Forethought, Inc.

Presenter

Product Marketing Analysis

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Summary

Market Analysis

The market for presentation graphics is huge—$5 billion in 1985, $10 billion in 1988, with over 1.1 billion original presentation slides made in 1985. So far, however, *only 12% of 35mm slides and only 1/2 of 1% of overhead transparencies are made on any kind of computer;* all the rest are produced manually. The reason for this is that earlier generations of personal computer hardware could not do the job adequately.

New graphics-oriented hardware, new peripherals such as laser printers, and new environments such as Microsoft Windows and Macintosh make possible really great presentation graphics, but only when new applications software is available to exploit them. Once such software is developed, presentations will become a new horizontal category, predicted to be even more widely used than spreadsheet software.

Display Environments and Computer Environments

A major segmentation—not always recognized—is between the vertical market for software used by professional artists (central graphics departments or independent producers) to prepare presentations for clients, and the horizontal market for software used by the content-originator or a staff member in the immediate department to prepare presentations for themselves. Our focus is the horizontal market, to offer a better way for what is today a manual task. We produce "overhead style" presentations on monochrome printers or color printers (for overhead transparencies), 35mm film recorders, and/or video.

Software for this task should be designed for both of the suitable graphics environments on business computers, Macintosh and Microsoft Windows. These two environments are very much alike, and are becoming even more alike.

Product Concept

What is needed is a personal presentation tool, designed to give the content-originator direct and personal control. This means it must contain the tools necessary to structure, compose, and edit presentations—not just those needed to type and draw a final form of slides from someone else's notes. One immediate implication is that the unit of work must be an entire presentation, not just a slide format. In addition to graphically typing and drawing on each slide, one should be able to graphically insert, delete, and re-order slides, and move them from one presentation to another.

A key design consideration is the new requirements and opportunities of uniform environments where one can switch contexts instantly, and where the user interface of many programs is identical. This permits, for the first time, a presentation program which can work along with the programs which people use to manage their data, integrated at the point of use, without the need to re-enter data.

Distribution Considerations

Presenter will be carried by computer hardware dealers, even as they reduce their software inventories, because it is the kind of program which sells hardware: it is a concrete reason to purchase a new graphics-oriented machine or to upgrade existing machines. Hence, *Presenter* can build on the existing Forethought dealer and distributor base.

It will also sell directly to large corporate accounts. Some particular corporations use presentations widely, as do some government agencies. These customers potentially need many copies of the software, and we will tailor sales policies to support this use.

Strategic Partners

Presenter is the kind of product which permits a number of potential partnerships with large companies who also have something to gain from it. These fall into three groups: (1) manufacturers of presentation preparation equipment (personal computers and workstations); (2) manufacturers of presentation display equipment (laser printers and color printers, electro-optical and video projectors); and (3) manufacturers of other software enhanced by *Presenter*.

Contents

1. Market Analysis

Preparation of business presentations—overhead transparencies, 35mm color slides, and their equivalents for video projection—is a new application area for personal computers. Personal computers and the programs which have been available in the past to make presentations have produced results of such low quality and have required so much effort that really only dedicated computer enthusiasts would put up with using them. We expect that this will change over the next two years, so that presentations will become one of the broadest and largest horizontal applications for personal computer software.

As it happens, personal computer equipment for preparing presentations and audio-visual equipment for displaying presentations are both changing radically so as to be easier to use together. The new personal computers can for the first time support the graphics needed to make presentations. The new audio-visual devices can for the first time economically image and project presentations originated from personal computers. The mutual reinforcement of these changes in the two industries makes presentation graphics on personal computers, at just this moment, a unique opportunity.

1.1 Lots of People Make Presentations

Everyday presentations are much more common than the very formal occasions for which thousands of dollars are spent to prepare stylized color slides. In fact, a very large number of businesspeople make "presentations" to others all the time as part of their work. These are semi-formal meetings in which an individual attempts to persuade others to make a decision, to approve a course of action, or to accept a result. Almost any manager, professional, or consultant considers presentations of this sort a major part of the job. Sales people perform these presentations with almost every customer. As knowledge workers come to play an increasing role in companies, those people too—the analysts, engineers, and the like—spend a

large amount of time on presentations to share information and to gain consensus.

There is a difference between the use of presentations in smaller companies and in larger companies. In smaller companies, it appears, most of the presentations are given to customers or to other outsiders. Such events as proposals to clients, progress reports, and major sales approaches are regularly handled by giving a presentation, even though the managers may seldom sit down themselves and show one another transparencies.

By contrast, in larger companies the great bulk of presentations are held for management and other insiders. Because of the increased difficulty of communicating with larger numbers of people, presentations are regularly used for project reports, internal proposals, status reports, and staff briefings. Very large multi-location companies often institutionalize the presentation and its associated "foils" as a standard form of memorandum. Compared to the vast number of internal presentations, the occasional preparation of slides for the annual meeting or for a standard sales presentation may be much less important.

Whether in small or large companies, however, the individuals making the presentations are united by common motivations which make them a single market for personal-computer presentation software:

—an individual's business success can often hinge upon the success of the presentation, yielding a strong personal motivation to do the best job (and to have the best tools) possible; and

—an economic value can be put on effective communication.

1.2 Presentation Graphics Market is Huge

The total volume of business done annually in the U.S. for "Business Presentations" is generally estimated to be over $6 Billion in 1985, rising to $10 Billion by 1990. (This includes hardware, software, services, and program material for 35mm slides and for overhead transparencies only. It does not include video, films, filmstrips, or other audio-visual market segments.)

The best market research in this area comes from *Hope Reports, Inc.* headed by Tom Hope, a former employee of Eastman Kodak, now a

consultant in Rochester, N.Y. According to his work (all numbers are aggregated and rounded off for simplicity), people in the U.S. produced:

- over 600 million original 35mm slides in 1985;
- over 500 million original overhead transparencies in 1985;
- together, over 1.1 billion presentation slides last year!

It is possible to gain an appreciation for the size of these numbers by hypothesizing that the average "presenter", a serious maker of presentations, makes about 100 slides per year, equivalent to 12 monthly presentations of 8 slides each, or 4 quarterly presentations of 25 slides each. (One study found that the average sales and marketing professional makes between 7 and 9 presentations a year, using between 7 and 10 slides each time—which adds up to 50 to 90 slides per year. That is the average, and our customers are at the upper end of that, so 100 slides per year is reasonable.) If we divide our 1.1 billion slides by 100 slides per presenter, we get the very rough estimate that there are—today—over *10 million people* in the U.S. who:

—need presentation software and hardware enough to buy it; and

—would consider presentation capability a major factor when purchasing a personal computer or peripherals.

1.3 So Far, the Market has been Small on Personal Computers

Despite the large number of people making presentations, and the large dollar value of the market, so far presentation graphics has been a rather small category in personal computer software. Again, *Hope Reports* has some eye-opening numbers:

For 35mm color slides:

—Of the 600 million original slides made in 1985, **only 12%** were produced using any kind of computer at all (mainframe, service bureau, minicomputer, or personal computer). This number is surprising small, but is rising rapidly, up from 3% in 1983 and 1/10 of 1% in 1978.

—Most of the initial growth has been in centralized systems for corporate communications departments, either dedicated

minicomputers or personal computers tied to a larger computer at the vendor's site, not in systems for use by individual presenters.

For overhead transparencies:

—Of the 500 million original transparencies, **only 1/2 of 1%** were produced using any kind of computer in 1985! This is a very small percentage, given the rise recorded in number of overhead transparencies (500 million in 1985, up from 450 million in 1984 and 400 million in 1983).

—Production of overhead transparencies is typically much more widely distributed than that of 35mm slides (lots and lots of people typing with Orator type balls and IBM Selectrics on pre-printed slide frames), and central services often don't produce them at all. Hence, if the initial computer systems have been for central service organizations, that explains why they are not being used for overheads.

So Tom Hope's numbers leave us with the realization that *88% of 35mm slides—and 99% of overhead transparencies—are still being produced manually,* by people typing, or drawing, or using rub-down lettering or Kroy machines, or using photographic processes.

Why don't those ten million people use personal computers to help them?

1.4 Presentations Require Graphics Personal Computers

The reason is simple: Previous generations of personal computers were not powerful enough to do the job.

—They couldn't address enough code, or execute it fast enough, or both, to support a really simple user interface for graphics tasks.

—Displays with limited resolution, whether text-only or coarse graphics, could not show a presentation on the screen adequately, so a user had to work 'blind.'

—Printers and film recorders were inadequate to produce finished output, so eventually some manual work had to be done to get professional quality.

Limited by all these hardware shortcomings, software for presentation graphics had a hopeless task, and as a result *no existing program for use on Apple II or IBM PC machines really does a good job.*

This is all changing very rapidly. The current generation of graphics personal computers can support *great* applications for presentations:

- Both adequate processing power and adequate memory are available in 80286-based machines from IBM (the 'AT' series) and from others (Compaq, AT&T, H-P, NEC, Tandy, Zenith, and many more), and in 68000-based Macintoshes from Apple.

- Graphics environments (MS-Windows for IBM and compatibles, Macintosh for Mac) provide a software base of hundreds of person/years each, plus data interchange among programs.

- Current widely-sold displays are for the first time adequate to display a presentation slide (640 x 350 color for IBM's EGA, 512 X 342 mono for Macintosh).

- New printers make professional-quality overhead transparencies very easily, particularly color printers and laser printers with PostScript interfaces, or the comparable Xerox Interpress interface.

- New film recording cameras utilizing similar techniques (in fact, some new film recorders will actually use PostScript or Interpress) can produce professional-quality color 35mm slides.

- New video projectors based on Liquid Crystal Displays are just beginning to make possible high-quality and inexpensive direct projection of computer images.

This new generation of personal computers and display peripherals could easily produce at least 80% of all 35mm presentation slides. (According to Hope, about 20% of all slides use photographic images, which would require additional equipment; but availability of alternative computer graphics such as scanned photographs might well cover much of that requirement.)

For overhead transparencies, this new hardware can produce effectively 100% of what anybody wants.

But the new hardware does not make the old software any better. Existing programs have been designed for the limitations of the last

generation, and for use by technical specialists, by AV experts, and by computer enthusiasts. It is still almost always easier for a presenter to sketch out a presentation using pencil and paper, then hand it off to a specialist who manipulates the computer. The further step of new software is required to deliver the advantages promised by the new generation of hardware.

1.6 Presentations Will Become a New Horizontal

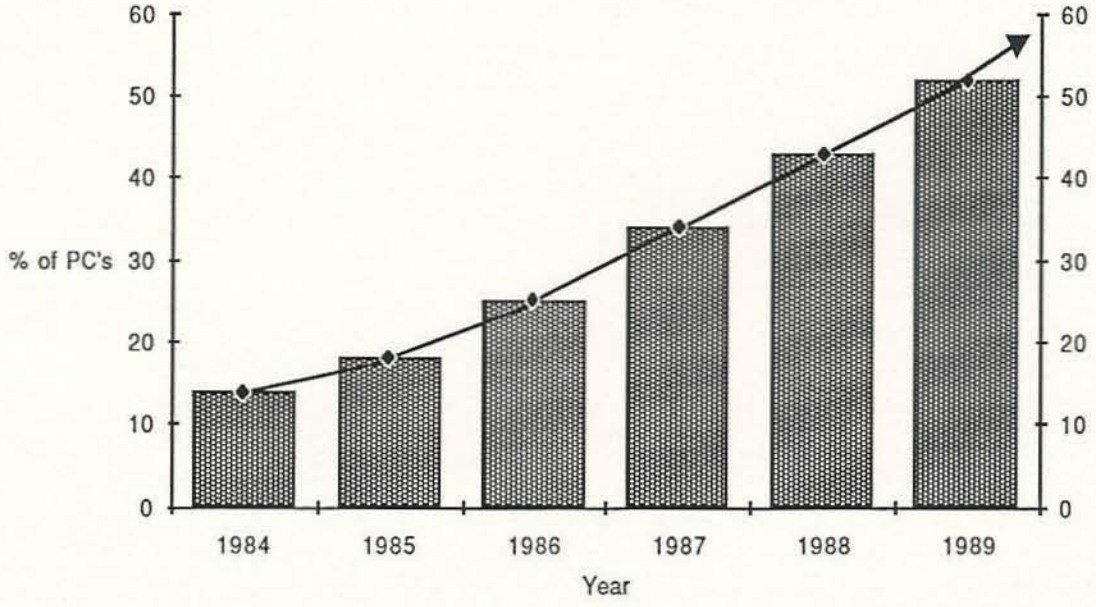
As a new generation of software becomes available for the new hardware, presentation graphics will become a major horizontal category. There have been similar cases before.

- Introduction of floppy diskettes, and then later of inexpensive hard disks, gave rise to two successive generations of successes in widely-used horizontal database software.
- The introduction of adequate keyboards and printers gave rise to successes in horizontal word processing software.
- The introduction of 16-bit machines with vastly larger address spaces gave rise to the success of 1-2-3 and other horizontal integrated software.

In the same way, the introduction of the new generation of machines capable of handling high-quality graphics will give rise to new categories of widely-sold software for the graphics tasks that large numbers of people want to do, such as making presentations.

This is backed up by some 1985 predictions from International Data Corporation, concerning the percentage of personal computers which will be used for presentation graphics.

PC's Used for Presentation Graphics



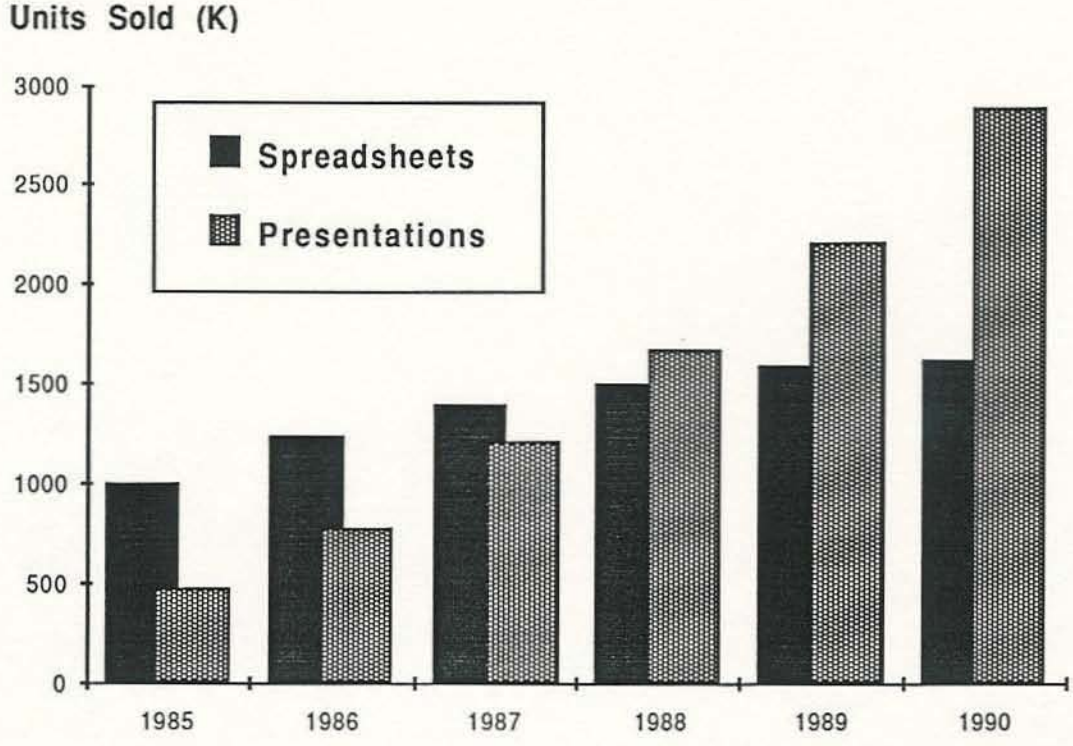
—International Data Corporation, 1985

According to IDC's analyses, in 1984 only 14% of personal computers were used for presentation graphics (a number which is equal to 406,000 machines, when applied to their estimate of the number of personal computers in use).

By 1989, this will increase to 52% of all personal computers—which coincidentally they calculate as equal to 10,600,000 machines, so by 1989 all of our 10 million presenters will finally be able to use appropriate tools.

As a point of comparison, note that IDC thinks (on comparable methodology) that 43% of all personal computers were used for spreadsheets in 1985; they are predicting that presentation graphics will be a more important horizontal than spreadsheets.

It is interesting that Future Computing believes the same thing. In their 1985 predictions of unit sales for personal computer software packages, they predict that unit sales for presentation graphics will surpass those of spreadsheets in 1988.



—Future Computing, 1985

Both of these groups of analysts seem to confirm the opinion that making presentations is a widely-desired task, and that sales of software to make presentations will increase dramatically as soon as better packages are available to exploit the new hardware just being introduced.

1.7 Presentation Graphics has Real Benefits

One reason for thinking that these predictions will in fact come true, with greatly increased use of personal computers for presentation graphics, is that graphic visual aids used in presentations deliver real benefits to users.

A well-known experiment, conducted by the Wharton School of the University of Pennsylvania in 1981, studied "Effects of the Use of Overhead Transparencies on Business Meetings." (The study was issued by the Wharton Applied Research Center, and was funded in part by the 3M corporation.) The results were astounding:

- Presenters using overhead transparencies were "perceived as significantly better prepared, more professional, more persuasive,

more highly credible, and more interesting" than speakers without visuals.

- Speakers supported by overheads won approval for their projects *twice as often* as speakers without visuals.
- Speakers with overheads generated on-the-spot decisions *33% more often.*
- Use of overheads reduced average meeting length *by 28%* (equivalent to 42 days per year for the average manager).
- Use of overheads raised retention to *as high as 50%* from about 10%.

But, despite all these measurable advantages, *only 1 business meeting out of 40* makes use of visuals of any kind!

This suggests that, in the future, even more people could make use of presentation graphics than our 10 million current presenters, if the new personal computers can make it easy enough. The total market size on personal computers may be even larger than substitution for the present manual preparation market alone.

1.8 Further Benefits from Using a Personal Computer

The Wharton School study demonstrated advantages of presentation visuals, no matter how they are produced. There are additional benefits to using a personal computer to prepare presentation graphics.

First, the ability to see and refine presentations on a flexible medium such as a graphic display screen allows the presenter to improve the effectiveness of presentation content, particularly in clarifying complex material. This advantage is analogous to the higher quality of writing which is widely observed to be possible using word processing software on a personal computer, as opposed to dictating and correcting typed drafts.

By using a representation on personal computers, parts of a single presentation can be prepared by several individuals, then put together in a common format. With convenient tools for exchanging information via communications, several individuals can collaborate on a presentation—even if they are not in the same location.

Digital communication of presentations from one location to another is also useful for preparing a presentation in one location, then sending the files via communications to a distant location where they are imaged (on a laser printer or a film recorder) at full original quality. Most managers in multi-location companies are all too practised at trying to make out blurry presentation foils sent by facsimile transmission from a distant site for a conference-telephone announcement or meeting. If the presentations were prepared on personal computers, then the files could be sent instead and the foils produced locally at the highest quality. Similarly, data for color slides can be prepared in California, sent electronically, and imaged on a film recorder in Boston, to produce 35mm slides in Boston in an hour—much faster than if physical slides had to be transported.

Substitution of personal computers for human assistants can reduce the time required to produce presentions (often dramatically), and reduce the cost to prepare presentations (equally dramatically). More important in practise is the gain in flexibility; a presenter can work through lunch hours, into the night, or on weekends, without requiring typists and artists. In this way, also, last minute corrections, changes, and revisions can be made ... *correctly*. How many times has every presenter had to explain mistakes and missing slides caused by last-minute revisions gone awry?

All these advantages are important, and the time and cost advantages are critical for cost justification. But from a sales standpoint, the most important advantage of using a program like the one envisioned here is *control*. When successfully completed, this program will *allow the content-originators to directly and personally control their own presentations*. For anyone who makes presentations regularly, the advantage (in time and in quality) of gaining enough leverage to directly and personally create all needed presentation materials far outweighs all other advantages.

1.9 The First Success is Yet to Come

Writing in *InfoWorld* in early 1985 on the topic "What's ahead for Software," William J. Coggshall summed up this situation when he wrote:

> "Graphics will come into its own. Currently, there is no market leader.
>
> "If you try to name the top five spreadsheet companies, you can tick them right off. Try to name the top five graphics companies, and

> they don't come readily to mind—for presentation graphics in particular.
>
> "There is an opportunity there to maintain substantial growth by providing professionals with a way to express their words and figures graphically ...."

We believe that he first successful competitor will leverage off of MS-Windows and Macintosh on the new generation of graphics personal computers to provide, for the first time, an adequate approach to using personal computers to create the kind of presentation lots of people need to create. The result will be a very successful software product, and our plan is to make Forethought that first successful competitor.

2. Major Market Segments

The two major segments of the market for presentations are traditionally described as "slides," meaning 35mm color slides mounted in two-inch-square mounts (cardboard or plastic, or in glass), and "overheads," meaning large transparencies (roughly ten inches square) mounted in cardboard frames or unmounted. Both of these formats have long histories. A third segment—video as a replacement for overheads or 35mm slides—is just beginning to emerge.

2.1 Background of Overheads and 35mm Slides

Slides in 35mm size go back to the invention of cameras for this format in the 1920's. It was discovered early that an artist's posters or drawings could be photographed in a copy stand, and the resulting slide projected for visibility by large groups. Even the slow color films available in the 1930's could be used in this way for full-color presentations. The small image size (24 x 36 mm) permitted projection optics to be much smaller and lighter than the larger "lantern slide" format previously produced directly. A variety of cartridge and tray systems were used for projection, but the 2-inch square format was standard.

In the early 1960's, Eastman Kodak introduced the 'Carousel' projectors which featured a round tray with gravity feed from the top of the projector. This system displaced all others, with the result that today, 25 years later, a presenter can carry slides in a carousel anywhere in the world and be certain of finding a compatible projector at the destination.

Overheads are a slightly later invention, having been devised first as a format for Army training and briefings in World War II. Overhead projectors were large and bulky, but because they projected a transparency almost as big as a sheet of paper, transparencies could be made quickly by hand—even drawn on clear transparencies in real time during discussions. (This use is still seen today in the arrangements for rolls of transparency material which provide a speaker with a scratch pad visible to the audience.)

After the war, the principal use of overhead projectors was at first in bowling alleys, to project score sheets as they were updated. They became popular with schools, because teachers could prepare customized instructional material cheaply. A whole industry of transparency materials (for grease pencil, for typewriters, for ball-point pen) and colored films, tapes, and inks grew up. Eventually, the popularity of overheads saturated the schools—even today, there is an overhead projector for more than 9 out of 10 U.S. classrooms—and sales of new hardware fell dramatically. (Sales of supplies for making overheads continued strong.)

Two things changed about ten years ago: (1) 3M invented lower-cost portable machines with reflective stages, which folded up to become practical to carry as sales aids; and (2) Xerox and other copier companies made overheads much easier to produce, since any paper document could be easily copied onto transparency film. Since then, sales of new overhead projectors have rebounded to surpass their historical highs. (In 1965, there were about 100,000 overhead projector units sold; in 1975, about 50,000 units; in 1985, over 120,000 units.) Today, sales of overhead projectors are virtually all made to businesses.

2.2 Differences between "Overhead Style" and "35mm Style"

Overhead transparencies and 35mm slides can be looked at as simply two different sizes of film, and in principle anything which can be imaged at one size can be imaged at the other size.

But in fact there are very strong differences in the habits and expectations associated with the two formats and in the way they are used. Historically, these differences may stem from the fact that professional graphic artists made the material which they photographed onto 35mm slides for clients, whereas overhead transparencies were mostly produced by the same people who used them—army officers preparing briefings, teachers preparing classroom materials, and eventually businesspeople photocopying overheads for meetings.

Whatever the historical source, today the markets and uses for overheads and 35mm slides are completely different. Video for presentations, as it begins to be used, seems to be splitting the same way into 'video replacements for overheads' and 'video replacements for 35mm.' A computer program to make overheads should be different from a computer program to make 35mm slides in ways that go far beyond the output device drivers.

• *Light Room vs. Darkened Room*

Overheads are typically designed for presentation in a lighted room, whereas 35mm slides are typically designed for showing in a darkened room. This observation is more important than it may at first appear.

In a lighted room using overheads, the human presenter is visible. There is opportunity for two-way discussion and interaction, since faces and expressions can be seen and reacted to. Documents (drawings, financial statements, site maps, contracts, ...) can be handed out for consultation and discussion. Overheads permit most of the activities of a regular business meeting to go on, with the transparencies as a device to focus attention.

But in a darkened room using 35mm slides, the human presenter is very likely invisible (very few setups have light on the presenter at a podium). It is not possible to see audience reactions or requests to be recognized, so the session tends to be one-way with the audience passively listening. It is not easy to take notes or to consult documents. All eyes are on the screen, because there is nothing much else visible.

• *Low vs. High Entertainment Value*

This difference means that overheads should have a very subdued "entertainment value," and should not attract so much attention that they overshadow all else. Overheads use dark letters on a light background, visible in lighted rooms. They do not have fancy transitions (being changed by hand). The screen can be left light (without a transparency) for discussion of an extraneous point easily. The presenter will point with a hand or a pencil, casually, to points of interest. Overheads, a surprising part of the time, consist simply of word charts. Overheads have very abstract diagrams, usually schematic with simple labeled boxes and lines. Charts and graphs are as plain as will do the job. There is never a synchronized sound track, since the overheads do not constitute a performance by themselves; they accompany a meeting.

35mm slides, in contrast, need a much higher "entertainment value" so they can carry interest all by themselves—as they must, since nothing else is visible and they must be a performance on their own.. They have light letters on dark backgrounds, so as not to be dazzling in a darkened room. They may have fancy transitions or fades. It is very difficult to leave the screen dark (without a slide) since then the audience is in total darkness, so extraneous points are discussed with a useless slide visible (another reason to discourage them). The presenter needs a lighted arrow pointer to point, and so usually

no pointing is done. Word charts are avoided if at all possible. Diagrams are fancier, and realistic photography will help to maintain interest. Charts and graphs are as fancy as possible—shading, three dimensions, etc.; these refinements do not add more information to the charts, but make them graphically more interesting to look at. Synchronized sound effects or narration are sometimes used.

• *Meeting Size and Formality*

There are other differences connected with these. Overheads are used in small group meetings, where discussion is possible. Indeed, overheads are frequently used in a one-on-one meeting, where they are not projected at all but just turned over in sequence for discussion. (Thus, the overhead merges with the flip-chart for single-person sales presentations.) As a group gets too large to support discussion, then using 35mm slides in a darkened room serves to control audience interference—slide show first, questions or discussion later. Overheads are not sufficiently formal for a really large group, whereas 35mm slides are pretentious shown to a single person (unless photography is required for information value).

In sum, overheads are usually used in situations where the audience is asked to concentrate on the information, and not to be awed by artistry. 35mm slides are usually used in situations where the audience should appreciate the artistic sophistication of the presentation as well as its content.

(There are, of course, exceptions to the generalizations made above, but upon close inspection these often support the distinction. 'Overhead' material will sometimes be reshot onto 35mm slides for better visibility in a moderately large company meeting, without changing its essential character. '35mm' material will sometimes be reproduced onto overhead foils for presentation in a small conference room without 35mm projection equipment, or where a lighted room is required. The distinction between the two styles of use is not exactly coextensive with the distinction between the transparency sizes, but it is surprisingly close.)

• *Preparation*

Overheads are almost always prepared by the person who will give the presentation or by an immediate staff member in the same department. It is extremely uncommon for overheads to be prepared by a centralized corporate graphics service department. And, even if a centralized service were willing, they would almost always be too slow; most overheads are made hurriedly, within a day of their being used, and copied to transparency

film on office copiers. Color would be useful, but is seldom used since copiers do not copy in color. Thus, the layout and artistic quality of overheads is almost always in the hands of amateurs who have little knowledge of effective presentation styles, no graphics training, and very poor tools.

35mm slides are more often prepared by a corporate- or division-level graphics service department. It will take some time to make them and process them anyway, so there is more advance planning. As befits a larger event at which they will be the center of attention, the slides are very frequently designed by professional artists and illustrators working from rough ideas submitted by the presenter. Color is mandatory. These people have very good (often expensive) equipment, and their work takes time. So 35mm slides must be planned well in advance, and cannot be easily changed at the last minute.

2.3 Implications of the Differences

For marketing purposes, the vital distinction seems to be that 35mm slides are produced by graphics arts specialists (corporate departments or independent producers) for clients, whereas overheads are produced by the clients themselves. Moreover, because 35mm slides are used for large audiences, where the slides will be the center of attention, the presenter will continue to need the help of professionals who know about graphics.

This means that for personal computer systems to prepare 35mm slides, the customer is a graphic arts department or production company. For personal computer systems to prepare overhead transparencies, the customer is the department or company which originates the content and makes the presentation.

The graphics department has artists who know a lot about graphics, but not much about personal computers. Quality is often more important to them than speed or flexibility. They will redraw everything (probably in fancy shaded three-dimensional perspective) anyway, so compatibility with other programs is unimportant.

Personal computer products for the graphics department to use are the lower-cost relatives of the software and hardware used to make animated video sequences (like Super Bowl introductions). They give the artist good control, but are relatively hard to use. They are often sold as expensive dedicated hardware and software workstations, sometimes by the same

people (*e.g.*, Genigraphics) who sell complete production services themselves . This is really a vertical niche application.

A personal computer system designed for use by the content-originator to directly prepare overheads obviously has very different qualities. For instance, compatibility with standard personal computer hardware and environments is crucial. The content originator already knows how to use any other programs from which data may come, and does not want to re-enter it. The graphic sophistication of charts and graphs generated by personal computer programs is appropriate to overheads. Saving time, making last-minute changes, and retaining control are most important.

Laser printers for overheads can be used for many other purposes as well (word processing, page layout, forms, ...) so chances are good that such a printer either exists in the department already or can be justified for these multiple purposes. In any case, a PostScript/Interpress laser printer costs about $6,000, heading rapidly for $2,000–$3,000.

(For imaging 35mm slides, the cost of devices will continue to be a problem: an adequate film recorder is about $8,000 plus $2,000 for a PostScript/Interpress interface. This $10,000 peripheral can be used only for making 35mm slides, an amount very hard to justify except for the graphic arts department. One way around this difficulty would be service bureaus which would receive presentation files on disk or via communications lines and return finished slides.)

A program intended to be used by a manager or a secretary as a replacement for a typewriter as a way to make overheads should not require very much artistic ability. These people do very little with graphics now, and do not have the time nor the training to do much more. They will want to begin, at least, by doing a neater and easier job of what they have done before.

2.4 Future Video Devices

In the past, almost all presentations utilizing video projection devices have fallen into the same psychological category as 35mm slides—darkened room, high graphics interest, artistic talent and time lavished on presenting a fairly static presentation. This may have come partly from the darkened room, which was required because of the very low brightness characteristic of video projectors (the only bright projectors are so expensive that they

would be used only for very large groups or very formal occasions, for which 35mm style would be appropriate anyway), and partly from the fact that production of material for the video device was likely to be handled by the central services group.

In the near future, as we will discuss, there will be much brighter and much cheaper video projectors which can connect more easily to personal computers. Programs such as Presenter will make it possible for individual content-originators to produce their own material. Together, these innovations should give rise to an entirely new phenomenon—presentations with the informality of overhead transparencies, delivered in lighted business meetings, but using video generated directly from diskettes instead of actual overhead foils.

These "electronic overheads" will actually be even easier to make and to use than real overheads, once the equipment is in place. They will not arrive overnight, but they are important for the future. We should not fall into the mistake of believing that all presentations generated for electronic delivery will share the artistic and stylistic qualities of 35mm slides.

2.5 Conclusion: Our Target is Overhead Style

Preparing presentations in the style associated with '35mm slides' is a vertical market, where the customers are graphics arts producers and central graphics service departments who prepare slides on behalf of clients. A much larger horizontal market is that for preparing presentations in the style associated with 'overheads,' where the customers are all the people who prepare presentations for themselves.

Personal computer users who are content-originators rather than artists are better suited to preparing overheads than 35mm slides. Presenter, and other personal computer software, will best fulfill the cluster of expectations surrounding overheads—informal, for lighted rooms, for smaller groups, for working meetings where content is more important than form or fancy graphics, for situations where speed and personal control are important.

The conclusion is that we should focus on the overhead market, while pointing out that we support color and that anything designed for an overhead can also be imaged on 35mm film. We should not position ourselves as an alternative to Genigraphics, nor think that our customers will

be in the central services department which concentrates on professionally artistic slides.

Our targets for Presenter should be people who want (in order):

(1) conventional overheads printed on a laser printer or impact printer in monochrome, for monochrome copying;

(2) color overheads, generated on color ink-jet or thermal printers;

(3) "electronic overheads" generated for direct video projection; and

(4) what we might call "35mm overheads," slides which must be in 35mm format for some reason but have the content more often associated with overhead transparencies.

All of these can be produced by the customer who is the content-originator or an immediate staff member in the same department.

3. Presentation Display Environments

By presentation display environments, we mean the devices necessary to produce actual presentations using our software. The following table shows the devices to be discussed in this section, and how they relate to one another.

Format	*Computer Peripheral*	*Presentation Device*
Monochrome Overheads	Laser Printer, or Impact Printer	(Photocopier), Overhead Projector
Color Overheads	Ink-jet Printer, or Thermal Transfer Printer	Overhead Projector
"35mm Overheads"	Film Recorder	35mm Projector
"Video Overheads"	Monitor Video Out LCD Overlay (Floppy Disk Drive)	Video Monitor, Projector LCD Overlay (Floppy to Video Player)

3.1 Printers and Projectors

Through MS-Windows and Macintosh, we will support all the printers and plotters supported in both environments, including common low-resolution printers such as the Epson impact printers, IBM ProPrinter, and Apple ImageWriters. These machines do a very good job, at a price as low as $500–$1,500. These printers can create paper for photocopying to overheads, or at least one company (Arkwright) is producing transparency films which can be printed directly by an impact printer. (There is no advantage to this for monochrome—there would be in the unlikely case that color impact printers became common before color copiers were to become common.)

Color printers will include high-resolution (200–300 dots per inch) color ink-jet and color thermal transfer printers. Price ranges are $1,500–$5,000. These printers have use in engineering and CAD/CAM applications, but not for office word processing. Preparation of color overheads is likely to be the largest office use of color printers. Overhead transparency films are available for both of these, and would be used in the absence of color copiers. Some of these devices will have PostScript and Interpress interfaces. Color pen plotters, the mainstay of presentation graphics for years, will be of very little importance (but Windows, at least, will support them, and films are available).

Most important for the immediate future will be very-high-quality printers with PostScript or Interpress interfaces, such as laser printers and typesetters (*e.g.*, the Apple LaserWriter and the Allied Linotronic 100). These devices provide superb quality over a wide performance range, and may be cheaply shared over a local area network. Driven by "desktop publishing," they are rapidly becoming cheaper and more widely installed. (Prices now begin about $5,000 but should drop to less than $3,000, perhaps less than $2,000.) All will produce overheads directly, or paper for photocopying.

All of the devices described above will connect to a personal computer, to produce overhead transparencies. All would use an overhead projector to display the presentation.

The same scheme applies to 35mm slides. Film recorders, some to have PostScript/Interpress interfaces, are available for $8,000–$15,000. Devices imaging from monitor video, or utilizing a 35mm camera to take pictures of a screen, are available for less but produce inadequate quality. The film so exposed would be processed and mounted, then projected in a 35mm projector.

The use of new graphics standards, particularly of the sort used in MS-Windows, should permit new higher-quality display boards which will generate anti-aliased (non-jaggy) video signals, comparable to the video now produced (not in real time) by General Parametrics' VideoShow. This video signal could be used to display presentations on conventional analog color monitors or analog color video projectors. Although the resolution of such video displays is poor, the anti-aliasing technique exploits the fact that each pixel may vary continuously in brightness and color to produce the subjective impression of higher resolution (but not higher detail). No such boards are yet available, but expected prices would be under $1,500.

All of these devices we will access through standard drivers for Windows or for Macintosh. We will not need to write special device-specific drivers for our *Presenter* programs.

3.2 Breakthroughs in Audio-Visual Presentation Devices

Up till now, presentations made by personal computers have almost always had to be imaged onto overhead transparencies or onto 35mm color film for projection by conventional electro-optical projectors. Even these often did not give adequate results (when slide quality was limited by the resolution of the screen graphics), but they are generally much better than trying to directly project the computer's video signal.

Video projectors have been divided into two classes. The first class consists of devices too expensive ($40,000 to $100,000) for almost all uses. These are generally rented for public events, and have been installed in a small number of corporate boardrooms. They yield very good images, with good brightness and registration.

The second class is devices of acceptable price ($7,000 to $20,000) but of almost unacceptable quality. These are industrial relatives of consumer projection TV video; they are very dim (250–400 lumens), a shortcoming they attempt to compensate for by using directional screens which are only visible to viewers near the axis of projection. Practical problems include focus and registration of red, green, and blue for color models, and the large size and weight required. For all these reasons, market acceptance has been grudging.

The only alternative to these devices has been to use one or more large monitors. These are feasible in very small conference rooms, but don't provide a solution for more than a dozen or so people.

There are two new devices just now coming to market which will change this state of affairs. Both are based upon Japanese advances in fabricating Liquid Crystal Display video screens for high-volume consumer television displays and for portable computers. Both depend on the observation that an LCD display can be fabricated on a transparent substrate, so that a strong light can be shined through the LCD panel and focused on a screen. Light passes freely through the clear transparent parts, and is colored where the LCD pixels are on. New LCD displays just now appearing on the market (called STB, for "super-twisted bi-refringent") provide higher contrast than previous designs.

3.3 Low-Resolution Color Video Projectors

The first new device is a full-motion video replacement for a slide projector. This is built around the same kind of screen (two inches diagonal, or slightly larger than a 35mm slide) used in color LCD pocket TV sets, now being sold to consumers for under $300. That screen can be used with a lamp and optics just like those of a conventional slide projector to make a very bright projection video display. The brightness of a high-output Xenon-lamp slide projector is about 5000 lumens, and even with the LCD image in the path 4000 lumens can be expected (at least 10 times the brightness of conventional color video projectors). The image is automatically registered at the LCD plane, so only conventional focusing is required. Such an LCD projector can be built to be as small and as quiet as a comparable slide projector. It can accept an external video signal, or can be packaged with a VCR into a self-contained player/projector. The consumer price of such a video projector is expected to be under $900.

Such a small LCD display cannot contain enough pixels (discrete picture elements) to provide very high resolution. (The Seiko consumer TV display is 220 x 240 pixels, or 52,800 color pixels total.) Thus, the expected anti-aliased video cards which can be used in PCs (discussed above) would be necessary to use this device effectively for presentations, and even then quality may not always be acceptable.

Higher resolution displays can be built in four times the area (diagonal about four inches) but then the size and weight of the projector optics increases substantially. It is likely that devices based on the consumer TV displays will proliferate because of their attractiveness for general video projection, and that presentations will have to make the best of them.

3.4 High-Resolution Video Projectors

The resolution problem is solved better by the second new device, which is based on the much larger LCD displays used for portable personal computers (rather than for consumer television). An LCD display with computer screen resolution (from 640 x 200 up to 720 x 480 pixels) is fabricated on a transparent substrate approximately eight inches square, within a frame about an inch thick. This transparent panel can then be placed on the stage of an existing conventional overhead projector, or built into a replacement for an overhead projector. A cable runs from the frame to the video output of a personal computer. Early versions, like portable computer

screens, are monochrome (typically dark blue on a nearly transparent background).

Full color versions at the same resolution require much denser fabrication, but are realistically within sight in the next year or so. One Japanese manufacturer (Toshiba) has already demonstrated an LCD display six inches by eight inches (the correct aspect ratio for graphics), with 640 x 480 pixels (same as IBM's new enhanced EGA standard), in full color (307,200 color pixels total).

The first device of this kind will be shipped this summer by Sayett Technologies, a subsidiary of Eastman Kodak. It is a frame about ten inches square, for use on an existing overhead projector. It delivers 1200 to 1600 lumens, or about 80% of the brightness of a standard overhead transparency when projected. It will sell to end users for $1,200, and accepts composite video from an IBM Color/Graphics Adapter (640 x 200). A color version of the same device is said by Kodak to be about a year away. In the meantime up to a dozen Japanese competitors are preparing to market comparable devices beginning early in 1987, some at lower cost, most at higher resolution.

These large displays will probably be dominant in presentation graphics, because of their enhanced actual resolution. Since they match the display video of existing cards, they can be plugged in and used with all software automatically. The screen resolution thus obtained is not wonderful, but is probably adequate for EGA (640 x 350) or higher resolution (640 x 200 is not adequate). When used with anti-aliasing video cards, still better results can be obtained.

Although the ten-inch display module is large, it is flat. For portability it can be carried in a briefcase along with a portable computer, and used with a conventional overhead projector which is almost certainly available at the presentation site. Hence, the larger-format display may actually be more portable than the smaller-format display, which demands a complete projection device because it is not designed to be inserted into a standard 35mm projector. (Current displays cannot be built as part of a portable (reflecting stage) overhead projector, since illumination must come through them from below. This can probably be changed with further development.)

There is some customer interest in having presentations on a disk. VideoShow from General Parametrics is a dedicated MS-DOS computer (price about $5,000) which does nothing but generate a video signal from a diskette written in its special graphics format (it cannot be used as a

computer). It has sold extremely well. Although designed to drive a monitor, so far more than half of the installations have been connected to video projectors. Better and cheaper video projectors may further encourage the idea of putting a dedicated device into a meeting room, to accept presentations on disks prepared by personal computers. These should work as automatically as putting a carousel on top of a slide projector or a cassette into a VCR, so that the presentations can be used by people who know nothing about personal computers or about the software which created the presentation.

3.5 Implications for Presentation Software

For the next few years, most presentations created on personal computers will be imaged onto overhead transparencies (using printers) or onto 35mm film (using film recorders) for conventional projection. So the first duty of a presentation graphics product will be to support these traditional, static presentations.

Nevertheless the excitement surrounding the introduction of the new LCD video projectors as computer peripherals will reinforce the importance of presentation graphics. And, over several years, these new projection devices may very likely account for a substantial part of the market.

Short-term—immediately—all that is necessary to take advantage of the new devices is to generate monitor displays which could be used for presentations in lieu of overheads.

Longer term, the importance of these devices will be to make motion and animation much more important than before. An initial step would be to provide for fades, transitions, progressive disclosure, pre-arranged highlighting, cycling color, and other 'automatic' forms of motion. It is important to have software to do these *early*—before devices are introduced—in order to induce the manufacturers of LCD video projectors to work with us. Software that does such things as fades and transitions will be sales tools for them, demonstrating a key advantage of their devices over static slides.

Eventually there will be increasing demand for something more like true animation, at least in replacements for high-quality 35mm slide shows where artists play a role in preparing the slides.

As a software company, we could address the market for 'presentation-players' in two ways. First, we could have manufactured and sell an infra-red remote control and a receiver which plugged into (teed into) the keyboard jack of a personal computer. With this and 'player' software, any personal computer could be used to give presentations by feeding its video to a monitor or projector.

Beyond this, we could work with boxes dedicated like the VideoShow just for giving presentations—a single box with IR receiver, single-board computer, disk drive (probably 3.5 inch), and LCD video projector. No display, no keyboard, no cables. One power cord, one off/fan/lamp switch,for the whole box. External video also accepted through a socket.

One device would look like and be set up like an overhead projector, at the correct distance near the screen. (It could physically resemble the Eiki POP-1, but with a larger base to house the computer board, disk drive, and LCD display module.) The presentor would go to it and insert the disk (like putting in a slide tray), then control the presentation using the cordless remote control.

A second device would look like and be set up like a 35mm slide projector, at the back of the room. (It could physically resemble a Kodak Carousel slide projector.) Again, the disk would be inserted (much like a carousel tray), then controlled by the presenter from the front of the room using the cordless remote control.

We would have to consider carefully the implications of selling such boxes ourselves—we would get into repairs, spare parts, and a host of other issues foreign to the software business. We might do better to encourage a company (such as Epson, Sharp, Sanyo, or Matsushita) which makes both computers and LCD displays, or one of their distributors, to distribute the machines under their name. Either device could be built with a VHS or 8mm VCR unit rather than a single-board computer and disk drive. Perhaps the manufacturer could sell that version as a compact projection VCR, helping out the economics of the computer version.

4. Personal Computer Environments

The *Presenter* program will be tailored for two personal computer environments:

—MS-Windows, running on a machine with at least an 80286 processor, 512K of memory, and EGA-level (640 x 350) or better color graphics (from IBM, Compaq, Tandy, Zenith, H-P, NEC, ATT, ...);

—Macintosh, with a 68000 processor, 512K of memory, and monochrome graphics.

These two environments are very much alike, and are becoming even more alike as MS-Windows continues to gain features more like Macintosh. Still, we think both will constitute significant markets. Fortunately, it is possible to develop related programs for the two environments; but scrupulous adherence to even the smallest conventions of each environment separately will be required.

Almost all questions of hardware compatibility are answered by saying that we will support these two environments fully, but only these two environments.

4.1 Apple Macintosh

Macintosh is being sold today intensively for "desktop publishing" applications, and it actually delivers the printers, the fonts, and the software necessary to do the job. Apple is clearly positioning Mac as the kind of machine on which one would make presentations, so many users already look to Mac for this application.

Mac lacks a large screen, color display, and color peripherals. Apple says it will inform developers (under non-disclosure requirements) about its color strategy in July of 1986. If this is so, it is quite likely that color on Macintoshes will not be available when Presenter is first shipped.

Even if Macintoshes get color displays, there will certainly not be a color LaserWriter soon. ImageWriter II is not a suitable color device, since the colored ribbon segments pick up contamination from other colors (and Apple support on Mac is sub-minimal). For color overheads, Apple would have to add a high-resolution color inkjet or color thermal transfer printer. For color 35mm slides, Apple would have to add a film recorder (very likely with a PostScript interface).

Neither the Mac nor the Mac Plus contains a video-out jack, so the installed base sold through 1986 at least will *not* be able to directly show video presentations of any kind, monochrome or color.

But the same hardware configuration being sold today for page layout use could also be used to make outstanding (monochrome) overhead transparencies by adding only our software. Hence, the initial positioning on Macintosh would be for producing overheads using LaserWriters (or ImageWriters). This could be introduced to dealers and salespeople as an extension of "Desktop Publishing."

4.2 IBM and Microsoft Windows

MS-Windows clearly will be the equivalent environment on IBM and compatible machines. According to a January 1986 survey of developers by Future Computing, 40% of developers intend to develop software for MS-Windows (as against 12% for TopView, and 6% for GEM). The dominance of Windows is probably even greater today. Not only does Windows provide the same high level of system support as Mac, but Microsoft has promised developers that software which runs on Windows and uses its multi-tasking and memory-management will continue to run on the new (*in*compatible) protected-mode "DOS 5.0" for 286 machines only, due early in 1987; this is an offer developers can hardly afford to refuse.

There is already an installed base of over one million IBM PC-AT compatible machines, and over half of these have been sold with high-resolution graphics display cards (either the Hercules monochrome or the IBM EGA color). Hence, the existing machines already in use which could adequately run Windows and provide a Macintosh-like level of performance is already about as large as the Macintosh installed base.

Note that our programs will *not* be optimized for use on the largest part of the installed base of personal computers, namely 8088-based IBM Personal Computers with either IBM Monochrome (character-mapped)

Displays or IBM Color/Graphics Adapters (640 x 200). We do not believe that an adequate program can be written for such hardware, and notice that MS-Windows itself does not deliver an adequate graphics interface on such older machines.

All evidence is that that older generation is at the end of its life. Compaq expects 60% to 80% of its sales in 1986 to be 286-based models, Tandy, Zenith, and NEC have made similar announcements, and it is widely believed that IBM will introduce a lower-priced 286-based machine soon, to replace the aging PC and XT as mainstream business machines. (The way in which this is done may be by introducing a new power machine and repricing the AT, or by actually introducing new PC and XT models. The 8088-based machines presumably have a future at still lower prices, for use at home and in very small businesses.) For the installed base, plug-in 286 accelerator cards ($800 with a megabyte of memory), EGA cards ($400), and expanded memory and hard disk cards offer a realistic upgrade path. For these reasons we think it is reasonable not to design new products for the old lower level of performance.

Lotus was widely criticized in January of 1983 for introducing a new spreadsheet program (1-2-3) which required the address space of an 8088, and which could not be engineered to work on the dominant 8-bit installed base. Subsequent events have demonstrated that they were right to fully exploit the power of what was then the emerging generation of machines, at the expense of forgetting the old installed base, because the new generation rapidly grew to dominate the old. We think the situation is precisely analogous with respect to the new generation of graphics-oriented personal computers today.

4.3 Relative Timing of Macintosh and MS-Windows Versions

During the last several months we have been discussing the product with Apple and with Macintosh users, we have also been discussing it with MS-DOS users and with presentation hardware companies. It has been interesting to observe that the Macintosh users grasp immediately the nature of the breakthrough, because *Presenter* is the natural way of making presentations in the Macintosh (or MS-Windows) environment. But MS-DOS users have had much more difficulty grasping the clear differentiation of *Presenter* from its older competitors.

In thinking about the reasons for this, we have realized that to fully grasp the Presenter product concept you must hypothesize an environment in which

—most personal computers have a high-quality graphics display, a mouse pointing device, and software to exploit them;

—most personal computers have a graphics printer, capable of printing multiple fonts and arbitrary graphics at moderate to very high quality;

—many other graphics programs exist, all observing the same standards of data interchange, so that text and graphics data can be received from them;

—many programs utilize the same user interface standards, so that moving rapidly from one program to another is smooth and not disorienting;

—some method exists for instantly switching from the context of using one program to using another, rather than quitting one application and opening another;

—device-independent graphics standards permit proofing documents on one device, then printing them on another substantially more expensive device with some assurance that they will print correctly (e.g., a laser printer or a $30,000 phototypesetter).

We believe that precisely these conditions will evolve under the influence of MS-Windows, eventually—but all of them are already true on Macintosh today. Thus it is no wonder that Macintosh users can understand immediately how *Presenter* would work and why they want it.

Just when all these conditions will be true on the IBM base is hard to predict. If IBM were to introduce a 286 machine with EGA (or better) graphics built-in, at a PC price level, include a mouse as standard, and bundle MS-Windows, then it could happen very fast. Without that help, it could be much slower.

The most problematic condition is when the *other* software will exist, because Presenter requires that programs such as *Excel*, *MacPaint*, *MacDraw*, and the like exist in the same environment to be of maximum value. Microsoft has announced that it will ship *Excel* for Windows, but has

not announced a time (rumor says February 1987). In February 1986, they were announcing further changes in the Windows user interface (in the direction of Macintosh) to facilitate a version of *Excel*. There are still some missing pieces of MS-Windows (support for rich text editing, a standard for rich text interchange, fonts, device drivers, a standard for PostScript- or Interpress-level device drivers, etc. These gaps may delay much software longer than we would have hoped.

None of these considerations is decisive. But it is at least reasonable that for the next year the market on MS-Windows machines may be no larger than the Macintosh market, and perhaps considerably smaller. This being the case, it appears that the lowest-risk strategy is to introduce *Presenter* on Macintosh, get maximum leverage from aiding Apple's strategy, and sell first in the Macintosh market where the product will be warmly received. Then, aided by that introduction, extend the product to MS-Windows a few months later.

This is our current intention. Forethought schedules the Macintosh version of *Presenter* for first customer shipment in February 1987, and the MS-Windows version of *Presenter* for first customer shipment in August 1987, presuming that schedules for funding and development can be achieved. A "Beta" pre-release of the Macintosh version for marketing purposes can be available in late November 1986.

5. Product Concept

Presentations are today handled by a variety of graphics arts and photographic techniques, and form a major part of the "audio-visual" (AV) industry. As personal computer programs are introduced to take over some of this work, they will exist at the intersection of the audio-visual and personal computer markets. It is essential to understand and fit into the expectations of both of these worlds if we are to be successful.

(Compare the situation in word processing a few years back, as word processing software on personal computers took over the market from dedicated word processing equipment. Programs such as *Microsoft Word*, which took maximum advantage of the new designs made possible by the personal computer, did not become the biggest sellers. Instead, programs which preserved some of the limitations of earlier dedicated word processors, such as *MultiMate* (modeled after Wang's word processor) and *DisplayWrite* (modeled after IBM's DisplayWriter) achieved the widest acceptance. Despite their—technically unnecessary—limitations, they did a better job of meeting the expectations of people who were actually using and buying word processing equipment.)

5.1 Product Concept: "Presenter"

We call the product we are developing for this market *"Presenter."* What will be its essential features?

Most importantly, it will be a *personal* presentation tool, designed for use by the content-originator directly, and not for use by the corporate communications department. This means that it must contain all the features necessary to structure, compose, and edit presentations—not just those needed to type and draw a final form of slides from someone else's notes. It must actually help the presenter in the intellectual task of creating the presentation.

Since many (or most) presenters are managers and senior people with limited time, *Presenter* must be simple enough and also powerful enough to deliver real advantages in speed and in quality over the alternative choice of using pencil and paper, then handing off notes to assistants who do the rest of the work. This is an essential requirement, difficult but not impossible to meet. Consider that the widespread use of spreadsheet programs has come about because the users find that they can do a better and faster job by directly and personally manipulating the numbers than by inspecting and questioning manual spreadsheets prepared and corrected over and over again by assistants. A similar result is possible for *Presenter*, with the observation that most presenters have less tolerance for complexity in their tools than do spreadsheet users, so there is a higher requirement for intuitive design.

A program to deliver those advantages would be organized around the unit of work being an entire presentation (not, as in current programs, just a set of slide formats). A "presentation" is an editable and extendable sequence of slides, each slide itself being editable as well. Any particular presentation has conventions such as standard repeating elements on every slide (perhaps logos, line, borders, dates, slide numbers, ...), standard arrangements for titles and text, perhaps repeated items of art or text which are special to that presentation. All these things should be explicitly associated with the presentation so that the program may handle them—not left as implicit conventions to be always remembered and obeyed by the preparer. Presentations use high-quality typeset text, in multiple sizes, styles, and fonts, plus the special kind of multi-level outline formatting which is not handled well by most word processors. Finally, a presentation needs tables, charts (both word and numeric), and art from almost any source, and must be able to clip and/or to resize art directly for use in the presentation.

In such a presentation, slides could be inserted, deleted, copied, and re-ordered. Single slides or sequences could be extracted from one or more previous presentations, edited, and reused in new presentations—automatically conforming to the style set for the new presentation—just like many people use paper copies of slides now, as directions for human assistants.

Finally, a presentation consists of a number of other elements besides the slides. For any presentation a presenter may want speaker's notes tied to the slides, outlines, hand-outs of various sorts, amplifying discussions accompanying the slides, perhaps even guides for a projectionist. All of these can be generated automatically, along with the slides themselves.

5.2 Design for a Particular Task

In order to maximize the power of the *Presenter* program and at the same time keep its use as simple and intuitive as possible, it is essential that every element and feature be sharply focused on the particular task of making presentations.

Many programs are used for making presentations today, and all of them have some helpful features, but each of them also has a host of lacking features and irrelevant complexities which make them much harder to use than necessary. Part of the *Presenter* design is to extract and utilize the successful features from other applications, adding only the special features especially required for presentations.

The same technical features which are present in Presenter could be used to make any number of other one-page documents—flyers, posters, point-of-sale information, bill stuffers, sales bulletins, and so on. We expect some customers to discover this, and to use the product for purposes other than presentations. But design will concentrate on tuning all the features to be in the form which is best for the narrow task of presentations.

5.3 Requirements of the New Environments

The requirements, and the opportunities, of new environments such as MS-Windows and Macintosh, lead to a product concept very different from any existing package sold to make presentations.

Most strikingly, virtually all existing presentation packages stress the creation of business charts (pie charts, bar charts, line charts) as their most important function; some very popular packages will do nothing else at all. They have a lot of function connected with data entry and editing, and chart attributes. In sharp contrast, *Presenter will have no tools at all within itself for making business charts!*

This decision comes about because of the difference in assumed environments. The existing packages were designed for a standard MS-DOS environment, where the numbers to be charted might come from many incompatible sources, where there was no standard form for graphics, and where just making a single chart which could be used as a slide was a difficult task.

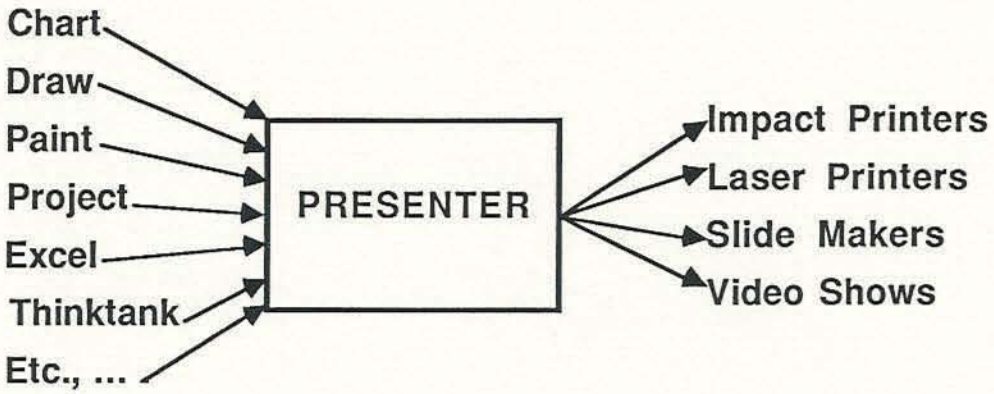
More recently, it has been discovered that users really benefit from a single program which can do both spreadsheets and charts (such as Microsoft's Excel) because much of the information from the spreadsheet can be used directly to annotate the charts, and users need to go back and forth between numbers and graphics while tuning plans and assumptions. The spreadsheet itself serves as the data entry and editing interface for charting, with a consequent unification and simplification of the whole process.

At the same time, in the new environments *Presenter* can depend on standard data interchange formats for use with other programs, and methods for instantaneous context switching from one program to another (via multitasking and Windows-level macros in MS-Windows, or even hot-links between two running programs, and via Switcher in Macintosh). Once this is true, it would clearly be a poor choice to duplicate the charting function in *Presenter*; users would have to learn a new way of doing things in addition to what they use in their spreadsheet/charting program, move numbers and then do redundant formatting, and so on. It is clearly better to let users do charts in their spreadsheet/charting programs that they use for analysis, then optimize the use of the same charts in the presentation program.

Some existing presentation programs are specialized to other kinds of drawings than business charts, such as signs, organization charts, project charts, CAD-type drawings, and so forth. For each of these the same argument holds as for pie charts: users already create specialized art using programs which manage that kind of data for them, and should be able to use the same art easily in presentations. Someone who manages projects using a scheduling program will be creating and using Gantt charts and PERT charts every day through a familiar interface; it should be possible to use that same program and the same schedule-charts in presentations, not to have to duplicate effort and learn something new.

Similarly, existing presentation packages come in multiple versions designed for specific output devices—different packages for 35mm, for overheads, and so forth. In the new environments, this is unnecessary complexity. Both MS-Windows and Macintosh offer device-independent graphics standards and system device drivers. A presentation should be capable of being generated for any device.

A diagram will show our model of how *Presenter* integrates into the new richer graphics environments:



On the left are samples of the many specialized sources of graphics and data elements: various tools that a presenter might (or might not) use to manage data. Whatever combination of these a presenter uses, the output of all can be used directly in presentations.

On the right are the various output devices supported. *Presenter* will create paper output, or overheads on transparencies, or 35mm slides, or video for a live presentation, all in monochrome or color. Presenter works with whatever devices are supported in the environment.

Between these two standards for data exchange, there is a coherent task for a presentation program regardless of the specific data to be presented. Presenter provides facilities for:

- organizing and composing a presentation, editing and merging presentations;
- laying out slides, creating and editing their content;
- creating text, both editing and formatting and graphics layout;
- creating multi-column tables, whether numeric or words;
- doing general drawing of the type used for simple diagrams;
- clipping and resizing art from any source;
- setting standard repeating elements, formats, and tools for the presentation;

- previewing the completed presentation on the screen;
- page layout for slides, talking papers, handouts, etc.

This is a substantially new concept for a presentation product, made possible only by the new environments of MS-Windows and Macintosh.

Just as *Presenter* would not be appropriate for the old environments of the previous generation, so too existing programs designed for those limitations will be strikingly poor in the new environments. For presentation graphics, this change makes possible a breakthrough in product design.

6. Product Features and Evolution

6.1 Presenter Features

Based on the foregoing considerations, the features of the initial release of *Presenter* (for both Macintosh and MS-Windows) will be focused on overheads, and primarily on those imaged statically on film for projection by conventional overhead projectors. Features include capabilities to:

- create, structure, and layout presentations;
- layout slides, do direct word-processing of word charts;
- do general drawing, clip and resize art from any source;
- utilize master formats, custom tools, libraries of art and of formats;
- layout pages to print slides, talking papers, and handouts;
- preview a slide show using the whole computer display.

It is also important to ship as part of the initial product a "template" library of clip art, such things as:

- borders, arrows, headline scrolls, sized to fit slides;
- thematic and decorative art for vertical specialties;
- maps of states, countries, SMSA's.

International versions could be of major importance, since there is relatively little cultural content in *Presenter* and the product could be used easily in many language areas. Development will be carried out so as to permit easy localization. Actual translation and preparation of localized versions will most likely be done in cooperation with a hardware partner. For Macintosh, Apple funding and sponsorship would probably be necessary to justify international versions. For Windows it should be possible to find

sponsorship from the leading Windows OEM in each language area—*e.g.*, Olivetti in Italy, Nixdorf in Germany, Apricot in the U.K., Thomson in France, etc. It is also possible that IBM would be interested.

When this Version I is developed, then it will be time to introduce a Version II designed to take advantage of the new video devices. Details remain to be worked out, but basically this would add:

- transitions, animation, motion;
- the ability to create a self-running presentation on a disk.

This would be the time when our cooperation with hardware manufacturers would pay off. We might ourselves be interested in selling hardware to remotely control a presentation, possibly to project it.

6.2 Other Companies

Since no existing program for Apple II or for the IBM PC does a good job, there is as yet no really successful competitor in the category of presentation graphics. No product is really widely accepted, no product generates a lot of revenue to permit expensive marketing, and no large installed base of users exists.

No program known to us combines even the features we have identified as critical for *Presenter*—rich text for wordcharts, drawing, import of charts, and graphical construction/editing of a presentation—let alone the other features.

Most of the programs listed here are not really competitors for *Presenter* at all, but rather sources of art that *Presenter* can incorporate and work with. Nevertheless, they are graphics programs which people might expect (incorrectly in many cases) to use for generally the same class of problem.

Business and Professional Software Inc. has products such as *Business Graphics* ($350) for charting, *35mm Express* ($695), and *Overhead Express* ($195). Company revenues for 1985 were about $2 million. IBM has licensed *Overhead Express* for non-exclusive distribution.

Graphic Communications, Inc. has products such as *Graphwriter* ($595) a charting package, and *Freelance* ($395) a free-hand drawing package used to touch-up single charts imported from *Graphwriter* or from

Lotus *1-2-3*. Revenues had been about $5 million per year. The company was very recently purchased by Lotus.

Decision Resources Inc. publishes *Chart Master* ($375) for organization and schedule charts, *Sign Master* ($245) for simple signs, and *Diagram Master* ($345) for simple diagrams. Company revenues have been about $8 million per year. Decision Resources claims to have 25% of the business graphics market, and published reports say it is about to go public. Ashton-Tate has very recently signed a letter of intent to acquire the company.

Digital Research Inc. has published *DR Graph* and *GEM Draw* and *GEM Wordchart* for its own operating environment. Although DRI considers itself a graphics application company, the decisive rejection of Gem by developers and manufacturers assures that these products will never find much of a market in their current forms.

Apart from Lotus's very recent acquisition of GCI, major software companies have not done much yet. Microsoft has had *Chart,* for charting, but rather obsoleted it when *Excel* was introduced with built-in charting. Ashton-Tate does not have a product in the area (but will have if the acquisition of Decision Resources goes through). H-P has a charting program and a drawing program, but H-P is not a major software company. The best entry is probably Software Publishing's *Harvard Presentation Graphics* ($395), introduced in March of 1986, as a stand-alone application.

Less well-known companies include Enertronics Research (*EnerCharts,* $395), Micrografx (*Draw!,* $195) Visual Communications Network (*VCN Execuvision,* $520), and Zenographics (*Autumn,* $395, and *Mirage,* $695).

6.3 Product Categories

- *Business and/or Scientific Charts*

BPS	*Business Graphics*	$350
GCI (Lotus)	*Graphwriter*	$595
Microsoft	*Chart*	$350
Microsoft	*Excel*	$495

Hewlett Packard	*Charting Gallery*	$295
Computer Support	*Picture Perfect*	$295
Cricket Software	*Cricket Graph*	$195–$495

• *35mm Presentations*

BPS	*35mm Express*	$695
Software Publishing	*Harvard Presentation Graphics*	$395
Enertronics Research	*EnerCharts*	$395
Zenographics	*Mirage*	$695
Zenographics	*Autumn* ['Auto-Mirage' add on]	$395

• *Overhead Presentations*

Living VideoText	*More* [Outliner]	$295
Digital Research	*GEM Wordchart*	$195
BPS (dist. IBM)	*Overhead Express*	$195
IBM Corp.	*SlideWrite*	$225
IBM Corp.	*PC Storyboard*	$250

• *Paint and/or Draw Programs*

Digital Research	*GEM Draw*	$195
Digital Research	*GEM Paint*	$195
GCI	*Freelance*	$395
Micrografx	*In*a*Vision*	$495
Micrografx	*Draw!*	$195
Hewlett-Packard	*Drawing Gallery*	$395
Microsoft	*Windows Paint*	[*free*]

Computer Support	*Diagraph*	$395
• *Signs and Diagrams*		
Decision Resources	*Chart Master*	$375
Decision Resources	*Sign Master*	$245
Decision Resources	*Diagram Master*	$345
Decision Resources	*Map Master*	$395
• *Animation*		
Zsoft Corp	*PC Presentation*	$95
VCN	*VCN Execuvision Concorde*	$695

Of all these, the real competitors are the ones listed under Overhead Presentation. It is fascinating to note that no less than 3 of those 5 programs are distributed by IBM—all created by outside companies.

7. Distribution Considerations

The basic plan is to make use of the sales and distribution network successfully built around Forethought's earlier products to assure rapid and effective introduction of *Presenter*. But *Presenter* also offers additional opportunities, which we should not miss.

7.1 Presenter Wll Sell through Computer Dealers

Forethought has traditionally sold its software through retail computer hardware dealers, as well as through software-only retailers and mail-order dealers. Recently there has been a trend for hardware dealers to reduce software inventories, and to sell less software. This makes it harder to introduce new software, and tends to consolidate sales of a few market leaders required to make hardware sales.

We believe that *Presenter* will be one of the favored software packages which will continue to be carried by hardware dealers, because it will sell hardware. *Presenter* provides a concrete reason to purchase a new graphics-oriented personal computer, which will be among the new models carrying higher markups. For existing users, *Presenter* will sell 286 upgrade cards, memory, EGA cards, and mice. In addition, *Presenter* will sell expensive peripheral devices, such as LaserWriters and slide film recorders, which may carry markups larger than an entire computer system.

Dealers are still an essential ingredient in software distribution. Many sales of Presenter will be made to small businesses and very small businesses, for whom retail distribution through dealers is the only practical answer. The most basic reason for a dealer to carry *Presenter* is because it makes people buy graphics-oriented personal computers—and we think *Presenter* will do that.

7.2 Presenter Will Sell Directly to Large Corporations

Presenter will also sell directly to large corporate accounts, and Forethought intends to exploit that fact as well.

People who make presentations are not randomly scattered throughout U.S. business—they are sometimes clustered in specific corporations which use presentations intensively. Northern Telecom is the largest purchaser of 3M transparencies in Nashville (its corporate headquarters); Intel Corporation has bought several hundred copies of *Overhead Express.*; and so on. (The U.S. government, military agencies, and military contractors should all be considered candidates here as well.) We can identify these companies and target them for a direct sales effort. This can follow the general retail introduction, when the PC enthusiasts in these companies have already found their copies. Adoptions and bulk purchases can follow.

We should be able to get some help here, from hardware vendors who want to sell graphics-oriented PCs into the same corporations.

Presenters—the content-originating people—*really want* to control their presentations. They lose both timing and control in manual or shared systems, and will respond strongly to the possibility of having a personal tool to create presentations.

Presentations require the use of graphics displays and peripherals, and the horsepower to run them. Hence, the need to make presentations is a very strong and a justifiable reason for a user to insist on a Macintosh or a 286-based IBM machine, instead of an old 8088-based hand-me-down. If you want to do just word processing or spread sheets, the MIS director at your company will probably insist you use a monochrome PC inherited from another department. For presentations, that is demonstrably not good enough to run Presenter.

Presentations are an easy sell in large corporations. They are a personal productivity function, requiring very little access to corporate databases or IBM mainframes, so there is no need to wait until the corporate computer communications plan is in place.

As compared with "desktop publishing," the presentation market is much larger. Presentations are composed by many people, almost all people above a certain level, whereas "desktop publishing" may mean one machine and one LaserWriter for the publications department, to which everyone else contributes via word processor files.

For presentations, many more people need a graphics personal computer on their own desktops. This need not be unrealistically expensive, since presentations are a good match to a department Local Area Network linking all the machines used to create presentations to shared files and shared expensive graphics peripherals for final output.

In talking with business people, we have gotten the very strong impression that *more people who can sign $10,000 purchase orders want to make presentations—themselves, personally—than to do anything else requiring a graphics-oriented personal computer.* Ultimately this personal motivation may be decisive.

7.3 Presenter Will Sell Through VARS

Current PC users, whether they now use any kind of presentation software or not, can be approached through retail computer dealers or directly in large corporations. In addition to these people, however, we believe (from the size of the manual presentation market today) that there must be a large number of potential buyers who do not now use a PC at all, but who would buy a PC with Presenter especially to do presentations (as well as all the other things they've been hearing about).

Some of these people can be reached through computer dealers, but others require more selling and more hand-holding than most dealers are capable of giving. Over a period of time, we should be able to build up a stable of VARS who specialize in such sales. We should try to begin by finding out if such VARS exist today selling Macintosh and LaserWriter with PageMaker. If so, they could add Presenter to enlarge their markets with minimal additional learning or overhead.

8. Strategic Partners

Presenter is the kind of product which permits a number of potential partnerships with large companies who also have something to gain from an association. These fall into three groups:

(1) Manufacturers of Presentation *Preparation* Equipment:

—Apple; strong extension to the Desktop Publishing niche

—IBM; important reason to buy a new graphics PC

—Other Windows OEMs; to show off superior graphics

—Microsoft; important reason to buy/use Windows

(2) Manufacturers of Presentation *Display* Equipment:

—manufacturers of laser printers

—manufacturers of color printers

—manufacturers of overhead projectors and transparencies

—manufacturers of new LCD video projection equipment

(3) Manufacturers of other software enhanced by Presenter

—Microsoft, *Excel*

—Aldus, *PageMaker*

8.1 Apple Computer and Presenter

Apple is surely not the most important partner for *Presenter* since it is surely not the dominant vendor of personal computers to people who make presentations. Nevertheless, Apple's partnership is particularly important in

view of our decision to proceed with the Macintosh version of *Presenter* first. Until we have an IBM version, other partners are reluctant to get seriously involved (very few of them believe that Macintosh has any importance for them). With Apple's active help and investment, we can use this situation to launch the product inexpensively.

Over the last three months, Forethought has held a number of discussions with the marketing management at Apple Computer responsible for Macintosh sales in the markets addressed by *Presenter*. We have shown them prototypes of the product and discussed its proposed features and positioning at length. Their response to us has been:

- The *Presenter* product is of critical strategic importance in Apple's intended positioning of Macintosh. Even today, they are running three-page ads in the Wall Street Journal including an overhead projector, but they have no presentation product to recommend for that function.

- *Presenter*'s planned ability to work with larger screen sizes, to support color presentations, and to drive color slide making peripherals, could all be of the greatest importance in connection with models of Macintosh and new peripherals which could be available in the foreseeable future.

- *Presenter* is so important that, if it can be developed and delivered, Apple "would provide support on the same scale as that given to Aldus." For Aldus (developers of *PageMaker*) Apple has run steady multi-page advertising in national magazines and the Wall Street Journal, promoted dealer tours through the major markets at Apple's expense, hired and trained a 62-person force to focus on sales of Aldus's software with Apple hardware to dealers and corporate accounts, provided support for internationalization, and provided a range of other services.

- Apple knows of no other developer working on a comparable or competitive product, so they would particularly like to see *Presenter* finished promptly. They would look forward to working with Forethought on its introduction, based on our experiences working together in the past.

- Apple is not offended by our intention to also do a version of the product for Microsoft Windows on IBM, but would be pleased if there were an initial period of up to six months during which the

product was available only on Macintosh. After that, they would welcome a compatible product for MS-Windows which could exchange data with the Macintosh version, as part of their strategy of compatibility through data communication.

8.2 Other Computer Manufacturers

We have had no real contact with manufacturers of MS-DOS machines for *Presenter,* although several of them have contacted us at low levels about Windows software (just to put us on lists of vendors). So far, all these contacts have been entirely ignorant of Macintosh software. We remain objects of suspicion as long as we have only Macintosh demonstrations.

When we have something—anything—to show on Windows, then we can approach MS-DOS manufacturers more successfully. Good possibilities include AT&T, Tandy, and Olivetti who have always attempted to use superior graphics as a differentiation from IBM. Others include Zenith and NEC.

The best opportunity, however, is IBM itself. The fact that IBM is selling 3 of the 5 available overhead packages (2 exclusively) suggests that someone in IBM understands the market. We should make the pitch to IBM early, so as not to cut ourselves off.

8.3 Manufacturers of Display Equipment

Presenter is great with laser printers, and in a way we are already making use of that fact in dealing with Apple on the LaserWriter, by far the most successful and satisfactory of the laser printers. As other manufacturers emerge, we should be careful to approach them.

In color printers we are dealing with Xerox's Advanced Products SBU, which is interested to sell "presentation workstations"—IBM AT clone, special Motorola 34010-based graphics board, high-resolution color monitor, laser monochrome printer, color ink-jet printer, possible 35mm slide film recorder and possible VideoShow 160. In addition, they are interested to sell just the board, the color printer, and presentation software for making color overheads.

Makers of 35mm film recorders are the least interesting category for us, but we could still be interesting to them. Polaroid, with their Palette recorder, could be a receptive target for the story about "35mm overheads."

For LCD displays, we should look carefully into the Eastman Kodak subsidiary Sayett Technologies and a new company Chisolm of Campbell which is readying a very similar product to be manufactured for Chisolm by Convergent Technologies. Both these products appear to be 640 x 200, CGA compatible, composite video (limited more by the LCD technology's available density than by a belief that that is adequate). Since we believe that such a level of resolution will not be important, and that composite video will not be the appropriate interface, we may really fit into their next generation of products.

8.4 Manufacturers of Other Software

Microsoft, as the manufacturer of Windows, obviously has much to gain from a very successful version of *Presenter* on Windows. They have already encouraged MicroGrafx in marketing In*a*Vision, a rather poor sort of drawing program, as a 'presentation graphics' offering, so perhaps they understand that really good overheads would be a help to Windows.

Up till now, we have avoided telling Microsoft much about our product plans. Now with Bill Gates personally heading up applications, it might be wiser to tell him everything and see what results. (Attempts to test the waters by making a presentation to Dave Marquardt of Technology Ventures, who sits on their board, have so far been unavailing. That would still be the best first step, if it can be done.)

Microsoft also has much to gain from *Presenter* in that we aim to work really well with *Excel* charts—not only via cut and paste as on Macintosh, but also via Dynamic Data Exchange (DDE) on Windows. In this respect they are the most prominent of a set of potential software partners: companies with products whose output we turn into great presentations (*i.e.*, those below us in the food chain of data exchange). We will work really well with these people via our ***Copy from...*** command, cut and paste, and (on Windows) DDE.

Companies who are above us in the food chain are also potential partners. We will package our output in a variety of attractive ways (scrapbook of slides, set of one-slide files, ...) for use by page layout programs such as Aldus's *Pagemaker*. There is perhaps some way that Aldus could be of help to us, given their immense acceptance in the desktop publishing category.