DIGI VIEW

User's Manual

Software Version 4.0

NEWTEK

INCORPORATED

DIGI-VIEW

Software Version 4.0 Manual

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Smart-View file requester by Stephen Hartford

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FOREWORD By Tim Jenison

I'd been hunched over my test bench for many hours before an image emerged from the original prototype Digi-View. When that first HAM image did finally appear I was so excited I had to run around the building several times. A few months later I was in Los Gatos to show the Amiga's creators what I'd gotten their machine to do. The stunned silence when that first image came up on the screen made all those months of work worthwhile. I was amazed to hear from Jay Miner that the Hold And Modify mode was almost taken out of the Amiga at the last minute. They didn't think anyone would ever find a use for such a complex mode.

Since then Digi-View has become the most successful video digitizer ever sold for any brand of computer. There are Digi-Views in every country on the globe. It has found a home among doctors, realtors, teachers, artists, and engineers. Even though our users include the three networks, Miami Vice and Oingo Boingo, I'm glad to know many students and hobbyists are getting just as much out of Digi-View.

Today, there are over a dozen programmers working with our Alcatraz Research Laboratory pushing the limits of the incredible Amiga. While I've been busy designing the Video Toaster, Ken Turcotte has been implementing my ideas and many of his own into Digi-View 4.0. When the first Dynamic HiRes 4096 color image came up on Ken's screen, I got that same "breakthrough" feeling I had four years ago. I'm glad we have a bigger building now, Ken's been keeping in good shape running around it. It's rewarding when our 60 hour work weeks pay off by showing the world what the Amiga can do. Thanks for supporting Digi-View. We are working every day exploring the awesome potential of the Amiga. Stay tuned, more exciting breakthroughs are on the way.

Tim Jenison
President, NewTek, Inc.
November 1989

What's new with Digi-View 4.0?

- Dynamic HiRes

  Using NewTek's new dynamic palette control all 4096 colors can be displayed in high resolution with overscan.
- Dynamic HAM

  Dynamic palette control provides sharper HAM images, virtually eliminating HAM fringing.
- LBJ Noise Reduction

  NewTek's LBJ technology allows the user to selectively filter background noise from the video signal for sharper, clearer images.
- ARexx support

  Digi-View 4.0 can be controlled externally by other programs allowing remote or automated operation.
- Digi-Port

  Captured images may now be displayed directly into Digi-Paint 3. HiRes images create super-bitmaps.
- Change Resolution

  Resolutions may be changed from inside Digi-View 4.0.
- Improved Multitasking

  Multitasking support has been improved including a toggle on/off drag bar and front/back gadgets.
- 24 Bit Color Support

  24 bit RGB files may loaded and saved for further image processing or exporting to typesetters or frame buffers.
- Enhanced memory management

  Digi-View 4.0 is more efficient with memory including optional WorkBench open/close to save chip memory.
- Smart-View File Requester

  New "smart" file requester that lists all available volumes or devices alphabetically.
- Dyna-Show

  Slide show program that supports IFF and NewTek's new Dynamic modes.
- Accu-Droid

  New smooth servo controls for accurate Digi-Droid alignment.
- TOLL FREE Support Line

  Extended-hours technical support. Our customer service staff is here to answer any questions you may have.
- 68020 Support

  Fully supports the high speed 68020 processor.
- and more ...

  Many other enhancements have been added to Digi-View 4.0 , allowing you to create images with ease.

How To Use This Manual

Generally, this manual assumes some familiarity with computers and the Amiga in particular. If you are totally unfamiliar with the Amiga, we recommend that you read the Amiga User's Manual before using Digi-View. If you're familiar with the Amiga, you should find Digi-View 4.0 quite easy to use.

In this manual when referring to the software we will use the term Digi-View 4.0 and when referring to the Digi-View or Digi-View Gold hardware module we will use the term Digi-View module. This software is compatible with both Digi-View and Digi-View Gold hardware modules. For more information about setting up the Digi-View hardware, please refer to your hardware manual provided with the Digi-View module.

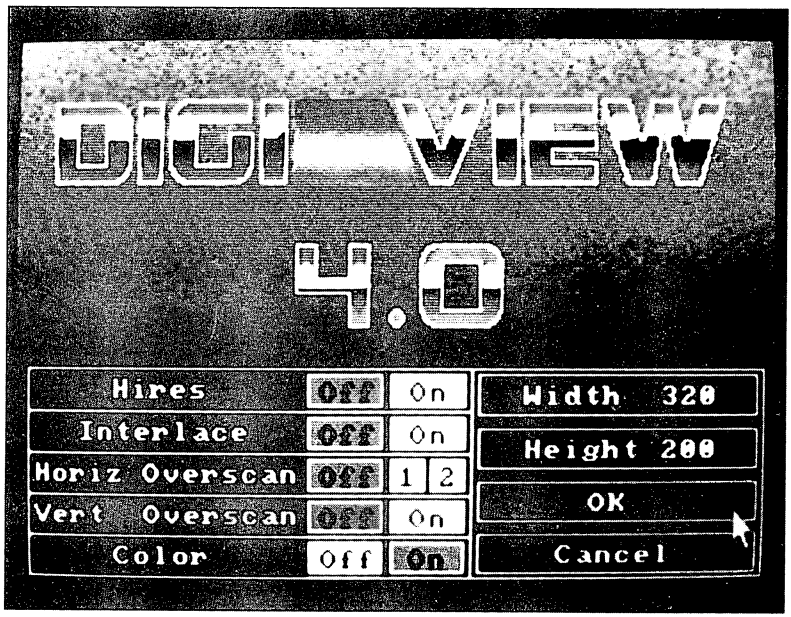
Getting Started

Hardware Installation

To install your Digi-View module or Digi-Droid Automated Filter Wheel, please refer to the manuals included with these products.

Software Installation

You should make a back-up copy of Digi-View 4.0 before using (Digi-View 4.0 is NOT copy protected), in case your disk is damaged during use. If you have already started Digi-View 4.0, pull down the Project menu by holding down the right mouse button, then move the pointer to Project. Still holding down the right mouse button, move the pointer down to Quit, then release the button. You will be returned to the Workbench, where you should make a copy of your Digi-View 4.0 disk. From now on, always use a copy of Digi-View 4.0 instead of the original. Store the original in a safe place away from your computer. For more information regarding how to make a backup disk, refer to your Amiga User's Guide.



Turn on your Amiga and insert the Digi-View 4.0 disk when the picture of the workbench disk appears on the screen (if you have an Amiga 1000, first insert the Kickstart disk in the internal drive. When the screen shows a picture of the Workbench disk, then insert the Digi-View 4.0 disk). When the Workbench screen appears, point to the Digi-View 4.0 disk icon and double click the left mouse button. The window will open. Double click on the Digi-View program icon. Digi-View 4.0 will then load into your Amiga.

Once this is done, you will see the Digi-View 4.0 title screen, which will allow you to select the resolution that you want to digitize in (see photo). There are two ways to select a resolution: by clicking on one of the gray (orange when selected) "on" or "off" boxes in the middle of the screen, or by clicking in the "height" and "width" boxes on the right. Continuous clicking with the left mouse button in one of these boxes cycles through all of the resolution modes available in that dimension, simply stop when you see the resolution you want. There are 2 levels of horizontal overscan available in Digi-View 4.0 which are accessed by clicking on either "1" or "2" instead of "on". The "Color" option is set "on" in default and can only be unselected by clicking in the "off" box next to it.

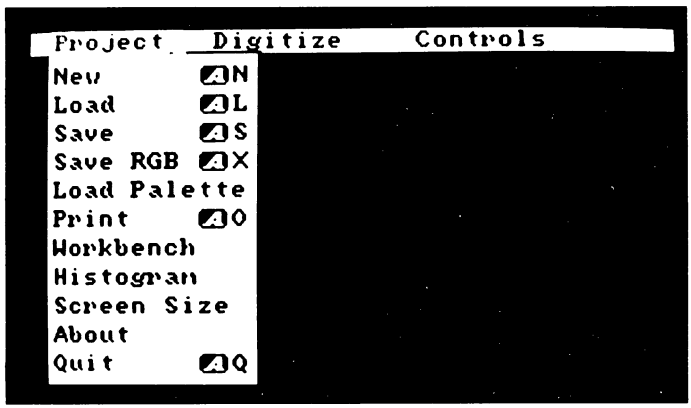
When you have the resolution that you want, click inside the "OK" box to get into Digi-View 4.0 . If you want to quit the program at this point, click in the "Cancel" box to get back to the Workbench screen.

Menus

There are three menus in Digi-View 4.0: Project, Digitize, and Controls. All menus are activated by holding down the right mouse button, moving the pointer to the top of the screen and pointing at the menu you want, then moving the pointer down until the menu item you want is highlighted. Then release the button, and that menu item will be activated. This process is called "pulling down a menu".

Whenever the term "click" or "click on" is used, it means that you should move the mouse pointer until the tip is resting on the object referred to in the text and then press the left mouse button. The term "drag" means to move the mouse pointer until the tip is resting on the object referred to in the text and then press the left mouse button and hold it while moving the mouse pointer; the slider you've "grabbed" will move as you move the mouse pointer. Release the button when the slider is in the spot you want. For more information about the use of the mouse, please refer to your Amiga User's Guide.

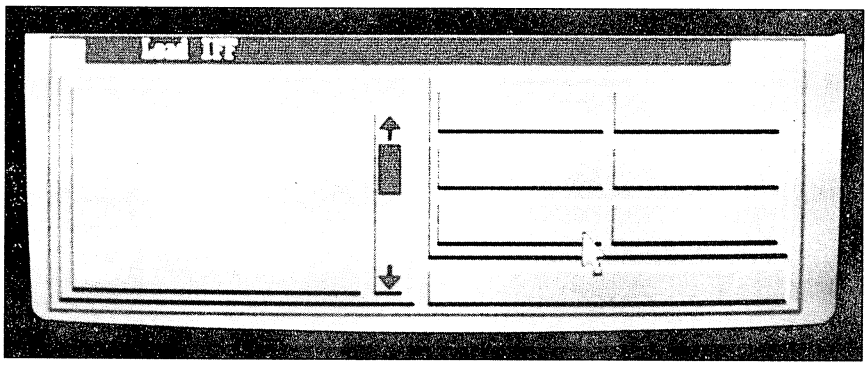
The menu bar on Digi-View 4.0 can be toggled on and off. This can be helpful if you wish to drag the window down to look at other tasks. To Toggle the menu bar, press and release the right mouse button without moving the pointer to the top of the screen. When the menu bar is activated, you can drag the window down or use the front/back gadgets. You cam also toggle the screen from front to back with the F10 key.



Project Menu

New: Pulling down this menu item clears the Amiga's memory of any images currently in Digi–View 4.0, which prepares you to start digitizing a new image. CAUTION: If you haven't saved the image on the screen before you use New, the image will be lost.

Load: Pull down this menu item to bring in IFF (Interchange File Format) images that you've stored on a disk. (IFF files are a standard format on Amiga graphics programs. Any IFF image can be brought into Digi-View 4.0) When you activate this item, the Smart-View requester will appear.



Smart-View Requester:

Layout: The current action is defined at the top of the requester. In this case it should say "Load IFF". The list window is on the left side of the requester. If there are more than seven entries in the list window you may click on the arrow buttons to slide up or down and reveal more entries. You may also drag the slider or use the up and down arrow keys from your keyboard to show more entries. The control buttons for the requester are on the right side. To select one simply click on it. The path box is below the control buttons. It lists the name of the disk and directory (and file if one has been selected) currently shown in the list window.

Choosing Disks: To select a floppy disk or hard drive, click on "Volumes". This will fill the list window with the currently mounted disks and volumes by name such as "WorkBench:" or "Devs:". Clicking on an entry will list the contents of the top (root) directory of that volume. Clicking on "Devices" will list all the disk drives and other devices such as "DF0:" or "RAM:" regardless of the name of the disk in them. (On A2000's an external floppy drive is "DF2:".) Clicking on an entry will list the contents of the top (root) directory of that device.

Choosing Directories: Directory entries (sometimes called Drawers) are preceded by "(dir)" and at the top of the list. Clicking on a directory entry will display the subdirectories and files contained in that directory. Clicking on the "Prior Dir" gadget will move up one level to display the last (also called parent) directory (if there is one).

Choosing a File: Clicking on "List Files" will fill the list window with entries from the directory shown in the path box. To select a file in the list window simply click on it. The filename will be added to the path box. Clicking "OK" will exit Smart-View and load the file. Double clicking on the filename in the list window will select and load the file as one action. Optionally, you may type the drive, directory or filename desired in the path box at any time. The right and left arrow keys and the <DEL> and backspace keys move the cursor

and edit within the path box. Press <RETURN> to enter the path or to load a file you've typed. Clicking "Cancel" at any time will abort the Smart-View requester and exit.

These are the function key shortcuts for the control buttons:

[F1] List Files	[F2] Volumes
[F3] Prior Dir	[F4] Devices
[F5] OK	[F6] Cancel

Save: This menu item allows you to save digitized images as an IFF file that can be read by other IFF-compatible programs like Digi-Paint 3. The same requester that you saw in Load IFF appears. Follow the same procedure to select the drive where you want the image to be saved, and the name you want to use for the file. **Note**: When saving a picture, make sure that what you see on the screen is what you want to go onto the disk; the "Save" option saves whatever is displayed on the screen. If you have been experimenting with the color controls, use "Display" to get the most current picture.

Save RGB: Lo-Res RGB files are much larger in size than 32 color IFF files . If you think that you'll want to re-adjust your image at a later date, save the image as an RGB file. You may want to save the image twice: once as an RGB file and once as an IFF file for use in other programs. The RGB files are 24 bit plane images that can be easily processed by Digi-View 4.0 into any display mode.

Load Palette: This menu item loads the palette associated with an image. As you will see later in the Controls menu, you can display your image in 32 color or less. You can also use Freeze Palette in the Palette menu, then digitize in 32 colors, and Digi-View 4.0 will construct the picture in the loaded palette. Load Palette is useful for digitizing images to be combined with pre-existing pictures.

Print: If you want to print your Digi-View 4.0 screen image, use this menu item. You will need to unplug the Digi-View module from the Amiga's parallel port to plug in your printer. If you have 2 MEGS of RAM, you can print from the RGB buffer by selecting RGB on the print requester. CAUTION: Make sure that the power is OFF before unplugging the Digi-View module. In order to print from Digi-View 4.0, save your image to disk, quit Digi-View 4.0, and turn off your Amiga. Unplug the Digi-View module and plug in your printer cable. Turn on the printer and then turn on your Amiga. Load Digi-View 4.0 and call up the image you want to print, then activate the Print function. Make sure you've set your Preferences on the Workbench disk to the correct printer. Additional information on Preferences is in your Amiga User's Guide. A Serial/RS-232 switch box can also be used to allow you to easily switch from Digi-View to the printer.

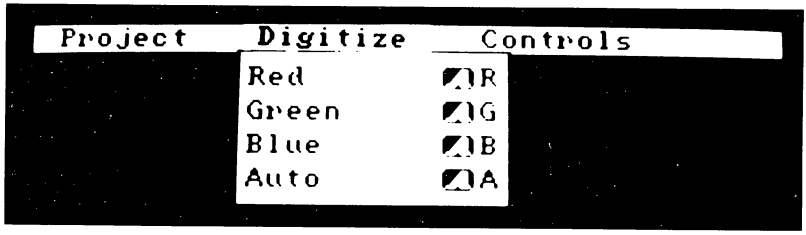
Workbench: This allows you to open and close the WorkBench screen. Digi-View 4.0 closes the WorkBench screen, if possible, to free memory. If you want to run another program, such as Digi-Paint 3, select Open from the sub-menu. When you're done, the Close selection will free the memory again. Click the front/back gadgets on the right end of the drag bar to move the Digi-View 4.0 screen to the back bringing WorkBench to the front. Pressing the F10 key performs the same action. NOTE: Digi-View 4.0 won't close the WorkBench if there is a CLI window open.

Histograms: The vertical axis represents the number of pixels, and the horizontal represents brightness (left to right is darkest to lightest). Typically used with a video processor in conjunction with Digi-View 4.0 to adjust the signal. Properly used, the histogram can tell you if you have enough light in the picture; the graph should cover 70% or more of baseline on the raw data side in a well-lit picture. The adjusted histogram shows what Digi-View 4.0 is doing to try to correct for that particular color.

Screen Size: Selecting this item will allow you to change the screen size of Digi-View 4.0 without having to exit the program. You'll be shown the same option screen that you used when you started Digi-View 4.0. CAUTION: The picture will be lost when you select another size or attribute. Select Cancel, if you do not want to use this function.

About: Selecting this item will display information about the revision of Digi-View 4.0 and additional programming information.

Quit: Select this menu item to exit Digi-View 4.0 and return to the Workbench. If you haven't saved the image on the screen, it will be lost when you Quit Digi-View 4.0.



Digitize Menu

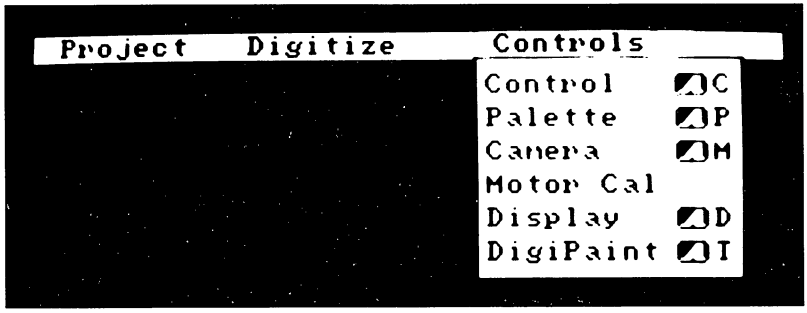
Red: Pulling down this menu item digitizes the red component of the video image. Make sure the red filter is in front of the camera lens before you activate this item. The keyboard equivalent is to press the right Amiga key (immediately right of the space bar) and the "r" key simultaneously.

Green: Pulling down this menu item digitizes the green component of the video image. Make sure the green filter is in front of the camera lens before you activate this item. The keyboard equivalent is to press the right Amiga key and the "g" key simultaneously.

Blue: Pulling down this menu item digitizes the blue component of the video image. Make sure the blue filter is in front of the camera lens before you activate this item. The keyboard equivalent is to press the right Amiga key and the "b" key simultaneously.

Auto: Selecting the "Auto" menu option tells the Digi-Droid Automated Filter Wheel to digitize all three colors one after another without any further menu selections.The keyboard equivalent is to press the right Amiga key and the "a" key simultaneously. For more information, see your Digi-Droid manual or contact your local dealer.

Note: If you want to digitize an image in Black and White or Line Art mode use the clear or green filter and turn off the color from the Digi-View 4.0 title screen.



Controls Menu

Control: Activating this menu item brings up the control panel. This may also be done from the keyboard by pressing the right Amiga key and the "c" key simultaneously. The Mode portion of the control panel determines how the digitized image will appear. When you first bring up the control panel, "4096" is highlighted. This means that when you digitize an image and hit the display button in this control panel, the image will appear using all 4096 colors of the Amiga's palette. This display mode is known as Hold-And-Modify (HAM).

The digitized image can also be displayed in 64 colors (labeled HBrite, and named HalfBrite because the extra 32 colors are always half as bright as the first 32; see the Palette menu); black & white (labeled BW); 32 colors (or less, see the Palette menu); 4096+ (also called Enhanced Hold-And -Modify); or in the new Dynamic HAM and Dynamic HiRes (labeled Dynamic) , which use NewTek's new dynamic palette control to display more color detail. Because 4096 mode is faster, use it to get all of your control settings just the way you want them, then display the image in the much sharper 4096+ or Dynamic modes for the best possible results. If not enough memory is available, the Dynamic button will be ghosted and not selectable.

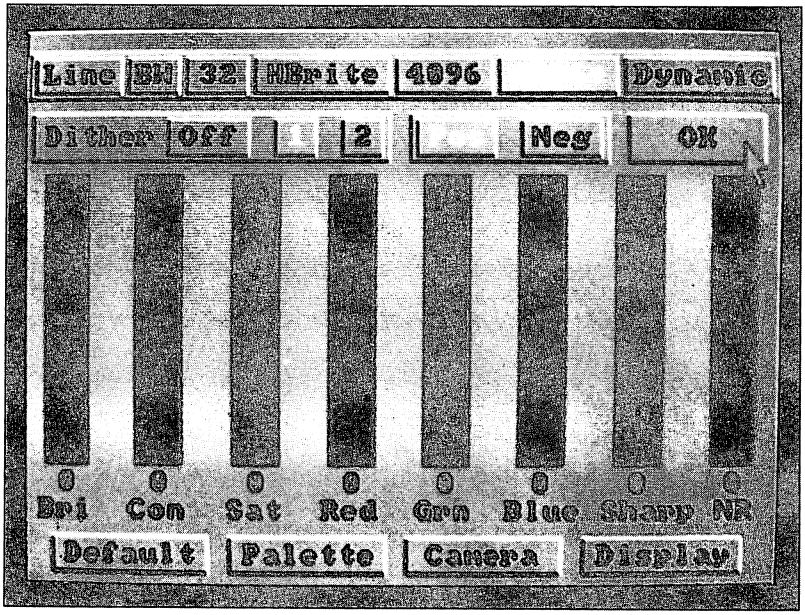
There is also a special display mode called Line Art (labeled Line) which is used for capturing high-contrast black and white artwork without any intermediate shades of gray. Brightness, Contrast, and Sharpness are the only controls that work in this mode with typical values being 10 to 20, -5 to 5, and 0 to 5 respectively. Line Art is particularly useful for desktop publishing, animation pencil tests or rotoscoping.

Dithering is the process of mixing colors to produce a new apparent color. There are 3 ways to dither in Digi-View 4.0: Dither 1 and 2, and sharpness. Just below the Mode panel is the Dither control. Setting the Dither to "1" or "2" will instruct Digi-View 4.0 to mix pixels of different colors to produce intermediate shades. Try viewing an image with Dither on, and then turn Dither off and hit Display again. The difference should be readily apparent. You can use dither along with sharpness, with the best result being a combination of the two. Typical values for sharpness might be 3-5. The Dither control gives a pebbly texture,with Dither 1 being less extreme and more subtle, and Dither 2 being more obvious and better for 8 or less colors. Digi-View 4.0 keeps track of over 2 million colors internally, but the Amiga can only display 4096; dithering helps to fill in intermediate colors for more realistic images. Typical pictures will contain tens of thousands of subjective shades.

The panel directly right of the Dither control has two buttons, Pos and Neg. The Pos button creates a normal digitized image. Activating the Neg button and then choosing display will create a negative version of

the image, inverting all of the colors. This option is useful for digitizing photo-negatives which can be turned back into positives.

There are eight sliders on the panel that control Brightness, Contrast, Saturation, Red, Green, Blue, Sharpness and Noise Reduction. These sliders adjust your digitized image for a better picture or just for special effects. To move the sliders, move the pointer onto one of the sliders and hold down the left mouse button. Drag the slider to the position you want and release the button. You'll notice that the number at the bottom of the



slider changes from -47 to 48 with the exception of the Noise Reduction slider which has a setting range from 0 to 15. You can record these settings for future reference. The best way to learn to use the controls is to experiment with their effects on an image.

Brightness: Like its namesake on a television set, this control increases the overall illumination of the image. Moving the brightness control even a little has marked effects on the image.

Contrast: Again, this control is similar to the control on your television set. Raising the control makes whites white, blacks blacker, and colors more intense. Lowering it makes blacks and whites more gray and colors washed out.

Saturation: This works like the color control on a television set. At minimum, the image is converted to black and white. At maximum, the colors are abnormally intense and cartoon-like.

Red: When set high, this increases the amount of red in the image; when reduced, the amount of red is diminished. At minimum, there is no red in the picture; at maximum, the picture is entirely in shades of red.

Green: When set high, this increases the amount of green in the image; when reduced, the amount of green is diminished. At minimum, there is no green in the picture; at maximum, the picture is entirely in shades of green.

Blue: When set high, this increases the amount of blue in the image; when reduced, the amount of blue is diminished. At minimum, there is no blue in the picture; at maximum, the picture is entirely in shades of blue.

Sharpness: Raising this control will sharpen the image but increase the amount of "grain" or "snow". Lowering the control will reduce graininess but will increase the amount of "contouring" or "banding".

Noise Reduction: NewTek's advanced LBJ Noise Reduction will help counteract grain, snow and high frequency noise in your video signal. It can also be very effective in low light situations. The results will be most apparent after increasing the Sharpness control. Noise Reduction will allow raising the Sharpness to increase detail without increasing the background noise. With Digi-View 4.0 pictures with sharp edges and intricate detail can be extremely crisp and sharp.

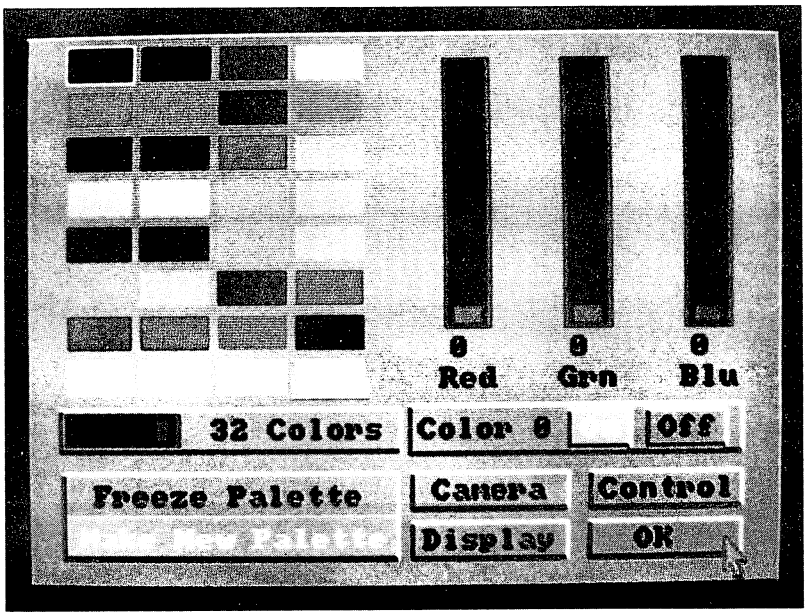
Default: Clicking on this button returns all the sliders to the neutral setting.

Palette: This button will take you directly to the Palette box.

Camera: By selecting this button, you jump to the Camera control box.

OK: This removes the control panel, but does not re-display the picture at any new settings.

Display: When you've adjusted the control panel to your liking, this control will display the picture with the new settings.



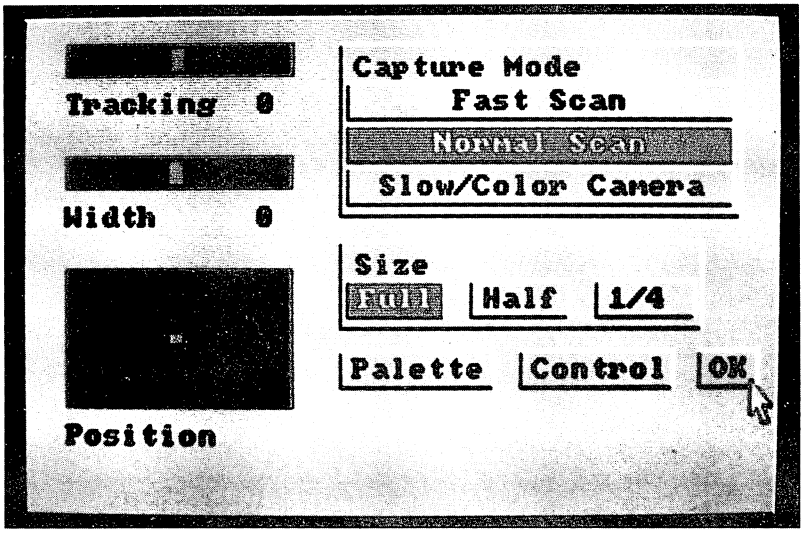
Palette

This menu item activates the Palette control. The palette shows the best 32 colors for displaying the image out of the 4096 possible. If you want to have less than a 32 color image, move the slider in the box labeled "Use 32 colors". You'll see the number of colors change as you move the slider. You'll also see a U-shaped outline move on the colored squares immediately above, showing the last color in the range you've selected. Hit the Display button and exit the Palette control. If the Display control was still set to 4096 ,4096+ or Dynamic modes, call up the Display control and hit the 32 color button (which, you'll note, has changed to reflect the new number of colors you're asking for). The image will now be displayed with the new number of colors.

If you select HalfBrite from the color control menu you will see an additional 32 color palette next to the original 32. These additional colors are exactly half as bright as the first 32 palette colors and can only be altered by changing one of the colors in the original 32 color palette. For example: to change the color in row 1, column 3 of palette 2, you must change the color in row 1, column 3 of palette 1. HalfBrite mode always has exactly 64 colors and can not be made to have any less by re-sizing the palette.

NOTE TO AMIGA 1000 OWNERS: Not all Amiga 1000's are capable of displaying graphics in the Extra-HalfBrite mode. If the colors in the second palette are exactly the same as those in the first, then you have an Amiga that is not capable of HalfBrite display.

You can also alter the individual colors in the palette to create interesting special effects. Point at the color you want to change and press the left mouse button. The colored square is now highlighted. If you move one of the Red, Green, or Blue sliders to the right, you'll see the color change. When you've adjusted the colors to your liking, click on the Freeze Palette button, and then hit Display. The image will be redisplayed using the palette colors you've chosen. If you turn off the Dither control in the Controls, you can get some very interesting effects. Other buttons on the Palette box are to easily jump to the other menu selections. If you select Camera or Control, you will jump to the Camera or Control box respectively. By turning off Color 0, you can force Digi-View 4.0 not to use that color when processing the image. This can be helpful if you will be importing the images into programs that reserve Color 0 or genlock devices.



Camera

This menu controls the various camera settings. This menu has no effect after you've already digitized a picture; it's used to adjust the camera before digitizing.

Capture Mode: The three boxes at the top right of the Camera Control are the different scan times you can use with Digi-View 4.0: fast, normal and slow. Use the fast scan mode for a quick test scan of the subject. This is especially useful when you have a live subject that you think might fidget during a longer scan. The picture quality can be quite good with a short scan. The normal scan is useful for every-day digitizing, especially with a static subject. The best images are obtained with Slow/Color Camera. If you're using a color video camera, you should use this setting every time. Consumer color video cameras have less resolution than black and white cameras. Use the slow scan mode so that Digi-View 4.0 can do its best job on the image. Even if you have a black and white camera we recommend using slow scan for important work. The slow scan takes four video samples of each pixel and averages them in order to eliminate random noise and capture a better image.

Size: The Full, Half, and 1/4 buttons directly below the scan time buttons give you the option of creating your image in different sizes. The Full button is the normal picture size; the Half button gives you an image with half the dimensions of the normal image; and the 1/4 button gives you an image with one-fourth the dimensions of the normal image. If you already have an image on the screen from a previous digitizing effort, use the New command in the Project menu to clear the screen before creating a smaller than normal size picture.

Tracking: This control, at the upper left of the Camera Control, is used to synchronize the camera signal with Digi-View 4.0. If you get a vertical stripe of "jaggies" approximately 1 inch wide on your screen, use the Tracking slider to eliminate it. Adjust the slider until the stripe has moved off the screen.

Width: This slider adjusts the width of the picture that results when you digitize. This is useful for slight adjustments to get a picture to fit a certain size. Large movements of this control will give you interesting special effects.

Position: This will select the overall position of the camera viewport.

Palette: By selecting this button, you will jump to the Palette box.

Control: This button is the same as selecting this from the menu.

OK: When you've set the Camera Controls the way you like, click on the OK button to return to Digi–View 4.0.

Motor Cal: This menu item brings up the display for calibrating the Digi-Droid Automated Filter Wheel motor as detailed in the Digi-Droid's instruction sheet.

Display: Selecting this item will display the image using the latest settings to process it.

DigiPaint: This links your Digi-View to the best-selling Digi-Paint 3 program. Select this after processing the image and it will be transferred directly onto Digi-Paint 3's canvas for retouching, compositing or other modifications. HiRes images will be transferred into a Digi-Paint 3 HAM super-bitmap. This allows capturing and modifying a HiRes overscan 4096 color image for the first time ever on the Amiga. Digi-Paint 3 includes several extremely powerful tools for working on digitized images such as transparency, anti-aliased texture mapping and soft-edge rubthru. For more information, please see Appendix H on page 19.

Appendix A: Optional Equipment

NewTek sells several products that make digitizing with Digi-View easier and more professional. For more information about these products and NewTek Demo Reels, NewTek Times and "The Cool Friends of NewTek Club" write to us at : 115 W. Crane Street; Topeka, KS; 66603 or for orders only call (800) 843-8934, 9-6 central time Monday thru Friday.

Panasonic WV-1410 Camera: This camera features very high resolution (more than 550 lines), a durable vidicon tube which resists burn-in, and a mechanical focus adjustment for a full range of macro focusing. Convenient mounting holes for the filter wheel bracket and our CS-1L copy stand make this camera the most complete solution for digitizing needs. Lens and all necessary cables included. **$279.95**

CS-1L Copy Stand: The best way to mount your camera for digitizing flat subjects (like photographs). Our CS-1L copy stand gives you 2 fully adjustable lights holders and vertical mount with adjustable brackets for your camera. Set-up is easy and adjustments are a snap. **$74.95**

Digi-Droid: Automate your Digi-View system with Digi-Droid. This special computer controlled motor and filter wheel combination automatically drives your filter wheel while you capture the red, green and blue images. **$79.95**

Digi-Paint 3: The best-selling Amiga paint program. Digi-Paint 3 takes full advantage of the Amiga's HAM (Hold-And-Modify) mode giving you more advanced features than any other, including: Anti-aliased texture mapping, variable transparency, anti-aliased fonts, ARexx support and Super Bitmaps with Auto-Scrolling. AMIGAWORLD says,"Competitors may want to head back to the drawing board, because Digi- Paint 3 is hard to beat!". **$99.95**

One way to monitor the live video from your camera for easy focusing is with the Radio Shack (#15-1103) 1 X 3 Baseband Distribution Amp and the Amiga monitor. Plug the video camera into the video input jack on the amp and plug the monitor and the Digi-View into one video output jack each. Then simply switch the monitor between composite (to view the live video) and RGB (to see the digitized image).

Appendix B: Installing Digi-View 4.0 on a Hard Drive

Installing Digi View 4.0 on your hard disk drive can be done in one of two ways:

1) From the Workbench screen open the Digi-View 4.0 disk icon and drag the icons from the Digi-View 4.0 window into any empty drawer in your hard disk.

OR

2) From CLI copy the files from the Digi-View 4.0 disk to any empty drawer in the hard drive.

Appendix C: Customer Service

You've just become one of the most important people in the world, a NewTek customer. Our technical support staff is on hand to answer your questions and assist you in any way possible. You may write or call us on our toll free help line. When you write please include your daytime phone number and the best hours to reach you. If appropriate please send an image on disk or a printout to illustrate your problem. When calling it's helpful if you're at your Amiga with Digi-View running. Our technician will try to duplicate the problem and give you an answer on the spot.

We'd like to hear from you even if you don't have any questions. Send us examples of your work and let us know how you're using Digi-View. We have dozens of Digi-View success stories posted in our office building. We look forward to hearing from you.

NewTek Digi-View Tech Support
115 West Crane Street
Topeka KS 66603

(800) 736-7617 Monday-Friday 8 a.m. - 7 p.m. Central Time

Appendix D: Dyna-Show

The Dyna-Show information is provided on disk in the DS_README file. Dyna-Show will display IFF and NewTek's new Dynamic modes.

Appendix E: An Explanation of HAM Mode

The Hold-And-Modify (HAM) display mode on the Amiga uses six bit planes to display images. This means that each pixel (**pic**ture **el**ement — one dot on the screen) uses 6 bits to determine its color.

If the first 2 bits are "00", the remaining 4 bits (giving a value of 0 to 15 in binary) are used to look up the pixel's color in the color table. This gives you 16 values from the possible 4096 colors available, which Digi-View 4.0 uses to choose the best 16 colors in the Color Palette to reduce the amount of "fringing". Each color has 4 bits worth of red, green, and blue information; thus, each color has a Red value from 0 to 15, a Green value from 0 to 15, and a Blue value from 0 to 15. This is the Enhanced HAM or 4096+ mode.

If the first two bits of a given pixel are 01, the pixel has the same color as the pixel to its immediate left, except that the last four bits can be used to replace the red value of that pixel. If the first two bits are "10", the last four bits replace the green value, and if the first two bits are "11", the last four bits replace the blue value.

The effect of all this is that you can display all 4096 colors on the screen at once, though you can't go from black (red 0, green 0, blue 0) to white (red 15, green 15, blue 15) in one pixel; it takes three pixels to make that transition, since you can only modify one of the RGB values for each pixel. The transition would take four pixels on the screen. The first pixel is RGB 0-0-0; the second pixel is RGB 15-0-0; the third pixel is RGB 15-15-0; the fourth pixel is RGB 15-15-15 (white).

Appendix F: Dynamic Modes

Digi-View has always been known for it's exceptional image processing capabilities. By using the previously mentioned techniques, Digi-View has created the highest quality 4,096 color HAM images on the Amiga. NewTek's new Dynamic HAM eliminates most if not all of the HAM side effects mentioned above. By taking the Enhanced HAM mode (4096+) one step further, we can make an even sharper picture without the typical HAM fringe effect. Dynamic HAM also uses the 16 color palette, but changes it on each line, as opposed to the use of the same palette for the whole screen (as in 4096+).

Dynamic HiRes brings new color depth to the Amiga's HiRes mode. Sharp, crisp detail never seen before on an Amiga is now possible. By combining the HiRes mode with the Dynamic display technology, we change the 16 color palette on each scan line to provide up to 4,096 colors on a HiRes screen, including Overscan mode.

Due to the way Dynamic display technology works, the most startling results will be obtained with images that have more vertical color range. Digi-View 4.0 uses all of the Amiga's power to maintain a Dynamic Mode and therefore the image cannot be held stable when the mouse is moved or menus are pulled down. While NewTek fully supports and strongly believes in the multitasking philosophy of the Amiga, Digi-View 4.0 must take complete control of your Amiga's 68000 processor and other co-processors for Dynamic displays. While in Dynamic mode Digi-View 4.0 shuts down all other tasks to gain the horsepower required. As soon as Dynamic Mode is exited all other tasks will resume undisturbed. We hope our customers will understand that when pushing the Amiga to the very edge some rules will be broken.

Appendix G: RGB and IP Files

The heart of the Digi-View module is a precision analog to digital converter. Instead of the high speed 4-bit flash converters found in many video digitizers, Digi-View uses a more accurate successive-approximation type converter along with a low-noise sample-and-hold amplifier. The result is an extremely faithful conversion of the original analog video signal into an array of 7 bit samples. All 7 bits are stored in RAM throughout the manipulation process. In color, each pixel is 7 bits per primary color, or 21 bits, for over 2 million shades. This extra accuracy is necessary for processing the image for display, for example to enhance contrast, sharpness, or color.

This information is available for use outside the Digi-View software via the RGBIFF or IP files. RGBIFF files are similar to standard IFF ILBM files. An extra chunk, called DGVW, contains the control panel settings at the time the image was saved. Note that the settings have no effect on the data stored in the body of the file. These numbers are always the exact samples as received from the digitizer. If you examine the file header, you will notice that the image depth is specified as 24 planes. All 24 planes of each scan line are stored together before proceeding to the next lower line. The order of the planes is as follows; Red 0 to Red 7, Green 0 to Green 7, Blue 0 to Blue 7, then the next line. Standard ByteRunl run encoding is used to compress the RGBIFF files. See "EA IFF 85 Standard for Interchange Format Files" available from Commodore-Amiga.

IP files use a simplified file structure for those who want to manipulate the picture data without the overhead of decompressing and converting bitplane to byte-per-pixel format. To save an image in the IP format, press function keys F1 or F2. F1 saves only the red array, for monochrome. F2 saves all three arrays in the following order: Red, Green, Blue. Format is byte-per-pixel starting with the upper left corner and going

to the right. In the case of 320x200 images, the first 320 bytes in the file represent the Red component of the top line of the image. The second 320 bytes represents the Red component of the second line of the image. The first 64,000 bytes contains the entire Red array. Byte 64,001 would be the Green component of the upper left pixel, and so on. Note: the LSB of each byte is zero. IP files can get rather large. A 640x400 IP file requires 768K or almost one entire disk. Hi-Res overscan files can be too large to even fit on one disk!

Appendix H: Digi-Port to Digi-Paint3

By combining the powerful features of Digi-View 4.0 with the best-selling Digi-Paint 3, we have created a package that will allow you, for the first time ever on a Amiga, to digitize and manipulate 4,096 color HiRes super-bit mapped images.

The Digi-Paint 3 package can be accessed in one of two ways depending on the memory available. If you are working with a machine with less than 3 megabytes of RAM (or less than 1 meg Chip RAM), you can quit Digi-View 4.0, load Digi-Paint 3, and then work with the image.

For users who been looking for something to fully take advantage of the multitasking nature of the Amiga with image manipulation, we introduce the Digi-Port. By selecting the Digi-Paint menu selection (under Controls), Digi-View 4.0 will check to see if Digi-Paint 3 is loaded, and if so, will output the image into the Digi-Paint 3 screen to be manipulated.

It is recommended that you start Digi-View 4.0, then open the WorkBench (if not already open) and start Digi-Paint 3. Set Digi-Paint 3 to accept super-bit map size. Return to Digi-View 4.0 and you are set to port the images. This will save you from having to save and load images over and over again.

If you are controlling Digi-View 4.0 from ARexx, you can tell Digi-View 4.0 to use the Digi-Port via the PANT command. Adding the power of Digi-View 4.0, Digi-Paint 3 and ARexx can provide unlimited uses of the Amiga.

Appendix I: ARexx Support

ARexx is an inter-process communication protocol. It allows complete control of an ARexx compatible application through another program or with a user written program. NewTek fully supports allowing our users access to the Digi-View technology and has included ARexx support in the release of Digi-View 4.0 to allow unattended or remote operation. We expect many vertical market applications to use this feature in exciting ways from medical imaging to telecommunications. The ARexx port name is "Digi-View".

ARexx commands in Digi-View 4.0 :

PRNT	Print Picture
PRNT 1	Prints Picture from RGB buffer
SIFF (name)	Saves an IFF file
SRGB (name)	Saves a 24-bit RGB file
LIFF (name)	Loads a IFF file
PANT	Sends image to Digi-Paint 3
CLRS	Clear screen and RGB buffers
QUIT	Quit Digi-View 4.0
LDPA (name)	Load Palette
DISP	Display picture
AUTO	Auto-digitize mode
DIGR	Digitize Red
DIGB	Digitize Blue
DIGG	Digitize Green
DTH0	Dither off
DTH1	Dither mode 1 on
DTH2	Dither mode 2 on
MLIN	Selects Line Drawing mode
MBAW	Selects Black and White mode
MCOL	Selects Normal Color mode
MHAM	Selects 4096 color mode
MHAP	Selects 4096+ Color mode
MDYN	Selects Dynamic mode
SARP (value)	Sets Sharpness value (-47 to 48)
CONT (value)	Sets Contrast (-47 to 48)
BRIT (value)	Sets Brightness (-47 to 48)
SATT (value)	Sets Saturation (-47 to 48)
NOIS (value)	Sets Noise Reduction value (0 to 15)
CRED (value)	Sets Red value (-47 to 48)
CBLU (value)	Sets Blue value (-47 to 48)
CGRN (value)	Sets Green value (-47 to 48)
FREZ	Freezes palette
NPAL (value)	Sets number of colors for the palette to use (2 to 32)

Appendix J: Digi-View 4.0 Specifications

Screen Resolution:

NTSC:

Number of colors	Screen Resolution in Pixels
2-32, 64, 4096,Dynamic HAM	(320 or 352 or 384) x (200 or 240) (320 or 352 or 384) x (400 or 480)
2-16	(640 or 704 or 768) x (200 or 240) (640 or 704 or 768) x (400 or 480)
Dynamic HiRes	(640 or 704) x (200 or 240) (640 or 704) x (400 or 480)

PAL:

Number of colors	Screen Resolution in Pixels
2-32, 64, 4096,Dynamic HAM	(320 or 352 or 384) x (256 or 296) (320 or 352 or 384) x (512 or 592)
2-16	(640 or 704 or 768) x (256 or 296) (640 or 704 or 768) x (512 or 592)
Dynamic HiRes	(640 or 704) x (256 or 296) (640 or 704) x (512 or 592)

Note on memory requirements: Hi-Res, overscan and/or Interlace and Dynamic modes require up to 2 megabytes of memory. Exporting super-bitmaps to Digi-Paint 3 may require up to 3 megabytes of memory.

Digitizing:

21 bits per pixel (2.1 million colors) resolution

File Format:

Read and write NewTek IP files
Read and write IFF files
Read and write 24-bit RBGIFF files

Image Processing Used in Digi-View 4.0:

Enhanced HAM Mode (high quality 4,096 color HAM images)
Dynamic HAM (fringe elimination extra-sharp HAM images)
Dynamic HI-Res (high resolution overscan 4,096 color images)
Control red, green, blue, contrast, brightness, saturation, and sharpness
Infinitely Adjustable Hi-Pass and Low-Pass Spatial Filtering (Convolution)
Automatic Histogram Slide and Stretch
Advanced LBJ Noise Reduction
Automatic Color Temperature Compensation
Adaptive Palette Selection
Edge-detection
Convert images between resolutions
Interstitial Line and Pixel Synthesis
and/or Pixel and Line Averaging
Digitize to specific palettes
Dither control
Positive or negative images
Control number of colors in image

Appendix K: Keyboard Equivalent Table

Key	Action	Menu	Reference Page
*A*N	New	Project	7
*A*L	Load	Project	7
*A*S	Save	Project	8
*A*X	Save RGB	Project	8
*A*O	Print	Project	8
*A*Q	Quit	Project	9
*A*R	Red	Digitize	9
*A*G	Green	Digitize	9
*A*B	Blue	Digitize	9
*A*A	Auto	Digitize	9
*A*C	Control	Controls	8
*A*P	Palette	Controls	11
*A*H	Camera	Controls	13
*A*D	Display	Controls	15
*A*T	Digi-Paint 3 Export	Controls	15
F1	Save IP file (RED/Monochrome)		18
F2	Save IP file (RGB)		18
F10	Show Workbench		8

Smart-View File Requester :

[F1] List Files	[F2] Volumes
[F3] Prior Dir	[F4] Devices
[F5] OK	[F6] Cancel

For all the letters that have a ***A*** preceding them, press the right Amiga key, and while holding it down, press the letter key following it.