Installing and Using OS/2 and MMPM/2 Multimedia Support

Software by IBM
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Introduction

At the OS/2 Technical Interchange conference in Phoenix, Arizona in early March, I received a free OS/2 Professional Developers Kit (PDK) beta CD-ROM. The PDK CD-ROM included the OS/2 2.1 beta, the Multimedia Presentation Manager (MMPM/2) and the MMPM Toolkit, among other products. In early April, I was finally able to order a Creative Labs Discovery CD 16 multimedia upgrade kit which included the CD drive I needed to install the software from the CD-ROM. Now that OS/2 2.1 is "GA", generally available, I have installed OS/2 2.1 and MMPM/2 from the shrink-wrapped CD-ROM upgrade package. The list price is for the CD-ROM $219 but you can get it cheaper from your local dealer or through mail order or by upgrading from DOS or a previous version of OS/2. The Programmer's Connection lists OS/2 2.1 on diskettes at $139. IBM's price for the CD-ROM upgrade is $90 until September 14th.

Most of the features mentioned were tested with both a SoundBlaster 16 and an older SoundBlaster 1.5 board. Although my experience is with the SoundBlaster products, much of the information applies to other sound boards as well. OS/2 and MMPM/2 also support the Pro AudioSpectrum 16 and IBM M-Audio boards.

Note: Before starting any major software installation, you should make sure you have a good backup of your current system.

In the following sections, lower case "d:\path" denotes the drive and path (typically \SB or \SB16) where the SoundBlaster files are located and lower case "addr" denotes the I/O address (default: 220) of the SoundBlaster board.

Obtaining Current Device Drivers

If you read the IBM documentation, you may notice it says that OS/2 2.1 "supports" CD-ROM drives connected to a few particular SCSI controller boards. What this really means is that those are the only ones for which drivers are included on the OS/2 2.1 installation disks. You can use other CD-ROM drives if you can obtain OS/2 2.x device drivers for them. You must add those drivers to the installation boot diskettes in order to install OS/2 from the CD-ROM. In case you can only get DOS device drivers for your CD-ROM drive, disk images of the 25 3.5" installation diskettes and the 31 5.25" installation diskettes are both included on the CD-ROM, allowing you to create a set of installation diskettes.

The SoundBlaster 16 I purchased came with 3.5" diskettes. Since I have only a single 5.25" diskette drive, I called the Creative Labs BBS at 408-428-6660 to download the drivers for the CD-ROM drive. By accident, this turned out for the best because the latest drivers are on the BBS (and on CompuServe). If you are installing a SoundBlaster board in an OS/2 system, I would recommend downloading SBMMPM2.EXE from the "File libraries" menu and also SBMMPM21.EXE and CLIOS2CD.EXE (if you have the CD-ROM drive) from the "Tester (beta)" "File libraries menu. Execute the files to unpack the drivers within.

Installation Boot Diskettes

Before OS/2 2.1 can be installed from the CD-ROM, you must have two boot diskettes to start up the system. With the beta version of the PDK these were shipped as diskette images on the CD-ROM. Therefore, you needed to have access to the CD-ROM before you could create the boot diskettes. This required first installing CD-ROM support on your current DOS or OS/2 operating system. With the GA version of OS/2 2.1 on CD-ROM both 3.5" and 5.25" boot diskettes are included. This is nice packaging because it allows you to install OS/2 2.1 from the CD-ROM even if you don't have CD-ROM support on your current system.

Adding CD-ROM Support to the Boot Diskettes

Start by identifying the two boot diskettes, labeled "Installation Diskette" and "Diskette 1". Since these provide support only for SCSI CD-ROM drives, you wouldn't be able to access a non-SCSI drive such as a Creative Lab's CD-ROM drive connected to a SoundBlaster board (if you have a CD-ROM drive connected to an Adaptec or Future Domain SCSI controller, skip this step; if you have another drive which uses proprietary device drivers, substitute the drivers you received from the vendor). Add the device drivers to the second boot diskette (Diskette 1) by copying the SBPCD2.SYS file to the root directory and adding the following line to the CONFIG.SYS file on that diskette just after "ifs=hpfs.ifs /c:64":
```
DEVICE=\SBPCD2.SYS /P:addr
```
Now the installation utility should be able to access to the CD-ROM drive.

Installing OS/2 2.1 from CD-ROM

The next step is to install OS/2 2.1 from the CD-ROM. Boot the system from the first diskette (the "Installation Diskette"), then switch to the second diskette when instructed. It will take a few minutes and display a message or two before it finally starts reading from the CD-ROM.

The first screen which requires you to make a choice is "Installation Drive Selection" (or "Preparing the Hard Disk" if the hard disk is empty). If you have a good backup, you should consider repartitioning your hard disk by selecting the "2.

Specify a different drive or partition" option to set it up with three or four partitions, plus Boot Manager. For example, with a 245 MB hard disk:, the following partitions could be defined (in order of creation):

Drive	Location	Format	Size	Use
			1 MB	Boot Manager
C:	beginning	FAT	31 MB	DOS
F:	end	HPFS	71 MB	future OS (optional)
E:	end	HPFS	71 MB	OS/2 2.1
D:	end	HPFS	71 MB	data

Starting with OS/2 2.0, I would highly recommend using Boot Manager instead of dual boot. Placing DOS in a separate partition from OS/2 allows booting a DOS virtual machine in a window under OS/2 and allows for easier operating system upgrades in the future. Keeping the FAT partition under 32 MB allows running earlier DOS versions from the partition, or accessing the partition from an earlier DOS version booted from a floppy disk.

Once you have partitioned the drive, highlight the drive where OS/2 2.1 is to be installed and select the "Set installable" option from the pop-up menu. After exiting the FDISK utility, you will be returned to the "Installation Drive Selection" screen where you can verify the drive letter and then select "1. Accept the drive".

If you don't repartition your hard disk, you will be given the option of formatting the install partition. If you have a good backup, reformatting is recommended. Some problems can be caused by installing OS/2 into a partition containing a previous version of OS/2, especially a beta version.

After the system files have been loaded onto the hard disk, you will be asked to remove the diskette and restart your system. After you restart, the installation progress messages will be presented within windows. The installation utility continues reading from the CD-ROM and eventually displays the "OS/2 Setup and Installation" screen. Unless you are tight on disk space, I would recommend selecing either "Install all features" or "Select features and install" since the online documents and games are not included in the "Install preselected features" option.

When you get to the "System Configuration" screen, you will see that this is where you can specify the type of CD-ROM drive. Select the "CD-ROM Device Support" check box and then click on the "OK" button to display a list of CD-ROM device drivers which are included with OS/2. Since the Creative Labs drive is not listed, select "OTHER" from the bottom of the list. This is supposed to install CD-ROM support in the operating system, with the assumption that the drive-specific device drivers will be added later. After clicking "OK" and selecting a printer in the same manner, you will return to the "System Configuration" screen. Notice, however, that the CD-ROM Device Support is still set to "None". This is a minor install problem with non-SCSI CD-ROM drives that will be corrected later by adding the

CD-ROM support manually.

When you click on "OK", the install utility will start transferring files to your hard disk. Complete the installation following the instructions on the screen. If in doubt, you can just click "OK" on the "Advanced Options" screen and select "Install standard WIN-OS2 desktop" on the "Configure WIN-OS2 Desktop" screen.

The "Migrate Applications" option on the "Advanced Options" screen takes a little more explanation. Migrating applications means that icons for selected programs will be created in folders on the OS/2 desktop. The installation utility can search your disks looking for programs that it "knows" - ones that are included its data base. When the "Find Programs" window appears it is a good idea to deselect the CD-ROM drive and any partitions containing previous versions of OS/2, so that the utility won't search them. When you click on "Find", the remaining drives (your hard disks) will be searched and a list of programs will be displayed in the "Migrate Programs" window. You don't need to "Add programs..." at this time because you can start "Migrate Programs" from the "System Setup" folder after the installation has completed. Clicking on "Migrate" will create the icons (which you won't see yet) and return you to the "Find Programs" window. Click on "Exit" then on "OK" in the "Advanced Options" window to continue with the installation.

You will be asked to restart the system again. If you have a non-SCSI CD-ROM drive, you probably won't be able to access it now, since CD-ROM support was not really installed by the "System Configuration" screen. It can be installed manually by copying the CDFS.IFS file from the second installation diskette ("Diskette 1"):
        COPY A:\CDFS.IFS d:\OS2
and then adding the following line to your CONFIG.SYS file just after the "IFS=D:\OS2\ HPFS.IFS /CACHE:512 /CRECL:4 /AUTOCHECK:d" line.
        IFS=d:\OS2\CDFS.IFS
Restart the system again, and you should be able to access the CD-ROM drive.

MMPM/2

Now that you can access the CD-ROM drive, you can install the MMPM/2 multimedia features using the following commands ("d" is the CD-ROM drive):
        d:
        CD \MMPM2
        MINSTALL
Specify the target drive and select the following features:
        SoftWare Motion Video
        SoundBlaster, Pro AudioSpectrum 16, or IBM M-Audio
                (depending on which sound board you have installed)
        CD Audio
If you are installing the SoundBlaster feature, you also have to choose one of five drivers: SoundBlaster (non-Pro), SB Pro OPL2, OPL3, or MCV, or SB 16. When the installation is completed, you will be asked to shut down and restart the

system. When the system comes back up, you will have a "Multimedia" folder and a "Volume Control" on the OS/2 desktop. The non-Pro SoundBlaster board does not support the software volume controls.

One of the features of MMPM/2 is "system sounds". This feature associates different sounds with various events within OS/2. This feature is on by default, so when the system was restarted just after installing MMPM/2 a "charge" tune was heard. You can customize the sounds on your system using the "Sound" program object in the "System Setup" folder, or using its shadow in the "Multimedia" folder. For example, you can replace the "Error" sound with the GLASS1.WAV file included with this issue of the Multimedia Digest.

GLASS1.WAV

This sound file was created using the editing capability of the "Digital Audio" program by extracting the last three-quarters of a second of sound from the GLASS.WAV file which comes with the SoundBlaster.

MMPM/2 also includes a "Digital Audio" program for playing .WAV files, a "MIDI" program for playing .MID files, a "Digital Video" program for playing movies, a "Compact Disc" program for playing audio CDs, and a "Multimedia Data Converter" program for converting audio and image files. The "Compact Disc" program displays a list of all of the track numbers on the audio CD and allows you to select a specific track, deselect some tracks, shuffle the play order, and select some general options such as "Automatic play" and "Repeat". The Creative Labs sound board and CD drive does not support the program's "Digital transfer" feature; the audio signal is transferred from the CD-ROM drive to the sound board.

The CD-ROM includes a few subdirectories which are not included on the diskette versions of OS/2 2.1. These subdirectories are:

\MMPM2\SOUNDS	additional sound samples, including some musical selections from 15 to 72 seconds long from the movies
\MMPM2\MOVIES\...	additional Ultimotion and Indeo movies
\MMPM2\VIDEODSK	installs videodisk support

For more information on the files in these subdirectories and on the SoundBlaster sound cards, type the README file in the \MMPM subdirectory of the CD-ROM.

The additional movies on the CD-ROM are:

FISH*	72 sec	- a variety of fishes swimming around
KICK*	5 sec	- man kicking a soccer ball
LASER*	38 sec	- light streams moving past a number of landmarks
MACAW*	15 sec	- longer version of MACAW movie (the one on diskettes is 3 sec)
PUPPY*	39 sec	- children playing with puppies
RAFT*	24 sec	- raft going through rapids
TENNIS*	12 sec	- two people playing tenis

There are different versions of these movies with different compression methods, sound resolutions, drive transfer times, video resolutions, and frame display rates. The two digits of the file name before the "." indicate the frame display rate; for

example, "24" indicates 24 frames per second. Intermittent pauses can be eliminated by running the movies from the hard disk rather than the CD-ROM drive. Copy the movies to your hard disk with the following commands before running them ("cd" is the CD-ROM drive, "hd" is the hard disk, and "n" is either "8" for 8 bit sound boards or "16" for 16 bit sound boards).

```
XCOPY cd:\MMPM2\MOVIES\ULTIMOTN\nBITAUD\HIGHPERF\320X240\LASER?24.AVI  hd:\MMOS2\MOVIES
XCOPY cd:\MMPM2\MOVIES\ULTIMOTN\nBITAUD\STANDARD\160X120\FISH?24.AVI  hd:\MMOS2\MOVIES
XCOPY cd:\MMPM2\MOVIES\ULTIMOTN\nBITAUD\STANDARD\160X120\PUPPY?24.AVI  hd:\MMOS2\MOVIES
XCOPY cd:\MMPM2\MOVIES\ULTIMOTN\nBITAUD\STANDARD\160X120\RAFT?24.AVI  hd:\MMOS2\MOVIES
XCOPY cd:\MMPM2\MOVIES\ULTIMOTN\nBITAUD\STANDARD\160X120\TENIS?24.AVI  hd:\MMOS2\MOVIES
XCOPY cd:\MMPM2\MOVIES\ULTIMOTN\nBITAUD\STANDARD\320X240\KICK?15.AVI  hd:\MMOS2\MOVIES
XCOPY cd:\MMPM2\MOVIES\ULTIMOTN\nBITAUD\STANDARD\320X240\MACAW?15.AVI  hd:\MMOS2\MOVIES
```

Use the "Digital Video" program to view the movies.

New WIN-OS2 Features

The version of WIN-OS2 (3.1) which is included with OS/2 2.1 now supports multimedia applications and enhanced-mode applications (excluding ones which require VxD device drivers). It also includes some WIN-OS2 applications which were not present under the version of WIN-OS2 (3.0) which came with OS/2 2.0. This article was produced using the WIN-OS2 "Write" application which is included with the new version. In the area of multimedia, "Sound Recorder" and "Media Player" applications are now included.

The only Windows applications I have are a couple on CD-ROMs which came with my Creative Labs multimedia upgrade. One of these is a multimedia encyclopedia. The video clips, which did not work under the old WIN-OS2 3.0, will now run successfully, displaying video and audio, similar to the MMPM/2 movies.

Installing WIN-OS2 Fonts for the WAFFER MultiMedia Digest

You can start WIN-OS2 applications from a WIN-OS2 Full Screen session, or from the folders inside the WIN-OS2 groups folders on the OS/2 desktop. To install the fonts for the WAFFER MultiMedia Digest, double click on the "Control Panel" group then on the "Fonts" application and select the "Add" button. Specify the drive and directory where the extracted font files are located. Next, click on "Select All" then on "OK" to install the fonts. Use the WIN-OS2 "Write" application to read the Digest. If you don't see all of the fonts, select "Print Setup..." from the "File" menu and select a printer that supports multiple fonts then click on "OK". If such a printer is not listed, you can install one. To do this, begin by starting the "Selective Install" program in the "System Setup" folder in "OS/2 System" on the OS/2 desktop. Click on the "Printer" box and then "OK" and select a suitable printer from the list.

Installing SoundBlaster Support in WIN-OS2

Before you can install support for the SoundBlaster board in WIN-OS2, the BLASTER environment variable must be set for the WIN-OS2 session. The easiest

way to do this is by adding the "SET BLASTER=" line to the AUTOEXEC.BAT file in the root directory of the OS/2 boot drive. This AUTOEXEC.BAT file is the one which is used by default for all of the DOS and WIN-OS2 sessions. If you can't put it there for some reason, such as not enough space in the environment, OS/2 2.1 allows you to specify a different AUTOEXEC.BAT file for a given session in the DOS_AUTOEXEC setting.

After adding the BLASTER environment variable to the AUTOEXEC.BAT file, start up a WIN-OS2 session using the WIN-OS2 icon in the "Command Prompts" folder or the Program Manager icon in the "Windows Programs" folder. Select "Run..." from the "File" menu of the Program Manager, click on "Browse", and find the WINSETUP.EXE program which came on the SoundBlaster install diskettes. Running this program will install the sound support and give you the option of restarting WIN-OS2. When WIN-OS2 is restarted, you will hear the "ta-da" sound indicating that sound support has been successfully installed and initialized.

Controlling Access to the Audio Adapter

In a multitasking environment such as OS/2, a number of audio applications may be competing for use of a single audio adapter. At any time, only one application can use the digital audio of the SoundBlaster (another application may be using CD audio, however). When WIN-OS2 has control of the sound board, the system sounds and audio from other programs are disabled. You must exit WIN-OS2 to enable them again. Also, if you try to start more than one WIN-OS2 session, you get some error messages indicating the SoundBlaster board cannot be accessed.

There is a new setting called AUDIO_ADAPTER_SHARING which can be used to control access to the audio adapter.   To prevent a WIN-OS2 session from accessing the audio adapter and disabling it in other applications, you can set this to "None". It can also be set to "Required" if you want to make sure an application gets access to the audio board. If you start such an application while another application is using the audio board, you will get this message:
> SYS1174: The (audio) device is already in use by another application

The default value for the AUDIO_ADAPTER_SHARING setting is "Optional".

If you get a "Divide by Zero or Overflow Error" message when starting a WIN-OS2 session with the SoundBlaster in use by another session, change AUDIO_ADAPTER_SHARING to "Required", save the settings, then change it back to "Optional" and save the settings again.

There are a couple of alternatives if you need to run two audio applications simultaneously.   OS/2 2.1 can support two SoundBlaster boards in the same system. You can also use an IBM M-Audio board which supports input from two "streaming" devices, such as digital audio from the hard disk.

Installing DOS after OS/2

If you reinstall DOS into a separate partition, DOS may boot automatically, bypassing the Boot Manager option to select which operating system you want to boot up. If this happens, use DOS's FDISK to make the "non-DOS" Boot Manager partition the active drive.   Once you have booted OS/2 again, copy the FSFILTER.SYS file from the \OS2\MDOS subdirectory into the root directory of the DOS partition and add the following line at the beginning of the CONFIG.SYS file:
        DEVICE=d:\FSFILTER.SYS
This line allows DOS to access the HPFS drives when running in a virtual machine under OS/2. Next, copy the "DOS from Drive A:" icon, change the name to "DOS from Drive C:", right click on the icon, open the settings notebook, and change the DOS_STARTUP_DRIVE in the DOS settings on the "Session" page to "C:". Now you should be able to start a DOS session which has access to all of your drives.

IBM Developer's Toolkit for OS/2 2.1

The OS/2 operating system provides an excellent environment for developing applications, even if the target operating system is not OS/2. Under OS/2 2.x, you can simultaneously start a number of DOS and WIN-OS2 sessions, in addition to running native OS/2 programs. Different sessions may even be running different versions of DOS. Applications can be developed using 32-bit development tools, taking full advantage of the 80386 and 80486 processors and then tested under DOS or WIN-OS2 for compatibility with the target operating system.

Development tools are not included with the base OS/2 operating system. The IBM Developer's Toolkit for OS/2 2.1 can be purchased separately or as part of the IBM C Set++. Some competitive development tools can be purchased from other vendors such as Borland. The list prices are $139 for the IBM Developer's Toolkit and $559 for the C Set++ CD-ROM. You might get these cheaper from your local dealer or through mail order. IBM's price for the C Set++ CD-ROM is $149 until August 31st, which is definitely a bargain I will take advantage of.

The Information Presentation Faciliity (IPF) is a feature of OS/2 which is used to display online information such as OS/2 help and reference information and online documents. IPF files can contain push buttons, hypertext links, graphic links, links which start or send messages to an application, customized windows, and application-controlled windows. The Toolkit includes a sample IPF application which links to a text description when you click on a PS/2 in a picture of an office.

MMPM Toolkit/2

The MMPM Toolkit/2 (MMPMTK/2) is included with the IBM Developer's Toolkit for OS/2 2.1. It includes a few interesting sample programs.

One of the sample programs is "Duet Player II". This program demonstrates how to play audio from two sources at once. One source is a "streaming device" and the other is a "non-streaming device". The input for the streaming device is a .WAV digital audio file on the hard disk. The input for the non-streaming device is from an audio CD in the CD drive. The program plays speech from the .WAV file while music from the audio CD is being played. The help for this program contains a link which plays another digital audio file, demonstrating how a program can be written to include audio help information in its IPF help files. There is also a "Duet Player I" which plays audio from two streaming devices simultaneously, but it does not work with a single SoundBlaster board, since two digital audio inputs, such as those available on an IBM M-Audio adapter, are required.

Another feature, which is especially nice for hearing-imparied users, is the ability for program authors to include "captioning" in their applications. An OS/2 user can turn the captioning on or off using "Multimedia Setup" in MMPM/2's "Multimedia" folder. Included with MMPMTK/2 is a sample caption application which can optionally display scrolling text that is synchronized with the audio narration.

.VOC and .WAV Alarms

You can set up OS/2 to play a given .VOC or .WAV audio file at a preselected time. First, create a "\ALARMS" directory for the alarm audio files. Record a .VOC file using the VOXKIT or VREC which comes with the SoundBlaster, or a .WAV file using the MMPM/2 "Audio Recorder" program. Create a file named ALARM.BAT in the \ ALARMS directory, with the following lines:

```
@ECHO OFF
IF NOT EXIST d:\ALARMS\%1.VOC IF NOT EXIST d:\ALARMS\%1.WAV GOTO ERROR
SET SOUND=d:\path
d:\path\SBFMDRV
IF EXIST d:\ALARMS\%1.VOC d:\path\VOCUTIL\VPLAY d:\ALARMS\%1.VOC
IF EXIST d:\ALARMS\%1.WAV d:\path\VOCUTIL\WPLAY d:\ALARMS\%1.WAV
GOTO EXIT
:ERROR
ECHO Cannot find d:\ALARMS\%1.VOC or d:\ALARMS\%1.WAV.
:EXIT
```

Create another file, named ALARM.CMD, in one of the directories listed in the OS/2 PATH statement in CONFIG.SYS, with the following lines:

```
/* REXX */
Arg Name Rest
'@echo off'
if Name = ' ' /* 2 single quotes, no space */ then do
   say 'The name of the audio file is missing.  Enter'
   say '   ALARM.CMD name'
   say 'where "name" is the name of the audio file.'
   pause
   signal done
end
else do
   'd:\ALARMS\ALARM.BAT' Name
```

```
      end
      if Rest \= ' ' /* 2 single quotes, no space */ then do
         say 'Extraneous parameters " ' Rest ' " ignored.'
         pause
      end
      done: exit
```

To set an alarm, start the "Alarms" program in the "Productivity" folder in the "OS/2 System" folder on the desktop and select "Set alarm..." from the "Alarms" menu. After setting the alarm time, enter "ALARM.CMD filename" (where "filename" is the name, without extension, of the .VOC or .WAV file) in the "Comment" field. Click on "PopUp" to remove the check, then click on "Execute comment as command at Alarm time". You can also click on the radio button "Activate on every Alarm time occurrence" to trigger the alarm more than once. For example, on "Weekdays" at 5:00, I have set an alarm with "ALARM.CMD HOME" on my system at work which sounds an alarm with my son's voice saying "It's time to come home, Dad!"

HOME.WAV

To get rid of the Alarms window, don't use "Close"; "Minimize" the window instead in order to keep the alarms active.

Conclusion

As a shareware developer, I have been very impressed by the OS/2 operating system. If you are developing applications and are still using DOS or Windows, you need to take a serious look at OS/2, whether or not you need its multimedia features. A user can run multimedia applications, or can customize the multimedia features to increase productivity or make the operating system more fun to use. Application developers can create programs which use some sophisticated audio and video capabilities which are now included with the operating system.

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