Burroughs

BTOS Printer Pass-Through (PPT)

Operations Guide

Relative To Release Level 1.0
Priced Item
August 1986 1188091

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About This Guide

Purpose

This manual enables system administrators to install Printer Pass-Through (PPT) and operate its status monitor utility. It provides host programmers with the information necessary to control and send information to PPT printers and disk files.

Scope

This manual describes loading, installing, configuring, and operating PPT. It also provides information for those writing host application programs.

Audience

The audience of this manual is system administrators who want to install and operate PPT and programmers who want to write applications that use PPT services. System administrators can use sections of this manual to guide operators (nonprogrammers) in configuring and installing PPT.

Prerequisites

System administrators should be familiar with BTOS systems and particularly the BTOS Editor and the files necessary for direct and spooled printing. Host programmers should be familiar with BMULTI and the general principles behind controlling printers over a data comm line.

How to Use This Manual

Section 1 describes how to configure and install PPT. Section 2 describes how to use the status monitor utility. If given configuration parameters by system administrators, operators can install PPT and operate its status monitor utility.

Related Product Information

BTOS Reference Manual
BTOS Programmers Guide
BTOS Standard Software Operations Guide
BTOS Status Codes Reference Manual
BTOS Editor Operations Guide
BTOS Debugger Reference Manual
XE 520 System Programmers Guide
BTOS B-NET Administrators Guide
BTOS Burroughs Multipoint Communication Service (BMULTI) Operations and Programming Guide
BTOS Context Manager Operations Reference Manual

Contents

Illustrations

Errata change for document:

BTOS Printer Pass-Through (PPT) Operations and Programming Guide
Relative to release level 1.0
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Please add the following information to your copy of the manual described above:

********** **page 1-13** **********

Insert the following note under the heading "Deinstalling PPT."

Note: *If you attempt to deinstall PPT from a remote node in a B-NET network (release level 2.0.4), the B-NET server in the node where BMULTI is installed will crash.*

Overview

PPT is a system service that enables a host application to send output to a BTOS printer or disk file. The host identifies these devices by their network addresses and sends information to them via BMULTI. PPT uses Queue Manager to service spooled print requests.

PPT normally runs as a background service, unseen after installation. However, PPT also includes a status monitor utility that displays operational statistics of PPT devices, including all spooled printers serviced by a Queue Manager running in a BTOS master. The status monitor utility allows you to send messages to the host and dynamically reconfigure all printers served by PPT.

PPT supports:

- 20 PPT devices (one PPT device per BTOS system)
- Context Manager
- B-NET
- Intelligent Data Comm Slice
- Spooled printing
- Direct printing (with a multipartition operating system)
- Serial and parallel printers
- Locking non-spooled devices
- Data filtering

PPT Files, Commands, and Functions

The following files are copied onto your hard disk during the loading procedure. You can invoke them from the Executive.

File	Command	Function
PPTInstall.run Size: 60K RAM	Install PPT	Installs PPT as a system service process
PPTDeinstall.run Size: 5K RAM	Deinstall PPT	Removes PPT as a system service process.
PPTStatus.run Size: 36K RAM	PPT Status	Installs PPT status monitor utility

Software Requirements

You should have the following operating systems:

- BTOS master or standalone operating system, release level 5.0 or higher
- XE 520 operating system, release level MS5 or higher.

You should also install these system services:

- BTOS Burroughs Multipoint Communications Services (BMULTI), release level 6.0 or higher (installed locally or at the master)
- Queue Manager (installed locally or at the master)
- Spooler (installed where the spooled printer is attached)

BTOS requires that every printer have a printer device configuration file. In these files you can specify a transmission timeout, that is, the period that a workstation waits for a printer to send a "ready to print" signal. You should specify a transmission timeout in the configuration files of all PPT printers because PPT does not have an internal timeout mechanism.

PPTStatus.Queue and PPTControl.Queue are file names appended to your Queue.Index file during the loading of PPT onto your hard disk. (The Queue.Index file is created during the loading of Queue Manager.) PPTStatus.Queue allows the PPT status monitor utility to know the status of a single PPT device if you have installed Queue Manager locally or all PPT printers if you have installed Queue Manager in a BTOS master. PPTControl.Queue allows an operator to split (print to) any PPT printer, transmit a message to the host, reconfigure PPT parameters, and lock or unlock direct PPT printers.

Note: *To effectively use PPT, read the* BTOS Standard Software Operations Guide (SSOG) *for information about the files necessary for printing, such as Queue.Index. The* SSOG *also contains general information about printing in a BTOS environment.*

Hardware Requirements

PPT runs on the hard disk versions of the following devices: B 21, B 22, B 26, B 27, B 28, and XE 520 systems. PPT runs on the Intelligent Data Comm Slice (IDS) and with the Data Comm Expander (DCX) and Local Area Network (LAN) modules.

RAM Memory and Disk Space

The *minimum* amount of RAM required by PPT is:

BTOS Systems:	
Standalone workstation	512K
Master workstation	512K
Cluster workstation	384K
XE 520 Systems:	
Cluster Processor	768K
Terminal Processor	768K
File Processor	768K

The *minimum* amount of formatted disk space required by PPT is:

B 21	10MB hard disk	630KB floppy disk
B 22	10MB hard disk	630KB floppy disk
B 26	10MB hard disk	630KB floppy disk
B 27	20MB hard disk	630KB floppy disk
B 28	10MB hard disks	630KB floppy disk
XE 520	37.6MB hard disk	

Cluster Configuration

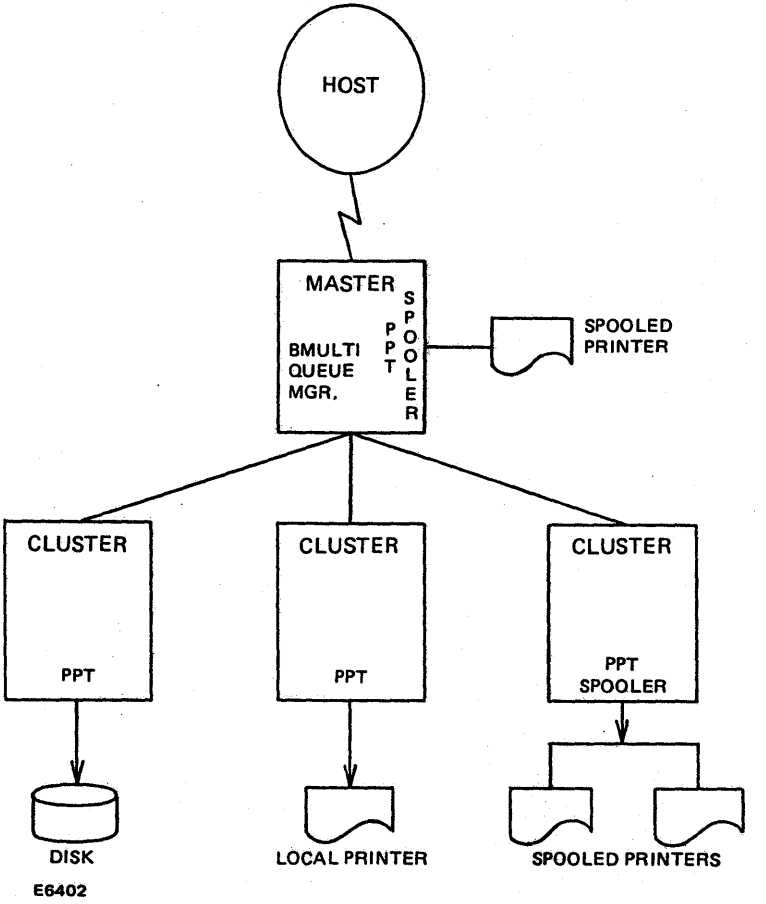
PPT supports one address for one local printer attached to a BTOS system. PPT also supports addresses for spooled printers.

When you are using an XE 520 as the master in a cluster configuration, install Queue Manager and BMULTI in the XE 520. Install PPT in the same processor in which you installed BMULTI.

If the host application requires a special printer (e.g., the AP1351), all printers servicing that queue must be the same.

Figure 1-1 illustrates PPT installed on a cluster workstation.

Figure 1-1 **PPT in a Cluster Configuration**



Spooled Printing

PPT prints to the spooler if:

- the spooler queue name (e.g., [Spl]) is specified in the device name field of the PPT configuration file.
- the Queue Manager is installed
- the spooler is installed on the workstation where the printer is attached

If the spooler queue is serviced by more than one printer, the spooler prints on the first available printer.

PPT automatically "splits" a spooler file after it receives 30 form feeds. Split means to put all data previously received, including data present in the print buffer, into the spooler queue for printing (thereby closing the bytestream). This prevents the spooler file from running out of room on the disk.

Direct Printing

PPT supports direct printing on one local printer from the workstation in which you have installed PPT. It supports printing for either [LPT], or [PTR]A, or [PTR]B. In the case of a Data Comm Expander (DCX) module, PPT supports either [PTR]1A, [PTR]1B, [PTR]1C, or [PTR]1D. If you use a DCX, make certain that you define the correct device type in your Sys.Printers file (use a numerical identifier for DCX devices, e.g., [PTR]1A, not [PTR]A).

You cannot use direct printers with a single-partition operating system.

Loading and Installing

Before using PPT, you must load the software from the release disk to the hard disk of your BTOS system.

Loading is the process of copying the programs from the release disk onto the hard disk of your master, standalone, or cluster BTOS workstation or onto the hard disk of your XE 520. *Installing* is the actual execution of the programs that have been copied onto the hard disk. Loading should have to be done only once because the procedure

permanently records (until a command to delete) PPT programs on your hard disk. Installation must be done every time you reset or turn off your workstation because the PPT program resides only in RAM.

Command Guidelines

A short series of commands makes loading PPT programs a simple procedure. Depending on whether you have a master, standalone, or cluster BTOS workstation or an XE 520, choose from the three loading procedures that follow. The following conventions are used in this manual:

- Characters that you must type are shown in **boldface**.
- Special keys, such as RETURN and GO, are shown in uppercase.

The characters that you type in can be upper- or lowercase.

Loading PPT

The PPT programs can be loaded only onto BTOS systems with hard disks operating as master, standalone, or cluster workstations and XE 520 systems. The loading procedure requires that you have a floppy disk drive.

Note: *Have your PPT network address on hand. You will be asked to type it in during loading.*

Master, Standalone, or Cluster Workstations

1 Turn on your standalone workstation and sign on.

2 Insert the BMULTI disk 2 of 2 into the floppy drive.

3 Execute the following command:

```
Command  Software Installation  GO
```

4 Follow the screen directions.

5 After loading is complete (a screen message informs you of this), remove the disk and put it in a safe place.

6 To install PPT, go to "Installing PPT."

Loading PPT on an XE 520

Note to System Administrators: *If a cluster workstation will sometimes use PPT installed on the XE 520 and at other times use PPT installed locally, execute both the Software Installation and the XESoftware Installation commands (or Submit as described in step 3). Before using the Software Installation command, boot your local operating system so that the proper <Sys> directory receives the PPT files.*

1 Turn on the XE 520.

2 Turn on a cluster workstation that has a floppy disk unit attached and load the operating system from the XE 520. Log on to XE 520 BTOS.

3 After you have inserted the PPT disk into drive [f0] of the cluster workstation, choose the appropriate loading procedure:

If you have MS 5.0 and BTOS 7.0, type **XESoftware Installation**. Press GO and follow the directions that appear on the screen. Go to step 4.

If you have MS 5.0 and a BTOS 5.0, type **Submit**. Press RETURN. Fill in the following parameter:

```
File list  [f0]<sys>XEInstall.sub
Parameters [!sys]<sys>Sys.Cmds [!sys]<sys>
```

Press GO and follow the directions that appear on the screen. Go to step 4.

4 After loading is complete (a screen message informs you of this), remove the disk and put it in a safe place.

5 To install PPT, go to "Installing PPT."

Installing PPT

Installing PPT on an XE 520

To install PPT from the command line interpreter, enter

```
$RUN [Sys]<Sys>PPTInstall.Run, Printer number, Configuration file
```

(A full discussion of the installation parameters is given in "Installation on a BTOS Master, Standalone, or Cluster System.")

To install PPT on the XE 520 so that it is available at bootup, use the following procedure.

Edit InitCPxx.jcl or InitTPxx.jcl, whichever is appropriate, incorporating the following command line:

```
$Run [sys]<sys>PPTInstall.run, Printer Number, Configuration File
```

Installing PPT on a BTOS Master, Standalone, or Cluster BTOS System

You can install PPT in standalone or master workstations, or in any cluster workstation. These systems must have hard disks.

```
Command    Install PPT                    RETURN
[PPT Printer Number]                      RETURN
[PPT Configuration File]
                                          GO
```

To operators: Fill in the parameters supplied to you by your system administrator on the selected (highlighted) line. You can step through the form by pressing RETURN. When you have finished filling in your parameters, press GO.

PPT Printer Number

The PPT printer number (0 to 99) identifies each copy of PPT installed in a cluster and is displayed by the status monitor utility. In addition to being a means of identification, the printer number is used by PPT as a reference to a configuration file, where the printer number equals x in PPTConfigx.Sys. This feature saves typing the complete configuration file name. If you chose a printer number and a configuration file name that conflict, PPT uses the configuration file name.

PPT Configuration File

The PPT configuration file contains the parameters used by PPT during its operation. To configure PPT for your environment, use the BTOS Editor to edit a PPT configuration file. (You can use the status monitor to change selected parameters after you have installed PPT, as described in Section 2.)

A default file called PPTConfig0.Sys was copied onto your hard disk during loading. It was into this file that your printer address was copied during loading.

Caution: *Do not use PPTConfig0.Sys without a backup copy. Make a copy of the configuration file in case you corrupt the file during editing.*

```
Copy
[File From]        <Sys>PPTConfig0.Sys
[Files to]         <Sys>PPTConfigBackup.Sys
[Overwrite ok?]
[Confirm each?]
```

Each copy of PPT must have a unique configuration file because each PPT device must have a unique network address. For each PPT device make a copy of PPTConfig0.Sys, that is, PPTConfig1.Sys, PPTConfig2.Sys, etc. Edit these files, changing default values where appropriate.

The following table lists the parameters in the PPTConfig0.sys file. It also provides a place for you to note your changes.

Screen Message	Default Value	Change to
DeviceName	[Spl]	_____
NodeName		_____
PrintBufferSize	2	_____
EnableSo/Si	Y	_____
EnableControlFilter	N	_____
EnableSplitEscChar	Y	_____
EnableLogicalACK	N	_____
SelectLogicalACK	20h	_____
EnableAutoSplitFF	N	_____
EnableAutoSplitTimeout	N	_____
SelectAutoSplitTimeout	10	_____
Enable Rcv Translation	N	Not applicable
Address		_____

In the explanation of parameters that follows, split means to put all data previously received, including data present in the print buffer, into the spooler queue for printing (thereby closing the bytestream).

DeviceName (default [Spl]): the name given the PPT device

in the spooler queue, e.g., [Spl], [SplB]

as a direct printer, e.g., [LPT], [Ptr]A

as a disk file name, e.g., <Text>Acct.report

NodeName (default = none): The name of the remote B-NET node where BMULTI is installed (e.g., {Paris}). Leave this parameter blank if BMULTI is installed in your local cluster. If you are using BMULTI in a remote node, you must have Queue Manager installed in the master of the local node, not in the remote B-NET node.

PrintBufferSize (default = 2): The size in kilobytes allocated for the print buffer. The valid range is 2 to 4.

EnableSiSo (default = Y): If Y (yes), PPT recognizes Shift In/Shift Out (SI/SO) control characters sent by the host. If enabled, the host can send values to the printer in the range 32-127 (20h-7Fh), 160-255 (A0h-FFh).

In the shifted-in state, PPT sends characters from the host to the PPT device unmodified. In the shifted-out state, PPT adds 128 (80h) to each character.

This parameter is required because BMULTI is a protocol that supports 7-bit character codes, which only allows 128 possible characters (0 - 1111111 binary). To support the full ASCII set of 256 characters, PPT uses the SO character (0Eh) as a trigger to a routine that adds 128 (80h) to each character that follows the SO character. For example, in the shifted-out state, a 66 (42h) sent by the host is sent to the PPT device as a 194 (C2h).

ESC SI/ESC SO (ESCape Shift In/ ESCape Shift/Out) are escape character sequences that function identically to the SI/SO characters described previously. However, PPT automatically acts on ESC SI/ESC SO; no parameter selection is necessary.

ESC ' (ESCape apostrophe) is an escape character sequence that host programmers can use in conjunction with ESC SI/ESC SO and SI/SO to map characters 20h-3Fh to a lower range. One advantage of this mechanism is that host applications can access the range of characters used by the BMULTI protocol. Without this mechanism you could not, for example, send a 03 to a disk file because BMULTI would interpret it as a ETX character (ASCII value of 03).

When in the shifted-in state, PPT subtracts 20h from each character that follows ESC ', mapping them to the range 00-1Fh. When in the shifted-out state, PPT adds 60h (80h minus 20h) to each character that follows ESC ', mapping them to the range 80h-9Fh. The ESC ' sequence cannot be filtered out by the control filter.

EnableControlFilter (default = N): If Y (yes), the PPT control filter discards ("filters") nonprintable control characters in the hexidecimal range 00-06 and 0E-1F. PPT does not filter control characters in the range 07-0D (i.e., BEL, BS, HT, LF, VT, FF, CR). When PPT receives an ESC sequence, it filters the ESC character and sends the control characters that follow to the PPT device. The control filter cannot filter the ESC ' sequence.

EnableSplitEscChar (default = Y): If Y (yes), PPT recognizes the ESC FF (ESCape Form Feed) sequence as a command to split a spooled file. If the PPT device is a direct printer, an FF is sent to the printer. If the PPT device is a disk file, PPT ignores the ESC FF.

EnableLogicalACK (default = N): If Y (yes), PPT sends a user-selected character to the host whenever the print buffer is empty, including immediately after installation.

There are two separate methods for telling the host when PPT is ready for more data. In the default method, known as ACK Trigger Level, PPT asks the host for more data when its receive buffer is empty by putting its BMULTI address in the receive-ready state.

In the other method, known as Logical ACK (acknowledge), PPT sends a user-selected character to the host whenever the print buffer is emptied. If the buffer is still full and the host is polling PPT, PPT tells its BMULTI address to go into the idle state until PPT is ready to send the Logical ACK message. The Logical ACK character is dependent on the host application.

Logical ACK increases efficiency in the message send/receive cycle for any single address by alerting the host as soon as the PPT receive buffer is ready to accept more data. If you enable Logical ACK and the host does not poll, the purpose of LOG ACK is defeated. The format of the LOG ACK message is as follows:

```
S  A  A  S  L  E  B
0  D  D  T  0  T  C
H  1  2  X  G  X  C
               I
               C
               A
               L

               A
               C
               K
```

See Appendix A for a sample LOG ACK exchange between a host and BMULTI/PPT.

The Logical ACK mechanisms of PPT and the ET 1200 (release 9.0) are compatible.

SelectLogicalACK (default = 20h): A value in the hexidecimal range 20-7F representing the Logical ACK character. See the previous parameter.

EnableAutoSplitFF (default = N): If Y (yes), PPT recognizes the FF (Form Feed) control character as a command to split a spooled file. If the PPT device is a direct printer, a FF is sent to the printer. If the PPT device is a disk file, PPT ignores the ESC FF. Set to N if following parameter is set to Y.

EnableAutoSplitTimeout (default = Y): If Y (yes), PPT splits a spooled file after a time specified by the following parameter. Set to N if preceding parameter is set to Y.

SelectAutoSplitTimeout (default = 10 minutes): The number of minutes before PPT automatically splits a spooled file. This number represents idle time, i.e., the time after PPT last received data from the host.

EnableRcvTranslation (default = N): You should not under normal circumstances need to change this parameter. Burroughs uses it to create various international versions of PPT.

Address (default = none): This is the network address used by BMULTI for the PPT service. This value can be any two ASCII characters between 020h and 07Fh.

Space Compression

Space compression reduces the number of space characters sent over the data comm line, thereby using the data comm line more efficiently. The escape sequence for this is

```
ESC [ n a
```

where:

[is a required character

n is the ASCII representation of the decimal number of spaces

a terminates the sequence

The value of *n* is 0 <=n<= 32767. For example, the following sequence causes PPT to insert 120 spaces into the print buffer:

```
ESC [ 120 a (hex representation: 1B 5B 31 32 30 61)
```

This hex representation is the actual sequence of data transmitted over the data comm line. Because of differences in data types in various programming languages, the host programmer is responsible for determining the appropriate data structure that represents the hex values. For example, in ALGOL the escape sequence would be represented by

```
WRITE (LINE), ("abc", 4"27", "[00120a", "def", 4"0D25"));
```

Deinstalling PPT

The Deinstall PPT command dynamically removes PPT from background processing. This allows you to change installation parameters and reinstall the system service without having to reboot.

The deinstall utility must be executed in the primary partition of the workstation in which PPT is running. Therefore, you cannot deinstall PPT when running Context Manager.

You cannot deinstall PPT from a single partition operating system.

You must finish any application that uses PPT before using the deinstall utility.

You cannot deinstall PPT from an XE 520.

You must deinstall PPT on the workstation in which you installed it.

To invoke the deinstall utility from the Executive, type on the Executive command line:

```
Command   Deinstall PPT     GO
```

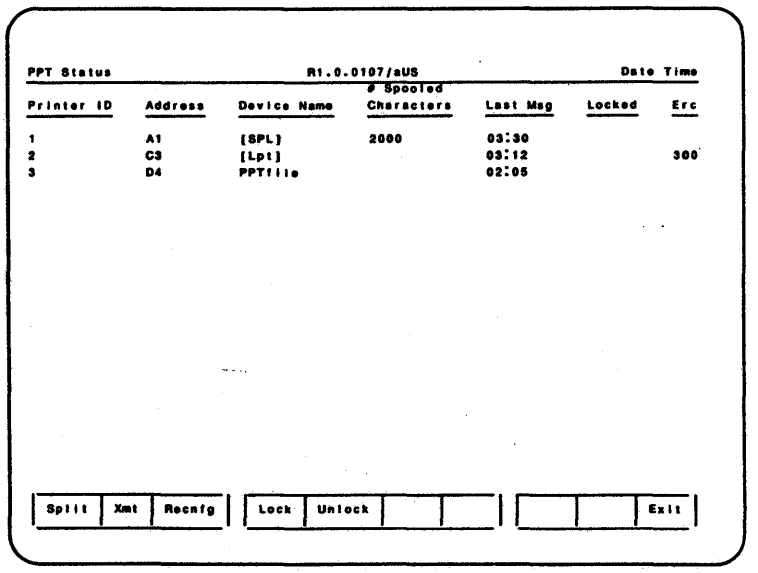
PPT Status

PPT status monitor utility displays the status of a single PPT device if you have installed Queue Manager locally or all PPT printers if you have installed Queue Manager in a BTOS master. It also provides subcommands for the following:

- Splitting a spooled printer
- Transmitting a message to the host
- Reconfiguring PPT parameters without reinstalling
- Locking and unlocking direct printers
- Exiting the status monitor utility

Enter **PPT Status** in the command line of the Executive to invoke the PPT Status display. Figure 2-1 shows a sample PPT status display.

Figure 2-1 **Sample PPT Status Display**



Printer Pass-Through Status Display

The upper portion of the display shows the current date and time as well as the column headings for each status category. This portion of the screen is always displayed.

The middle portion of the display shows the current status of all devices connected to PPT, and is updated every three seconds. You can scroll this portion of the display. Any line on this portion of the screen is marked in reverse video by cursor position.

The lower portion of the display shows which function keys on the keyboard activate the subcommands. This portion of the display is always shown.

The PPT status display may be used with the Context Manager.

For more information about spooled devices, use the Spooler Status command to view the spooler status display. See the *BTOS Standard Software Operations Guide (SSOG).*

PPT Subcommands

Split

The Split command is used with spooled printers. To queue a spooled file for printing, do the following:

1 Move the cursor to the line containing the address of the printer to be affected.

2 Press SPLIT (F1).

3 Press GO to execute the command or CANCEL to cancel it.

Split means to put all data previously received, including data present in the print buffer, into the spooler queue for printing (thereby closing the bytestream). A spooled file is split automatically if the autosplit timeout option is enabled. This helps prevent you from running out of room on a disk.

A split can also be effected by the ESC FF (ESCape Form Feed) sequence and FF (Form Feed) control character. For a discussion of their use, see Section 1, "Installing PPT on a Master, Standalone, or Cluster BTOS System."

XMT

The XMT function key is used to transmit a message to the host and can be used as follows:

1 Select the PPT address and press XMT (F2). The cursor will move to the input line at the bottom of the screen.

2 Enter the message.

3 Press GO to send the message or CANCEL to cancel the input.

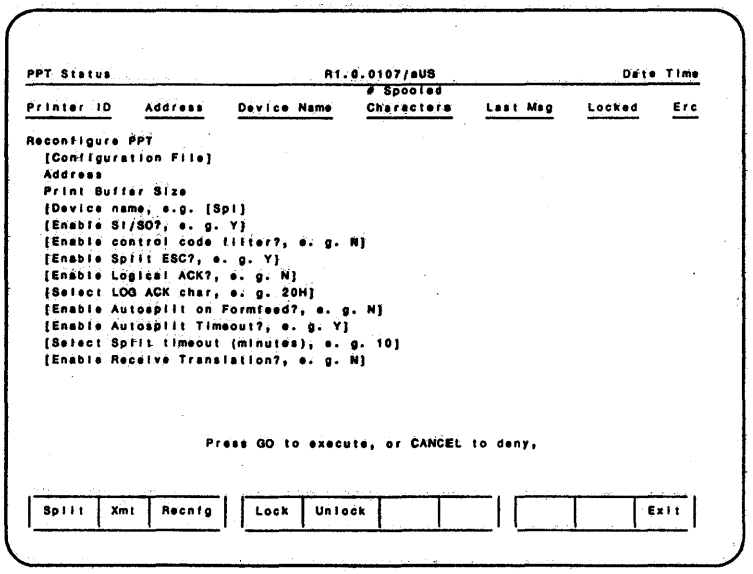
You cannot cancel the message once you have pressed GO.

Recnfg

RECNFG (F3) is used to change PPT parameters. Select the appropriate address and press RECNFG.

The status display is replaced by the Recnfg form (Figure 2-2).

Figure 2-2 **PPT Reconfigure Form**



The current parameters and recommended defaults are displayed. The PPT address and print buffer size are there for information only and cannot be changed.

Enter the changes in the appropriate parameter fields and press GO.

The status display is then redisplayed. You can cancel the input by pressing CANCEL.

Lock/Unlock

The LOCK (F4) and UNLOCK (F5) function keys are for direct printers.

Place the cursor at the address of the printer to be affected and press LOCK. This allows the direct printer to be used by other applications on the workstation. PPT data is not printed on that printer until it is unlocked.

Select the printer again and press UNLOCK to unlock the printer.

Exit

To exit from the status monitor utility press EXIT (F10) and GO or FINISH.

Errors/Error Recovery

If the direct printer is not ready or if a fault has occurred, a message appears on the PPT status display. Spooled printer errors are shown on the spooler status display.

To cancel printing, transmit the appropriate host command to abort the current job (e.g. **DS**). The transmit function key sends
an end message to the host.

Note: *BTOS requires that every printer have a printer device configuration file. In these files you can specify a transmission timeout, that is, the period that a workstation waits for a printer to send a "ready to print" signal. You should specify a transmission timeout in the configuration files of all PPT printers because PPT does not have an internal timeout mechanism.*

Printer Errors

Printer errors are shown on the PPT status display. Check the printer to see if it is offline or out of paper.

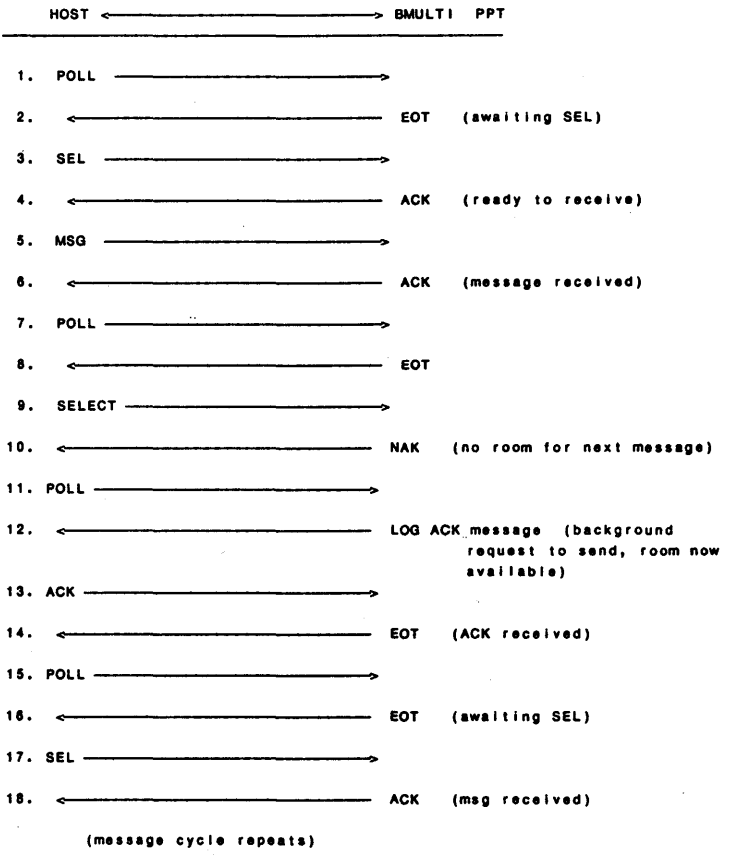
If PPT is using the spooler, use the Spooler Status command to view printer status.

System Command Errors

If an incorrect file name or parameter is entered, an error message appears on the screen. Enter the correct name or parameter to remove the error.

LOG ACK Exchange Sample

Figure A-1. **LOG ACK Exchange Sample**



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