# PCX2SIX
# SIXEL Graphics Utility
# Guide 1.00

PCX2SIX
conversion program
SIXEL Graphics Utility
Guide

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J.G.Zvonar12/4/95 1.00all   Original Version

John G. Zvonar
10309 Trout Cove
Austin, Tx 78749

EMAIL JohnG.Zvonar@AMD.COM

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1. Introduction

        The ability to display pictures on the VAX systems both
inside of specifications and as stand alone reference
documents can aid in the daily job performance.  This utility
provides the ability to put any PC picture into native VAX/VMS
SIXEL format.

 1 Major Components

   1VAX/VMS

   1PCX2SIX.EXE

   1Graphics capable terminal or emulator


 2 Copyrights & Trademarks

   1SIXEL - Digital Equipment Corporation

   1Windows - Microsoft Corporation

   1PAINT, PBRUSH, PCX - ZSoft Corporation

   1Kermit - Columbia University

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2. Scope


     This document will cover the use of the PCX2SIX utility to
create pictures in SIXEL format for specifications and stand
alone pictures.  The features provided will be described as
will the few limitations of the conversion utility.


  1Intended Audience

   This user guide is written assuming that the reader has at
least a basic familiarity with DOS, and has a need to display
SIXEL graphics perhaps on a VAX/VMS system.



  2What is not covered

   This document does not cover information related to PCX or
SIXEL or the internal program code.

   This document will not cover the details of creating the
graphic that is to be displayed, other than how to get it into
the correct file format.

   Limited coverage of how to get the file from PC platforms to
the VAX/VMS system will be done.

   No coverage of Windows or DOS is attempted.


 3 General Information

  1The author has no association with ZSoft Corporation.

  1The conversion utility is supplied as is. FREE of charge.

  1The  utility  is  for  unlimited,  unrestricted  use  except  as
      follows.  The utility may not be bundled with other "FOR
      SALE"  software  without  prior  written  permission  from
      John G. Zvonar, otherwise the utility may be given away
      for FREE with all documentation.

  1There is no warranty, period!

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    1The SIXEL output has been tested on TRUE VT340 terminals and
        various terminal emulators.

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3. References


  1 Additional Documents Required

        No additional documents are needed for using the PCX2SIX
    utility  to  create  pictures  for  use  in  a  SIXEL  graphics
    environment.

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. Conventions


  2 Items of special interest are in **bold** characters.

  3 User typed input is in underlined _italics_.

  4 Single stroke key presses are identified as press <key>.  The
     keys <enter> and <ret> or <return> are used interchangeably.

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4. Overview


   Graphics provided as reference documents or as part of the
operating specification provide significant benefit over just
having words for descriptions, or using character based
pictures.
  This utility allows the viewing of PC based pictures on the
VAX/VMS system using the capability of terminals supporting
SIXEL graphics protocol.



1SIXEL Graphics

   The DEC Terminals which support SIXEL graphics information
can display pictures with VGA to Super VGA (PC based measure)
quality levels.  The SIXEL protocol is a bitmap based graphics
capability supplied by DEC integral to several terminals in VT
terminal product line.  Many VT terminal emulators also
provide full, or partial, SIXEL graphics support, most in at
least 16 colors.



2PCX Format

   1The ZSoft PCX format was chosen was chosen to be the 'common
        format' for the utility.  This was chosen due to the
        wide variety of applications **on many different platforms**
        that support and generate PCX files.  PCX files are
        bitmap files.

   1Any application that can create PCX files can generate a file
        suitable for the PCX2SIX utility.  Color is supported
        for up to 256 colors.  Note though that most terminals
        only support the first 16 colors.

   1Almost all PC Windows applications can output to this format
        at least through the WINDOWS clipboard capture.

   1PAINT supplied with Windows can put any clipboard image into
        the PCX format.

     1The final SIXEL files can still be used to create hard copy
          output by printing them to an appropriate network SIXEL
          printer once they are on the VAX/VMS system.


     1The PCX2SIX utility will not add or delete pixels.  If the
          number of X direction pixels was 640 then the number of
          X direction SIXELS will also be 640.  See section 8.2
          for more information.

5.0 Overview

3General procedure outline

1Select an application package for graphics generation on your
    platform of choice running your operating system of
    choice.

1Create the drawing.

1If needed capture the picture to the clipboard and paste it
    into PAINT.  Save the image as a PCX file.

1Convert the file using the PCX2SIX utility.

1Upload/Transfer the SIXEL file to the VAX/VMS system.

1Use the type command to display the picture and determine if
    the appearance is what was desired.  With MS Kermit the
    REPLAY command can also be used to display the SIXEL
    graphic without transferring the graphic to a VMS host
    system.

1Use the PCX2SIX command line switches as needed to change the
    picture appearance.

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5. Using PCX2SIX


This   section   describes   basic   operation   of   the   PCX2SIX
conversion utility.  This is a DOS PC based tool.  No special PC
requirements are needed.

1Hardware: IBM Compatible PC

   1The  utility  will  create  the  SIXEL  file  on  the  hard  disk.
        There  must  be  enough  free  disk  space  for  the  output
        files.

   1There must be at least three free file spaces available from
        the FILES & BUFFERS settings.  This is usually not  a
        problem.

   1The utility should run in as little as 64K of ram.



2Software: PCX2SIX.EXE

   1The only software required for the conversion is the PCX2SIX
        utility itself.

   1Create a directory for the utility then use a copy command to
        copy the executable from the distribution disk onto the
        hard disk.

3. Running PCX2SIX

   1The conversion utility is started by typing pcx2six followed
        by  the  full  filename  and  optional  extension.  For
        example:


                    **C:>**_pcx2six test.pcx_    <ret>


   1Note that unless otherwise indicated the file must reside in
        the current directory. Optionally a disk drive and path
        may precede the full filename and optional extension.
        For example:


                    **C:>**_pcx2six D:\files\test.pcx_    <ret>

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In this case the output file test.six will also reside in the directory D:\files.

1 The file is now transferred to the VAX using any number of utilities, or displayed in Kermit v 3.14 using the REPLAY command at the prompt.  The file is an ASCII file, do not use a binary file transfer protocol.  The file may be viewed on the VAX by a simple TYPE command.

4 Optional Command line inputs

There are numerous optional command line switches to allow minor customizing and correction of the bitmap images.

1 The command line input will accept a second filename parameter.  This filename parameter indicates to the utility that the output is to be directed into a file with a user specified file name.  The parameter is the filename to create.

1 When invoked as **C:>**_pcx2six test.pcx capture.txt_  <ret> the file capture.txt will be created and will contain all of the SIXEL commands needed to draw the picture.

1 After transfer the SIXEL file may be viewed by using the VAX/VMS type command, for example **$**_type capture.txt_ <ret>. Kermit 3.14 can also be used to view the file, at the prompt **>**_replay capture.txt_

1 This SIXEL file is also suitable for printing on any SIXEL compatible printer.

5 The Palette Features

A feature of the utility is the ability to adjust the palette.  Most of the command line switches are related to palette manipulation.  The SIXEL protocol supports up to 256 colors, however most emulators only support 16.  Best results have been obtained by keeping to 16 or less colors.

      1The /I

            The /I switch will instruct the utility to ignore any
            palette information.  This means that it will select the
            colors based on id number but will make no attempt to
            adjust the RGB value of the id number.  In this case the
            terminal palette colors will be used for display, even
            if the colors have been changed by someone or something.
            Note that under normal condition the terminal colors map
            well to the standard PC colors.


      1The /P


            The /P switch will instruct the utility to create and
            use a default Palette.   The default palette will be
            identical to the factory default 16 color palette on a
            VT340.


      1The /R


            The /R switch will instruct the utility to Read in and
            use a palette file.  The palette file name must be the
            same as the PCX file being processed but with the
            extension of .PAL.  This feature allows fine tuning of
            the individual palette values for the SIXEL output file.
            The palette file format is discussed later in this
            document.


      1The /W


            The /W switch will instruct the utility to Write out the
            palette information.  A file with the same name as the
            PCX input file but with the extension of .PAL will be
            created.   If the file already exists it will be
            overwritten.  This output file is in the same format
            that is needed for the /R switch.


      1The /S


            The default output disables SIXEL scrolling.  This is to
            insure that the image does not roll off of the top of
            the screen.  Using the /S switch will ENABLE SIXEL
            scrolling if desired.

1The /M

The /M switch must be followed by a number between 0 and
15.  This number sets the color to be used for the
Monochrome image conversion.  The default if /M is not
used is color 7 (white).  The exact syntax would appear
as /M5 to use color 5 for the monochrome image.  Note
that this does not change the background color which
will remain at whatever the terminal has set into the
palette for color 0.

1The /B

On occasion it may be desirable to scale up or down the
palette values.  The /B allows the scaling without
having to modify a palette file.  The exact syntax would
be /B120 or /B90.  The scaling is performed relative to
100, so /B120 will increase the palette numbers by
approximately 120/100, whereas /B90 would decrease the
palette values by about 90/100.  The maximum palette
value is 100.  The default /B value is 100.

1The /X and /Y

The two switches /X and /Y work together to set the
pixel aspect ratio.  The default values are 2 and 1 for
X and Y respectively.  These switches can be used to
change somewhat the size of the image.  The switches
when used would look like /X2 /Y1.

6Multiple command line switches may be used.  The only
restriction is to separate the switches requiring a numeric
input by a space.

1 Good Example: C:>pcx2six input output /P/W/B110 /S

1 Bad Example:  C:>pcx2six input output /P/B110/W/S

1 Summary:Switches /B, /M, /X, /Y must all be followed by a
space.

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# 6. Palette file format

  1 The palette file used by the utility is in ASCII.

  2There is one line per color, and there must be either 16 or 256
       lines or the palette file will be considered invalid.

  3The color values are stored three to a line in Red Green Blue
       format.

  4    Each RGB value is separated by a vertical bar character |.

  5The file may be edited with any ASCII editor like NOTEPAD, or
       DOS EDIT utility.

  6 An example file:

```
|0|0|0|
|20|20|80|
|80|13|13|
|20|80|20|
|80|20|80|
|20|80|80|
|80|20|20|
|53|53|53|
|26|26|26|
|33|33|60|
|60|26|26|
|33|60|33|
|60|33|60|
|33|60|60|
|60|60|33|
|80|80|80|
```

  7Each palette value can be from 0 to 100.

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7. Limitations


   1Colors - Most terminals in use today only support 16 colors.
            The utility supports 256 colors.  If the pictures
            are to be viewed by a wide audience use a maximum
            of 16 colors.


   2Resolution - The VT340 supports 800 x 480 pixels, across and
               down  respectively.   The typical PC is 640 x
               480.   Aspect ratios will not be exact.   Some
               emulators  will  show  a  reduced  size  version
               that is the 640 x 480 within an 800 x 480
               emulated  window,  while  others  chose  to  show
               the 640 x 480 as the entire screen.   A true
               VT340  shows  the  PC  picture  as  640  x  480
               within the 800 x 480 window.

               When creating the PCX file set the number of
               pixels desired, draw, then convert.  Also try
               using the /X /Y options for aspect ratios.


   3VT330 -The VT330 is a monochrome terminal.  The terminal will
           adjust the color information into 4 shades of white.
           Test color images on VT330 terminals.


   4VT240 -The  VT240  has  less  vertical  pixels  than  the  newer
           graphics terminals, therefore part of the image will
           not be on the screen.


   5Speed -On a main frame system the drawing speed is limited by
           the  speed  of  the  terminal  connection.   The  faster
           the connection the faster the picture shows up.

. Troubleshooting

        This section contains some common problems.

  6 Switch problems

    1All command line switches must be in UPPER CASE.

    1If the switch requires a number the number must be followed
        by a space.

  7 Invisible Colors

    1Try converting into 16 colors using PAINT or PBRUSH from
        ZSoft Corporation.

    1Try setting the palette colors manually using a .PAL file.

  8 File Transfer VAX/VMX Buffer overflow

    1Transfer the file to VAX using ASCII(text) protocol not
        Binary.

  9 Blank Screen

    1The terminal does not support graphics.  Switch to a VT330 or
        VT340.

    1If using an emulator check the documentation to verify that
    it supports SIXEL GRAPHICS.  A VT320 for example will not
    support SIXEL or ReGis graphics.