VGA PAINT

Description

VGA PAINT is a graphics/drawing program that produces screen
images in up to 248 colors at once. Fourteen brush shapes
and four automatic shapes are provided. Image handling
capabilities include: sizing, flipping, moving, copying and
saving images to disk. Although the resolution of the
screen is only moderate (320 X 200), the careful use of
color mixing can produce images with near-photographic
realism.

VGA PAINT is written in Micosoft QuickBASIC 4.0. The
pictures and images produced by VGA PAINT are saved on disk
in the form of BASIC "BSAVE" files. When loaded into an
integer array with the dimension of 32004, these files may
be loaded by BASIC application programs and put on the
screen with the PUT (0,0) command in screen mode 13.

Requirements

IBM PC/XT/AT or compatible. (? Sys 2 /OS 2)
450K RAM
VGA card & appropriate analog or multi-sync monitor
   capable of displaying screen modes 12 and 13.
Mouse (3 buttons recommended)
MSDOS 3.2

Note: VGA PAINT was written for and on a KAYPRO PC
(8MHz), with 640K RAM, a Vega VGA card, a multi-sync
monitor in analog mode, and a PC Mouse. It has also
been tested with several other (cheap) mice, and seems
to work o.k. with all of them. VGA PAINT generates its
own cursor, and does not require a VGA mouse driver,
providing that the program can access the existing
driver with standard mouse calls to read the motion
counters and the status of the buttons.

Display:

320 X 200 with 248 displayable colors from a palette of
256K colors (screen mode 13). Eight colors of the
usual 256 displayable colors are reserved for program
use.

Files provided:

VGAPAINT.EXE (the main program)
MENU.VGA   (graphic menu screen file)
VGAPAINT.PAL (a spare palette file)
LOGO.VGA   (the logo screen file)
VGA.DOC   (this file)

For the program to run, VGAPAINT.EXE & MENU.VGA must be in the
current directory. If the file LOGO.VGA is present, the logo
screen will appear when the program is run.

PROGRAM OPERATION

Note:

B1=the right button on the mouse or CRTL
B2= the middle button or Left SHIFT
B3=the left button or ALT

For the indicated keyboard keys to function as mouse
buttons, the keyboard status byte for these keys must be at
0000:0417. This is the standard address for IBM PC's and
truly compatible clones. The four cursor direction keys will
move the cursor one pixel at a time.

The program is invoked by typing VGAPAINT <enter>. If the logo
file is present, the VGA PAINT logo screen will be displayed. To
proceed, press any mouse button, or the spacebar. The screen
will clear, and the cursor will appear. At this point, the color
is set to EGA red, and the brush shape is a small box.

Press B3 to display the menu.

MENU

To return to the drawing, press B3.

PALETTE: The left half of the menu shows the palette of the 248
displayable colors as they are originally set by the VGA card.
These are not in numerical order. The color with the white box
around it is the current Selected Color for drawing. The color
with the yellow box around it is the "color at cursor" -- the
color in the drawing that was at the center of the cursor just
before the menu was displayed.

To select a color, move the cursor over the desired color,
and press B1. The white box moves to the Selected Color.

Pressing B2 while the cursor is over a palette color will
change that color to the Selected Color. This is useful for
subsequent mixing of a color that differs only slightly from
the Selected Color. NOTE: once changed, the only ways to
regain the original color are to mix it, or to load a
palette file with that color in it (e.g.,VGAPAINT.PAL)

FUNCTION BOXES: The function boxes on the right half of the menu
include the brush shapes (14), automatic shapes (circle, ellipse,
box, line), and screen, image, and file manipulation functions.
The "Mix" box on the left side of the screen is also a function
box.

When the cursor enters a function box, the box is outlined in
bright green; the function may be selected by pushing B1.

MIX: Each of the 248 displayed colors may be mixed to any of
256K displayable colors. When B1 is pressed, the drawing
appears on the screen, with the mixing box in the upper left
corner. The bottom of the mixing box shows a sample of the
current Selected Color for mixing. The small blue, red and
green boxes are used for mixing. The color bars above the
small boxes show the relative mixture of blue, green, and
red for the Selected Color. (None will appear is the
Selected Color is initially black).

You may select a different color to mix from the drawing by
moving the cursor to a point of that color and pressing B1.
The mixing box will show the new color. This will not change
the Selected Color when you resume drawing.

To increase the amount of blue, green, or red in the color
  to be mixed, place the cursor over the appropriate small box
  and hold down B1. The color bar will grow in length, and
  the sample of the color at the bottom of the mixing box will
  show the new color. If the color being mixed is in the
  drawing, it will also change as you mix.

To decrease the amount of blue, red, or green, put the
  cursor over the appropriate small box and hold down B2.

  To save the color you have mixed and put it in the palette,
  move the cursor over the sample of the color at the
  bottom of the mixing box, and click B1. You are now
  returned to the drawing.

To cancel the mix and return the color to its original hue,
  click B3.

BRUSH SHAPES & AUTOMATIC SHAPES: The 14 brush shapes and four
automatic shapes comprise the basic drawing tools. When selected,
the box containing that tool is set to red. Selecting a tool
does not immediately return to the drawing, so you can change
your mind, select another color, or select another function.

  B1 selects the tool.
B3 returns to the drawing.

BRUSH SHAPES: when you return to the drawing:

  Hold B1 to use the brush.

  Hold B2 to use selective erase. (See "ERASING" below).

  Click B3 to return to the menu.

AUTOMATIC SHAPES: The shape will appear on the screen in a
light color, indicating the size of the shape to be drawn.

CIRCLE: B2 toggles between moving the circle and changing
the diameter. Initially, the circle moves with the cursor.

Click B2 to freeze the midpoint of the circle and
adjust the diameter. Moving the mouse to the right
will increase the diameter; moving left decreases the
diameter. Click B2 again to move the adjusted circle
around the screen.

Click B1 to draw the circle in the Selected Color. Move
the cursor to see the circle you have drawn. The
circle tool is still selected and active.

Double click B1 to draw a circle filled with the
Selected Color. (Objects in the circle which are
outlined in the Selected Color will not be filled.)

Click B3 to return to the menu.

ELLIPSE: works just like the circle, but when the midpoint
is frozen (B2), vertical movement of the mouse changes the
"aspect" of the ellipse, and horizontal movement changes the
diameter.

BOX: works like circle and ellipse. But:

To completely fill the box, regardless of what is in
it, click B1 and then (quickly) B2. A filled box is
drawn covering all points in the box.

LINE: no image except the cursor appears (the initial line
has a length of zero).

Click B2 to freeze or unfreeze the cursor. When
frozen, mouse movement causes a light-colored line to

appear, lengthening, shortening and rotating in
response to the mouse.

Click B1 to draw the line in the Selected Color. The
line tool is still selected and active.

Click B3 to return to the menu.

Note: when you return to the menu, automatic shapes are
deselected and the drawing tool "small box" is selected.

SCREEN FUNCTIONS

UNDO: when selected, the previously KEEPed screen drawing is
put on the screen and you return to the drawing. The drawing
also remains in the UNDO buffer. Drawing on screen is lost.

KEEP: when selected, the drawing on the screen is put in the
UNDO buffer. You are returned to the drawing.

CLEAR: the screen is cleared and you are returned to the
blank screen.

IMAGE FUNCTIONS: Image functions allow you to select an area of
the screen to MOVE, COPY, FLIP, or SIZE.

TR (Transparent) and OP (Opaque): these two function effect
the MOVE, COPY, H FLIP, V FLIP, SIZE, and LAST image
functions. If OPaque is selected, subsequent file
manipulations will place images just as they appear,
background & foreground. If TRansparent is selected, any
points in the image that are the Selected Color will appear
to be transparent, letting the background show through.
While being moved around the screen, a TRansparent image
does not have the correct colors; it will when it is set in
place. A TRansparent image takes longer to set in place. The
cursor will reappear when the process is finished.
NOTE: The TRansparent color is the currently Selected Color,
which may or may not be the color you think of as the

background color. Be sure to set the Selected Color to the
one you want before performing TRansparent image
manipulations. (If you forget, don't worry; you can always
cancel any image manipulation and start over).

Common Features of MOVE, COPY, H FLIP, V FLIP and SIZE

When selected, each of these functions returns to the
drawing and puts on the screen a dotted box that
follows the cursor. All points in the box and under the
dotted border will be in the final image.

B2 switches between moving the box around the screen,
and freezing the upper left corner of the box so that
you can adjust its size with the mouse or cursor keys.

B1 freezes the box and initiates the image
manipulation.

B3 cancels the image manipulation and returns to normal
drawing.

MOVE: when B1 is pressed, the image inside the box will
follow the cursor. The space behind the box is filled with
the currently Selected Color (be sure it is the color you
want before using MOVE).

B1 puts the image down and returns to normal drawing.

B3 cancels the image manipulation, saves the image
inside the box so that it can be retrieved with the
LAST function, and returns to normal drawing.

COPY: works exactly like MOVE, but the area behind the image
is not filled.

H FLIP and V FLIP: these functions flip the image as
indicated, and then make a COPY of the image that you can
move if you want to.

Mouse or Cursor Key movements will move the copy.

B1 puts the image down and returns to normal drawing.

B3 cancels the flip operation, saves the image
inside the box so that it can be retrieved with the
LAST function, and returns to normal drawing.

SIZE: after adjusting the size of the dotted box, press B1.
A white line appears around the image, and the dotted box
appears on top of it. The dotted box will follow the
cursor.

B2 freezes and unfreezes the upper left corner of the
box, allowing for box movement or size adjustment.
Adjust the size of the box to the size you want the
finished copy of the original image.

Note: you do not have to put the dotted box where
you want the sized image to appear, though you may
do so. You can move the sized image after the
sizing is done.

B3 cancels the sizing operation and returns to the
drawing.

B1 initiates the sizing operation. Sizing is done on
screen. The screen will clear and the original image
is placed in the upper left corner. The image is
sized, the drawing is put back on the screen, and the
sized image appears and follows the cursor.

B1 puts down the sized image and returns to the
drawing.

B3 cancels the sizing, saves the sized image so
that it may be retrieved by LAST, and returns to
the drawing.

Note: There is one limit to the size of an enlarged image: an image enlarged to full screen size will actually be 319 X 200 pixels, not the expected 320 X 200 pixels (a quirk in the sizing subroutine).

LAST: this means "retrieve the last image" that was made by any of the image manipulation functions. A LAST image is created during any image operation that involves pressing B1, whether the operation is completed, or cancelled (B3). If there is no image in the LAST buffer, nothing will happen when you select LAST from the menu. When selected and there is an image in the buffer, LAST gets the image, and the image follows the cursor.

B1 puts down the image and returns to the drawing. If there is no LAST image, you will be returned to the drawing.

B3 causes the image to disappear (it is still in the LAST buffer, however), and returns to the drawing.

TEXT: A limited text entry function is provided. Text is entered on a separate screen, and transferred to the drawing with the COPY function, which is invoked automatically. Text appears in the Selected Color. Be sure this is not the background color (the first box in the next-to -the-last row of the menu palette; initially black). Select the TEXT function by clicking B1 when the TEXT box is selected on the menu. The screen clears, and a box appears at the top. If there is any text in the TEXT buffer, it will appear in the box; if not, the box will be empty.

To cancel the TEXT operation at this point, press B3.

If there is text in the box that you want to transfer to the drawing, press B1. The dotted copy box will come on the screen. Copy the text as you would any other image. (B2 to adjust and move the dotted box, B3 to cancel, B1 to COPY the

text and automatically return to the drawing).

Note: Copied text becomes the LAST image.

If there is no text, or if you want to enter new text, press B2 to clear the text box, and put the text cursor on the screen for text entry.

If you press ENTER at this point, with no text typed, TEXT is cancelled and you return to the drawing.

Type the text you want to enter. Only one line is permitted. Press ENTER to start the COPY function (see above).

Note: when initially copied from the text box, if TRansparent is active, the TRansparent color is the text background (the screen background) color, no matter what the Selected Color is. However, if the text is retrieved as the LAST image, the TRansparent color will be the Selected Color.

FILL: the FILL function fills areas with the Selected Color. Borders around the space to be filled may be different colors. Objects within the selected area are not filled if they have a horizontal dimension of three or more pixels; single dots of colors in the area to be filled may or may not be covered over. The FILL function can also be used to outline a figure, or to "inline" the inside of a figure or space.

Filling: Select FILL from the menu. You are returned to the drawing. The cursor is modified to indicate that you are in the FILL mode. Place the cursor in the area to be filled.

B1 first draws a line around the inside of the area, and around all objects the program can identify inside the area, and then fills the spaces between all outlined areas.   The FILL function remains selected and active.

Note: individual points, and vertical lines one
pixel wide cannot be filled. Use the point or
line tool. FILL may "inline" some areas but not
fill them if they connect to the main fill area by
very slender "necks". Move the cursor to the
unfilled area and press B1 to fill these areas.

B3 cancels the FILL operation, restores the cursor to
its usual appearence, and returns to normal drawing.

B2 outlines and "inlines". See below.

OUTLINING and "INLINING": Select FILL from the menu. You are
returned to the drawing. To outline, place the cursor to the
right of an edge of the object/area you want to outline. To
"inline", place the cursor in the area, to the right of the
border.

B2 initiates the lining operation. FILL is still
selected and active.

B3 cancels, as above.

B1 will line AND fill. If you are in the background
area, you may inadvertantly fill the entire picture.
If so, repeat the process with the desired background
color.

ERASING: There are two ways to erase parts of images.

SELECTIVE ERASE: During normal drawing with any of the brush
shapes, releasing B1 and holding B2 invokes the selective

erase function. This will replace the previously selected
"color at cursor" with the currently selected drawing color.
Points selectively erased are those within the open space at
the center of the cursor -- a box 3 pixels square --
regardless of the current brush shape. This function is

useful for changing the color of small areas that are close to colors you do not want to erase. Releasing B2 and pressing B1 returns to the selected brush shape and color.

LARGE AREA ERASE: set the Selected Color to the color you want to erase to, and use the box automatic shape, pressing B1 and (quickly) B2.

FILE FUNCTIONS

There are three types of files manipulated by VGA PAINT. PICTURE files (????????.PIC) are full screen images that take about 63K to store on disk. IMAGE files (????????.IMG) are files containing images, and may be up to 63K, depending on the size of the image. PALETTE files (????????.PAL) are 1K files which contain the color numbers used by the VGA. If you mix colors, and want to see the related picture with those same colors the next time you run the program, save the palette you adjusted as a PALETTE file.

SAVE: the screen clears and three boxes appear. Move the cursor to the type of file you want to save to disk.

Press B1. If you previously saved a file of the selected type, you will be asked if you want to use that file name again. Press B1 or "y" for "yes", B2 or "n" for "no", or B3 to cancel the file save operation

If you pressed B2 or if no file of the selected type has been saved, the text cursor will appear.

Pressing ENTER at this point will cancel the file save.

Enter a file file name of up to eight letters/numbers. DO NOT type the file extension (.PIC, PAL, .IMG). Press ENTER.

If you have typed more than eight characters, the

program will beep and back up to let you try
again.

You will be shown the file name you o.k.ed or typed,
and will be asked if it is o.k. to save it to disk.
Follow the instructions on the screen.

Note: For image files, the image you save is
always the LAST image. Cancel the SAVE and use
the LAST function to see the image if you are not
sure what it is. If there is no LAST image, the
program will tell you so. Follow the instructions
on the screen. To make a saveable LAST image, use
any of the image functions (COPY, MOVE, etc.),
surround the part of the drawing you want with the
dotted box, press B1 and then B3. This will put
the image in the LAST buffer.

The PICTURE file saved is always the picture on
the screen when the menu was selected.

The PALETTE file saved is the palette displayed in
the menu.

LOAD: the screen will clear and switches to mode 12 (smaller
characters). The cursor will be white and smaller. Three
boxes appear.

B3 will cancel the LOAD operation at any time and
return to the drawing.

Move the cursor to the box of the file type you want to load
and press B1. A list of all files of that type will appear.

If there are no files of that type in the directory, a
message will appear. Follow the instructions on the
screen.

Move the cursor over the name of the file you want to load.

B1 will highlight the file name and freeze the cursor

Pressing B1 again will load the file and return to the drawing.

B3 will un-highlight the name, unfreeze the cursor, and allow you to pick another name or to cancel the LOAD operation.

EXIT

To exit (end) VGA PAINT, select the EXIT box and double click B1. A single click will not cause the program to end.

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*************
 ERRORS
*************
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VGA PAINT has been working error-free for me for some time, but it may contain errors, or may cause errors on some combinations of equipment. If an error occurs a message should appear on the screen indicating the BASIC error code number and a "Section" number which refers to sections of the source code. I would appreciate hearing from anybody who encounters an error.

Simulated errors have all been recoverable by repeatedly pressing B3 until the error message goes away. Try this if a real error occurs.

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SUMMARY OF COMMANDS

Drawing with Brush as Selected Tool   Drawing with Auto Shape

  B1 Draw with brush   B1 Draw shape

B2 Selective erase   B2 Adjust size or
B3 Put menu on screen   move shape
                           B3 Cancel Shape (tool
                         becomes small box)

MENU   B1 B1 Fill shape
                       B1 B2 Total fill box
B1 select any function or color   (large area erase)
B2 (Palette) set color to the
   Selected Color (white box)
B3 Return to drawing (except when
   cursor is in "EXIT" box
B1 B1 Exit when cursor is in
    "Exit" box

   yellow box = last color at cursor.

FUNCTIONS

MIX
 B1 Selects new color if cursor in drawing.
   Keeps mixed color if cursor over color sample
   at bottom of the mixing box.
   Increases B/G/R if cursor over small B/G/R box.
 B2 Decreases B/G/R if cursor over small B/G/R box.
 B3 Cancels color mixing

MOVE, COPY, H FLIP, V FLIP   UNDO restores previously
 B1 Initiates the action, makes   saved screen.
   copy of original image.   KEEP saves screen
 B2 Moves dotted box around or
   allows size of box to be adjusted   LAST gets last image made
 B3 Cancels operation   by MOVE, COPY, FLIP,
                      SIZE, or TEXT.
SIZE
  B2 Moves dotted box around or
    allows size of dotted box
    to be adjusted
  B3 Cancels size operation
  B1 First time: outlines orig. image.

Second time: starts sizing operation.
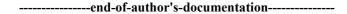
TEXT
  B1 starts COPY so you can make copy of
    text to put in drawing
  B2 Clears text box & puts text cursor
   on screen for text entry

  ENTER before typing text cancels TEXT operation.

  ENTER after typing text ends text entry. Starts COPY.

  B3 Cancels text operation

----------------end-of-author's-documentation---------------

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