

January 17, 2026

## Using DOS to frequency filter

You have already opened up the zip file where these instructions are found as a pdf file. We will get to the other files in it below.

This is a very old-school program, but very robust software that can do a number of tasks with GPR profiles. All your data files must first be converted to the GSSI dzt SIR-10 format. Which can be done quickly in batch mode using GPR Viewer, or in Process where there is a menu item that converts SIR-3000 data to the SIR-10 format. If you have Sensors and Software .dt1 files, you can convert them with Viewer, or Mala .rd3 files. Other formats of GPR data from other systems, as well as the new Mala .rd7 files must be converted using some other software such as ReflexW.

Create two new folders in your c: drive, one called **x** and the other called **DOS Box**

The first thing to do is look in the zip file and find this other zip file in this called **DOS-Box.zip**

Open it up and you will find these files in it:

Name	Type	Modified	Size	Ratio	Packed
DOSBox 0.74-3 Manual.txt	Text Document	6/26/2019 8:53 AM	64,230	66%	21,525
DOSBox 0.74-3 Options.bat	Windows Batch File	6/26/2019 8:53 AM	107	42%	62
DOSBox.exe	Application	6/26/2019 8:53 AM	3,745,792	60%	1,517,...
Reset KeyMapper.bat	Windows Batch File	6/26/2019 8:53 AM	23	0%	23
Reset Options.bat	Windows Batch File	6/26/2019 8:53 AM	21	0%	21
Screenshots & Recordings.bat	Windows Batch File	6/26/2019 8:53 AM	37	0%	37
SDL.dll	Application extension	4/9/2010 12:04 PM	448,231	58%	188,558
SDL_net.dll	Application extension	4/9/2010 12:04 PM	13,312	60%	5,349
stderr.txt	Text Document	1/11/2026 8:53 AM	0	0%	0
stdout.txt	Text Document	1/11/2026 8:53 AM	0	0%	0
uninstall.exe	Application	12/22/2019 11:04 ...	36,934	41%	21,810

Create a new folder in your C: drive called DOS Box. And put all these files in it. Then click on **DOSbox.exe** to open the program. You can create an icon for this also and put it on your desktop.

**Before you start it may be important to allocate enough memory on your computer, if the lines you are processing are long. To do this go into the folder you created to put DosBox into and look at all the files there. You will see the one that is titled **DosBox 074-3 Options.bat** . Double click on it, and it will open up in your default editing program, which on my computer is NotePad.**

Below is what all the files are that you have in this folder.

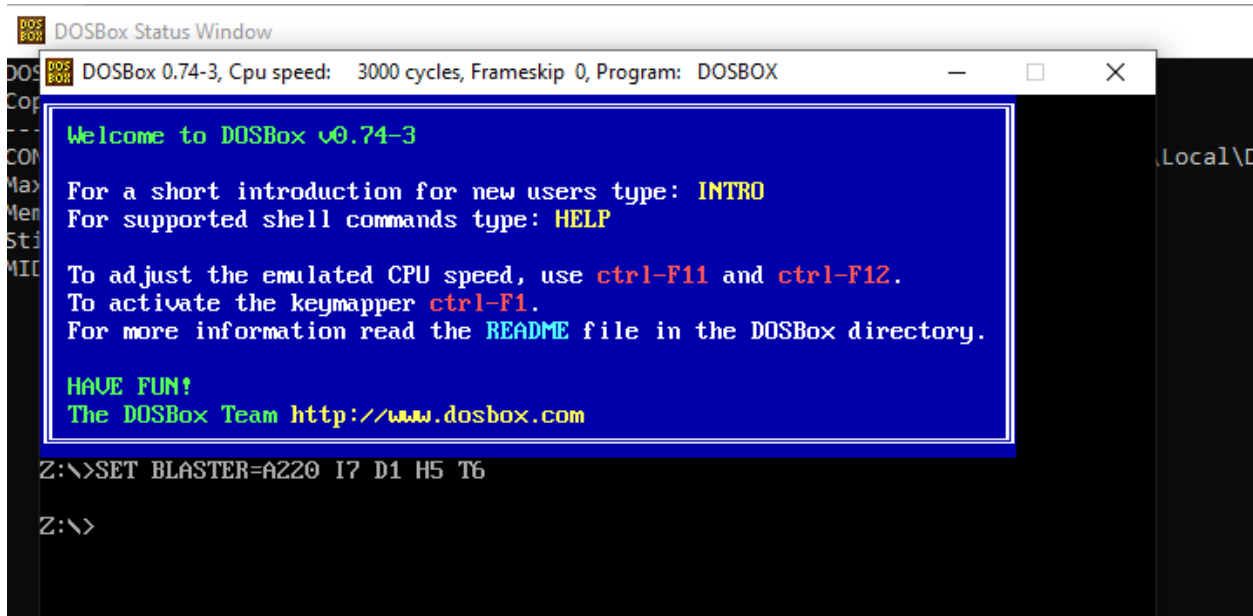
Documentation	12/22/2019 11:03 AM	File folder	
Video Codec	12/22/2019 11:03 AM	File folder	
DOSBox 0.74-3 Manual.txt	6/26/2019 8:53 AM	Text Document	63 KB
DOSBox 0.74-3 Options.bat	6/26/2019 8:53 AM	Windows Batch File	1 KB
DOSBox.exe	6/26/2019 8:53 AM	Application	3,658 KB
Reset KeyMapper.bat	6/26/2019 8:53 AM	Windows Batch File	1 KB
Reset Options.bat	6/26/2019 8:53 AM	Windows Batch File	1 KB
Screenshots & Recordings.bat	6/26/2019 8:53 AM	Windows Batch File	1 KB
SDL.dll	4/9/2010 12:04 PM	Application exten...	438 KB
SDL_net.dll	4/9/2010 12:04 PM	Application exten...	13 KB
uninstall.exe	12/22/2019 11:03 AM	Application	37 KB

When you click on the .bat file this will show up...scroll down until you see a simple line that says **memsize**...change it to 500 after the equals sign. That will give you more than memory to do all you need to do. Then save this .bat file and you are ready to go:

```
language=
machine=svga_s3
captures=capture
memsize=500
```

Then double click on DOSBox.exe to run the program. You can right click on that to create an icon on your desktop also.

This is what it will look like when you click on this file:



Then at the **z:x>** prompt at the bottom type this: **mount c c:\x** as you see below and then type "enter"

```
Welcome to DOSBox v0.74-3

For a short introduction for new
For supported shell commands typ

To adjust the emulated CPU speed
To activate the keymapper ctrl-F
For more information read the RE

HAVE FUN!
The DOSBox Team http://www.dosbo

Z:\>SET BLASTER=A220 I7 D1 H5 T6

Z:\>mount c c:\x
```

Then type **c:** “enter” and it will look like this below:

```
Z:\>mount c c:\x
Drive C is mounted as local directory c:\x\
Z:\>c:
```

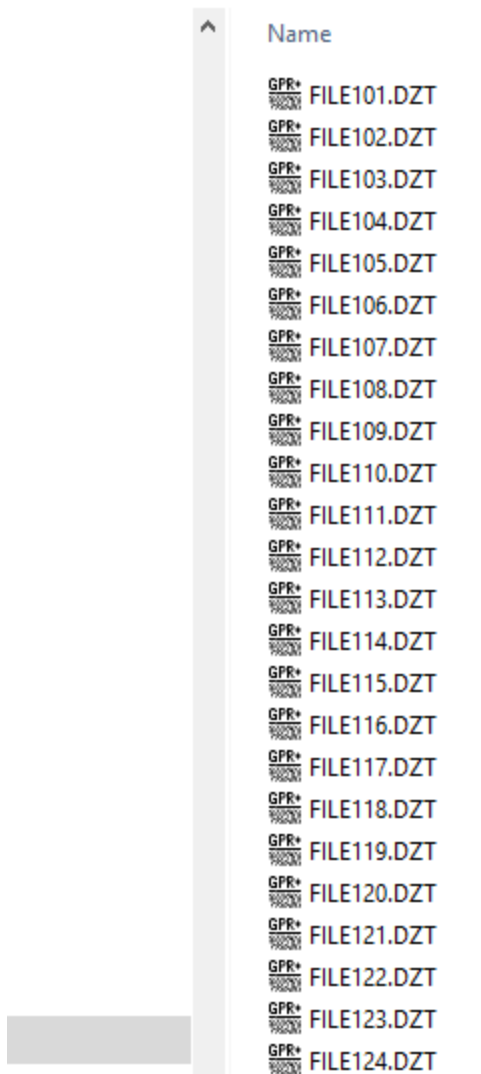
You are now ready to use it when it looks like this:

```
Z:\>c:
C:\>
```

Here it is time to put the data files, which you have already converted to SIR-10 dzt files, into the folder called x.

Here I have put files 101-124.dzt in the folder called x:

Windows (C:) > x




Then take two other files that are in the zip file, one called **gpr\_proc.exe** and the other called **freq100.cmd** and put them in the x: folder.

In the folder x you will now have all you need to process these 24 files for frequency. There are other tasks that can be performed also, but I will not go over those here.

Using a silly little program that all of you have, but you may not have used, called Notepad, open up the file in x: called **freq100.cmd**

It will look like this:

 freq100.cmd - Notepad

```
File Edit Format View Help
|***** GPR_PROC.CMD *****|
This file is GPR_PROC.CMD. It is the default keyword fi
for GPR_PROC.EXE version 1.05.02.00. May 2, 2001.

***** PROGRAM CONTROL *****
batch = "true"

***** INPUT AND OUTPUT DATA *****
num_input_files = 94
input_filelist[] = file101.dzt
                   file102.dzt
                   file103.dzt
                   file104.dzt
                   file105.dzt
                   file106.dzt
                   file107.dzt
```

Note that the last time we did anything with this program was in 2001!

In that file (which is called the command file) are what you need to modify to have the program called gpr\_proc.exe do the work for you. This is the way DOS works. You have an .exe file, called the executable file that does all the processing, and a .cmd file, called the command file where you set up instructions for the software to follow. In that file command I have given you called freq100.cmd I have it set up to do a batch processing of 94 files, starting at file101.dzt and going to file 194.dzt. They must be in sequential order! You can modify it for whatever your file names are, but they must only be 8 characters long. Instructions for renaming them in batch are below.

Below that in the command file are the new files you are going to create, here I have given them new names, so I know what I have done. These will be 94 new processed data files starting at file201.dzt and going to file294.dzt. If you want to process files that are of other names, then you need to put new file names and numbers in, which can be a pain and laborious. Instead, when I am confronted with this, I save time and use a free re-naming file that you can download called Bulk Rename Utility, which you can get here:

<https://www.bulkrenameutility.co.uk/>

**Be also aware that your file names can ONLY be 8 characters long! This is a DOS requirement from long ago.**

I have now set it up to produce 94 files and create 94 new files as seen below:

```

output_filelist[] = file201.dzt
                   file202.dzt
                   file203.dzt
                   file204.dzt
                   file205.dzt
                   file206.dzt
                   file207.dzt
                   file208.dzt
                   file209.dzt
                   file210.dzt

```

**Here is the important part.** Below the files shown above, are the options for processing. We will use here the low frequency cutoff and the high frequency cutoff. There are many other processes also such as doing background removal, gain adjustments, smoothing of traces and adjustments of the amplitudes around a mean. But we will just be doing the frequencies here. Type in your frequencies for filtering, making sure that you do NOT remove the equals sign (=). This equals sign means that the software will perform what you are asking it to!

```

***** PROCESSING OPTIONS *****
; NOTE that options are performed in the order they are listed by you. One
; suggested sequence is given below.
glob_bckgrnd_rem = "FALSE"
glob_forgrnd_rem = "false"
num_gain_off 0
gain_off[]
amp_adjust      "INVALID_VALUE"
low_freq_cutoff = 200 ; NOTE: both low and high cutoffs must be given if
high_freq_cutoff = 300 ; either or both are requested
preprocFFT      "false"
samp_slide      0
wind_bckgrnd_rem 0
wind_forgrnd_rem 0
stack           0
amp_scale        1.0
hsmooth         0
vsmooth         0
spatial_median   0
temporal_median  0
inst_amp         "FALSE"
inst_pow         "FALSE"
num_gain_on     0
gain_on[]
trace_equalize   -1
***** END OF FILE GPR_PROC.CMD *****

```

Now you are ready to process. Save this command file (you can give it a new name here for your task perhaps) and we will run the program in the DOS box.

Type at the c: prompt this: **gpr\_proc.exe freq100.cmd** and hit "enter" (see below);

```
Z:\>c:
```

```
C:\>gpr_proc.exe freq100.cmd
```

When it is running it will look like this as the software is creating new files:

```
file211.dzt file212.dzt file213.dzt file214.dzt file215.dzt  
file216.dzt file217.dzt file218.dzt file219.dzt file220.dzt  
file221.dzt file222.dzt file223.dzt file224.dzt file225.dzt  
file226.dzt file227.dzt file228.dzt file229.dzt file230.dzt  
file231.dzt file232.dzt file233.dzt file234.dzt file235.dzt  
file236.dzt file237.dzt file238.dzt file239.dzt file240.dzt  
file241.dzt file242.dzt file243.dzt file244.dzt file245.dzt  
file246.dzt file247.dzt file248.dzt file249.dzt file250.dzt  
file251.dzt file252.dzt file253.dzt file254.dzt file255.dzt  
file256.dzt file257.dzt file258.dzt file259.dzt file260.dzt  
file261.dzt file262.dzt file263.dzt file264.dzt file265.dzt  
file266.dzt file267.dzt file268.dzt file269.dzt file270.dzt  
file271.dzt file272.dzt file273.dzt file274.dzt file275.dzt  
file276.dzt file277.dzt file278.dzt file279.dzt file280.dzt  
file281.dzt file282.dzt file283.dzt file284.dzt file285.dzt  
file286.dzt file287.dzt file288.dzt file289.dzt file290.dzt  
file291.dzt file292.dzt file293.dzt file294.dzt
```

```
For DZT files only: channel = 1  
USER INPUT FOR PROCESSING PARAMETERS:  
Low frequency cutoff = 200.000 MHz  
High frequency cutoff = 300.000 MHz  
preprocFFT = TRUE  
In Batch processing mode.  
Processing file file102.dzt ..._
```

You now have a whole new set of files to process using other software to make slice-maps or 2-d reflection profiles. Move them from the x folder and put them in a sub-folder where your raw data files are called something **like frequency filtered 200-300**.

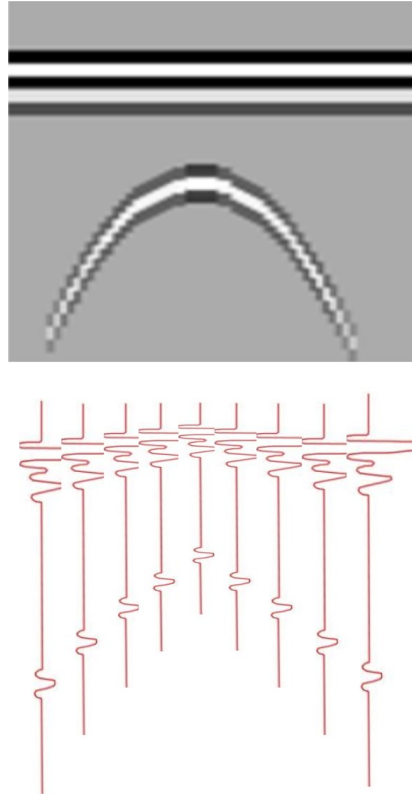
**Below is the DOS version of AI that Jeff Lucius and I created back in 1998 to solve our migration problems. In those days we were just beginning to understand the importance of migration to remove hyperbolas before we sliced up profiles in a grid (we had just learned how to slice in those days!).**

The migration programs that were available to us in the late 1990s were poor. So, we came up with a way to remove hyperbolas without doing any velocity analysis or migrating the axes back to their origin. I know this is cheating! And it is not “real” migration. But our goal was to remove the axes, so this works just as well, if not better.

The idea is that you command the same software that we use for frequency filtering to look for any reflections in sequential traces that have reflections in the shape of a hyperbola when analyzed in 2-D. And then remove them. In this philosophy we are creating a “model” of what a hyperbola shape would

be, and then searching the whole profile for any shapes of that size and removing those specific reflections in sequential traces. There is a risk in doing this, as other reflections may also be removed that just happen to be that shape. But so far, I have never found this to be a problem.

Below is a very simple diagram of what this is doing:



Above we have a hyperbola that is displayed in a 2-D profile and below it the traces that are used to display this in profile. You can see specific reflections from the hyperbola, with only the middle one being the reflection from the point source, and there are 4 traces on either side of it being the hyperbola axes. What we want to do is remove all those reflections on either side of the apex, leaving only the one in the middle.

**Important note:** the software will look for both axes independently, so it will do the left side first, and then the right side, when it finds a hyperbola. This is important as often only one hyperbola axis is displayed, and we don't want the software going out and removing one side if no reflections are there to remove! Or it "may look" like it is one small point source in a profile, but when we remove the axes independently the source is actually much more complicated than just one "point". When you think about this, this method is much more intuitive than standard velocity migration methods.

We now get into the command file. If you are using the same profiles that were illustrated above for frequency filtering, you can use that same command file. Open it in NotePad and the file numbers can be the same for input, or you can change them to process files that are of different names. I am leaving them the same for this illustration.



Here is a new command file that I created, called hyp100.cmd, which is included in the zip file. All the file numbers are the same, and I have removed the equals sign in the high and low frequency cutoffs lines, so it doesn't try to do that, and put in an equals sign after **wind\_forgrnd\_rem**

Then I put in the number of traces to search for a hyperbolic shape. In this case I am going to look for 11 traces. This is the number of traces for the whole hyperbola (both axes). It must be an odd number. This will leave ONE trace in the middle for the axis. In this case, which is shown in the diagram above, 5 traces on one side, and 5 on the other side of the apex.

```
***** PROCESSING OPTIONS *****
; NOTE that options are performed in the order they are listed by you. One
; suggested sequence is given below.
glob_bckgrnd_rem = "FALSE"
glob_forgrnd_rem = "false"
num_gain_off 0
gain_off[]
amp_adjust "INVALID_VALUE"
low_freq_cutoff 200 ; NOTE: both low and high cutoffs must be given if
high_freq_cutoff 300 ; either or both are requested
preprocFFT "false"
samp_slide 0
wind_bckgrnd_rem 0
wind_forgrnd_rem = 11 ; Note: input # traces to search for a hyperbola: must be odd number
```

Then save this new command file in the same folder as we used before, where the input data files are located.

Then in DOSBox type: **gpr\_proc.exe hyp100.cmd**

```
C:\>gpr_proc.exe hyp100.cmd
```

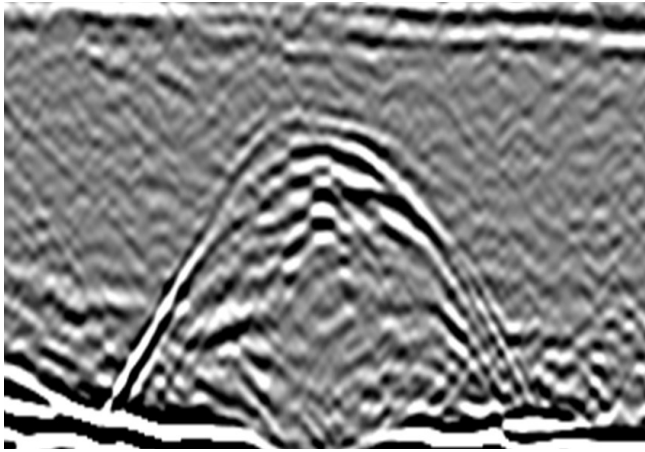
And it will start processing and look like this. Here I am saving the files as the same names as I used in frequency filtering above, which is perhaps not a good idea. Depending on what you are doing it is better to save them as a new set of file names such as file301.dzt etc., so as not to get too confusing

```
output data files [22]:
file201.dzt file202.dzt file203.dzt file204.dzt file205.dzt
file206.dzt file207.dzt file208.dzt file209.dzt file210.dzt
file211.dzt file212.dzt file213.dzt file214.dzt file215.dzt
file216.dzt file217.dzt file218.dzt file219.dzt file220.dzt
file221.dzt file222.dzt

For DZT files only: channel = 1
USER INPUT FOR PROCESSING PARAMETERS:
Windowed foreground removal = 11
In Batch processing mode.
Processing file file104.dzt ...
```

Now you can look at the files in GPR Viewer to see if you used the correct number of traces to do your search.

In this case I am not sure I did very well with 11 traces. Here is the raw hyperbola, and below it the search for 11 traces:



I will try it again and see if I can remove more of that left axis. But it did nicely on right axis. You may need to do a few trials to get it perfect.