The Latest Word

Marketing edge over Sony

Canon offers still-video camera

Sony had a large booth at ANPA to tout its Magvis Plus video imaging system, but Canon beat it to market with a still-video camera. Like the unreleased Sony Magvis, the Canon RC-701 uses a CCD array and a 2" floppy disk to record the video. The introductory price is $2,500. A playback unit is $2,700 and the color printer comes in just under $7,000. Although these prices are not low enough to attract consumer attention, we imagine that a reasonable number of news organizations and industrial concerns will pick up systems to experiment with. As Canon ramps up its volume manufacturing, system prices will fall.

For the publishing industry, image quality will be the major concern. We haven’t seen actual samples from the RC-701, but its resolution is specified as 780 x 488 pixels. This is similar to the Sony Magvis’s resolution.

Although the images we saw at ANPA looked good as 3" x 3" prints, they obviously would not hold up well under enlargement. At the present state of the art, the newspapers that use video images only when nothing better can be found. Desktop publishers, on the other hand, will find the 300-dpi resolution of their laser printers the factor that limits quality, and the still-video camera’s resolution should fit well with that technology. For that market, getting the cost of the camera down will be the primary issue.

OEM customers sought

Superset interfaces Eikonix, PC

Superset, Inc., has a hardware interface between its XP48 graphics processor and the Eikonix, PC. The combination can scan a full-color image at 4,096 x 4,096-pel resolution, store and manipulate the image, and output the result on a variety of devices.

The XP48, a 48-bit wide-bit-slice processor optimized for vector graphics, is controlled by an ordinary PC through a DMA and Plc interface. The XP48 supports various graphic standards, such as GSIs, IGES, AutoCAD and MacIntosh’s SCODL. It is able to manipulate the color images at real-time speeds and to merge vector-based image files. It can then output four-color separations to high-resolution imaging devices. Superset has announced it will support the GREP, ESC/2, and Image language and, that it is willing to write customized drivers for typesetting.

Superset, which also has products for the seismic plotting industry, wants to sell this product to publishing-industry outfits. The first unit was delivered to Logicon, Inc., for a mapping application. The XP48 and interface will sell for between $20,000 and $27,500, depending on software options.

Comments from Our Readers

GrafMark’s Aquaproof

I would just like to refer to your article on GrafMark in your recent Designa report issue. You refer to the ink used in our Aquaproof system as dye. I would just like to clarify that the inks are in­deed the same density, color match and pigment you’d expect to find on your own dye, the only difference being that our inks are developed by water, so it is truly ink on paper.

Secondly, we claim that the only vari­able is given by the different substrates and that will be a user variable on the press also, remembering that by exposure we have control over dot gain.

Thirdly, it was reported in The Seybold Report on Publishing Systems, Vol. 15, No. 4, October 21, 1986, that Braun, Ron Johnson and Tina Arndt have formed a new company, GrafMark.

GrafMark. The company was estab­lished, therefore, prior to the release of old boyhood chums, Burns and Thompson.

Finally, any system that is auto­mated, gives a controllable proof to match the press run in under 15 min­utes, and is half the running cost of systems on the market can use Mickey Mouse, Donald Duck or what­ever, this one is called Aquaproof, and if it is half as successful as the fon­ded names, both ourselves and our exciting industry will be the much happier.

Keep up the good work

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Interleaf: A Fast-Moving Tech-Doc Supplier

At the Seybold Show in 1983, we invited David Boucher, president of Interleaf, to speak at the up-calling Seybold Seminars. ’84. He declined on the grounds that Interleaf did not sell a publishing system. Its OPS (Office Publishing System) was essentially a super-writer system. It was a typesetting system intended for office documentation.

We argued that we thought Interleaf and its system would be of interest to the seminar attendees. Only half convinced, Interleaf decided to tone down its demonstration system to see what people in the publishing market would think of this office automation product.

The system did not come off as a graphics or product. It could accommodate only a specially digitized type face/size combinations. It could only output to a 300-dpi laser printer. It could handle only single-column work. It could not perform hyphenation. Nevertheless, the Seminar at­tendees loved it. They liked the way Interleaf handled style specifications and text formatting. They liked the way it allowed users to create and edit graphic frames in the middle of a text document. Most of all, they liked the extraordinary speed, the ease of use, and the fact that the software was written to run on standard off-the-shelf engineering workstations rather than specially-built hardware.

Interleaf soon discovered that it is, indeed, in the publishing systems marketplace. It shipped its first system in May 1984, two months after the Seybold Seminars debut. In October it took a hotel suite to demonstrate its system at CopExpo East because it was too late to get space on the exposition floor. In March 1985, it returned to the Seybold Seminars with more sophisticated software and a cooperative demonstration with Monotype, ImageX and Data Recording Systems. This year it put on a tour de force at the Seminars with software running on Sun, Apollo, DEC and IBM workstations, and scheduled a release of 3.0 software, which will give Interleaf much more sophisticated capabilities in both text and graphics.

Two years later, Interleaf was not sure it belonged at a publishing conference. This year there were so many Inter­leaf users among Seybold Seminar attendees that they were able to form an Interleaf user’s group at the seminar.

Thus far, Interleaf has been the biggest winner in the “tech-doc” revolution. It has sold fast, easy-to-use, and cost-effective systems to a lot of first-time users, most of whom had not typeset documents in the past. But it has also been steadily increasing system functionality. Release 2.5 software used to prepare this article provides excellent working space for many people engaged in the production of utility documents. Release 3.0 (due for field release this fall) will move the system squarely into the typesetting system market. We have every reason to expect that continuing de­velopment will make the system an increasingly attractive alternative for people with more sophisticated composition and graphics requirements.

In this issue, we will concentrate first on the current 2.5 software, then preview the features which will be added with 3.0. We did most of our testing with software running on a Sun Microsystems 2/120 workstation. Not all of the fea­tures we discuss are currently available on all other platforms. Interleaf hopes to get everyone except IBM on the common release level by summer.

The market. Interleaf has focused initially on users who are satisfied with 300-dpi pages. Interleaf is out of a few type fonts in a few sizes. The current software will also drive a typesetter for higher-resolution output, but it would not be fair to characterize it as a typesetting system. The typical customer has been a company or a group engaged in prod­uct documentation, proposals, engineering change orders and the like.

With the increased sophistication of the next software releases, Interleaf will move into broader markets—including those which require higher quality output and more sophisticated composition and page formatting. The em­phasis will remain on documentation applications, but the system should be attractive to some portions of the com­mercial, magazine, and even newspaper markets.

Products. Interleaf offers two products; a composition and pagination application package which comes in several fla­vers, and a series of laser printers. There are three versions of the applications software: WPS (Workstation Publishing Software), TPS (Technical Publishing Software), and UPS (University Publishing Software).
can be edited and output on another. At the moment, Interleaf expects to have 2.5 running on DEC workstations later this summer, and will also expect to use.

Hardware

Unlike most of its competition, Interleaf is truly hardware independent. It has been careful to write program code to be as transportable as possible. It has also been careful to ensure that any new hardware features and functions can be supported across the range of workstations the company expects to use.

Interleaf currently supports engineering workstations from four vendors: Sun Microsystems, Apollo, DEC VAXstation II, and the new IBM RT. The company has traditionally brought new software releases up on Sun workstations first, then carried them over to the other platforms. At the moment, Sun and Apollo workstations support the latest software release 2.5. Interleaf expects to have 2.5 running on DEC workstations later this summer, and will also have the IBM RT up to 2.3 by the summer. There are, as you would expect, slight differences in the way things operate between machines, but the software is completely compatible, and documents created on one brand of workstation can be opened and edited on any other.

In fact, it is even possible to mix different brands of workstation on the same Ethernet network. As demonstrated at Seybold, several copies of the software can be run on the net given access privileges to call up, edit, and compose documents stored on another brand of workstation. The only real exception is the Interleaf application software itself. To prevent piracy, Interleaf has decided that its software will run only on workstations which allow application software to be run over the workstation ID. The software is therefore created for a specific piece of hardware and will not run on any other device.

Typical configuration. It is difficult to cover each of the possible configurations from all of the vendors which can run the TPS software. We will therefore use a Sun-based configuration as an example:

Within the Sun product family, the base TPS product would be a Sun 3/160 workstation. This has a 16-MB disk, 16-MB RAM, and a 16-MB hard disk. Larger disk and secondary memory are used when the system is expected to support scanned graphics.

The Sun workstation has a 19" screen with a resolution of 1152 x 900 pixels. This works out to a quarter of the resolution of the 300-dpi output printer. The Apollo and DEC workstations have similar screen configurations with 15" and 18" displays respectively. Interleaf uses a single bit plane for display of graphics as well as text. Scanned continuous tone images are displayed as screened halftones.

Networking. An Ethernet link is used to connect several workstations and peripheral file servers together. The average configuration for Interleaf at this time is about four workstations per system. File servers may be other workstations or "headless workstations" (workstations without display screens). Workstations used as file servers are typically configured with larger disk (in the range of 190, 300 or 500 MB).

Workstations also serve as controllers for output printers and typesetters and input scanners. Controllers for output devices can also support terminals. But scanner controllers cannot. The non-stop nature of scanner input requires a dedicated processor which is always available to receive image data as it is sent from the scanner.

Most workstations operate off their own disk while composing and paginating a document. It is also possible to have workstations which do not have any local disk storage. A diskless workstation will "page" data into and out of its RAM over the Ethernet link. All processing will be done locally. What amount of RAM a diskless workstation can make use of, even when paginating pages which include graphics.

Pages are composed with a target typesetter or printer in mind. However, since composition produces an intermediate file which is output-unit independent (except for set widths of characters), the paginated document may be sent to a different printer for proof output. The actual conversion of the file into the particular typesetter or printer format occurs as a separate batch routine within the printer server.

Scanners. Oddly enough, even though virtually all Interleaf systems are digital, there are still a number of output printers which do not support input from inexpensive tabletop scanners. At the moment, the only output printer which does not support input from an Interleaf workstation is the ImagiTex units. While Interleaf defends this decision by contending that the only way to drive the ImagiTex is through the ubiquitous Canon CX. For higher-volume requirements Interleaf has signed a reciprocal OEM agreement with TPS. The TPS uses its own RIP and when running in a DEC environment, the same program will run under VMS.

Software

All of the application code for the TPS and WPS products is written in "C." However, since the software must run on a variety of workstations (VAX, Sun, Apollo, and IBM) it has to run under a variety of different operating systems. For instance, when running in a Sun environment the software runs under the control of Sun Unix 2.2 (essentially Berkeley 4.2). In a DEC environment, the same program will run under VMS.

Operating environment. To run the Interleaf system, the user will boot up the basic computer operating system, log on with his password, then give the command to load the Interleaf software. For instance, "ps -e | grep Interleaf" will present a list of running processes (except for certain process identifiers such as data backup) he will be in the Interleaf "world."

Interleaf's Graphic Desktop

A file which has been opened for editing and/or composition is automatically "check-pointed" (saved to disk) at intervals. If a user attempts to close a file which contains unsaved changes the system will present a list of files which are actually resident both on his own workstation and on one or more system file servers.

Printers and typesetters. Interleaf is optimized for output on IBM's PostScript printer. It also supports laser printers, most of which have resolutions of 200 to 300-dpi range. For best results, Interleaf prefers to drive printers through its own RIP. This gives it control over output printer and typesetter. This works out to a quarter of the resolution of the ubiquitous Canon CX. For higher-volume requirements Interleaf has signed a reciprocal OEM agreement with TPS. The TPS uses its own RIP and when running in a DEC environment, the same program will run under VMS.
leaf uses are available in versions which display gray levels on the screen, the company has elected to stay with the least common denominator and does not use this facility.

Screen fonts are carefully tuned for the resolution to be used. Until now, the company has relied on a specific screen font for each output typeface and size. For 300-dpi printers driven by the Interleaf or ImageMark RIP, Interleaf provides two faces, “Modern” (sans serif) and “Classic” (serif), in 6, 8, 10, 12, 14, 16, and 18 pt sizes. These have been digitized in both 75- and 300-dpi (output renderer) and 300-dpi (output printer resolution) versions in roman, italic and bold (but not bold italic). All software releases include two typewriter fonts, one medium, one extended math font, a symbol font, and a Greek font.

Interleaf expects to increase this font library in the near future with additional fonts made from outline masters supplied by Bitstream.

For typesetter output on the Monotype Lasercom Interleaf supplies three screen fonts which correspond to the Monotype Times Roman, Century, and Helvetica faces.

**Flexifonts.** This approach is obviously too limited if Interleaf wants to support a large number of type fonts on a variety of output typesetters. It has therefore come up with a scheme for “generic” screen faces which can represent a wide variety of output fonts. Release 2.5.7 of the software includes support for five generic serif and sans serif character sets in each point size. The software will thus have its choice of five different widths for each serif or sans serif character set. It will pick the version for screen display and laser proofing which is closest to the width of the final typeset character.

As with other new fonts, Flexifonts will originate as Bitstream outline fonts and be digitized and stored as individual bit maps. Since these bit-mapped fonts will not exactly match the set-widths of the character they are emulating, Interleaf will adjust the interword spacing in a line to compensate for any accumulated differences. This does mean that users will not be certain that the interword spacing they see on the screen will correspond to the spacing on the output. We will not know if this is a problem until we have more experience with Flexifonts under a variety of conditions. For most fonts, we do not anticipate too many problems.

For purposes of proof printing only, Flexifonts will also be digitized for a resolution of 300-dpi. However, it does not anticipate that these fonts will be used in applications in which the 300-dpi output is the final output. For these applications, it will continue to use specifically tuned laser printer fonts with matching screen fonts.

**User Interface**

Interleaf has done an excellent job in providing a relatively easy-to-use user interface which does not compromise on speed and production performance. The workstation consists of a large (19") high-resolution monitor, a keyboard and an optical three-button mouse. The mouse works in conjunction with a small (about 10") pad which can be positioned anywhere on the user’s work area. Although there are some functions which have short-cuts, single keystroke capabilities programmed directly onto the keyboard, all the application functionality is directed with pop-up menus and icons on the screen and commanded by the mouse.

**Desktop display.** At the desktop level, the screen presents what amounts to the systems data base, organized within different icons. The screen icons include file cabinets, file drawers, folders, and documents. Theoretically, you can place documents within folders, folders within file drawers, and file drawers within cabinets. But in reality, there are no restrictions above the document level. You can place frequently-used documents or folders directly on the desktop. You can place folders within folders, or even file drawers within folders. As is typical for systems of this sort, when you “open” a cabinet, drawer or folder icon, the system draws a screen window which displays the contents of that icon.

Other icons include the clipboard for documents being held temporarily, read-only cabinets for graphics components used in drawing routines and templates used for text and graphics. There is also a “terminal” icon which allows the user to open up a screen window which functions as an ASCII terminal to the Unix operating system.

In many ways, the setup is similar to the familiar Macintosh desktop. The major differences are:

- The use of three different icons (cabinets, drawers and folders) rather than simply folders.

**Command menus.** As with most mouse/icon systems, the basic method of entering commands is by pointing to the command you want in a pop-up menu. As has always been the case with any system which uses more than a single button on the mouse, it takes the user a little while to adjust to the different functions performed by the three different mouse buttons. Basically, the left button selects an object, the right button extends the selection, and the middle button causes a menu to pop up at the current cursor location on the screen.

Having the command menu pop up at the cursor position rather than having to move the mouse to the top or side of the screen, is a considerable advantage for systems with large display screens. (It is not much trouble to move the cursor to the top of the screen to execute a command on Macintosh. It is a real nuisance on the 19" Sun or Apollo screen.)

But there are three tricks Interleaf does that make the system much more effective for the moderately experienced user (at the expense of some confusion for the first-time or novice user):

- The menus will pop up when you point to different parts of the screen before pressing the middle mouse button. In all, there are over a dozen different sets of menus you can get by clicking the mouse button with a document open on the screen. Essentially, you determine what kind of function you want to perform by pointing to the appropriate place on the screen, then click the mouse button to execute a command.

The menus which are displayed at any given time are relevant to the context of the operation you are currently performing. For instance, if a particular paragraph has been selected and a menu is requested (by hitting the middle button on the mouse), the displayed menu presents a list of options that apply to selected paragraphs. But if the menu is requested while the cursor is in the area of the Page Box in the header bar (information area about the document), options relating to pages are displayed.

The pop-up menus are relatively short. Simple, frequently used commands (such as “open,” “cut,” or “paste”) appear at the top level of a menu. Other, more complex commands may require stepping through a series of submenus.

**Graphics Cabinet.** This cabinet displays a list of available pre-drawn flow chart symbols.

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day-in, day-out use for a specific application. We have only two real complaints:

1. Changing from one type face combination (e.g., serif roman) to another (e.g., sans serif bold) is more cumbersome than we would like. As InterLeaf adds support for more type faces, it may have to give a little more thought to the command procedures involved in this sort of function.

2. There are a couple of functions which should have two levels of protection but do not. It is far too easy to click on the "print" command, for example, and cause the system to print out your entire document when you really meant to click on the "page" command right below it.

In addition to the strings of command menus there are several command sheets which open up "property sheets" used to specify page and paragraph formats (more on these later). We have watched several demonstrations of the InterLeaf equipment and the multiple "string" menus always appeared to be confusing and cluttered the screen. However, after using the system to prepare this article, we are very impressed with it. We found it to be an easy-to-use, consistent, and very fast approach to entering commands. It is one of the best menu driven user interfaces we have tried. We also found it much easier to work with than the accustomed to Inter-Leaf's use of defaults. Since each menu has a designated default associated with it, the user can quickly select items from multiple menus without even displaying the entire set of menu commands on the screen. The number of things you can do with a single mouse click is really amazing.

Property sheets

Document appearance is controlled by two sets of property sheets, one group which controls the form or style of a page and a second set which controls the typographic style or format of individual elements on a page.

Page properties. The properties of a page are controlled via a "dialog" and selections contained in a Page Properties Sheet. There is one property sheet for the entire document. However, different page styles such as multi-column and single-column pages can be produced via other means. The Page Properties Sheet presents choices for the user which includes the following (see photo).

1. Orientation - The user can select either a landscape or portrait orientation for the document.

2. Columns - The user can specify both the number of columns he wants for the document and the gutter space between columns. The program automatically calculates (based on the page margins and gutter space) the measure of each column. In a multi-column setup, all columns are the same width. Currently, the user cannot mix different numbers of columns. However, within a multi-column document, the user can specify that specific components straddle the entire width of the page. This allows him to mix a multi-column format with a single-column format on the same page.

3. F.J - The user can turn vertical justification on or off for the entire document. However, there is no user control over where the justification space is allocated between elements.

4. Page dimensions - The user can specify both the size of the final page and the area on the page to be occupied by text and graphics.

5. Margins - Within the page boundaries, the user can control the top, bottom, left and right margins collectively for any and all text, graphics, footnotes etc. which are part of the document.

6. Start page - Since the document may be assembled into separate sections, the user may specify the starting page number for this part of the eventually grouped document.

7. Page number and style - The document can be specified as a single-sided document (all headers, footers, and page numbers the same on all pages), or left or right pages where the beginning of the document and chapters will always begin on even-numbered pages or odd-numbered pages. The page number may be specified as either Arabic, lowercase Roman or uppercase Roman characters.

8. Headers and footers - Headers and footers can be typed in any font and may be different for first pages versus all others. They can also be specified as displayed on the left, right, or centered.

The headers and footers are created as graphic windows. In Release 2.5 the header and footer styles are very much restricted by the limitations on text editing and text formatting in graphic windows. With the enhancements promised in Release 3.0 this limitation should pretty much go away.

Component properties. A second set of property sheets specifies the style for the components (paragraphs) of a document. Each type of component is assigned a name (which is displayed in a special area to the left of the page). A set of property sheets which specify paragraph style and paragraph-related pagination parameters is associated with each component type. The user may edit these sheets at any time. Once he has done so, he may "apply" the changes he has made to that individual component. (In which case that component will have a different appearance than other components with the same name.) Or, he can apply the changes globally to all components with the same name anywhere in the document. (In which case the entire document may take on a completely changed appearance.)

The user may create new component styles at any time by simply editing an existing component property sheet, and giving it a new name.

The component property sheets allow the user to specify paragraph indent (including different indents for first and subsequent lines in a paragraph), spacing above and below components, type face, point size and leading, tab settings, line endings, hyphenation, justification, etc. All component sheets are treated as "applying" to the left and right page numbers and giving them a new name.

Unfortunately, all of these values (except for line spacing) are specified in inches rather than picas and points, ems or ens. Even given the fact that the original intended market was office applications, we cannot see any reason for this.

The user can type in a conversion chart which tells him what values to specify to get the typographic values he wants, but why should the user have to do this? One of the things a computer does best is calculate. It would have been so easy to let the user specify his own preferred units of measure.

Inter-line spacing is specified in terms of decimal fractions. For example, if you want eight-point type on ten points of leading you will have to specify an inter-line space of 1.26 lines.

Frames

Interleaf uses the concept of a "frame" to set off specific elements of a document from the main running text. Frames are constructed to contain elements such as any graphic (created or scanned), tables, footnotes or any other component which doesn't follow the normal paragraph-related pagination parameters is associated with each component type.

This can range anywhere from "full on" to "off" with nine levels in between. We will discuss this more fully in the section below on Composition.

A separate set of menus are provided to change the font and size properties of arbitrarily selected text within an element. For instance, to change several words within a paragraph to italic, the user would select the words as a selected text string and use the "text selected" menus to specify and apply the appropriate italic font. (Or, strike a dedicated command key on the keyboard.) These are not treated as fill-in-the-blank property sheets such as those above, but instead are individual typographic commands used to markup specific portions of text.

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the elements within it. Alignment is also specified in the property sheet. For frames containing elements that will be positioned directly within the text stream itself (such as frames containing mathematical equations), the vertical alignment relative to the baseline of the text around it can be specified. For more typical frames such as those containing photos, a horizontal alignment can be specified (left, right, centered or a specified value in inches from the left-hand margin).

Frames are always positioned on a page relative to an anchor. An anchor is simply a marker within the text, which usually references the contents of a frame. For instance anchors may be located within text at a footnote reference or a call to a photograph or illustration that is defined for that frame to its anchor is specified in the property sheet for that frame. Frames can be specified as being at anchors, following anchors or text, or at the top, bottom, or middle of pages.

If specified at the location of its anchor, the frame will be positioned directly within the text stream with all text wrapped around the frame. If the frame is specified to follow the anchor, the frame will be positioned directly beneath the line containing the anchor. If, however, there is not enough room on that page, the frame will be placed at the top of the next page. If the frame is specified to follow the text, the frame is positioned after the last line of text for that element (for instance after the entire paragraph). Top, bottom, and middle frames are placed as their names imply on the same page as their anchors, they are placed in those named locations on the following page.

Pagination

The combination of document property sheets and the use of anchors and frames provides control over pagination. Obviously the program itself has its own set of rules and defaults on where and how it places the elements of a document. In general we found the user options coupled with the programs rules set to produce good-looking pages with logical placement of text elements and graphics.

The only problems arise when you decide that you want to do something differently than the program has done it. If, for example, you decide that you would rather place an illustration in the middle of a column rather than at the top of a page, then you must change the location of that frame to its anchor is specified in the property sheet for that illustration, but you cannot predict exactly how that change will affect pagination for the entire rest of the document.

Similarly, you have very little recourse if you want to control how space is distributed in a column or if you want to force the program to break at a particular point to solve a particular problem—especially since this program (like most pagination programs) works only one page at a time with no ability to adjust earlier pages to make things work out better on the current page. As with virtually any batch pagination program, there are times when you find yourself trying to sort things out to fool the programs into producing the results you want. The difference (and it is a vital one) is that pagination takes place virtually instantly so you can see immediately if you have gotten the results you want.

In general, if your pagination needs are relatively straightforward you will be delighted with the program. Even for unusual typographical things you want its own properties or format, you will find it quick and easy to do so. If, on the other hand, you want to do complex pages and you are very fussy about getting everything just the way you want, you should probably look elsewhere.

Editing

Writing and editing copy on this system reminded us of working on the original Xerox Alto systems or more recently the Xerox Star. Like the Xerox systems this is a fully page-bite-mapped text editor. The screen display and the fact that documents are always maintained in page form means that this is very much a page-oriented system and, in a logical operational sense, you will view a page of copy at a time on the screen. Sometimes, when he is working with something which spills over from one page to the next, he will page down a part of a page so that the display shows the bottom half of one page and the top half of the next. In general, you do not scroll through copy on this system, you page through it, a page or partial page at a time.

We found even ten-point type legible enough for comfortable editing on the screen, and we always like to work on a display which shows a page of copy at a time. It is much easier to view text in context on a large display, and it is quick and easy to zip around the page to make changes with the mouse. In general, we found the use of hard copy for review purposes than we do when working on system with partial-page display. Single keystrokes on the terminal keyboard will page you backwards or forwards a page at a time, and the paging is as quick as turning a page in a book.

In general, the editing functions work as you would expect on a system of this sort: you “define” a block of text by pointing to it with the mouse and clicking, then you delete, cut, copy, or change the style of the text you have defined. Since the system is always in insert mode, you insert new copy by simply clicking on the location where the copy is to appear, typing in the new copy, and pressing [Return].

This is not to say, however, that the program could not be improved. We think some of the basic editing functions in the Minitext Write program are, page by page, and faster to use. To replace a word in the Interleaf system, for example, you have to position the cursor at one end of the word, click the left mouse key, move the cursor to the right end of the word, click the right mouse key, strike “delete,” then key in the new word. To perform the same function on a Macintosh you simply point anywhere in the force the program to go into the word (a quick and less precise task), double click the mouse and type the new word.

We would also like to see ATEX/Write-like use of multiple save/gets, and single-key mapping for frequently-used components (paragraph styles), type face/font size combinations and the like.

All editing functions work within a document as well as across documents. Therefore you could easily “cut” a section of text and redefined up to the size of the entire document and “paste” it anywhere else within the same document or any other document. Depending on how this is done there is an opportunity for the system to take on the properties of the element into which it was pasted. The system also supports simple splitting and merging of text components. This makes it very convenient to modify or correct the structure of text that was improperly structured upon input.

These interactive editing tools as well as the ease at which one could quickly change the properties of individual elements, groups of elements or frames provide a very fast and flexible scheme for editorial intervention to review or change the pagination decisions of the software. In this regard the Interleaf system is very powerful.

Composition

If Interleaf’s strengths is viewed as its user interface and interactive page assembly facilities, its weakness is still fairly undistinguished. The program provides the ability to specify the baselines on a global or individual element basis, font, point size, leading, left and right indents, and quadling: ragged right, left, center or justify can all be specified. It does not yet provide support for more than a few type faces and point sizes, and it does not provide precise control over interword spacing that commercial users have come to expect.

Nor does it provide the second level of composition control, which allows for the explicit specification of inter-letter control, and set size modifiers. Also missing are forming capabilities and automatic features such as handling dropped

initials or setting to fit. There aren’t any true forming capabilities which allow the user to build standard typesetting structures using masters and conditional styles. These are clearly less important in highly structured documents in the text-doc field as long as there is a good pagination program to handle the logical placement of all elements. But they are important to some users who are more familiar with true composition and demand this level of sophistication. Most current copy systems are quite happy without higher quality composition, but it is clear that the company can expand its market if it adds the features that more sophisticated users soon demand more typographical sophistication after they have gotten more experience with systems of this sort. As of now it is not yet a system for quality typesetting.

Hyphenation. Hyphenation and justification can be controlled at two levels. At the document level the user has the option of turning hyph and off or entirely. If turned on, he has the option to specify the number of consecutive lines that are allowed to be hyphenated. The user can select either one, two, three, four or “any.” If he selects “any” the program allows hyphenation on any line of the document.

At the component level he can specify more precisely what hyphenation will be allowed in that component. Since component properties can be applied globally, the user may be able to employ this capability to prevent hyphenation for all heads, subheads, intros and chapter headings and allow normal hyphenation for all body copy.
As we mentioned earlier, the user can specify no hyphenation, "full", hyphenate between different types of hyphenation, or hyphenate between different levels of hyphenation frequency between. The default level (5) is in the middle of the range. Basically, the different levels of hyphenation are provided by Housekeeper/Milton. The "full" end of the spectrum, the program will take every possible hyphenation point in an effort to keep interword space minimising to a minimum. At the low end of the range, it will only resort to hyphenation if the interword space would be very large.

Maybe this is what is easiest for Interleaf's customers to understand, but we would have preferred more direct control over interword spacing. This could have been done, we think, in a fairly graphic manner (with slider type controls and the like) which would have given experienced typsetters the control they would like without mystifying the less-sophisticated customer.

Dictionary. Years ago, we had the idea that it would make logical sense to look up every word in a dictionary as it is entered and carry with the word from that point forward all possible hyphenation points. This would permit you to do the dictionary look-up once when the computer had lots of time to spare, rather than doing it over and over again (during h&k) when computer resources are at a premium. It further occurred to us that the same look-up could also serve as a spelling check.

It has taken a long time, but we are finally seeing this concept put into practice. Interleaf is one of the first companies to take this approach, and a number of others (e.g., Itek, Ventura) are following suit.

The dictionary in this case is the 80,000-word American Heritage Dictionary of the English Language. It is supplemented (for words not in the dictionary) by Donald E. Knuth's TeX hyphenation algorithm. This algorithm is very conservative and usually does not hyphenate all at if there is any possibility of hyphenation to take place. In addition to the software-generated hyphens, the system allows the user to intervene manually and insert his own hyphenation points or remove software-generated hyphens.

The dictionary is used for a spelling check program, and spelling checks is not our favorite approach, the spelling check program itself is very well implemented. Like everything else in the system, it is essentially an interactive process. When invoked the program highlights the insertion of any of the hyphenation points. When invoked the program highlights the insertion of any of the hyphenation points. This would permit you to do the dictionary look-up once when the computer had lots of time to spare, rather than doing it over and over again (during h&k) when computer resources are at a premium.

Character sets. One final note that relates to the subject of composition: like most word-processing-based systems, Interleaf provides the full complement of characters which people in the typesetting industry expect to see. In particular, we could find no way of generating fractions. Foreign language accents are treated as supplemental characters, and are inserted visually (rather than as accent codes for typesetting). These may not be important in some applications, but they are vital for us.

Input from PCs. Although Interleaf has focused on the tools required to create, edit and compose documents directly on engineering workstations, there are a lot of users who would like to be able to bring generic-coded text into the system from other sources and especially from PCs.

Interleaf provides a program that runs against the incoming text and through global search-and-replace operations has the ability to convert the text strings to user-definable data. The user can also develop his own programs for dealing with this input translation problem. As we will discuss later, this general input process can also be used to merge graphics into the appropriate locations within a document.

The system also provides another helpful data analysis function on data input from a PC or word processing environment. Interleaf uses an AI-type program as a generic input filter (not an error checking filter) based on characteristics such as margins, indents, font changes, carriage returns and spacing between elements. It will then make educated judgments on this criteria and tag elements with common characteristics. The program actually makes several passes on the data first to analyze the entire document for common characteristics and then to label common elements.

In effect this is automatic penciling. We played with the idea of having both straight text and tabular data and found it to be quite helpful in sorting out common elements from raw text input streams. Paragraphs entirely typed in a separate (font) Bold were labeled differently from paragraphs typed in the normal font. All elements with common indents were labeled as another common element type.

One final touch which we think Interleaf should add would include a more conventional user-definable template which could be used as well. Interleaf does not, for example, provide a straight-forward input coding scheme for defining tabular data in specified row and cell format.

Written by Interleaf. The ImagiTax/Codex scanner to input all scanned file and contour images. Since all image processing takes place on the Interleaf system, the Lyric processor (Level 1 is a simple scanner which runs an unprocessed stream of digitized data). A time-dedicated Interleaf "scanner server" or headless terminal acts as the controlling, buffering and storage device for all incoming data from the scanner. Once started, the scanner continually digitizes and outputs data at a steady rate. There is no separate capability for the scanner controller itself to be used for any other purpose while the scanner is running.

Although the scanner has the ability to scan at resolutions as high as 800 characters per inch, Interleaf encourages its customers to scan at much lower resolutions. Images which are to be output as 85 or 100-line screen halftones are typically scanned at about 100 to 150 samples per inch. This greatly reduces storage for contour images to about 10K bytes per square inch, much less than the 1/4 MB-per-page for scanned machine output. This reduced sampling rate produces adequate results for both image manipulation and output (samples we viewed were very smooth and natural).

For line art scanning, Interleaf recommends scanning at the resolution of the output device. In most cases this
means 300 samples per inch for laser printing and the ImagTex maximum of 775 samples per inch for typesetting.

To further reduce storage and transmission of data between processors, Interleaf stores both line art and contone data in a compressed format. It claims compression ratios for line art up to 20:1. This is almost double what most vendors are getting from standard run-length encoding of data. Interleaf has a proprietary scheme which we have not been able to evaluate. It also contains contone data and claims anywhere from a 2:1 to 3:1 ratio.

**Scanned graphics processing.** All scanned graphics are first buffered and stored on the scanner file server. The graphic can then be cut or copied from this data base and pasted into a text document. When this is done, the actual high-resolution format of the graphic is moved onto the disk which contains the rest of the document (including all text). Therefore graphic images are maintained (in all resolution formats) as an integral part of the document itself.

Processing of scanned images can occur on any workstation. Usually 4 MB of RAM are provided on workstations which are likely to perform graphics image enhancement and manipulation. This is sufficient space to deal with full-page photos in full true high-resolution formats. There are two schools of thought on image manipulation of contone images: 1) manipulate lower screen resolution images in real-time—then operate on the actual high-resolution file in a batch mode with a set of tranformation instructions, or 2) operate directly on the high-resolution file in real-time. Interleaf has chosen the latter. Without any specialized high-speed bit-slice processors to aid in the high-volume number crunching, Interleaf has been able to accomplish a fair amount of image manipulation in real-time on the high-resolution files. This includes cropping, sizing, rotating and tonal adjustments.

Currently only rectangular cropping is provided. A window is used to select the portion of the photo which is to be cropped. Sizing can be specified in inches or the image can be sized directly to the size of a frame (which can be built as a multiple of the column size). Rotation is very fast and very flexible. Rotation can take place anywhere on the image, including the frame itself. It can be a simple copy, move, or rotate, or it can be a combination of these actions with a scale factor applied. Each action can be specified for any object in the image, or for all objects in the group. The concept of locking elements is used to freeze the position of an object relative to itself or to other objects within the group. The concept of locking elements is used to freeze the position of an object relative to itself or to other objects within the group. The concept of locking elements is used to freeze the position of an object relative to itself or to other objects within the group.

**Vector art.** Interleaf's set of drawing tools for creating drawings and diagrams are better than others we have tried. The program is somewhat MacDraw-like in that it creates resolution-independent drawings made up of layered geometric shapes filled with patterns. The major features of the program as far as we are concerned are a "clip art" library of arrowheads, curved lines, flowchart symbols, geometric shapes and other handy objects, and powerful ability to stretch and shrink these objects (or any object) into almost any manageable size and shape. Flow charts, line drawings etc. can be created directly on the screen by connecting, distorting and combining these basic primitives. With the aid of the mouse, boxes, lines, ovals, splines, polygons and charts can be sized, rotated, filled and positioned in order to create the desired line drawing.

Another nice feature is the concept of "gravity." This means that lines which connect two objects will automatically attach to logical points (the center of an edge or a corner, for example) on each of the objects without overlapping or failing to butt.

There is an alignment grid and a variety of other aids which can be invoked. The functionality of their rulers and guidelines are not as complete as on other systems we have tried.

**CAD graphics.** Graphics created on other systems can be converted into an Interleaf language for further processing and inclusion in text documents. Once "foreign" graphics have been converted into Interleaf language, the full set of graphic manipulations such as cutting, copying, sizing, rotating, grouping and editing (as an object) can be employed.

CAD art can also be input directly into the system. Data in 299 or 923 Calcomp plotter formats as well as IGES and HPGL format can be loaded directly into the system. However, Interleaf does not convert these into its own graphic language and thus can perform only limited manipulation of these graphics on the screen. The Interleaf system, for example would describe an ellipse as a single object which could be stretched, sized or otherwise manipulated. The same shape output from a CAD system in standard output format would consist of a series of short connected vectors. The notion that this collection of lines is an ellipse has been lost. A growing number of CAD vendors are writing filters to put their drawings into Interleaf's vector format.

**Charts and graphs.** The fourth type of graphics which can be easily created on the system is data-driven charts. These are charts which are automatically created by the system based on data provided by the user. The data itself determines the size of each element in the chart. Charts can be created in one of three styles: bar charts, pie charts and line charts. In addition, bar charts can be oriented vertically, horizontally, or in a surface format.

However, all of the Interleaf graphics can be combined within the same frame. The various types may be grouped for positioning as a single element, rotated as a group, or have certain elements of a group "locked" or frozen relative to others within the group. The concept of locking elements and treating locked and unlocked elements as a group provides an infinitely complex array of capabilities for the graphic designer. About the only function that could use some enhancement would be layering. Although any object can be placed behind or in front of any other, the concept of transparency and reversing text and images which overlap (ala Canvas) isn't supported.

With all four types of graphics, Interleaf uses the "clipboard" to move graphics into or out of a document. A graphic is first cut from its original location, file or disk. It is then "pasted" into the final location from the clipboard.

**Performance.** We have not done any benchmarks to the speed of the Interleaf system. How fast is it? Here are some concrete figures.

(All times were measured on a dedicated Sun 2/120 worksta­tion using the document you are reading as a test document.)

- Copy file (create a new version on disk): 10 seconds.

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Recompose the entire document after making a major format change: 4 seconds to 12 seconds, depending upon the change. (Four seconds was the most common time.)

• Output to Canon CX printer via an Interleaf file. Time workstation is tied up 25 sec. First page emerges from the printer: 55 sec. Print speed: 8 pages/min.

• Save edited file to disk: 5 1/2 sec.

• Close edited file and return to desktop: 1 sec.

• Step one page backwards or forwards through file: 1 sec.

• Go directly to any specific page: 1 sec.

• Edit composed text: If you insert text at the beginning of a long paragraph there is a slight delay while the program recomposes the balance of the text on every keystroke. The constant rippling of the display can also be disconcerting. We found that the best way to insert a couple of sentences at the beginning of a long paragraph is to key a carriage return first to break the paragraph, key the new text, then delete the extra return. (It is easier and quicker than it sounds.)

In general, the times are very impressive indeed. We are not entirely certain why Interleaf does not take greater advantage of the multi-tasking nature of the Unix operating system. (Why, for example, should it have to tie up the workstation while it composes a job to be printed?) We suspect that this may be because the compose function requires lots of memory and does not leave many computer resources available to perform other tasks.

But this is a minor complaint. In general, the system is so fast that you cease to think about composition and page formatting at all. You simply work on the content of your document, and whatever you do, the document is always magically kept in pages.

Working on standard hardware

We have been saying for a long time that systems based on standard, off-the-shelf hardware were going to prevail in most applications. What does the user give up in comparison with a system based on hardware specially built for the application?

Although we have seen the Interleaf system running on a variety of workstations, most of our in-depth hands-on experience has been on the Sun 2/120 which Interleaf lent us for testing. Based on this experience, we would have the following observations:

A. The keyboard is OK. The feel is similar to the clacky feel of an IBM PC keyboard. The layout is not outstanding, but usable. None of the key action is bad, of course, but you could add your own. In general, the layout is not as good as a layout designed for the purpose, but better than the layouts on some of the dedicated systems we encountered.

B. The screen display is large and reasonably crisp, but as typical of bit-mapped displays, there is no anti-glare treatment. Almost no one has done as good a job as Apple (on the Macintosh) in providing a screen which combines a sharp image with some anti-glare properties.

C. The cabinet which contains the processor, memory and disk is moderately noisy—about on a par with most other

similar-sized systems we have used. We think that the newer hardware (Sun 3s and Apollo 3500s) is quieter, but we have not yet had any of these in the same quiet environment.

D. Dealing with Unix for utility functions is a little bit of a nuisance. It would be nicer if these could be executed from within the Interleaf desktop. On the other hand, we are impressed with some of the Unix facilities now available.

Although Berkeley 4.2 and Unix System V are greatly improved, there is still a little gun-shy about the vulnerability of Unix systems to data base corruption. We are very careful not to do things like inadvertently powering down the system while application software is running.

But given this caution (which, we will admit, is based on our prior experiences with earlier versions of Unix), for most day-to-day operator functions, dealing with Unix is really not much worse than dealing with MS-DOS on an IBM PC system.

On the whole, our complaints are fairly minor. From the user's standpoint, about the only thing you really give up is a keyboard optimized for the application. We would willingly trade this to get the advantages of standard hardware and operating system software. (Besides, if a customized keyboard was the only reason for buying a specially-built system, it would be a lot cheaper for a vendor to supply a customized keyboard than it would for him to build an entire dedicated system.)

Release 3.0 features

We have dedicated the majority of this article to coverage of what really exists in the field, the software you could purchase and install today. However, Interleaf has shown us a number of significant improvements which address many of the shortcomings of the current 2.5 release. We have therefore separated these features from the primary review of the product to minimize confusion of what is ready now and what is planned for release 3.0 in the fall.

All of the improvements (which were shown publicly for the first time at the Seybold Seminars in March) deal with items which might be construed as short-comings in release 2.5 and earlier software. In general Interleaf has done its homework in identifying the areas needing attention and has developed an excellent set of new functionality to address these needs.

Autonumbering, cross-referencing, and indexing. Until now it was almost impossible to add numbers to sections of text; it was almost impossible to reference different sections of the same document, or even to add cross-references from earlier versions of the document. With the addition of newly created property sheets labeled by name (Interleaf calls these numbering sequences "streams") the user can quickly and easily setup the sequence and the style of the numbering tags (numbers, alpha etc.). A user would establish a numbering stream for each category of elements he wishes to be numbered. Therefore he can set up a numbering stream for all heads and paragraphs, a separate one for all figures, and another for tables.

Once the properties of each stream are established, the system automatically numbers the elements and sub-elements of the entire document. As the user inserts numbered paragraphs, deletes them or moves them, the program dynamically renumbers them based on their relative location within the numbered sections. The user also has the ability to intervene and manually restart the numbering scheme for certain elements such as numbered lists where the same numbering scheme may be repeated several times within the document.

Cross references. For charts, photos and footnotes the cross reference scheme is excellent. The system automatically numbers items such as photos and inserts the corresponding cross reference numbers directly into the text where the photo was referenced. As with all other autonumbering streams, as the elements are moved to other sections or within sections the system resolves the numbering sequence automatically.

Since the numbering scheme is based on a property sheet which can define the style of the numbers themselves, we found it very easy to use the numbering scheme to set up outlines. The system automatically numbers in the user-specific style (Roman followed by dashes etc.) and indexes the number for each element of the outline automatically.

Indexing. Another attractive new feature is indexing. In a matter of seconds, the system will automatically build indexes (one at a time) on the marked sections of the document. The indexing handles all of the special conditions and cross-references, and indexes all of the cross referenced property sheets placed within the text. Interleaf indexes the ideas behind the words rather than the actual text which appears in the document. Markers placed in text indicate the point at which the reference occurs. The reference entry is itself inserted into a property sheet associated with each reference marker.

In essence, the user enters the index terms into the property sheet. In this menu the user would type what being indexed at this point. In other words, he is typing the text that will actually appear in the index when it is built. He also specifies a "range" which indicates how many pages are part of this indexed item. Ranges are not restricted to numbers, but can be expressed in more meaningful terms such as "for the rest of this section or chapter." In this way the index program will figure out the actual pages to be included in the index once the document is complete and truly ready to be indexed.

The indexing handles all of the special conditions common to most indexing such as multi-level sub-elements (including "see" and "see also" references). It provides a reasonable sort algorithm which will cope with text as well as numbers. Since the index is built as another set of pages within the same document, it can be edited and formatted like any other portion of the document.

The book. Along with the autonumbering, cross-referencing and indexing functions comes the concept of a "book." Until 3.0 the largest structure contained in the system was
the document. The entire document was one piece. Its format was consistent for the entire document.

With the concept of a book, the structure of the system has been elevated one level. In essence, a book is a collection of documents, each of which could have been built separately with different document formats. Therefore, part of the book may come from one document which was built in a two-column format, while another may have been built as a single-column format. However, for the purposes of page numbering, cross referencing, indexing, and autonumbering, all of the documents must be treated as a single entity.

Math. Another weak link in 2.5 was the handling of mathematical equations. With the new release, math will be handled as text as well as a graphic. Equations will still be placed in frames and positioned as any other framed item. But they will be built from input text with imbedded commands modeled after the Unox EQN program.

The Interleaf software uses essentially the same commands as EQN. Text is input as a coded file, then the system compiles this file and displays it in graphic form on the workstation screen. It he/she does not like the result, the operator can correct the input text and redisplay it on the screen.

Each expression will have its own property sheet. Within this the user would type the equation including these special mark commands which would add form to the equation. At the present time the special Greek and math symbols must be entered as words (such as lambda) — which is what EQN had to do because it was written to accept input prepared on ASCII terminals. Interleaf intends also to make these special characters available directly from its keyboard.

Once the property sheet is filled out and stored, the equation is automatically built and displayed within its frame. At any time the user can return to the property sheet to correct or format text or form formulas graphically manipulate the math expression within the frame. At this time the user cannot edit equations directly within the document. However, this is understandable if one graphically manipulates the values in the equation properties sheet. However, he can size it there, move it into position, and do any other function allowed for graphic elements within a frame.

For the convenient inputting of mathematical data, Interleaf will set up special filters or translate tables to convert incoming data into a format which is consistent with this approach.

Text manipulation within frames. One of the most powerful additions to the system, and one which generated a lot of excitement at the Seminar, is the ability to completely and freely manipulate text within frames. The easiest way to state this is to say that any function that could be performed on the text of a document, outside of a frame, can now be performed within a frame as well, but this underestimates the true capability.

Not only can the user perform all of the standard Interleaf text functions within a frame, he can also perform much more free-form composition which will allow him to cope with all kinds of problems which did not do on the Interleaf system. The demo version of this, at least, was very impressive. The user can dynamically stretch or shrink a column measure, for example, and the text is recomposed interactively to fit the changing boundaries.

Further, in the future the new text manipulation software will allow users to link arbitrarily-sized copy block areas (a & Aldus PageMaker) and flow text over several pages. This should give Interleaf the ability to cope with magazine pages and other free-form documents which the current system does not handle at all.

Bitstream type. For composition of display type and headlines within a graphic window, Interleaf will support Bitstream font masters in outline form. The outline font masters can be manipulated like any other graphic element. Then, the system will fill the character outlines.

Enhanced graphic manipulation. Release 3.0 will also include significant enhancements to the already impressive graphic manipulation facilities.

Spell check. The next version of the spell check program will include a pop-up menu of system generated words on the spelling of words which are not in the dictionary.

Pagination. Finally, the release 3.0 page formatting properties sheet will give the user more flexibility and control over the vertical justification process. The user will be able to control the percent of feathering as well as define when (by percentage of a page with non-breaking elements) VJ is allowed to be used.

Not included. As we mentioned above, the new feature and functions of release 3.0 go a long way in addressing the weak points of an already strong release 2.5 product. There are a few areas, however, that have not been completely addressed in this release and are planned for the next release:

A. The system will still lack a full complement of quality composition features. It does not provide any direct user control over indentation, spacing, or kerning, or the ability to redefine the display font. Interleaf has not added these features as yet because its existing customers have not demanded them. We would expect that this will change since Interleaf is planning to extend its market focus to include users with more commercial-quality typesetting concerns.

B. Another area which has lightly addressed is user control over the pagination rules. The user is still not given some of the control more sophisticated customers often want over this process.

C. Finally, the area which must be considered the weakest link in the Enlarge system is the ability to handle tables. There is the possibility that some automatic table handling will be ready for 3.0, but we have not been able to see any yet. However, added features in the system, most notably the ability to freely manipulate text in

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Product line. Document processing and pagination system which is designed to run on a variety of off-the-shelf hardware workstations. Currently, the system is configured to run on Apollo, Sun, DEC VAX, and the new IBM RT PC.

Interleaf sells both software and turn-key hardware software systems. Interleaf OEM's (except for Kodak) sell Interleaf software to run on their systems.

Workstation Publishing Software (WPS). This has most of the functionality of the complete TPS software but differs primarily in the fact that it is not configured to handle scanners or typesetters. Other than Kodak, this is the only product which is being sold by Interleaf's OEMs.

Technical Publishing Software (TPS). This is a super set of the functionality included in the WPS system. In addition to all WPS software features, it handles scanned line art and contone data from an IMagetex scanner and has the support of Interleaf's communications group for customizing input filters (translation programs) to allow easy link-up to for­eign systems.

Input and output hardware. Imagetex scanners are used for input of graphics. Output is generally to 300-dpi electronic printers driven by an Interleaf RIP. Interleaf sells the 8-ppm Canon LB8 CX and the 26-ppm Dataport laser printer. It also sells an Interleaf Lasercom device. Other output devices supported include the Monotype Lettercorder and the III Comp 80.

The Principals. Three members of the Interleaf board who are also officers of the company are co- founder and chairman Gary George, and George Potter. Boucher who is president of Interleaf, was a co-founder of Kurzwiel where he served as chief financial officer. George, also a co-founder of Kurzwiel was both controller and Vice President of Finance and a member of the Board. He also served as Chief Financial Officer of Microindustries. George Potter presents a familiar face in the publishing world having served as National Sales Manager for Publishing Systems for Aldus, and now as District Sales Manager for Wang. He also held management positions in marketing and sales for both IBM and Aldus.
frames, will, by itself, greatly improve the table-building process.

User comments

The Interleaf customers we have talked with are generally very pleased with the system. Most of the comments are along the lines of “best thing since sliced bread.” In general, those who have purchased the system for the purpose it was intended (technical documentation reproducible on high-quality plain-paper output devices) are exceptionally happy. They all spoke of significant improvements in the quality of their documents (many had been outputting on dot-matrix or daisywheel printers) and were surprised in actually achieving the “order of magnitude” improvement in speed and turn-around.

When asked if the system could be improved the answers were very similar. The most common reply was the need for more fonts. Everyone agreed that the quality of the existing fonts was equal or better than they had anticipated from a plain-paper, 300-dpi device. Many use the system for documents which used to be set outside by commercial typesetters. But everyone wanted a larger number of fonts to choose from.

It almost sounded as if users have been teased with quality, almost-typographic quality fonts, and now want the larger libraries of fonts normally associated with typesetters. However, most of the users we talked to were not typesetters or typesetter’s typesetter’s typesetter’s clients and were not trying to compare the quality or features of the Interleaf system with commercial typesetting systems. As you would expect, those users that had come from a more typical typesetting background did ask for more composition features.

In wanting more fonts, the users requested parallel improvements in system functions. Most were very pleased with the general functionality of the page make-up, editing, and graphic features. The most frequent comments were those relating to the speed to improve footnotes. The current system requires non-automatic work-around procedures to properly insert, number, edit, and position footnotes. The biggest concern seemed to be positioning footnotes on the same pages with running headers and footers.

The rest of the concerns seemed to be in line with what Interleaf itself recognizes as its areas of needing improvement. The same type of footnotes, tables and numbering are clearly the targets in Interleaf’s next release of software. In this regard, Interleaf appears to be listening to its customers’ needs.

Larger systems

As we noted in the introduction, most Interleaf systems sold to date have been relatively small configurations. However, some users are moving towards relatively large networked configurations which include Interleaf software. Note, for example, the Apollo installation described in our Seybold Seminar report. We do not think that Interleaf itself is likely to be the sole turn-key supplier of systems of this sort. Rather, they will be good-sized networked systems which support a variety of application software, including Interleaf Word and TPS software for composition, graphics and page output.

Such a system will rely on the basic Apollo, Sun, or DEC file management capabilities. It does not have the more elaborate database management facilities described by Caddex, Context et al. in the Seybold Seminar presentations. However, it is a distinction that Interleaf says it plans to address.

Pricing

Standard Interleaf pricing (as of May 1, 1986): WPS software for other workstations: $3,000.

Volume discounts available.

WPS software for IBM PC RT: $1,995.

TPS software for any configuration: $20,000/terminal with disk, $10,000/diskless terminal.

A typical four-workstation system with a 515-MB file server with 1/4" tape back-up and a Dataproducts 26-ppm printer: $40,000.

ImageTex scanner (completely interfaced but not including controller): $40,000.

Installation and support: Interleaf offers a three-day training session with all sales: $1,000.

Hardware and software maintenance: Generally 1% of total system price. This includes on-site hardware maintenance, toll free telephone support (application and hardware), and all future product enhancements. (2.5 customers would receive, free of charge, all standard features of release 3.0 which are made available.)

Software maintenance only: 1.1/2% of software charge. This includes toll free support and future software enhancements as above.

A complete single-user starter configuration with either a Sun or Apollo desktop workstation, 86 MB hard disc, 1/4" tape back-up, Interleaf RIP, Canon CX printer driven via a single serial port, and full TPS software: $29,995. (This is a single-user system without any network interface.)

Individual pricing Sun or Apollo desktop workstation with TPS software: $25,000.

Interleaf RIP and Canon printer with a parallel port interface: $95,000.

Interleaf RIP and Canon printer with a parallel port interface: $10,000.

Dataprocesses 26-page/min. printer with Interleaf RIP: $27,500.

An alternate laser printer to complement a configuration to provide full function final publishing (Imgen with Interleaf fonts): $11,500.

Conclusions

There is little doubt in our minds that the Interleaf system is powerful, fast, easy to use, and produces an excellent product on laser printers. For pagination of structured documents it is a pleasure to work on and the quality is excellent.

It is also clear that the current system has some limitations: footnotes, tables, automatic numbering and math. Most important, it really only supports a few type fonts in a few sizes on a few output devices.

The most important Flexfonts should go a long way towards giving Interleaf the ability to drive a wider variety of output devices with larger font libraries. The additional capabilities of release 3.0 will add much of the remaining short-comings of the current system. You might argue that release 2.5 software is still essentially a super word processor with exceptionally good facilities for handling text.

We do not think that you will be able to make the same argument about 3.0.

This does not mean, however, that the Interleaf system will never find its one suitable for highest-quality book composition. Interleaf is concentrating its development efforts on the systems of this sort.

Interleaf makes its product very well, but there are other very high-quality products in the market. Truly high-quality composition is not a high priority in this market. For the most part, customers simply want to produce good-quality text quickly and easily. This Interleaf is certainly able to do.

In all, this is a very impressive product. There are very few users at any price which offers complete suites of tools for producing completely paginated documents with text and a full range of graphics. If Interleaf’s capabilities meet your needs, the system is hard to beat.

Bill Salome
Jonathan Seybold

Interleaf and a Data Base Application

During the Seybold Seminar, we looked at an interesting intersection of two technologies: the Interleaf publishing system and the Isocrates CD-ROM data base system. It so happens that the Classics Department of Brown University was working on the beta sites for the IBM RT computer and the WPS software that is being offered on it. Of course, the classics were also familiar with the Thesaurus Linguae Graecae, a compilation of the full text of nearly all known Greek literature written between 700 B.C. It includes over 170 volumes of poetry, drama, philosophy, history, and religious writings such as the New Testament.

The TLG data base, which takes about 250 megabytes of storage, had just been indexed by the Harvard Classics Computer Project. The indexing data takes an additional 150 megabytes. Harvard had also written software designed to run on a variety of Unix systems and to support any display or printer capable of imaging the full Classical Greek character set. It was the implementation which Valencia University decided to convert the data base to a CD-ROM, to run the data base retrieval software on the RT, and to use the serifed software in publishing treatments on the ancient texts.

It is, so to speak, a classical application of data storage and retrieval techniques. A user can search the data base by author or keyword, the only complicating factor being the use of the standard English alphabet to transliterate classical Greek, since the retrieval software runs under Unix. Even that complication can be smoothed out: Apple Macintoshes, using a Greek font and MacTerminal, have been running the retrieval software on the RT.

During the seminar, we were given the opportunity to do a simple search in Greek and Latin. The result: the scholar can freely intermingle Greek and Latin within a single search. One could, for example, look for something like 'Isocrates' 10-12 and 'Cicero's De Officiis.'

We were able to see and print this query, and a list of hits was returned immediately. We were able to see the text at a glance by author or keyword, the only complicating factor being the use of the standard English alphabet to transliterate classical Greek. Since the retrieval software runs under Unix. Even that complication can be smoothed out: Apple Macintoshes, using a Greek font and MacTerminal, have been running the retrieval software on the RT.

Having searched the data base and found something quotable, the user simply marks the beginning and ending of the text selection. The software then copies the text to a Unix file in Interleaf-readable format. When the user exits Isocrates and starts the Interleaf software, the file appears on the user's desktop and may be treated like any document.

The Brown scholars concocted 10-12 and 13-14 of Classical Greek texts from the Math Greek symbols provided by Isocrates meets Interleaf. Since the Classical Greek text is extracted from an authoritative data base, the odds of introducing printer’s errors are much reduced. The proofreading of this text is left as an exercise for the student.

Interleaf. The principal issue was how to treat the accented characters; Classical Greek vowels may take seven accent marks appearing in several different combinations. The scholars elected to make each combination a separate character. This implied that there would be about 220 total characters, so each Classical font was handled as two Interleaf fonts. With that problem solved, the rest of the implementation was straightforward.

The result: the scholar can freely intermingle Greek and Latin within a single search. One could, for example, look for something like 'Isocrates' 10-12 and 'Cicero's De Officiis.' The result: the scholar can freely intermingle Greek and Latin within a single search. One could, for example, look for something like 'Isocrates' 10-12 and 'Cicero's De Officiis.'

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