Chapter 3 Palettes and Palette Manipulations

Chapter Overview

What is a Palette?

Palette Manipulation Command Keys

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This chapter describes the characteristics of various palettes and the commands which permit manipulation of palettes. The online Palette Help Screen is also depicted for easy reference.

What is a Palette?

A *palette* is a group of data used by the computer to determine how the data in the image file is to be mapped to the set of available colors. The palette is arranged in memory as three separate arrays, each of 256 bytes of character data. Each of the arrays represents one of the color components of the palette-red, green, or blue. Entries in each component array range from 0 to 255. The smaller values correspond to lighter shades and larger values correspond to darker shades. The color displayed on the video screen is a combination of red, green, and blue shades from individual component arrays indexed by the value of the data from the image file.

The Revolution 512 board by Number Nine Computers provides a full 256 shades of red, green, and blue for each of the 256 entries in the palette. The VGA board by IBM provides only 64 shades of red, green, and blue for each of the 256 entries in the palette. The EGA board provides the same 64 shades of red, green, and blue, but the palette is limited to only 16 entries.

Because the EGA palette is limited to only 16 colors, and most image information has 256 colors, an algorithm is required to convert between the two. This method uses a frequency count to find the colors occurring most often in the image data, and assigns their values to the first 16 entries in the palette. In this fashion, the image is displayed in only the 16 most popular colors contained in the data.

Many of the PC Show command keys intended to modify the palette will not work properly for an image which is displayed on an EGA monitor. If the command fails, pressing the command key will not affect the palette. The command keys that modify the palette are presented in the following

section.

The palette is arranged in memory as three separate arrays of 256 bytes of character data corresponding to each color component. These arrays are modified in various ways by the palette manipulation command keys.

NOTE: Unless otherwise noted, it is assumed that succeeding command keys will modify all components of the palette in the same manner.

Palette Manipulation Command Keys

Table 3.1 lists the command keys that manipulate the palette.

Table 3.1 Manipulation Command Keys

Command Key	Function
f	Rotates the palette. The second entry replaces the first, the first entry replaces the zeroth, the zeroth the 255th, and so forth, until all the entries are moved down one increment. This continues until the SPACE BAR is pressed. You may control the speed of the rotation using the + and - command keys.
b	Performs the same function as the f command key, except that it rotates the palette in the opposite direction. The speed of the rotation may be controlled using the + and - keys.
+	Increases the speed of the rotation of the palette when the continuous rotation commands are operating.
-	Decreases the speed of the rotation of the palette when the continuous rotation commands are operating.
space bar	Stops the rotation of the palette only when the continuous rotation commands are operating. Also stops animations in mid-sequence.
e	Rotates the palette forward one increment.
v	Rotates the palette backward one increment.
r	Resets the current palette to the default values defined when it was read in. This command will affect *all* palette manipulations which have been performed. You may make the current palette the default palette by pressing the command key d.

Table 3.1 Manipulation Command Keys (Continued)

Command Key	Function
c	Toggles the color bar on or off. Displays the current palette in the lower-left hand corner of the screen. The palette is represented as a color bar of continuous values from

0 to 255 observing manipulations underneath

from left to ight.This is useful for the effects of various palette and does not change the image the palette.

l Reads a new palette from the disk. If an HDF file is in use, then another palette is read from that file. If binary files are being used, then a palette file name is requested.

n Advances the current palette to the next palette stored in memory. If the current palette is the last one in memory, this command advances to the first palette in memory.

s Stores the current palette in the HDF file if one is in use, or requests a file name for the current palette. The convention for assigning names to a palette is to append the palette name with .pal.

u Exchanges the red, green, and blue components of the current palette in the following fashion: the red component is replaced by the green component, the green component is replaced by the blue component, and the blue component is replaced by the red component.

t Exchanges the entries in the palette end for end.That is, the last entry is exchanged with the first, the next to last is exchanged with the second, and so on through the palette.

g Takes the binary value for each of the components and inverts it bit by bit; thus, a dark red becomes a light red and black becomes white.

Table 3.1 Manipulations Command Keys (Continued)

Command Key	Function
h	Invokes the *fiddle mode.* In this mode, you can use the arrow keys modify the palette in the following way: up or down movement compresses or expands the palette, and left or right movement shifts the palette left or right. To view the help screen that lists the fiddle command keys, press **?**. The EGA mode command is not available for graphics mode.

d Replaces the default palette in memory with the current palette. You should store the modified palette before loading or switching palettes in order to prevent loss of the modifications made.

p Moves the color bar on the screen. Prompts you to enter the upper-left hand corner coordinates of the color bar.

For easy reference, the Palette Help Screen which displays the commands

associated with manipulating the palette is shown in Figure 3.1. You can only access this help screen by entering the command **?** and pressing **ENTER** to pass by the General Help Screen. To return to the image, press any key but **ENTER**. Pressing **ENTER** advances to the Image Help Screen.

Figure 3.1 Palette Help Screen

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f               Rotates Palette Continuously Forward
b               Rotates Palette Continuously Backward
+               Speeds Up Palette Rotation
-               Slows Down Palette Rotation
space bar       Stops Palette Rotation
e               Rotates Palette Once Forward
v               Rotates Palette Backward
r               Resets Palette To Initial Settings
c               Toggles Color Bar On Or Off The Screen
l               Loads In A New Palette
n               Shows Next Palette In Memory
s               Stores Current Palette On Disk
v               Swaps Red, Green, And Blue Components  Of
Palette
t               Transposes Palette
g               Inverts Palette Bitwise
h               Enters Fiddle Mode
d               Makes Current Palette The Default
Palette
p               Moves Position Of The Color Bar
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