

XEROX
PALO ALTO RESEARCH CENTER
Computer Science Laboratory
August 27, 1979

To Spruce Users and Installers
From Dan Swinchart
Subject Spruce Reference Manual
Filed as [Maxc]<Spruce>SpruceManual.Press

This document describes the procedures for printing Press files using the Spruce printing service on an Alto II/Orbit/Printer configuration. It is also a reference manual for the operation and installation of the Spruce program. Charts summarizing these procedures appear in appendices.

Spruce Operations

Capabilities

The Spruce software is capable of printing a subset of Press format files. It will print characters, rectangles, and the Alto resolution bit map output from Draw and Markup. It will not print bit maps at other resolutions, objects, half-tones, etc. Spruce does implement the "only on copy" feature.

Spruce runs on Dovers and other Press printers. Recommended resolutions are in the range 300 to 384 bits/inch (most, if not all, current systems run at 384. See [Printing] for a fuller discussion of these options, and for details of Spruce configurations in Palo Alto.) Color pictures can be printed by treating each group of three Press pages as the three color separations (magenta, yellow, cyan) for a single piece of paper. The ability to print bit maps is limited, especially on Dover, by memory and bandwidth limitations.

Spruce will run in a stand alone mode, printing Press files that reside on the Spruce disk. However, its intended use is as a server, receiving and printing Press files using the EFTP protocol. See [Printing] for a complete description of methods for transmitting files to Spruce servers.

A Spruce system may be configured to run with either one or two Diablo Model 31 disk drives, or with one Model 31 and one T80 drive (yielding considerable performance and capacity improvements). The single-drive system has only limited font and spooling capacity.

Spruce and Fonts

Unlike earlier printers, fonts may not be sent to a Spruce system, but must already reside in its local storage. When Spruce cannot find a requested font, it substitutes one that seems to have similar attributes, reporting a substitution on the break page. The substitution may or may not be acceptable to the user. See [Printing] for a typical set of Spruce fonts.

The Break Page

The break page contains a region reserved for comments about the user's Press file. Spruce inserts these to indicate that some font was not available, some entity could not be fully printed, etc. When there is a problem severe enough to suspend Press file processing, the user will be blessed with a lone break page containing the explanation. If the offending file does not even look like a Press file, the sender and file name will not be identified on the break page.

What To Do When it Crashes

If red lights are on on the printing machine, and Spruce is oscillating between a status report and a blank screen, *do not touch the keyboard* (except perhaps to disable printing -- see below). Arrange to get the offending condition cleared, and Spruce should continue normally.

If you find Spruce in Swat, or otherwise hopelessly lost, try to locate a Spruce maintenance person. Failing that, record the screen, and try <ctrl>P (proceed). The program should recover from the problem. If it does not (swats again, or does something really odd), boot the machine and restart Spruce.

Report all abnormal occurrences, hardware or software, in the nearby log book, if there is one. Otherwise, send a message to the appropriate authority. Please do not restart a Spruce server without submitting a report.

Important

If you have been using a printer system in stand alone mode, or for some other purpose, always return it to server operation before leaving it, unless something is broken.

The following sections describe the operator functions in both server and stand alone modes. Instructions for restarting Spruce are found in the stand alone section.

Spruce as a Server

To run Spruce as a server, be sure it is installed properly, then simply type:

Spruce Server^{CR} -- *But be sure to read the Restarting section on the next page!*

Commands

When Spruce is processing or printing a file, it must turn the display and keyboard off. Thus, it will only accept interactions with an operator when it is idle, or when it is receiving (spooling) a file from some remote user. You will be able to identify the interactive state because status entries for the last few documents to be handled will be visible on the screen.

There are only a few interactive Spruce server commands. Each is specified by typing one character. Some then require additional input.

- | | | |
|---|---------------------|--|
| S | start/stop spooling | When Spruce is started, it is set to accept Press files from remote users. It is sometimes convenient to disable spooling activities for a while (perhaps in preparation for taking the system down.) This command toggles the "spooling switch", and tells you the new state. After you disable spooling, one more file might arrive. |
| P | start/stop printing | This command toggles the "printing switch". Spruce is initially set to print files as they arrive. One should disable printing, for instance, in order to take the printer down for cleaning or other maintenance. |
| C | check queue | This prints identifying information for the last few Press files that have been received, along with their current status (pending, in progress, printed, etc.) This is a good first-level check that Spruce is up and operating normally. |
| V | verify queue | Performs the "check queue" operation, pausing after each line for a one-character confirmation. Type <i>P</i> to finish the list without further pausing. |
| R | reason | One must next type a line, terminated by carriage return, that will be sent with other status to remote users when spooling is disabled. This allows one to specify the reason that Spruce is unavailable. |
| M | modify queue | This command provides a limited repertoire of operations for reprinting documents, aborting troublesome ones, etc. See the <i>Queue Modification</i> section on the next page. |
| Q | quit | Causes Spruce to finish and return to the executive. |

Status reporting

Spruce displays the remote host identifier, file name, sender, and internal numeric identifier for each Press file up to three times during its stay: when the file has been successfully received, when it has been printed, and when its contents have been overwritten by a newly arrived Press file. This information disappears when processing of the next file begins.

Spruce will also display a message when a problem is detected in the Press file or in program or printer operation. When the printer is in trouble, the system will cycle between a display-off state when it is checking to see if the problem has vanished, and a display-on state when it is reporting the problem. If you think the problem will take a while to fix, try to catch Spruce in the display on state and disable printing (and possibly spooling).

If Spruce requests that you notify maintenance personnel, please do so.

Special Server Functions

Queue Modification

This facility is currently in a particularly primitive state. Using it, one can request that a document which is still available but has already been printed be reprinted, or that a document that is scheduled for printing (or is already in progress) be marked *printed* (and thus be effectively aborted.) These activities apply only to the files that appear in response to the *C* (check queue) command, usually the last 25 or so that have been received.

To use this function, type "M" (for "modify queue".) The currently-queued files will be presented, one at a time. Respond with:

- R To cause the document to be reprinted.
- A To abort the printing of the document.
- P To complete the file listing without modifying any more files.
- CR To advance to the next file.

If the printing of documents is enabled when the *R* option is chosen, the selected document will be reprinted right away. Therefore, it is wise to disable printing (see the *P* command, above) before using the *M* command.

Interrupting the Printer

Although the keyboard functions are not available when the printing subsystem is running (the screen is blank except for a cursor), one may attract the attention of the spooling subsystem by pressing the ESC key. You may have to do this several times, especially if the printer itself is running. When the status legends appear, indicating a return to the spooler, you should toggle the printing switch (using the *P* command) to inhibit the return to the printer, which will otherwise occur within 10 seconds or so.

Restarting

Spruce saves sufficient information about the files it has queued for printing that it can be restarted, in most instances, without losing any files. This is true whether system operation terminated due to power failure, a crash in the printer or spooler subsystem from which manual continuation does not seem possible, or in response to the *Q* (quit) command. Restarting after the use of *Spruce/I* (see installation section) to change installation options does not currently work, although it is (errantly) permitted. Be sure to start over, using "Spruce Server", whenever you have performed any installation activity.

To invoke the restart action from the Alto Executive, simply type

```
Spruce RestartCR
```

Spruce should quickly bring up its status display. It will have both spooling and printing inhibited, so that you can use the *M* (modify queue) command to adjust the queue (perhaps to flush an offending file or to flush files that have been printed but not recorded.) Be sure to toggle both the spooling and printing indications before leaving the site. If this process does not seem to work well, quit or boot and do a cold start (via "Spruce Server".)

Spruce as a Stand Alone Printer

The Print Command

The basic command to Spruce is "Print," followed by a file name. Thus

```
>Spruce print memo-1.press
```

will invoke the process of printing the file "memo-1.press." The Spruce command words (e.g., "print" above) can be abbreviated as long as they remain unambiguous.

If you wish to override the number of copies specified in the Press file (usually 1), append the clause "copies n" to the end of the command:

```
>Spruce print memo-1.press copies 3
```

If you wish to print certain pages selectively, you may append the clause "page n" or "pages n to m" to the command:

```
>Spruce print memo-1.press page 2
>Spruce print memo-1.press pages 3 to 4
```

Spruce takes some time to format the files properly and begin printing. If you simply wish additional copies of a file you have just printed, you may avoid the formatting delay by using the "reprint" clause in place of the "print file" clause:

```
>Spruce reprint page 2
>Spruce repr cop 2
```

"Wrong" pages. If Spruce prints your document, but it doesn't seem to have the right things on it, it may be that the Press file was trivially invalid. You can run Spruce again, with the "verbose" mode enabled, and see if it indicates any problems. Use the /V switch:

```
>Spruce/V pri memo-1.press
```

In some configurations, "verbose" mode is the default. The /V switch will disable it.

Illegal Press files. If Spruce complains that your file is illegal, and you suspect the method used to generate the file, the program ReadPress (see the bibliography), which prints on your screen a quasi-intelligible dump of the Press file, may be helpful in tracking down the problem.

```
>ReadPress memo-1.press
```

will bless you with more information that you can handle!

Complete Command Description

The repertoire of Spruce commands offers several options when a file is printed. The format of the command line is:

>Spruce/switches option <arg> option <arg> ...

The "switches" govern the overall operation of Spruce; the "options" label the specific options being used and can be abbreviated as long as they remain unambiguous; most of the options take arguments.

Options:

- | | |
|------------|--|
| Server | This command may appear alone, or in conjunction with a stand-alone command. It starts Spruce in server mode. To run Spruce as a server, type "Spruce server ^{CR} " to the executive. See the previous section for subsequent operation. If another command appears, it will be obeyed before entering server mode. |
| Restart | Type "Spruce Restart" to attempt a recovery from catastrophic error or other spooler termination. Then adjust the queue as necessary and enable spooling and printing. If this fails, perform a cold start using the <i>Server</i> command. |
| Print | This is the main command to print a Press file. The argument is the name of the file to be printed. Example: "Spruce print memo-1.press". |
| Copies | The argument is a number, the number of copies of the document that should be printed. Default is "Copies 1." |
| Pages | This option governs which pages of a file will be printed. Standard use is with the "to" option: "Spruce print memo-1.press pages 2 to 3". If the page range does not match the page range of the Press file, the largest overlap of the two ranges is printed. Default is "pages 1 to 99999." |
| RePrint | The file most recently printed is re-printed, avoiding the scan-conversion processes. The "Copies" option applies to reprinting. Not available in server mode. |
| XOffset | This option allows the page to be displaced in the X direction on the page, by an amount given by the argument (in inches). This feature may be disabled. |
| YOffset | This is analogous to XOffset, but governs vertical displacement. |
| Resolution | This option allows a user to override the default setting of the resolution of the output device being used. Be warned that changing resolution will usually result in poor font matches from the font dictionary. The argument is the resolution, measured in bits per inch. |
| PowerOn | Used to set the printer's internal clocks and to stabilize them before running the printer. This function is usually performed adequately each time a document is printed, but it can be used alone to be sure things are set right before performing diagnostic tests, etc. |
| PowerOff | Not applicable to current Spruce printers. |

There are two global switches that alter the use of Spruce: /V (verbose) gives better error messages. /D is equivalent to the Debug 32 (usually -- don't really print) option.

- Debug The argument is a decimal number comprising the sum of several option codes. These are for use by Spruce maintenance people only:
- 1 The printing program (Sprint) pauses just before processing and printing a file. It pauses by entering Swat.
 - 2 File processing and printing is inhibited, but the printing program (Sprint) is brought in.
 - 4 Any printing program (Sprint) error condition is reported via Swat, before standard error recovery procedures are invoked. This function is inhibited if the code 512 (don't Swat) is also present.
 - 8 The printing program will not monitor the Ethernet for spooling requests. It will therefore be totally unavailable while processing and printing files. It will not even respond to simple status requests.
 - 16 The printing program will monitor the Ethernet (unless code 8 is also requested), and will respond to status requests, but it will not suspend processing or printing to accept additional files.
 - 32 The printing program will process files, but will only pretend to print them. This is useful when one's Alto can only pretend to have a printer.
 - 64 The printing program will call Swat when it has swapped in the processing overlay, but has not yet started processing.
 - 128 The printing program will call Swat when it has swapped in the printing overlay, but has not yet started printing.
 - 256 Spruce (the spooling program) pauses via Swat whenever it regains control, either on completion of printing several files, or due to some error detected by Sprint.
 - 512 The printing program, Sprint, will never invoke Swat due to an error it detects. Instead, for otherwise fatal errors it will terminate printing the file and report the problem to the spooler. That file being processed will not be retried. System errors may still, at this writing, invoke Swat.
 - 1024 Spruce will not invoke Swat. This feature is not implemented, so it is fortunate that Swat is rarely invoked in Spruce.

Spruce Installation

This section describes in detail the installation of a Spruce system for any of the currently supported printers.

Operating Files

Six files are needed to produce a Spruce system. Five may be obtained from the dump file [Maxc]<Spruce>Spruce.dm. They should all be placed on the server's DP0 disk:

File	Description
Spruce.Run	The spooling program
Spruce.Syms	
Sprint.Run	The printing program
Sprint.Syms	
Spruce.Errors	Error messages

In addition, one must obtain a version of the font dictionary, *Spruce.Fonts*, appropriate for the printer, the disk configuration, and other installation-dependent conditions. Each installation tailors the font directory to its own needs. For more information about font production, see [Fonts] and [PrePress]. Also, please consult your local font experts.

Finally, several other files will be produced during installation. They will contain spooled Press documents, system state information, and intermediate results. They are:

File	Disk ¹	Size ²	Comment
Spruce.Spool	any	option ³	Spooled Press documents for server
Spruce.Bands	any	option ⁴	Intermediate file processing results
Spruce.CheckPoints	DP0	ca. 40	Holds installation values, file descriptions

1 DP0 -- DP0 only; any -- either M31 or T80.

2 In disk pages, for whichever disk is chosen -- 256 words each for M31s, 1024 words each for T80.

3 Supplied at installation time. This file must hold all documents that have been spooled but not yet printed. See the chart at the end of this section for typical values. For stand-alone systems, this file must exist, but may be made as small as is desired.

4 Supplied at installation time. This scratch file contains the results of the pre-scan pass over the Press file. Its size, for the largest Press file to be accommodated, must be roughly $(2c + 4r + 80s)$ words, where c is the length of the Press file in bytes, r the total number of rectangles, and s the total number of different font characters used in the file. Again, see the chart below for typical values.

It is important for correct operation that the various files be allocated contiguously, or at least nearly so. Therefore, the following procedure is recommended for initial installation.

Complete Spruce Installation ("from scratch")

First, obtain a disk whose current contents is not valuable. Use the "Ether boot" facility to obtain a new operating system. Install it using the long installation dialogue, erasing the disk first. *Do not install a password.* Provide the Alto's name as the user name: "Menlo", "Clover", etc., and a disk name of "Spruce Server" or "Spruce Dover Server".

Unless you are producing a T80 installation (whence space is not at a premium on DPO), you should immediately delete DMT.Boot and FTP.Run. Then use the "Ether boot" facilities to run Ftp, and obtain <Alto>Installswat.Run (from [Maxc] or your local IFS if it's there.) Run InstallSwat, then delete InstallSwat.run.

Get FTP back, then fetch the Spruce operational files from [Maxc]<Spruce>Spruce.dm, plus the appropriate *Spruce.Fonts* as described above. You should also get <Alto>Sys.Errors.

Now type "Sprint^{CR}". This will install the printing program. It should type the current Sprint version number, run for less than a minute, then exit.

Finally, type "Spruce/I^{CR}". This will produce the Spruce installation menu, whose use is described on the next page.

Subsequent Installations

Once-Only Procedure: *When updating from Spruce 8.x or earlier to Spruce 9.y or later, delete the file Spruce.CheckPoints before proceeding. This is very important!*

If you have fetched a new font file or either of the new run files, if you need to modify the size or location of any of the scratch files, or if you need to modify any of the printing parameters (see next page), you should first run Sprint (type "Sprint^{CR}"), then proceed to the installation sequence (via "Spruce/I^{CR}".) It is not strictly necessary to run Sprint unless Sprint.Run has changed, but it will never hurt anything, it is sometimes necessary to clean up messy situations, and it is always recommended.

Spruce, as distributed, contains defaults to install a Dover system at 384 bits/inch, with average printer-dependent adjustments (see below). On subsequent installations, unless the spooling program's version has changed, the most recently installed values will be used as defaults.

Version Numbers

Both the spooling program, *Spruce*, and the printing program, *Sprint*, contain a version number of the form (*major version*) . (*minor version*) (e.g., Spruce version 8.3). It is intended that Spruce version *n.x* will run successfully with Sprint version *n.y*, for any *x* and *y*. The system will refuse to start if the major versions differ. Fetch the most recent versions and continue.

Printer Parameter Installation

When you enter spruce via "Spruce/I", you are presented with the following menu:

DEVICE PARAMETERS			
Printer Type	<input checked="" type="checkbox"/> Dover	<input type="checkbox"/> Epson 2	<input type="checkbox"/> Epson 3
Paper Size	Scan Direction	<input type="text" value="8.5"/>	Bit Direction
Resolution	Scan Direction	<input type="text" value="384"/>	Bit Direction
Margin Adj.	Scan Direction	<input type="text" value="190"/>	Bit Direction
Scan Line Length	<input type="text" value="11.7"/> (in)	Paper Speed	<input type="text" value="10.2"/> ips
Printer Name	<input type="text" value="Clover"/>	Debug Settings	<input type="text" value="#40"/>
<input checked="" type="checkbox"/> Landscape	<input checked="" type="checkbox"/> First Page First	<input checked="" type="checkbox"/> No Break Page	
<input type="button" value="QUIT"/>	<input type="button" value="INSTALL FILES"/>		

This is a typical menu-based presentation, using the ubiquitous menu package produced by Keith Knox (WRC). One or two words should suffice to describe it:

There are numerical (or string), selection, and boolean parameters.

An example of a numerical parameter is the Scan resolution. One selects it by clicking any mouse button while the cursor is positioned over its box, then types the new quantity, terminated by CR -- standard sorts of editing operations also work.

The printer type (Dover, etc.) is a selection parameter. For some perverse reason, the selected printer is displayed as black text on white background, while the rejected ones are shown in the inverse sense. Let me know how you would like that choice if you weren't already used to the opposite approach.

There are two kinds of boolean parameters. The landscape/portrait mode option is an example of the first -- clicking the box toggles the underlying parameter and reflects the choice by modifying the legend. The other kind, seen only in the files menu (two pages hence), is *true if it is displayed as black text on a white background, false if inverted* -- again, a perverse reversal of the standard inversion scheme.

Description of Printer Parameters

If you haven't fetched a new version of the run files, all parameter settings will be remembered from installation to installation.

Printer Type. Select one of the available printers. A number of the other parameters, described below, will now change to reflect typical default values for that kind of printer. You must now modify those to suit.

Resolution: The number of scan lines per inch and bits per inch for the device. This value depends on the capabilities of the device and on the resolution of characters in the current *Spruce.Fonts* dictionary. I believe that all current systems run at 384 dots/inch.

Paper Parameters, Printer Parameters: These are values that describe the physical parameters of the printing device and the paper it prints on. They are used to control the actions of the imaging

hardware. See the chart at the end of this section for typical values.

Margin Adjustments. These numbers should be used to center the Press page image on the real page. The default values are approximately correct for Dover, although the actual values vary from printer to printer and from time to time. The printer-dependent values given in the appendix were once correct, but will probably not remain so. Use the file Align.Press, a cross whose arms are 5" long, and whose center is at the center of the page. Larger values for "scan margin adjust" move the image to the right. Larger bit values move the image towards the page top. On "portrait mode" printers (Dover is a "landscape mode" printer, since the paper moves sideways through the machine), scans move the image down and bits move it to the right. The alignment file is supplied as part of the Spruce release.

To adjust the length of the arms of the alignment cross to exactly 5", you can try modifying the scan line length and paper speed parameters. Scan line length can be adjusted in .1" units, paper speed in units of .01"/sec.

Break Page/No Break Page: Determines whether an informative title page will be issued as the first page of each document. Enable the break page unless your printer is very slow and is used by only a small number of people.

Landscape/Portrait Device: You should change the defaults only to obtain certain novel effects.

Printer Name: defaults to the disk installation name. This name will be used in display and status messages to the clients.

Debug Settings: This value provides the Debug argument to be supplied when the global "/D" switch is used. As distributed, it is 32 (40b): Spruce will not actually try to run the printer.

To abort the installation without changing any values, click the *Quit* menu item in the bar below the window. To accept the printer parameters and proceed to file installation, click *Install Files*.

File Parameter Installation

The second and final menu facing you looks like this:

FILE CONFIGURATIONS			
Disk Configuration	<input checked="" type="checkbox"/> DP1		Trident
Spruce.Errors	38	pp	DP0
Spruce.Fonts	2503	pp	Trident
Spruce.Spool	1500	pp	DP0
Spruce.Bands	3000	pp	Trident
QUIT	INSTALL		

Description of File Parameters

Disks. To produce a single-disk system, or a system where two model 31s are configured as one file system, do not change the default disk settings. When using two model 31s, however, it is preferable (because it minimizes head motion) to configure them separately, placing *Spruce.Fonts* and *Spruce.Bands* on DP1, everything else on DP0. By far the preferred configuration uses a T80 to hold the *Spruce.Fonts*, *Spruce.Spool*, and *Spruce.Bands*. When using this configuration, the second model 31 is legal, but relatively useless. Remember, *a disk is considered available if its menu entry is shown as black text on a white background*. The installer must explicitly toggle each disk entry to indicate interest in that disk. Spruce will refuse to consider a disk which is not currently connected, on line, and possessing a valid format.

Files. The menu contains one line for each file, with fields for specifying the file's size and disk location. Spruce will try to find each of the named files on the currently-specified disk. If successful, the file name will appear in black text on white background, and its size (in pages) will be indicated. Otherwise, the name field will remain inverted, with a null size field.

For each file, first select the desired disk by toggling the associated disk entry until the right name comes up. Spruce will try to find a matching file. Failing this, fill in the size field, then click the file name entry. Spruce will create a file of the appropriate size.

To place a file on a different disk, toggle the disk entry and repeat the above steps. To change the file's size, fill in a new size entry and click the file name entry. To cause Spruce to rebuild its structures representing a previously-installed file (black on white background), toggle the file name and wait for it to return to the installed state -- see *TroubleShooting*, below.

Finishing up. Finally, to accept the files as produced and modified, click the *Install* button, and wait for Spruce to finish. The system is now ready for operation. If you run into trouble along the way, click the *Quit* entry to return to the executive, fix the problem (see below), then repeat the installation sequence.

Trouble Shooting

If, during or after installation, there are zero or fewer free pages remaining on any of the disks, perform the whole process over, reducing the size of the bands or spooling file as needed. As a guideline, after running *Sprint*, the spooling and bands file sizes may be chosen to use up all but 257 of the remaining pages on DP0, and essentially all the pages on other disks. We suggest leaving at least

20 additional pages for breathing room -- to allow larger program files, small Press files to be printed in stand-alone mode, etc.

If, after Spruce has been successfully running for some time, things go bad and it looks like software, *try re-installing both Sprint and Spruce* before resorting to sterner measures. If Spruce seems to be having trouble accessing its files, try verifying each file, even if it appears to be properly installed, by toggling its name entry in the file parameter menu.

Never try to perform a "Spruce Restart" after an installation sequence. In a future release, this action will be either prohibited or made to work.

Typical Spruce Installation Values for Dover

Parameter	Dover	1 M31	2 M31s	1 M31, 1 T80
Bands File Size	-->	1100	2500	semi-infinite ³
Spool File Size	-->	650	3000 ²	semi-infinite ³
Debug Settings		32		
Print Break Page		Yes		
Landscape device		Yes		
Paper parameters: bit direction		11.0 ⁵		
Scan direction		8.5		
Output Device		Dover		
Resolution in Bits/Inch		384		
Resolution in Scans/Inch		384		
First page at top of stack		No		
Paper Speed in Inches		10.20		
Scan line length in inches		11.7		
Scan margin adjust		350 ⁶		
Bit margin adjust		120 ⁶		

2 On DP1.

3 On T80 (by far the highest performance, for ALL scratch files). Expressed in 1024 word pages -- use at least 2000..

5 At resolution of 384, this must be reduced to 10.6.

6 These values vary somewhat from machine to machine, and from time to time. Use Align.Press to set precisely.

References

- [Fonts] *Font Representations and Formats*, by Robert Sproull, March 5, 1977,
[Maxc]<PrintingDocs>FontFormats.Press, 21 pp.
- [PrePress] *PrePress*, by Robert Sproull, July 3, 1977,
[Maxc]<Altodocs>PrePress.Press, 18pp.
- [Press] *Press File Format*, by William Newman and Robert Sproull,
[Maxc]<PrintingDocs>PressFormat.Press, about 15 pp.

Appendix A -- Summary of Spruce Operation

See Appendix B for current version (1st digits of Spruce and Sprint versions must agree)

Starting Spruce

Type Spruce Restart^{CR} to restart server without losing information. Failing that, or to start from scratch, type, e.g., Spruce Server^{CR} or Spruce Print xxx^{CR}.

Server Mode Commands

S	start/stop spooling	Toggle "spooling switch".
P	start/stop printing	Toggle "printing switch".
C	check queue	Print description of current printing queue.
V	verify queue	Same as C, but requires keystroke after each line; P to finish.
R	reason	requires one input line -- reason for Spruce unavailability.
M	modify queue	exhibits each queued file in turn. Respond with
	R	reprint file
	A	abort file
	CR	no modification -- go on to next
	P	proceed -- print rest of queue entries and finish command.
Q	quit	Return to executive.

Stand Alone Mode Command Line Entries

Global Switches

/V verbose Print more diagnostics

/D debug Use standard debugging codes (currently 32, see below).

Command Line Options (e.g., Spruce/switches option <arg> option <arg> ...

Server	Starts Spruce in server mode. See above commands for interaction.
Restart	Restarts without destroying print queue. Not guaranteed to work.
Print	Arg is Press file name. File to print.
Copies	Arg is number of copies. Default is 1.
Pages	Arg is <first> [to <last>]. Pages to print. Default is whole file.
Reprint	Reprints last document printed. Copies option applies.
XOffset	Default 0.
YOffset	Default 0.
Resolution	Default 384.
Power	Arg is <i>on</i> or <i>off</i> . Power off is not applicable to any current printers.
Debug	Arg is sum of debugging codes:
	1 Swat before file processing and printing.
	2 Inhibit file processing and printing, but bring in printing program.
	4 Swat on any error condition, unless also 512.
	8 Do not monitor Ether for print, status requests.
	16 Do not suspend processing and printing to accept more files.
	32 Run printing code, but do not print. Do not try to use printing hardware.
	64 Swat just prior to executing file processing code.
	128 Swat just prior to printing the file.
	256 Swat on return to spooler.
	512 Report all printing program errors to spooler -- do not enter Swat.
	1024 Spooler does not enter Swat on error, but tries to continue.

Trouble Shooting

Dover Ready light not on: Alto screen will (at intervals) contain further explanation (use P command to disable printing and freeze in display mode.) Clear printer condition, reenable Spruce printing if necessary.

Dover Ready light won't come on, but there's power to the machine: Push the "power on" button. If that doesn't work, call maintenance personnel.

Program is in Swat, or is obviously misbehaving: log the trouble, try to find software maintenance people. Failing that, boot and restart server.

After any problem: log the problem in the adjacent log book, or send a message to an appropriate authority.

Please do not leave a functioning Spruce printer without restarting the server.

Appendix B -- Spruce System History

The version numbers, dates of release, and dates of retirement (disappearance from on-line storage) are given for all relatively recent Spruce systems. For each release, a brief description of its purpose is included.

Release Date	Retirement Date	System File ¹	Version	Internal File	Sys. Description
Found on [Maxc]<Printing>Docs>Spruce.dm					
6-79		Spruce	10.0	100	Matches OS16, deals with very large font sets
		Sprint	10.0	10.0	Major performance improvements
		Errors	?	?	
11-28-78		Spruce	9.0	90	Major performance improvements, user interface improvements
		Sprint	9.0	90	Major performance improvements
		Errors	11	11	
Found on [Ivy]<Spruce>Spruce.*, Sprint.*					
6-14-78		Spruce	8.0	13	Ether Ear improvements
		Sprint	8.0	22	Alternate widths, new Press commands
		Errors	10	10	
4-13-78	11-28-78	Spruce	7.0	12	Engine control and Document interpretation revisions
	11-28-78	Sprint	7.0	21	Engine control and Document interpretation revisions
	11-28-78	Errors	9	9	New printer microcode failure checks
3-4-78	11-28-78	Spruce	6.0	11	Adopt new time standard -- requires OS v14 or later
	11-28-78	Sprint	6.0	20	Adopt new time standard -- requires OS v14 or later
2-24-78	11-28-78	Spruce	5.2	10	File length error for n*256-page files
	11-28-78	Sprint	5.5	19	File length error for n*256-page files, left over table fixes
2-15-78	11-28-78	Sprint	5.4	18	Remove restriction on occurrences of single font
2-13-78	2-23-78	Sprint	5.3	17	Add timeout to compensate for Sequoia status hardware bug
2-3-78	2-23-78	Spruce	5.1	9	Checkpoint restore bug when using T80
	2-23-78	Sprint	5.2	16	Checkpoint restore bug, don't report minor font mismatch (gates)
1-30-78	2-23-78	Sprint	5.1	15	Less fatal behavior on left-over table overflow, larger table
1-23-78	2-23-78	Spruce	5.0	8	Short odd-length files nonfatal, better kbd interface, spool bugs, zero-length incoming packets OK.
	2-23-78	Sprint	5.0	14	Space savings through better overlays, much more print pass space, more printer checks (in local, Dover laser off)
		Errors	8	8	New printer status checks
12-7-77		Spruce	4.3	7	Turn on verbose, minor fixes
		Sprint	4.9	13	Turn on verbose, minor fixes
		Errors	7	7	Track system
11-15-77	12-7-77	Sprint	4.8	12	Fixes in preparation for major demonstration
11-3-77	2-23-78	Spruce	4.2	6	Improved control, errors
	2-23-78	Sprint	4.7	11	Improved control, errors
	2-23-78	Errors	6	6	Track system

¹ *Spruce* means *Spruce.Run* and *Spruce.Syms*; similarly for *Sprint*.
Errors means *Spruce.Errors*.