DIGITAL - AUDIO/VISUAL PRESENTATION WORKSTATION

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Eastman Kodak Company
343 State Street
Rochester, New York 14650

DIGITAL AUDIO/VISUAL PRESENTATION WORKSTATION

FEATURES:

- ERASEABLE OPTICAL DISK STORAGE
- HI-RESOLUTION (1024 X 768) DISPLAY
- HIGH QUALITY DIGITAL STEREO AUDIO
- BUILT-IN DIGITAL AUDIO SAMPLER
- BUILT-IN STEREO AMPLIFIER AND SPEAKERS
- SUPPORTS UP TO SIX MONITORS SIMULTANEOUSLY
- OPTIONAL FLAT PANEL TOUCH SCREEN MONITOR
- COMPATIBLE WITH ALL MACINTOSH SOFTWARE
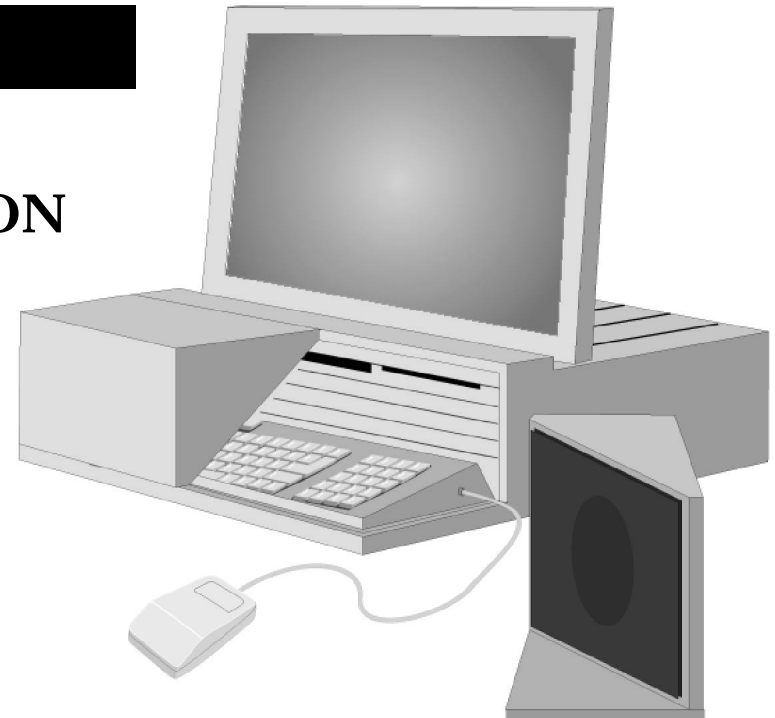
The Audio/Visual Presentation Workstation is an affordable still image store and graphic production center utilizing the lastest in optical disk technology.   Utilizing removeable 65 Mb floppy style optical disks which are capable of storing either 80 standard resolution (512 X 512) images, or 30 high resolution (1024 X 768) images, or up to 55 minutes of high quality stereo sound or any combination of of the above. An expandable chassis design allows the addition of special cards for image compression, transmission, or multiple monitor cards for multiple monitor displays. With the optional image compression card up to 1200 standard or 325 hi-res images may be stored on a single disk.

OPTICAL DISK
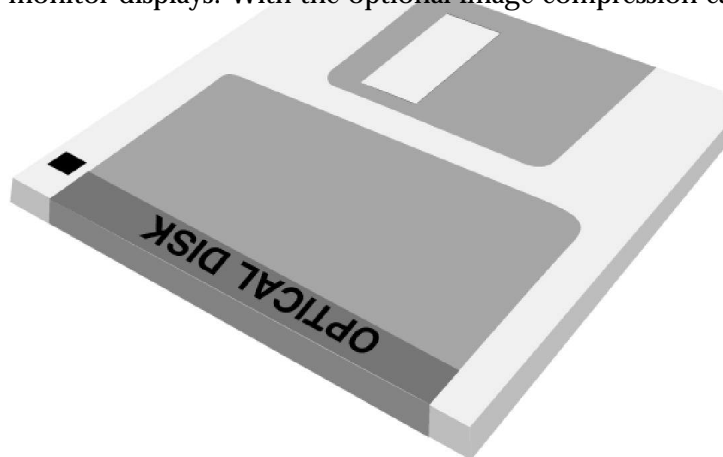
COMPLETE DESKTOP PRESENTATIONS

- CAPTURE AND STORE CONTINUOUS TONE IMAGES AT 1024 X 768 X 24 BITS

- GENERATE TEXT, GRAPHICS AND ANIMATIONS

- RECORD AND EDIT DIGITAL STEREO SOUND

- CHOOSE FROM A VARIETY OF SPECIAL EFFECTS AND TRANSITIONS

- CREATE POWERFUL PRESENTATIONS UTILIZING ALL OF THE ABOVE

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INTRODUCTION

THE DIGITAL AGE HAS ARRIVED!!!

Computers are a part of our everyday life now. There are computers in our cars, watches, toys, appliances, and in fact it is pretty hard to find something in this day and age that hasn't in one way or another been influenced, designed, simulated, manufactured, painted, tested, advertised or written about without the help of a computer.

The introduction of the personal computer must rate as one of the most significant contributions to modern history since the invention of the printing press. (The photograph must rate an extremely close third.) What all of these innovations have in common is that they made information accessable to a much wider audience.

For the first time personal computers have become powerful enough to allow a user to combine text and graphics on a single page, thereby facilitating effective communication of thoughts and ideas to others. A term was coined for this new form of communication **"Desktop Publishing"**. This document is an example of this new medium.

However, the 'nearly typeset' report is not the last word in communication in corporate America. The slide show and the overhead projector have been the most popular presentation mediums in conference rooms across the country and around the world for many years.

However, film or video can in most instances deliver a more persuasive message, although albeit at a much higher rate. (Pun intended)

As more and more powerful computers become affordable enough for the majority of corporate desktops, this extra speed and power is putting both word processing and **image processing** capabilities into to the hands of the individual.

Apple Computer the company that planted the original seed of the PC Revolution with the announcement of the Apple IIe, and then the Desktop Publication Revolution with the Macintosh Plus and the LaserWriter, has planted the seed of yet another. Yes, you guessed it!

The **"Desktop Presentation Revolution"**.

The **Macintosh II** is the latest Apple seed. This powerful new computer offers a state of the art microprocessor, nearly unlimited expandability, and high resolution color displays (Yes that's plural, as in up to six simultaneously.). True minicomputer capabilities in a desktop package priced at under $5000. The **Mac II** by virtue of its forward looking design, holds great promise for this new Desktop Revolution everybody's just beginning to get excited about.

But, before we can get too excited, there are a couple of key elements still missing, namely
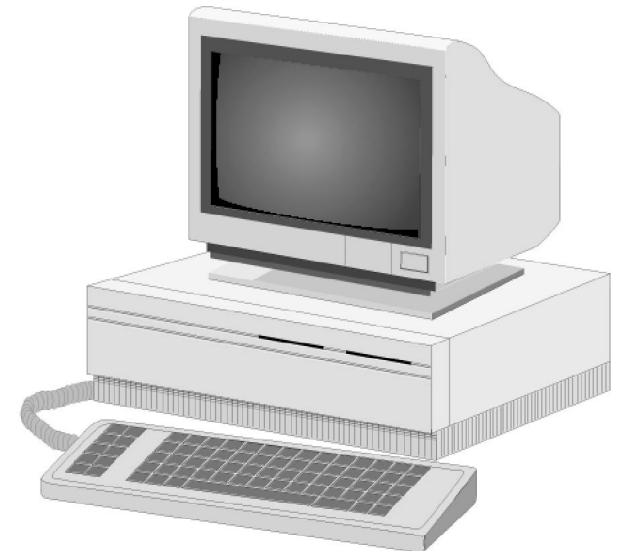
APPLE'S New Workstation, The Macintosh II

Input, **Output** and **Storage**. Sure we have a computer with tremendous image handling capability, but a way is needed to get an image in there in the first place. There aren't any video cameras out there that can take advantage of the 1024 X 768 pixel resolution of the first generation of color monitors available for the **Mac II**.

Just possilbly though, a premier imaging company known for a CCD sensor with more pixels than any other (1.4 million to be exact), could use that technology to market something called the **MegaPixel Transfer Stand.**
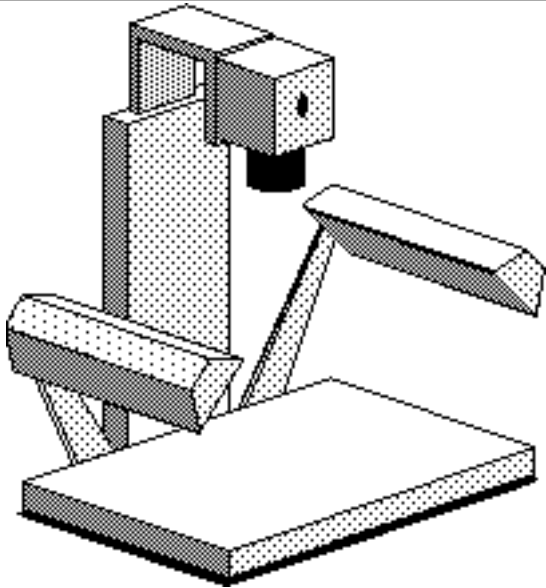
The **MegaPixel Transfer Stand** would provide a high quality way of transferring slides, prints and negatives to the computer in digital format. By storing custom lookup tables it could be optimized for each and every type of input.

Once the image is in the computer and filling the monitor (probably of flat tension mask technology), it can be processed and manipulated to your hearts content. But, now that you've spent the last sixteen hours massaging that image, where are you going to put those bits so that they don't disappear when you turn off the computer?. You discover as you try to save your masterpiece to floppy disk that 1600 more Kilobytes are needed on that newly initialized blank disk. It certainly won't take long to fill a 40Mb hard disk with images that are in excess of a 2 Megabytes each.

However, a unique image compression algorithm developed by the that same imaging company offers hope. Called a **Compander**, the algorithm would be available in firmware. By adding a special card that plugs into one of the Nubus expansion slots in the Mac II, images could be compressed into a fraction of the original size. Then the image could either be stored on floppy or hard disk or sent over the telephone lines to another computer through a modem in another Nubus slot.

Even with image compression a 20Mb hard disk would probably only fit a portion of your image bank. Take heart though, a new **Magneto/ Optical disk** that holds 65Mb of digital data and is both eraseable and removeable is currently under development. The 3.5" disk and drive can neatly replace one or both of the floppy drives currently in your computer. Additional 65Mb disks are only $40 each or about two times more expensive than a box of ten 3.5" floppies.

Magneto/Optical disks look very much like the 3.5" floppy only they are about three times thicker. By the way since the music on the familiar Compact Disk is only digital recorded data, **Magneto/Optical** disks can store music or audio just like CD's. However, if you wanted to store music at the same quality as a CD on the 3.5" **Magneto/Optical** disk you could only store about 6 minutes worth. But, if high quality FM stereo audio is good enough, you could store

almost 60 minutes worth. As you decrease the required quality you can increase your playback time. For example, if telephone quality is all you require, you could store about 23 hours worth.

Now that we have recorded high resolution color images and high quality sound onto the optical disk we need some way of presenting it. This means writing a software program that displays the images in a user programmed sequence on the monitor and synchronizes the image changes to the sound. Fortunately, that innovative imaging company has had some experience in writing that type of software. Valuable experience was gained in the development of a patented image handling system, called the Still Video Floppy based **Multidisk recorder**.
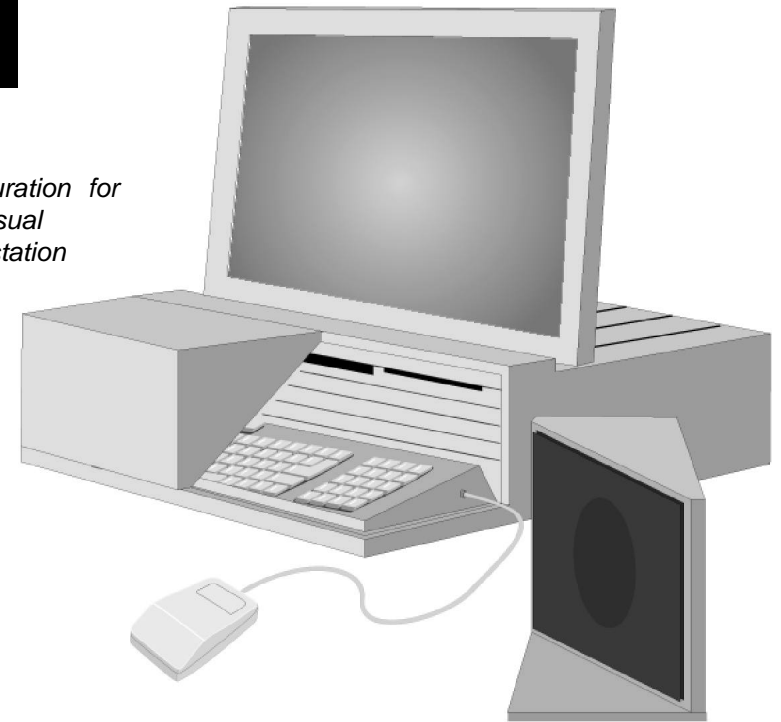
When you get right down to it, the computer system we have just put together is nothing more than a more sophisticated version of the **Multidisk recorder.** However, now instead of recording analog signals on magnetic media, we can record digital data on optical disks. And of course, we've added high quality sound, as well as the ability to combine computer graphics, that can be created with any of the many graphic software packages available for the **Mac II.** Quite a repertoire of tools for the corporate communicator.

INTRODUCTION

A possible configuration for the Digital Audio/Visual Presentation Workstation

One final area needs to be addressed, and that is **Output**. While it is possible to view a presentation on the Mac's monitor (or monitors), most presentations are going to be to large groups and in such instances a 19" monitor may lack the necessary impact. With color thermal technology, images could be output and printed in either 35mm slide format or overhead transparencies, the two traditional presentation formats. The computer could play back the audio and sychronize several slide projectors.

Another alternative , would be to offer an electronic projection system similar to the Kodak Datashow only with a higher resolution color output. Or perhaps by spending some money on R&D come up with a new technology for displaying high resolution images on a large, flat, wall mountable, presentation monitor.

SUMMARY

What I've tried to illustrate in the rather lengthy monolog above is that the Multidisk recorder as it is currently defined, is rapidly heading for obsolesence. This is especially true in light of what is capable with a personal computer equipped with an optical disk storage device and given the growing use of personal computers in industry. Whether or not we choose to develop a product that puts the two technologies together, such as this proposal suggests, I'm sure somebody will, eventually (I'm sure I will as soon as I can). And it follows that many of the same peripherals mentioned here will still need to developed.

The proposal that follows describes a way to produce an optical drive based presentation device in a relatively cost effective and timely manner. The prime assumption here is that we OEM Macintosh II computer boards directly from Apple and repackage them in a more integrated form with 3.5" Magneto/Optical drive(s), a framestore or two, possibly a flat touch screen monitor, and an operating environment that allows capturing, recording, and presentation of high quality images and sound for output to either the computer's monitor(s) or to hard copy in the form of slides or overheads for presentation in the traditional way.

NEW OPTICAL DISK TECHNOLOGIES

Optical disk technology has been with us for quite a few years now. The reason optical disks are so attractive is that they are capable of storing vast amounts of information compared to magnetic media of comparable dimensions. Until recently however, the only way to get information onto these disks was through a complex and expensive process called mastering.

The mastering process is still used in the making of Compact Discs, LaserVision Disks, and CD ROM disks. Generally, any time you need to produce multiple copies of any of these types of disks, the expense can be spread out over a large number of end users, thereby justifying the mastering costs.

Once a disk has been produced in this way the information cannot be changed by the end user. CD ROM for example would not be used for a large database application that needs constant updating, but is ideally suited to storing reference materials such as the dictionary or an encyclopedia.

A new technology has recently become available that allows the end user to store data from his computer on an optical disk.

This new technology called WORM for Write Once Read Many allows information to be written and read from an optical disk.

There are a number of drives currently on the market for PC's with storage capacities of between 250Mb's and 1 Gigabyte. These disks resemble regular floppy disks such as the Sony 3.5", except in a 5.25" format.

Once you fill up one of those disks you must buy another, since you can't erase nformation once it is written. However, at a typical cost of between $50 and $200 depending on capacity they are very cost effective.

Sony and Sharp both recently annouced new 5.25" drives utilizing a breakthrough technology called Magneto/Optical recording that allows optical disks to be written and erased many times.
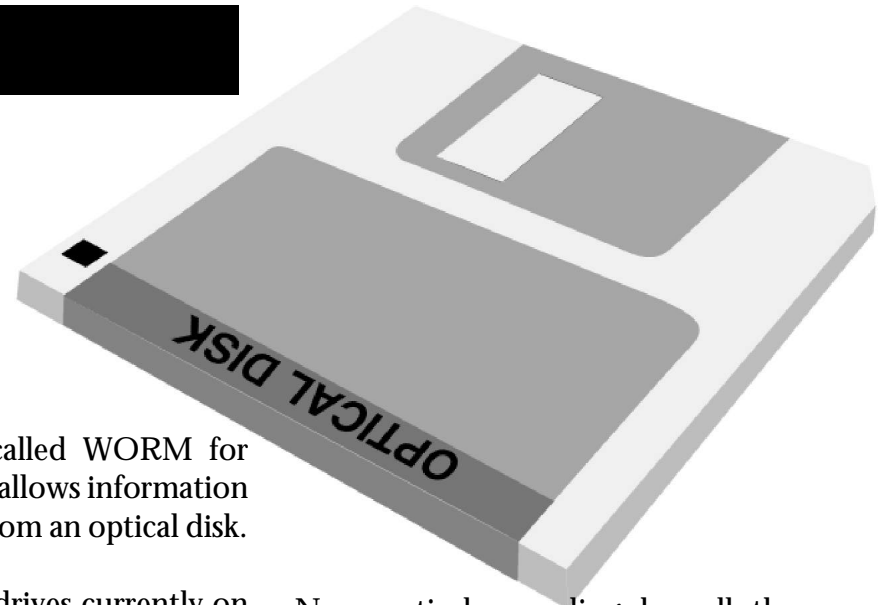
Now optical recording has all the same advantages of magnetic recording plus a significant cost/Mb advantage. It's not too hard to speculate where the market is headed.

Verbatim, a Kodak subsidary is currently working on a Magneto/Optical disk and drive in a 3.5" format. This size will be very attractive to computer manufacturers because the drive is the same size as the Sony 3.5" floppy drive.

The disk can store 65 Megabytes of data and will probably cost about $40 each.

The Digital Audio/Visual Workstation proposal that follows is based on the Verbatim drive technology.

Technical Information on the Verbatim 3.5" Magneto/Optical Disk and Drive
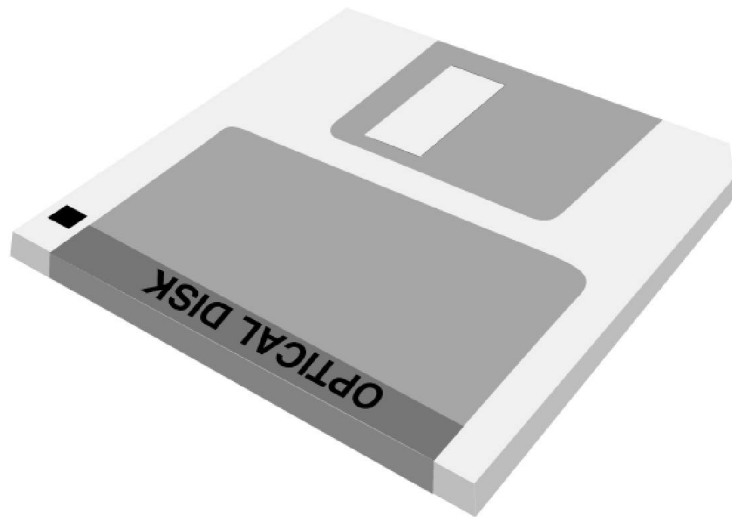
* 3.5" disk, inner radius = 25mm, outer radius = 42mm
* 65 Megabytes of formatted storage
* 84 uncompressed images, or 1680 compressed (512 X 512)
* Erasable media (magneto-optical)
- Drive can read a prerecorded disk
- 100 millisecond worst case access time
- Typical access time is 70 milliseconds
- 10,000 tracks, 13 sectors per track, 512 K bytes per track
- Track pitch =1.67 μm
* Data rate = 3 Megabits per second
- Power consumption is 15W (+12 vdc & +5 vdc)
- From power up to ready is <2.5 seconds
- SCSI interface (ESDI internal interface)
- Disk is in a hard jacket, 94mm X 96mm X 8mm
* Verbatim is proposing this disk as a standard
* Drive is very small, approximately 120mm X 200mm X 40mm
* Shipping approval is August 1988
- Drive is for OEM's and subsystems
- Shipping one unit to Apple September 1987
* Transfer price will be approximately $650 for drive, $40 for disk

PROPOSED PRODUCT CONCEPT

This product is a self contained production/presentation system that will allow the capture, storage and display of video images, the modification of these images, the creation of graphics and text for inclusion in the presentation and the capability to digitally record a stereo soundtrack for playback sychronized to the video presentation. The presentation may then be played back on a single monitor, projection system, or with the addition of multiple display boards it could be displayed on multiple monitors which could either be displaying a portion of one large image or completely different images on each monitor. These plug-in boards would also allow one unit to drive either NTSC, PAL, SECAM or RGB monitors, making it a truly universal presentation system.

The basic components of this proposed product are:

Macintosh II computer board
Custom case
Mass storage device - Magneto/optical disk or WORM optical disk
One framestore for capture (working framestore) w/graphics chip
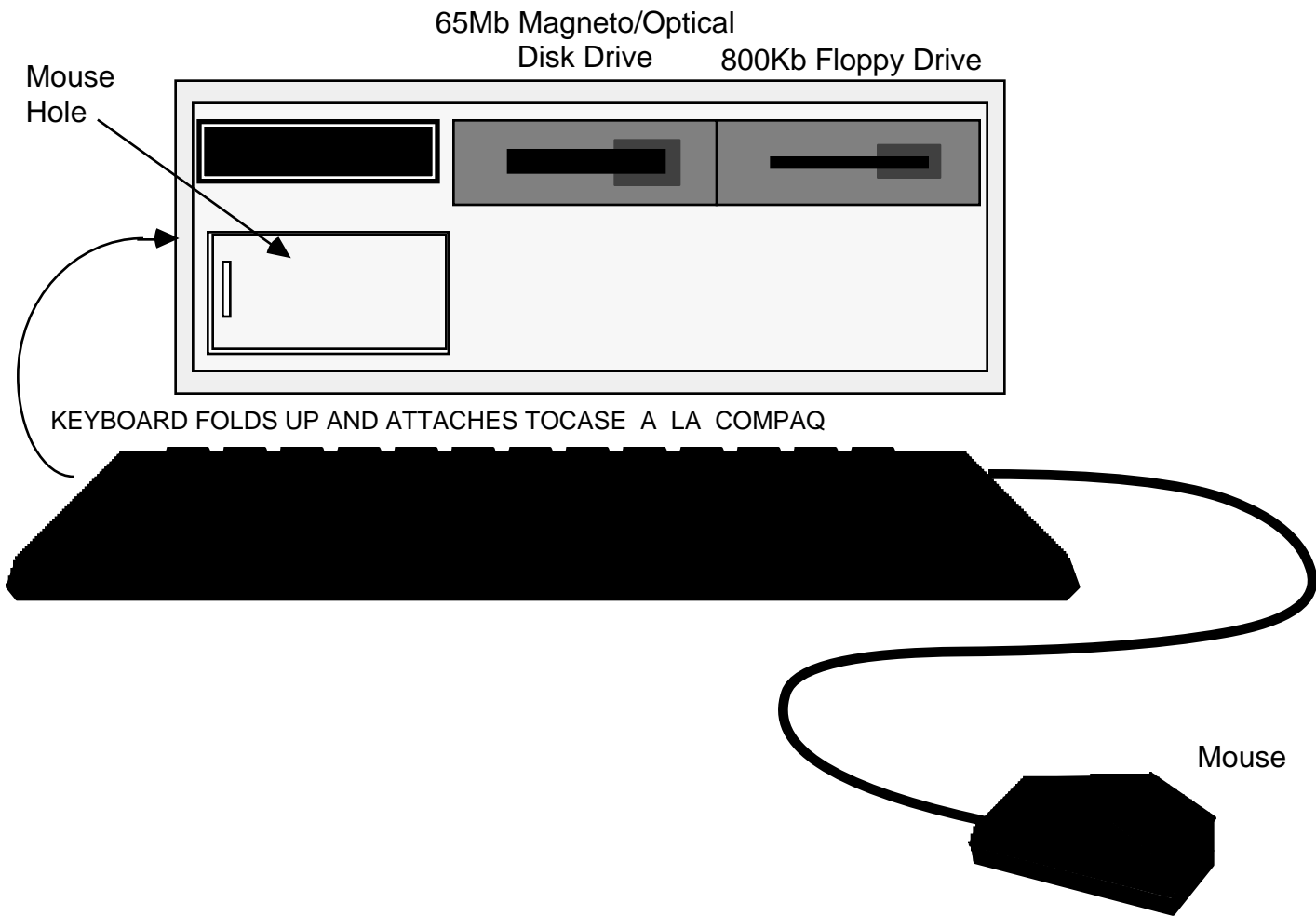One framestore for display
Keyboard
Mouse
Audio A/D converter
Stereo amplifier
Graphics tablet (optional)
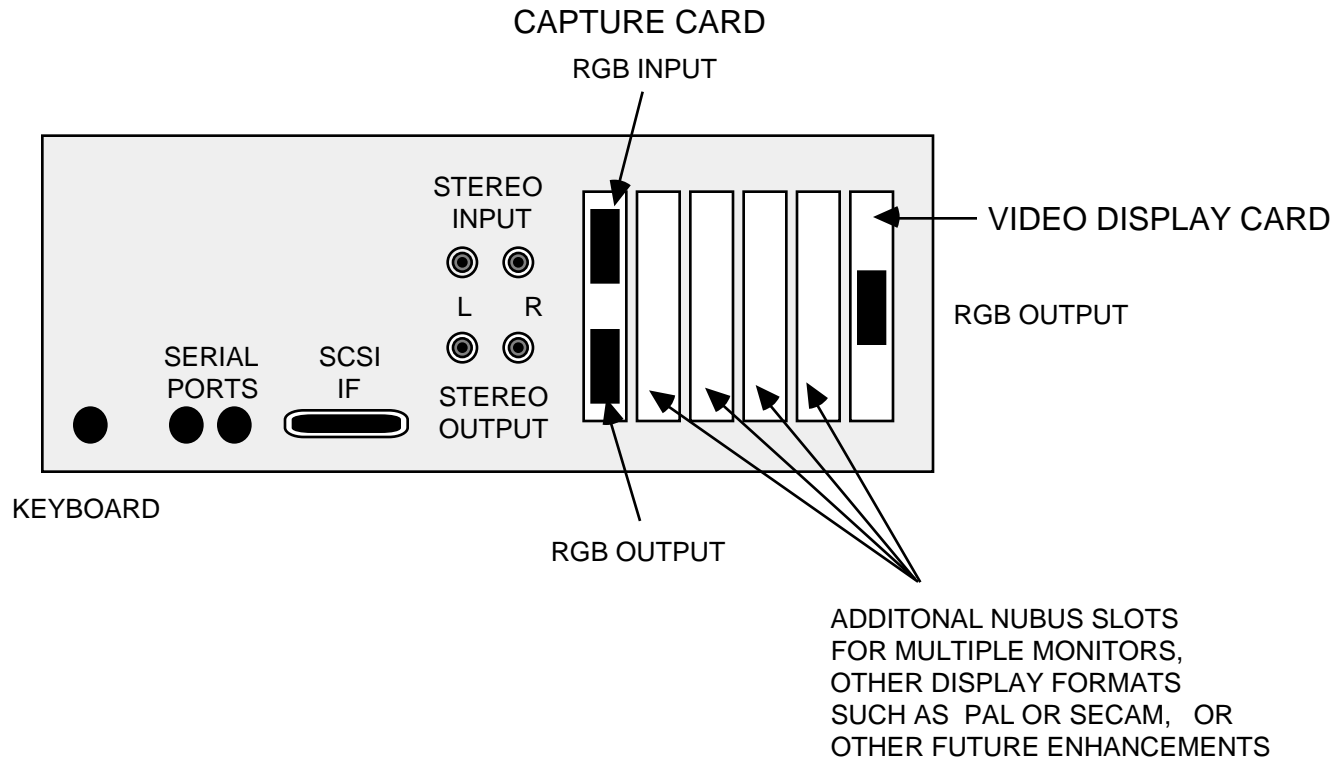Flat, touch screen monitor (optional)
Image Capture, Processing and Presentation Creation Software

PROPOSED PRODUCT CONCEPT

65Mb Magneto/Optical
Disk Drive   800Kb Floppy Drive

Mouse
Hole

KEYBOARD FOLDS UP AND ATTACHES TOCASE A LA COMPAQ

Mouse

PROPOSED PRODUCT CONCEPT

CAPTURE CARD

RGB INPUT

STEREO INPUT

L   R

STEREO OUTPUT

SERIAL PORTS

SCSI IF

VIDEO DISPLAY CARD

RGB OUTPUT

KEYBOARD

RGB OUTPUT

ADDITONAL NUBUS SLOTS
FOR MULTIPLE MONITORS,
OTHER DISPLAY FORMATS
SUCH AS PAL OR SECAM,   OR
OTHER FUTURE ENHANCEMENTS

By basing the unit on the Mac II CPU a number of benefits are gained.

- Existing software base of graphic programs, fonts, music creation software, spreadsheets, graphing utilities, etc.
- Easy to learn and use menu driven operating system and software.
- Powerful image processing capabilities
- Custom stereo sound chip
- NUBUS architecture allowing up to six display boards/monitors, each capable of simultaneously displaying different images or parts of one large image.

If the Verbatim 3.5" Magneto/Optical disk with a 65Mb capacity is chosen for mass storage the user can then, for example...

- Store up to 50 high resolution uncompressed RGB images (more if some of these are graphic images)
- Store up to 30 minutes of high quality stereo sound and up to 25 uncompressed high resolution images. If lower sound quality is acceptable longer presentations are possible.
- Store a whole presentation on one optical disk which will retail for approximately $40 each.

By utillizing two framestores a number of image processing routines and special effects are possible.

Dissolves
Wipes
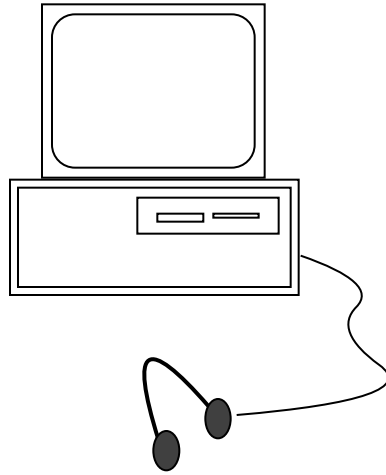*Irises*
Fades
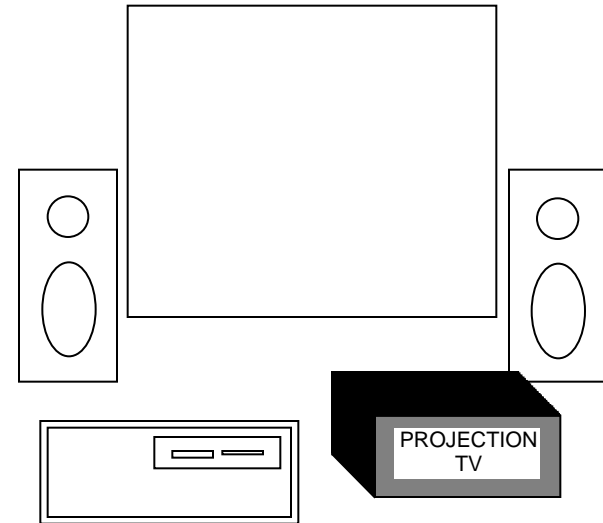*Barndoors*
Mosaics
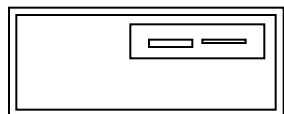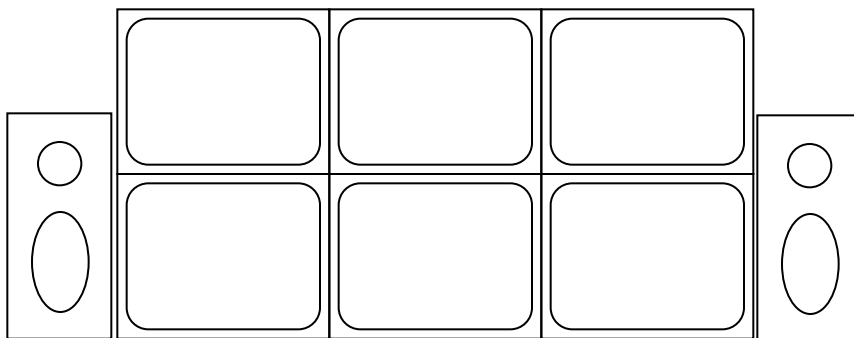*Translations*
Inserts
Cut and Paste
Rotations
Pixelations

PROPOSED PRODUCT CONCEPT

TRAINING WORKSTATION

PROJECTION
TV

POSSIBLE CONFIGURATIONS

MULTIPLE MONITOR PRESENTATIONS

COST ESTIMATE

COST ESTIMATE

Hardware

Macintosh II computer (OEM) w/2MB RAM	$2000.00
65MB Optical Drive OEM'd from Verbatim	650.00
Capture/display framestore w/graphics chip (1024X1024X32bits)	800.00
Display board	500.00
Audio amplifier	25.00
Keyboard	50.00
Mouse	25.00
Case	100.00
Labor and Assembly costs	100.00

	$4200.00

Software

Image Processing/Presentation software development ......3-4 people - 1 year

MARKET APPLICATIONS

Current users of still images for presentations are same potentional customers for this new product.

Some example application areas are:

Advertising

Business presentations

Education

Business presentations

Retailing

Business presentations

Real Estate

Business presentations

Training

Business presentations

Travel promotions

COMPETING TECHNOLOGIES

Currently there are dedicated graphics workstations costing upwards of $25,000 that might offer mostof the features this product would provide, however they are primarily production units not presentation devices. None that I'm aware of, offer sound recording or even sound editing.

There are several PC based products at the low end of the scale that attempt to address this market. Videoshow the prime contender, is a hardware/software product, that is priced at about $5000. It allows graphic images to be presented on video displays in a slide show format. However, it lacks many of the features of this proposed product, most notably sound and the ability to use continuous tone images. Some others that are either hardware or software only are:

Software only:
     Execuvision
     Harvard Presentation Graphics
     Power Point
     PC Carousel
     Cricket Presents...
          and more everyday...

Hardware only:
     Kodak Datashow