



NEAR EAST UNIVERSITY

COMPUTER ENGINEERING DEPARTMENT

MULTIMEDIA PROCESSING SYSTEMS

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Paper Port Software

a) Introduction to the Paper port Software:

The Visioneer Paper Port Software works with the HP flatbed scanner and its scanning software. You use your HP scanner and its software to scan an item. When the scanned items are on the Visioneer Paperport desktop, you can use the Paperports features to work with the scanned items.

For example, with the Visioneer Paper Port Software, you can annotate, organize, and find scanned items. Plus, with Paper Ports document communication features, you can send scanned items electronically with the application links—such as electronic fax, electronic mail, and word processing applications—without leaving Paper Port.

Sharing items with others, even if they do not own Paper Port, is possible with Paper Port Viewer. Paperport Viewer is available free for both Windows and Macintosh computers.

b) Starting the Paper Port Software:

When you installed the Paper Port Software, the visioneer program group was automatically created for you in the Windows Program Manager. You can open the Paperport software from the visioneer program group.

c) Using the PaperPort software:

SCANNING

Scanning Items:

To scan an item with Paper port software;

- 1) Turn on your HP flatbed scanner.
- 2) Place the item that you want to scan, printed side down, on the scanner glass and close the cover.
- 3) From the PaperPort **FILE** menu, choose **Acquire**, or click the **Scan** button on the **command bar**.

The scanner begins its scan. Depending on the type of the scanner that you are using, and its settings, the scan may happen in one or two stages. For example if the scanner is set for scanning text, the item may scan directly to the Paper port desktop.

If the scanner is set for scanning pictures, the scan may happen in two stages. The first scan is the preview that lets you see the picture's

quality and make adjustments if necessary. The second stage of the scanning takes place when you click the button for accepting the scan. It may be an Accept button or a Final button.

When the scanning is completed, a **thumbnail** – a small image representing the item you scan-appears on the PaperPort Desktop. It will be labeled Untitled-1 if it is the first untitled image on the PaperPort Desktop.

4) Scan the next page:

The PaperPort Desktop now displays thumbnails, one for each item that you scanned.

Scanning to get the best image

By using the HP scanning software, you can adjust the scanning image and select options appropriate for the item you want to scan.

With in Paperport, you can also make adjustments to a scanned item after it appears on the Paperport desktop by :

- Straightening a page that was crooked.
- Cleaning a page

Straightening Pages:

If you inadvertently scan an item at an angle, you can straighten the item without having to rescan it. You can straighten an item by using one of two methods.

- Using the Auto-straighten page command in the page menu.
- Using the straighten page tool on the Annotation tool bar. With this tool, you draw a reference line that indicates which edge of the item you want to straighten.

To automatically straighten a page after it has been scanned:

- 1) Display the page in the view.
- 2) From the **page** menu, choose **Auto-straighten Page**.

The PaperPort software, analyses the image to determine the most likely angle to use to straighten that page, and then automatically straightens the page.

To straighten a page by using the straighten page tool.

- 1) Display the page in page view.
- 2) Click the **straighten page** button on the **Annotation Tool Bar**.

A message box explains how to draw a reference line for straightening the page. If you don't want the message box to appear from now on, select the check box.

- 3) Click **close**.

The cursor becomes a crosshair.

- 4) Hold down the mouse button and drag the crosshair across or down the page, along the crooked edge of the item, to draw a line. PaperPort uses the line as a reference for straightening the page. The item is straightened when you release the mouse button.

Note: A page with annotations, can not be straightened. If the page already contains annotations, choose select all from the edit menu to select all of the annotations; Then choose cut from the Edit menu to cut them from the page. Straighten the page then choose past from the edit menu. The annotations will be pasted back onto the now straightened page. You may have to move them slightly back into place.

SELECTING AND DESELECTING AN ITEM

After you scan an item, it is automatically highlighted, or selected, on the PaperPort desktop. A selected item has a red line around it. To work with a selected item- for example, to move an item, to drag an item to a link, or to display an item in Page view- You must select it.

To select or Deselect an item:

- 1) Click any empty space on the Paper Port desktop. Notice that both untitled thumbnails are no longer selected.
- 2) Click one of the thumbnails, such as untitled-2, to select it. Untitled-2 is highlighted.
- 3) To deselect an item, click another item, or click anywhere on the Paper Port desktop.

TIP: To select multiple items, click each thumbnail while holding down the Shift key or the CTRL key, or click on the PaperPort desktop and drag a rectangle around the items to select.

CLEANING PAGES

Sometimes a page has small marks, dots, or speckles that appear on the scanned image. If you scan a newspaper article, for example, the news print may have speckles that the scanner picks up. If you are using OCR software, to process pages, speckled pages can slow down the performance of the OCR software. The Clean Page command works only on black and white images.

To clean a scanned page:

- 1) Display the page in page view.
- 2) From the **page** menu, choose **clean page**.

If the cleaning removes portions of the image that you want to keep, choose **Undo** right away from the **Edit** menu. The original image will reappear.

To manually clean a page:

- 1) Display the page in pageview.
- 2) Click the **Selection** tool.
- 3) Drag around a dirt spot to be removed.
- 4) From the **Edit** menu, choose **Cut**. The spot is cut from the page.

You can also use this manual process to remove ragged edges, such as from an article torn out of a newspaper.

TIP: Sometimes, the lines on a spreadsheet or a form are broken or need to be darkened. To darken or connect broken lines, display the item in Page view and choose the Enhance lines command from the page menu. This command works only on Black and White images.

EDITING PICTURES

Using Windows object linking and embedding:

You can insert a paperport item into another Windows applications, such as word 6.0, using Object linking and Embedding.(OLE). The item will appear in the word document creating a special link between Paperport and word. An application that contains an OLE object is called **Container application**. Word 6.0 is a typical container application for a paperport item.

When you double click the item in Word , paperport opens so that you can view or edit the item. Furthermore , if you edit the item in Paperport, the item in Word contains those edits. For example if you add annotations to an item, they will be maintained on it in the Word document.

Before starting , check to see if the other applications uses OLE. Look for the Insert Object command, usually found in the Edit or Insert menu.

NOTE: Not all Windows applications use OLE in same way .

To insert a paperport item into another application:

- 1) In the other application , where you want the PaperPort item inserted.
- 2) From that application's Edit or Insert menu, choose Insert Object ,or a similar command. The Object dialog box appears. The Object dialog box may be different, depending on the version of Windows and OLE that you are using.
- 3) Select PaperPort Document and click OK . Paperport opens. A message summarises to steps to insert an items.
- 4) Click continue. If you don't want this message to appear again, select don't diaplay option in the dialog box.
- 5) On the PaperPort Desktop, select the item that you want to insert in to the other application.
- 6) Click the **OLE Rtn** button on the **Command Bar** , or from the **File** menu choose return to where the file is the name of the container file.A message appears and asks you to complete the OLE connection.
- 7) Click yes to insert the selected item into the other application. The PaperPort item appears at the cursor position in that application , such as Microsoft Word 6.0 document.

To select a different item,click **cancel**, and PaperPort remains open. If you don't want to insert the item, click **No**.

When you double click the item , PaperPort opens and displayesthe item,so that you can read and edit it.

EDITING AN OLE OBJECT

To edit an inserted item :

- 1) In the container application, such as Word double click the item.

PaperPorts starts and a temporary copy of the item is selected. On the PaperPort desktop,a dotted outline around the copy indicates that it is linked to a container application.

- 2) Edit the item in Page view.

Annotations will not appear in the container application.

- 3) From the **File** menu choose **Update PaperPort Document** in where the file name is the name of the container file.

If you updated the item, the container application is displayed with the updated item.

PRINTING

You can print from both Page view and Desktop view. Paperport can print in black and white, grayscale, and colour. For example, if you import a color image into PaperPort, you can print it on a color printer.

To print an Item:

- 1) In desktop view, select the item that you want to print. In page view, you do not have to select it. If the item has annotations that you don't want on the printed copy, display the item in page view. From the annotations menu, choose **show annotations** to remove the checkmark next to it.
- 2) In desktop view, drag and drop the item onto the **Printer** icon on the **Link bar**, or just click the Printer icon. In the Page view, choose Print from the **File** menu.

Select the print options from the print dialog box.

USING PAPERPORT WITH AN ELECTRONIC FAX

You can send an item from the PaperPort Desktop, with annotations, as an electronic fax. Your computer must have access to a fax modem and electronic fax software before you can send a fax from PaperPort software before you can send a fax from paperport.

To send items using the fax link:

- 1) On the PaperPort desktop, select the items you want to fax. If you do not want PaperPort annotations to appear in the faxed item, deselect the **Show annotations** option from the annotations menu.
- 2) Drag the item onto **fax** icon on the **Link bar**, or choose **Links** from the **File** menu and choose the fax name from the submenu. To send a fax from page view, use **Links** command.
- 3) Use your electronic fax application as you normally do.

READING FAXES IN PAPERPORT

If you are using Delrina Winfax, you can read faxes in Paperport.

To read a Winfax in Paperport:

- 1) From the **File** menu , choose **import fax**. The import fax dialog box appears and lists the faxes available to read in PaperPort.
- 2) Select one of the faxes in the list. A thumbnail of that fax appears in the dialog box.
- 3) Find the faxes that you want to read, and then select them. To read all of the faxes, click **select all**.
- 4) Click Import. The selected faxes appear on the PaperPort Desktop. You can now select them there and switch the page view to read them.

5) USING PAPERPORT WITH E-MAIL

Using the PaperPort e-mail link, you can send an item from the PaperPort desktop as an attachment to an e-mail message.

To send items using e-mail:

- 1) On the PaperPort desktop, select the items you want to send.
- 2) Drag and drop the item onto the e-mail icon on the **Link Bar** , or from the File menu , choose **Links** , and then choose the e-mail application name from the Links submenu.
- 3) Log on to the e-mail application in the usual way. The message addressing dialog box , which is different for each e-mail application, appears.
- 4) Fill in the message information , and send the message.

PaperPort creates a file and attaches it to an e-mail message. The file has the extension .MAX , for example , DOC-0001.MAX. If the item is a single page, the file name begins with Page and is followed by the item's number, for example , PAGE0002.MAX.

DISPLAYING E-MAIL MESSAGES SENT FROM PAPERPORT

When you receive an e-mail message with an attached PaperPort file, you can view the e-mail message and the attached file. You can display an attached file in a variety of ways, depending on your e-mail software.

- With some e-mail applications, such as Lotus cc:Mail, you can double click to attachment to display it. Or depending on the e-mail settings, you can use Shift-double-click to automatically run the PaperPort application and display the attachment.
- Save the attached file using the e-mail Save or Save as command. Then open the attachment in PaperPort to display it.

SCANNING A DOCUMENT TO FAX

- 1) Double click the PaperPort icon. The PaperPort window appears.
- 2) Make sure the scanner is turned on.
- 3) Lift the scanner cover and place the next page down the scanner glass near the upper right corner. Close the scanner cover.
- 4) In the Paperport window, click the scan button. The HP picture scan task manager appears.
- 5) Click fax.
- 6) Under select page, choose text page and then click scan.
- 7) The scanner scans the document and automatically optimises the document for faxing. You return to the Paperport desktop with the scanned page. Notice how the border around that page is highlighted, indicating that is the selected document.
- 8) In the PaperPort window click and drag the scanned document to the fax icon in the lower left corner of the window. Because of a special link to your fax software, you automatically send the document to your fax.

SCANNING A DOCUMENT FOR EDITING

To scan documents for editing in your word processor, the scanned document must be converted into characters that you can edit. The optical character recognition, (OSR) software that is built into the PaperPort program is specially designed for these purposes. After scanning the page using the special OSR setting in HP picture scan, you use PaperPort and its built in OCR feature to automatically convert your scanned document to word processor text.

- 1) Make sure the scanner has been turned on.
- 2) Lift the scanner cover and put the text page face down on the scanner glass near the upper right corner. Close the scanner cover.
- 3) Double click the PaperPort icon. The PaperPort window appears .
- 4) In the PaperPort window, click the scan button. The HP picture scan Task manager appears.
- 5) In the task manager window, click OCR.
- 6) In the task manager window click Scan.
- 7) The scanner scans the document using HP accupage technology so that it is optimized for OCR conversion to text. You return to PaperPort with the scanned page.

- 8) In the PaperPort window, click and drag the scanned document to the word processing item in the lower left corner of the window. Because of the special link to your word processing software, and PaperPorts OCR feature, the document is automatically converted to text and inserted into your word processing document.

BASIC IMAGE MONIPULATION

WORKING WITH MASK AND FILTERING IMAGE

What is a mask?

A mask is a define area that covers that part of an image or the entire image. A mask determines how much or how little of an effect is applied to an image.

Manipulating masks: Once a mask has been created, it can be rescaled, resized, rotated, distorted, deleted, saved or even combined with other masks to make a compound mask. All mask monipulations use the Mask Picker tool from the Toolbox. While a mask is being altered there is information that is continuously displayed in the lower left corner of the status bar.

Resizing a mask: The mask Picker tool is used to resize masks. A mask is resized proportionally by clicking and dragging a corner control handle. The opposite corner of the mask remains fixed and size of the mask increases or decreases from that point. Holding down the shift key while the mask is being resized results in the mask increasing or decreasing in size from its center. The lower left status bar, displayes the position of the cursor, Delta(width and height), scale as the mask is being scaled. All values displayed are in units of measure that are selected in Preferences under the special menu.

Precision mark resizing: For precision mark positioning use the tool settings Roll up.(ctrl+F8)and select the Mask scale button. Values of mask scale are provided in percentage of original size. These are the buttons that provide the creation of horizontal or vertical mirrors of the mask. By clicking the maintain Aspect check box any changes in either the horizontal or vertical scale causes the value to change proportionally.

Rotating and skewing a mask: All basic and computer aided masks can be rotated and skewed. The Mask Picker Tool is used to rotate and skew masks by clicking on the selected mask. Grabbing a corner and drag it produces rotation of the mask. The amount of rotation is shown in the lower left status bar during rotation. The point of rotation is determined by

the location on the circle in the middle of the mask. To move the point of rotation, Place the cursor over the point of rotation. The cursor becomes a crosshair symbol. Click and drag the symbol to the desired position. The point of rotation can be moved anywhere within the image area. The point of rotation doesn't have to be inside of the mask.

The mask can also be skewed by dragging any of the four arrows located on the sides of the mask . The status bar indicates the degree of skew as it is being skewed.

Distorting the mask: The distortion command allows you to select a mask and transform it into different shapes. To access the distortion, feature click on the mask with the left mouse button and the rotation arrows appear. Click on the mask second time and Distortion arrows appear. Grabbing any of the arrows and dragging them to a new location will distort the mask. As the arrow is being moved, the mask shape will move to show the new shape being created. This command and its counter-part, in objects provide an easy way to make very realistic three dimensional effects and extrusions. There is no precision command equivalent to distortion.

Other precision mask commands:

- Mask position: Used to place masks on the base image at exact locations.
- Mask size: Allows masks to be resized with precision.
- Mask scale: Provides for accurate and repeatable scaling of masks.

The mask menu: Any image that has a mask and is saved in Corel Photo Paint format (*.cpt) will have its masks and objects saved with it. The ability to save a mask apart from the image allows it to be loaded and applied to other images for special effects or accurate placements of objects or effects.

Saving a mask: After a mask has been created it can be saved by the following procedure.

- 1) Select the mask with mask picker tool.
- 2) Pick save from the mask menu. The common save an image to Disk dialog box opens.
- 3) Name the mask and click the OK button.

Loading a mask: The load mask function, allows a wide variety of image file formats to be loaded as masks. Loading a mask into an image involves the following procedure.

- 1) Select the image the mask is being loaded into.
- 2) Choose load in the mask menu.
- 3) Select the file to be used for a mask. Click the OK button and the mask will load into the image and the mask outline appears on the image.

Removing a mask: There are several ways to remove a mask. The quickest way is to click the Remove Mask button in the ribbon bar. One of the masks must be selected for the mask buttons in the ribbon bar to be available. The mask can also be removed with the delete key if the mask is selected. The mask is selected whenever the Mask Picker tool is selected. If it is not selected, the contents of the mask will be cleared when the delete key is pressed.

Inverting a mask: This is one of the more useful mask functions available. When a mask is created, the area inside the mask can be modified and the area outside the mask is protected. The invert mask command reverses the mask so that the area that was inside the mask now becomes protected, and the area outside can be modified. The Invert mask command can be accessed through the mask menu or by clicking on the Invert Mask Button.

Masking an entire image: To mask the entire image, select the ALL command from the Mask menu. The mask will encompass the entire image inside of the Window frame. Even if the image is only partially visible because the image has been zoomed in, the entire image is still masked. There are several shortcuts for the ALL command: Clicking the select all button in the ribbon bar; Double-clicking any of the basic mask selection tools such as the rectangle, circle, polygon, or free hand in the tool box.

Making Compound Masks: A compound mask is a mask that is made up of several masks. It is ability to combine several masks or types of masks into a single mask that allows the user to quickly create a very detailed and intricate mask. There are too many combinations of masks .

Select Command: The select command changes the mode of mask tools. If the select command is On, the objects and masks created are defined areas based on the type of tools selected such as a rectangle or circle. If on eof the other buttons, Add to selection, Remove from selection or XOR are on, the defined areas objects, and masks can be added to, subtracted from or XORed. The select command returns the object and mask tools to select mode after using the Add to selection, Remove from selection or XOR commands.

Add to selection Command: This command in conjunction with the remove from Selection Command provide a method to quickly ‘clean up ‘ and adjust an existing mask. The add to selection command adds areas to a mask. When this command is selected it is possible to add to an existing mask. Where the area of a mask being added intersects an existing mask they are combined. When the areas do not intersect they are still part of the original mask but in two separate areas. Regardless of the Mask Tool that created the mask , any tool can be used to add to the mask. The dimensions and the shape of the area are determined by the Mask Tool selected.

Remove from selection command: This command in conjunction with the Add selection command provide a method to quickly ‘clean up’ and

adjust an existing mask. The remove from selection command subtracts areas from a compound object or mask. The dimensions and shape of the area are determined by the mask tool selected.

XOR Selection command: This command exclusive or, allows the creation of unique masks based on where multiple masks overlap. If the existing area and new area do no overlap, they become a compound mask. Any operations you perform affect both parts of this new compound mask. If the existing area and the new one overlap, the overlapped area is excluded from the mask.

FAMILIRIZATION WITH STATION YAMAHA

< Soft synthesizer Configuration >

The Soft synthesizer supports GM system level 1 MIDI data. Its volume is adjusted by the Wave volume control.

Quality: These four options determine the sound quality and the number of voices that the soft syn can produce simultaneously. Select a mode appropriate for the CPU performance of your computer. If you choose a high quality mode and your computer does not have adequate processing performance, the soft synth may not produce sound fluently. In this case select a lower quality mode.

Reverb: If you choose ON, you can add reverb to the sound of the softshynt.

MPU401 OUT: These settings allow to you to select an External Midi instrument or the softsynth for used with DOS based games that are played on Window box. The MS_DOS prompt item, in the main program Group opens at MS_DOS window. Select general MIDI in the game settings to use this function.

Full Duplex: It is possible to record a new wave file while playing an existing Wave file.

<MIC volume control>

When the MIC +20dB is checked, microphone volume increases 20dB at play back and reccording.

<Tone Configuration>

This function can be controlled at using YMF715(OPL3-SA3).

Tone control: The each quantity of bass and treble can be adjusted by two pieces of slider.

3D Enhanced: Ymersion is a yamaha's original technology for wide stereo.

Default: When this button is clicked, the each value can be returned to default.

3D Sound User Guide:

- 1) Select the 'Yamaha Station' dialog box.
- 2) If your sound card is PS-YM-02, (Yamaha 719 chipset) then your Yamaha station will have a 3D button. PS-YM-01(Yamaha 718 chipset) will not have this button. Press the 3D button which is on the top of right hand corner.

VIDEO CAPTURE

The capture TV M230 virtually turns your computer into a television set, complete with an infra-red Remote control. You can watch TV in a window while working in other applications, or switch to full screen mode for leisurely viewing. From within Windows , you will have direct control of TV tuner , MPEG and closed caption functions-via the remote.

Live Video display: Plug in your camcorder , VCR or laser disk player. The capture TV M230 allows you to monitor multiple video sources on your computer screen at up to 30 frames per second with a maximum resolution of 1024x768x16.7 million colors. The following video sources are supported and software selectable:

- The internal TV tuner
- Composite Video
- S-video: NTSC,SECAM,PAL

Image capture: The M230 allows still image capture as well as full-motion capture. Capture images from any supported video source to use in pictures, presentations , movies and more.

AVI driver: It support allows the capture TV M230 to operate with other AVI supported software, making motion capture possible and easing preparation requirements for live presentation.

M230 ATI Player: Lets you watch up to 125 cable television channels and 70 antenna channels is smooth, full-motion video in a window or full screen. You can capture still frames and movie clips , channel surf or create your own TV transcripts. Composite Video and s-video inputs support VCR's , video cameras, laser-disc players , video game consoles, etc. Still image and Live video capturing is easy with a simple mouse click.

Closed Captioning(NTSC only): Support including transcript creation and hot words that alert you when the M230 ATI player is broadcasting information that you want to watch.

Optional Tele text Model: This optional board allows you to display multiple tele text windows for different pages , letting you to view as

many teletext screens as you want and view all the information at the same time.

MPEG1 Video Playback: For windows 95 and windows 3.1x , full screen at up to 30 frames per second on most Pentium PCI systems or better. Also supports video CD 2.0 and Karaoke , including dual-channel audio, CD, games and reference application titles.

Overview: After installing the VGA drivers and ATI player software, The M230 ATI Player and M230 Uninstaller icons will appear at the desktop.

The Task control Panel: The task control panel indicates what mode the player is in and what it is doing.

The Control Panels: When you select a mode in the task control panel or press a short cut key , the control panel changes to the appropriate control panel for that mode. All modes provide context sensitive on-line help.

Controlling the Audio Volume: The TV tuner panel has a volume control slider. Use the mouse to move the slider to increase and decrease the audio volume.

Muting the Audio Volume: The TV tuner panel has a Mute button that you can click to temporarily turn off the audio. Clicking the button again, or moving the volume control slider cancels muting.

The Display Panel: The display pane is the screen where your media plays. It is a familiar , TV style display that you can resize, place on top of other windows, or position automatically in one of nine locations on the screen.

Sizing the display panel: You can resize the Display panel using the mouse, the control panel buttons, or CTRL key combinations. In TV mode , when you play full-screen video, the playback panel comes 'thin' , so that you can move it to the top or bottom of your screen. To show/hide the Playback panel, press ALT+Space BAR.

You can also use the CTRL key to switch to these present sizes:

- 160x120 Pixels: Ctrl+1 640x480 pixels: Ctrl+4
- 240x180 Pixels Ctrl+2 Toggle between full Ctrl+F
- 320x240 Pixels Ctrl+3 Screen and current size: Alt+F

Attaching and Detaching panels: You can detach M230 ATI player control panels from the Display panel, move them to any location on your screen , and re-attach them. Panels attached to the Display panel share the Display panel's 'snap window to' and 'always on top' settings. When you display closed captioned text in a window , you can attach and detach the closed-captioned window.

- To detach a panel : While holding down the shift key, click the panel where the Panel edges meet, then drag it away.

- To attach a panel: Drag it near the Display panel until its outline changes , then release the mouse button. The panels will snap back together.

On-Line Help:

Context sensitive Help: Context sensitive help is always available in each panel. Just press the F1 key.

Bubble Help: Simply move the mouse cursor over a control to see a description of its purpose. As you become familiar with M230 ATI player, you may want to turn off help-click the Show Bubble Help check box in the display configuration dialog .

PLAYING MEDIA FILES

Click the Media Playback button .

You can use the Media Playback panel to play the following media files:

- Mpeg-1 digital audio and video, including Karaoke including dual-channel audio, CDi games and reference application titles.
- AVI video files.

Playing a File: In the playback panel, click the File Open button. Select a file from the list. Click Add, then OK. Click the Play button. The file displays in the display panel.

Playing Interactive disks: When playing video CD 2.0 discs , the Control panel changes to this interactive panel.

The TV tuner: The TV Tuner displays cable or broadcast television on smooth , full motion video in a window or full screen. You can use the TV tuner to:

- Watch television on your computer as you work in another software application.
- Watch a videotape or laser disk movie on your computer.
- Capture , save and print TV and video images.
- Display and record closed captioned text.
- Display and record closed captioned text.

The M230 ATI player accepts a wide range of video inputs-from just about any device that has a Video Out connector: TV antenna or cable, VCR, Video camera , laser disk, and video game devices. Click the Tv tuner button in the task control panel to switch to TV mode.

Auto scanning for TV Channels :

When you click the autoscanner button in the Tuner setup dialog, the TV tuner scans for all available channels and store them. When scanning is complete , you

can type in a name for each channel. Before scanning , use the drop-down list box to select the broadcast format and the cable standard.

Zooming and Unzooming: To select and enlarge a portion of the display: Click within the display panel. Hold down the mouse button and draw a rectangle around the area that you want to zoom. You can select and enlarge a portion of the display by dragging the mouse across the display panel. To return your display to normal , click the Unzoom button in the Control Panel.

Displaying Closed Caption Text: You can display closed captioned text that's broadcast with NTSC videotapes that contain closed-captioned material. In full screen , the text overlays the video as in standard TV.

When you play video in a window, you can display the text in a separate window.

To display closed-captioned text:

1. Click the closed captioned button in the TV tuner Panel.
2. To display the text overlaid on the video, click the setup button. Click the display over video check box in the closed caption configuration dialog.

To transcribe closed captioned text: Click the create Transcript file ... check box in the closed caption configuration dialog.

Using Hot words: Have your computer watch TV for you. When you turned on closed captioning, you can specify words and phrases that the M230 ATI player will detect in the closed captioned text. You can enable Hot words to begin transcribing the text or to maximize the TV tuner when the Hot Words appear. You specify words that you want using the Hot words configuration dialog.

To select Hot Words:

- 1) Click on the setup button in TV tuner mode.
- 2) Click on the Hot Words configuration dialog.
- 3) Type in the Hot Words you want.
- 4) Choose the type of match you want.

Always takes effect when the Hot word occurs.

With takes effect when the Hot Word occurs, and is immediately followed by a second word.

Without takes effect when the Hot Word occurs, if not followed by a second word.

Within takes effect when the Hot word occurs , if it is within a definable number of words of a second Word.

- 5) Type in a second word where required.

- 6) Click on Add .

- To enable the M230 ATI Player to maximize from a minimized state, click the Enable Hot words box.

- To enable the Hot word to trigger transcription, Click the enable transcription on match box.

To enable / disable specific hot words: To enable specific Hot Words, select the Hot word from the list and click on the Enable /Disable button.

+appears before enabled Hot Words.

- appears before disabled Hot Words.

Note: The closed Caption button in the TV tuner panel must be enabled for Hot Words to function.

Optional Teletext module: The teletext function allows you to display multiple windows for different pages , letting you view as many teletext screens as you want and view all the information at the same time.

Using Teletext software: Use this software only if you have the optional teletext module installed.

Getting Started: Click the capture button in the task control panel to switch to teletext mode. When the text application starts and a proper channel is selected , the main window will be displayed. The bottom displays four related pages linked to this home page. You can choose one of the four colored circles in the tool bar to view the corresponding page or select the white circle to view a new page.

The file menu:

- New: Create a new window for teletext viewing.
- Open: Open a saved teletext file.
- Close: Close the active teletext window .
- Save as: Save the teletext contents to a file.
- Print: Sent the teletext contents to a printer.
- Print Preview: Preview the teletext contents before printing.
- Print Setup: Setup the printer.
- Exit: Exit the teletext software.

The view Menu:

- Tool Bar: Display or remove the toolbar from the top of the window.
- Status Bar: Display or remove the status bar from the bottom of the window.
- New Page: Key in a new page number of viewing.
- Red Page Bottom: View the red link page from the four related pages shown on the bottom .
- Green Page: View the green link page.
- Yellow Page: View the yellow link page.
- Cyan Page: View the Cyan link page.

The Window Menu:

- New window: Create a new window similar to file New.
- Cascade: Cascade all active windows.
- Tile: Tile all active windows.
- Arrange icons: Arrange all the inactive icons on the desktop.

Capturing Video and Audio:

Still images: You can capture full-color , 24 bit per pixel still images from your camcorder or television, save them on your computers Hard disk, and print them. The images are placed on the clipboard , or you can display them in their own window as 'thumbnails'.

M230 ATI Player, saves still images as windows standard bitmaps. It also supports most industry –standard graphics file formats, so you can insert the images into reports , presentations, letters and other documents, to add impact to training applications and presentations.

Full motion video. You can capture a stream of full motion video plus audio from your video source and save it as an .AVI file on your computers Hard disk. You also have the option of capturing only audio- uncheck the Capture video box in the capture dialog. Click the capture button in the task control panel to switch to capture mode. You can use the setup button to specify capture options, file names, display options, and file handling for captured video.

Capturing Still Frames: Click the camera button to capture the current frame.

Reviewing Captured Images:

Click the images thumbnail. If the selected image has not been saved , the thumbnail has a red border. If it has been saved, the border is green. If an unselected image teas between saved, its border is gray. If it has not been saved, there is no border.

- You can use the buttons at the top of the still capture window to save the captured image, delete it, print it, or make it into a desktop pattern.
- If you try to delete unsaved still frame, M230 ATI Player prompts you to save it before deleting.

Capturing Video: You can capture video with in two ways.

1. As a stream of video and audio that you save as an .AVI file.
2. As a sequence of still frames that you save in .AVI file.

The quality of the video that you capture depends on the following conditions:

- The speed of your system(CPU)
- The amount of system memory(RAM)\
- The performance of your Hard Disk(HDD)
- The size of video capture window.

To capture a stream of video and audio: Click the record stream button in the Capture panel. M230 ATI Player starts recording video and audio.

To capture a sequence of frames: Click the capture sequence button in the Capture panel. M230 ATI player starts recording a sequence of frames. Note that audio is not captured in this mode.

Playing capture Video and Audio: Click the Play button in the Capture panel. M230 ATI Player plays your captured file.

VIDEO LINK

Using VideoLink Mail

VideoLink Mail provides you with a virtual VCR which allows you to record and save both audio and video from your local camera and microphone. The operation of the VCR is similar to that of a standard VCR. Recordings are referred to as 'tapes', and control over the VCR is accomplished with the buttons provided on the VCR display. You can then playback recordings at a later time or send the files to friends and associates. The VideoLink Mail application appears as follows:

Changing views

VideoLink Mail can show either of different views in it's view window. This settings can be changed with the View button.

The View button, when pressed, will change the current video image in the view window to the option that is written on the button.

For example, if the button reads You, pressing View will change the picture in the video window to show the image from the local camera. When the Off option is enabled the video window will display a static image. No video from your camera will be recorded in this mode.

Recording VideoLink Mail files

To begin recording a VideoLink Mail, Press the Rec button. Once started the VCR will continue to record until the Stop button is pressed. When you make a recording, the VCR stores the video in a temporary file. To store the recording for later viewing, you will need to press Save to store the tape before closing the VCR. To save a file and immediately send it, press Mail. Use the Play button to watch a recording that has not been saved.

Your VideoLink Mail VCR saves tapes in the form of shelf-contained executable video files. These files are electronic mail-ready, and can be sent using any PC mail utility over the internet or via on-line services such as America On-line and compuserve. These files are executable files that can be run by anyone with 486/66 or faster PC. Since file recipients are only viewing received Video Link mail files, they do not need the full setup with camera and microphone. Even if they do not have a sound card, they can still view your message although they will not be able to hear it.

AUDIO COMMUNICATION

Video Link mail provides two methods to take advantage of digital voice technology when recording your video link mail files. This allows you to choose a method that feels most comfortable for you.

- Voice activated talk
- Push to talk.

For voice activated talk, simply start talking. Whenever you speak, the digital audio will be recorded. However in very noisy environments, you may want to use the Talk button to specify when to record your voice.

Push to talk uses the Talk button.

When you wish to talk, hold the talk button down. You must use the left mouse button to depress the Talk button. When you are done talking, release the button. When the Talk button is in the 'up' position you are not recording audio data. This allows for more efficient video recording as only video data will be recorded. When the button is 'down' the color coded display will turn green. When the button is 'up' the color display will be dark red.

Dark red- audio is not being recorded.

Green – you can speak and audio will be recorded.

FINE TUNING VIDEO LINK MAIL

Video link mail provides you with controls over your video, audio and call connections. To access these controls, use the *Fine Tune* option from the setup menu, or press the **Tuning** button. The fine Tuning dialog will appear.

VIDEO CONTROLS

With any Video technology, there is a trade off between picture quality and picture frame rate. At one end, a very high quality image with virtually no loss in picture quality from the original will require greater processing power, providing a low number of picture updates in each second. On the other end of

the spectrum, a picture that has lost much of its clarity and appears blocky will provide a high frame rate. This Trade off is true of video link mail aswell. Video link mail has built with the idea that the perfect compromise between picture speed and quality is a personal thing; one on which each one of must be able to control. This is why VideoLink mail has included local video controls.

The following controls are provided:

- Picture quality
- Camera sensitivity

The following controls may also be available if your video input device does not configure these settings automatically.

- Brightness
- Color saturation
- Lighting options

Each of these options are described below.

Picture Quality: As described above, you can control the Trade off between high picture quality and high speed. By moving the slider for Picture quality between Sharpest and fastest, you will find a point where the speed of the image and the look of the image is best for you. If you get confused and find it difficult to get back to the original settings , simply click on the Default button at the bottom of the Fine Tuning dialog box. Note that this will reset the factory defaults for all settings on the Fine Tuning dialog.

Camera Sensitivity: This setting is a filter that helps to clean up . images from some cameras. Sometimes cameras can generate Visual noise in a picture. This can be seen by taking your camera and pointing it at a blank, white wall and studying the image it produces. Typically you will see 'boiling' or some kind of movement or motion in the picture, even if there is no real motion.

By decreasing the sensitivity, you can cut down on the effects of this visual noise. All cameras produce some level of noise , so the filter is usually not all the way on the *High* end. If the setting is too far towards Low sensitivity, you will see the image 'smear' as things move across the screen-almost as if part of the image moves and part of the image stays still. In this case, the sensitivity is set so low that is actually ignoring real motion, rather than just camera noise.

OPTIONAL VIDEO CONTROLS

There are many different types of video input devices. VideoLink mail detects the type of device being used and provides controls which allow you to adjust settings that your video unit does not set automatically. If your fine tuning dialog does not provide any or all of the following options, then these settings are configured automatically.

Brightness: This setting helps to control the brightness of the picture. This option effectively opens or closes the amount of light that gets into the camera lens, thus making the picture bright or dark. If the image appears too dark, move the slider towards the Bright setting until the image has the best possible appearance.

Color: This setting controls the color saturation which will be used in the display. This works like the color option on your television. If the image appears dull, move the slider towards the Color setting until the image has an appropriate amount of color.

Lighting options: These options allow you to adjust VideoLink mail for your current lighting situation and preset the camera so that it is best suited for specific types of lighting. The following options are available:

- *Daylight:* This section will adjust VideoLink mail for day light conditions or when your camera is near uncovered windows.
- *Indoor:* This section will adjust VideoLink mail for standard indoor lighting conditions where plenty of incandescent or fluorescent lighting is available.
- *Low light:* This section will adjust VideoLink mail for low light conditions.

INTERFACE UNIVERSAL MEASUREMENT SYSTEM WITH COMPUTER

1) AC/DC VOLTAGE MEASUREMENT:

Warning: Do not try to measure a voltage greater than 1000 volts DC or 750 volts AC. You might damage your meter and expose yourself to a severe shock hazard.

Note: All figures on the display blink when more than the maximum voltage (DC 1000/AC 750 volts) is supplied.

Follow these steps to measure AC/DC voltage:

- 1) Rotate the range selector to the desired V position.
- 2) Press the DC Ω /AC button to toggle between DC and AC voltage.
- 3) Plug the black probe into the meter's com terminal and the red probe into the meter's v/ Ω terminal.
- 4) Connect the meter in parallel with the load of the circuit.

Notes:

- If polarity is negative ,appears on the left of display.
- For the most accurate measurement,select the lowest voltage range possible without getting an overload reading.
- Each of the ac/dc voltage ranges presents an input impedance of approximately $10\text{M}\Omega$ in parallel with less than 100pF .AC voltage is ac-coupled to the $10\text{M}\Omega$ input.

CAUTION:Never try to measure an AC voltage that is riging on DC voltage level where the peak AC voltage 1000V exceeds with respect to earth ground.

2.MEASURING AC/DC CURRENT

WARNING:YOU MAY DAMAGE THE METER OR BE INJURED IF THE FUSE BLOWS WHILE CURRENT IS BEING MEASURED IN A CIRCUIT WHICH EXHIBITS AN OPEN CIRCUIT VOLTAGE GREATER THAN 250VOLT .THE 20A TERMINAL IS FUSED.A SEVERE FIRE HAZARD AND SHORT CIRCUIT DANGER EXISTS IF YOU APPLY A VOLTAGE WITH HIGH CURRENTS CAPABILITY TO THIS TERMINAL. THE METER CAN BE DESTROYED UNDER SUCH CONDITIONS.

Follow the steps to measure current:

- 1.Rotate the range selector to the desired amper position.
- 2.Press DC Ω /AC button to toggle between DC and AC amper.
- 3.Plug the black probe into your meters COM terminal and the red probe into your meters mA or 20A terminal.
- 4.Remove power from the circuit under test and than break the circuit at the appropriate point.
- 5.Connect the meter in series with the load or circuit under test.

Notes:

- If you do not know approximately what the current is, connect the circuit to 20A input terminal first to see if you have a safe level for the mA input terminal. Use the mA input terminal for current up to 400mA .
- When measuring current, the meters internal shunt resistors develop aq voltage accross the meters terminals called 'burden voltage'. This voltage drop is very low in your meter, but it may effect precision circuits or measurement.
- If you set the meter for DC current,m –appears or dissappesars to indicate the polarity of the measured current.

3) MEASURING CAPACITANCE

Follow the steps to measure normal capacitance.

- Discharge each capacitor before testing by shorting its leads together. Use caution when handling some capacitors, as they can be charged with considerable electricity.
- Insert the discharged capacitor into CAP+ and – clips connectors. Your meter displays the capacitance value.
Note: for polarized capacitors, be sure to insert the negative lead in the clip.

4) MEASURING RESISTANCE

Warning: NEVER CONNECT THE TEST PROBES TO A SOURCE OF VOLTAGE WHEN YOU HAVE SELECTED THE OHMS FUNCTION AND PLUGGED THE PROBES INTO THE V/ Ω TERMINAL. BE SURE THAT THE CIRCUIT UNDER TEST HAS ALL POWER REMOVED AND THAT ANY ASSOCIATED CAPACITORS ARE FULLY DISCHARGED BEFORE YOU MAKE A RESISTANCE MEASUREMENT.

Follow these steps to measure Resistance:

- 1) Rotate the function selector to the Ω range.
- 2) Press the DC Ω /AC button to toggle between resistance and continuity.
- 3) Connect the probes to the device you want to measure.

Notes:

- If the measured resistance value exceeds the maximum value of the range selected, 'OL' displays to indicate overload and the bar graph flashes.
- The resistance in the test leads can diminish accuracy on the lowest range. The error is usually 1 to 0.2 ohms for a standard pair of test leads.
- For resistance of approximately 1 megohm and above, the display might take a few seconds to stabilize. This is normal for high resistance readings.

5) CHECKING DIODES

This function lets you check diodes and other semiconductors for opens and shorts. It also lets you determine the forward voltage for diodes. You can use this function when you need to match diodes.

Follow these steps to check diode.

- Rotate function selector to the diode position.
- Plug the black probe into your meter's COM terminal and the red probe into your V/ Ω terminal.

- Connect the probes to the diode you want to check and note the meter reading.

Notes:

- If the display shows a value , for example 0.2 for germanium diode or 0.5 for a silicon diode, reverse the diode. If the meter indicates an overrange , the diode is good. The displayed number is the diodes actual forward voltage.(up to 0.2 volts).
- If the display indicates an overrange condition, reverse the polarity of the connection. If the display shows a value , the device is good. The displayed value is the component's actual forward voltage . If the display still indicates an overrange condition, the device is open.
- If the display shows a value both before and after you reverse the polarity,the device is shorted. When you connect the diode to the meter, and the meter displays the devices forward voltage, the red test probe or socket is connected to the diodes anode, and the black probe or socket is connecte to the diodes cathode. This meter supplies enough forward voltage to light most leds. However if the leds forward voltage is greater than 2.0 volts, the meter incorrectly indicates that the device is open.

6) CHECKING CONTINUITY

Continuity testing verifies that circuit connections are intact. To perform audible continuity tests, set the rotary switch to Ω press the DC/ Ω AC butto to toggle between resistance and continuity, and connect the meter to your circuit.

Note: The buzzer sounds if the measured resistance is below 30 ohms.

7) LOGIC TEST

The logic function lets you easily check the digital circuits to determine the logic state of different parts of the circuit. Rather than display an absoute voltage, this function displays Hi, LO or ---- indicated logic high, low and undetermined respectively.

Follow these steps to perform Logic test:

- 1) Rotate the function selector to the logic range.
- 2) Plug the black probe into your meters COM terminal and the red probe into your meters V/ Ω terminal.

- 3) Connect the black probe to the ground point (GND) of the test circuit and the red probe to the supplying voltage point(V+). While keeping the test probes firmly connected to each point, press Set/Reset key.
- 4) While keeping a connection between the black probe and the circuit's GND point, move the red probe to the other desired points. The meter immediately displays one of the 3 modes, as follows:
 - If value exceeds 70% of the stored (V+) value, Hi(high) appears.
 - If value falls below 30% of the stored (V+) value, Lo(LOW) appears.
 - If value is between 30% and 70%, the segment ---- appears.

Note:

- In this mode, the data-hold and Max/min hold functions do not work.
- The supplying voltage above 3V for setting the reference value and from 0V up to 39.99V is limited for testing a logic.
- After performing logic test, you must press set/reset button before rotating the range selector to another range.

8) USING THE METER WITH A COMPUTER

INTERFACING THE METER WITH A COMPUTER

Follow these steps to interface the meter with a computer:

- 1) Connect the RS-232 cable between the meter and computer's serial ports.
- 2) Turn on the meter.

USING THE SUPPLIED SOFTWARE

The supplied software runs on PC-compatible computers only.

Follow these steps to use the supplied software.

- Place the diskette into the disk drive. Copy the files from the diskette to the computer's hard disc or make a back-up copy of the diskette to use.
- Input execution filename at DOS prompt and type ENTER.
- Press F10 on the keyboard to start the program. Follow the On-screen prompt.
- Select meter type of M3850/3830 on Setup menu.

Notes:

- To stop execution or to escape from a device, I/O error, press CTRL+BREAK at the same time.
- The supplied program works only with VGA monitors.
- For more information on running the program, select the HELP option from the menu.

Caution: To avoid operation error , do not set your meter at COM mode during interfacing the meter with a computer.

Communication Parameters:

- Transmission rate: 1200 baud.
- Character coding: 7-bit ASCII
- Parity: None
- Stop bits: 2

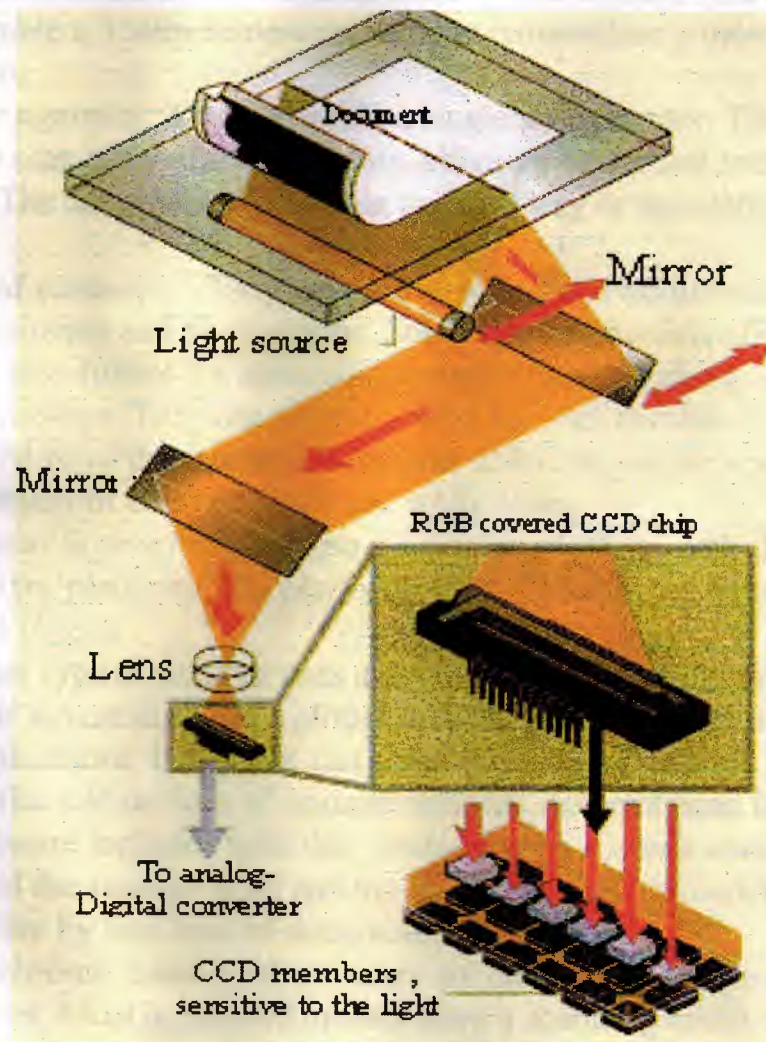




SCANNER



STRUCTURE OF A CCD DESKTOP SCANNER



SCANNING TECHNOLOGY

SCANNERS

Scanners evolved from the large, expensive self contained units to smaller, printer sized units and even low -cost hand-held units. These smaller units are often grouped together as desktop scanners. The following types are generally referred to , although there is some overlap in classification.

Camera Based scanners: They use photographic technology to produce very high resolution scans of two or three dimensional objects. The scanner head might resemble a 35mm camera and can be mounted on a moving tower above a flat platform.

Feeder scanners: They resemble a single sheet printer. They are usually designed to scan letter size documents, although larger and smaller sizes can be supported. The document is placed in an input tray or manually fed through the unit.

Flat-bed scanners: They are used to scan flat, two dimensional objects such as documents and photographs. Some flat-bed models offer a multiple page feeder attachment for automatic multiple page scanning.

Slide scanners: They are typically used for high resolution color scans of 35 mm slides. Most of these scanners support 256 Gray -scale level output for gray scale conversion of color or black and white slides.

Overhead Scanners: They use a scanning platform with the scanning head fixed above the platform. The platform allow the scanning of small three dimensional objects.

Another type of scanner uses a device that replaces the drawing head of a plotter. This device is called a plotter add-on type of scanner and is used for drafting applications because it can scan large sized drawings.

A similar add on type of scanner replaces the print head in a dot-matrix printer. Software included with this printer add on scanner controls the movement of the scanner head and the document feed through the printer, allowing a line by line scan of documents and photos.

Monochrome hand-held scanners are small , low cost, manually operated scanning units. Most hand-held models have a scanning width of about four inches and use imaging software for scanning larger documents.

Color hand-held scanners can provide full color of 256 gray-scale level scans. The color output is usually produced by combining information from separate red , green and blue scan passes.

SCANNING TECHNOLOGY

The scanner is the unit that converts the marks on the page being sent into electrical signals. A photosensor, looks at a very small spot, determines whether it is black or white, and generates a strong or weak electrical pulse. To read a page

electronically, all of the spots on a thin strip, 1/100th inch high across the top of the page are read, one at a time, starting with the upper left hand corner. A stepper motor moves the page down and the photosensors reads the next strip below. Successive strips are read until the whole page is converted into electrical pulses. An electronic clock, which ticks about a million times a second, causes one photosensor to be read Per tick. The whole page can be read in 10 seconds or less.

Both the CCD chip and contact image sensor types are available in 1728, 2048, or 2432 photosensor arrays.

Self contained scanners are available for personal computers. When scanners first became available, most were based on facsimile scanning technology with 230 dpi. Now most scanners for PC's offer higher resolutions of 300 or 400 dpi.

CCD CHIP SCANNERS

The camera type of optical imaging system has a small charge coupled device(CCD) photosensors chip were the film would be in a camera. There are 1728 photosensors in a straight line across the chip. A reduced size image of the page is focused on to the CCD chip in a manner similar to that of a 35 mm camera.

The scanning line position on the page is determined by the part of the image falling onto the photosensitive strip of the chip. A fluorescent lamp near the page being sent illuminates the scanning line. As with a camera, the lens can not be very close to the page. A distance of at least 12 inches is required between the scanning line and the CCD chip. Precision optical alignment is then required with a rigid mounting for the optical components. Limitation on lens designs result in slight geometric and other distortions. The 8 1/2 inch page width matches that of the 10:1 reduced size image on the CCD chip.

Each photo sensor element across the CCD chip is a light sensitive resistor connected in parallel with a small capacitor. The capacitor starts with a full voltage charge. If the image spot is white, the photo sensor has a very low resistance and the voltage drains off the capacitor. A black image spot causes the photo sensor to have high resistance and the capacitor is not discharged. The voltage at each photo sensor element, when read depends on the black-white image pattern for the thin strip scanning line across the page being sent. The picture signal is the current pulse into the capacitor as the photo sensor is charged for the next scanning line. Each capacitor has the whole time between scanning lines for the voltage to leak off, providing good sensitivity.

A clock and shift register starts sampling at the left edge photo sensor with the current pulse amplitude representing brightness of the imaged spot. The amplitude of this video pulse is highest for white and lowest for black. Gray

pixels have intermediate amplitudes. The next clock pulse connects the adjacent sensor to the output. The process repeats until the last sensor for the right side of the page is sampled. After this 1728th pixel is sampled, a stepper motor moves the page down 0.01 inch, and clock sampling continues across the next scanning line.

An electronic shading circuit then corrects for fall off in brightness near the edge of the page and the variations in sensitive of the individual photo sensor elements. This circuit stores in a RAM the white signal voltage for each pixel across the page when a white border is scanned. Correction is then made for each pixel sensitivity while the page is being sent.

The voltage of the corrected picture signal at this point varies directly with the darkness of marks being scanned. This signal is then changed to black or white only by an analog to digital converter(A/D). The A/D converter has an input threshold voltage that separates the mark voltages from those of the backgrounds. The output of the A/D is a digital signal with each pixel converted to a one-bit pel. This step is necessary for efficient coding of the picture signal. The black-white effect on the page being sent is the same as that produced by an office copier.

CONTACT IMAGE SCANNERS

CIS uses a strip of photo sensors the 8 ½ inch width of the page being scanned instead of about 0.8 inch across a CCD chip. All of the scanner elements are contained in a small bar mounted so as to be in contact with the page being scanned. The bar contains lamps for illumination of the scan line, optics if any, and video signal processing circuitry.

The photo sensor strips usually are three silicon CCD or cadmium sulfide-cadmium selenide strips, each three inches wide, or a single full width strip of amorphous silicon. The three strips are assembled end to end for an 8 ½ inch wide scanner. The strips may be staggered with overlap to allow a mounting area for the sensors at the end of each strip. Analog memories fabricated with the CCD chips compensate for the offset stagger required between adjacent strips. Signals from the strips that first see the scan line being read delay their outputs for a few paper feed steps until signal for the remaining sections of the same scan line is available from the other strips. One company, Matsushita has developed a manufacturing technique for mounting all CCD chips in a straight line, thus avoiding the stagger compensation problem.

Amorphous silicon arrays use a coating process that makes a single array the width of the whole scanning line. Amorphous silicon is less expensive, but the signal noise ratio is less than CCD types.

CIS scanners have the advantage of the exact dot position across the page and the same sharpness of focus on the end of a line as in the center.

OPTIC CIS

A narrow bar containing rod lens fiber optics is mounted between the page being scanned and the photo sensors. Only about five centimeters are required between the sensor array and the page being scanned. (See the figure.)

A florescent lamp, mounted close to the scanning line, illuminates the page being scanned. The scanning line is directly above the fiber optics rod lens array. It is focused with a 1:1 magnification onto the long image sensor strip below it. Each photo sensor element is the same size as the pixel image that it sees. In an alternative arrangement, illumination of the line being scanned is provided by one or two rows of light emitting diodes.(LEDs). The led arrays have a built-in lens on the end of each diode. cx

Optic CIS unit is also available in moving scan head design where the page to be sent is held face down on a glass plate and the scan head reads through the glass as it moves down the page.

FULL CONTACT CIS

The full contact type of the CIS is constructed with a whole through the center of each photo sensor element. The LED array for illumination of the scan line is on one side of the photo sensor strip and the page being scanned is on the other. Light from a LED passes through a photo sensor hole (window) to illuminate a very small spot on the page being scanned. A transparent coating on the page side holds the paper a small distance from the sensitive side of the photo sensor strip, allowing light from the illuminated spot to reach the sensitive area of the photo sensor surrounding this hole.

Practically none of the light reflected by one spot is picked up by adjacent sensors. The optical efficiency of this system is higher than with rod lens optical imaging.

Higher resolution camera and full-contact CIS scanners with 300 or 400 dpi are available for using with PCs.

CHARGE-COUPLED DEVICES

CCDs (charge-coupled devices) are important component in today's scanners. They have evolved over the years to their present level of capabilities. CCDs have improved along with large scale integrated circuits and the reduction in size of memory chips. CCD images are being used to bring back photos from distant planets. In the 1970s they were used in products like electronic still-video cameras and camcorders.

The actual scanning is performed with an array of CCD elements. Each element is a pixel or picture element with the light from the object image on it.

In the CCD a photo conductive material is used similar to that in the vidicon tubes used in video cameras. IN the vidicon tube, a single layer is used where the scanning beam defines the picture element. The solid-state CCD sensor has individual picture elements that are accessed by separate leads. This construction makes the solid-state sensor more expensive to manufacture.

In the vidicon tube, change in the scan velocity and other problems affect performance. Solid-state sensors provide better positional accuracy. Color is created by using a repetitive pattern of color filters. Using these CFA(color filter array), each pixel is covered with a color filter that allows only that color to pass.

The CCD uses charge couplings. Small amounts of electrical charge are created in the silicon semiconductor material. These areas are created by an electric field between a pair of gate electrodes, which are located close to the surface of the silicon.

The CCD elements are placed next to each other and as the voltages on adjacent gate electrodes change, the individual charge packets beneath them are passed from one element to the next. The CCDs act as shift registers because they transfer their charge to the next element while the amount of charge in each packets stays the same, even as it is passed from one element to another.

When the silicon absorbs the light striking its surface , free electrons are generated. The number of free elements generated is proportional to the light striking the surface. This light image is a reproduction of the original scene and it generates a proportional electrical charge. The charge packets are transferred by charge coupling, and the value of each charge packet corresponds to a picture element or pixel. The actual CCD sensors are made of a series of horizontal and vertical rows, creating xy array of elements.

CCD SENSORS

Monochrome have higher speeds because it is not necessary to have the three alternating systems of red, green, and , blue, all of the pixels are available for the collection of photons. The newer sensors transfer energy closer to the surface so more energy can be collected and produce a higher speed sensor.

CCDs are more reliable compared to vacuum picture tubes. They are lower power devices , but they can accept large amounts of light without damage or change to the photo sensitive surfaces. CCDs generate electrical noise but this noise is low enough to give good performance.

Noise is an image appears as granular spots. Most noise in the systems does not come from the CCDs. It comes from adjacent circuits and connections on the system.

The scanners use multi-element CCD arrays and some units can be used with large format E-size drawings that are 34x44 inched. Some of the larger

units have a fixed scan head and a drum on which the paper moves. Others use a flatbed for the document and move the sensor array.

Gray scale refers to the number of shades of the gray the scanner is able to represent Per dot or pixel. A scanner that is able to represent only black-white is said to have two levels of gray. The more shades of a gray scanner able to detect and record the more closely the scanned reproduction matches the original.

Conventional halftone techniques for printing photographs use dots of different size to represent the shades. In many digital scanning device , the dots are the small units called grains. A grain can be made up to 4,9,16,25,36,64 dots in a square array. The smaller grain sizes provide more details.

Gray scales are produced by partially filling the grain . A2x2 grain has four possible fill slots, and it provides a five step gray scale. An 8x8 grain can provide 33 grain levels that means more shades but less detail. Grains are no used for line art.

The resolution of a scanner refers to the scanners sensitivity. A scanner resolution is measured in dots (or pixels) Per square inch. The maximum image size depends on the scanner physical scanning range. Scanning speed refers to how quickly the scanner operates.

In a color scanner , the color information the scanner detects and records is done for each of the three basic colors: red, green and blue are mixed to produce other colors.

PRINTERS

Types of printers:

Dot-matrix printers:

The dot-matrix printer creates the character by selectively moving tiny pins to form a pattern of dots in the shape of the desired character. The dot-matrix printing mechanism does not rotate , but it prints using a vertical array of the wire pins. Typically seven to nine pins are used in low resolution printers, and 18 or 24 pins are used in high resolution printers. The more wire pins the unit has, the more closely the printing mechanism approximates the print quality of fully formed characters.

The characters to be printed are stored in ROM , which determines which pins in the array are to strike the ribbon and imprint the character on the paper.

The impact process used is the traditional way to transfer ink to paper. It involves the compression of paper, type element, and inked ribbon . Impact printers Press the character element against

PRINTING TECHNOLOGY

The print head has a row very small resistor-element spots across the recording paper width, 1728 for 8.5 inches or 2048 10 inches. The thermal causes it to become hot enough to mark the paper in a spot about 0.005 inch in diameter. The spot temperature must be changed from non marking temperature to marking temperature and return to non marking before the paper steps to the next recording line. The recording cycle may be 2.5 to 5 ms. In one design, 24 V at a power level of 0.5 W is applied to a marking resistor for about 0.6 ms. Marking temperature is about 200 F . Other head designs use 12 or 6V.

Either thin film or thick film technology is used for making the print heads take lower recording power and can be made with higher resolution. The head wires and integrated circuit elements are made in one compact head assembly.

PRINTERS

Generally, the most convenient and useful method by which the computer can deliver information is by means of printed characters. For the sake of convenience, the printer should have the ability to print alphabetical characters, decimal digits, and also common punctuation marks.

The process in printing is the inverse of the encoding procedure in which a key corresponding to an alphanumeric character is depressed, causing a coded binary character to be punched into a tape or card. In this case, coded groups of binary bits are delivered to the printer, which decodes them and then prints the correct characters. The basic binary code groups may contain five through nine bits depending on the coding for alphanumeric characters that the printer provides.

The information delivered to a printer operated online will be in the form of electronic signals directly from the computer. If the printer is operated offline, the reading and the coding of data stored on punched tape, punched cards or magnetic tape may be a part of the printing operation. Since the electronic circuitry of a computer is able to operate at speeds much higher than those of mechanical printing devices. It is desirable that a printer operated online be capable of printing at a very high speed. Even if the printer is operated offline, speed is highly desirable since the volume of material to be printed may be quite large.

Most of the original printers were converted electric typewriters, and this type of printer is still popular. If the code used contains eight bits per character and the printer is operated online the computer will deliver eight bits to the printer which will decode them and energize a solenoid which will actuate the correct key of the typewriter. The codes used generally include coded characters.

Faster printers are constructed in which the raised characters are distributed around a print wheel which revolves constantly. In this case, print wheel does not contain moving parts but consists of a motor driven drum with a number of bands equal to the number of characters printed per line. A set of all the characters which are used is distributed around each band. The print wheel is revolved continuously when the selective character is in position the print hammer strikes the ribbon against the paper and thus against the raised character on the print wheel located behind the paper. A printer of this type requires a decoder and the memory for each character position along the line, and also a character timing encoder for each position, which determines when the selected character is in position. Printer of this type can print up to 1250 lines Per minute with 160 characters per line.

In order to provide inexpensive printers for mini and micro computers, lower speed "character at a time" printers are used.

The use of pins which are driven against the paper to print characters also provides low cost printing. Sometimes, the pins are arranged in a complete dot matrix but sometimes only a single column 7 pins is provided and this is moved across the paper requiring 5 positions per character.

The ideal system would of course be able to adopt to many different fonts. Some systems particularly one developed by the Post Office, even read handwritten characters. The limited success of these systems is due to many shapes that a given character can have.

PRINCIPLES OF DIGITAL SATELLITE COMMUNICATION WITH SATELLITE ANTENNA

INTERNATIONAL COMMUNICATIONS BY SATELLITE

Various organisations and governments provides operational satellite communication service. The use of satellites for communication continues to expand as existing networks are enlarged, and numerous other countries are implementing their own domestic satellite communication networks.

In almost all systems the communication satellites are in orbits that are synchronous with the earth rotation, which allows considerable systems simplification. Each earth terminal then operates continuously with the same communications satellite. The initial defense communications satellites (IDCS) were not synchronous , but instead they drifted slowly around the earth, relative to a fixed point on earth in approximately two weeks. They required each earth terminal to hand over from satellite to satellite thereby causing time gaps in communications. Synchronized satellites avoid the hand over problem but require additional fuel to make longitudinal and possibly latitudinal corrections to the orbit. This additional fuel is a small price to pay however for the simplicity in system operation and the avoidance of communication gaps.

ADVANTAGES OF DIGITAL TRANSMISSION

Communications by digital signaling is an increasingly imported technique for radio-communication by satellites relay and other means. Digital transmission has a number of advantages over other techniques. This includes:

1. The ease and efficiency of multiplexing multiple signals or handling digital messages in packets for convenient switching.
2. The relative insensitivity of digital circuits to retransmission noise. Commonly a problem with analog systems.
3. Potential of extremely low error rates and high fidelity through error detection and correction.
4. Communications privacy and
5. The flexibility of digital hardware implementation, which permits the use of microprocessors and mini processors, and the use of large scale integrated (LSI) circuits.

Digital transmission techniques are gaining increased usage for satellite communication, microwave relay, and the cable of waveguide transmission. However, the original and final forms of the information transmitted by the digital link may be analog voice or video and therefore

the analog/digital interface is an important element of the communications system.

SYSTEM CONFIGURATION

Inputs can arrive at the ground terminal in a variety of analog and digital forms. These original information sources analog and digital commonly include:

Analog

Voice

Multiplexed voice

Video

Scanned mail or letters

Digital

Teletype or multiplexed teletype

Computer input/output

Digital television or imagery

Digitized voice

THE EARTH SEGMENT

The earth segment of a satellite communications system consists of the transmit and receive earth stations. The simplest of these are home TV receive only systems, and most complex are then terminal stations used for international communications Networks. Also included in the earth segment are those stations which are on ships at sea, and commercial and Military land and aeronautical mobile stations. The earth stations are used exclusively for logistic support of satellites, such as those providing the telemetry, tracking, and command functions, are considered as part of the space segment.

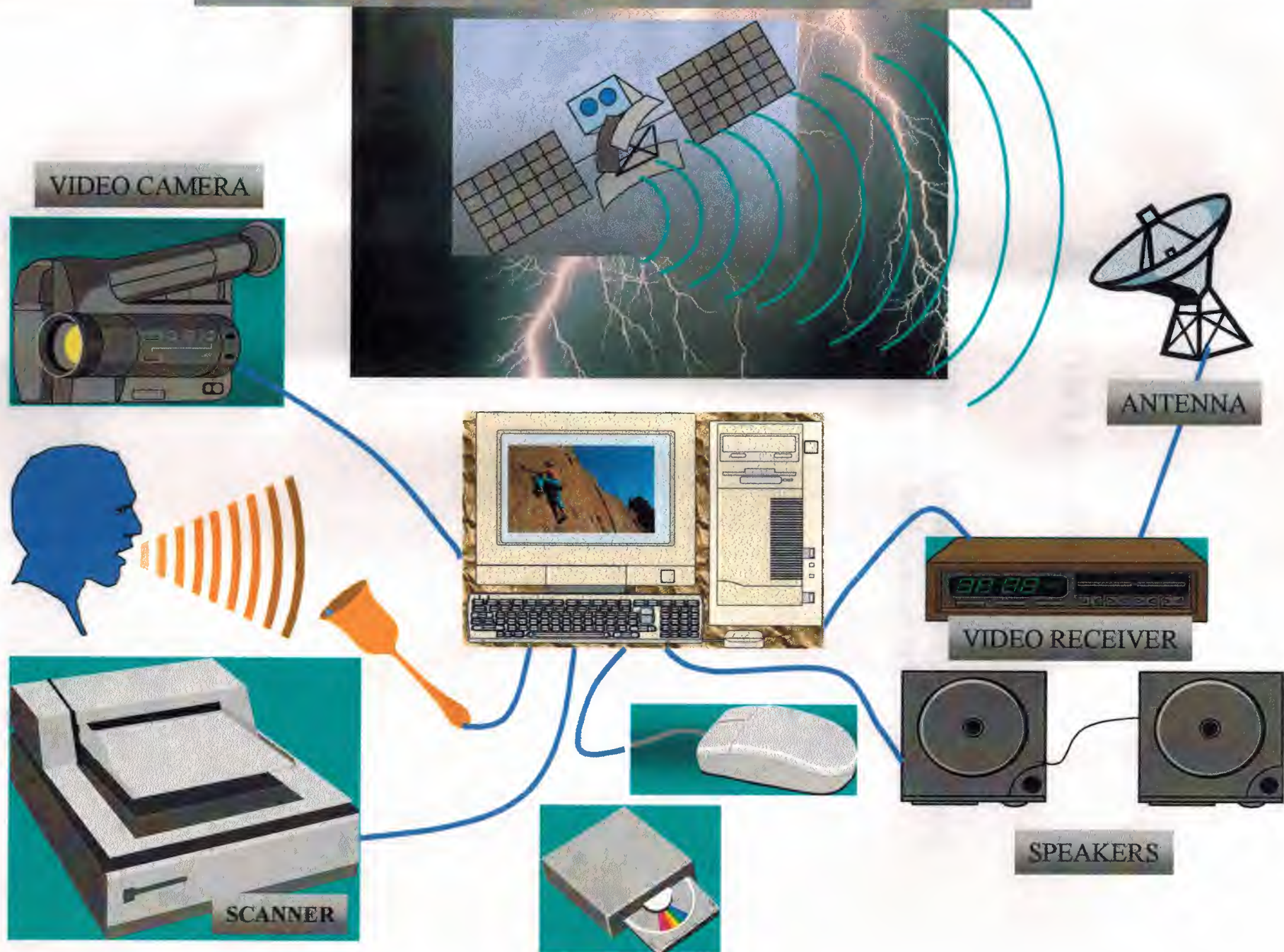
RECEIVE ONLY HOME SYSTEMS:

Planned broadcasting directly to home TV receivers is scheduled to take place in the Ku (12-GHz) band. This service is known as direct broadcast satellite (DBS) service. There is some variation in the frequency bands assigned to different geographical regions. In the Americas for example, the downlink band is 12.2 to 12.7 GHz.

The comparatively large satellite receiving dishes which are a familiar sight around many homes, are used to receive downlink TV signals at C band (4 GHz). Such downlink signals were never intended for home reception but for network relay to commercial TV outlets (VHF and UHF TV broadcast stations and cable TV head end studios). Although the practice of intercepting these signals seems to be well-established at present, various technical, commercial and legal factors are combining to deter their direct reception. The major differences between the Ku-band and the C-band receive-only systems lies in the frequency of operation of the outdoor unit, and the fact that satellites intended for DBS have much higher EIRP.

Cost estimates for a complete receive-only station for the home are in range of 300\$ to 800\$, with some operators holding the view that the cost must be 350\$ or less for the DBS service to win public acceptance.

MULTIMEDIA PROCESSING SYSTEM



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