

SIBO on Windows XP



by Mark Stevenson.

This article describes a method of making the Psion Series 3a emulator run from within Windows XP, normally this is impossible as the Series 3a emulator requires direct access to the computer hardware which is strictly controlled by Windows. It was possible to persuade the emulator to run from Windows '95/'98 but this simply forced Windows to shut down , the emulator was started and once the emulator was closed Windows was rebooted, hardly convenient. This method will allow the emulator to run in its own window , with no reboots necessary once the programs are set up .

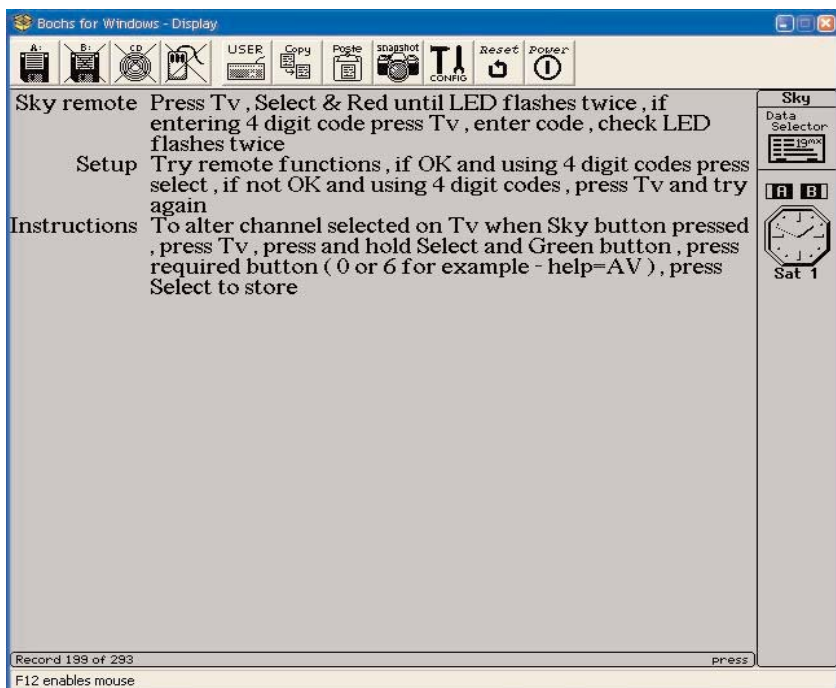
The original system requirements for the Series 3a emulator were of a minimum 386 processor, 4Mb ram and a VGA graphics adaptor. Of course this is easily provided by any PC capable of running any version of Windows '95 , '98 ME or XP, the trouble is that the Psion emulator can't use it while

Windows is running, and later versions of Windows will not provide a pure DOS environment either. By running another program called Bochs which uses software to create an artificial computer we can run the emulator from there. Here's how:

You will need:

- 1.Copy of the Psion Series 3a emulator (S3AEMUL.ZIP)
- 2.Copy of DOS installation disk(s) preferably version 6 or above .
- 3.DOS based unzipping program
- 4.Copy of Bochs (pronounced 'box') in the correct format for your 'host' computer.

Bochs is a multi platform tool so it could be possible to follow these instructions to set the emulator to run on a variety of computers such as Linux or OS/2 machines. I have not tried this but I see no reason why it shouldn't work. (Bochs is a free download from <http://bochs.sourceforge.net/>) The version I have is 2.1.1



and these instructions are based on this.

Once you have a copy of Bochs, first thing to do is to install this, start the installer, read and agree to the licence terms and conditions then accept all the default settings in the following prompts as suggested.

Next step is to create a 'virtual' hard disk for Bochs to save DOS and the emulator onto. This does not need to be much more than 25Mb in size and is created as a file on your PC hard drive. On the Windows start menu you should have a new folder entry 'Bochs 2.1.1', open this and start the

Disk Image Creation Tool. This will open a window which will ask a few questions regarding the type of disk we want to create.

Do you want to create a floppy disk image or a hard disk image?
Please type hd or fd. [hd] We want to create a hard disk image , so type hd and press enter.

What kind of image should I create?
Please type flat, sparse or growing.
[flat] Type flat and press enter.

Enter the hard disk size in megabytes, between 1 and 32255 [10] Type 25 and press enter.

'What should I name the image ?' Type Psion3a.img and press enter.

After doing this the 'disk' will be created and the following lines should be displayed:

The following line should appear in your bochsrc:

```
ata0-master: type=disk,
path="Psion3a.img", mode=flat,
cylinders=50, heads=16, spt=63
```

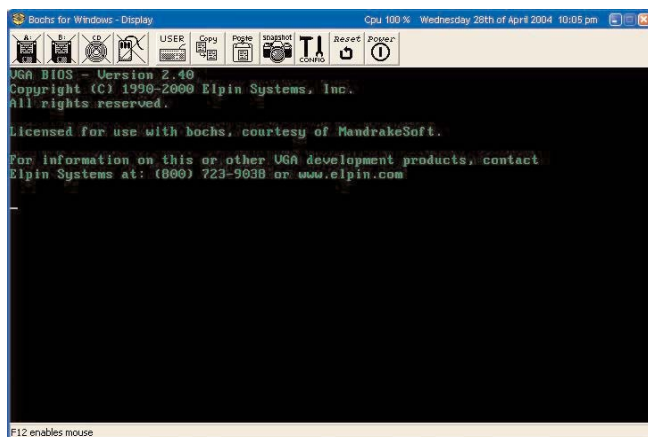
Press any key to continue.

Make a note of the settings contained in the line starting 'ata0-' these are very important and we will need this

later on , especially if you modified any of the settings from the example given here. Press any key to close the Disk Image Creation Tool.

In order for Bochs to run we need to tell it what sort of computer it should provide to us, this is done using a text file. Start a plain text editor (Notepad - NOT Wordpad) and enter the following lines (see text box on next page).

If for some reason you did not follow the instructions earlier when creating the hard disk image, you will need to ensure that you substitute the line which starts 'ata0-' with the information you wrote down when the hard disk creation tool had finished - see, I told you it was important !



Here's one I did earlier!

```
display_library: win32
megs: 8
romimage: file=$BXS SHARE/BIOS-bochs-latest, address=0xf0000
vgaromimage: $BXS SHARE/VGABIOS-elpin-2.40
boot: disk
floppya: 1_44=a:, status=inserted
ata0: enabled=1, ioaddr1=0x1f0, ioaddr2=0x3f0, irq=14
ata0-master: type=disk, path="C:\Program files\Bochs-2.1.1\Psion3a.img", mode=flat, cylinders=50, heads=16, spt=63
parport1: enabled=1, file=""
com1: enabled=1, dev=com1
vga_update_interval: 300000
keyboard_serial_delay: 200
keyboard_paste_delay: 100000
floppy_command_delay: 500
ips: 10000000
clock: sync=realtime, time0=local
newharddrivesupport: enabled=1
```

As the configuration file is not to be saved in the Bochs directory where the Bochs disk was created , the ata0-line must have the full filename and path information to the Bochs disk included or the disk will not be found. If you did not install Bochs to the default directory or if your Bochs version is other than 2.1.1 this path may need to be modified to reflect the actual path to your Bochs directory.

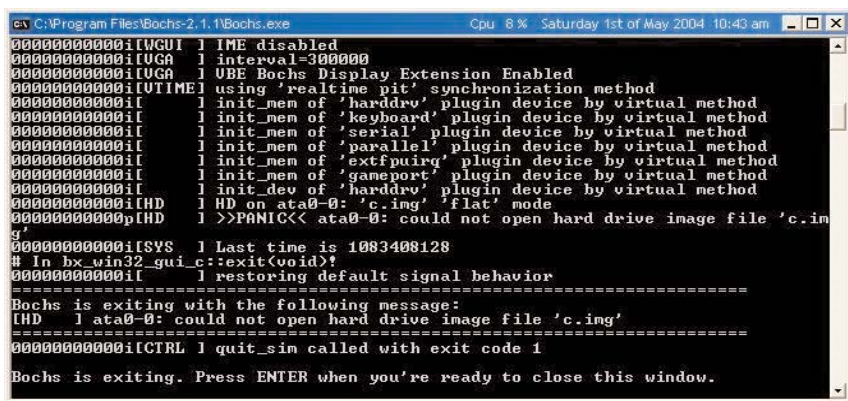
Save this text file on the desktop as Psion3a.bxrc. After you have saved this, check that Notepad has not added '.txt' to the end of the filename, if it has, rename it so that the name is Psion3a.bxrc.

It is now time to test the progress so far. Double click on the 'Psion3a.bxrc' file and see what happens. If you see one window open, some text flash past, another window open, then close (it is important that this second

window is opened and closed, this proves that Bochs is starting the artificial computer up) and finally a message which says ;

"Bochs is exiting . Press ENTER when you're ready to close this window" as shown in the picture at the bottom of the page.

Then all is working as it should . If this does not happen, you will need to check that the Psion3a.bxrc file has not been renamed. Check also that the information entered in the configuration file has been entered correctly. As the configuration file is not in the same directory as the Bochs program files the full path to the Bochs disk must be included in path setting on the line which starts ata0- . The configuration file must be entered in a plain text editor , not a word processor - this is vital, Bochs will not be able to read the file if it is not in plain text.



```

C:\Program Files\Bochs-2.1.1\Bochs.exe      Cpu: 8 %   Saturday 1st of May 2004 10:43 am
000000000000iVGUI  I IME disabled
000000000000iVGA  I interval-300000
000000000000iVGA  I UBE Bochs Display Extension Enabled
000000000000iVTIME I using 'realtime pit' synchronization method
000000000000iI    I init_mem of 'harddrv' plugin device by virtual method
000000000000iI    I init_mem of 'keyboard' plugin device by virtual method
000000000000iI    I init_mem of 'serial' plugin device by virtual method
000000000000iI    I init_mem of 'parallel' plugin device by virtual method
000000000000iI    I init_mem of 'extfpurg' plugin device by virtual method
000000000000iI    I init_mem of 'gameport' plugin device by virtual method
000000000000iI    I init_dev of 'harddrv' plugin device by virtual method
000000000000iIHD  I HD on ata0-0: 'c.img' 'flat' mode
000000000000pIHD  I >>PANIC<< ata0-0: could not open hard drive image file 'c.img'
000000000000iSYS  I Last time is 1083408128
# In bx_win32_gui_c::exit(void)?
000000000000iI    I restoring default signal behavior
Bochs is exiting with the following message:
IHD  I ata0-0: could not open hard drive image file 'c.img'
000000000000iCTRL I quit_sim called with exit code 1
Bochs is exiting. Press ENTER when you're ready to close this window.
  
```

If Bochs reports that "a bochsrc option needs at least one parameter" then the chances are that your configuration file is not in plain text or has become corrupted.

Assuming you have got this far , we

Please be absolutely certain that you are working within the Bochs PC at this point, if you agree to format your main computer hard drive by mistake then you will lose the entire contents of your main computers hard drive. *Check and double check!*

```

C:\Program Files\Bochs-2.1.1\Bochs.exe Cpu: 12 % Saturday 1st of May 2004 10:56
=====
Bochs x86 Emulator 2.1.1
February 08, 2004
=====
0000000000i[ 1 reading configuration from C:\Documents and Settings\
evenson\Desktop\Pision3a.bxrc
0000000000p[ 1 >>PANIC<< C:\Documents and Settings\Mark Stevenson\D
sion3a.bxrc: a bochsrc option needs at least one parameter
0000000000i[SYS 1 Last time is 0
0000000000i[ 1 restoring default signal behavior
=====
Bochs is exiting with the following message:
[ 1 C:\Documents and Settings\Mark Stevenson\Desktop\Pision3a.bxrc: a
option needs at least one parameter
=====
0000000000i[CTRL ] quit_sim called with exit code 1
Bochs is exiting. Press ENTER when you're ready to close this window.

```

When you hit a problem!

now need to load MsDos onto the 'hard drive' of the artificial PC so start Notepad, open the Psion3a.bxrc file and edit the line which reads

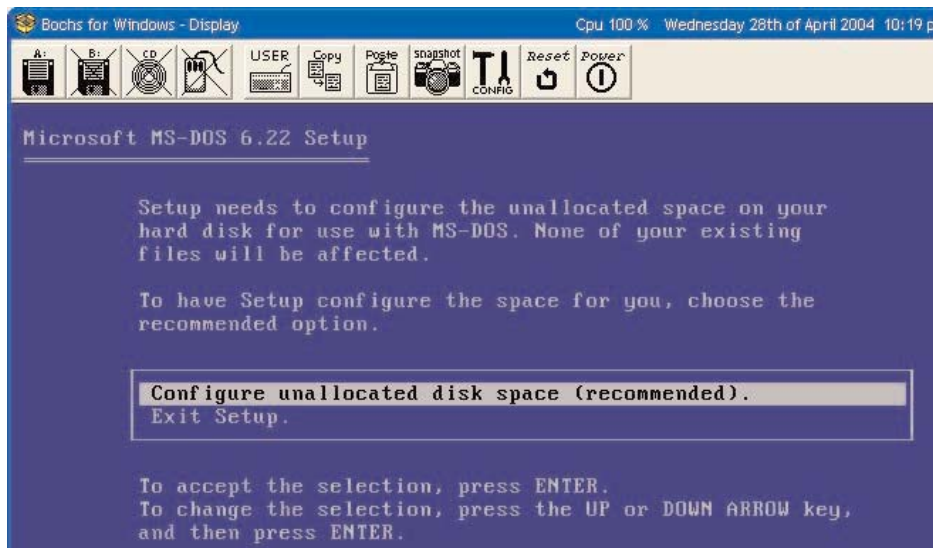
Boot: disk

to , Boot: floppy

save the configuration file making sure that it is not renamed and then place disk one of your MsDos installation disk in the computer floppy disk drive, double click the Psion3a.bxrc file and hopefully the Bochs PC will start up and begin to install MsDos onto the Bochs disk.

If your Dos installation disks are spread across more than one disk as mine are at some point you will be asked to "Insert disk 2", if you do this then it may cause the main computer to show an error message about "Wrong disk inserted", before you can remove and replace Disk 1, you must unmount it from within Bochs.

To do this, click on the Floppy disk icon for the A: drive in the main Bochs window (it is in the left hand corner of the toolbar), and remove



the tick in the "inserted" box, click OK then remove Disk 1, place Disk 2 in the drive, click on the floppy icon again, in the "Path" box type A:, tick the inserted box and click OK, now that you have changed the disk, you can press Enter to continue to install MsDos.

Obviously if you have a third (or fourth) Dos disk then this will need to be repeated for each additional disk. Eventually the installer will ask you to remove all disks and restart your computer, when you get to this point you will have to click on the "Power" icon on the right hand side of the Bochs toolbar, this will close the Bochs computer down.



In order to boot from the newly formatted and Dos installed Bochs disk, reopen the Psion3a.bxrc file and edit the line which reads :

Boot: floppy
to , Boot: disk

save the configuration file (make sure it is not renamed) and then double click on it to start the Bochs PC, this time booting from the Bochs hard disk, rather than the floppy disk.

It is now time to install the Emulator onto the Bochs PC.

Place the disk with the emulator files into the floppy disk, click on the floppy icon and set the Path to A: and tick the inserted box. At the C:\ prompt type:

```
mkdir c:\Psion [press enter]
mkdir C:\Psion\emulate [enter]
copy a:\*.* c:\psion\emulate [enter]
```

this should then copy the emulator files onto the Bochs disk.

If you have the files in zipped form you will also need a Dos unzipping tool copying to this directory. As the files are relatively small it may pay to unzip them on the main PC before copying them to the Bochs disk.

If the files are in their zipped form then unzip them now. I have the files zipped and have a copy of PKUNZIP on the floppy disk along with the S3AEUL.ZIP file so it has now been copied to the C:\psion\emulate directory.

To unzip the files type:

```
cd c:\psion\emulate [press enter]
pkunzip S3AEMUL.ZIP [press enter]
```

After unzipping the files we must create an internal disk for the Psion emulator to use. Type:

```
cd c:\psion\internal [press enter]
```

Before the emulator can use this disk it needs to be mapped to an 'artificial' hard drive called M: (this is the name that the Series 3/3a refers to its own internal disk on the machine itself) so we must map the directory just created called internal to an artificial hard disk named M: .

With Dos 6 this is an easy process, using the Subst command and this is why Dos 6 is recommended. Other versions of Dos may have similar functions but you would need to read the manual supplied with that version to correctly set the M: drive.

In Dos 6 the drive would be setup like this, Type :

```
Edit c:\config.sys [press enter]
```

The spelling of these next commands is vital - it won't work correctly if not typed EXACTLY as shown here.

Press the down arrow until the cursor is positioned underneath all of the other lines and type:

```
Lastdrive=M
```

now save the edited file and exit the editor.

Press Alt to activate the menu, select the Save command with the down arrow, press Enter.

Then Press Alt once more, select the Exit command and the editor should close and return you to the Dos (C:\). Now type :

Edit c:\autoexec.bat [press enter]

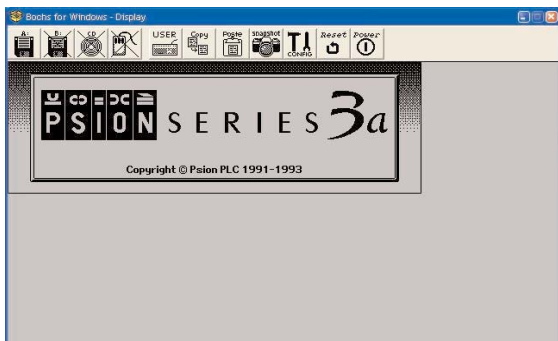
again press the down arrows to move the cursor underneath all the other lines and type:

```
Subst m: c:\psion\internal [enter]
cd c:\psion\emulate [press enter]
c:\psion\emulate\s3aemul.exe
[enter]
```

operates, mistakes in these may prevent the Bochs PC from running at all .

Before the Psion emulator will run we need to restart the Boch machine , so simply click on the reset icon on the Bochs toolbar .

If everything has gone according to plan , after a few moments the Series 3a start up screen should appear. Following a further small delay the Series 3a system screen will be displayed .



save this file and exit the editor. When editing these two files , be sure that you do not accidentally edit any of the other lines of text - they are vital to how the Bochs PC starts and

You will notice that the Series 3a 'screen' only 480 x 160 pixels in size , and thus not using the whole of the Bochs window area. It is possible to set this so that the whole of the

Bochs window is used by the 3a emulator.

To exit from the 3a emulator and close it down , press Ctrl+Alt+Esc together. This actually shuts the Psion down with immediate effect , if you were in the middle of editing any files all changes will be lost , so be sure to save any open files before shutting the emulator down.

Once the emulator has closed type:

Edit c:\emulate\hhserver.par

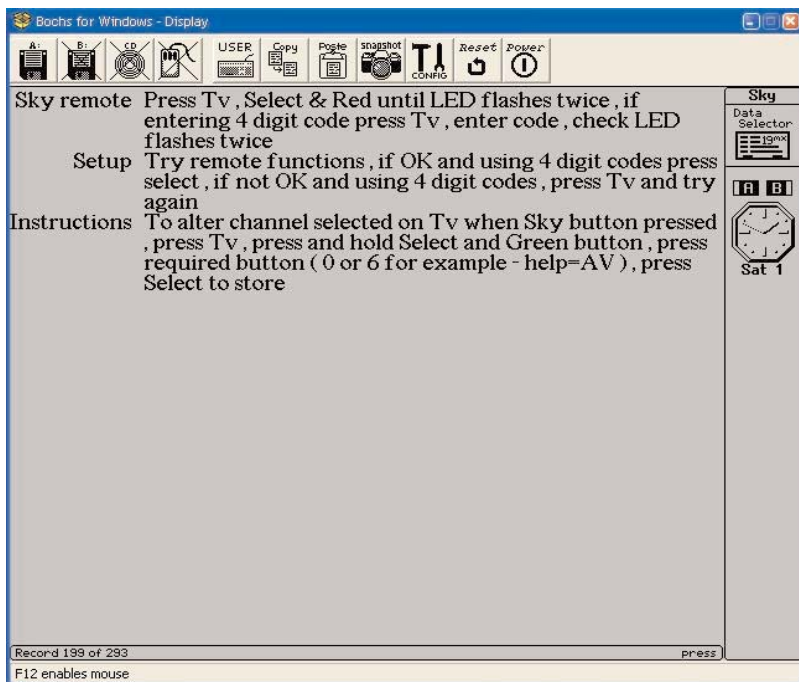
this will open the editor and there

are normally two lines in this file:

```
SERVER_PARAMS -X480 -Y160 -D
SERVER_DUMP server.dmp
```

If you edit the SERVER_PARAMS line so that it reads -X640 and -Y480 then save the file it will force the emulator to run in full screen mode.

I have found that one program (AutoRoute Express) will not run at all if the screen is set to full some programs run , but in a window , some programs will take advantage of the whole screen.



SIBO Full Screen!

Whilst working in the 3a emulator the function keys replace the soft keys on the Psion machine;

F1 is System

F2 Data

F3 Word

F4 Agenda

F5 Time

F6 World

F7 Calc

F8 Sheet

F9 is Menu

F10 Help

F11 switches (invisibly) off and on

F12 should be the diamond key, unfortunately Bochs grabs the F12 key to switch mouse support on or off and so F12 has no effect.

The Alt key replaces the Psion key and as previously stated Ctrl+Alt+Esc shuts the emulator down.

The easiest way to get information in and out of the emulator, is to save all your files to a floppy disk, this way you can then transfer files quickly between a real Psion and the emulated one.

As the Psion files are not very large it is possible to get a whole Psion disk copied to a floppy with room to spare.

I have also been able to copy SSD disks to floppy, then to the Bochs disk and then mount these as a B: drive.

To do this, create a suitable directory, and then copy the file into it.

Close down the Psion emulator and at the C:\ prompt type:

```
mkdir c:\psion\bdrive [press enter]
xcopy a:\ c:\psion\bdrive /e [enter]
```

the final '/e' is important as it tells Dos to copy the file and directory structure to the directory as it is found on the floppy disk, this saves a lot of needless typing!

Remove the floppy disk as it is no longer required.

It is now necessary to tell the 3a emulator where to find our artificial B: drive, type:

```
edit c:\autoexec.bat
```

and insert the line:

```
subst b: c:\psion\bdrive
```

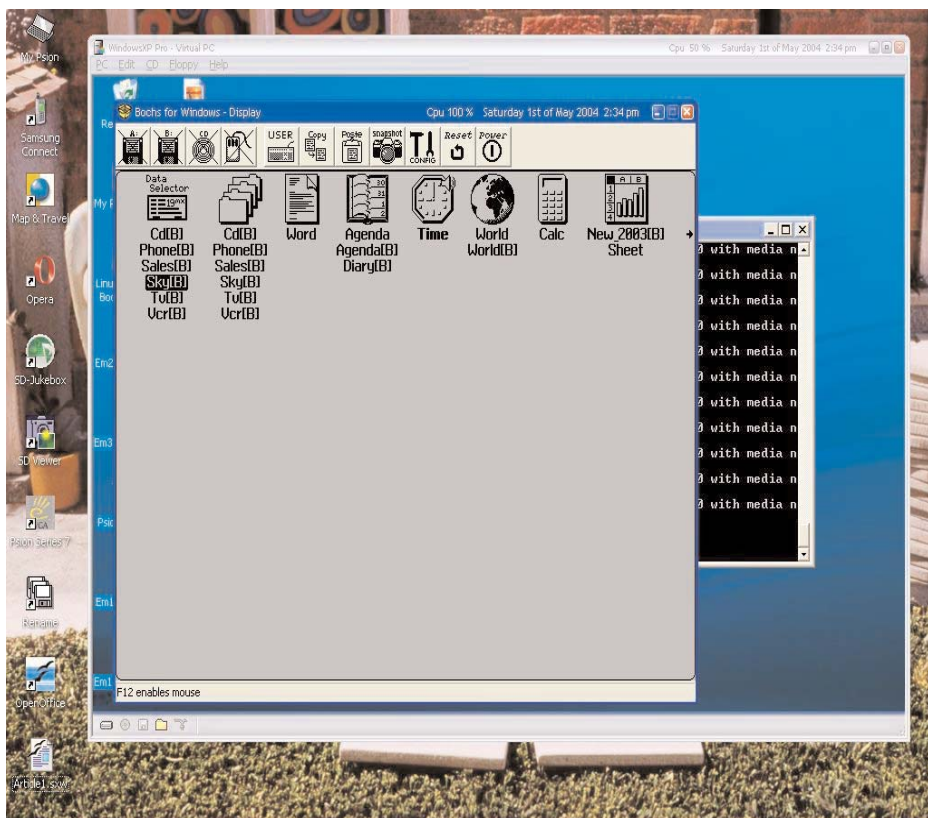
immediately below the line which reads subst m: c:\psion\internal .

Save this edited file , and exit the editor . Shut Bochs down by clicking on the 'Power' icon in the Bochs toolbar and then restart it , the files copied to our bdrive directory should now appear in the file lists on the Psion system screen .

This picture shows the Bochs PC running, with the Psion Series 3a that I created as I wrote this article (to prove it does work!).

The Bochs PC works so well that this Series 3a is running inside a Bochs PC which is itself running inside a Virtual PC (Connectix Virtual PC) with Windows XP on it , this running on my main PC , itself running Windows XP!

There are always two windows running while Bochs is open, the main Bochs window and a secondary win-



SIBO on XP!

dow (partly visible here) which shows debugging information.

Do not click the 'Config' icon on the Bochs toolbar, it is not recommended to make any alterations here , certainly not while the 3a emulator is active it could cause serious loss of information.

You should now have a fully operational Series 3a, based on your PC.

Should your trusty Psion be lost or become faulty, you should now be able to access your backups and edit them easily.

If you have a lot of information to enter on the Psion, it can be easier to enter it on the PC and then transfer it to the Psion later.

One slight disappointment is that the emulator has the same memory limits of the physical Psion so very large files can not be opened or edited even though there is not the same limited memory available to it as on the actual Psion Series 3a.

Now all I need is a Series 3a emulator for the Series 5/revo - any takers ?

If you should want to obtain the program which places the current time/date in the topmost windows caption area as seen in some of the screenshots, visit my website and

download AutoTypist .

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Homepage www.mkstevo.co.uk .