XEROX

Whole ALTO World Newsletter

TECHNOLOGY AND TOOLS FOR THE FUTURE

August 30, 1979

SPECIAL ANNOUNCEMENTS

CHANGE IN WAW MEETING

The date for our next meeting has been changed from October 2 to Tuesday October 9, 1979. The meeting will be held at the TLC Best Western Hotel, 460 Totten Pond Road, Waltham, Mass., 617-890-7800. Darwin Newton, our host, has provided a list of other hotels in the area:

Holiday Inn Waltham, Totten Pond Rd., Waltham, 617-890-3000 (adjacent to the Best Western)
Waltham Motor Inn, 385 Winter St., Waltham, 617-890-2800
Sheraton Lexington, 727 Marrett Rd., Lexington, 617-862-8700
Marriott Hotel, 2345 Commonwealth Ave, Newton, 617-969-1000
Holiday Inn, 399 Grove St., Newton (Riverside), 617-969-5300
Wellesley Motor Inn, Rt. 9, Wellesley, 617-235-8555
Howard Johnson, 300 Washington St., Newton, 617-969-3010 (over turnpike)
Boston Sheraton Hotel, 39 Dolton St., Boston, 617-236-2000 (downtown)
Coply Plaza Hotel, Coply Square, Boston, 617-267-5300
Colannade Hotel, 120 Huntington Ave., Boston, 617-261-2800

WRC will have a series of demonstrations available Wednesday afternoon, October 10, for those who would like to see what's new at Webster. Make your plans now to attend. Please message Ron Cude to reserve a place at the meeting.

ALTO'S GIVE WAY TO DO'S

Well Alto fans, it looks as though the current Alto build will really be the last one ever. I know you've heard this before, but this time it looks for real. The flavor of DO that is likely to be the standard configuration will be the CSL/ASD package. More detailed information about this will be known soon and passed on in the Newsletter.

WHAT WILL WE CALL THE WAW???

Now that DO's will be augmenting, and at some point in time outnumbering the Alto's that make up our Whole Alto World, the time has come to seriously think about changing our name to reflect more than just the Wonderful World of the Alto. Perhaps a contest. Submit your ideas, good bad or ugly, to Ron Cude. The winner may receive a no expenses paid trip to beautiful downtown Gilroy, Ca., "The Garlic Capital of the World" and $1.47 in walking around money.

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GENERAL NOTES

NOVA GATEWAY RECALL

PARC, SSL has decided to reclaim the Nova Gateways that it has on loan to various groups. This decision has been motivated by two major factors:

1. Many of the pieces of hardware in these gateways are needed by SSL.

2. The existance of Alto Gateways will soon obsolete the Nova Gateway. The Alto Gateway now dominates the Nova Gateway in terms of its reliability and capabilities. Soon the Nova Gateway hardware will not be supported by the gateway software.

Here are the details:

PARC cannot guarantee software compatibility with any Nova Gateway past January, 1980. SSL requires the return of all Gateways on or before July 1, 1980.

Since we are all at 1980 Operating Plan time, it is important that you factor the replacement of your Nova Gateway into your plans.

Submitted by Bert Sutherland, PARC SSL

ELECTRONIC MAIL SYSTEM CHANGES

This item concerns some important changes in the operation of our electronic mail system. The changes will be most noticeable to Laurel users, though users of Maxc message systems (Msg, etc.) will also be affected somewhat.

Until now, all users have had mailboxes on one central mail server machine, namely Maxc. All Laurel mail delivery and retrieval has consisted of making a connection to Maxc. As the number of Alto users outside Palo Alto has grown, this arrangement has become administratively unmanageable, as well as being a source of poor performance.

We are therefore in the process of converting over to a new arrangement, under which nearly all users outside Palo Alto will keep their mailboxes on a local mail server machine (an IFS) rather than on Maxc. When you deliver or retrieve mail, you will make a connection to your local mail server rather than to Maxc. The mail servers will take care of delivering messages to other mail servers when necessary. This arrangement is expected to provide much better service to non-Palo Alto users, and the administration of the mailbox accounts will be decentralized.

Each user community has a name, called its "*registry*", that identifies the mail server that services it. Eventually, the registries will be as follows:

> PA .... (Palo Alto)
> ES .... (El Segundo)
> WBS .... (Webster area)
> HENR .... (Henrietta area)
> EOS .... (Electro-Optical Systems, Pasadena)

That is, all users in the Palo Alto area will keep their mailboxes in a registry called **PA** (which is really just an alias for Maxc); all users in the El Segundo area will keep their mailboxes in a registry called **ES** (a new IFS to be installed for this purpose); etc.

For now, we are just going to use the **PA, WBST, HENR,** and **EOS** registries. Users who currently have their mailbox on the Erie IFS will be in either **WBST** or **HENR**, users who currently who have their mailboxes on the XEOS IFS will be in the **EOS** registry, and users who currenty have their mailboxes on Maxc1 or Maxc2 will be in the **PA** registry.

Later, the ES registry will be created, and certain PA users' mailboxes moved to ES, WBST, HENR, and EOS, as appropriate. But for the next few weeks, all users in El Segundo will continue to have their mailboxes in the PA registry. A general announcement will be made at the time the El Segundo mailboxes are moved to the ES registry. **No MAXC mailboxes will be removed until another announcement is made.**

Because there are multiple registries, when you send a message to somebody outside your own registry, you must specify the registry of that recipient. This is done by appending a period followed by the registry name. For example, if your name is Jones and your registry is **PA**, and you want to send a message to Smith whose registry is **WBST**, you will have to say:

To: **Smith.WBST**

When Laurel sends the message, it will identify the message as coming

"From: **Jones.PA**".

When you send a message to somebody in your own registry, you do not need to qualify the recipient's name with the registry name. That is, if you are Jones and your registry is **PA**, and you want to send a message to Brown whose registry is also **PA**, you need only say:

To: **Brown**

(though it is also correct, though unnecessary, to say "Brown.PA"). Laurel's "Answer" command will always qualify the automatically-generated recipient names with registries wherever appropriate.

If your mailbox is currently on MAXC, and you are a Laurel user, here is what you should do right now. Use the "Get" menu item to read the file Laurel.profile into the composition window. In this file, you will find the following statements:

Send: **Maxc**
Retrieve: **Maxc**
Authenticate: **Maxc**

Delete these three statements and replace them with the single statement:

Registry: **PA**

Now use the "Put" menu item to write onto Laurel.profile, then "Quit" and restart Laurel.

This enables all the "multiple registry" mechanisms in Laurel. Until you have done this, Laurel will refuse to send messages to recipients in other registries.

You **MUST** be running Laurel 5 in order for this to work. If you have not already converted to Laurel 5, you should do so now, by retrieving <Laurel>Laurel.cm from your local file server and issuing the executive command "@Laurel@".

If you are outside of Palo Alto, you will be notified by your local support organization of the time at which your mailbox will be moved from Maxc to your local IFS mail server. This will be a few weeks from now (the exact details of this operation are still being worked out). At that time, you will be asked to edit your Laurel.profile again, to change your Registry from **PA** to your local registry name.

If your mailbox is currently on MAXC2, and you are a Laurel user, you should proceed as above, except that the three original statements in Laurel.profile should be replaced by:

Registry: **PA**
Retrieve: **Maxc2**

If your mailbox is currenty located on your local IFS (Erie or XEOS) rather than on Maxc, you should follow the procedure given above, except that the "Registry" statement should say:

> Registry: **WBST** .... (if you are in Webster)

or

> Registry: **HENR** .... (if you are in Henrietta)

or

> Registry: **EOS** .... (if you are in Pasadena)

You will now be able to send messages to people in other registries, whereas before you could send only to people who had mailboxes on your local IFS.

You might not know that there are already sizable mail user communities in **WBST** and **EOS**. Until now, they have been independent from the Maxc-based mail system, and it hasn't been possible to send messages between these communities. You can now send messages directly to people in these registries, rather than indirectly via **PA** mailboxes such as 〈WRC〉 and 〈LizBond〉.

If you maintain any distribution lists, particularly any that are used in multiple organizations or whose membership crosses organizational boundaries, you should modify them to include the correct registry of each recipient. Centrally-maintained distribution lists for Parc and SDD will have this done to them automatically.

To send a message to the Arpanet, use the syntax **"name@host"** or **"name at host"**, where "host" is the Arpanet host name. The "@" or "at" construct is used exclusively for Arpanet host names, and Laurel knows that any message with a recipient name containing "@" or "at" must be sent to Maxc for forwarding to the Arpanet.

If you receive messages from the Arpanet and your mailbox is not in the PA registry, you will have to inform your Arpanet correspondents that they must address messages to you by specifying **"name.registry@Parc-Maxc"**. For example, if your name is Smith and your registry is **ES**, then messages from the Arpanet will reach you only if they are addressed to **"Smith.ES@Parc-Maxc"**. (When you send a message to the Arpanet, Laurel will correctly identify you in this form.)

If you use Msg (or some other Maxc mail system) rather than Laurel, you should be aware that the recipient names put in the **"To"** and **"cc"** lists by the "Answer" command won't always be properly qualified by the registry name. These mail systems aren't maintained here, and there is nothing we can do about this problem.

The Maxc/IFS distributed mail system is still very much an "interim" arrangement. In future mail systems, registries will be decoupled from file servers entirely. Accomodating such future changes is the reason for choosing registry names ("PA", "EOS", etc.) that are distinct from file server names. Please use registry names, not file server names such as "Maxc", when addressing messages.

If you have any questions or problems, please contact your support organization.

> *Submitted by Ed Taft, PARC CSL*

ALTO ETHICS

There has been little if any discussion about the philosophy regarding the privateness of files on the Alto Network, particularly those on easily accessible shared utilities such as MAXC and IFS's. Many personal directories allow read access to the World. Is it ethical to assume that this implies permission for anyone to browse? The temptation to do so can be almost irresistable. Yet we are not so tempted to browse through the paper documents in someone else's unlocked file cabinet.

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Probably several other ethical issues could also be found. For example, is it OK to use an Alto for personal (not-for-profit) activities outside of business hours? How about IFS file space (since there is presently a surplus), or Dover? How about MAXC or other local computers, during periods when they are otherwise idle?

This should be actively debated within the Whole Alto World. When the Alto community was small and cohesive, common behavior patterns diffused by osmosis. But now that the Whole Alto World includes at least a thousand people, more explicit indoctrination may be necessary.

Submitted by Dave Damouth, WRC

ANOTHER LAUREL HACK

It has been observed that many Laurel users make good use of the "Move To" mail file feature to organize their mail into different categories. This is as it should be except that when the list of different mail files gets very large, it becomes difficult to remember them all or what they are called. Thus in order to recall a mail file name, it becomes necessary to go back to the Executive and get a list of all the "*.mail" files and then go back into Laurel to retrieve the desired one.

One way to overcome this is to create a message that lists all of your mail files so you can refer to it while in Laurel. To do this, display "New Form", compose the message listing all the names of your mail files, select the "Put" command and edit in the brackets an easy name like "MailFiles" and type ESC. This writes your message on your Alto disk. To retrieve this message while in Laurel, select "Get", type "MailFiles" in the brackets and ESC. This message can be edited at any time to reflect maintenance of your list of mail files and then re-"Put". It can also be displayed, edited, and re-"Put" using Bravo. Note that it is not necessary to ever "Deliver" your mail file list message.

Submitted by Chuck Henderson, ASD

ORDERING DISK PACKS IN EL SEGUNDO

Alto disk packs are now available from *Forms and Supplies* in El Segundo. Please direct requests for ALTO disks to *Forms and Supplies*, Mail Stop M4-14, INTELNET 8*823-2378.

You may order ALTO disks (Memorex model MK III 2F-12) by sending a Supplies Request form (#339) and specifying stock number MK III 2F.

ASD will no longer stock ALTO disks. If you have any questions, contact:

> J. H. Mathus
> WOS/Graphic Services
> El Segundo, M4-04
> INTELNET 8*823-2757

NEW NETWORK DIAGRAM

A new Alto Network Topology diagram is available and is stored in [MAXC]<AltoDocs> AltoNetwork.press and is included within the Newsletter, page 37.

UNIVERSITY GRANT NOTICE

As some of you may know, Xerox is making a grant of Alto hardware and software to the computer science departments of three universities: *Carnegie-Mellon, MIT,* and *Stanford.* The *University of Rochester,* which already has some Alto equipment, will also participate in the software release. Included in this grant will be nearly all the "basic" software used at PARC for document preparation and for Bcpl and Mesa programming.

The mechanism for release will be that representatives of the universities copy files from certain designated directories on Maxc1, including <Alto>, <AltoDocs>, <AltoSource>, <Mesa>, and <Pup>, as well as several new directories that are in the process of being set up. Maxc has the protection facilities required to permit us to give the university liaisons access rights to selected directories and to selected files within those directories; the security of other files on Maxc will not be compromised by this release procedure. The university liaisons will have no access at all to file servers besides Maxc.

The policy being followed with respect to this software release is that we are making available as much software as possible, consistent with proprietary considerations. Exceptions will be decided on a case-by-case basis by a Xerox committee that is administering the grant program.

The software release is being coordinated by PARC liaisons who are alumni of the universities (presently Roy Levin (CMU), Mike Schroeder (MIT), Dan Swinehart (Stanford), and Joe Maleson (U of R)). In general, all software and documentation in the above-mentioned directories (either now or in the future) will be released to the universities; however, all files are being considered on a case-by-case basis, and authors or maintainers will be consulted before any software is released. Once a given piece of software or documentation has been cleared for release, updates to or new versions of it will also be made available to the universities unless the PARC liaisons are notified to the contrary.

For legal reasons, each source file and document released as part of the grant program must be edited to include the following copyright notice, near the beginning of the file:

Copyright Xerox Corporation 1979

This will be taken care of by the PARC staff members who are coordinating the release. However, next time you modify such a program or document for which you are responsible, you should be careful to obtain fresh copies of the source files from Maxc rather than use versions you might have saved elsewhere (e.g., on an Alto disk).

If you are responsible for software or documentation kept in the above-mentioned Maxc directories, and you have not yet been contacted about this matter (or you have questions or comments), you should contact Dan Swinehart, who is coordinating the software release at the present time.

Submitted by Ed Taft, PARC CSL

MARKET PLACE

Market Place provides a forum for Alto users to make offerings and requests for Alto related hardware and software. To place an "ad" or offering, send the text to the WAW Coordinator, Ron Cude, in El Segundo, message <CUDE>, or phone Intelnet 8*823-2465.

HARDWARE CATALOG UPDATE

The Alto Hardware Catalog is still being updated. (Primarily because I've received very little input from any of you regarding new items.) Please provide me with any items eligible for inclusion. Devices included in this catalog have at least one prototype considered to be working properly and must be reproducible from existing documentation. A copy of the current (outdated) catalog (see page 15)is in the Newsletter. Please send comments, additions and corrections to Ron Cude.

1600 BPI MAG TAPE INTERFACE

Alto II's can now run 1600 BPI 9 Track Phase Encoded (PE) Magnetic Tapes. An installation requires two ASD tape controller boards, cables, and a few backplane modifications. Both

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Kennedy (ANSI) and Mohawk style drives can be accomodated, with up to four drives daisy-chained by one controller set. The initial software has been released. This includes Tape (integrated with Trident) microcode, low level (buffer I/O) software, a streams package, a utility for copying unlabeled tapes of varying formats, and a diagnostic. Interested parties should contact Alan Paeth % <LIZBOND.EOS>, XEOS MS - 359 or Intelnet 8*844-2232.

Submitted by Alan Paeth, XEOS

NEW SOFTWARE OFFERING

★ AFTP.RUN ★

Requirements at ADL have necessitated the production of a modified version of EFTP, called AFTP.Run. It is compatible with the old EFTP and uses modified versions of the latest EFTP packages.

It differs from EFTP in that it caters to a new EFTP package type: a LeaderPage packet. If requested by a /f global switch, AFTP will send the leader page of the file being transmitted as a separate LeaderPage packet. The receiving AFTP will recognize this special packet and try to open a new file under the name carried by the LeaderPage packet. Subsequent data packets will be written to this file. If the file already exists and the receiving version of AFTP was not started with the /f global switch, then the file will not be accepted and an abort code will be returned to the sender. This prevents accidental overwriting of files.

The format of the command line differs slightly from EFTP in that the filename(s) to be sent are the last things on the line; i.e. the format is Aftp[/f] to/from foreign-port filename-list

The reason for the changes arise from a requirement to run a press printer server for the TC200 instead of a Spruce Server. Some way was needed to send file names to that server and still be able to do hardcopy (no file names) from Bravo, Laurel etc. Hence the compatibility requirement. The program is filed as [MAXC]<Cronshaw>Aftp.Run

Two other programs used regularly at ADL which might be useful to others are:

★ FILEDUMP.RUN ★

This program produces on the display and, optionally as dump.txt file, in Octal or Hexadecimal and Ascii form, a dump, disk page by page, of any file. It is used as a debugging aid when trying to generate or interpret files. The command line format is:

FileDump[/f] filename

If the /f option is used a file dump.txt is produced as well as the display output. This program is filed as [MAXC]<Cronshaw>FileDump.Run

★ SPLITFILE.RUN ★

This program is used to split large text files which are too big for Bravo. It arbitrarily splits the file into 60 page files called Part # .txt. It is filed as [MAXC]<Cronshaw>SplitFile.Run

TOOLS

HARDWARE

SPG is currently debugging the first articles of the new 3K CRAM module and the Shugart Rigid Disk Controller module. They hope to be finished soon and go into the first build of production.

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MAINTENANCE NOTES

According to an article in *Computer World*, those occasional single errors that you see after DMT has run all night might be a problem that is inherent in the manufacturing of most large scale integration (LSI) memory chips.

It appears that the actual physical individual cell dimensions inside the chip are approximately 20 microns and store information as the "presence" or "absence" of 1,000,000 electrons.

All memory chips being manufactured today are made of ceramics and plastics which contain very small amounts of radioactive uranium and thorium. These emit alpha particles which occasionally pass through a bit cell. This can cause a disturbance of up to 1,500,000 electrons thereby destroying the information stored in the cell. It will remain this way until that bit has been rewritten.

This is why you may see from time to time a single error detected by DMT that does not repeat itself and appears to go away.

Submitted by Phil Hoffmann, Field Service

SOFTWARE

In general, the subsystems, packages, and documentation indicated here will be available from your local File Server under the directories <Alto> and <AltoDocs>. If they are not available, or if you are in doubt as to the version, they may be retrieved from [MAXC] (same directories). Files stored under other directories are on [MAXC] unless otherwise indicated, e.g. [ISIS].

NEW RELEASES

★ AIS ★

Two new pieces of AIS software are being released at this time. They are AISHALFTONE.RUN and AISROTATE.RUN. Both are available from [Erie]<Ais> and both have been loaded with the new AIS software, i.e. to work with OS 17.

> [Erie]<Ais>AisHalftone.Run, version 1.1, requires the text editable file Picture.Data. One is available on [Erie]<Ais>. The documentation can be found on [Erie]<Ais>AisHalftone.press. This software was written by Jim Bollman.

> [Erie]<Ais>AisRotate.run, version 1.7, rotates bit/pixel or byte/pixel images. No documentation is available at this time. Written by Brett Fleisch.

RE-RELEASES - SUBSYSTEMS

★ SIL ★

The Control-Shift-View command was broken and has been fixed. About 100 words of free space has been taken back and given to the operating system. This is required for the new OS 17 which will come out in the next month or so.

Corrections have been made on MCT6, added LS109, LS393, and 74128. In addition, the comments of DataSheets have been changed from Font-2 to Font-1-I. Files altered are Sil.lb5, Sil.lb6, TTLDict.Analyze, ECLDict.Analyze and TTL/ECL-DataSheets.

Additionally, the N123, retriggerable multivibrators, have been fixed so that ANALYZER will not complain about missing component name "a'". Both [MAXC1] and [IVY] have been updated. File Sil.lb5 is in SilLibraries.dm.

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★ BROWNIE ★

Brownie 4.0, a program for moving files between several hosts (in particular updating directories on IFS's) has now been installed on the <Brownie> directory on [Iris]. To run Brownie, retrieve <Brownie>Brownie.image and <Mesa>RunMesa.run. Brownie requires about 2000 free pages on your local Alto disk to transfer large directories. There are a number of changes in this release. It is strongly recommended that you read the documentation (<Brownie>Brownie.press, see page 11 of the Newsletter) before using the new version. (The old version of Brownie has been moved to <OldBrownie>.) As always, bug reports and change requests should be submitted via the message system to <SDSupport>.

★ IFS 1.22 ★

Version 1.22 of IFS is now available on [MACX1]<IFS>. This is a maintenance release and changes have been limited to bug fixes.

A new startup-time global switch "/F" has been added: each occurrence of /F on the command line extends the directory file map by 100 words. This is needed only on [IRIS] and one /F elsewhere should be sufficient at present.

RE-RELEASES - PACKAGES

★ AIS ★

The imminent arrival of OS 17 requires thatall current AIS software be updated. Any software that is not updated will not work with OS 17. In addition, a small AIS file format change has been made at this time, and old AIS software will be unable to read the new format files. Updated software, however, will work on both OS 16 and OS 17 and will be able to read either old or new format AIS files.

To update your software, you need to retrieve the following files:

            [ERIE]<AIS>AisFile.d
            [ERIE]<AIS>AISUCA0.BR
            [ERIE]<AIS>AISUCA1.BR
            [ERIE]<AIS>AISUCA2.BR
            [MAXC]<Alto>TFS.DM

Recompile your sources, with the new AisFile.d, and load them with the new AISUCA*.BR files and the new TFS*.BR files.

Other AIS software being re-released is listed below:

            [Erie]<Ais>AIS.RUN -- version 3.2
            [Erie]<AltoDocs>AISMANUAL.PRESS (updated documentation, August 1979)
            [Erie]<Ais>AisAttributes.run -- version 1.2
            [Erie]<Ais>AisDump.run -- version 1.3
            [Erie]<Ais>AisHalftone.run -- version 1.1
            [Erie]<Ais>AisHistogram.run -- version 3.1
            [Erie]<Ais>AisMagnify.run -- version 2.3
            [Erie]<Ais>AisMonochrome.run -- version 1.1
            [Erie]<Ais>AisRotate.run -- version 1.7
            [Erie]<Ais>AisShow.run -- version 2.3

TECHNOLOGY

This month two papers by Don Winter and Don Stewart are featured. *Future Trends in Electronic Publishing* begins on page 20. *Micrographics and Personal Computers in Information Science in 2001* begins on page 29.

CATALOGS

The Alto Hardware Catalog can be found this month beginning on page 15. Since it is being revised, please check it for errors and submit any changes or additions to Ron Cude.

To	Brownie Users	Date	August 14, 1979
From	Bruce Malasky	Location	Palo Alto
Subject	Brownie 4.0	Organization	SDD/SO/Mesa

XEROX

Filed on: [IRIS]<BROWNIE>BROWNIE.BRAVO

Brownie is intended to aid in the problem of distributing software and maintaining consistent copies of *Bible directories* on several hosts. It may also be helpful in moving files around in private development directories during the software development process. This memo describes how to use Brownie and does not go into much detail about the actual implementation.

Getting Started

Brownie can be found on [IRIS]<BROWNIE> as BROWNIE.IMAGE and takes 242 pages on a Model 31. When Brownie is started a herald appears indicating which version of Brownie you are using and when it was built, followed by the current date and time. NOTE: Brownie 4.0 is written in Mesa 5.0 and is the only supported version available. Brownie 3.0 is a prerelease of 4.0 and is no longer supported. Version 4.0 represents major internal restructuring and cleanup from 3.0. Brownie 1.0 runs in Mesa 3.0 and only on a network with fewer than 20 nets. Brownie 2.0 was written in Mesa 4.2 and was never debugged. Any existing copies of this version should be deleted. The following command line is how Brownie is invoked.

```
>Brownie[/q] [DataFile]
```

If DataFile is not specified, Brownie searches the local disk for the file BROWNIE.DATA during initialization. The data file describes the operations to be performed. The /q switch will cause Brownie to prompt for connect passwords to directories as it parses the data file. It will always prompt for login passwords if they are missing. A sample data file and an explanation of its format are included at the end of this memo. When it is running, Brownie uses approximately 1 page on the local disk for every 15 files to buffer internal tables.

DataFile Options

Brownie can be used either to update one directory from another or to copy entire directories (all versions). While it is running, it displays (and logs in mesa.typescript) informational messages about what it is doing, including a list of the files it is tranferring. The amount of information logged is controlled by a switch on the first line of the DataFile. The choices are: **error, brief, verbose, debug**; these cause Brownie to log successively more details. In **debug** mode, Brownie will print out passwords as well as other internal information. **Verbose** mode is worth trying once, to see all the steps that Brownie goes through. **Brief** mode is normally recommended, to keep the mesa.typescript from getting large. **Error** mode is not recommended, as Brownie will only display error messages. FTP error messages are followed by a code in parentheses; this is intended for debugging purposes only.

In Brownie 4.0, it is possible to specify a start-up time. This permits lengthy transfers that tie up a lot of network resources to be delayed until nighttime. Brownie processes the data file before doing any transfers so that any errors may be discovered immediately. While waiting for the start time, the display is turned off, and a moving Brownie cursor is displayed. The height of the cursor on the screen is proportional to the amount of time left to wait. In addition, it is also possible to specify a stopping time.

Files are moved using one of three methods: renaming, a diskless transfer, and retrieving followed by storing the file. The method to use is specified at the end of each command line with one of these keywords: **Rename, NoBuffering,** or **BufferFiles**; the default is **NoBuffering.** Renaming a file will work only if files are being moved within a directory, or if the user's login, as specified in the **DataFile**, grants the correct access permissions for both directories. In any event, renaming files across directories is only supported for two directories on the same IFS. **NoBuffering** indicates that the files are to be transferred using memory instead of the disk for a temporary copy of the file. This works by having one Ftp connection storing a file at the same time another one is retrieving it. WARNING: If the file transfer mode is **BufferFiles**, there must be enough room on the local disk to hold the largest file to be transferred. **NoBuffering** is about 30% faster than **BufferFiles**.

The parameter **TestFTP** now defaults to **TRUE** in order to help track down a suspected FTP problem. This will cause Brownie to trap to the debugger on a fatal FTP error in addition to creating the file Brownie.FtpTrace on the local disk. **TestFTP** must be explicitly set to **FALSE** to avoid trapping.

Brownie goes through some effort to do the right things for different hosts. For example, using "*" as a wild card on an IFS will get a complete list of files, whereas "*.*" and "*" are both necessary for a Tenex such as Maxc1. Alto FTP servers do not work as suitable hosts, since they do not support wild cards at all. Although hosts may be specified by a name or a network address, Brownie does not understand "3#200#" as being equivalent to "Maxc". Brownie treats any server name that starts with the string "maxc" as a Tenex.

Updating Directories

Normally, Brownie works by first enumerating files from both the source and destination hosts. The cursor blinks once for each file it enumerates. After the enumerations, Brownie then decides which files to transfer by comparing the write dates of files with the same name to determine if any files on the source [host]<directory> are newer than their counterparts on the destination [host]<directory>. This algorithm will be changed to use creation dates as soon as the file servers are brought up to the standard described in Ed Taft's memo on [MAXC]<AltoDocs>FileDates.press. If there are communication problems during any of these steps, Brownie automatically reopens connections after a two-minute wait.

Filenames are compared ignoring both version number and case. Subdirectories not specified as part of the command line are included in the file name for comparison purposes. This results in subdirectory structure being preserved for all transfer operations. In the sample directories below, we are updating [DestinationHost]<mumble>foo> from [SourceHost]<Mumble>Foo>. The file Bas>B.mesa will be transferred only if its write date is newer on SourceHost. The file a.mesa will be transferred regardless of its write date, because it is not on the DestinationHost. This will result in one version of a.mesa in the Foo>Bar> subdirectory and one in the Foo> subdirectory.

```
[DestinationHost]                              [SourceHost]
<Mumble>Foo>                                   <Mumble>Foo>
        Bar>                                           a.mesa!2
            A.mesa!1                                   Bas>
        Bas>                                               B.mesa!3
            B.mesa!4                                   Baz>
        Baz>                                               a.bcd!1
                                                           b.bcd!2
```

Copying Directories

By specifying **CopyAll** on a command line, it is possible to instruct Brownie to copy all files, maintaining version numbers, from one directory to another. If any of the files exist on the destination directory, the new files will have higher version numbers.

Delver

Delver on a command line instructs Brownie to delete all but the latest version of every file in the destination directory using a telnet connection after the transfer is finished. This command will work only on an IFS. In addition, it is a requirement that the user's login grant the correct access permissions or that a connect password be specified.

Planned Enhancements

In the future Brownie may provide a mechanism for changing the contents of files as they are transferred. This feature is motivated by the desire to alter command files automatically to use the new host.

In addition, Brownie currently uses two connections when transferring files on the same host. It will probably be changed to use only a single connection when it can.

Problem Reporting

Any requests or problems concerning the use of Brownie should be sent to <SDSUPPORT> (8*823-2565). Please include pointers to the MESA.TYPESCRIPT and BROWNIE.FTPTRACE when submitting bug reports.

Sample Brownie.data

The format of Brownie.data has been changed since Brownie 1.0, mainly by the addition of new fields. However, old data files are compatible with the new format. In addition, Brownie is slightly more understanding about the placement of blanks between fields. Note that capitalization of commands is ignored. Despite these improvements, Brownie is still strict about the data file following the exact layout specified. The sample data file shown below is also stored on [IRIS]<BROWNIE>BROWNIE.DATA.

```
{brief}
TestFTP: {false}
Start: {20:00}
Stop: {2:00}
// logins follow
[Isis]<Malasky>()
[Iris]<guest>(guest)
[Maxc]<Malasky>(secret)
// These are commands
[Isis]<Mesa> (secret) ← [Maxc]<Mesa> () NoBuffering
[Isis]<OldMesa>4.2>() ← [Isis]<Mesa> () rename
[Isis]<MesaLib>3.0> () ← [Iris]<MesaLib>3.0>(foo) NoBuffering delver
[Iris]<Malasky> (secret) ← [Isis]<Malasky> () CopyAll
```

The first line controls how much information Brownie will log. The next three lines may occur in any order and are optional. *TestFTP* is for internal debugging, and may be FALSE. A *Start* time of NOW tells Brownie not to wait before running. Now is the default. The default *Stop* time is to run until finished. Times may be in any of the following formats: HH:MM, HHMM, H:MM, or HMM. The following line is a comment, but the leading // is required.

The next section is used by Brownie to log into the various hosts. A host is delimited by [], a user name by <> and a password by (). Spaces are not allowed between fields of a login line. Logins are terminated by the second comment line. Only the two comment lines shown are allowed.

All the remaining lines in the data file are command lines specifying what updates are to be performed. Each command line is in this format:

[Destination]<To directory>(*CP*)*SP*← *SP*[Source]<From directory>(*CP*) *TO CO DO CR* ,

where

SP is a space,
CR is a carriage return,
CP is a connect password, possibly null,
TO is Transfer Options {BufferFiles, NoBuffering, Rename} or null (BufferFiles),
CO is Copy Options; CopyAll or null, and
DO is Delver Options; Delver or null.

No *'s are permitted in any of the directory specifications. Subdirectories for <To directory> and <From directory> are permitted, but they are ignored by Maxc. The connect password is required only when the login name does not have the necessary access permissions. Nonetheless, the parentheses are required. Normally, a connect password will be specified for the destination [host] to store files, while one is usually not necessary to retrieve files.

ALTO HARDWARE CATALOG

This catalog lists and briefly describes Alto hardware options and peripheral devices that may be attached to an Alto, along with their required interfaces. Devices included in this catalog have at least one prototype considered to work properly and to be reproducible from existing documentation. The standard Alto peripherals, display, mouse, keyboard, keyset, and Diablo model 31 disk have not been included. Each device has an entry of the following format:

> *ITEM NAME:* Description
>
> INTERFACE: Other options or modifications required.
> SOFTWARE: What/Where is the appropriate code?
> DOCUMENTATION: Where is it written down?
> AVAILABILITY/SOURCE: Who did it and can I get one?

The entries are organized by hardware type: Alto Options and Chassis Mounted Interfaces, Alien Processors, Disks, Fabrication Equipment, Printers, Scanners, and Workstations.

This catalog is maintained and distributed by the *Alto User Support Coordinator*, Ron Cude. If you have questions or know of a device which you feel should be included, please provide the above information to Ron for inclusion in the next revision. Message <CUDE> or call Intelnet 8*823-2465.

ALTO OPTIONS AND CHASSIS MOUNTED INTERFACES

EXTENDED MEMORY: An Alto II option (standard on 8th. build and later machines) permitting memory to be increased from 64K to 256K in 64K chunks. Though the 16-bit addressing of the Alto prevents transparent use above 64K, data such as the display bit map may be placed there and code may be executed out of any 64K bank.

> INTERFACE: Modifications to the Backplane, AIM, DIM, CRAM, Control, and Memory boards are required for pre-seventh build Altos. A MEAT module must be purchased to replace the old Terminator module.
> SOFTWARE: Microcode AltoIICode3XM.MB.
> DOCUMENTATION: Alto Hardware Manual.
> AVAILABILITY/SOURCE: Contact SPG for modification drawings and details.

EIA/RS-232C: A serial communications module supporting up to eight lines in either synchronous or asynchronous mode at 14 selectable transmission rates from 50 to 9600 baud.

> INTERFACE: None.
> SOFTWARE: STREAMS type package.
> DOCUMENTATION: EIA Board Specification, memo from Shingo Arase, Aug. 31, 1977; Engineering drawings; "EIA Streams Package", memo from Rick Tiberi, Dec. 9, 1977.
> AVAILABILITY/SOURCE: 24 were built to order by XEOS.

EIA/RS-232C, 300 BAUD: A simple serial communications module.

> INTERFACE: None.
> SOFTWARE: An assembly language driver and supporting microcode.
> DOCUMENTATION: "Alto II 300 Baud Serial EIA Interface", memo from Gerald Justice, Feb. 17, 1977.
> AVAILABILITY/SOURCE: Developed for special project by XEOS.

ORBIT: A four module interface designed to help the Alto convert character code/position information to a format suitable for a scanning laser printer.

> INTERFACE: Alto II with ORBIT backplane.
> DOCUMENTATION: "ORBIT General Description", Severo Ornstein, April 22, 1977; "Programmer's Guide to ORBIT, the ROS adapter, and the Dover Printer", Bob Sproull, June 15, 1977.
> AVAILABILITY/SOURCE: Contact SPG.

ORBIT BACKPLANE: An Alto II backplane that has been modified to accept and operate the ORBIT interface.

> INTERFACE: None.
> DOCUMENTATION: Engineering drawings.
> AVAILABILITY/SOURCE: Contact SPG.

TRIDENT DISK INTERFACE (TRICON): A disk controller for the Trident T80 or T300 model disks.

> INTERFACE: None. May be some wiring changes????
> DOCUMENTATION: "Trident Disk for the Alto" filed on [MAXC]<AltoDocs>Trident.Ears.
> AVAILABILITY/SOURCE: Contact SPG.

TRICON MULTIPLEXER: Used to interface 2 to 8 Trident disks to the same Alto.

> INTERFACE: Trident Disk Interface.
> DOCUMENTATION: Engineering Drawings.
> AVAILABILITY/SOURCE: Contact SPG.

WIRE-WRAP BOARDS, GENERAL PURPOSE: Four quadrants, each of which accepts eighteen 14/16 pin dip packages, separated by a longitudinal row of 92 pads and two horizontal rows of 27 pads that accept .300, .400, or .600 center dip packages (SSI, MSI, LSI).

> INTERFACE: None.
> DOCUMENTATION: PWB, GENERAL PURPOSE WIRE WRAP, Dwg. 596P61506.
> AVAILABILITY/SOURCE: 40 were fabricated by XEOS Publishing Programs Department and are currently available.????

2K CONTROL MODULE: Replaced the previously standard Alto II 1K Control Module for applications requiring additional microcode such as Trident based file systems. It has been standard since 6th. build machines.

> INTERFACE: None.
> DOCUMENTATION: Alto Hardware Manual.
> AVAILABILITY/SOURCE: Contact SPG.

ALIEN PROCESSORS/INTERFACES

XEROX SIGMA 3/7/9 INTERFACE: This line of processors has been interfaced to the Ethernet.

> SOFTWARE: Alto and Sigma 3 programs to facilitate data transfer.
> DOCUMENTATION: WRC Report X7703234, Mar. 77.
> AVAILABILITY/SOURCE: Built for special project by WRC.

DACONICS VT-2 INTERFACE: The VT-2 (and soon VT-3????) has been attached to the Ethernet via the standard transceiver and modified to support the EFTP protocol.

SOFTWARE: Specially written for VT-2 and Alto II to support a Trident based filing system (but not TFS).
DOCUMENTATION: Drawings of hardware interface.
AVAILABILITY/SOURCE: Developed for special project by ASD.

XEROX 800 ETS, COMMUNICATING: A typewriter/cassette based word processing system.

INTERFACE: 300 baud EIA board.
SOFTWARE: None????.
DOCUMENTATION: None????
AVAILABILITY/SOURCE: Xerox

DISK DRIVES

DIABLO 44: Similar to the Diablo Model 31 except having an additional fixed disk, shorter seek times, higher transfer rate and sounds like a Boeing 747 taking off.

INTERFACE: Requires a different clock crystal on the Alto's Disk Controller board and a new cable.
SOFTWARE: None. Executive treats it as a dual Model 31 Alto (fixed disk is drive 1).
DOCUMENTATION: Alto Hardware Manual.
AVAILABILITY/SOURCE: May be ordered from Diablo; cable fabricated by buyer.

TRIDENT T-80/T-300: Removable media drives with 80 megabyte and 300 megabyte capacities respectively and a 9.7 megabit transfer rate. They support the Trident and File Server systems.

INTERFACE: Trident Disk Interface (TriCon) and 2K Control Module.
SOFTWARE: Interim File System, TFU utility subsystem, TRIEX maintenence subsystem, and TFS support package.
DOCUMENTATION: "Trident Disk for the Alto", filed on <AltoDocs>Trident.Ears.
AVAILABILITY/SOURCE: Century Data Systems, a Xerox company. Contact SPG for appropriate cables.

FABRICATION EQUIPMENT

PRO-LOG 92 PROM PROGRAMMER: A multi-personality PROM blower.

INTERFACE: Plugs into the Alto's HYTYPE port, special PROM's required for the PROM blower.
SOFTWARE: [MAXC]<Alto>Pnew.Run.
DOCUMENTATION: [MAXC]<AltoDocs>PromManual.Bravo/Press.
AVAILABILITY/SOURCE: Pro-Log Corp. (Buyer must fabricate cable and blow the special PROM's).

PRINTERS

COLOR GRAPHICS: A 6500-based scanning laser, three color printer with a resolution of 200 bits/inch horizontal, 100 bits/inch vertical. Image width is limited to 6.4 inches, length to that of paper. Developed for use with color CRT's to provide hardcopy output.

INTERFACE: SLOT/3100 interface board.
SOFTWARE: Basic software to process AIS files.
DOCUMENTATION: Xerox Technical Bulletin 610P11514 and Advertising Bulletin 610P11259.
AVAILABILITY/SOURCE: Xerox.

DOVER: A 7000-based variable rate scanning laser, high volume printer. A set of fonts has been developed to run at 384 scanlines/inch.

INTERFACE: ORBIT and an Alto II with an ORBIT backplane.
SOFTWARE: Spruce (server subsystem), Empress and others (user subsystems).
DOCUMENTATION: "Overview of the DOVER", John Ellenby, February 24, 1977.
AVAILABILITY/SOURCE: No longer being manufactured. Developed jointly by PARC and SPG. Some may be available from ASD????

FUJI XEROX 1660: A 660-based low cost, 200 bits/inch optical fiber printer.

INTERFACE: Connects to HYTYPE port.
SOFTWARE: Project specific software and microcode exist to convert text files to bands-type bitmaps and to transfer the bitmaps to the printer. WHOSE PROJECT????
DOCUMENTATION: Engineering drawings.
AVAILABILITY/SOURCE: Fuji Xerox markets the printer in Japan.

PIMLICO: A 6500-based variable rate scanning laser, three color printer.

INTERFACE: ORBIT and an Alto II with an ORBIT backplane.
SOFTWARE: Spruce (server subsystem), Empress, Color-Draw, Bravo 7.1X, and others (user subsystems).
DOCUMENTATION: Engineering drawings.
AVAILABILITY/SOURCE: No longer being manufactured. Developed jointly by PARC and SPG.

PRINTER MULTIPLEXER: A small black box device which allows a single server processor to operate up to four 9-wire interfaced printers. Two operational modes are provided: MANUAL, via a rotary switch; and AUTO, via software control from the server processor. No software is currently available to support the AUTO mode.

INTERFACE: ORBIT and an Alto II with an ORBIT backplane.
SOFTWARE: None required for MANUAL use, not available for AUTO use.
DOCUMENTATION: Engineering drawings.
AVAILABILITY/SOURCE: Contact SPG, four are currently available.

SEQUOIA: A 3100-based variable rate scanning laser, high quality, limited volume printer.

INTERFACE: ORBIT and an Alto II with an ORBIT backplane.
SOFTWARE: Spruce (server subsystem), Empress, and others (user subsystems).
DOCUMENTATION: Engineering drawings.
AVAILABILITY/SOURCE: Unknown at this time. Developed by XEOS.

SLOT/3100: A 3100-based scanning laser, limited volume printer.

INTERFACE: SLOT/3100 interface board.
SOFTWARE: Press.
DOCUMENTATION: Xerox Report X7902143, *SLOT Revisited.*
AVAILABILITY/SOURCE: A limited number were built.

TC-200: see TC-200 entry under SCANNERS.

VERSATEC D900A: An electrostatic printer.

INTERFACE: Standard Alto HYTYPE connector.
SOFTWARE: Vprint (.tty and Bravo/Gypsy files), Press (press files).

DOCUMENTATION: Alto Hardware Manual.
AVAILABILITY/SOURCE: Versatec (XEOS Publishing Programs Department has a few extra????).

SCANNERS

JOYCE-LOEBL SCAN-DIG 3: A selectable rate scanner (25/50/75/100 micron) for color or greytone material up to 10 by 10 inches.

INTERFACE: Specially built for Alto II.
SOFTWARE: Controls scanner and converts output to AIS format files for Alto and Trident file systems.
DOCUMENTATION: NSIL drawings of the interface.
AVAILABILITY/SOURCE: Built for special project.

TC-200: A variable rate scanner (94-240 points/inch) and Alto screen resolution printer. The supporting software creates/prints PRESS format files.

INTERFACE: Extensive modifications to the TC-200 and an Interface Box that attaches to the Alto via the HYTYPE connector.
SOFTWARE: Press for printing on an Alto I, modified Press and microcode for printing on an Alto II. New subsystem for scanning (unnamed).
DOCUMENTATION: None currently.
AVAILABILITY/SOURCE: Uncertain at this time.

WORKSTATIONS

REMOTE WORKSTATION: Permits placing an Alto workstation (minus keyset) and HYTYPE printer up to 1000 feet from the Alto.

INTERFACE: None.
SOFTWARE: None.
DOCUMENTATION: Engineering drawings.
AVAILABILITY/SOURCE: Built for special project.

VIDEO BUFFER BOX: Supports the connection of 5 displays to a single Alto.

INTERFACE: None
SOFTWARE: None.
DOCUMENTATION: Engineering drawings.
AVAILABILITY/SOURCE: 15 were built by Cybernex.

WORKSTATION MULTIPLEXER: A 4 by 4 switch that permits manual selection of an unused Alto from any workstation.

INTERFACE: None.
SOFTWARE: None.
DOCUMENTATION: Engineering drawings.
AVAILABILITY/SOURCE: May be ordered from Cybernex.

FUTURE TRENDS IN ELECTRONIC PUBLISHING

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Electronic Publishing is not a speculative notion, it is not prediction, it is accomplished fact. The major question regarding the use of electronics and computer techniques in publishing is not whether, or when, or how, but how much, and how fast. Already, the vast majority of newspapers in this country is published electronically all the way from the keying of a story by the reporter through to composition and phototypesetting of composed galley. Electronic publishing has now spread to the weekly magazines, encompassing, in this case, full-page composition including *all* pictures, as well as electronic transmission for typesetting at remote printing facilities.

At the other end of the process, the Library of Congress no longer maintains a vast pre-printed inventory of its library cards from recent years, but rather prints cards electronically 'on demand'—on request from a specific user—using a laser xerographic printer and the magnetically stored MARC data base. The electronic printer, in this case, has simply been substituted for the former phototypesetter used to produce the masters from which the inventory was printed. The typeface and card layout produced by the electronic printing system are virtually indistinguishable from those used in the former card inventory.

This paper covers the present situation and future trends in electronic publishing, as the areas presently making use of electronic aids expand and grow together into a cohesive whole in which authorship, publishing, and 'reading' become intermingled, and in some cases indistinguishable, activities.

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ELECTRONIC PUBLISHING TODAY

The publishing industry is presently in the throes of a profound technological revolution. New electronic tools make it possible to re-think and re-structure the editorial process. It is important to step back and look at the entire process from author to the final user in light of what is now possible that was not possible only a few years ago. We must consider how information is 'created', edited, formatted and disseminated.

INPUT:

Virtually everyone who has had a chance to use a good video terminal to write copy will agree that it is a far better device than a typewriter. The keyboard is faster. It is easy to correct mistakes or to change your mind and re-work copy. It is easier to move copy around—especially since you always have a clean version of your manuscript to work with. It is possible to save the current version of a section of the text while you work on an "improved" one. If the new version is, indeed, an improvement, you can kill the original. If not, you can go back to the original. And, there are facilities such as string searches and string replaces which help the author to find words and phrases he wishes to check for accuracy or consistency.

Where it is possible for an author to work directly on a video terminal, the industry has found that he feels that he can do a better job, and that the copy which he writes should never have to be re-typed or re-proofread for new typographic errors before it is put into final form to be distributed to the 'customer'.

Where it is not feasible for the author to work directly on a video terminal, it is sometimes possible to 'capture' his original work via an OCR reader or (in some situations) an interface which will accept input from a simple word processor. Most commonly, however, it makes most sense to 'capture' the material the next time it is re-keyboarded. As a general rule, the greatest benefits can be derived from the new technology if the data can be 'captured' as early in the editorial/production process as possible and advantage taken of electronic tools from that point forward.

EDITING

It has been the newspaper industry which has seen the first wide-scale use of video terminals as writing and editing tools. Within approximately a half-dozen years the industry has progressed to the point where the video terminal has replaced pencil and paper as the dominant working tool for editors. Over this period of time the companies which supply electronic systems to this industry have improved terminals and terminal functions to make the terminal an effective tool for the working editor.

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In the word-processing industry, on the other hand, the 'editor' has generally continued to work with hard-copy 'print-outs' rather than working directly on the video terminal himself. The video terminal has been introduced for use by secretaries who implement the changes marked on paper by transcribing them to the terminal screen, then asking for a new printed copy to hand back to the 'editor'. This requires an extra person in the process and will naturally take longer than if the editor were to make the changes himself. However, if the 'editors' do not edit much copy (as would be true in an office environment) it may be cheaper than giving each 'editor' his own terminal. And, if the editor does not know how to type, it may be the only realistic solution.

For many of the situations found in the commercial and scholarly publishing world, it will be most effective to follow the 'newspaper' example and have editors working directly on video terminals. However, there are situations in which it will remain more desirable to have editors work with pen or pencil on paper and to have someone else transcribe the changes, as in the word processing example. A good terminal will generally be a better working tool for the editor if there are a moderate number of changes to be made. He will find the fact that he can verify what he has done as he is working rather than wait for it to be implemented by someone else and returned to him to be a major advantage. If he has only very light changes to make, he may find that he can flip through paper faster than working on a screen—although even here he may prefer the screen because of the immediate feed-back and having him work directly on the screen may save the extra labor cost of having someone else to transcribe his changes.

REVISIONS
One of the real advantages of the new electronic systems is the ease with which previously-input material may be revised. Only the changes need be keyed and verified. And, the new version may appear in an entirely different format and/or be produced on a different type of output 'printer' than was the previous version.

MULTIPLE USE OF DATA
A related advantage is the opportunity for multiple uses of the same information. A few of the possibilities which come to mind include the direct transcriptions of abstracts and key words for secondary publishing and indexing services, as well as the capture of the full-text of articles, monographs, and books themselves for use in electronic full-text form or as the data-base for electronic 'demand publishing' operations. These possibilities may barely scratch the surface. Some of the publishing companies who moved into electronic systems early have become quite creative in exploiting the information which they have stored electronically.

TEXT ANALYSIS

One of the potential benefits of an electronic text processing system is the use of the computer to check and analyze text which is stored in the system. Relatively few companies have really exploited the possibilities yet, but there is increasing interest in the concept. Some of the possibilities include:

- Checking the words in a document against a relatively large dictionary to check for spelling accuracy. Some systems flag all of the words in the document which are not in the dictionary as words which are possibly mis-spelled. Some will even change the spelling of frequently mis-spelled words (with an indication to the editor that the change has been made).

- Checking a document for the occurrence of certain words which are considered appropriate or in-appropriate for certain reading levels.

- Applying a standard test for reading difficulty.

There are others as well — probably including some things that no-one has yet thought of. This sort of analysis is particularly useful for companies which are involved in educational publishing, but they may be useful in other contexts as well. One of the best-known uses of a dictionary to check spelling is in the work which International Computaprint processes for the Patent Office, and one of the first companies to incorporate tests for reading difficulty in its text processing system is an insurance company.

FORMATTING

The better text processing systems now provide very powerful capabilities for formatting output copy. These include high quality hyphenation/justification routines to format copy into lines and page make-up facilities to format pages. In a number of cases it is possible to accomplish this without requiring that the user imbed esoteric commands in the text file. This, again reflects the fact that much of what has been developed over the past half-dozen years especially is intended for use by a non-technical writer or editor.

OUTPUT

The new electronic devices provide powerful tools for writing, editing, updating and formatting material. They also bring about a situation in which the mechanical "production" aspects of typesetting and even printing become a simple extension of the editorial process. The hardcopy output device may be a daisy-wheel printer, an electronic printer such as the Xerox 9700—a modified version of which forms the basis of the Library of Congress card printing system mentioned earlier—or a phototypesetter. All function as fancy computer output printers and it is not all that material to the electronic system (or to the user) which one is used.

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ELECTRONIC PAGE MAKE-UP AND DIGITIZED GRAPHICS:

Initially it has been important to concentrate on perfecting the use of electronic tools for input and editing text. However, many publishing organizations will soon be able to move into electronic page make-up for a significant portion of their work. Journal publishers could assemble pages for their periodical production by entering the page layout or page dummy information into the electronic system, then using a graphic display screen to manipulate the text elements to appear on the page. Publishers may be able to handle book work as well by using some combination of automatic page make-up program and interactive graphic display.

As publishing organizations gain more experience in using electronic systems and as the page make-up functions available in the systems improve, they should be able to make more extensive use of electronic page make-up for an even larger proportion of their product. Beyond this, it is anticipated that they would be able to move into storing, manipulating and outputting graphics (line drawings, half-tones and even color pictures) in digital form so that they will be able to produce complete pages with all elements (text and graphics) in position.

As alluded to earlier in this paper, *U.S. News and World Report* has been producing all editorial pages in this fashion since the summer of 1977. All line art, half-tones and screen tint backgrounds (including colored screens and spot color) are digitized and stored in the text processing computer (an Atex system). Pages are set on a Information International VideoComp CRT typesetter at the *U.S. News* offices for proof purposes. Pages to be printed are transmitted to other VideoComps located at remote printing plants where the complete pages are "typeset" on film which is used to make printing plates. *U.S. News* does not, in early 1979 use interactive graphic display tubes to speed the process of assembling the elements to appear on a page—but this should come before the middle of 1980. Nor does it yet digitize and transmit color separations—but this will come within the next few months.

In early 1979, because of the cost of the equipment used to digitize pictures and artwork, and the cost of the digital storage required to accomodate digitized graphics, the *U.S. News* approach makes sense only in situations in which there is a high value to be gained by transmitting complete pages in digital form. However, there is little doubt but that as the technology improves an increasing number of firms will find that it pays to handle graphics in digitized form—especially if they expect to be able to output complete pages directly to an electronic printer or a laser plate-maker.

A DIGITAL WORLD

In a longer view, electronic publishing systems do more than provide a better means of producing "traditional" published materials. They also provide a bridge into a world in which information is stored and transported in digital form rather than as images on paper. Digitally stored information may be transferred to paper when, where, and as needed. It may never be transferred to paper at all. The "publisher of the future" may think of himself as being in the information business or the information/entertainment business rather than the book or magazine publishing business.

THE PROGRESS OF THE REVOLUTION

People have been working with computer-based text processing and typesettting systems for almost twenty years, and have been using computer systems to assist in the editorial process for books and magazines at least since *Time inc.* installed its system in the mid-60's. However, the real impact of the revolution has been surprisingly recent—just since the commercial use of video terminals for text editing. The move to electronic publishing systems passed a major milestone with the first use of video terminals by the *Associated Press* and the *United Press International* in 1970. But the real watershed event was the installation of the first electronic newsroom system at the *Detroit News* in 1972. In just six years since that time, virtually every newspaper of any size in this country either has installed such a system or plans to do so. Some are already on a *second generation* system!

From newspapers, the revolution has spread to magazines, government agencies, "in-plant" documentation centers, and even some book publishers. It seems likely that no publisher, save perhaps the very small 'garage' operations, will be immune to the changes resulting from the Electronic Publishing revolution.

FUTURE TRENDS

A number of possible future developments and trends in the on-going Electronic Publishing revolution has been alluded to already in this paper, along with the discussion of those areas of the revolution which have already started, and in some cases, reached a degree of maturity.

EDITORIAL SYSTEMS

Editorial systems—those used for keying, editing, revisions, and text analysis—represent pretty much a mature technology already, except in the instance of text analysis software. The improvements to be expected in the next few years will be limited to the introduction of partial page or single line display terminals for

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repro typist input of hard copy, and perhaps the increasing use of OCR devices for hardcopy input where the volume warrants. In other respects, editorial systems will remain very much like the video terminal systems already in use in newsrooms, except that these systems will become steadily cheaper and thus more widespread.

COMPOSITION SYSTEMS

Composition systems—those used for formatting, page makeup, and the inclusion of digitized graphics—will see great advances in technology and functional richness in the next several years. Systems capable of performing each of the necessary functions have already been demonstrated, but integrated systems remain deep in the research laboratories, as yet.

Improvements to come include systems which are capable of dealing with form and content simultaneously, systems with (perhaps interactive) hyphenation and justification routines which are adaptive as the page layout changes, and display the results immediately to the user, systems capable of the interactive creation and scaling of synthetic line art, and systems capable of the inclusion of all of these, together with scanned-in art and pictures, in interactive page makeup. Increasingly, such systems will also possess the capability to deal with color specifications for text and synthetic graphics and with digital color separations for scanned-in graphics and pictures.

OUTPUT AND PRINTING SYSTEMS

One of the more recent developments in Electronic Publishing has been the introduction of laser xerographic output printers capable of producing reasonable facsimiles of graphic arts quality typefaces, and of including these along with line graphics and perhaps halftones on fully made-up pages. These devices are capable of producing the entire press run of limited-distribution publications directly from the electronic memory to the final printed page. It is one of these devices—a modified version of the Xerox 9700—which forms the basis for the Library of Congress' card printing system mentioned earlier.

Electronic printing using laser xerography has also been applied to the *color* xerographic marking engine. This type of electronic publishing output has applications even at the high-quality end of the spectrum for publications in which the final product is to be typeset and printed on gravure or offset color presses. The electronic color printer allows prepress proofing of color masters without extensive (and messy) photographic techniques, which produce colors that are at best approximations to those which are obtained from a printing press, since they (unlike the xerographic ones) are formed in a different way.

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The addition of communications links to the electronic publishing system will also allow the use of remotely-located electronic printers for the rapid distribution of finished documents.

SECONDARY USES OF ELECTRONICALLY PUBLISHED DATA

Computerized literature searching services have been available to librarians and information specialists for some time now. In some cases, the abstracts and index terms used in the data bases provided on these systems have been obtained in digital form from magnetic tapes provided by the primary publisher as a spin-off from his computerized composition activities. In many more cases, however, the abstracts and index terms have had to be manually re-keyed from printed versions of the primary material.

This situation is likely to change rapidly as more and more journals and monographs are composed electronically, and in many cases the transfer from primary to secondary publisher could take place electronically over communications links, rather than by the physical transfer of magnetic tapes. The full-text of journal articles and monographs may also be captured as 'full-text files' by these means, with the co-operation of primary publishers, possibly in an integrated system if a standard format can be adopted.

The technological development of trillion-bit computer memories, which can store entire libraries (or at least, whole sections of libraries), better access methods, the growing network of interconnected computer-communication networks, the local usage of personal computers with CRT displays rather than 'dumb' hardcopy terminals for reading, optical disks for local storage, and speedy hardcopy printer systems, together point to the real possibility of a national or international system of full-text files. The functions of libraries could change drastically as they move from their traditional role as store houses of collections of materials to becoming dynamic nodes in information networks

ELECTRONIC JOURNALS

Computerized message systems are already in use by some groups of workers engaged in closely related activities in geographically dispersed areas. These systems provide for asynchronous communications between or among any subset of the group, and allow the easy transmission of data which might be difficult to transfer by means of voice communications. The computer's ability to retain a permanent record of these messages allows one to compile a sequence of interactions on a particular subject, which is, after all, the original meaning of journal.

The advent of full-text files would allow the publication of completely electronic journals. The *meaning* of publishing, and indeed of authorship, could change in substantive ways. For example, the legal moment of publishing could be either the time the author enters his text into the system, perhaps by means of his personal computer, or the time when it is first called up for reading by a user. For authors, the satisfactions and prestige of "seeing their work in print" could be largely diminished, so that motivations to publish might be altered. The role of 'editors' also could change considerably, and the protocols for refereeing professional papers would need to be restructured for the all-electronic medium.

The hardcopy replication of digitally stored text at widely dispersed points of use and sale—a form of demand publishing—will be a natural adjunct of full-text files and electronic journals.

DEMAND PUBLISHING—PAPER IS NOT DEAD

As mentioned earlier, library cards for materials published in the United States since 1968 are currently being printed electronically directly from the computerized database. Although this is taking place in a centralized location, it is easy to imagine developments leading to the use of similar (but cheaper) printers connected to one's personal computer for local printout, rather than distribution through the mails. Eventually, as the files created during computer composition and typesetting of publications come to be collected and stored, one's local printer might be used for creating a paper copy of a stored publication 'on-demand'.

SUMMATION

These are just some of the trends which have been forming in the Electronic Publishing Revolution within the last few years, and which can be expected to come to fruition and into widespread use in the publishing industry in the next several years.

MICROGRAPHICS AND PERSONAL COMPUTERS IN INFORMATION SCIENCE IN 2001

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A growing revolution is taking place in the ways in which information is acquired, used, manipulated, created, and stored. This paper discusses the impacts which are projected for micrographics and personal computers in the field of information science by the year 2001. It covers the rapid emergence of new and improved technologies, both in information science and in the world at large, which are leading us into what Daniel Bell has called the *Post-Industrial Society*.

Before proceeding with any discussion of the impacts of the new breed of *personal* computers and of the relatively old, but still emerging, micrographics it would be well to describe what we will mean by these terms as they apply to the years remaining in the twentieth century.

A **Personal Computer** provides a user with his own private processing space and storage space, inaccessible to others without his active cooperation. In this respect, personal computers differ from central computers in that they have local file storage and from computer terminals in that they have local, private, processing space. Even so-called intelligent terminals generally require access to a central computer for program loading, file access or both. By the turn of the century, personal computers will not be stand-alone devices, but will have virtually instantaneous access to a multitude of shared-resources over communications links. The user's (private) local files will be accessible to him alone, but much information will be stored in public files, accessible to all, or in 'group' files, accessible only to members of formal (or perhaps informal) groups.

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Micrographics is the art of transforming information into reduced imaginal form for manipulation and storage. Traditionally, this has been performed by photographic means, but holography, as well as facsimile techniques using optical disks, must also be considered for the future. With the emergence of computer-output-microfilm, computer-indexed and accessed microform data-bases and the forthcoming optical disks, the merger of computers and micrographics has begun. Note that an optical disk is not a synonym for a video disk, despite the fact that one of the video disk approaches uses optical reading techniques.

This paper is concerned with the ways in which personal computers and micrographics will be used for information storage, access, acquisition, use, manipulation and creation. The applications of personal computers and micrographics will include the areas of:

> o   libraries as a means of access to information, rather than as repositories of paper;
> o   electronic journals and other information sources;
> o   demand publishing of paper copies of articles, books, reports, and other information sources; and,
> o   imaginal information.

The reasons for the inclusion of personal computers and micrographics in the overall information system of the future are not hard to discern. Microform represents a very economical form for the storage of imaginal information and as a replacement for paper in locally stored manual indices etc., and makes a good data base for demand publishing applications, although it may eventually be supplanted by completely digital storage of current information and publications.

Personal computers are already starting to be used in all facets of the overall information syatem, with the exception of mass central storage. Personal computers are especially adaptable to the creation, acquisition and manipulation of information, such as the printed version of this paper, and have been known to make drastic changes in the habits of authors. Self-plagiarism, for instance, becomes ridiculously easy, and the pain of extensive rewrites is considerably reduced, perhaps to the point of encouraging an excessive number of iterations of a document.

Let us consider these areas of applications in turn, and then go on to the world of 2001 and how to achieve it.

LIBRARIES AS A MEANS OF ACCESS TO INFORMATION RATHER THAN AS REPOSITORIES OF PAPER

One hears and reads a lot these days about 'networking' for libraries, and its potential for improving a library's access to materials not in it's collection. At present, a 'network' in this sense seems to mean a set of telephone lines or other communications links providing one with access to a bibliographic data base located on a large central computer. Of course, a library's personal operations, such as computerized shelf-lists, circulation systems, and the like, are usually located locally to the library, but these operations are not often directly connected to the network access mechanism, as yet.

Libraries have traditionally viewed their role in society as amassing a collection of books and periodicals in order to maintain a store of the accumulated knowledge of the world. It has begun to be realized in recent years, however, that such a collection, however comprehensive, is of little value if the information therein cannot be conveniently accessed when, or where, it is needed. The role of the library is thus being reassessed as that of providing a means of access to information. The increasing costs of labor and the shelving and facilities required to store the collection, coupled with the slow rise in library operating and capital budgets has squeezed acquisitions budgets so that libraries are also economically unable to collect as much.

Computer based bibliographic services and abstracting and indexing services have become increasingly more effective over the past decade, so that advanced libraries now can search automatically through many large and comprehensive data bases, including (largely current) periodical and report data bases. Though there has been little pressure thus far—except in the legal field—to develop the digitized storage of complete texts and graphics of articles and books—known as 'full-text files'—rather than simply abstracts, the delays between finding abstracts and retrieving the complete information content have become a significant factor in information services. It may take one half hour to find a desired reference and weeks to get a copy mailed from a distant library.

The technological development of trillion-bit computer memories, which can store entire libraries, better access methods, the growing network of interconnected computer-communication networks, the local usage of personal computers with CRT displays rather than 'dumb' hardcopy terminals for reading, optical disks for local storage, and speedy hardcopy printer systems, together point to the real possibility of a national or international system of full-text files. The fact that much current

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information is composed and typeset through computer techniques makes such information available for filing and storage, possibly in an integrated system if a standard format can be adopted. The functions of libraries could change drastically as they move from their traditional role as store houses of collections of materials to becoming dynamic nodes in information networks

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Digital storage and electronic publishing techniques are not, of course, *requirements* for publishing on demand. Alternative demand publishing methods include the substitution of an automated regional repository, duplicating library, or demand publishing service for conventional publishing, library service, or interlibrary loan service. The storage may be in any form available, although we are concerned here mainly with the alternatives of microform and computer storage. Demand publishing techniques would allow the individual user of information to obtain only those items of interest to him, such as individual journal articles, thus enabling him to establish a comprehensive personal library for a price comparable to that of a small number of journal subscriptions.

Demand publishing allows easy retrospective acquisition of material needed when a user's interests change, which is presently inconvenient without extensive photocopying. Retrospective material would almost certainly be stored in microform, due to the prohibitively high cost of backfile conversion. Microform storage, of course, somewhat restricts the prospects of instantaneous access to information over a communications network. Mechanical and opto-mechanical devices are less amenable to automation and data transfer than electronic and elctro-optical devices.

IMAGINAL INFORMATION—THE FUTURE ROLE(S) OF MICROGRAPHICS

Microform, today, is by far the most economical medium for the storage of imaginal information. It was long believed that microform was *the* solution to library storage problems, and to a certain extent it has been. However, the problems of indexing, the difficulty of retrieval, along with the lack of really satisfactory microform display-readers, the lack of integration between hardware and software producers, and the lack of standardization, have prevented microform from becoming the success that had been predicted. Moreover, clear reader preference for hardcopy over microform displays (except for quick look-up of facts and reference numbers) points to the role of microform as being chiefly in the area of back-file reproduction rather than current information, except in the areas of ephemeral or frequently updated current information, such as telephone numbers, library catalogs and parts catalogs. Even these may eventually be replaced by computer files, as digital storage and access costs continue to drop. Thus, technologically, microform appears as an interim solution to dissemination of catalogs and indices and storage of back files and full graphics until microform is overtaken by the development of digitized full-text files and network access to them.

The advent of wide-band communications networks permits microform to be utilized as a central data-base of imaginal information, to be accessed under

computer control. It is not clear at present when digitized storage of imaginal information will become more cost-effective than microform under these circumstances. The advent of optical disks, predicted to be on the market by the mid-1980s, should clarify this area somewhat. But no matter what happens, the imaginal information will be perceived by the user as being supplied by the computer, and not as a piece of film in a viewer.

THE WORLD OF INFORMATION IN 2001

What, then, are we expecting to see in the information world in 2001 as far as micrographics and personal computers and their respective contexts are concerned?

As stated earlier, microform, in its conventional sense, will likely be restricted to the storage of backfile and of high quality graphics. Even this is likely to be under computer control for retrieval purposes by the turn of the century. Non-conventional forms of micrographics will be indistinguishable from other pieces of computer systems, at least as far as the user is concerned. Micrographics as a whole will thus be considered to be subsumed into the overall context of an *information system* by 2001.

An information system consists of three main classes of people and organizations—the producers, distributors, and users of information—which sometimes overlap and are often indistinguishable from one another. The producers of information include authors and publishers; the distributors of information include libraries, networks, journal subscriptions, bookstores, literature-searching services, and information archives; the users of information include libraries, information specialists, and the individuals requiring the information, who may also be authors.

By 2001, the overall electronic information system will encompass every facet of the information communication process from authorship to end use of the information. In this overall electronic information system, the producers of information include word processing and document creation systems and electronic publishing systems; the distributors of information include the mass storage systems and electronic full-text file access over a network, and the users of information include local storage and local use on an office terminal using either individual or shared storage and processing. The systems used at the local level for information use and for information creation can obviously be identical, or very similar systems—what we are defining here as **personal computers**. The publishing systems may be very similar to, or expanded versions of, the document creation systems. Only the mass storage systems, and network access to their contents can not be considered directly as personal computers.

We are talking, then, about a world in which every information producer and user has his own personal computer for information generation and use, which is attached by means of communications links to one or more resource-sharing networks for information transmission, public storage, and retrieval. The geographical location of any given item of information will be completely transparent to the user, except, perhaps, for it's speed of transmission to him.

HOW WILL WE GET THERE FROM HERE?

The nuclei of these personal computer/resource-sharing network systems exist today, both within the research laboratories of private organizations, and increasingly in government and the business world, perhaps as market probes.

There are strong pressures within the library world, at least within the United States, for the development of a comprehensive, integrated library system for access to the Library of Congress MARC data-base and to the nation-wide locator list for inter-library loan purposes. It is envisioned that the locator list, at least, may not be a single centralized file, but may have some geographical hierarchy to it, preferably one which is transparent to the user.

In terms of more generalized resource-sharing information networks, the existing nuclei within industry will doubtless be expanded to the full extent of the geographical spread of each organization. *Interconnection* of such systems remains problematical at best, except for electronic mail or messaging purposes. However, some level of standardization of formats will probably occur, to facilitate access of these systems to public data bases. This level of interconnection may well be all that is required to allow these systems to reach their full-potential for use in the world of information and information science.

As we develop the uses of micrographics and personal computers, we must be careful to keep the *system* aspects in mind, to identify the interfaces between separate portions of the system, and to determine where possible format problems, as well as both software and hardware incompatibilities may occur. In this way, the separately developed 'independent systems' can easily become the 'modules' of the overall information system when technological developments and reduced software, hardware, and communications costs permit its formation. Present trends suggest that this is likely to happen several years before 2001.

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SantaClara
| 10 | N |
| 24 | |

Santa Clara
17 # #

PRINTER:
Clara - 346 #

FDDC 74072
9600

ASD-PA-
Gateway
| 11 | N |
| 375 | |

Hanover
20 # #

IFS:
Ibis - 111 #
PRINTER:
Chester - 112 #
Adelie - 156 #

6FDDT 104342
9600

SoEasy
| | A |
| 123 | |
24 # #

Packet-Radio

FDDC 72282
9600

→ ArpaNet
4 # #

Twinkle
| 15 | C |
| 364 | |

| Maxc1 [PA] | 200 |
| Maxc2 | 5 |

Parc 2 Fl.
3 # #

IFS:
Ivy - 325 #
PRINTER:
Menlo - 155 #
Clover - 121 #
Viola - 341 #
Slot-2 - 166 #

147

DLS 177

→ Dial-out
← Dial-in
←→ Telenet
Corp.

6 # #
PRINTER:
Wonder - 265 #
32

7KD2274
9600

Parc 1&3

5 # **Parc 33&34**
92

IFS:
Igor - 40 #
Iris - 50 #
PRINTER:
Daisy - 6 #
Kanji - 52 #

Beaver
| 26 | C |
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Toronto
33 # #

(8/79)

9FD5790
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Polaris
| 21 | C |
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FDDT 30953
9600

**Webster 128,
105, 1O2**
14 # #

IFS:
Erle [WBST] - 101 #
PRINTER:
Genesee - 116 #
47

Webster 114
27 # #
15

Dallas-
Gateway
| 14 | A |
| 11 | |

Mockingbird
23 # #

IFS: 8
Cactus [DLOS] - 100 #
PRINTER:
Ranger - 150 #

FDET69239
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R9FDDT 1897
9600

Amp-Gateway
| 17 | N |
| 51 | |

Webster 200
2 # #
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ASD-ES-
Gateway
| 7 | N |
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FDDC 75935
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El-Portal
| 2 | N |
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A&E Bldg.
10 # #

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M1 Bldg.
11 # #

IFS:
Isis - 4 #
PRINTER:
Rover - 15 #
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Giant - 105 #
Aardvark - 13 #

Mercury
| | A |
| 216 | |

7KD3829
4800

A/E Bldg
35 # #
20

IFS:
Oly - 240 #
PRINTER:
Bud - 277 #

FDEC 56103
9600

DC-Gateway
| 22 | A |
| 222 | |

Arlington
26 # #

PRINTER:
Windfall - 223 #

R9FDDT 1874
9600

Henrietta-
Gateway
| 16 | A |
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Henrietta
1 # #
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XCS-Gateway
| 13 | N |
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Los Angeles
22 # #
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FDDC 73677
9600

PD-Gateway
| 12 | N |
| 370 | |

Imperial
21 # #
22

Portcullis
| 4 | A |
| 56 | |

**XEOS
Pasadena**
12 # #

IFS: 23
Xeos [EOS] - 130 #
PRINTER:
White - 122 #

6KD609
4800

ADL-Gateway
| 5 | N |
| 1 | |

**ADL
El Segundo**
13 # #

IFS: 4
Adl - 200 #

Leesburg-
Gateway
| 30 | A |
| 375 | |

(8/79)

Leesburg
36 # #

FDEC 8049
9600

Pioneer
| 27 | A |
| 375 | |

Stamford
34 # #
15

IFS:
Eagle - 200 #
PRINTER:
Yankee - 100 #

LEGEND

TelCo Line S/N
Baud rate

SLA Host #

Polaris → Gateway Name

| 21 | C |
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*N = Nova, A = El,
C = CommProc*

Ethernet Host #

FDDT 30953
9600

Webster 114 ← *Location*
14 # # ← *Network #*

35 ← Hosts on Net

[WBST] = > Mail Registry

ALTO NATIONAL NETWORK
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