

# The Software Toolworks

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SPOOL-N-GO  
HDOS Disk Spooler  
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A Product of  
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## 1. INTRODUCTION

SPOOL-N-GO is a software package which allows you to run programs on your computer at the same time your printer is listing a file.

Your computer is capable of creating formatted text, listings, and so forth, at dazzling speeds. But once your printer starts going, your computer just sits there and waits for it to finish. Often, you just sit there as well.

The problem is that your computer is only doing one thing at a time. Large timesharing systems, which are capable of doing several tasks at once, store files to be printed in a spool area on disk, and then print them out at printer speed. At the same time, the user can continue working without interruption.

SPOOL-N-GO applies the same principle to your computer, making it a miniature timesharing system. SPOOL-N-GO provides a device SP:, which works similarly to LP:. As you copy or output from a program onto SP:, printing starts, but your program continues and finishes running without waiting for the output. You can then run other programs while the printer catches up. SPOOL-N-GO "borrows" the tiny chunks of computer time needed to keep sending characters to the printer, but you will notice very little, if any, effect on the speed of even interactive programs.

Lines to be printed are stored on a spool file to which you may dedicate between 2 and 368 sectors on any 5 1/4 inch drive. The spooler then uses this spool file for temporary storage. It can hold up to 94,000 bytes of data waiting to be

printed. (More data can be printed than the spool file can hold, but program execution must wait until there is room in the spool file.)

SPOOL-N-GO runs on the H89/Z89 and H8 computers under the HDOS operating system, versions 1.5, 1.6 and 2.0, with 5 1/4" disk drives.

## 2. FEATURES

The basic function of any disk spooler is to spool output to the printer. However, SPOOL-N-GO incorporates several features which make its operation particularly flexible, convenient and smooth:

### 1. LP: driver compatibility

Use of the SP: device, and the SET SP: options, provide the same flexibility as the HDOS drivers for the H14 and Diablo printers. This lets you use the logical SP: device just as you now use LP:.

### 2. Dynamic spooler activation, deactivation and allocation.

The spooler command processor allows you to enable or disable the spooler at any time, and to allocate and release of disk space used by the spooler to suit the needs of your current program.

### 3. Dynamic printer activation/deactivation.

You can stop, restart or abort the printing of data after it has been spooled. This allows you to adjust print alignment, change forms, or abort a listing which was started in error.

### 4. Timesharing spooler operation.

The spooler uses clock interrupts to share the computer with your running program on a "timeslice" basis, just as large timesharing systems do. This allows the printer to operate with almost no visible slowing of your program, even an interactive editor or game.

### 5. Data Compression

The spooler compresses multiple spaces into a single byte for temporary storage on diskette. This permits many types of print data to be spooled using much less diskette space.

### 3. INSTALLATION

This section describes how to install SPOOL-N-GO on your HDOS system diskette. You may need to refer also to Sections 6 and 7 of this manual in order to get SPOOL-N-GO working with your printer. At the end of this section, there is a list of some of the special ways in which you can configure your spooler, and where to look for further instructions.

**IMPORTANT:** Be sure to read Section 4 carefully before using SPOOL-N-GO. That section lists several restrictions on the use of SPOOL-N-GO. Ignoring them can result in loss of data.

#### 3.1. Standard Installation Instructions.

- 1) Boot up your HDOS system diskette.

Mount the SPOOL-N-GO distribution diskette in SY1:.

If you have a Diablo printer,

```
COPY SP.DVD=SY1:SPH44.DVD
```

Otherwise,

```
COPY SP.DVD=SY1:SPH14.DVD
```

(If you have a single drive system, use ONECOPY instead of COPY.)

Reboot your HDOS system diskette.

- 2) Make sure file SET.ABS is on your system disk, copying it if necessary from the HDOS distribution disk. Using the HDOS SET command, alter the SP: driver options as needed. (See Section 7 for the SP: SET options available.)
- 3) Mount the SPOOL-N-GO distribution diskette in SY1:, and

```
COPY *.*=SY1:SPOOLER.ABS
```

```
COPY *.*=SY1:SPLLOG.ABS
```

If you have installed a PROLOGUE.SYS file on your system diskette,

```
RENAME USERLOG.SYS=PROLOGUE.SYS
```

Next,

```
COPY PROLOGUE.SYS=SY1:SPLLOG.ABS
```

Reboot your HDOS system diskette.

- 4) Allocate a spool file using the SPOOLER ALLOCATE command. See Section 6 for instructions on how to do this, but for



now you can use the command

```
SPOOLER ALLOCATE SY0:-20
```

which will allocate 20 disk blocks on drive 0. Or you can allocate some other number of available blocks instead of 20. The more you allocate, the further ahead of the printer your program can get. But the space you allocate will not be available to other programs.

Turn the spooler on with the command

```
SPOOLER ON
```

You may now use the SP: device just as you have been using the HDOS LP: device.

- 5) When you reboot, the spooler will normally be turned off. If your spooler file is on your system disk SY0:, you may configure SPOOL-N-GO for AUTO ON operator by the HDOS command

```
SET SP: AUTO-ON
```

If your spooler file is on another disk, see Section 8 for details of how to configure for AUTO-ON operation. If you do not configure for AUTO-ON operation, the spooler will be turned off every time you reboot, and you must turn it on again with the SPOOLER ON command before using it.

You may RESET your system disk while the spooler is turned on, but be sure to observe all the restrictions in Section 4.

### 3.2. Options in Installing and Using SPOOL-N-GO.

To set printer line length, character width, number of lines per page, etc., see Section 7.

To turn spooler on and off, abort printout, and reallocate the spool area on diskette, see Section 6.

To configure your system disk so that the spooler is automatically turned on when you reboot, see Section 9.

To use SPOOL-N-GO with printers other than the Hi4 or Diablo printers, see Section 9.

#### 4. RESTRICTIONS

It is very important that the following restrictions be observed whenever SPOOL-N-GO is in use:

- 1) Do not dismount the diskette on which the spool file has been allocated while the spooler is in the SPOOLER ON state. Always disable the spooler first using the SPOOLER OFF command. Failure to observe this restriction may cause loss of printer or diskette data.
- 2) Do not use the LP: device driver at the same time that the spooler is in the SPOOLER ON state. You may use the LP: device driver if the spooler is not on.
- 3) When the spooler is disabled with the SPOOLER OFF command, printing stops, and any data which has been spooled but not yet printed is lost.
- 4) In the SPOOLER ALLOCATE command, the specified disk drive must be one of the 5 1/4" diskette drives. Further, the logical drive specified must be the same as the physical drive number. (The only time this will not be the case is when you have booted from a drive other than the default system drive.)
- 5) This version of SPOOL-N-GO is not compatible with 8" drives, or any disk drives other than the single sided single density 5 1/4" drives. Performing operations on other than 5 1/4" drives while the SP: driver is printing is absolutely prohibited, and may cause loss of data.

## 5. SPOOL-N-GO DISTRIBUTION DISKETTE

The SPOOL-N-GO distribution diskette contains the following files. Many of them are to be installed on your system diskette in accordance with the instructions in Section 3.

### SPH14.DVD

This is the SP: device driver for the H14 and other printers which use hardware handshaking. It is loaded into memory when the system is booted, and becomes part of your resident operating system.

### SPH44.DVD

This is the SP: device driver for Diablo and similar printers which use the ETX/ACK protocol to control data transmission.

### SPLLOG.ABS

This is the spooler prologue program which, when installed as PROLOGUE.SYS on your system disk, is run automatically whenever you boot. Its function is to load the SP: device driver into memory and lock it, insuring that it will always be resident. To allow you to have your own prologue program, SPLLOG will transfer control to the program USERLOG.SYS, if it exists.

### SPOOLER.ABS

This is the spooler command processor. It allows you to issue commands to the spooler as described in Section 00.

### SAMPLE.ABS

This is a sample prologue file which turns the spooler on automatically when the system is booted. Its installation and use is described in Section 8.

### SAMPLE.ASM

This is the source code for SAMPLE.ABS.



## 6. SPOOLER COMMANDS

SPOOL-N-GO is controlled through the SPOOLER command. Once you have installed SPOOLER.ABS and the other spooler program files as described in Section 3, you can type the commands in this section any time you see the HDOS prompt ">".

If the SPOOLER command causes an error message to appear, check to be sure that a spool file has been allocated on a disk which is currently mounted. This can be done by using the HDOS command "DIR SYn:/s" (where n is a drive number) to see if the file SPFILE.SYS exists.

If the printer does not produce any output, check to make sure that the spooler has been turned ON, and that the proper SP: driver for the printer has been installed as described in Section 3, and configured for your printer using the SET commands in Section 7.

### SPOOLER HELP

This command prints out a brief list of the SPOOLER commands. For more details on a particular command, see the paragraphs below.

### SPOOLER ON

This command turns the spooler on. If you attempt to use the SP: device before you allocate a spool file and turn the spooler on, all data written to the SP: device will be ignored and lost. When the system is booted, the spooler is initially off; in order to print using SP: you must either execute a SPOOLER ON command or else configure SPOOL-N-GO for AUTO-ON operation (Section 8).

### SPOOLER OFF

This command turns the spooler off. When this command is executed, the spooler discards all data which has not yet been printed, and printing stops.

### SPOOLER STOP

This command stops the printer temporarily, but does not discard any data. This permits you to adjust or change print forms, etc., and then continue printing. While the spooler is stopped, you can still write data to SP:; only the actual printing is halted.

### SPOOLER START

This command starts the printer again after printing has been temporarily halted with the SPOOLER STOP command.

## SPOOLER STATUS

This command prints a message telling whether the spooler is ON or OFF. If the spooler is ON, it also lists the number of available sectors remaining in the spool file.

## SPOOLER ALLOCATE dvn:-nnn

This command is used to allocate an area of one of the 5" disks for use as a spool file. "Dvn:" is the physical drive on which the spool file is to be allocated, and "nnn" is the number of sectors to allocate on the diskette which is mounted on that drive. For example,

```
SPOOLER ALLOCATE SY1:-100
```

allocates a spool file containing 100 sectors on SY1:. The spooler must be OFF for this command to have any effect. The "dvn:" device must be a 5" disk drive, and the system must have been booted normally (i.e., from the drive which is usually SY0:). Once a spool file has been allocated on a particular diskette, that diskette should not be removed or dismounted while the spooler is ON.

## SPOOLER DELETE

This command deletes a spool file which was previously allocated by the SPOOLER ALLOCATE command. The spooler must be OFF for this command to have any effect.

## SPOOLER FP OFF

This command applies only to H8 computers. It disables the PAM-8 front panel update and refresh. Since the spooler "steals" time during clock interrupts, turning the front panel off can reduce the total system overhead during clock interrupts.

## SPOOLER FP ON

This command applies only to H8 computers. It enables the PAM-8 front panel update and refresh.

## SPOOLER RENAME dv:

Normally, the spooler device is called SP:. If you wish, you may rename it to be called by any other two letter device name. To do this, it is necessary to inform the SPOOLER and SPLLOG programs of the change. The SPOOLER RENAME command does this. For example, to rename the spooler device so that it is called LP:, perform the following commands:

```
RENAME LP.DVD=SP.DVD  
SPOOLER RENAME LP:
```

and then reboot the system.



## 7. SPOOLER SET OPTIONS

The SET command described in your HDOS manual can be used with the SP: device driver to configure it to your system needs. In order to invoke a SET option, the file SET.ABS from your HDOS distribution must be on your system disk.

NOTE: Since the SP: driver is always loaded into memory, you must reboot your system after invoking a SET option before it actually takes effect.

A SET option is invoked by typing the HDOS command

SET SP: command

### Options for use with all printers

- HELP Prints a brief list of all SET options. For details of each option, see the following paragraphs.
- LINES nnn "nnn" is a number between 0 and 255. This sets the number of lines to be printed on a page before a form feed is automatically performed. By setting LINES to zero, you may disable automatic form feeds entirely. The default is LINES 60.
- PORT nnn Sets the base address of the port which you are using to communicate with your printer. The default port address is 340.
- BAUD nnnn Sets the baud rate for transmission of data. This should be set to correspond with the baud rate at which your printer is set to receive data. Default is 4800 for H14 and compatible printers (SPH14.DVD), and 1200 for Diablo and compatible printers (SPH44.DVD).
- AUTO-CR Causes the spooler to insert a carriage return after each line feed and form feed. This is the default for Diablo and compatible printers (SPH44.DVD).
- NOAUTO-CR Suppresses insertion of a carriage return after each line feed and form feed. This is the default for H14 and compatible printers (SPH14.DVD).
- CTS Causes the spooler to perform hardware handshaking using the CTS (Clear To Send) control line. This is the default option.
- DTR Causes the spooler to perform hardware handshaking using the DTR (Data Terminal Ready) control line. The default is to use CTS.

- AUTO-ON Causes the spooler to be enabled (SPOOLER ON) automatically during the boot process. For a description of how to install this feature, see Section 8. The default is AUTO-OFF.
- AUTO-OFF Causes the spooler to be disabled (SPOOLER OFF) after booting, until a SPOOLER ON command is executed. This is the default.
- H14 Causes the spooler to output H14 control sequences to the printer to set the character width and number of lines per inch at the time SP: is opened. This is the default.
- NOH14 Suppresses sending of H14 control sequences to the printer at open time. This option should be selected when using a printer other than the H14.
- VAL Validates characters to insure that only valid printing characters and H14 control sequences are sent to the printer. This prevents physical damage to the H14 which can be caused by invalid control sequences. VAL is the default option.
- NOVAL Suppresses validation of control sequences. This option should be selected when using a printer other than the H14.

#### Options for use with the Heath H14 printer

- LPI n Sets the number of lines per inch. Valid values for "n" are 6 and 8. The default is 6.
- WN nnn Sets the number of characters per line for the ON setting of the WIDE CHAR switch on the H14. Valid values for "nnn" are 80, 96 and 132. The default is 80.
- WW nnn Sets the number of characters per line for the OFF setting of the WIDE CHAR switch on the H14. Valid values for "nnn" are 80, 96 and 132. The default is 96.

#### Options for Diablo and compatible printers

- BURST nnn Sets the burst count, or number of characters to be transmitted to the printer before waiting for the printer's internal buffer to empty. The default is 32. For best printer performance, the burst count should be set to the size of the printer's character buffer.



## 8. AUTO-ON PROCESSING

When the system is booted, the following steps are performed for to place the spooler in operation:

1. The SP: driver is loaded and locked into memory.
2. A disk is mounted with a spool file allocated on it. This can be done by executing the SPOOLER ALLOCATE command, by having a spool file previously allocated on the system disk, or by mounting another disk (on SY1:, for example) which has a previously allocated spool file on it.
3. The spooler is enabled by the SPOOLER ON command.

When the spooler is installed with AUTO-OFF (the default), as described in Section 3, the SP: driver is loaded by the SPLLOG.ABS program, running as PROLOGUE.SYS on your system disk. It is up to you to allocate the spool file or mount a disk with a previously allocated spool file, and to turn the spooler ON after booting.

AUTO-ON provides two alternatives under which the spooler is automatically turned on when the system is booted. The simplest alternative, described in Section 3.1, is to allocate the spool file on your system disk, and use the SET SP: AUTO-ON command to activate the spooler automatically upon reboot.

However, you may wish to bring your system up automatically in some special configuration which would conflict with the way the spooler is usually placed in operation. For example, you may wish to allocate a spool file on SY1: or SY2:, which means the disk with the allocated file must be placed in the proper drive and mounted before the spooler is turned on. Or you may want to boot from the system disk, load the SP: driver, then reset the system disk in order to run in STAND-ALONE mode, with the spool file on the STAND-ALONE disk.

You can do this sort of thing automatically during the boot process by installing SPOOL-N-GO as follows. You must provide a PROLOGUE.SYS program which does whatever processing you wish to perform, makes sure the disk with the spool file is mounted (if it is other than the booted system disk), and links to, or executes, the SPLLOG.ABS program, which will turn the spooler on.

The file SAMPLE.ABS on the distribution diskette is a sample of such a prologue program, for use when the spool file is allocated on SY1:. It simply mounts SY1: and links to SPLLOG.ABS. The source for the program is provided as SAMPLE.ASM, so you can modify it to suit your own needs.

To install SPOOL-N-GO to operate with such a prologue program, install as described in Section 3, but copy SY1:SPLLOG.ABS to SY0:SPLLOG.ABS, and copy SY1:SAMPLE.ABS (or



your prologue program) to SY0:PROLOGUE.SYS. Allocate the spool file, and make sure when you boot that the diskette is in a drive where it will be mounted. Execute the command

```
SET SP: AUTO-ON
```

Now each time you boot the spooler will be enabled automatically.

Following is the source listing of the SAMPLE.ASM prologue program:

```
**
* SAMPLE AUTO-ON PROLOGUE PROGRAM
*
* THIS IS A SAMPLE PROLOGUE PROGRAM FOR USE WITH THE AUTO-ON
* SPOOLER SET OPTION. THE FUNCTION OF THIS PROGRAM IS TO MOUNT
* THE DISK THAT CONTAINS THE SPOOL FILE AND LINK TO SPLLOG.ABS
*
* USEFUL SCALL EQUATES
*
* OTHER EQUATES
USERFWA EQU 042200A START OF USER PROGRAM AREA
NL EQU 012Q HDOS NEW LINE CHARACTER

ORG USERFWA
ENTRY DS 0 PROGRAM ENTRY POINT
**
* USER PROCESSING MAY BE PERFORMED HERE
**
LXI H,SYLDEV (HL) = POINTS TO 'SYL:'
SCALL .MOUNT MOUNT THE DISKETTE
JC ERROR IF ERROR -> EXIT

LXI H,SPLLOG (HL) = POINTS TO 'SPLLOG.ABS'
SCALL .LINK LINK TO SPOOLER PROLOGUE PGM

ERROR MVI H,NL (H) = NEW LINE CHARACTER
SCALL .ERROR PRINT ERROR MESSAGE
XRA A (A) = ZERO
SCALL .EXIT RETURN TO HDOS

SYLDEV DB 'SYL:',0 DISKETTE TO MOUNT
SPLLOG DB 'SY0:SPLLOG.ABS',0

END ENTRY
```

## 9. PRINTER INTERFACING

Most printers use some type of handshaking, or control arrangement, in order to prevent the computer from sending characters faster than the printer can accept them. SPOOL-N-GO supports several types of handshaking. This section details how to configure the SP: driver to work with each of them.

If your printer is not covered below, consult the printer documentation to determine which of the printers below is most similar to yours, and configure SP: accordingly. You may need to set switches on your printer in order to make it respond to one of the types of handshaking supported by SPOOL-N-GO.

If none of these configurations works, your printer is not compatible with SPOOL-N-GO, although you may still be able to use it by setting the printer and SP: baud rate low enough that the printer can keep up without handshaking.

### Heath H14 Printer

This device uses the CTS line as a printer busy signal. When the printer's buffer is full, it sets the CTS line to the ON state to indicate that it can not accept any more characters. To configure SP: for the H14, use the SET SP: CTS command.

### Diablo and compatible printers

Diablo printers, and those which are "Diablo-compatible", can use the ETX-ACK form of handshaking. The computer sends a burst (a number of characters which is not enough to overflow the printer's buffer), followed by the ETX control character. When the printer gets to the ETX character in the buffer, it sends back an ACK character which indicates that the computer can send another burst. For Diablo and compatible printers, use the SPH44.DVD driver. You may also want to use the SET SP: BURST command (Section 7) to increase the burst count, in order to print more efficiently, if your printer has a buffer larger than 32 characters.

### Most other printers

Most printers (e.g., the TI-810, IDS-440 Paper Tiger, and Base-2) use the DTR signal as a printer ready signal. This line is set to the ON state to indicate that the printer can accept characters. To configure SP: for these printers, use the SET SP: DTR command.

10. PROBLEMS AND ENHANCEMENT REQUESTS

While no warranty is made for this product, either express or implied, every effort has been made to find and fix errors prior to release of this software. If you should find an error, or would like to suggest enhancements and improvements, you may fill out this form and return it to Barnard Software Services. We will do our best to find and correct any error.

When describing a problem, please be precise enough, if possible, to allow us to duplicate the problem on our computer.

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Home Phone: (402) 475-4471  
Work Phone: (402) 474-8305

Purchaser Name and Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

Hardware: CPU \_\_\_\_\_ Memory \_\_\_\_\_ K Disks \_\_\_\_\_ drives

Other equipment: \_\_\_\_\_

Version of SPOOL-N-GO: \_\_\_\_\_

Suggestion or Description of Problem:

Most printers (e.g., the TI-810, IDS-440 Paper Tiger, and Base-2) use the DTR signal as a printer ready signal. This line is set to the OK state to indicate that the printer can accept characters. To configure SP: for these printers, use the SET SP: DTR command.