Displaying NAPLPS (Telidon 709) graphics on a modern computer: Technical note

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Background

Telidon was a project of the Communications Research Centre of the Canadian Federal Government Department of Communications. Lasting from 1978 through 1985, it promoted the creation of consumer Videotex networks using Canadian technology for the transmission of high quality (for the time) graphics and text in the context of highly limited bandwidth and processing power. [Wikipedia, n.d]

During the project's existence its image/text encoding standard went through two major versions. The first version, Telidon 699 (named for CRC Technical Note 699) dated from November 1979. The second version, Telidon 709, superseded 699 in 1982. Telidon 709 became NAPLPS, the North American Presentation Level Protocol Syntax. As its name implies, NAPLPS was a North America-wide standard, due to the involvement of US entities such as AT&T who saw potential in the Canadian technology.

A significant amount of content was created for the Telidon project. Educators, artists, writers and businesses developed Telidon content across a wide range of disciplines, covering topics as diverse as Business Education, Computer Literacy, Fine Arts, Geography, Math and the Social Sciences [Consortel Catalogue, 1985]. It is uncertain how much of this content still exists.

NAPLPS content continued to be created in the years immediately following the end of the Telidon project, as NAPLPS had a post-Telidon life in the Bulletin Board Systems that were popular during the latter 1980s and early 1990s. NAPLPS graphics proved to be well-suited for 1200 BPS transmission speeds and low-powered home systems common in that era of computing. [Hughes, 1993]

In 2015, the University of Victoria Archives began work on restoring some early-80s Telidon graphics created by local artist Glenn Howarth. During the course of that work we determined that it is still (as of 2016) possible to render NAPLPS graphics on contemporary computing systems using readily available shareware (Microstar PP3) running in an open source DOS emulator (DOSbox). Due to the cross-platform compatibility of DOSbox it is possible to display NAPLPS graphics on all major operating systems currently in use (Windows, Linux and Mac OS). This technical note documents our method in sufficient detail that others seeking to display NAPLPS graphics should be able to do so by following the instructions below.

Note that this method does not work for Telidon 699 graphics, as the 709/NAPLPS standard was not fully backwards compatible. As of this writing, no software decoder for Telidon 699 graphics is known to exist, and hardware decoders are exceedingly rare.

Please note: Versions of DOSBox, PP3 and Stackey3 may have been distributed with this paper. However the version of DOSBox included here may be out of date; it is advisable to use the most recent version available.

Overview

The method described herein relies on the following third-party software programs:

1. DOSBox, an open source x86 emulator with DOS.

2. Microstar Personality Plus 3 (PP3), a shareware bulletin board client.

3 Optionally, Stackey3, a shareware DOS macro utility

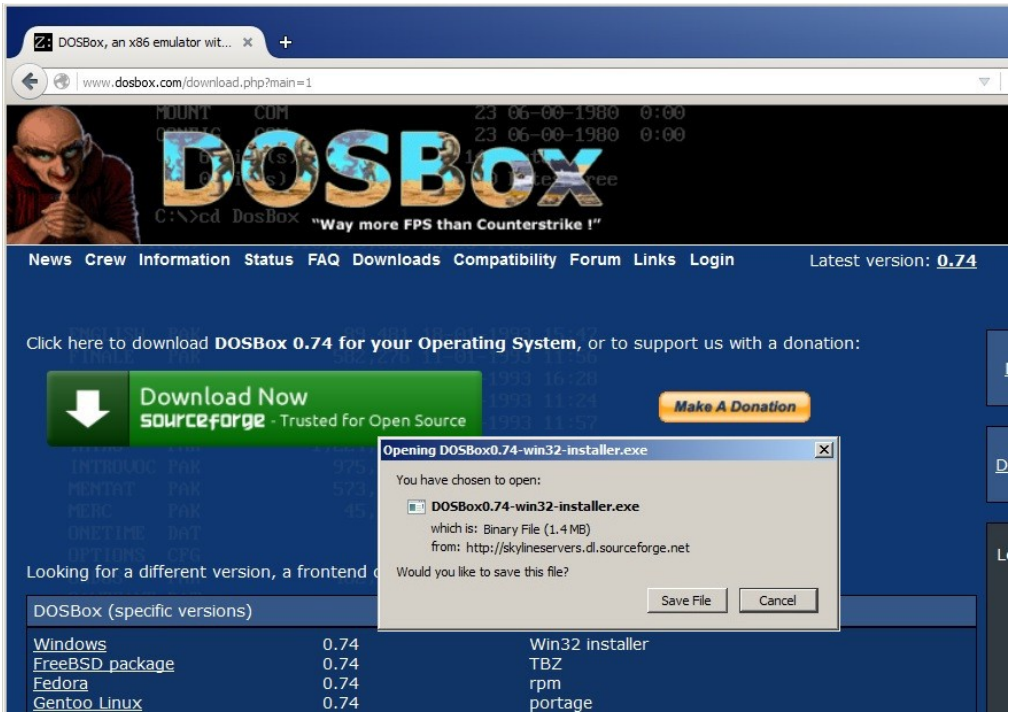
Briefly, the method involves downloading and installing DOSBox, downloading PP3, running PP3 from within DOSBox, and then entering a combination of PP3 and DOSBox commands to display your NAPLPS files optimally. You will likely need to rename your NAPLPS files prior to displaying them if you want to invoke PP3's slideshow capability. You can automate the process of starting up a slideshow using Stackey3 and the DOSBox config file.

Step by step

1. Download and install DOSBox.

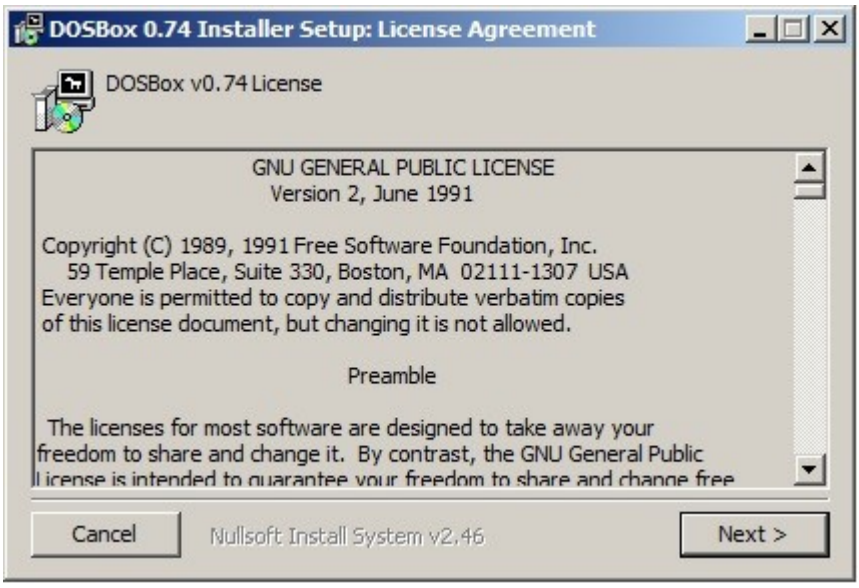
DOSBox is available from http://www.dosbox.com. It is available for all common operating systems including Windows, Mac OSX and Linux. This technical note describes a typical Windows installation.

Download the correct version for your operating system from the DOSBox downloads page:

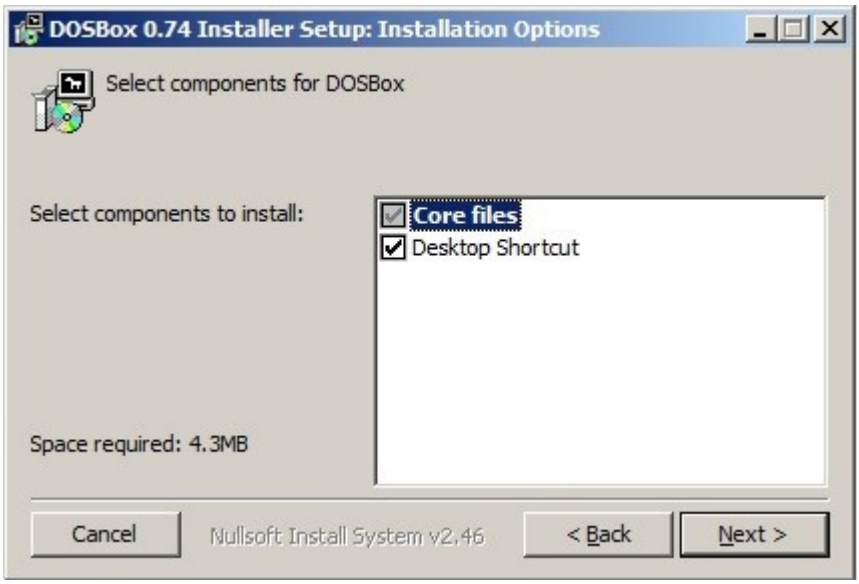


Once the file has been downloaded, click on it to begin the installation process. You will likely be prompted for your Windows administrator password at this point.

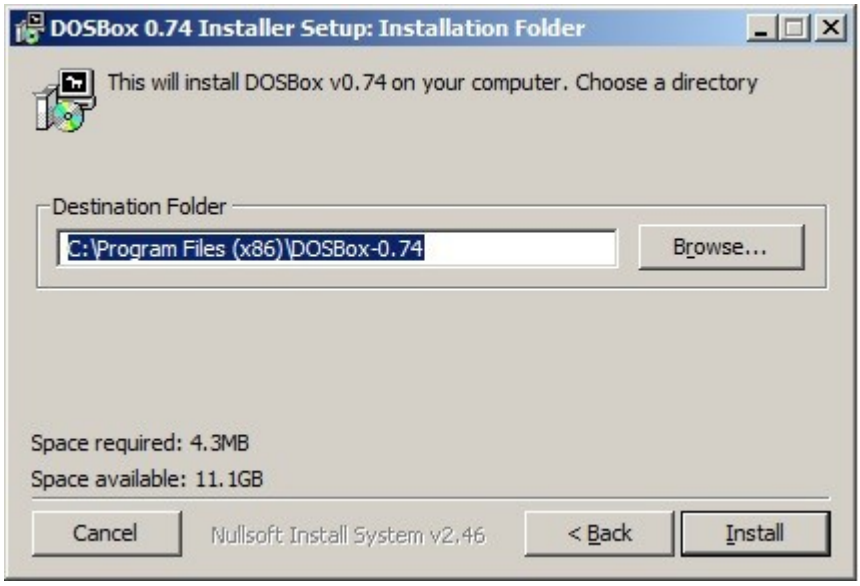
The first dialogue box is the license agreement. DOSBox is licensed under the GNU GPL 2, a standard open source license. Click Next to accept the license terms:



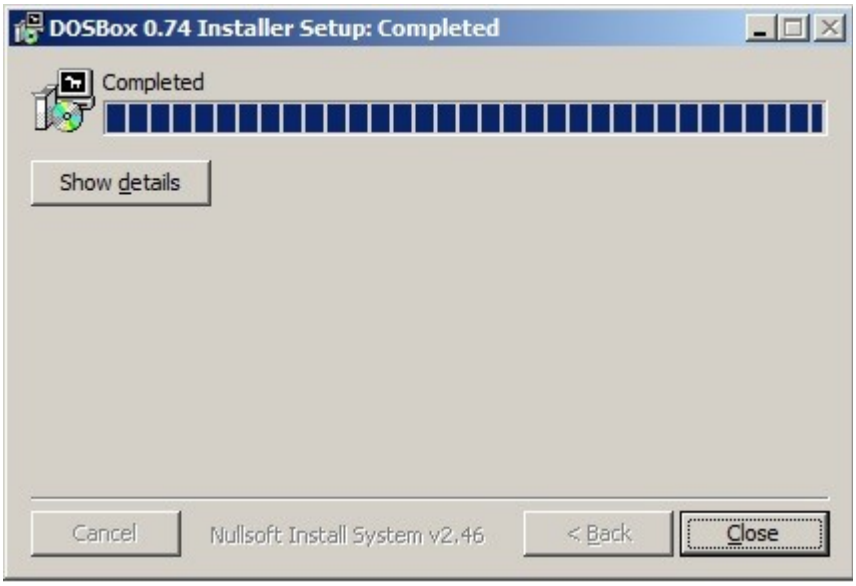
There is only one meaningful installation option. I want to add a DOSBox shortcut to the desktop, so I will leave that option checked, and then click *Next*



Next choose the installation folder. The default should be fine. Click *Install*.



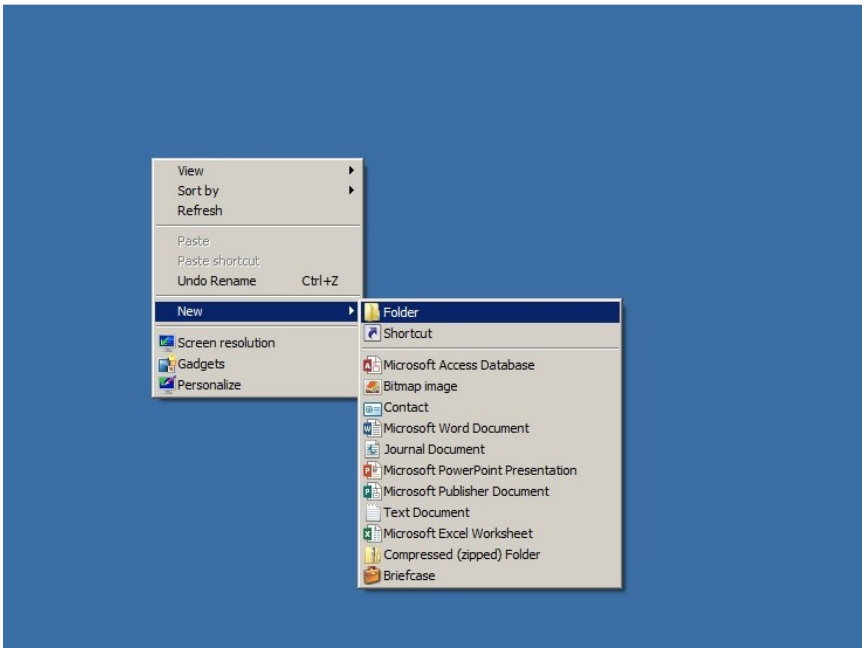
DOSBox installation is complete. Click Close to close the dialogue box.



2. Create a suitable directory to contain the PP3 software and any NAPLPS files you want to display.

You will need to create a directory that is accessible to DOSBox. The directory can be called anything you want and be located anywhere you have permissions to read and write files. In this case, we will create a directory called “DOS” located on the desktop.

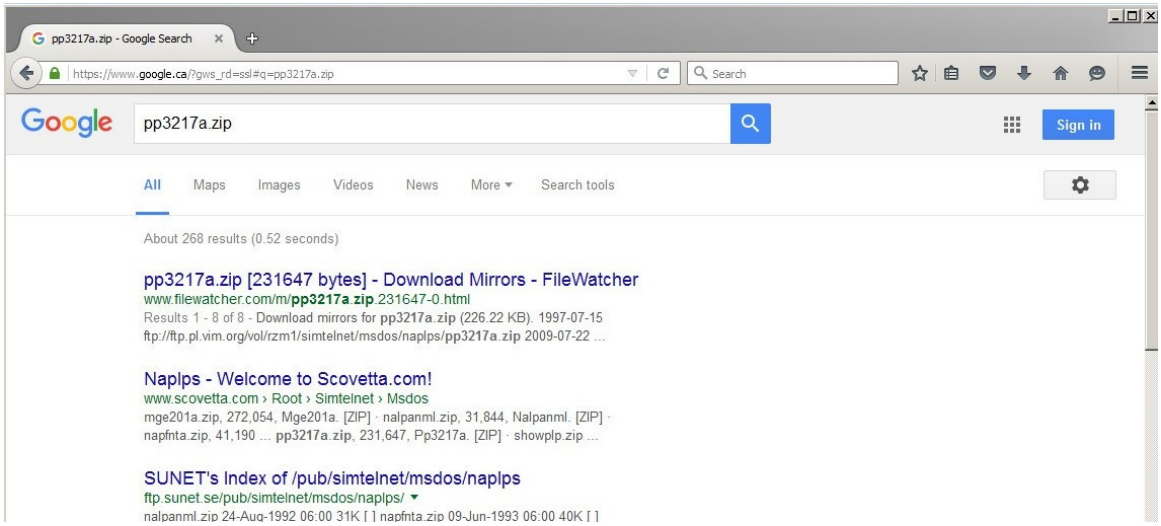
Right-click on the Desktop and select New->Folder from the pop-up menu.



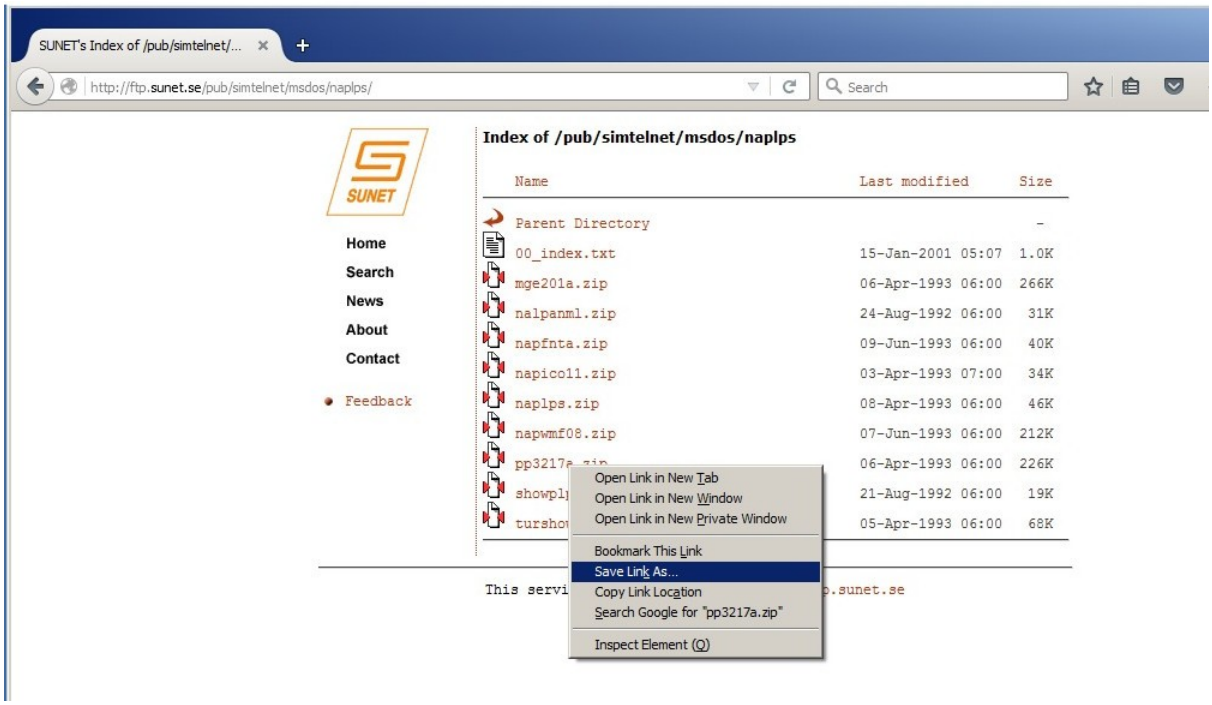
Name the new folder *DOS*:

3. Download and unzip PP3 in the DOS directory.

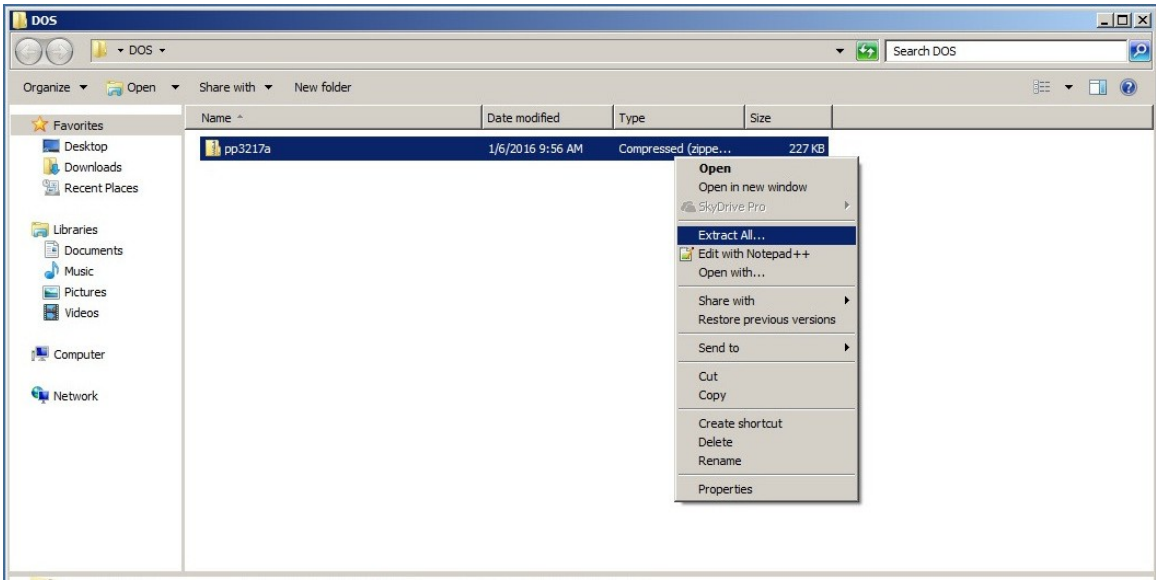
In its time (the early 1990s) PP3 was widely distributed via the Simtel DOS shareware archive. The Simtel archives are no longer being actively maintained or officially hosted, but mirrors still exist. You can try http://cd.textfiles.com/simtel/simtel20/MSDOS/NAPLPS/.index.html or if that's not working the easiest way to find the software is to search for its filename (pp3217a.zip) in Google:



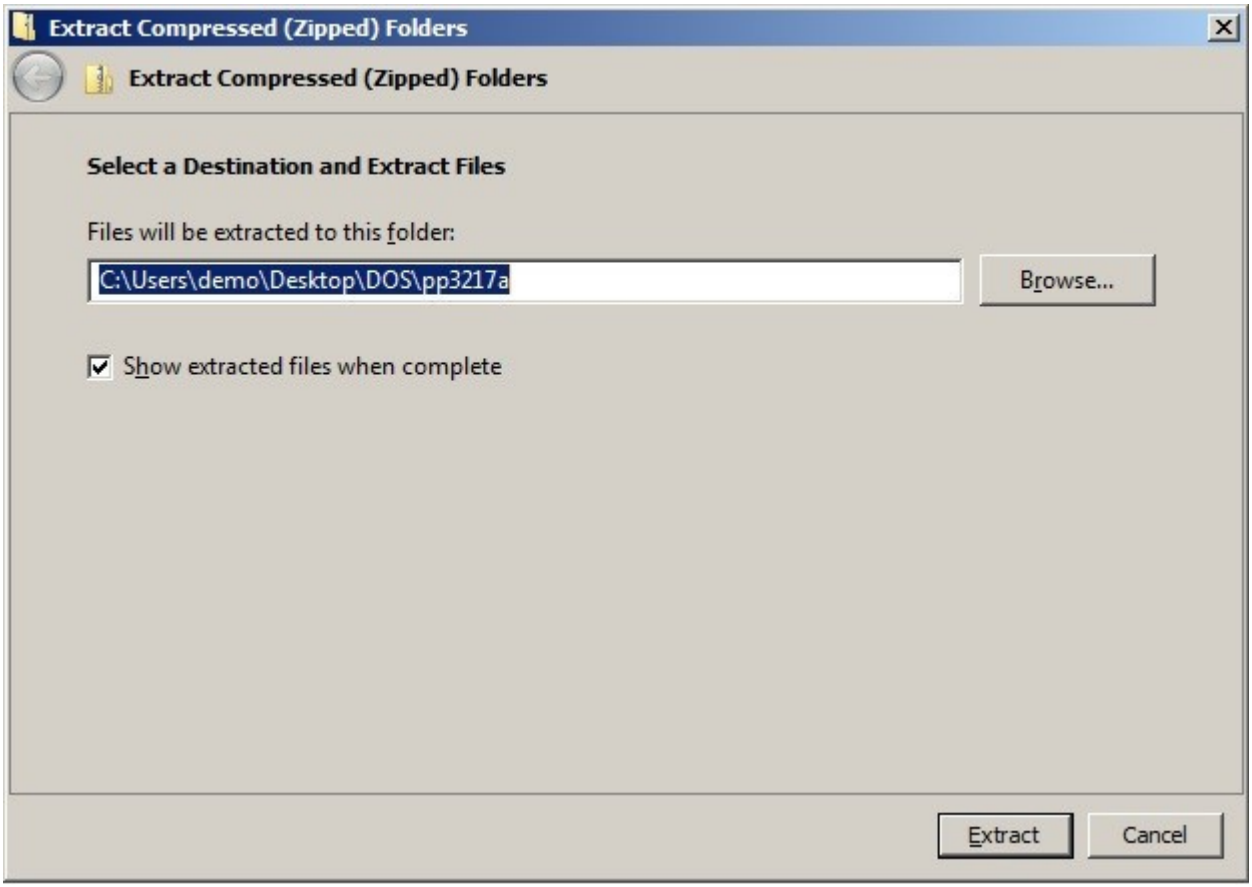
Connect to one of the mirror sites you found and download the file pp3217a.zip to the DOS directory you created in the previous step. If you're using Firefox, you can right-click on the file and select “Save Link As ...” from the pop up menu. This will give you the option to select the DOS directory on your Desktop as the save location.



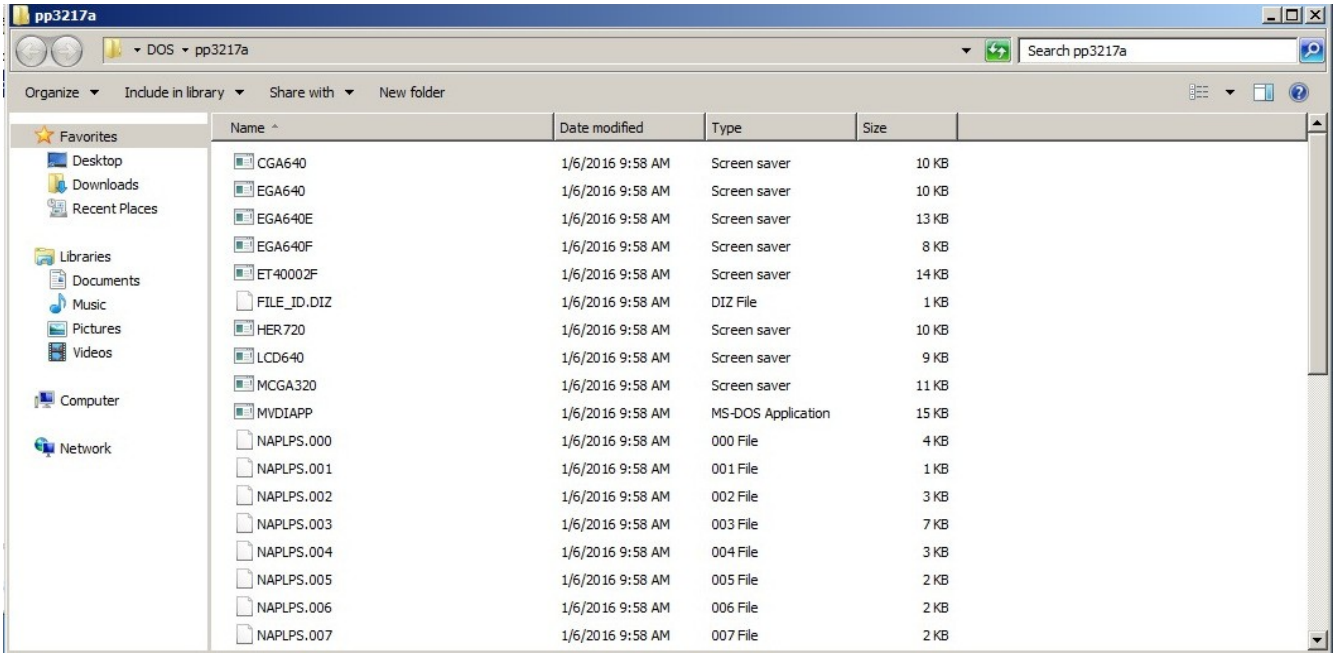
After the file has been downloaded to the DOS directory, you will need to uncompress it. Right-click the pp3217a.zip file and select “Extract all” from the pop-up menu.



You will be prompted to select a location for the uncompressed files. The default should be fine. Click “Extract” to complete the operation.



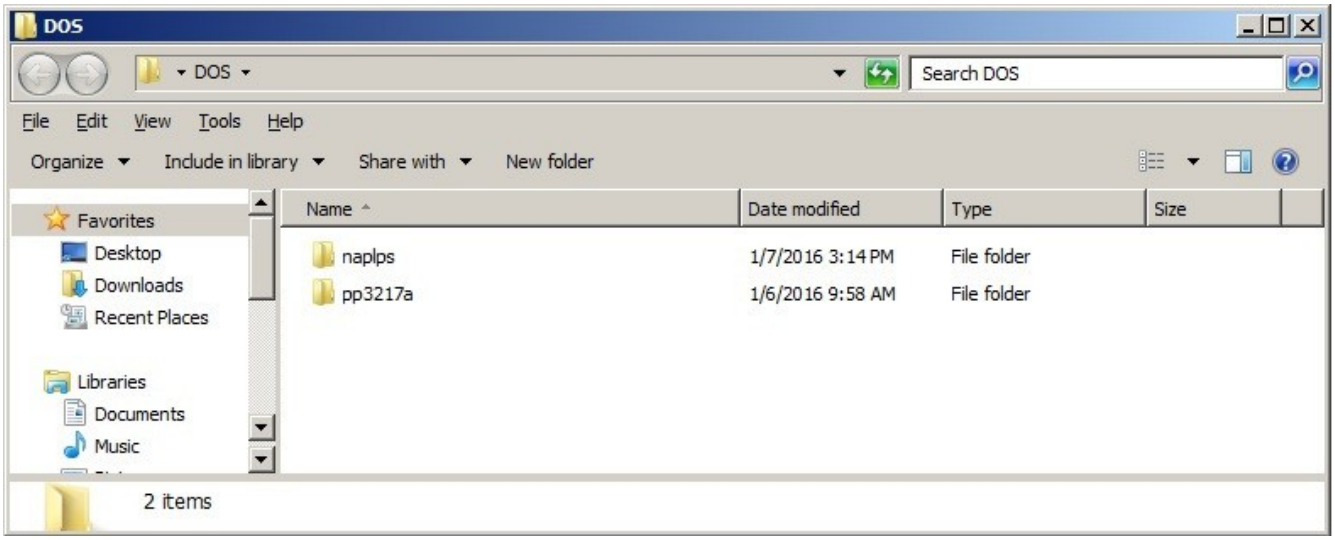
This operation will create a folder called pp3217a in the DOS folder on your Desktop. It contains the files for the PP3 application.



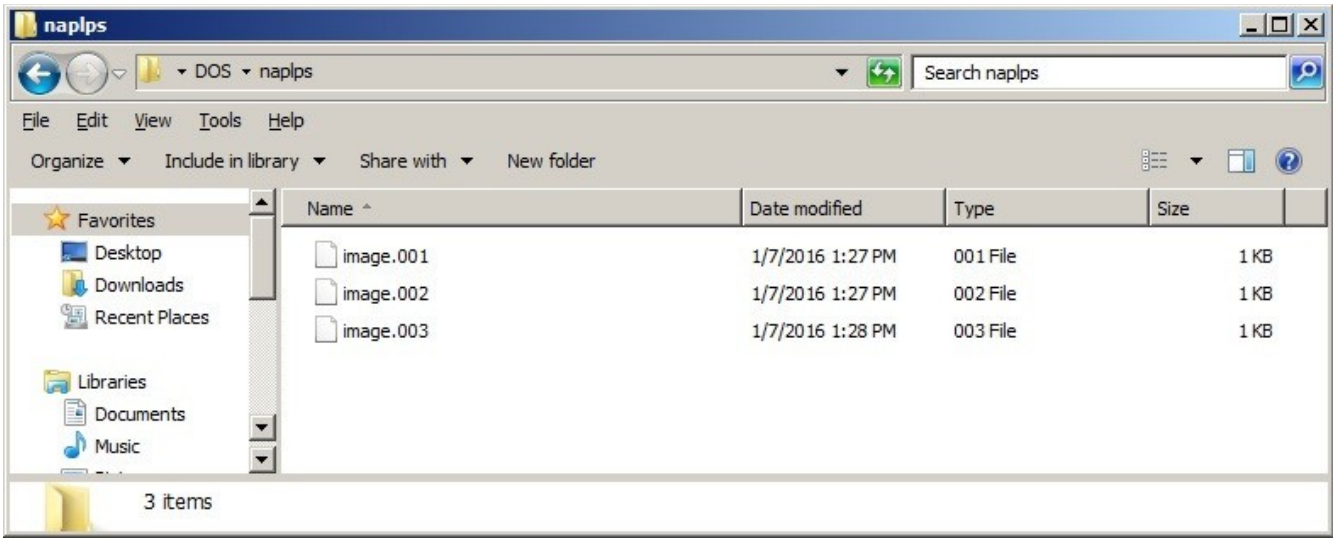
You can remove the compressed file pp3217a.zip from the DOS directory at this point. We will have no further need of it.

4. Put your NAPLPS images in one or more directories adjacent to the PP3 directory.

In this example, our NAPLPS files will be located in a folder called “naplps”.



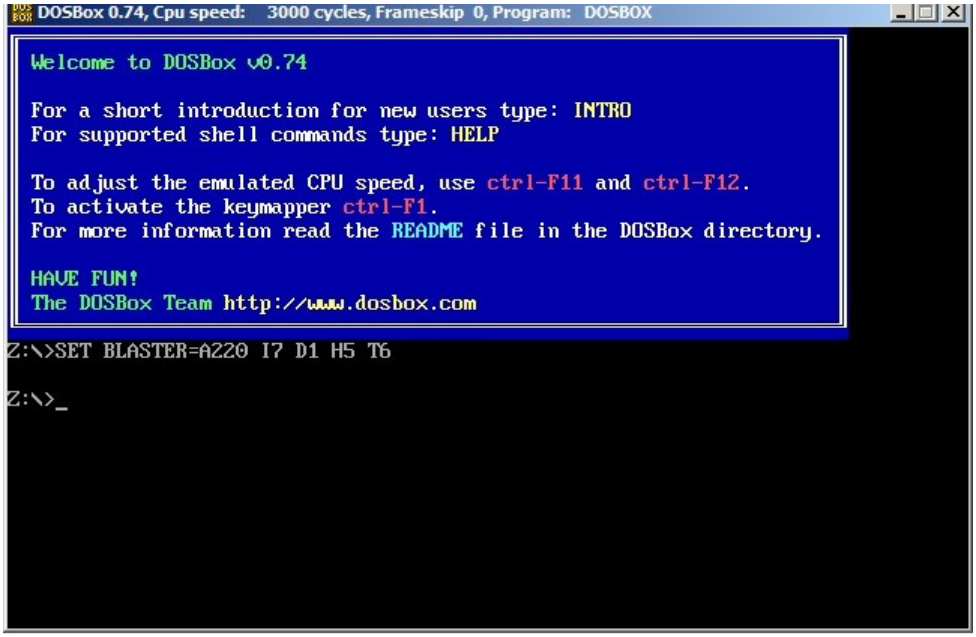
Inside the folder there are three files, named image.001, image.002 and image.003. The files are named according to the convention expected by the PP3 slideshow function: all the files must have a maximum 8 character filename followed by a three-digit numeric extension in ascending order.



Since this is a non-standard way of naming NAPLPS files, it is likely you will need to rename your files before you can display them in PP3. You can either do this manually, or use one of many available tools for automating the renaming operation. Coverage of those tools is beyond the scope of this technical note.

5. Run DOSBox

If you followed the DOSbox installation method above, you will have a DOSBox icon on your Desktop. Click that to launch DOSBox. When DOSBox starts up, it looks like this:



Initially you have no access to your local hard drive. You must first mount part of your local drive so DOSBox can see it. In this example, we will mount the DOS directory we created in step 2 above. We do this by typing the following command at the Z:\> prompt:

mount c c:\users\demo\Desktop\DOS

Then press enter. DOSBox will tell you if the mount operation was successful.

```
Z:\>mount c c:\users\demo\Desktop\DOS
Drive C is mounted as local directory c:\users\demo\Desktop\DOS\

Z:\>
```

In this example, my home directory is called 'demo'. You will of course need to substitute the name of your home directory to run the command on your own system, like so:

mount c c:\users\<your home directory>\Desktop\DOS

Switch to your newly mounted C: drive by typing c: at the Z:\> prompt. This will change the Z:\> prompt to a C:\> prompt.

```
Z:\>c:

C:\>_
```

6. Run PP3 from within DOSBox

The PP3 program is located within the directory 'pp3217a' at the root of our C: drive. Change into the pp3217a directory by typing 'cd PP3217A' at the prompt.

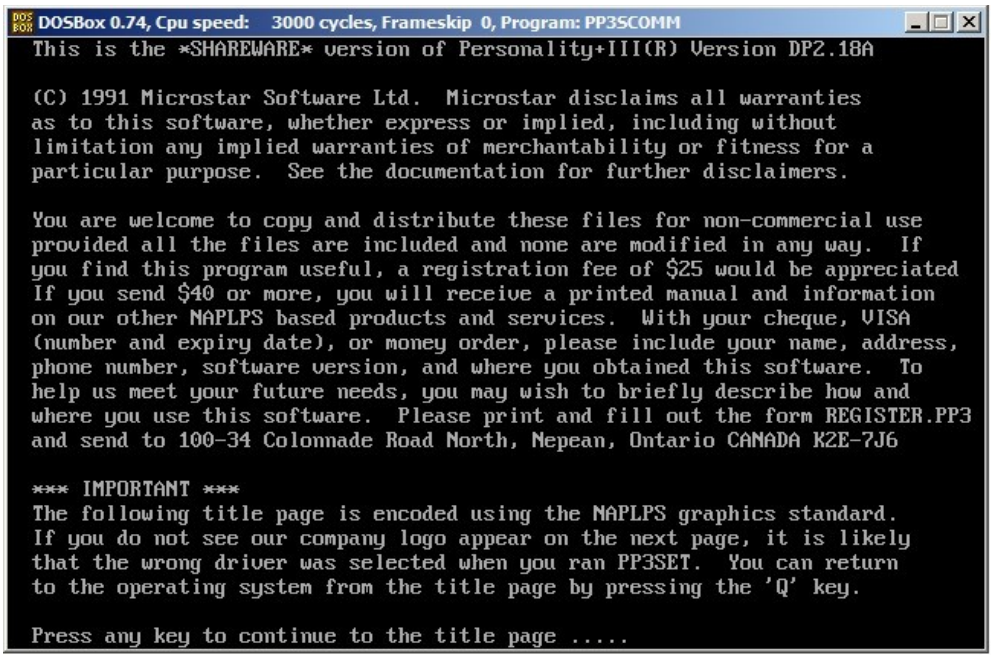
If this is the first time you have run PP3, you will need to first set the video mode before you can run the program. You can do that by typing 'pp3set e vga640' at the prompt after you've changed into the pp3217a directory. The program will respond with a couple of comments as below:

```
C:\>cd PP3217A

C:\PP3217A>pp3set e vga640
C:\PP3217A>echo off

  Type "PP3" to use Personality+III.
  To change the graphics card support again, type "PP3SET".

C:\PP3217A>_
```

Now you can run PP3. Type 'pp3' at the C: prompt:

```
C:\PP3217A>pp3
```

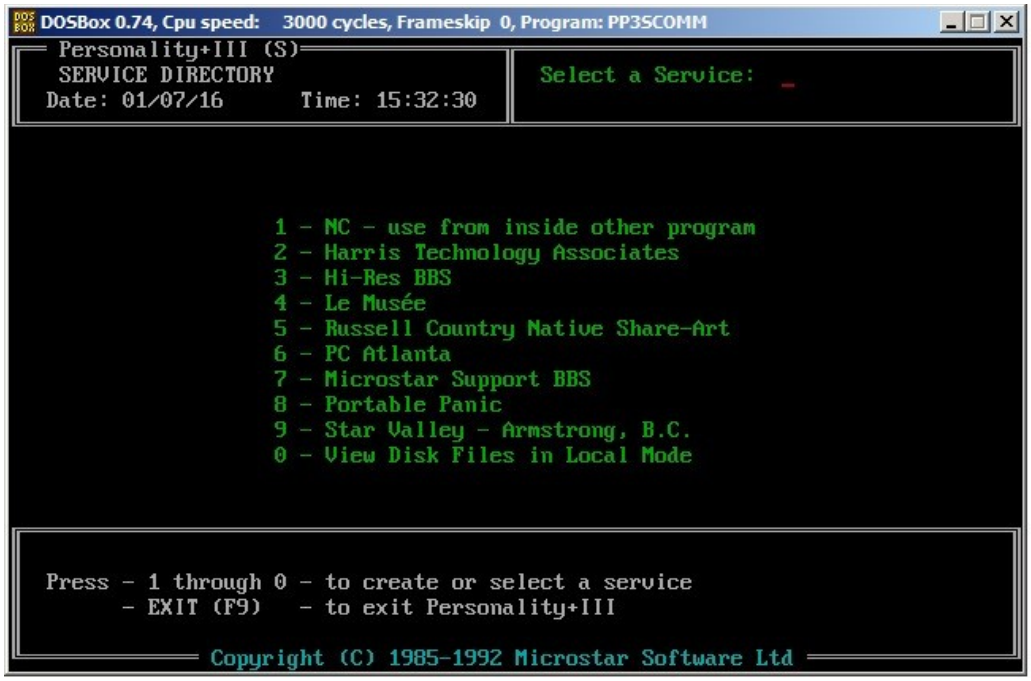
The program launches by displaying the licensing terms. Press any key to go to the next screen.



The next screen is the splash screen. Press any key to continue.

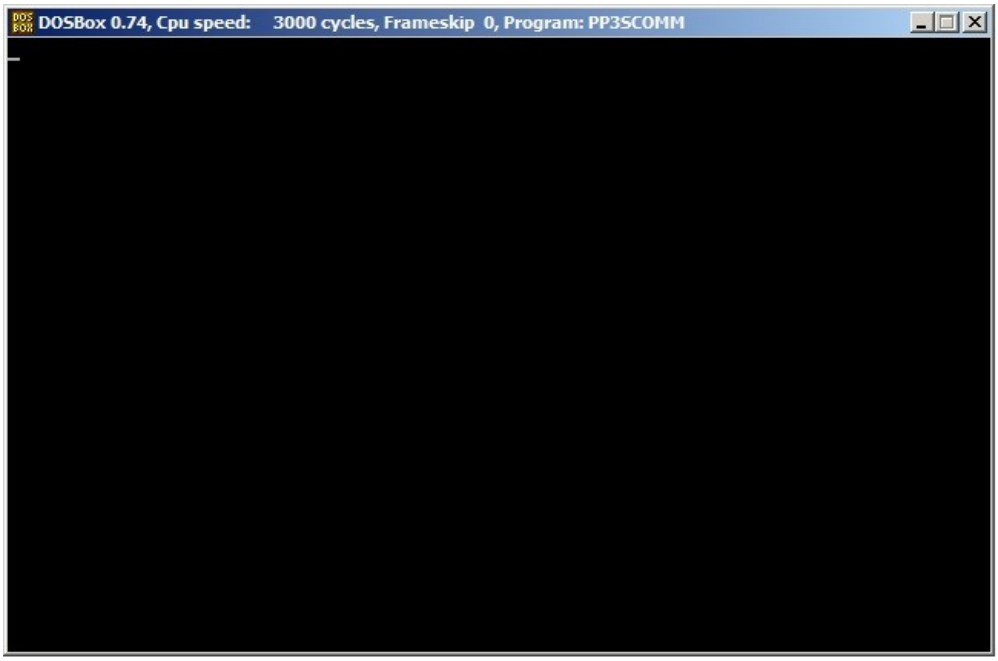
7. Displaying NAPLPS Graphics

Once past the splash screen, PP3 displays a menu of options:

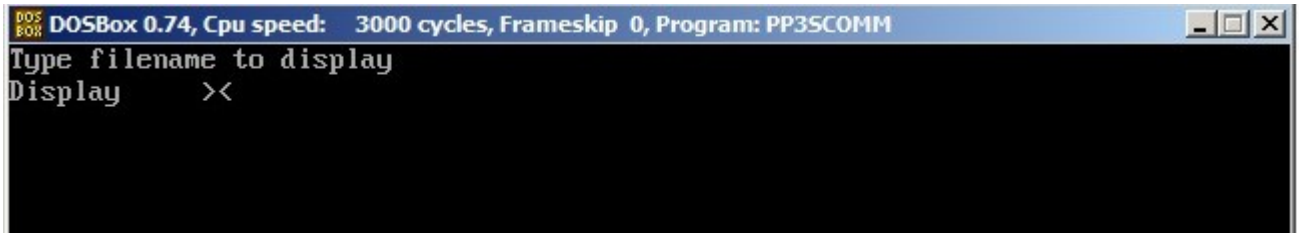


The last option, “View Disk Files in Local Mode,” is the one we're interested in. Press 0 to select it.

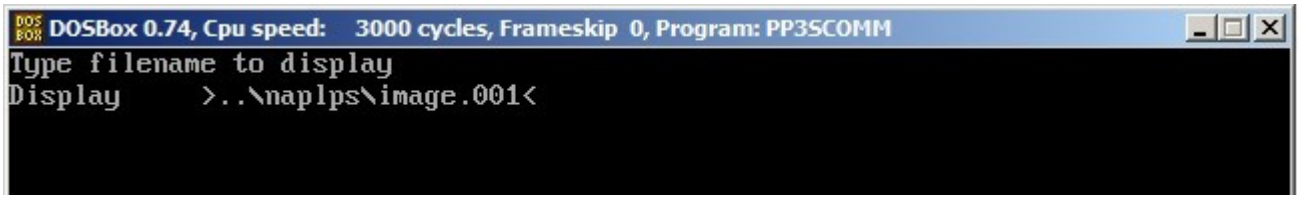
You will be greeted with a blank screen and a blinking cursor. This is normal:



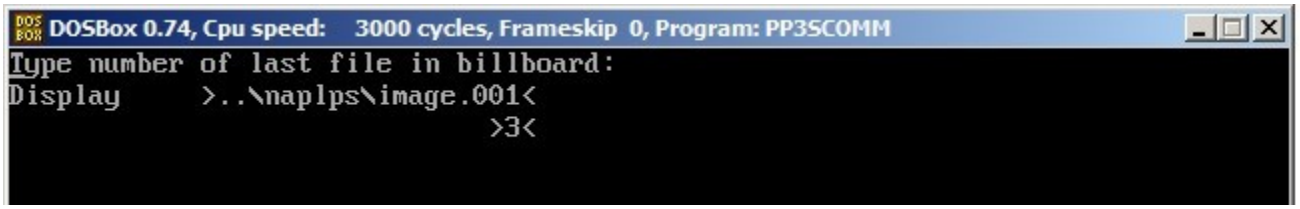
Press the control key (Ctrl) and the F2 key together and the program will ask you to specify an image to display:



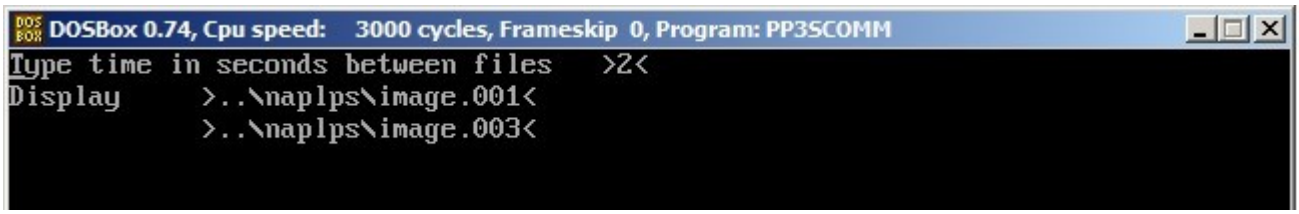
Enter the name of the first image in the sequence you wish to display. In this example, the images are located in a directory called 'naplps' that sits at the root of our C: drive, one level up from the pp3217a directory. We can specify this location using a relative directory path: ..\naplps\image.001, like so:



Hit enter and it will prompt you to indicate the last number of the image in the sequence. In this case, the last image we want to display is named image.003, so here we will enter '3':

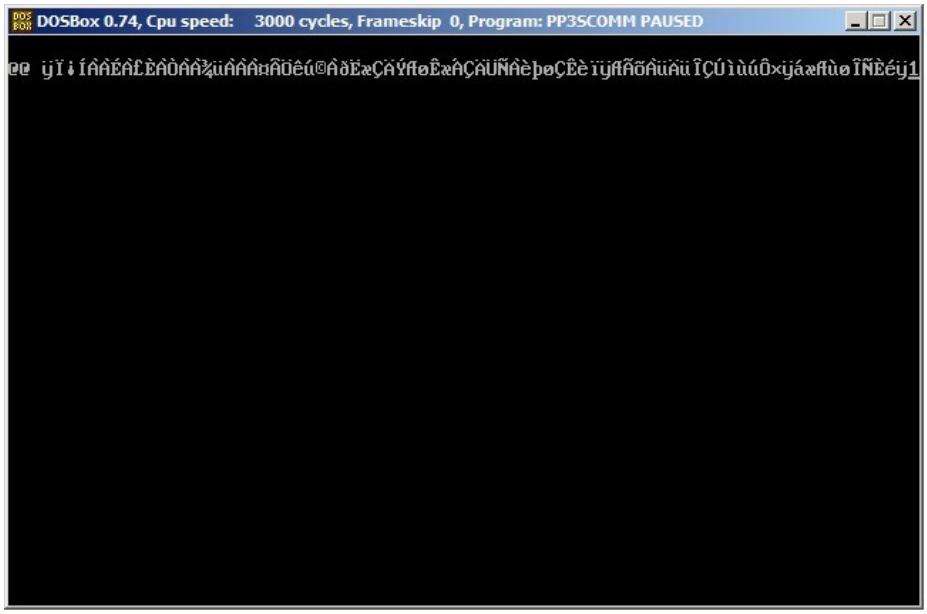


Finally we will be prompted to indicate the number of seconds to pause between images in the slideshow. In this example, we specify 2 seconds. Note that PP3 has automatically filled in the full path to the last image in the slideshow:

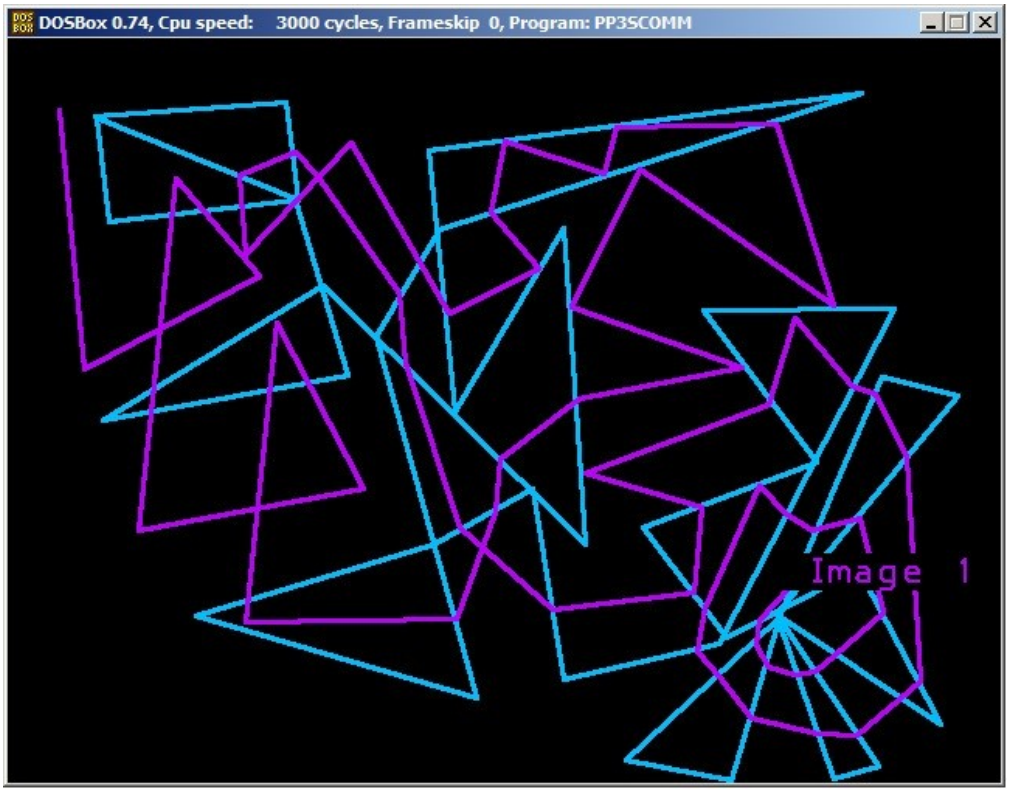


Press Enter.

You will see a screen displaying a line of text rather than the image you were expecting:



This is because PP3 is displaying your image file in ASCII mode rather than NAPLPS mode. To change to NAPLPS mode, press the Alt key and F9 together. The next image in the sequence will display in NAPLPS mode:



The slideshow will continue to cycle until you tell it to stop. Pressing Alt and F10 will return you to the PP3 menu. From there, pressing F9 will allow you to exit PP3 and return to the DOS prompt. Control/F9 exits DOSBox, or you can just close the window.

For more detailed instructions on PP3, including how to display single images rather than multiple images in a slideshow format, see the file README.PP3 in the pp3217a directory.

8. Speeding Up/Slowing Down

By default, DOSBox runs at a speed that will cause your images to render significantly faster than they would have on the hardware that was available in the mid 1980s. DOSBox gives you the ability to vary processing speed. Press Control & F11 to slow down your rendering speed (multiple times if necessary), and Control/F12 to speed it up. Number of cycles will display in DOSBox window bar.

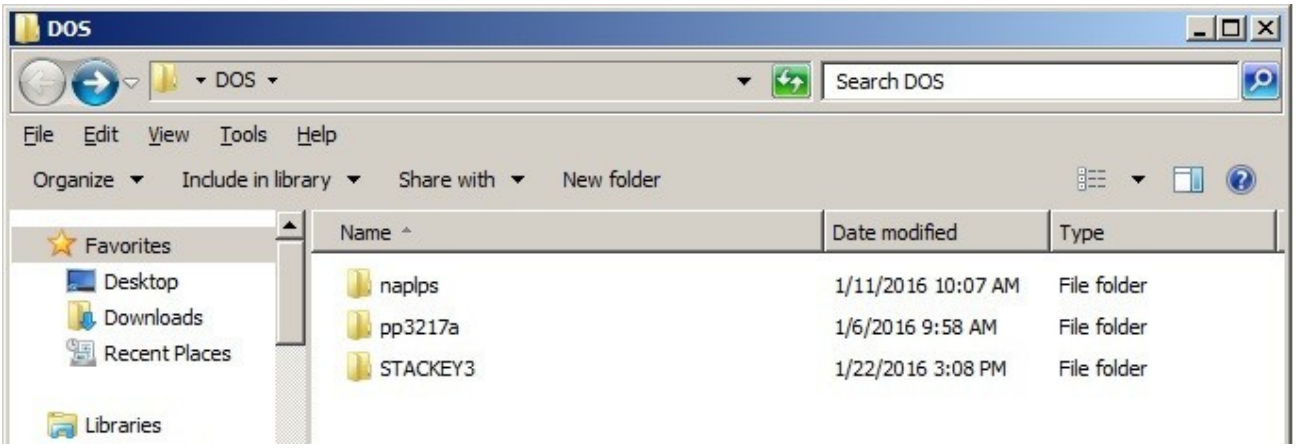
Alternatively you can set the speed to a defined value in the DOSBox config file before starting DOSBox. See the section below, “Automating Startup” for more details.

9. Automating Startup (Optional)

As we have seen, starting up a NAPLPS slideshow in DOSBox/PP3 requires entering several commands in sequence. This may not always be convenient. It is possible to automate the process using a shareware utility called Stackey3 and calling it from within the DOSBox config file.

First you will need to download and install Stackey3. This is similar to installing PP3, in that you will need to download and unzip the program files into the DOS directory we created in Step 2. As with PP3, Stackey3 is also available from various Simtel archive mirror sites. You can try downloading the file STACKEY3.ZIP from http://cd.textfiles.com/simtel/simtel20/MSDOS/BATUTL/.index.html or if that's not available simply search for the filename in Google.

The process for downloading and installing Stackey3 is the same as for PP3, so you can refer to section 3 of this document if you need detailed notes. You should install (unzip) it at the top level of your DOS directory, same as for PP3 and the NAPLPS files. When you're done, your DOS directory should look like this:

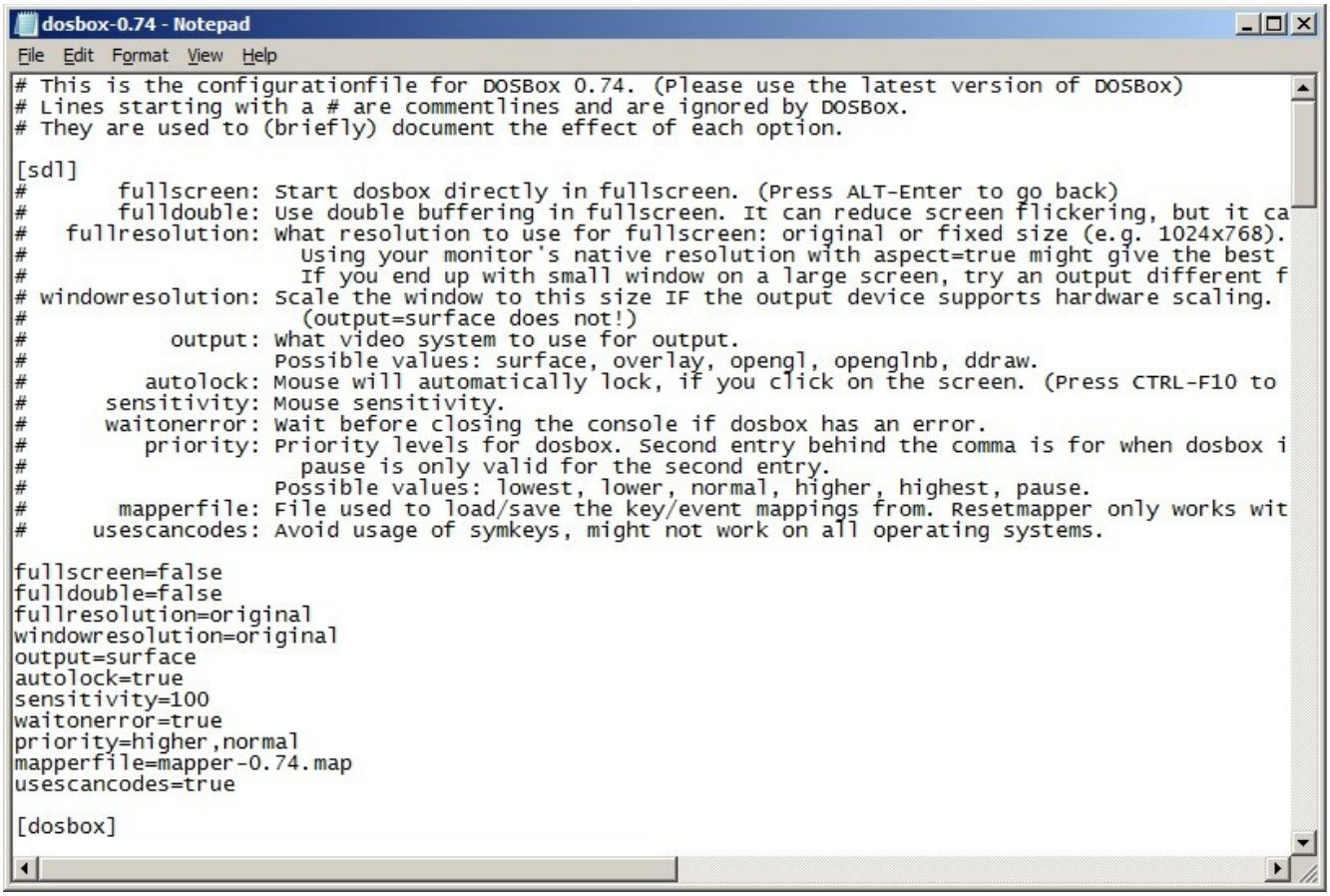


Next you will need to modify your DOSBox config file to set the necessary parameters and activate Stackey3. The config file is located in different places on different systems. According to the DOSBox documentation, on Windows Vista, 7 and 8 systems the config file is located in:

{system drive}:\Users*{username}*\AppData\Local\DOSBox\dosbox-{version}.conf

Since we are using a Windows 7 system and DOSBox version 0.74, and our username is "demo," our config file is located in C:\Users\demo\AppData\Local\DOSBox\dosbox-0.74.conf

Open your config file in a text editor and have a look at it. Use Notepad (under the Accessories menu) or another text editor if you prefer. (Do not use Word). You can leave most of the file unchanged but there are two or three sections you might want to modify. The config file looks like this when you open it in Notepad:



Sections of the comfig file are denoted by the words in square brackets. Look for the section called [cpu].

By default, the [cpu] section contains the following settings and values:

```
core=auto
cputype=auto
cycles=auto
cycleup=10
cycledown=20
```

As noted above, the default CPUspeed in DOSBox renders NAPLPS graphics much more quickly than they would have rendered on 1980s-era hardware. To slow down the CPU you can change the processor type to a slower model, and set the cycles to a defined value. For this example, we will change the CPU type to 386 and set the cycles to 400. The CPU values now look like this:

```
core=auto
cputype=386
cycles=400
cycleup=10
cycledown=20
```

Even if you think you might want different values leave them set this way for now. The following modifications depend to a certain extent on the processing speed.

The next section we need to modify is down at the bottom of the DOSBox config file, called [autoexec]. It should be empty except for a couple of comments. Enter the following values:

```
mount c C:\Users\Demo\Desktop\DOS
c:
cd pp3217a
..\stackey3\stackey W36 CR W36 CR W36 "2" W36 "1" W36 "0" CR W36 C2 W36
        "..\naplps\image.001" CR W36 "3" CR W36 "2" CR W54 A9
PP3
```

Important: This line beginning with " ..\stackey3\stackey W36 CR W36 " needs to be on a single line. It only wraps here because it exceeds the length of the page margin.

Assuming your system is set up exactly the same way mine is, your demo should now start automatically. However it is likely you will need to change some things. Lets step through the commands in the autoexec section to see what they are doing.

mount c C:\Users\Demo\Desktop\DOS
Mount the designated folder as your C: drive. You will likely need to change this with the appropriate values for your system

c:
Make c: the active drive

cd pp3217a
Change to the directory where the PP3 program is located

..\stackey3\stackey W36 CR W36 CR W36 "0" CR W36 C2 W36 "..\naplps\image.001" CR W36 "3" CR W36 "2" CR W54 A9
Initialize the stackey macro utility with the commands you want to run in PP3. We'll come back to this in a minute. Again, this all needs to be on one line in the DOSBox config file.

pp3
Start PP3

About Stackey3 Commands

Stackey3 is a utility that enables you to automate the entry of keyboard commands in DOS. The stackey3 line in the config file plus the following pp3 line automate the steps outlined in section 6 above.

The trick to making it work successfully is to ensure that wait times between commands are sufficient to allow the previous commands to complete before entering the next one. A “wait” command in Stackey3 is indicated by 'W' followed by an integer. W18 indicates Stackey3 should wait one second before entering the next command. W36 indicates a two-second wait is required.

The line above tells Stackey3 to enter the following sequence of commands

W36 - wait two seconds while the PP3 intro screen loads
CR – enter a carriage return to move to the next screen
W36 – wait two seconds while the PP3 splash screen loads
CR – enter a carriage return to move to the next screen
W36 – wait two seconds while the menu selection screen loads
“0”– select service number zero
CR – enter a carriage return
W36 – wait two seconds while the next screen loads
C2 – enter “Control – F2”
W36 wait two seconds
"..\naplps\image.001" – enter the location and file name of the first image in the sequence
CR – enter a carriage return
W36 – wait two seconds
“3” - enter number 3 (the number of the last image in the sequence)
CR – enter a carriage return
“2” - enter the interval to wait between images
CR – enter a carriage return
W54 – wait 3 seconds while the first image loads
A9 – enter “Alt-F9” to switch into NAPLPS mode

As noted above, the processor speed and the wait times between commands are somewhat interdependent. The sequence will fail if commands are entered before the results of the previous command have been processed. You may need to play around with the values in the sequence for

optimal results on your system.

10. Full screen mode

Finally, you may want to display your images larger than the default size of DOSBox on your system. You can modify the the size of the display in the [sdl] section of the DOSBox config file. The fullscreen, fullresolution, and output settings may all need to be set. Change fullscreen to 'true', 'fullresolution' to your monitor resolution, and as noted in the comment lines for the [sdl] section, change the output value to something other than 'surface' if you wind up with a small window on a large black background. Possible settings for 'output' are identified in the comment section. They include surface, overlay, opengl, and openglnb

References

Consortel Catalogue. 1985. Vancouver, BC: Consortel.

Hughes, D. 1993. One BBSCon 1993: NAPLPS: Universal Graphics for BBSs to the Internet. Retrieved from https://archive.org/details/93bbscon-naplps

Wikipedia, n.d. Telidon. Retrieved from https://en.wikipedia.org/wiki/Telidon