# ***** PROPOSAL*****

FrameSERVER

A

FLEXIBLE

GENERATION 2

DESIGN

APPROACH

EASTMAN KODAK COMPANY

343 STATE STREET

ROCHESTER, NEW YORK 14650

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Prepared by: Pete Sucy

ELECTRONIC IMAGING SYSTEM

SOLID STATE CAMERA & READER
- Uses Solid State Image Cards
- Image Card Reader
- Software/PROMs
- SCSI Interface
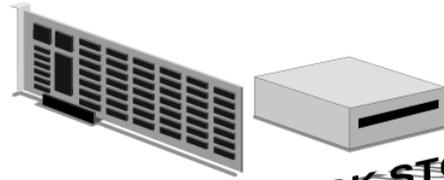
OPTICAL DISK STORAGE
- Hi-Speed DSP w/compander
- Verbatim 3.5" Optical Drive
- Software/PROMs
- SCSI Interface

SVF RECORDER
- Software/PROMs
- SCSI Interface

MULTI-CHANNEL TAPE PLAYER
- Software/PROMs
- SCSI Interface

DIGITAL CAMERA
- Digital Color Sequential Output Interfaces to Digital Framestore
- Camera Head for Digitized Pixel Transfer Stand
- Software/PROMs
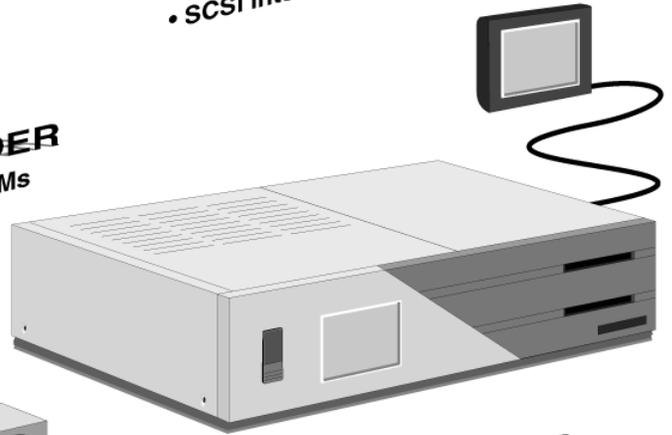
FRAMESERVER
- Power Supply
- Microprocessor board
- Digital Framestore Board w/Camera Interface
- Analog Framestore Board
- SCSI Interface

TRANSCEIVER
- Hi-Speed DSP w/compander
- Modem board
- Software/PROMS
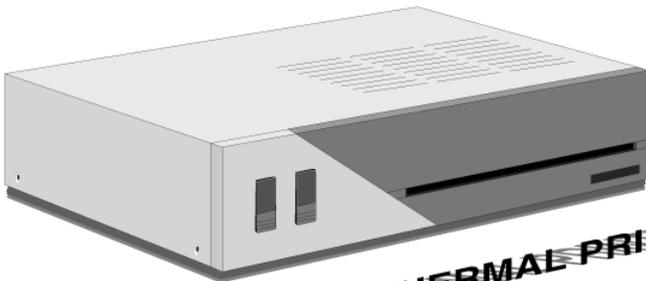
8" X 10" THERMAL PRINTER
- Power Supply
- Printer Mechanism
- SCSI Interface
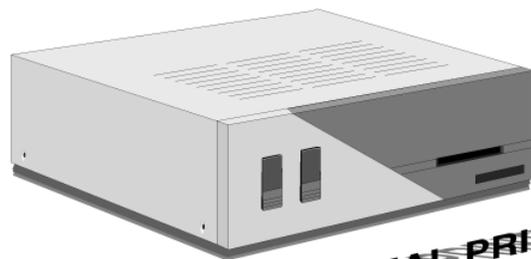
35mm THERMAL PRINTER
- Power Supply
- Printer Mechanism
- SCSI Interface

INTRODUCTION:

As design work is beginning to get underway for the next generation of EPD products, there are many questions that need to be addressed so that the eventual designs will make sense in the market and provide the right mix of product features/cost for the end user. If we knew exactly who the end user was we could ask them what they would like for features and how much they would be willing to pay. However, lacking this input, the only way we can design a product that will be successful in the market is to design products that are as flexible as possible and can be updated and enhanced as new technologies become available. The design should provide as many options as possible for the system integrator, dealer or end user to configure an imaging system that meets their needs, while at the same time being very easy to use.

We have started down the right path with the current proposal for utilizing the NuBus architecture and a common framestore design for all our products. The NuBus design allows additional boards to be plugged into the expansion slots within our products. Examples of these boards are modems, DSP processors, audio boards and higher resolution display buffers. What this might mean is that a person buying our generation 2 image storage product , could also buy a NuBus modem board and a NuBus image compression (DSP) board, plug them into the extra NuBus slots, and have a storage device with transmission capabilities.

Let's take this idea one step further. Instead of selling a line of products in boxes (each with its own framestore, analog board, microprocessor board, power supply and case), provide the customer with one box with a framestore, analog board, microprocessor board, power supply and case, and provide a line of specialized boards, storage options and output devices that can be plugged into or connected to this one box.

In essence, what this concept really implies is that we build a computer, an imaging computer, but that is an important distinction as opposed to the general purpose desktop computers we are familiar with today. Al though both have the same components, the EPD unit would be a computer designed specifically to work with integral image capture, storage, transmission, and printing products. From this point on I'd like to refer to this product as the FrameSERVER, a name coined by John Compton.

FrameSERVER

- NuBus Architecture
- Microprocessor board
- Digital RGB Framestore Board
  1024 X 1024 pixels
  w/Camera Interface
- Analog Board
  w/RGB and NTSC I/O
- SCSI Interface
- Friendly Menu Driven
  User Interface

Wired Remote Control

Room for up to two internal SCSI drive units for image storage capability.
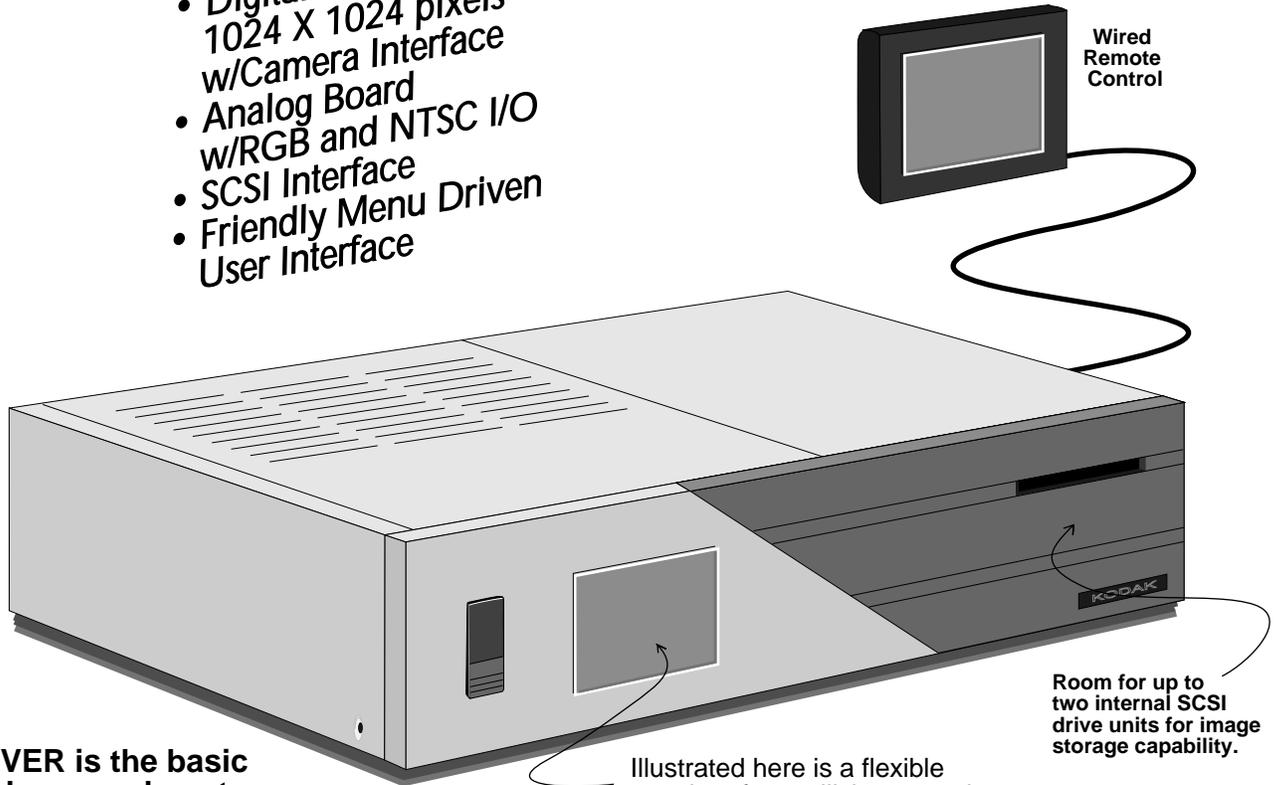
FrameSERVER is the basic unit which houses almost all the other EPD products.

It features a NuBus architecture which can support up to 16 slots for NuBus based board products such as framebuffers, modems, coprocessors, etc.

As new product boards, storage devices or printers are added to FrameSERVER they are recognized automatically by the microprocessor and will present the user with the correct control options for his current configuration.

ROM on board each product would download an identifier and the control program to the main microprocessor in FrameSERVER. Configuring a system is as simple as plugging in the necessary boards, drives, and cabling to the printers.

Illustrated here is a flexible user interface utilizing a touch sensitive tablet. Menus would appear on the monitor when the tablet was touched. (Only the ones needed for the installed products.)

Moving your finger around the tablet would move a cursor around the menus on the monitor, highlighting the current option, pressing the tablet would select that option.

Removing your finger from the tablet would after a few seconds deactivate the menu display and allow you to view your image.

THE FrameSERVER

The FrameSERVER will be the basic unit of the product line. This unit is a box with a power supply, microprocessor board, digital framestore board, analog board, digital and analog inputs and outputs to interface with other computers and video products.

The FrameSERVER features a NuBus architecture (like the Mac II) with at least six NuBus expansion slots into which boards with specific functions (such as a digital signal processing board for compression, or a modem board for transmission) can be installed. The software for controlling the functions of the board would be located in ROM on the board and be downloaded to the operating system on power up. NuBus cards are self-configuring so the user does not have to set any jumpers, DIP switches or load any software, making installation of new products easy enough for the end user.

The operating system would be "smart" enough to know what products are installed and provide the right options for controlling those products. In addition, custom product software could be downloaded into EEPROM's on the microprocessor board for controlling the product in specialized applications.

Since the FrameSERVER uses the NuBus design, boards developed by third parties for the Mac II, could also be used in the FrameSERVER and likewise our boards could be used in the Mac II.

The FrameSERVER would also have room for two drive units for image storage.   The drives could be a SVF drive, optical disk drive, Multi-channel tape recorder, or a solid state card reader or any combination of the above. These drives would have a SCSI interface and would also be compatible with a variety of computers.

The printers would also be SCSI devices and attach to the FrameSERVER via the SCSI port on the rear of the unit. The printers would consist of the necessary electronics and mechanicals needed for printing. Video input would be via the FrameSERVER analog inputs and then digitized in the FrameSERVER framestore and sent digitally via the SCSI interface to the printers. As strictly digital devices without a framestore or the accompanying analog I/O their costs should be lower and because of the SCSI interface they also are compatible with most computers as stand alone printer devices.

The customer now has the option of configuring the product for his own needs. If he wants a transceiver he orders the FrameSERVER and the transmission option which is a DSP board configured with transceiver firmware and a modem board and plugs them into the FrameSERVER. If he wants storage he adds a drive of his choice to the FrameSERVER. The same DSP board used for the transceiver can be used to compress images for digital storage. A transfer stands' camera head would attach to the FrameSERVER's framestore board via a cable.

Since the FrameSERVER framestore has an interface for a digital camera the user need only purchase the camera head to add a high quality input to his new system.The firmware for controlling the camera would be stored in ROM in the FrameSERVER.

An entire system, with capture, storage, transmission and hard copy output would at most consist of two boxes and possibly a transfer stand, the FrameSERVER unit and the printer unit. If the user already owns a Mac II computer he just buys the various boards, drives and printers and adds them to his computer. The framestore and analog boards in the FrameSERVER could also be sold as separate board level products. This would allow a Mac II user to have a standard video input and output as well as an interface to the digital camera head.

While this concept will no doubt cost the user a bit more for a single product, the costs of buying any additional capabilities will be significantly reduced. Ease of use, easier interconnect and a convenient upgrade path are several of the customer benefits this proposed design would provide. More efficient utilization of our resources and the abIlity to rapidly adjust to a changing market are just two of the benefits for EPD.

FrameSERVER Main Menu

| FrameSERVER | ImageSTORE | TRANSCEIVER | PRINTERS |

This menu bar appears on screen when the touch controller detects the presence of a finger
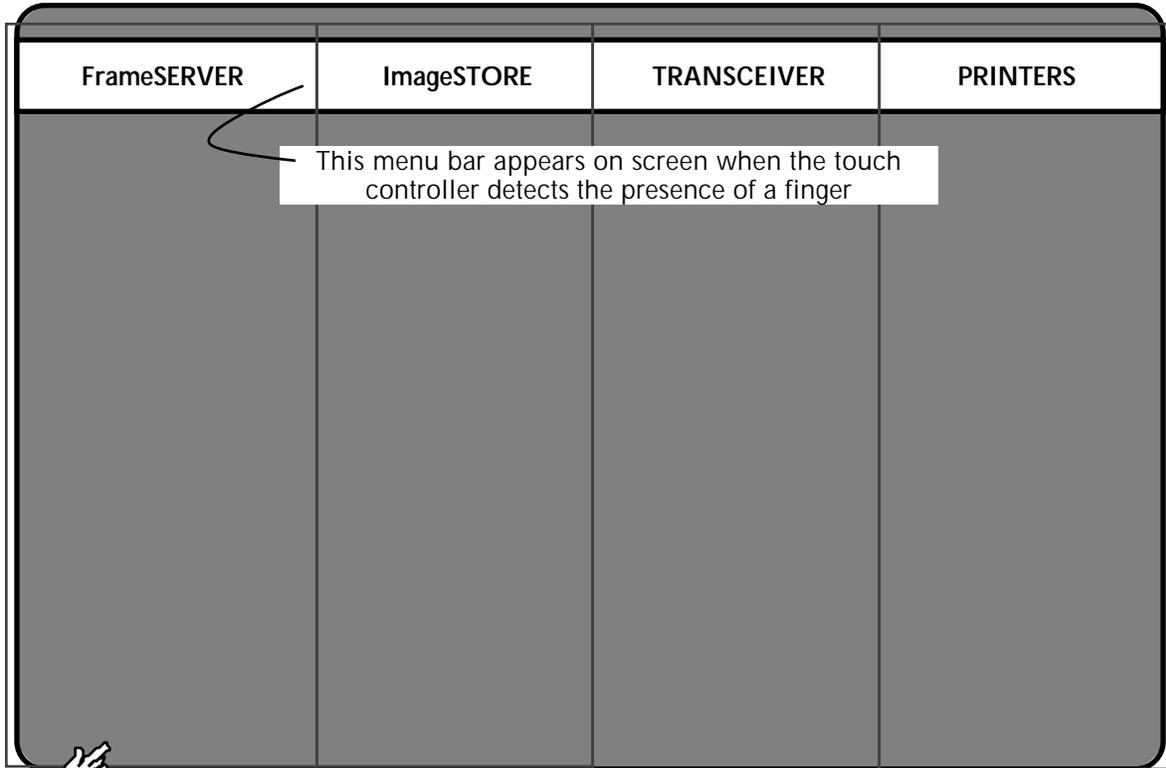
Active areas for menu displays, when cursor enters these zones the appropriate menus will pop up.

| FrameSERVER | ImageSTORE | TRANSCEIVER | PRINTERS |

CAPTURE

LIVE
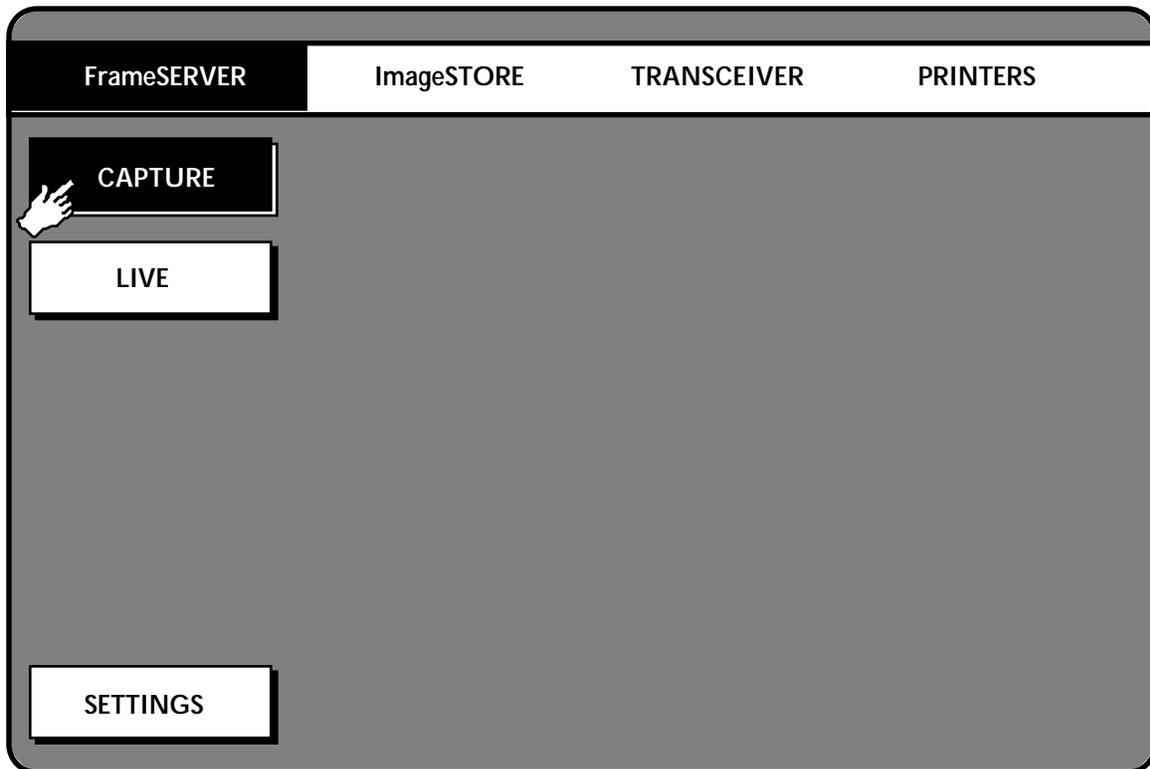
SETTINGS

When the cursor is over a display command it appears in reverse video indicating that it is the active command. Tapping twice on the panel will activate that command.

FrameSERVER Menu

FrameSERVER	ImageSTORE	TRANSCEIVER	PRINTERS

CAPTURE

LIVE

FIELD
✓ FRAME

INPUT
✓ RGB
NTSC

SCSI
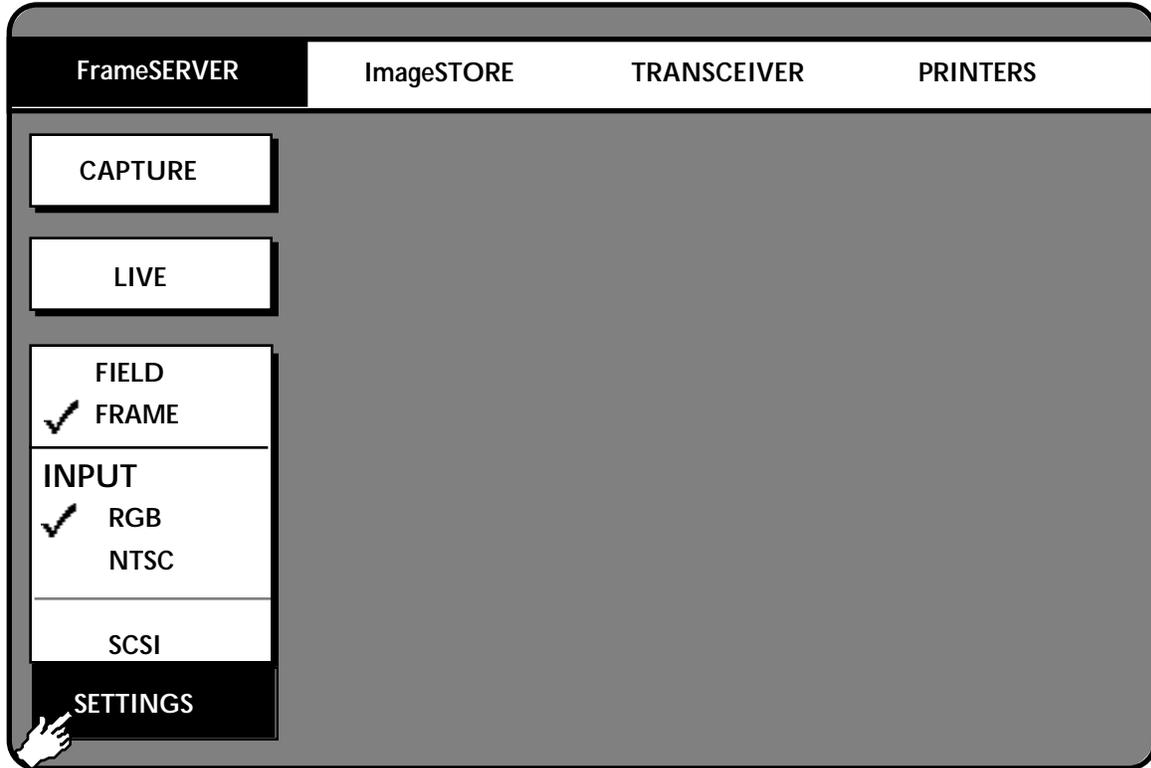
SETTINGS

Settings Menu with options specific to the FrameSERVER

ImageSTORE Menu

FrameSERVER	ImageSTORE	TRANSCEIVER	PRINTERS

STORE

RETRIEVE

TOOLBOX

SETTINGS
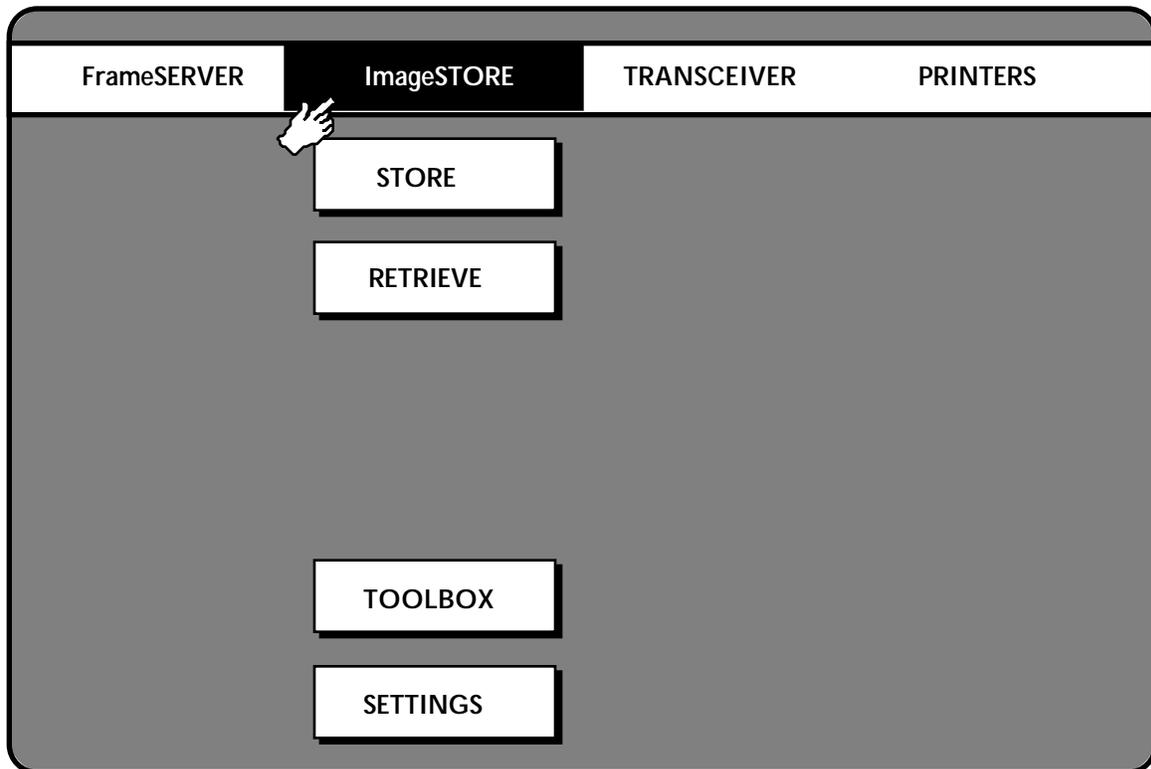
FrameSERVER commands disappear and ImageSTORE options appear under that heading

ImageSTORE Menu
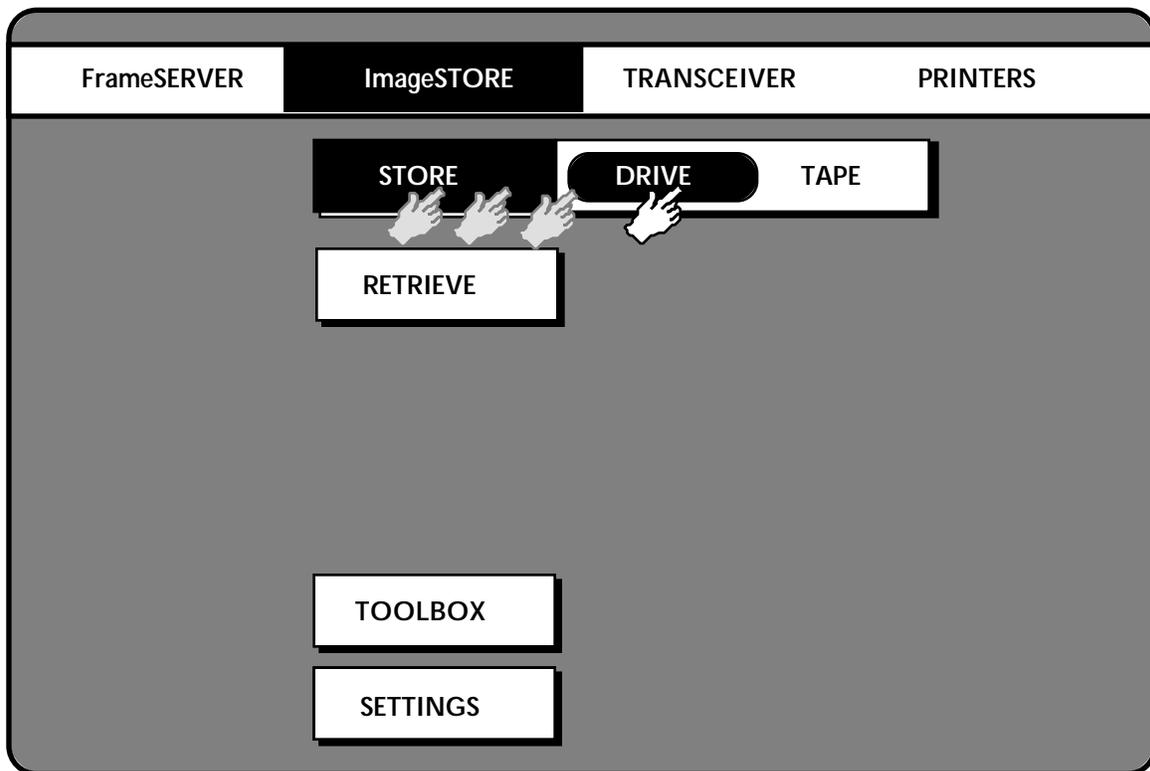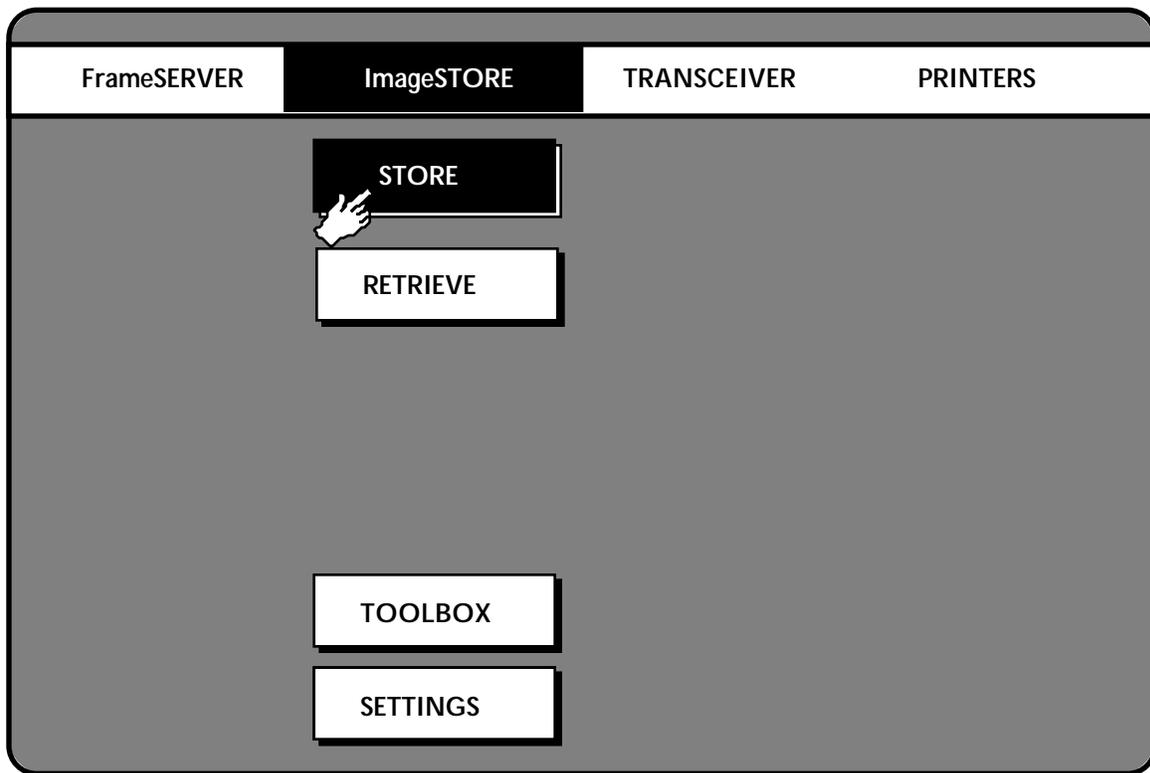
| FrameSERVER | ImageSTORE | TRANSCEIVER | PRINTERS |

STORE

RETRIEVE

TOOLBOX

SETTINGS

| FrameSERVER | ImageSTORE | TRANSCEIVER | PRINTERS |

STORE   DRIVE   TAPE

RETRIEVE

TOOLBOX

SETTINGS

Moving the cursor to the left side of the command reveals another menu of choices for storage, if they are installed in the FrameSERVER. Tapping on drive button toggles through the other drives that are installed.

ImageSTORE Menu
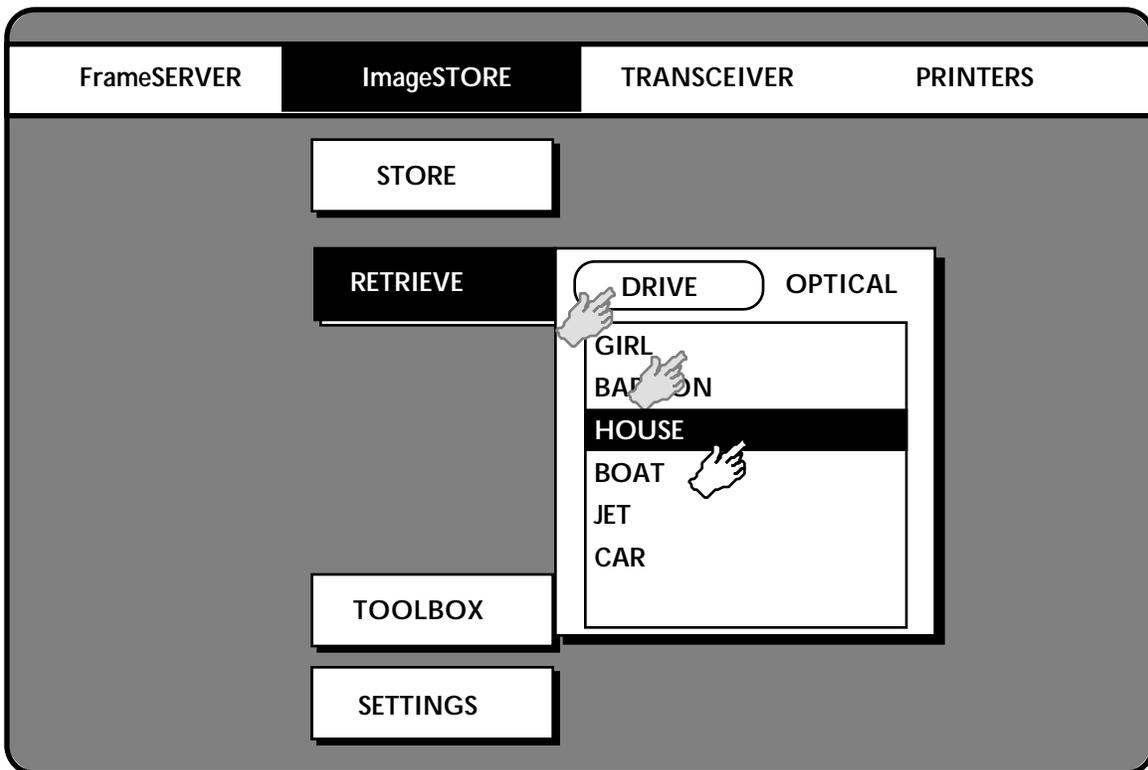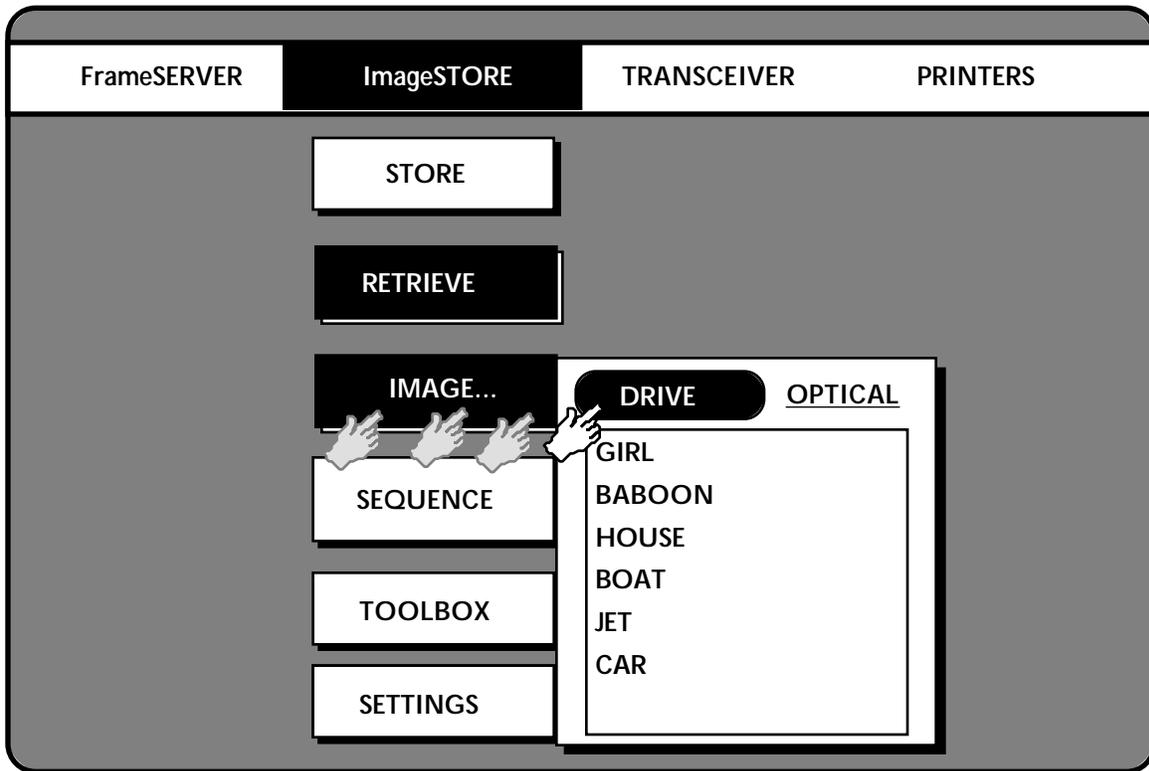
FrameSERVER	ImageSTORE	TRANSCEIVER	PRINTERS

STORE

RETRIEVE

IMAGE...

DRIVE	OPTICAL

GIRL
BABOON
HOUSE
BOAT
JET
CAR

SEQUENCE

TOOLBOX

SETTINGS

FrameSERVER	ImageSTORE	TRANSCEIVER	PRINTERS

STORE

RETRIEVE

DRIVE	OPTICAL

GIRL
BABOON
HOUSE
BOAT
JET
CAR

TOOLBOX

SETTINGS

Moving the cursor to the left side of the command reveals
another menu of choices for storage if they are installed
in the FrameSERVER

CUSTOMER BENEFITS

- Lowers cost of an imaging system (two or more products) - reduces duplication of common components (framestores, analog boards, power supplies, cases)

- If user already has NuBus computer only needs to purchase boards and storage/printer options

- More compact, uses less desktop space than current products.

- Less cabling required.

- System interconnect simplified. NuBus boards are self configuring just plug in and go.

- WYSIWYG (What you see is what you get). Only one framestore, therefore the displayed image is always the image being worked with. Eliminates need for a control center as proposed. Need only one monitor.

- Upgrade path for new products with extended capabilities (Example: new, better compression or faster modem, user only needs to replace board not whole unit.

- Common user interface for all products. Shorter training time required.

- Standard user interface can be replaced with custom interface for specific applications. (Will appeal to VAR's (Value Added Reseller's) as a platform for software /hardware products to sell into vertical markets.)

- Brings easy yet powerful image capture, storage, transmission and hard copy output to users not wanting the complexity associated with a computer.

EPD BENEFITS

- Efficient use of limited, existing manpower.

- Reduces duplication of effort in many areas.

- Lower EWO costs.

- Products can be sold into more markets

- Shortens time to introduce new products

- Faster response to changing market.

- NuBus design means that third party products can be utilized in the FrameSERVER such as microprocessor boards,modems special DSP's, etc., eliminating the need to manufacture all components ourselves.

- Common development language and operating system means that software routines for the control of the framestore and graphics are done only once.

EPD CONCERNS

- Approach is very software intensive, would require a well coordinated effort.

- Results in lower cost for most applications, but not all.

DIGITAL IMAGE CAPTURE

- Interfaces directly to Digital Framestore in FrameSERVER
- High Resolution CCD imager
- Control Firmware in FrameSERVER ROM

Wired Remote Control

KODAK
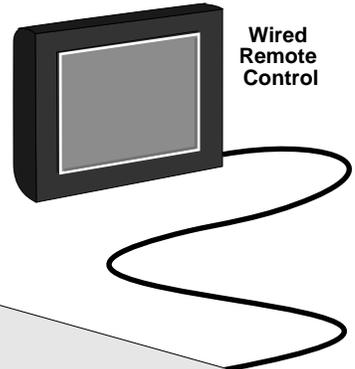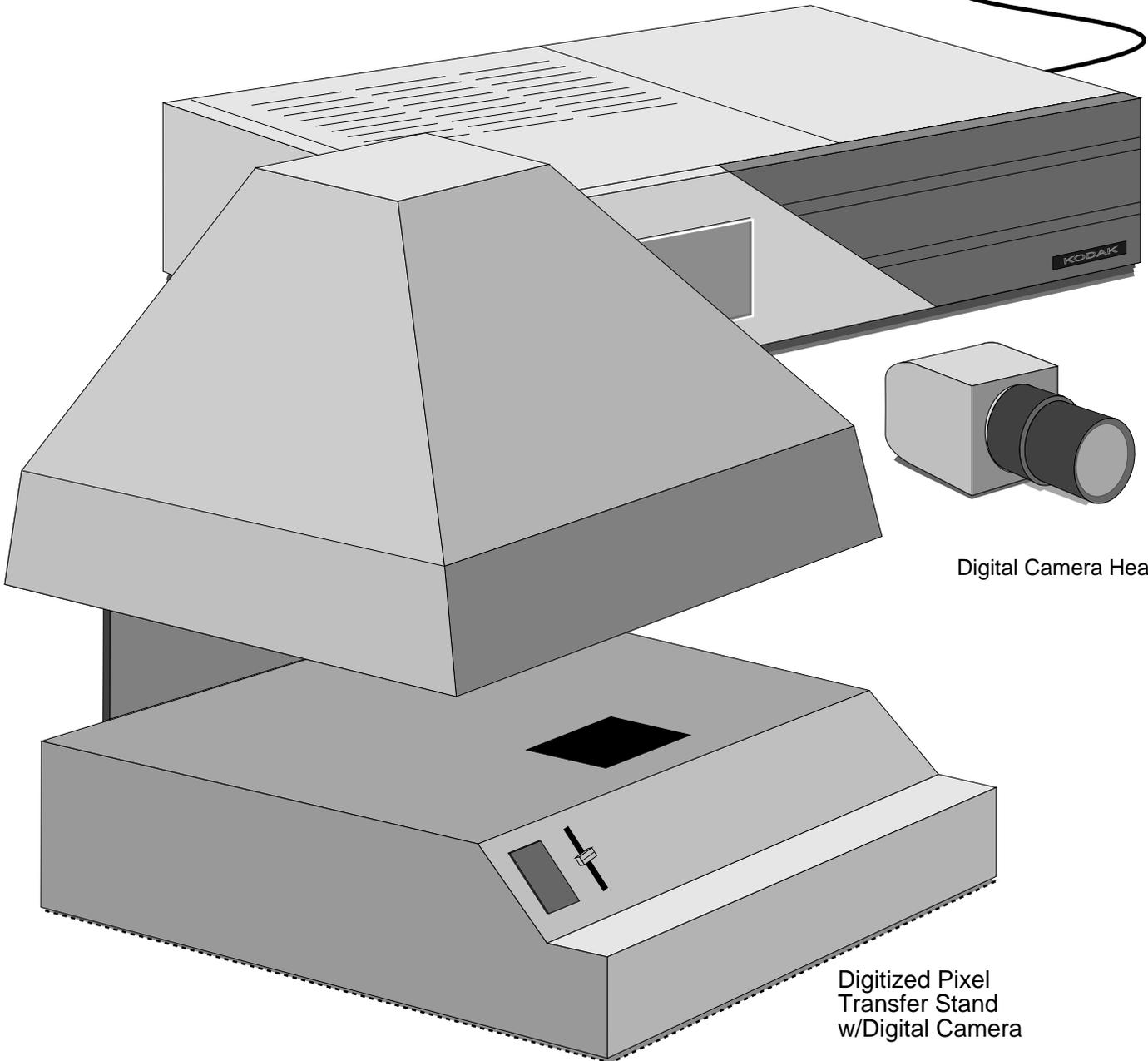
Digital Camera Head

Digitized Pixel Transfer Stand w/Digital Camera

DIGITAL IMAGE STORAGE

Solid State Memory Cards
and Reader.
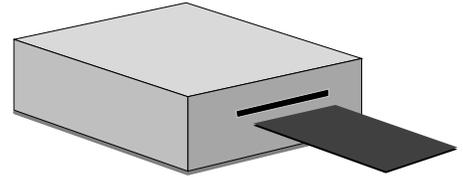
• Optional Hi-Speed DSP
w/Image Compression
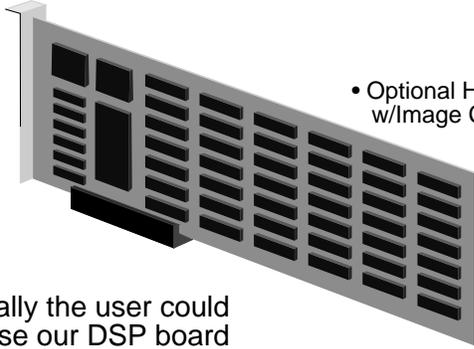
Optionally the user could
purchase our DSP board
w/Image Compression to
get the most from his storage
choice.

Streaming Tape
DAT or 8mm
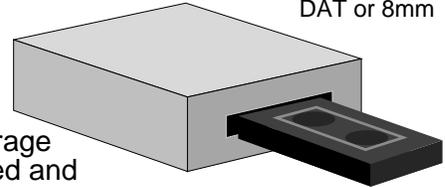
Additional external storage
devices can be attached and
multiple units chained via the
provided SCSI interface.
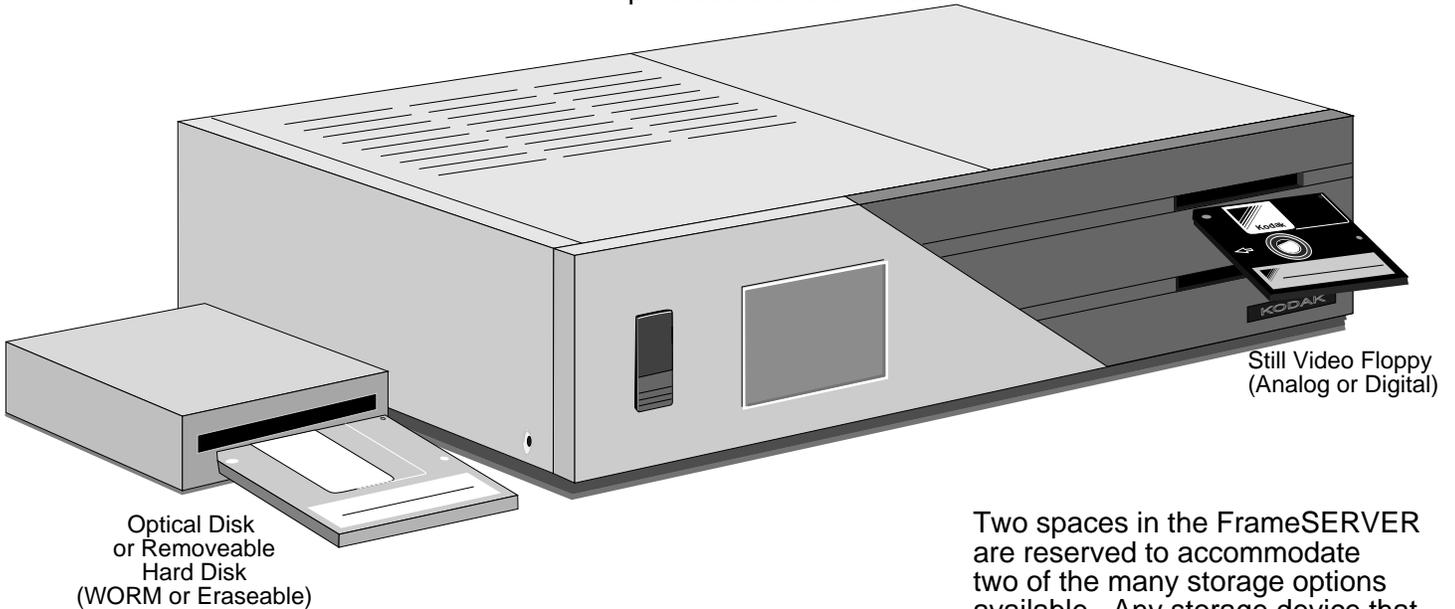
Still Video Floppy
(Analog or Digital)

Optical Disk
or Removeable
Hard Disk
(WORM or Eraseable)

Two spaces in the FrameSERVER
are reserved to accommodate
two of the many storage options
available. Any storage device that
has a SCSI interface and is a half-
height 5.25" or 3.5" unit, will work
in the FrameSERVER.

8 X 10 THERMAL PRINTER

- SCSI Interface
- RAM Image buffer
- Prints or Overheads

Wired
Remote
Control
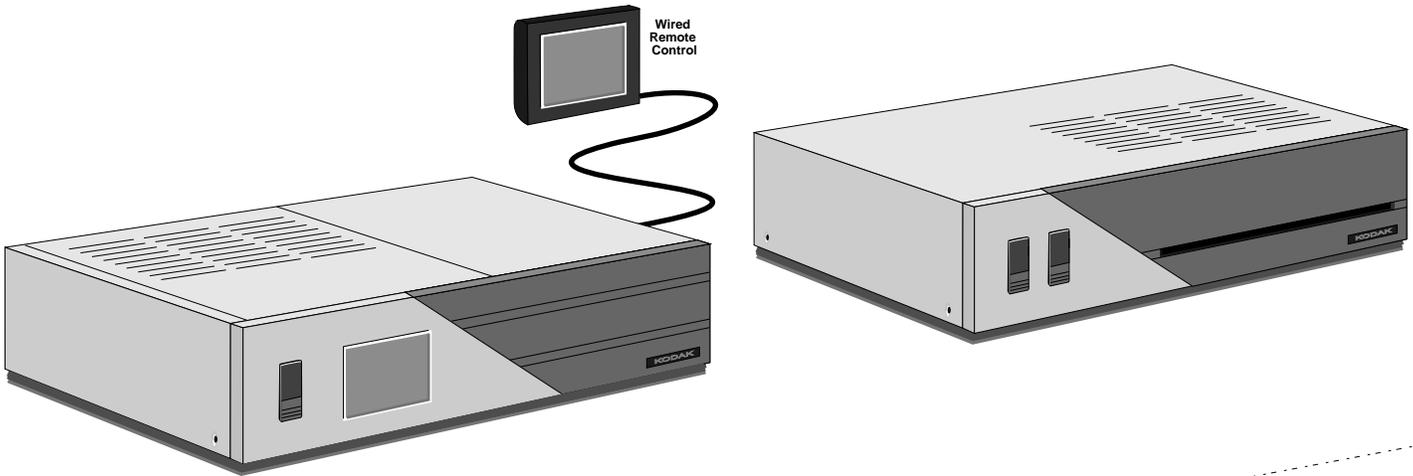
Also connects to computers
with SCSI interface for use
without needing FrameSERVER.
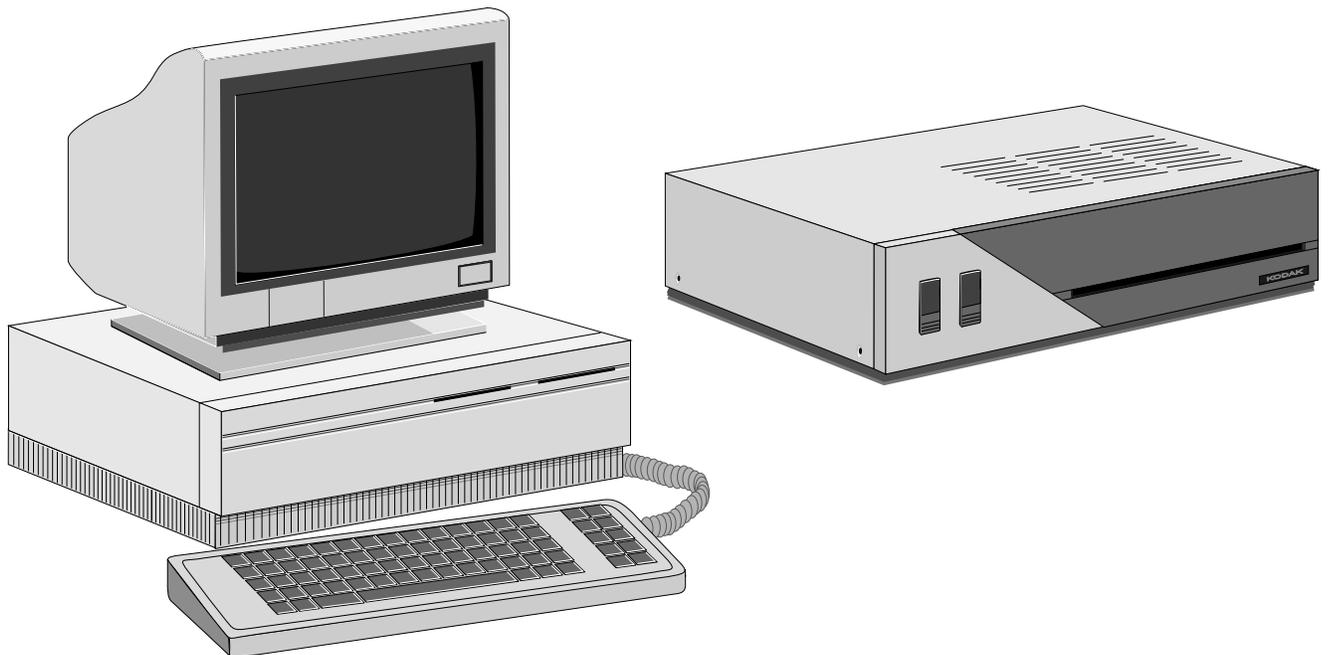
Desktop Publishing Network

Mass Storage Device

Macintosh and IBM PC Workstations

**Hi-Speed Network
(Ethernet?)**

8 x 10 Printer

35mm Printer

FrameSERVER Imaging Workstation

Network Shared Printers