountered before the EOJ command the batch processor assumes an EOJ command.

If the QMG batch job includes two or more user batch jobs, the batch processor logs out the first user batch job before it continues with the next user batch job in the batch chain.

3.4.3 DATA

The DATA command marks the beginning of a data block included in the batch job. EOD is required to end the data block. Data is any required user input, other than DCL, MCR, or any other CLI commands. The DATA command is optional unless one of its qualifiers is needed. When used, the DATA command in batch jobs should immediately follow the command that requests input.

PREPARING A USER BATCH JOB

Format

```
$DATA[/qualifier[s]]
```

Command Qualifiers

```
/NOCOPY
```

```
/DOLLARS[:"string"]
```

/NOCOPY

This qualifier prevents printing of the data blocks in the log file. The default is /COPY.

/DOLLARS[:"string"]

This qualifier permits you to include data with dollar signs (\$) in the first position in the data block. Otherwise, the batch processor interprets the first line beginning with a dollar sign (\$) as marking the end of the data block.

The /DOLLARS qualifier also allows you to use an argument string (one to 15 characters in length) as a terminator for a data block. The batch processor ignores \$EOD until the argument string is encountered.

Example

```
$RENAME  
BEATLES.FAB  
PEPPER.SGT  
$PRINT PEPPER.SGT
```

```
$RENAME  
$DATA  
BEATLES.FAB  
PEPPER.SGT  
$PRINT PEPPER.SGT
```

The two examples are equivalent. They rename BEATLES.FAB to PEPPER.SGT and print PEPPER.SGT.

The data is input for the RENAME command. In the first example, the first line without the dollar sign (\$) is taken as data, because the previous command called for user input. In the second example, the DATA command identifies the following text as a data block for the RENAME command. In both examples, the next dollar sign (\$) encountered marks the end of the data block.

```
$RUN BILL.TSK  
$DATA/DOLLARS  
$1      George  
$2      Tom  
$3      Jim  
$5      Abe  
$10     Al  
$20     Andy  
$50     Ulysses  
$EOD
```

The task named BILL reads data with the dollar sign (\$) in the first position. The /DOLLARS qualifier allows this data to be passed to the task instead of being interpreted as batch commands. EOD is required to end the data block.

PREPARING A USER BATCH JOB

The /DOLLARS qualifier also allows you to create a batch command file within a batch job through the use of an argument string. The argument string (enclosed by double quotation marks) is used as a terminator for the data block. The batch processor continues to accept input data for the command (ignoring \$EOD) until the argument string is encountered.

The /DOLLARS qualifier without an argument string is equivalent to /DOLLARS:"\$EOD". Data will be terminated upon the first encounter of a \$EOD in your batch job.

The terminator that you use to end a data block will not appear in the log file.

```
$JOB
$!
$! This creates a batch command file
$! Within a batch job
$!
$PIP CAT.BAT=TI:
$DATA/DOLLARS:"PURR"
$JOB
$RUN MEOW.TSK
$DATA/DOLLARS
$3.00 TUNA
$2.98 LIVER
$1.58 CATNIP
$EOD
$EOJ
PURR
$EOJ
```

In this example PIP reads lines of data from TI: (the virtual terminal) and copies them to the file CAT.BAT. The batch processor does not terminate data until "PURR" is encountered. \$EOD and \$EOJ are included in the file CAT.BAT.

Notes

You do not need the DATA command unless you need to specify its qualifiers. Any line without the dollar sign (\$) in the first position will be interpreted as data if the preceding command called for user input. The batch processor continues to read data until it encounters the first dollar sign (\$).

Qualifiers for \$DATA affect only that particular data block, not subsequent data blocks. You can create a batch command file within a batch job through the use of an argument string to the /DOLLARS qualifier. If you use the /DOLLARS qualifier without an argument string, the batch processor will terminate data when it encounters the first \$EOD. If you do not specify the /DOLLARS qualifier, the first dollar sign (\$) encountered closes the data block.

The DATA command does not appear in the log file.

3.4.4 EOD

The EOD command marks the end of a data block.

Format

```
$EOD
```

PREPARING A USER BATCH JOB

Notes

The EOD command must be used if you have specified either DATA/DOLLARS or DATA/DOLLARS:"EOD".

3.4.5 STOP

The STOP command stops the batch job. It can be used alone or with the ON or the IF command.

Formats

```
$STOP
$ON statuscode THEN STOP
$IF statuscode THEN STOP
```

Notes

The STOP command without a qualifier is a batch-specific command. A STOP command followed by a qualifier or any other command line element will be passed to the current CLI.

If the batch processor reaches a STOP command, it considers the command equivalent to an EOJ command. You can have more than one STOP command in a batch job, when it is used with the GOTO, ON, or IF command.

If the QMG batch job includes another user batch job, the batch processor continues with the next user batch job.

You can stop a QMG job interactively with the DELETE/JOB or QUE/DEL command. See Section 2.3.

3.4.6 CONTINUE

The CONTINUE command is a no-operation. It can be used alone or with the ON or the IF command.

Formats

```
$CONTINUE
$ON WARNING THEN CONTINUE
```

Notes

For the most part, this command is used with the IF or the ON command. Its main use is to keep the batch processor from stopping the job when it encounters a status return code other than SUCCESS.

3.4.7 GOTO

The GOTO command directs the batch processor to skip directly to the line beginning with a specified label and continue processing from there. It can be used alone or with the ON or the IF command.

PREPARING A USER BATCH JOB

Format

```
$GOTO label  
.  
.  
.  
$label:[command]
```

Parameter

label

The label can be from one to six alphanumeric characters terminated by a colon (:).

The line with the referenced label must have the form:

```
$label:[command]
```

Examples

```
$GOTO NEWJOB
```

In this example, the batch processor goes to the line with the referenced label NEWJOB. Note that the label reference has no colon (:) at the end.

```
$NEWJOB:DEV
```

The batch processor skips to label NEWJOB and uses the MCR command DEV to display all the devices on the system.

```
$ON WARNING THEN GOTO HANDLE
```

If a task returns a WARNING or more severe error, the batch processor goes to the label HANDLE and proceeds.

Notes

Since batch processing allows backward referencing, your job may get caught in an infinite loop, hence the /TIME qualifier to the JOB command.

Note that when the label is referenced, no colon is included, but when the label begins a line, the colon is included.

Command lines that are skipped are displayed in the batch log.

3.4.8 ON

The ON command defines an exit status code and specifies the action to be taken by the batch processor when that code or a more severe code is returned by subsequent commands and tasks. The default setting is:

```
$ON WARNING THEN STOP
```

PREPARING A USER BATCH JOB

Format

```
$ON statuscode THEN { STOP  
                     { CONTINUE  
                     { GOTO label }
```

Parameter

statuscode

In order of increasing severity, the status codes are SUCCESS, WARNING, ERROR, and SEVEREERROR. If you choose ERROR, the batch processor will ignore all WARNINGS. If you choose SEVEREERROR, the batch processor will ignore both ERRORS and WARNINGS.

ON SUCCESS is not legal.

Note that SEVEREERROR is one word when used in this field. (Since batch-specific commands may be abbreviated, SEV will do.)

If no code is returned, the batch processor assumes SUCCESS.

Examples

```
$ON WARNING THEN STOP
```

This is the default setting. If you do not override it with some other ON command, then any WARNING or more severe status return code will stop the batch job.

```
$ON ERROR THEN GOTO NEXT
```

After it executes this command, the batch processor ignores all WARNINGS. When it receives an ERROR or SEVEREERROR code, it goes directly to the line labeled \$NEXT: and processes the command and all subsequent commands following the label.

Notes

Once the condition specified by the ON command is encountered, the ON command is canceled and the default setting, ON WARNING THEN STOP, is restored. You can reset the ON command at any point in the user batch job.

The conditions that produce a particular status code are determined individually by each system task.

The ON command remains set until superseded by another ON command, by the specified error condition, by a SET NO ON command (Section 3.4.9), or by the end of the user batch job. Compare with the IF command.

UFD [200,1] on the system disk contains tasks that do nothing but exit with status. You can copy these tasks and use them to test uses of the sequence control commands. They are: SUCCESS.TSK, WARNING.TSK, ERROR.TSK, and SEVERE.TSK.

PREPARING A USER BATCH JOB

3.4.9 SET

The SET command enables or disables the ON command setting.

Format

```
$SET [NO] ON
```

Parameters

SET NO ON

The SET NO ON command disables the ON command, including the default setting. The batch processor ignores status return codes (unless an IF command follows a particular command).

The space is optional. Either NO ON or NOON is acceptable.

SET ON

The SET ON command is reinstated. The batch processor returns to the ON setting in effect before the SET NO ON command was used.

Notes

SET [NO] ON can be used with a CLI command and has the same effect in batch jobs as in interactive mode.

Although the SET NO ON command disables ON, any error messages returned by commands or tasks will be included in the batch log.

The SET NO ON command has no effect on any IF command your job may include.

3.4.10 IF

The IF command checks for a given status code following execution of a given command in the batch job. The IF command then specifies the action to be taken by the batch processor when that code is returned by the preceding command.

Format

```
$IF statuscode THEN { STOP  
                     { CONTINUE  
                     { GOTO label }
```

Parameter

statuscode

The status codes are SUCCESS, WARNING, ERROR, and SEVEREERROR.

IF SUCCESS is not legal.

If no code is returned, the batch processor assumes SUCCESS.

PREPARING A USER BATCH JOB

Example

```
$JOB AONE[303,14]
$!
$! IF command example
$!
$RUN WONDER.TSK
$IF SEVEREERROR THEN GOTO BOMB
$IF ERR THEN GOT ALAS
$IF WARNING THEN GOTO OKAY
$GOTO REST ! SUCCESS ASSUMED
$BOMB:
$BRO TT10:SEVERE ERROR.RUN ENDS
$STOP
$ALAS:
$BRO TT10:ERROR.RUNNING OLD.TSK
$RUN OLD.TSK
$GOTO REST
$OKAY:
$BRO TT10:WARNING RECEIVED
$REST:EOJ
```

Notes

If the status code specified in any of the IF commands matches the task's exit status, the specified action is taken and any ON command in effect is ignored.

If the status codes in any of the IF commands do match the task's exit status, then the ON command (if enabled) takes effect.

3.4.11 Comments (!)

The exclamation point (!) is used to include comments in the batch log. It is the only comment character that should be used in user batch jobs.

The batch processor does not send text preceded by the exclamation point (!) to the CLI. Comments beginning with any other characters will be passed to the CLI and could cause problems with batch processing.

Formats

```
#!comment
#[label:]batch-specific command !comment
```

This field can include any character. The batch processor does not process anything that appears after the exclamation point (!).

Examples

```
!$BIG QUESTION?
```

The second dollar sign (\$) has no effect. The line beginning with the second dollar sign (\$) appears in the batch log.

```
$CONTINUE !A NO-OP COMMAND GETS A NO-EFFECT COMMENT.
```

Nothing happens. The line following the exclamation point (!) appears in the batch log.

Notes

The batch processor does not take out comments within or following CLI commands. Check the appropriate command language manual to use these types of comments.

3.5 INDIRECT COMMAND FILES

The at sign (@) invokes an indirect command file from within a batch job. When the command is executed, the indirect command file is accessed and the commands in it are executed.

Format

```
$@indirect[.CMD]
```

Examples

```
$@BACK
```

This command line finds the file named BACK.CMD on the default device and UFD and invokes it.

```
$@DB0: [20,20]BACKUP
```

This command line finds the file named BACKUP.CMD at the specified location and passes it to the indirect command file facility from the virtual terminal.

Notes

The at sign (@) command is both a DCL and an MCR command, but it may not be a valid command in some other CLI.

Note that the default file type for the SUBMIT command is not .BAT, but rather .CMD. You should not have .BAT and .CMD files with the same name or you may inadvertently submit an indirect command file as a batch file.

3.6 ALLOCATING DEVICES AND MOUNTING VOLUMES FROM BATCH JOBS

Normally, in interactive mode, you must allocate a device, physically load the device on a drive, and mount the volume before you can issue commands involving that volume.

This is not always convenient or possible if you want your batch job to run in your absence at a later time. First, you have no way of determining which drive will be available when it is time for your job to be run, and, second, you will need an operator to load the device and mount the volume when the drive does become available.

The ALLOCATE command has a keyword that handles the first problem, and the MOUNT command has a keyword that handles the second problem.

It is necessary to first include a generic ALLOCATE command in your batch job. The command format is as follows:

```
(DCL) $ALLOCATE [/TYPE:devtype] dd ddnn:
(MCR) $ALL dd=ddnn: [/TYPE:devtype]
```

PREPARING A USER BATCH JOB

The /TYPE keyword is necessary whenever a device name (dd) refers to more than one kind of device. For example, DB: can be an RP04 or an RP06 disk pack.

The ALLOCATE command allocates the first available drive and assigns the device the logical name (ddnn:) you specified.

The MOUNT command can then be used with the /WAIT keyword to notify the operator (by outputting a message to the console terminal) to load the volume with the specified label on a specified drive. After sending the message the MOUNT command stops itself. The operator then loads the device, and unstops the MOUNT command. When the MOUNT command has completed, the remaining commands in the batch job are executed, including a command to DISMOUNT the volume and DEALLOCATE the drive.

Examples

```
$JOB
$!
$! This batch job does a validity check on an RK07
$! disk pack labeled CHECKME.
$!
$ALLOCATE/TYPE:RK07 DM IN0:
$MOUNT/WAIT IN0: CHECKME
$RUN $VFY
INO:
$DISMOUNT IN0:
$DEALLO IN0:
$EOJ
```

In this example, you do not know the physical device name, so you give it a logical device name, IN0:.

If you intend to load the device yourself on a specific drive, you need only use the standard form of the ALLOCATE and MOUNT command as shown in the following example.

```
$JOB
$!
$! This batch job will get a full directory listing
$! of an RL01 disk that is already loaded and spun up.
$!
$SET TERMINAL MCR
$ALL DL1:
$MOU DL1:IMREADY
$PIP LPO:=DL1:[*,*]/FU
$DMO DL1:
$DEA DL1:
$EOJ
```

3.7 QUEUING BATCH JOBS

The SUBMIT (SUB) command is to QMG batch jobs, what the PRINT (PRI) command is to print jobs.

User batch jobs are queued by the SUBMIT command. As a result of being queued, one or more user batch jobs become a QMG batch job.

PREPARING A USER BATCH JOB

Formats

DCL> SUBMIT[/qualifier[s]] filespec[s][/filequalifier[s]]

MCR> SUB [queueName:] [jobName] [/jobswitch[s]]=filespec[s] [/fileswitch(es)]

DCL Command Qualifiers

/AFTER: (dd-mmm-yy hh:mm)
(mm/dd/yy hh:mm)

/[NO]HOLD

/NAME:jobName

/[NO]RESTART

/PRIORITY:n

/QUEUE:queueName

MCR Job Switches

/AF:hh:mm:dd-mmm-yy

/[NO]HO

jobName=

/[NO]RE

/PRIO:n

queueName:

DCL File Qualifiers

/[NO]DELETE

/[NO]TRANSFER

MCR File Switches

/[NO]DE

/[NO]TR

DCL Batch Logfile Qualifiers

/NAME:jobName

/[NO]LOGFILE

/[NO]PRINT

/PRINT:printQueue

MCR Batch Logfile Switches

SUB jobName=

/[NO]LO

/[NO]PRIN

/PRIN:printQueue

Parameter

filespec[s]

Specifies the file(s) containing the user batch job(s).

If you include multiple file specifications, separate them using commas. You can use wildcards (*) in the UFD, name, type, and version fields of the file specifications.

If the user batch job has no UIC after the JOB command, then anyone who has read access to the file can submit it.

If your file specification includes no file type, the default file type is .CMD. See Notes.

Command Qualifiers (Job Switches)

/AFTER: (dd-mmm-yy hh:mm)
(mm/dd/yy hh:mm)

/AF:hh:mm:dd-mmm-yy

Blocks the job until after the specified time. Depending on the batch queues at that time, your job may be run immediately or later when its turn comes up in the queue.

PREPARING A USER BATCH JOB

If your system CLI is DCL, the parentheses, hyphens (or slashes), colons, and the space between the calendar and clock fields are all necessary syntax. Note that a space is used only between the calendar and clock fields. The space is not used if either field is omitted.

You can specify the calendar field in either of two formats.

dd-mmm-yy Uses a one- or two-digit number for the day, the first three letters for the month, and two numbers for the year.

mm/dd/yy Uses a one- or two-digit number for the month, a one- or two-digit number for the day, and two numbers for the year.

If you leave out the calendar field, the day defaults to the current date.

If you leave out the clock field, the time defaults to 00:00:00.

If your system CLI is MCR, your job is time-blocked in its queue until after the stated time:

mmm Must contain the first three characters of the month.

yy Can be from 00 to 99

If you do not specify the /AF: switch, your job is dequeued until after other jobs in the queue are despoiled.

/[NO]HOLD

/[NO]HO

Specifies that the job be held in its queue. You can release the job with the RELEASE/JOB command.

/NAME:jobname
jobname=

Specifies a job name for the QMG batch job. The job name can be up to nine alphanumeric characters.

If you specify a job name, that name appears in the output from SHOW QUEUE (QUE /LI) commands. Otherwise, the file name of the first file specification submitted will be used as the job name.

If you have specified /NOPRINT (/NOPRIN) and a job name, then the permanent file copy of the batch log will have the job name as its file name and the type .LOG.

Note that individual jobs in the chain can label their portion of the log with the label field of the JOB command.

/[NO]RESTART

/[NO]RE

Indicates whether or not a job should be restarted from the beginning if it is interrupted for any reason.

The default is /NORESTART (/NORE). If a nonrestartable job is aborted, it is deleted from the queue.

/RESTART (/RE) means the job will begin again at the beginning if it is aborted.

PREPARING A USER BATCH JOB

`/PRIORITY:n`
`/PRIO:n`

Sets the queue priority of the batch chain. For nonprivileged users, `n` can be 1 through 150. Privileged users can set `n` 1 through 250. The default is 50. The Queue Manager runs the highest-priority job first. If two jobs have the same priority, the job that has been waiting longest runs first.

This qualifier (switch) has no effect on the running priority of any tasks run from your batch job. It only affects the job's position in the queue.

`/QUEUE:queuename`
`queuename:`

Specifies the name of the batch queue in which the job is to be placed.

The default is the BATCH queue.

File Qualifiers (File Switches)

`/[NO]DELETE`
`/[NO]DE`

Specifies whether you wish to delete the file or files containing user batch jobs after processing. The default is `/NODELETE`.

`/[NO]TRANSFER`
`/[NO]TR`

Specifies whether or not the system should make temporary copies of batch command files submitted from a volume mounted on a private (allocated) device. The default is `/TRANSFER (/TR)`. This permits you to dismount the volume and deallocate the device as soon as the prompt returns after the `SUBMIT` command.

If you specify `/NOTRANSFER (/NOTR)`, no copies will be made and you must keep the volume mounted and the device allocated until the batch processing is completed.

Batch Logfile Qualifiers (Switches)

`/NAME:jobname`
`jobname=`

Gives a name to the QMG batch job and the log file, if one is produced. This name will appear in the page heading of the log file. The name will also appear in the display from the `SHOW QUEUE (QUE /LI)` command. If you do not specify a name, the name of the first file in your QMG batch job will be used.

`/[NO]LOGFILE`
`/[NO]LO`

Suppresses the creation of a log file. The default is `/LOGFILE (/LO)`.

PREPARING A USER BATCH JOB

```
/PRINT[:printqueue]  
/PRIN[:printqueue]
```

Causes the log file to be queued to a line printer and deleted after it is printed. The temporary file is created in SP:[1,7].

Although the PRINT queue is normally used, you may spool the log file to any print queue by specifying an optional queue name. The default is /PRINT:PRINT (/PRIN).

```
/NOPRINT  
/NOPRIN
```

Causes a permanent copy of the log file to be created under your login UIC and default SY: device. The log file is not spooled to any queue. The log file name is the same as the QMG batch job name with the file type .LOG.

Examples

1. DCL>SUBMIT JANE.BAT
MCR>SUB JANE.BAT

The batch file JANE.BAT is spooled to the default batch queue BATCH. The name of the job is JANE. The log file JANE.LOG will be printed and then deleted.

2. DCL>SUBMIT/PRINT JANE.BAT
MCR>SUB /PRIN=JANE.BAT

The /PRINT qualifier (/PRIN) is the default. The command is equivalent to the previous one.

3. DCL>SUBMIT/NOPRINT JANE.BAT
MCR>SUB /NOPRIN=JANE.BAT

In this example, a permanent log file is created in your UFD. After the batch job completes, you may examine the log file JANE.LOG at your terminal or use the PRINT command to spool it to a line printer.

4. DCL>SUBMIT/NOLOGFILE JANE.BAT
MCR>SUB /NOLO=JANE.BAT

In this example, no log file is produced.

5. DCL>SUBMIT BABY.BAT,BOY.BAT,MAN.BAT,OLD.BAT
MCR>SUB BABY.BAT,BOY.BAT,MAN.BAT,OLD.BAT

The batch files in this example are processed in the order submitted, by the same batch processor, without interruption. Each file contains a user batch job. The four files are brought together by the SUBMIT command to form a QMG batch job. The name of the job is BABY and the name of the log file is BABY.LOG. The log file contains a record of each of the four user batch jobs.

PREPARING A USER BATCH JOB

```
6. DCL>SUBMIT/NAME:FRETS GUITAR.BAT,BANJO.BAT/DELETE,UKE.BAT
```

```
MCR>SUB FRETS=GUITAR.BAT,BANJO.BAT/DE,UKE.BAT/NODE
```

In this example, the name FRETS is given to the QMG batch job. The batch file BANJO.BAT is deleted after it is processed. Notice that in the MCR command line, it is necessary to use the switch /NODE on the last file. Without /NODE, UKE.BAT would be deleted with BANJO.BAT.

```
7. DCL>SUBMIT/QUEUE:BAT2/AFTER:(27-JUN-83) LATE.BAT
```

```
MCR>SUB BAT2:/AF:::27-JUN-83=LATE.BAT
```

In this example, the batch file LATE.BAT is submitted to the queue BAT2. It will not become eligible for processing until after midnight, June 27, 1983. Note that two extra colons are needed after the MCR switch /AF to take the place of the hours and minutes fields.

3.8 THE BATCH LOG

A QMG batch job creates a log file containing a record of activity on the virtual terminal. Unless you specify otherwise, the log file will be printed automatically on your system's line printer after batch processing is completed and then the log file is deleted.

The log file includes the commands in the batch chain and the time they were executed, the error messages received, any comments and, optionally, login messages and the data blocks for the job. The log also includes all system output that would normally appear on your terminal during an interactive session. Any spooled output or maps are also appended to the print job that contains the log file. This is called the log file print job.

If you specify the /NOLOG or /NOPRINT qualifier, there will be no log file print job, therefore, any output, listings or maps will be spooled as separate print jobs.

The batch log file is divided into three general fields of information.

1. The log file heading contains the following:

- Title "QMG Batch Job"
- QMG batch job name
- Version number of the batch processor
- Day, month, year, and time the batch job began
- Batch log page number
- Task name of the batch processor

PREPARING A USER BATCH JOB

2. The user job flag appears directly after the job command and displays:

- User job name
- Device name of the logged in virtual terminal
- UIC under which the batch job was logged in

This information is followed by system messages from a successful login.

3. The remaining portion of the log file documents the activity of the user batch job, which includes the following:

- Command lines and comments preceded by a time stamp
- Output from commands and tasks (normally written to your terminal)
- Data for commands and tasks
- Lines skipped by a GOTO statement
- EXIT STATUS MESSAGES

There are three line identifiers that appear in the space between the time stamps and the command lines in the log file. These identifiers are TERM, DATA, or SKIP.

TERM identifies the line as output from a task to the virtual terminal.

DATA identifies the line as input data to a task.

SKIP indicates that the line was skipped because of a GOTO command.

Periods that appear below an identifier indicate a continuation of that particular line identifier.

Your batch log file may also contain a message that indicates that the severity level in a previous ON command has been met or exceeded when a task exited. The message displays the exit status returned by the task.

Examples 3-1 through 3-4 show user batch jobs and the log files they produce.

Example 3-2 shows the output for the user batch job in Example 3-1. The UIC is not specified in the job but is displayed in the user job flag. The system messages, therefore, are not suppressed.

Note when data appears on the same line as a prompt, it causes the line to be labeled TERM rather than DATA.

Also, note that when the GOTO specified in the ON and IF commands is enabled, the lines that are skipped are labeled as SKIP.

PREPARING A USER BATCH JOB

Example 3-1 User Batch Job Orwell

```
$JOB ORWELL
$!
$! Generate and print calendars for year 1984
$!
$ON ERROR THEN GOTO TRYNEW
$RUN CALENDAR
1984
$EOD
$GOTO SPOOL
$TRYNEW: ON ERROR THEN GOTO NOFILE
$RUN NEWCAL
L
1984
$SPOOL:
$PRI BIGBRO:=1984.CAL/CO:10
$IF ERROR THEN GOTO DIFFQ
$STOP
$DIFFQ: PRI LP0:/HO=1984.CAL/CO:10
$STOP
$NOFILE:
$!
$! Couldn't create calendar file.
$EOJ
```

Example 3-2 Log File for User Batch Job Orwell

QMG Batch Job - CALENDAR BPR V02 15-JUL-81 11:03 Page 1
Processor BAPO

11:03:48 \$JOB ORWELL

```
=====
User Job - ORWELL            Terminal VT2:
                             UIC = [301,31]
=====
```

TERM

```
.            RSX-11M-PLUS V02 BL10    [2,54] System            CASTOR
.
.                                12-APR-84            B. Brother
.                                Tape drive MM1: will be down until tomorrow.
.
```

```
11:03:54            $!
11:03:54            $! Generate and print calendars for year 1984
11:03:54            $!
11:03:54            $ON ERROR THEN GOTO TRYNEW
11:03:54            $RUN CALENDAR
```

(continued on next page)

PREPARING A USER BATCH JOB

Example 3-2 Log File for User Batch Job Orwell (Cont.)

```

TERM
.   ** Calendar generator program - version 2.03 **
.
.   Enter year: 1984
.   Sorry, year must not exceed 1982

'ERROR' exit status returned - enabling action in "ON" command

SKIP  $EOD
.     $GOTO SPOOL
11:03:57 $TRYNEW: ON ERROR THEN GOTO NOFILE
11:03:57 $RUN NEWCAL

TERM
.   ** Calendar generator program - version 2.10 **
.
.   Enter 'S' for small format, 'L' for large format: L
.   Enter year: 1984
.
.   File 1984.CAL has been created

11:04:01 $SPOOL:
11:04:01 $PRI BIGBRO:=1984.CAL/CO:10
TERM    PRI -- Queue does not exist
11:04:03 $IF ERROR THEN GOTO DIFFQ
SKIP    $STOP
11:04:04 $DIFFQ: PRI LP0:/HO=1984.CAL/CO:10
TERM    PRI - Job 850, name "1984", submitted to queue "LP0"
11:04:08 $STOP
TERM    Connect time: 1      mins.
.       CPU time used: 4      secs.
.       Task total: 16

```

In Example 3-3, PIP requires input from the virtual terminal TI: to create the file GREET.FTN therefore, the program itself is identified as DATA. Example 3-4 shows the output file for the user batch job in Example 3-3.

Example 3-3 User Batch Job Friend

```

$JOB FRIEND [301/31]
$!
$! Program development example - CLI is MCR.
$!
$PIP GREET.FTN=TI:
PROGRAM GREET
LOGICAL NAME(15)
WRITE (5,90)
90  FORMAT (' What is your name, please?')
READ (5,91) NAME
91  FORMAT (15A1)
WRITE (5,92) NAME
92  FORMAT (' Hello there, ',15A1)
CALL EXIT
END
$FOR GREET=GREET
$TKB GREET=GREET, LB:[1,1]FOROTS/LB
$RUN GREET
Napolean B.
$PIP GREET.*;*/DE
$EOJ

```

PREPARING A USER BATCH JOB

Example 3-4 Log File for User Batch Job Friend

QMG Batch Job - EXAMPLE BPR V02 9-JUL-81 15:32 Page 1
 Processor BAP0

15:32:14 \$JOB FRIEND [301/31]

```
=====
User Job - FRIEND            Terminal VT2:
                             UIC = [301,31]
=====
```

```
TERM
.                    RSX-11M-PLUS V02 BL10    [2,54] System            CASTOR
15:32:18                    $!
15:32:18                    $! Program development example - CLI is MCR.
15:32:18                    $!
15:32:19                    $PIP GREET.FTN=TI:
DATA                    PROGRAM GREET
.                               LOGICAL NAME(15)
.                               WRITE (5,90)
.                    90                    FORMAT (' What is your name, please?')
.                               READ (5,91) NAME
.                    91                    FORMAT (15A1)
.                               WRITE (5,92) NAME
.                    92                    FORMAT (' Hello there, ',15A1)
.                               CALL EXIT
.                               END
15:32:24                    $FOR GREET=GREET
TERM                    GREET
15:32:29                    $TKB GREET=GREET,LB:[1,1]FOROTS/LB
15:33:18                    $RUN GREET
TERM                    What is your name, please?
DATA                    Napoleon B.
TERM                    Hello there, Napoleon B.
15:33:19                    $PIP GREET.*;*/DE
15:33:20                    $EOJ
TERM                    Connect time: 1            mins.
.                               CPU time used: 14        secs.
.                               Task total:    15
```

3.9 CARD READER INPUT SPOOLING

Card reader input spooling allows you to submit a card deck, containing a batch job, directly to a batch queue. You do not have to be logged on at a terminal to submit your batch job.

When a card reader is spooled, it is owned by the Card Reader Processor (CRP) and other tasks cannot access it. When you place a deck of cards in the hopper of a spooled card reader and press the RESET button on the reader, CRP reads the deck, copies the cards to a file, and requests the Queue Manager to create a job containing this file. While a batch job submitted from an interactive terminal may contain several files, each executing as a separate batch job, the entire deck of cards is read into a single file and this file is submitted as one batch job.

You may also submit a deck of cards to be printed. You can then check the listing for the accuracy of the card deck contents.

PREPARING A USER BATCH JOB

3.9.1 Card Deck Format

The format of a batch job card deck is similar to the format of a single batch command file on disk. However, for your card deck to be successfully read by the Card Reader Processor, you must include a few additional control cards. Your card deck should look like this:

1. \$SUBMIT or \$PRINT card
2. \$PASSWORD card
3. Cards to be submitted or printed:

\$JOB

.

.

.

\$EOJ

4. End-of-file card

The \$SUBMIT and \$PRINT cards have a format similar to the format of the DCL commands SUBMIT and PRINT. They identify the beginning of a card deck and determine whether the cards will be submitted for batch processing or printing. They are described in more detail in Sections 3.9.1 and 3.9.2.

The \$PASSWORD card is used to specify your password. This should be the same password that you use to login to an interactive terminal. It is used with username or user UIC information specified on the \$SUBMIT or \$PRINT card to identify and authorize you to enter batch jobs.

The next cards in the deck make up the actual batch job. These are copied to a file that is then submitted to a batch or print queue.

The end-of-file card is used to signal the end of your card deck. It consists of the punches 12-11-0-1-6-7-8-9 in column one. This card is not copied to the file.

Example 3-5 shows a user batch job that is to be submitted by the Card Reader Process.

Example 3-5 User Batch Job to be Submitted by CRP

```
$SUBMIT/QUEUE:BAT2/PRINT:LP1/USER:KENT KRYPTON
$PASSWORD CLARK
$JOB XRAY [20/20]
$RUN PLANET
$DATA
J. Olson
L. Lane
P. White
$EOD
$EOJ
end-of-file card
```


PREPARING A USER BATCH JOB

3.9.1.1 The \$SUBMIT Card - The \$SUBMIT card is formatted to look like a DCL SUBMIT command:

```
$SUBMIT[/qualifier[s]]/USER:userid [jobname]
```

Command Qualifiers

```
/AFTER:(dd-yyy-mm hh:mm)
```

```
/[NO]HOLD
```

```
/NAME:jobname
```

```
/[NO]HOLD
```

```
/[NO]SEQUENCE
```

```
/PRIORITY:n
```

```
/QUEUE:queue name
```

```
/[NO]RESTART
```

Batch Logfile Qualifiers

```
/[NO]LOG_FILE
```

```
/[NO]PRINT
```

```
/PRINT:printqueue
```

These qualifiers are the same as those you use when you enter the DCL SUBMIT command entered from a terminal. They are described in detail in Section 3.7. Exceptions follow.

/USER:userid

The /USER:userid qualifier must be specified. The userid argument may contain either your last name or your UIC of the form [g,m].

/NAME:jobname

The batch job name may be specified with either the /NAME qualifier or the optional jobname parameter at the end of the command line. You may not specify both. If you do not specify a job name, it will default to the name INPBATCH (unless your system manager has set up a different default job name). The QMG job UIC will be the same as your login UIC.

/[NO]SEQUENCE

If /SEQUENCE is specified, columns 73 through 80 of each card will be interpreted as a sequence field. A sequence field may consist of any eight alphanumeric characters. In a sequenced card deck, the sequence fields should be ascending from one card to the next, although not necessarily by any fixed amount. (MYJOB335, MYJOB336, MYJOB447 is a valid sequence, for example.) A sequence field consisting of all blanks is allowed anywhere in the deck, however. No sequence fields may appear on control cards.

PREPARING A USER BATCH JOB

CRP checks the sequence fields to ensure that the deck of cards has not been shuffled. The sequence field is not copied to the batch file. If /NOSEQUENCE is specified, however, columns 73 through 80 are considered part of the batch command file. Therefore, if your deck contains sequence fields, the /SEQUENCE qualifier must be specified so that the sequence fields are deleted before the batch commands are copied to the batch file. The default is /NOSEQUENCE.

3.9.1.2 The \$PRINT Card - The \$PRINT card is formatted to look like a DCL PRINT command:

```
$PRINT[/qualifier[s]]/USER:userid [jobname]
```

The descriptions for the /NAME:jobname and /USER:userid qualifiers for the \$SUBMIT card apply here as well. All of the other qualifiers are the same as those used for the DCL PRINT command.

Command Qualifiers

```
/AFTER:(dd-mmm-yy hh:mm)
```

```
/COPIES:n
```

```
/DEVICE:queuname
```

```
/[NO]FLAG PAGE
```

```
/FORMS:n
```

```
/[NO]HOLD
```

```
/[NO]JOB_PAGE
```

```
/LENGTH:n
```

```
/LOWERCASE
```

```
/NAME:jobname
```

```
/PAGE_COUNT:n
```

```
/PRIORITY:n
```

```
/QUEUE:queue
```

```
/[NO]RESTART
```

```
/UPPERCASE
```

```
/USER:userid
```

```
/COPIES:n
```

The /COPIES qualifier controls how many file copies are printed. You cannot have more than one job copy printed, as with the DCL PRINT command.

PREPARING A USER BATCH JOB

3.9.1.3 The \$PASSWORD Card - The \$PASSWORD card has strict syntax. PASSWORD may not be abbreviated and exactly one space must appear before the password field:

```
$PASSWORD password
```

3.9.2 Card Reader Processor Operation

When the Card Reader Processor (CRP) is initialized, a default batch queue and a default print queue are selected for \$SUBMIT and \$PRINT, respectively. These may be different from the queues BATCH and PRINT, or they may be the same. These defaults can be overridden by the /QUEUE qualifier.

Each spooled card reader has a terminal that is used for displaying messages about the state of the card reader and the status of jobs read. This terminal may be the same as the console terminal COO:, or it may be some other terminal.

After you have punched your deck of cards, place them in the hopper of the card reader and press the button marked RESET. If there are already cards in the hopper being read, there is no need to wait until the hopper is empty; simply press the button marked STOP, place your cards on top of those in the hopper, and press RESET. It is a good idea to place an end-of-file card before your deck of cards as well as at the end of them. This ensures that your deck will not be read as part of the preceding job, if the last user forgot to put an end-of-file card at the end of his deck.

If the hopper runs out of cards before CRP has encountered an end-of-file card, the Card Reader Processor will wait until more cards are put in the hopper and the RESET button is pressed again. This allows the Card Reader Processor to read a deck of cards that is too big to fit in the hopper at one time.

The following are common errors that CRP may detect while reading a deck of cards:

- Syntax error in a \$SUBMIT, \$PRINT, or \$PASSWORD card
- Missing \$PASSWORD card
- Invalid user account information
- Card out of sequence when /SEQUENCE is specified

If one of these errors occurs, CRP sends an error message to the terminal and continues reading cards until an end-of-file card is encountered. In this situation, however, the cards are not copied to a disk file; CRP is simply searching for the end of your card deck. This is referred to as flushing. Once a job has been flushed, it is as if the job had not been read at all. If an end-of-file card is encountered before the hopper empties, CRP starts reading and processing the next group of cards as a new job.

When any of these errors occur, you can remove your card deck from the card reader stacker, correct the problem, and put the cards back in the hopper.

PREPARING A USER BATCH JOB

If CRP detects a card out of sequence, you can replace the \$SUBMIT card with a \$PRINT card, print the card deck then inspect the sequence numbers and determine to what extent the cards are shuffled.

You may want to refer to the RSX-11M/M-PLUS I/O Drivers Reference Manual for more detailed information about how the card reader device works. Especially useful is the table of ASCII characters and their representation in two different card codes, DEC029 and DEC026. Some characters may not appear on the keyboard of your keypunch. For these, you will need to look up the character in the table and use multipunches (more than one keystroke in one column) to represent the desired ASCII character.

CHAPTER 4
AT-A-GLANCE GUIDE

This chapter consists of summaries of command information from the previous chapters. These summaries do not include full information on the commands, but just enough to remind you of how the commands work.

The commands covered in this chapter are listed below:

PRINT (PRI)
BATCH-SPECIFIC Commands (RSX-11M-PLUS)
SUBMIT (SUB) (RSX-11M-PLUS)
SHOW QUEUE (QUE /LI)
SHOW PROCESSOR (QUE /LI:DEV)
SET QUEUE (QUE /MOD)
HOLD (QUE /HO) and RELEASE (QUE /REL)
DELETE (QUE /DEL)

4.1 PRINT (PRI) COMMAND

PRINT queues files for printing on a line printer. It may also be used to queue jobs for other output devices.

Format

```
DCL>PRINT/commandqualifier[s] file[s]/filequalifier[s]
MCR>PRI [queuename:][jobname][/]jobswitch[=]file[s][/]fileswitch[s]]
```

| DCL Command Qualifiers | MCR Job Switches |
|------------------------|------------------|
| /JOBCOUNT:n | /CO:n |
| /QUEUE:queuename | queuename: |
| /UPPERCASE | /NOLO |
| /LOWERCASE | /LO |
| /[NO]HOLD | /[NO]HO |
| /PAGE_COUNT:n | /PA:n |

AT-A-GLANCE GUIDE

| | |
|-----------------------------------|-----------------------------|
| /NAME:jobname | jobname= |
| /PRIORITY:n | /PRIO:n |
| /FORMS:n | /FO:n |
| /LENGTH:n | /LE:n |
| /[NO]RESTART | /[NO]RES |
| /[NO]FLAG_PAGE | /[NO]FL |
| /AFTER:(dd-mmm-yy hh:mm) | /AF:hh:mm:dd-mmm-yy |
| /DEVICE:ddnn: | queuenam: |
| /NOJOBPAGE | /NOJO |
| DCL File Qualifiers | MCR File Switches |
| /[NO]DELETE | /[NO]DEL |
| /COPIES:n | /CO:n |
| /[NO]TRANSFER (RSX-11M-PLUS Only) | /[NO]TR (RSX-11M-PLUS Only) |

Notes

DCL file qualifiers override settings of command qualifiers.

The default file type for PRINT is .LST.

If you want your job restarted, you must use the /RESTART (/RES) qualifier.

For /AFTER: (/AF:), omit the calendar field to default to today's date.

4.2 BATCH-SPECIFIC COMMAND SUMMARY (RSX-11M-PLUS)

4.2.1 Opening and Closing Batch Jobs

JOB

JOB marks the beginning of the batch job and must appear first in the file.

```
$JOB [/TIME:(hh:mm)] [loglabel] [[uic]]
```

No password is required or accepted.

The loglabel field of JOB affects only the batch log.

The /TIME:(hh:mm) qualifier limits the job to hours (hh) and minutes (mm) of CPU time.

AT-A-GLANCE GUIDE

EOJ

EOJ marks the logical end of a batch job.

```
$EOJ
```

4.2.2 Data in Batch Jobs

DATA

DATA marks the beginning of a data block included in the batch job. The data block includes any required user input, other than DCL, MCR, or user-written CLI commands, for the batch job.

```
$DATA [qualifier[s]]
```

You do not need DATA unless you need its qualifiers. (Any line without a dollar sign (\$) in the first position will be interpreted as data.)

```
/DOLLARS["string"]  
/NOCOPY
```

The argument string for the /DOLLARS qualifier allows the creation of a batch command file within a batch job. /DOLLARS without an argument string is equivalent to /DOLLARS="\$EOD".

The /NOCOPY qualifier prevents reprinting of the data blocks in the logfile. The default is /COPY.

EOD

EOD marks the end of a data block. If you use /DOLLARS with DATA, the data block will be closed by default upon encountering an EOD. If you used an argument string with /DOLLARS, EOD is negated.

4.2.3 Sequence Control Commands

These commands respond to the exit-with-status codes from tasks. Status can be SUCCESS, WARNING, ERROR, or SEVEREERROR. You cannot respond to SUCCESS.

STOP

STOP stops the batch job. It can be used alone or with ON or IF.

```
$STOP
```

```
$ON status-code THEN STOP
```

```
$IF status-code THEN STOP
```

AT-A-GLANCE GUIDE

STOP without a qualifier is a batch-specific command.

STOP followed by any command line element, will be passed to the current CLI.

CONTINUE

CONTINUE is a no-operation. It can be used alone or with ON or IF.

```
$CONTINUE
```

```
$ON status-code THEN CONTINUE
```

```
$IF status-code THEN CONTINUE
```

GOTO

GOTO directs the batch processor to skip directly to a line with a specified label and continue processing from there. It can be used alone or with ON or IF.

```
$GOTO label
```

The label can be any six alphanumeric characters. There is no colon on the GOTO line.

```
$label:[command]
```

The label must be terminated by a colon (:).

GOTO may reference forwards or backwards.

ON

ON checks throughout the job for the return of a status code. If that code or a more severe code is returned, ON specifies an action.

```
$ON status code THEN { STOP  
                      CONTINUE  
                      GOTO label }
```

ON WARNING THEN STOP is the default setting. If you do not override it, any WARNING will stop the batch job.

You cannot check for a return of SUCCESS.

AT-A-GLANCE GUIDE

SET

SET with special batch parameters is used to override ON (or the default) or to reinstate it.

```
$SET NO ON or $SET NOON
```

```
$SET ON
```

SET NO ON has no effect on any IF your job may include.

IF

IF checks for a status code following execution of a given command in the batch job.

```
                STOP
$IF status-code THEN CONTINUE
                GOTO label
```

IF will override a previous ON command if the status code returned matches the severity specified in the IF.

You cannot check for a return of SUCCESS.

4.3 SUBMIT (SUB) COMMAND (RSX-11M-PLUS)

SUBMIT queues files for processing by a batch processor.

Format

```
DCL>SUBMIT[/qualifier[s]] filespec[s] [/filequalifier[s]]
```

```
MCR>SUB [queueName:][jobName] [/jobswitch[s]]=filespec[s] [/fileswitch[s]]
```

DCL Command Qualifiers

```
/AFTER:(mm/dd/yy hh:mm)
        (dd-mmm-yy hh:mm)
```

```
/[NO]HOLD
```

```
/NAME:jobName
```

```
/[NO]RESTART
```

```
/PRIORITY:n
```

```
/QUEUE:queueName
```

DCL File Qualifiers

```
/[NO]DELETE
```

```
/[NO]TRANSFER
```

MCR Job Switches

```
/AF:hh:mm:dd-mmm-yy
```

```
/[NO]HO
```

```
jobName=
```

```
/[NO]RE
```

```
/PRIO:n
```

```
queueName:
```

MCR File Switches

```
/[NO]DEL
```

```
/[NO]TR
```

AT-A-GLANCE GUIDE

| DCL Batch Logfile Qualifiers | MCR Batch Logfile Switches |
|------------------------------|----------------------------|
| /NAME:jobname | jobname= |
| /[NO]LOGFILE | /[NO]LO |
| /[NO]PRINT | /[NO]PRIN |
| /PRINT:printqueue | /PRIN:printqueue |

Notes

The default file type for SUBMIT is .CMD.

If you want your job restarted, you must use the /RESTART (/RE) qualifier.

For /AFTER: (/AF:), omit the calendar field to default to today's date and time.

4.4 SHOW QUEUE (QUE/LI) COMMAND

SHOW QUEUE (QUE /LI) displays information about QMG print jobs and (in the case of RSX-11M-PLUS systems) batch jobs.

Format

| | |
|--|---------------------------|
| DCL>SHOW QUEUE [queuename]/qualifier[s] | |
| MCR>QUE [queuename:][[uic]][jobname]/switch[s] | |
| DCL Qualifiers | MCR Switches |
| /FULL | /FU |
| /FILES | /LI |
| /BRIEF | /BR |
| /DEVICE | /LI:P |
| /ENTRY:nnn | /EN:nnn |
| /FORMS[:n] | /FO[:n] |
| /NAME:jobname | jobname |
| /OWNER_UIC:uic | [uic] |
| /PRINT | /LI:P |
| /BATCH (RSX-11M-PLUS Only) | /LI:B (RSX-11M-PLUS only) |

Notes

There are no prompts from this command.

AT-A-GLANCE GUIDE

4.5 SHOW PROCESSOR (QUE /LI:DEV) COMMAND

SHOW PROCESSOR (QUE /LI:DEV) displays information about the initialized characteristics of batch processors (RSX-11M-PLUS systems), printers, and other devices under control of the Queue Manager.

Format

```
DCL>SHOW PROCESSOR/qualifier
```

```
MCR>QUE [processorname:]/switch
```

DCL Qualifiers

```
processorname[:]
```

```
/BATCH
```

```
/PRINT or /DEVICE
```

```
/INPUT or /CARD_READER
```

MCR Switches

```
/LI:DEV
```

```
/LI:DEV:B
```

```
/LI:DEV:P
```

```
/LI:DEV:I
```

4.6 SET QUEUE (QUE /MOD) COMMAND

SET QUEUE (QUE /MOD) modifies attributes given to either print jobs, batch jobs, or files that compose jobs in queues. Such jobs and files have been entered in queues by either the PRINT command or (on RSX-11M-PLUS systems) SUBMIT command.

Job Format

```
DCL>SET QUEUE queuename:jobname/qualifier[/qualifier[s]]
```

```
DCL>SET QUEUE /ENTRY:nnn/qualifier[/qualifier[s]]
```

```
MCR>QUE queuename:jobname/MOD/switch[/switch[s]]
```

```
MCR>QUE /EN:nnn/MOD/switch/[switch[s]]
```

DCL Qualifiers

```
/AFTER:(hh:mm dd-mmm-yy)
```

```
/JOBCOUNT:n
```

```
/FORMS:n
```

```
/LENGTH:n
```

```
/LOWERCASE
```

```
/PAGE_COUNT:n
```

```
/PRIORITY:n
```

```
/[NO]RESTART
```

```
/UPPERCASE
```

MCR Switches

```
/AF:hh:mm:dd-mmm-yy
```

```
/CO:n
```

```
/FO:n
```

```
/LE:N
```

```
/LO
```

```
/PA:n
```

```
/PRIO:n
```

```
/[NO]RE
```

```
/NOLO
```

AT-A-GLANCE GUIDE

File Format

```
DCL>SET QUEUE/ENTRY:nnn/FILE_POSITION:n/qualifier[/qualifier[s]]
DCL>SET QUEUE queuename jobname/FILE_POSITION:n/qualifier[/qualifier[s]]
```

```
MCR>QUE /EN:nnn/MOD/FI:n/switch[/switch[s]]
MCR>QUE queuename:jobname/MOD/FI:n/switch[/switch[s]]
```

| DCL Qualifiers | MCR Switches |
|----------------|--------------|
| /COPIES:n | /CO:n |
| /[NO]DELETE | /[NO]DEL |

Notes

When you issue the PRINT or SUBMIT command, you specify "attributes" of the QMG job. SET QUEUE changes the matching attribute. You cannot change the attributes of an active job.

You can change some attributes of files that make up a QMG print job by specifying the FILE_POSITION:n (FI:n) qualifier in the SET QUEUE command line.

4.7 HOLD (QUE /HO) AND RELEASE (QUE /REL) COMMANDS

You can specify that a job be held when you issue your PRINT or SUBMIT command. You can also hold jobs with the HOLD command and release such jobs with the RELEASE command.

4.7.1 HOLD (QUE /HO)

HOLD (QUE /HO) blocks a job in its queue until it is explicitly released.

Format

```
DCL>HOLD/JOB queuename jobname
```

```
DCL>HOLD/ENTRY:nnn
```

```
MCR>QUE queuename:jobname/HO
```

```
MCR>QUE /EN:nnn/HO
```

AT-A-GLANCE GUIDE

4.7.2 RELEASE (QUE /RE)

RELEASE (QUE /RE) unblocks a job that has been held in queue.

Format

```
DCL>RELEASE/JOB queueName jobName
```

```
DCL>RELEASE/ENTRY:nnn
```

```
MCR>QUE queueName:jobName/REL
```

```
MCR>QUE /EN:nnn/REL
```

4.8 DELETE (QUE /DEL) COMMAND

DELETE deletes queues or QMG jobs by name or by the job's unique entry number.

Format

```
DCL>DELETE/JOB queueName jobName[FILE_POSITION:n]
```

```
DCL>DELETE/ENTRY:nnn[/FILE_POSITION:n]
```

```
MCR>QUE queueName:jobName/FI:n/DEL
```

```
MCR>QUE /EN:nnn/FI:n/DEL
```

Notes

Use these commands to delete a job in a queue by specifying either the job's entry number or job name. You can also delete a single file in a job by specifying the /FILE_POSITION:n (/FI:n) qualifier.

Nonprivileged users can delete only their own jobs; privileged users can delete any job.

There can be more than one job in a queue with the same name. The DELETE command will delete the first job of a given name in the queue. You can distinguish between jobs with the same name by using the unique entry number instead.

APPENDIX A
ERROR MESSAGES

A.1 BATCH PROCESSING ERROR MESSAGES

Commands in batch jobs can send error messages that appear in your batch log.

In addition, the batch processors themselves can send error messages concerning your batch jobs. Some of these messages result from system problems and are returned to the operator's console. Others reflect difficulties in processing your batch job and are returned to your batch log.

A.1.1 Error Messages in Batch Logs

BPR -- Batch file already open

Explanation: QMG or BPR attempted to open the specified file when it was already open.

User Action: System problem. See your operator or system manager.

BPR -- Batch file close failure

Explanation: BPR failed to close the specified file.

User Action: The batch job should not be affected. Check the UFD to see if the file is locked. If so, issue the DCL UNLOCK command or the MCR PIP/UN command.

BPR -- Batch file deletion failure

Explanation: The /DELETE qualifier to the SUBMIT command failed to execute.

User Action: Check the directory. The file may not be in the directory, or the batch job lacked delete access to the file. Delete the file with the DCL DELETE command.

BPR -- CPU time limit exceeded, user job terminated

Explanation: The batch job ran longer than the /TIME qualifier to the JOB command permitted.

User Action: Retry the batch job and increase the amount of (pu time using the /TIME qualifier.

ERROR MESSAGES

BPR -- I/O error

Explanation: The batch processor failed to read from or write to the virtual terminal, or the batch processor was unable to open the batch file.

User Action: Retry the batch job. This may indicate a system error. See your operator or system manager.

BPR -- Virtual terminal I/O was aborted

Explanation: The task sending I/O to the virtual terminal was aborted.

User Action: None.

BPR -- Label label undefined

Explanation: The batch job specified a label that was not in the job.

User Action: Check the job to see that the label is present in proper form. The label must begin with a dollar sign (\$) and end with a colon (:).

BPR -- Log file directory not found - aborted batch job

Explanation: The SUBMIT command included the /NOPRINT qualifier, but the batch job cannot find the directory for the batch log.

User Action: See your system manager.

BPR -- Logon privilege violation

Explanation: The \$JOB command gave an incorrect UIC.

User Action: Check the command for proper syntax and retry the job. For nonprivileged users, the UIC in \$JOB must match the login UIC in effect when the SUBMIT command was entered.

BPR -- Output request from incorrect virtual terminal

Explanation: System error.

User Action: See your operator or system manager.

BPR -- Spawn failure

Explanation: System error.

User Action: See your operator or system manager.

BPR -- Specified maximum CPU time too large

Explanation: The largest amount of CPU time that may be specified is 65535. minutes (1092 hours, 15. minutes)

User Action: Specify less CPU time.

ERROR MESSAGES

BPR -- Syntax error

Explanation: A command line in the batch job does not start with a dollar sign (\$), or special batch commands (Table 2-1) have improper syntax.

User Action: Check the batch file for proper syntax and retry the job.

BPR -- Syntax error -- \$JOB does not appear first

Explanation: \$JOB logs in the user batch job on the virtual terminal and must appear first in the batch file.

User Action: Edit the batch file so that \$JOB appears first.

BPR -- Virtual terminal output too long for buffer

Explanation: A stream of characters from the virtual terminal was too long to fit in a storage buffer.

User Action: Make sure that the task outputs RETURN and LINE-FEED characters when performing terminal I/O.

A.1.2 Error Messages to the Operator's Console

BPR -- Batch file input error

Explanation: BPR could not read from the batch file.

User Action: Check the batch file status. The file may not be in the directory.

BPR -- Batch job jobname still in progress

Explanation: System error. QMG attempted to start the batch job while another job was in progress.

User Action: Inform the system manager.

BPR -- Error during send to QMG

Explanation: System error.

User Action: Inform the system manager.

BPR -- Illegal error - severity code n

Explanation: System error.

User Action: Inform the system manager. An SPR should be submitted including the console output and any other relevant information. If possible, reproduce the error.

ERROR MESSAGES

BPR -- Incorrect Emit Status Block (ESB) address returned by spawned task

Explanation: System error.

User Action: Inform the system manager.

BPR -- Log file close failure

Explanation: BPR failed to close the log file.

User Action: Check the log file status. The device may not be available or the file may not be in the directory.

BPR -- Log file open error

Explanation: BPR failed to open the log file.

User Action: Check the log file destination. The device may be write-locked.

BPR -- Log file output error

Explanation: BPR failed to write to the log file.

User Action: Check the log file status. The device may not be available or the file may not be in the directory.

BPR -- Output request from incorrect virtual terminal

Explanation: System error.

User Action: Inform the system manager.

BPR -- Unable to create virtual terminal

Explanation: The system does not support virtual terminals.

User Action: A new system generation is required.

A.1.3 Error Messages from the Card Reader Processor

The User Action suggested for these errors is directed to both privileged and nonprivileged users. In most cases where the suggestion to see your operator or system manager is included, the condition can only be corrected by a privileged user.

CRn -- Reader spooled

Explanation: The card reader has been initialized and is ready to read cards.

User Action: None.

ERROR MESSAGES

CRn -- Reader unspooled

Explanation: The card reader processor has been removed. Jobs can no longer be read.

User Action: None.

CRn -- Job (jobname) was entered in queue (queue name)

Explanation: A job has been successfully read and entered in a queue.

User Action: None.

CRn -- Illegal \$SUBMIT or \$PRINT card - job flushing
Invalid card was " ".

Explanation: A syntax error was encountered.

User Action: Repunch the control card and resubmit your card deck.

CRn -- \$PASSWORD card illegal or missing - job (jobname) flushing

Explanation: A syntax error was encountered.

User Action: Repunch the control card and resubmit your card deck.

CRn -- Invalid account was given - job (jobname) flushing

Explanation: The account information taken from the /USER:userid qualifier and the \$PASSWORD card do not match any entries in the account file.

User Action: Inspect your control cards and see if your password or userid was misspelled.

CRn -- Sequence number check - job (jobname) flushing
Invalid card was " ".

Explanation: The CRP read a card whose sequence number in columns 72 through 80 was not larger than the sequence number of the previous card.

User Action: Replace the \$SUBMIT card with a \$PRINT card to get a listing of your card deck. Determine where your cards got out of sequence.

CRn -- Job (jobname) flushing due to operator request

Explanation: An operator issued a command that aborted your job while it was being read.

User Action: See your operator or system manager.

ERROR MESSAGES

CRn -- Queue (queuename) does not exist - job (jobname) flushing

Explanation: The queue specified for your job (either by default or explicitly with the /QUEUE:queuename qualifier) does not exist.

User Action: Repunch the \$SUBMIT or \$PRINT card to specify an existing queue.

CRn -- Queue (queuename) marked for delete - job (jobname) flushing

Explanation: The queue specified for your job is marked for deletion and no new jobs may be entered into it.

User Action: See your operator or system manager.

CRn -- No queue file space available - job (jobname) flushing

Explanation: The queue file QUEUE.SYS is full and no more jobs can be entered in any queues.

User Action: Wait until the queue file has emptied or been reinitialized. Resubmit your card deck.

CRn -- Card reader not ready

Explanation: Usually, this message means that the hopper was emptied while a job was being read. This message may also be given if a pick check, read check, or stack check occurred.

User Action: Check the card reader. Put more cards in the hopper and push the RESET button to start reading again.

CRn -- Illegal error message number = nn - parameter address = nnnnnn

Explanation: System error.

User Action: See your operator or system manager.

CRn -- Account file open error

Explanation: System error. The account file could not be opened.

User Action: See your operator or system manager.

CRn -- Account file close error

Explanation: System error. The account file could not be closed.

User Action: See your operator or system manager.

CRn -- Account record locked

Explanation: System error. A record in the account file could not be read.

User Action: See your operator or system manager.

ERROR MESSAGES

CRn -- Couldn't find physical LB

Explanation: System error.

User Action: See your operator or system manager.

CRn -- Account file read error nn

Explanation: System error. An error occurred in reading the account file.

User Action: See your operator or system manager.

CRn -- Card reader read error nn

Explanation: An error occurred in reading a card.

User Action: See your operator or system manager.

CRn -- Output file write error nn

Explanation: System error. An error occurred in copying the contents of a card to the card image file.

User Action: See your operator or system manager.

Crn -- Output file open error nn

Explanation: The card image file could not be opened.

User Action: See your operator or system manager.

CRn -- Output file close error nn

Explanation: The card image file could not be closed.

User Action: See your operator or system manager.

CRn -- Error code nn returned by QMG - function code of packet sent = nnn

Explanation: System error.

User Action: See your operator or system manager.

CRn -- Send directive failed - DSW=nn

Explanation: System error.

User Action: See your operator or system manager.

CRn -- Exiting due to fatal error

Explanation: An unrecoverable error condition occurred, causing CRP to exit immediately.

User Action: See your operator or system manager.

ERROR MESSAGES

A.2 OUTPUT DESPOOLER ERROR MESSAGES

All of these messages indicate a FATAL exit status for the job. These error messages from the output despooler task appear on the operator's console and in the listing on the output device. When these errors occur, the despooler task prints the job flag pages first and then the error messages on the first page of the listing.

The messages are preceded by the name of the output despooler (desp, in the following list), This name is derived from the name of the output device owned by the despooler, such as, LP0: and TT2:.

I/O error code numbers are explained in the IAS/RSX-11 I/O Operators Reference Manual.

desp -- Attempt to space nn pages beyond eof on- filespec

Explanation: A privileged user's START/PROCESSOR command attempted to start beyond the end of the specified file.

User Action: Correct the command and retry.

desp -- I/O Error nn on file- filespec

Explanation: The task encountered an I/O error nn, which is the I/O error code number. These codes are explained in the IAS/RSX-11 I/O Operations Reference Manual.

User Action: Look up the error and take corrective action.

desp -- Job limit of nn pages exceeded on file- filespec

Explanation: The PRINT command included the /PAGES:nn qualifier. The job exceeded this limit.

User Action: Shorten the file or issue the PRINT command with a higher limit.

desp -- Open error nn on file- filespec

Explanation: The task could not open the file named in the error message for output. The value nn is the I/O error code number. These codes are explained in the IAS/RSX-11 I/O Operations Reference Manual.

User Action: Check the directory listing for the state of the file. Look up the error.

desp -- Print error nn on file- filespec

Explanation: The task could not print the file named in the error message. The value nn is the I/O error code number. These codes are explained in the IAS/RSX-11 I/O Operations Reference Manual.

User Action: Check the directory listing for the state of the file. Look up the error.

ERROR MESSAGES

A.3 DCL AND MCR ERROR MESSAGES FROM QUEUE MANAGER COMMANDS

These error messages appear on your terminal as you issue DCL or MCR commands.

The error message is preceded by the first three letters of the erroneous command. For instance, the message

```
-- JOB DOES NOT EXIST
```

might result from several commands, including HOLD or DELETE. Thus, you might see either of the following error messages:

```
HOL -- JOB DOES NOT EXIST
```

```
DEL -- JOB DOES NOT EXIST
```

If your CLI is MCR, the error message is also preceded by the first three letters of the command.

```
QUE -- JOB DOES NOT EXIST
```

The messages are listed in alphabetical order.

The User Action suggested for these errors is directed to both privileged and nonprivileged users. In most cases where the suggestion to see your operator or system manager is included, the condition can only be corrected by a privileged user.

com -- Bad queue name

Explanation: The queue name included illegal or too many characters.

User Action: Try a new queue name. Limit: six Radix-50 characters.

com -- QMG not active

Explanation: The Queue Manager task is not active. It may be stopped, aborted, not running, not installed, or the like.

User Action: Wait and retry the command. If QMG does not return, see your operator or system manager.

com -- Processor does not exist

Explanation: A command named a device that is not set spooled.

User Action: Retry the command with the proper device name.

com -- Directive failure

Explanation: System error.

User Action: See your operator or system manager.

ERROR MESSAGES

com -- Illegal argument value

Explanation: A command specified an illegal argument for a qualifier (switch).

User Action: Check for proper value range and retype the command.

com -- Bad processor name

Explanation: The processor name includes invalid or too many characters.

User Action: Retry the command with the proper processor name. Names are limited to six Radix-50 characters. Print processors must be named after the device the control, such as, LP2: controlled by LP2. Batch processors must have names in the form BAPn. Applications processors can have any legal name.

com -- I/O Error

Explanation: System error.

User Action: Try again. See your operator or system manager, if the error persists.

com -- Job does not exist

Explanation: A command named a job that does not exist in the form the command recognized or under the name the command recognized. The job name includes UIC.

User Action: Issue SHOW QUEUE (QUE/LI). Determine the name and status of the job. Check for the proper command syntax and retype the command.

com -- Operation inconsistent with job state

Explanation: A command attempted action inconsistent with the job state.

User Action: Issue SHOW QUEUE (QUE/LI). Determine the status of the job. Check for the proper syntax and retype the command.

com -- Queue does not exist

Explanation: A command named a queue that does not exist in the current system.

User Action: Issue SHOW QUEUE (QUE/LI). Retry the command with the name of an existing queue. See your operator or system manager.

ERROR MESSAGES

com -- Queue file full

Explanation: The queue file [1,7]QUEUE.SYS on LB for RSX-11M or SP for RSX-11M-PLUS is full.

User Action: Wait and try again. If the error message persists, see your operator or system manager.

com -- Queue marked for delete

Explanation: New jobs cannot be added to a queue marked for delete.

User Action: Send the job to another queue.

com -- Redundant operation

Explanation: A command requested an operation that has been done.

User Action: None.

GLOSSARY

This glossary contains brief definitions of terms used in the RSX-11M/M-PLUS Batch and Queue Operations Manual.

ACTIVE JOB

An active job is a job currently being processed.

APPLICATIONS PROCESSOR

An output despooler written by the user for a special purpose or specific job. See your system manager for information on any applications processors in your installation. Applications processors are treated like print processors in most cases.

BATCH COMMAND (RSX-11M-PLUS only)

A batch command is a CLI command in a batch job. All batch commands must be preceded by a dollar sign (\$) in the first position of the command line. Compare with batch-specific command.

BATCH-SPECIFIC COMMAND (RSX-11M-PLUS only)

Batch-specific commands are commands that are independent of your CLI and designed exclusively for batch processing. These commands can be used for logging the batch job on and off the system, for including data, and for sequence control in the batch job when errors are returned. They must be preceded by a dollar sign (\$).

BATCH JOB (RSX-11M-PLUS only)

There are two kinds of batch jobs in RSX-11M-PLUS. See USER BATCH JOBS and QMG BATCH JOBS.

BATCH LOG (RSX-11M-PLUS only)

Each QMG batch job produces a log that represents the output that "appeared" on the virtual terminal. You can save a permanent copy of the log file. You can also include comments in the log file. You can print the log file.

Regardless of the number of user jobs in the QMG job, there will be only one log. You can differentiate between user jobs within the log by using the log label field of the JOB command that logs in each batch job.

GLOSSARY

BATCH PROCESSING

On RSX-11M-PLUS only, a means of automatically passing commands and data for processing. Batch-specific commands, CLI commands, and data are placed in a file and submitted to the system for execution.

You do not have to be present when your batch job is run, nor do batch jobs require a physical terminal to run. Batch processing uses virtual terminals and thus does not tie up interactive terminals.

BATCH PROCESSOR (RSX-11M-PLUS only)

A batch processor is a task that passes commands and data to CLIs and other tasks using a software terminal called a "virtual terminal."

BATCH QUEUE

BATCH queue refers to the default queue for batch jobs. A batch (lowercase) queue refers to any queue that is used to contain a list of batch jobs. (A queue may be assigned to more than one processor.)

CLI

An acronym standing for Command Line Interpreter. CLIs act as interpreters between people and computer operating systems.

(See MCR and DCL.)

COMMAND

A command is an instruction or request for the operating system to perform a particular action. See CLI.

COMMAND LINE INTERPRETER

See CLI.

COMMAND QUALIFIER

A command qualifier (DCL) or job switch (MCR) is a command element preceded by a slash (/) that alters the action of a command. See FILE QUALIFIER.

DATA

On RSX-11M-PLUS only, any information that is required input to a batch job. This is a special definition used in batch processing on RSX-11M-PLUS. The term "data" includes not only data in the conventional sense of information to be processed by a program but also responses to prompts from CLI commands or from indirect command files. In fact, anything -- except commands -- that would have to be typed by the user in an interactive session is called "data."

DCL

DIGITAL Command Language. An RSX-11M/11M-PLUS supported CLI designed for ease of use. DCL uses English language words and prompts you for necessary parameters. Compare with MCR.

GLOSSARY

DEFAULT

A default is a value or condition that is assumed by the operating system and performed automatically.

For example: The default queue for the PRINT command is PRINT. There are other queues available on the system, but, to place your job in one of these other queues, you must specify the queue in the PRINT command. If you do not specify one of these other queues, your print job will default to the queue called PRINT.

DESPOOLER

A print processor may also be called a despooler.

DEVICE

Any peripheral hardware or software connected to the processor and capable of receiving, storing, or transmitting data. Line printers and terminals are examples of record-oriented devices. Magnetic tapes and disk devices are examples of mass-storage devices. Terminal line interfaces and interprocessor links are examples of communication devices.

DEVICE-SPECIFIC QUEUE

Some print queues have names derived from the names of the output devices on the system, such as LP0, named after LP0:. These queues are needed for certain system tasks that send print jobs to line printers directly. These queues will usually send their output to the printer they are named after, but they need not do so.

DIGITAL COMMAND LANGUAGE

See DCL.

DISK

A disk is a high-speed, random access mass storage device. RSX-11M/M-PLUS systems use disks as their major form of mass-storage device.

ERROR

An exit status code found on batch logs. ERROR indicates that expected results are unlikely.

ERROR MESSAGE

Error messages are sent by the system when some action you have requested fails.

Each error message identifies the particular part of the system that detected the error.

GLOSSARY

EXIT STATUS CODE

All system tasks on the RSX-11M/M-PLUS systems, DCL and MCR commands, and utilities send a status-return code when they have completed their operations. The codes are:

| | |
|--------------|--|
| SUCCESS | Results should be as expected |
| WARNING | Task succeeded but irregularities are possible |
| ERROR | Results unlikely to be as expected |
| SEVERE ERROR | One or more fatal errors, or ABORT encountered |

As a rough rule, you can expect that any error message you receive on your terminal will reflect an exit status less than success. Again, roughly, any error message tagged *FATAL* will probably represent a status return of ERROR or SEVERE ERROR, and any error message tagged *DIAG* will probably represent a status return of WARNING. These are by no means hard and fast standards. Each system task follows its own rules.

You can use the ON and IF commands inside your batch job to program responses to status-return codes job.

FIELD

A field is a portion of a command or a command element.

FILE QUALIFIER

A file qualifier (DCL) or switch (MCR) is a command element preceded by a slash (/) that alters or modifies the action of a command as it affects that particular file. Depending upon the position of the file qualifier (switch), all or only certain files may be affected. See COMMAND QUALIFIER.

FORMS

All standard-length forms use form feeds, which are set on the hardware. All nonstandard forms use simulated form feeds, which are set through the software by replacing the form feed character with the appropriate number of line feeds.

Whether a form length is standard or not depends on whether it can be set using hardware facilities on the line printer. If it can be set on the line printer, then it is a standard form length.

Your system manager can tell you what /FORM:n option to specify in your PRINT command for any particular form. In this way, your print jobs will be queued for the proper printer and held until the proper forms are placed on the printer.

FORM FEED

A form feed is a character that directs the line printer to move to the top of the next continuous-feed form page. The line printer moves past the perforation in the paper to the top of a new form.

GLOSSARY

GENERAL QUEUE

Queues with names not derived from hardware devices. Each hardware output device has a queue named after it. See DEVICE-SPECIFIC QUEUE. All other queues are general, including the default PRINT queue, other print queues, and all batch queues.

HARD-COPY TERMINAL

Terminals that print output on paper are called hard-copy terminals.

INDIRECT COMMAND FILES

A means of automatically passing commands for processing on an RSX-11M/M-PLUS Operating System. Indirect command files remain active at the terminal from which they are invoked. Indirect command file directives permit symbol substitution, testing system functions, and such programming techniques as loops, counters, and subroutines.

INSTALLATION

The installation is the full computer system (hardware and software) at your location. This includes the operating system, the programming languages, and all applications tasks, as well as the computer and all its hardware devices.

INTERACTIVE TERMINAL

A standard hardware terminal with a keyboard from which you can type responses to prompts. Compare with VIRTUAL TERMINAL.

LINE PRINTER

An output device that prints files a line at a time. Even if your system does not have an actual hardware device of the line-printer type, it will have some device designated as the system output device and taking the part of the line printer.

LOG

A log is a record of activity. In this manual, the term refers to a file produced by a batch processor. See BATCH LOG.

LOGICAL PAGE

The line printer moves to the top of a new PHYSICAL PAGE each time a form-feed character (CTRL/L) is encountered. If you use the /LENGTH qualifier on the PRINT command, you define a LOGICAL PAGE length. If the line printer does not encounter a form-feed character within the length of the logical page, it will automatically supply one at the end of the logical page, moving the printer to the top of the next physical page.

LOGIN

The LOGIN command identifies you to the operating system and informs the system that you have certain privileges and are using a particular terminal.

GLOSSARY

LOGOUT

The LOGOUT command informs the operating system that you have finished using a particular terminal.

MCR

Monitor Console Routine. An RSX-11M/11M-PLUS supported CLI. Most MCR commands use mnemonics in strict syntax. See DCL.

NONPRIVILEGED USER

Nonprivileged users have access to most of the system's facilities but cannot alter the system.

OPERATING SYSTEM

An operating system is a set of tasks that collectively automate the management of computer resources to provide efficient computer operation.

An operating system is used for user communication with the computer, for program development, and for scheduling the use of the central processing unit and its peripherals for efficiency.

OPERATOR

The person who is in direct charge of the computer.

OPERATOR'S CONSOLE

A hard-copy terminal, usually located near the computer, used by the operator. This terminal has the logical name CO: and records certain system information.

PERIPHERAL DEVICES

Any unit, distinct from the CPU and memory, that can provide the system with input or accept output from it, is called a peripheral device, or peripheral.

PHYSICAL PAGE

A physical page is the part of a printer form between one perforation and the next perforation. Standard line-printer paper has a physical page length of 66 lines. Each time the line printer encounters a form-feed character (CTRL/L), the line printer moves the paper to the top of the next physical page. Compare LOGICAL PAGE.

PRINT COMMAND

The PRINT command queues files for printing on a line printer. The PRINT command may also be used to enter jobs in queues for other output devices, such as plotters or punches. The PRINT command is to print jobs as the SUBMIT command is to batch jobs.

PRINT PROCESSOR

Each spooled output device has a print processor, a task that attaches the device and directs output to it. The Queue Manager handles the orderly printing of files through the print processor.

GLOSSARY

PRINT QUEUE

PRINT queue refers to the default queue for print jobs. A print (lowercase) queue refers to any queue that is used to contain a list of print jobs.

PRIORITY

Priority is a rank assigned to a task to determine its precedence in obtaining system resources when the task is run. The default priority for a task is 50. QMG jobs are also assigned a priority. The default priority for a job is 50.

PRIVILEGED USER

Privileged users can alter the operating system through the use of privileged commands.

QMG BATCH JOB

A QMG batch job is a chain of one or more user batch jobs to be processed. The SUBMIT command defines a QMG batch job. User jobs within the QMG batch job run serially on the same batch processor without interruption from other batch jobs. The QMG batch job has a name derived from the name of the first file in the job or from a name given in the SUBMIT command.

QMG PRINT JOB

A QMG print job consists of one or more files to be printed at the same time. Jobs in a QMG print job go to the same line printer in the order they were listed and without interruption. The print job has a name derived from the name of the first file in the job or from a name given in the PRINT command.

QUALIFIER

See COMMAND QUALIFIER and FILE QUALIFIER.

QUEUE

A queue is a waiting line of jobs that are scheduled or processed according to system or user priorities.

QUEUE FILE

A disk file used by the Queue Manager for storage of control information and entries for all batch and print processors, all jobs and files to be processed, and all queues. On RSX-11M this file is LB0:[1,7]QUEUE.SYS and on RSX-11M-PLUS the file is SP0:[1,7]QUEUE.SYS. Since this information is retained on disk, your job will not be lost should the system stop operating.

QUEUE MANAGER

The Queue Manager (QMG) is a system program that provides for the orderly processing of print and (on RSX-11M-PLUS only) batch jobs.

GLOSSARY

SEQUENCE CONTROL COMMANDS

IF and ON are special batch commands that control the batch job when errors are encountered. They provide a means of programming error response into the batch job when used with the commands STOP, CONTINUE GOTO, and SET [NO]ON.

See the individual command descriptions for details.

SEVERE ERROR

Exit status code. This is usually returned when one or more fatal errors are encountered or a task is aborted. When used in a sequence control command, this term should be typed as a single word: SEVEREERROR.

SPOOL

This is an acronym for Shared Peripheral Operations On Line. It refers to the process of sending output to a peripheral device, particularly a line printer, in an orderly fashion.

Many users and tasks may be directing output to the line printer at the same time. Rather than print three lines of one file and then two of another, as might happen if the output was passed directly to the line printer, the output is sent to a mass storage device -- usually a disk -- to be saved in separate files.

The process of saving files on disk in this fashion is called spooling. The orderly transfer of these files from the disk to the output device is called despooling.

SPOOLED DEVICE

A spooled device is a line printer or other output device under control of the Queue Manager. Spooled devices are initialized with certain attributes.

SUBMIT COMMAND

The SUBMIT command queues user batch jobs. As a result of being queued, one or more user batch jobs becomes a QMG batch job. The SUBMIT command is to QMG batch jobs what the PRINT command is to print jobs.

SUCCESS

Exit status code. Results should be as expected.

SYNTAX

Syntax is the form that a command must follow. Misspelled words are the most common syntax errors, but misplaced delimiters are also common.

SYSTEM MANAGER

The person responsible for setting policies for using the RSX-11M/M-PLUS Operating System.

GLOSSARY

TERMINAL

A terminal is a hardware device with two functions: (1) sending input to the operating system from a keyboard and displaying it and (2) receiving output from the operating system and displaying it.

TRANSPARENT SPOOLING

Transparent spooling is only available on RSX-11M-PLUS. It means that you can substitute the device name of a spooled output device for a file specification in any system task or user-written task that creates an output file.

UFD

All files on mass storage devices are cataloged in User File Directories, or UFDs. The UFD is a file listing all the files included in the Directory. The UFD is a two-number code in the form [g,m] that is included in every file specification, either explicitly or by default, and that the file system uses to locate the file.

In most cases, the UFD will be the same as the User Identification Code, or UIC, under which you logged in. See UIC.

UIC

User Identification Code. Each RSX-11M/11M-PLUS user has a two-number identification code enclosed in brackets that is used (with password) for logging in. The number is in the form [g,m,], with g giving the user's group number and m giving the user's member number.

USER BATCH JOB

A user batch job is a file created by the user containing batch-specific commands and CLI commands and data, beginning with JOB and ending with EOJ. It may also be referred to as a batch job file or batch file.

Each batch job must constitute a complete terminal session. The batch job must log itself in, issue commands, supply information in response to prompts, provide necessary data for programs it runs, respond to errors, and log itself out.

Compare with QMG BATCH JOB.

VIRTUAL TERMINAL

A software terminal created by a batch processor to issue commands within the batch job. Your user batch job must constitute a complete terminal session, logging itself in, issuing commands, and logging itself out. Special batch commands enable you to do by remote control at the virtual terminal what you would do directly at an interactive terminal.

Compare with INTERACTIVE TERMINAL.

WARNING

Exit status code. The task succeeded, but irregularities are possible.

INDEX

- Active job,
 - definition, Gloss-1
- /AF job switch,
 - QUE /MOD command, 2-20
 - SUBMIT command, 3-15
- /AF switch,
 - PRI command, 2-6
- /AFTER job qualifier,
 - SET QUEUE command, 2-20
- /AFTER qualifier,
 - PRINT command, 2-6
 - SUBMIT command, 3-15
- Applications Processor,
 - See Queue Manager (QMG)
 - special applications, definition, Gloss-1

- Batch command,
 - CLI commands, 3-2
 - definition, Gloss-1
 - dollar sign, 1-8, 3-2
 - format, 3-2
 - label, 3-2
 - line continuation, 3-2
- Batch job,
 - See also QMG batch job
 - See also User batch job
 - allocating device,
 - ALLOCATE command, 3-13
 - card deck, 3-23
 - card reader input spooling,
 - example, 3-24
 - deallocating device,
 - DEALLOCATE command, 3-14
 - definition, Gloss-1
 - dismounting volume,
 - DISMOUNT command, 3-14
 - mounting volume,
 - MOUNT command, 3-13
 - queuing, 3-14
 - scheduling, 1-7
 - submitting, 1-7
- Batch log file, 3-2, 3-19
 - definition, Gloss-1
 - example, 3-20 to 3-23
 - line identifiers,
 - DATA, 3-20
 - SKIP, 3-20
 - TERM, 3-20
- Batch processing, 1-7
 - definition, Gloss-2
- Batch processor,
 - definition, Gloss-2
- /BATCH qualifier,
 - SHOW QUEUE command, 2-16
- Batch-specific command, 3-2
 - command summary, 3-3
 - definition, Gloss-1
 - line continuation, 3-3
- BPR, 3-1
 - See Batch processor
- /BR switch,
 - QUE /LI command, 2-15
- /BRIEF qualifier,
 - SHOW QUEUE command, 2-15

- Card deck,
 - example, 3-24
 - format,
 - \$EOJ, 3-24
 - \$JOB, 3-24
 - \$PASSWORD card, 3-24
 - \$PRINT card, 3-24
 - \$SUBMIT card, 3-24
 - sequence field, 3-26
- Card reader input spooling,
 - 3-23
- Card Reader Processor (CRP),
 - 3-23
 - error recovery, 3-27
 - operation, 3-27
- /CO file switch,
 - PRI command, 2-6
 - QUE /MOD command, 2-21
- /CO job switch,
 - PRI command, 2-4
 - QUE /MOD command, 2-20
- Command Line Interpreter,
 - See CLI
 - definition, Gloss-2
- Command summary, 4-1
- Comment in batch job,
 - example, 3-12
 - format, 3-12
- CONTINUE command,
 - See also ON and IF commands
 - format, 3-8
- /COPIES file qualifier,
 - PRINT command, 2-6
 - SET QUEUE command, 2-21

- Data, batch job,
 - definition, Gloss-2

INDEX

- DATA command, 3-5
 - example, 3-6 to 3-7
 - format, 3-6
 - qualifiers, 3-6
- DCL (DIGITAL Command Language),
 - definition, Gloss-2
- /DE file switch,
 - PRI command, 2-6
 - SUB command, 3-17
- /DEL file switch,
 - QUE /MOD command, 2-21
- DELETE command,
 - example, 2-11
 - format, 2-10
- /DELETE file qualifier,
 - PRINT command, 2-6
 - SET QUEUE command, 2-21
 - SUBMIT command, 3-17
- Despooler,
 - definition, Gloss-3
- /DEVICE qualifier,
 - PRINT command, 2-6
 - SHOW QUEUE command, 2-15
- /DOLLARS qualifier,
 - DATA command, 3-6

- /EN switch,
 - QUE /DEL command, 2-10
 - QUE /LI command, 2-16
- /ENTRY qualifier,
 - DELETE command, 2-10
 - SHOW QUEUE command, 2-16
- EOD command,
 - format, 3-7
- EOJ command,
 - format, 3-5
- Exit Status Code,
 - definition, Gloss-4

- /FI file switch,
 - QUE /MOD command, 2-21
- /FI switch,
 - QUE /DEL command, 2-11
- /FILE POSITION file qualifier,
 - SET QUEUE command, 2-21
- /FILE POSITION qualifier,
 - DELETE command, 2-11
- /FILES qualifier,
 - SHOW QUEUE command, 2-15
- /FL switch,
 - PRI command, 2-5
- /FLAG PAGE qualifier,
 - PRINT command, 2-5

- /FO job switch,
 - QUE /MOD command, 2-20
- /FO switch,
 - PRI command, 2-5
 - QUE /LI command, 2-16
- Form,
 - special hardcopy, 1-2
- Forms,
 - definition, Gloss-4
- /FORMS job qualifier,
 - SET QUEUE command, 2-20
- /FORMS qualifier,
 - PRINT command, 2-5
 - QUE /LI command, 2-16
- /FU switch,
 - QUE /LI command, 2-15
- /FULL qualifier,
 - SHOW QUEUE command, 2-15

- GOTO command, 3-8
 - See also ON and IF commands
 - example, 3-9
 - format,
 - label, 3-9

- /HO job switch,
 - SUB command, 3-16
- /HO switch,
 - PRI command, 2-4
- HOLD command,
 - format,
 - entry number, 2-22
 - job name, 2-22
- /HOLD qualifier,
 - PRINT command, 2-4
 - SUBMIT command, 3-16

- IF command,
 - See also STOP, CONTINUE, GOTO commands
 - example, 3-12
 - format, 3-11
- Indirect command file,
 - definition, Gloss-5
 - example, 3-13
 - format, 3-13
- Interactive terminal,
 - definition, Gloss-5

INDEX

- /JO switch,
 - PRI command, 2-6
- Job,
 - deleting, 2-10
 - holding, 2-1
 - modifying, 2-1
 - releasing, 2-1
- JOB command, 3-3
 - example, 3-4
 - format, 3-4
 - qualifiers, 3-4
- /JOBCOUNT job qualifier,
 - SET QUEUE command, 2-20
- /JOBCOUNT qualifier,
 - PRINT command, 2-3
- Jobname= job switch,
 - SUB command, 3-16
- Jobname= log file switch,
 - SUB command, 3-17
- Jobname parameter,
 - DELETE command, 2-10
- Jobname switch,
 - QUE /LI command, 2-16
- Jobname= switch,
 - PRI command, 2-4
- /JOB PAGE qualifier,
 - PRINT command, 2-6

- /LE job switch,
 - QUE /MOD command, 2-20
- /LE switch,
 - PRI command, 2-5
- /LENGTH job qualifier,
 - SET QUEUE command, 2-20
- /LENGTH qualifier,
 - PRINT command, 2-5
- /LI switch,
 - QUE /LI command, 2-15
- /LI:B switch,
 - QUE /LI command, 2-16
- Line printer,
 - definition, Gloss-5
- /LI:P switch,
 - QUE /LI command, 2-15 to 2-16
- /LO job switch,
 - QUE /MOD command, 2-20
- /LO log file switch,
 - SUB command, 3-17
- /LOGFILE qualifier,
 - SUBMIT command, 3-17
- Logical page,
 - definition, Gloss-5
- /LOW switch,
 - PRI command, 2-4
- /LOWERCASE job qualifier,
 - SET QUEUE command, 2-20

- /LOWERCASE qualifier,
 - PRINT command, 2-4

- /NAME log file qualifier,
 - SUBMIT command, 3-17
- /NAME qualifier,
 - \$PRINT card, 3-25
 - SHOW QUEUE command, 2-16
 - \$SUBMIT card, 3-25
 - SUBMIT command, 3-16
- /NAME:jobname qualifier,
 - PRINT command, 2-4
- /NOCOPY qualifier,
 - DATA command, 3-6
- /NOLO job switch,
 - QUE /MOD command, 2-21
- /NOLOW switch,
 - PRI command, 2-4

- ON command,
 - See also STOP, CONTINUE, GOTO commands
 - default setting, 3-9
 - example, 3-10
 - format, 3-10
- /OWNER UIC qualifier,
 - SHOW QUEUE command, 2-16

- /PA job switch,
 - QUE /MOD command, 2-20
- /PA switch,
 - PRI command, 2-4
- /PAGE COUNT job qualifier,
 - SET QUEUE command, 2-20
- /PAGE COUNT qualifier,
 - PRINT command, 2-4
- \$PASSWORD card,
 - format, 3-27
- PRI command,
 - file switches, 2-3
 - format, 2-3
 - job switches, 2-3
- /PRIN log file switch,
 - SUB command, 3-18
- \$PRINT card,
 - command qualifiers, 3-26
 - See PRINT command
 - format, 3-26
- PRINT command, 1-3, 2-2
 - command qualifiers, 2-3
 - definition, Gloss-6
 - example, 2-7
 - file qualifiers, 2-3

INDEX

- PRINT command (Cont.)
 - format, 2-3
 - processing, 1-4 to 1-6
- Print job,
 - definition, Gloss-7
 - queued by system tasks,
 - DCL COPY command, 2-12
 - maps, logs, listings, 2-12
 - PIP, 2-12
 - PIP line printer, 2-12
 - queued by user tasks,
 - opening file on LPn:, 2-14
 - .PRINT, 2-13
 - PRINT command, 2-13
 - submission notification, 2-2
- /PRINT log file qualifier,
 - SUBMIT command, 3-18
- Print processor, 1-3
 - See also Despooler
 - definition, Gloss-6
- /PRINT qualifier,
 - SHOW QUEUE command, 2-16
- /PRIO job switch,
 - QUE /MOD command, 2-20
 - SUB command, 3-17
- /PRIO switch,
 - PRI command, 2-5
- Priority,
 - definition, Gloss-7
- /PRIORITY job qualifier,
 - SET QUEUE command, 2-20
- /PRIORITY qualifier,
 - PRINT command, 2-5
 - SUBMIT command, 3-17

- QMG batch job, 1-7, 3-2
 - definition, Gloss-7
- QUE /DEL command,
 - format, 2-10
- QUE /HO command,
 - format,
 - entry number, 2-22
 - job name, 2-22
- QUE /LI command, 2-14
 - batch queue, 1-9
 - display, 2-16 to 2-17
 - format, 2-15
 - print queue, 1-9
 - QUE /LI display, 1-10
 - switches, 2-15
- QUE /LI:DEV command,
 - format, 2-18
- QUE /MOD command,
 - example, 2-21
 - file format,
 - switches, 2-19
 - job format,
- QUE /MOD command (Cont.)
 - switches, 2-19
- QUE /REL command,
 - format,
 - entry number, 2-23
 - job name, 2-23
- Queue, 1-1
 - assignments, 1-2
 - BATCH queue,
 - definition, Gloss-2
 - definition, Gloss-7
 - device,
 - definition, Gloss-3
 - device-specific, 1-2, Gloss-3
 - disk file,
 - definition, Gloss-7
 - disk file (QUEUE.SYS),
 - RSX-11M, 1-1
 - RSX-11M-PLUS, 1-1
 - displaying information, 2-1
 - general, 1-2, Gloss-5
 - job,
 - holding, 2-1
 - releasing, 2-1
 - status,
 - altering, 2-1
 - PRINT,
 - definition, Gloss-7
- Queue Manager (QMG), 1-1
 - definition, Gloss-7
 - dequeuing jobs, 2-1
 - output, 1-3
 - queuing jobs, 2-1
 - special applications, 1-2
- /QUEUE qualifier,
 - SUBMIT command, 3-17
- Queuename job switch,
 - SUB command, 3-17
- Queuename parameter,
 - DELETE command, 2-10
- Queuename switch,
 - PRI command, 2-4
- /QUEUE:queuename qualifier,
 - PRINT command, 2-4

- /RE job switch,
 - QUE /MOD command, 2-21
 - SUB command, 3-16
- RELEASE command,
 - format,
 - entry number, 2-23
 - job name, 2-23
- /RES switch,
 - PRI command, 2-5
- /RESTART job qualifier,
 - SET QUEUE command, 2-21

INDEX

- /RESTART qualifier,
 - PRINT command, 2-5
 - SUBMIT command, 3-16

- Sequence Control Commands,
 - See also STOP, CONTINUE, GOTO and SET ON
 - definition, Gloss-8
- /SEQUENCE qualifier,
 - \$SUBMIT command, 3-25
- SET command,
 - format, 3-11
- SET QUEUE command,
 - example, 2-21
 - file format,
 - qualifiers, 2-19
 - job format,
 - qualifiers, 2-19
- SHOW PROCESSOR command,
 - format, 2-18
- SHOW QUEUE command, 2-14
 - batch queue, 1-9
 - display, 2-16 to 2-17
 - format, 2-15
 - print queue, 1-9
 - qualifiers, 2-15
 - SHOW QUEUE display, 1-10
- Spool,
 - card reader input spooling, 3-23
 - definition, Gloss-8
 - spooling output, 2-1
- Spooled device, 1-3, 2-1
 - definition, Gloss-8
 - line printer, 1-3
 - output, 1-3
- Status code, 3-11
 - ERROR, 3-10
 - definition, Gloss-4
 - SEVERERROR, 3-10
 - definition, Gloss-4
 - SUCCESS, 3-10
 - definition, Gloss-4
 - WARNING, 3-10
 - definition, Gloss-4
- STOP command,
 - See also ON and IF commands
 - format, 3-8
- SUB command, 3-14
 - example, 3-18 to 3-19
 - file switches, 3-15
 - format, 3-15
 - job switches, 3-15
 - log file switches, 3-15
- \$SUBMIT card,
 - command qualifiers, 3-25
- \$SUBMIT card(Cont.)
 - format, 3-25
- SUBMIT command, 1-7, 3-14
 - command qualifiers, 3-15
 - definition, Gloss-8
 - example, 3-18 to 3-19
 - file qualifiers, 3-15
 - format, 3-15
 - log file qualifiers, 3-15

- /TIME qualifier,
 - JOB command, 3-4
- /TR file switch,
 - PRI command, 2-6
 - SUB command, 3-17
- /TRANSFER file qualifier,
 - PRINT command, 2-6
 - SUBMIT command, 3-17
- Transparent spooling,
 - definition, Gloss-9
 - (EDT) WRITE command, 2-1
- /TYPE keyword,
 - ALLOCATE command, 3-14

- [uic] switch,
 - QUE /LI command, 2-16
- /UPPERCASE job qualifier,
 - SET QUEUE command, 2-21
- /UPPERCASE qualifier,
 - PRINT command, 2-4
- User batch job, 1-7
 - batch chain, 1-7
 - command, 3-2
 - comment, 1-8
 - creating, 3-1
 - data, 3-2
 - definition, Gloss-9
 - example, 1-8
- /USER qualifier,
 - \$PRINT card, 3-25
 - \$SUBMIT card, 3-25

- Virtual terminal,
 - definition, Gloss-9
 - login UIC,
 - default, 3-1
 - privileged user, 3-1

- /WAIT keyword,
 - MOUNT command, 3-14

READER'S COMMENTS

NOTE: This form is for document comments only. DIGITAL will use comments submitted on this form at the company's discretion. If you require a written reply and are eligible to receive one under Software Performance Report (SPR) service, submit your comments on an SPR form.

Did you find this manual understandable, usable, and well-organized? Please make suggestions for improvement.

Did you find errors in this manual? If so, specify the error and the page number.

Please indicate the type of user/reader that you most nearly represent.

- Assembly language programmer
- Higher-level language programmer
- Occasional programmer (experienced)
- User with little programming experience
- Student programmer
- Other (please specify) _____

Name _____ Date _____

Organization _____

Street _____

City _____ State _____ Zip Code _____
or Country

Do Not Tear - Fold Here and Tape

digital



No Postage
Necessary
if Mailed in the
United States



BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO.33 MAYNARD MASS.

POSTAGE WILL BE PAID BY ADDRESSEE

BSSG PUBLICATIONS ZK1-3/J35
DIGITAL EQUIPMENT CORPORATION
110 SPIT BROOK ROAD
NASHUA, NEW HAMPSHIRE 03061

Do Not Tear - Fold Here

Cut Along Dotted Line

READER'S COMMENTS

NOTE: This form is for document comments only. DIGITAL will use comments submitted on this form at the company's discretion. If you require a written reply and are eligible to receive one under Software Performance Report (SPR) service, submit your comments on an SPR form.

Did you find this manual understandable, usable, and well-organized? Please make suggestions for improvement.

Did you find errors in this manual? If so, specify the error and the page number.

Please indicate the type of user/reader that you most nearly represent.

- Assembly language programmer
- Higher-level language programmer
- Occasional programmer (experienced)
- User with little programming experience
- Student programmer
- Other (please specify) _____

Name _____ Date _____

Organization _____

Street _____

City _____ State _____ Zip Code _____
or Country

Do Not Tear - Fold Here and Tape

digital



No Postage
Necessary
if Mailed in the
United States

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO.33 MAYNARD MASS.

POSTAGE WILL BE PAID BY ADDRESSEE

BSSG PUBLICATIONS ZK1-3/J35
DIGITAL EQUIPMENT CORPORATION
110 SPIT BROOK ROAD
NASHUA, NEW HAMPSHIRE 03061



Do Not Tear - Fold Here

Cut Along Dotted Line

