
◆ miroSOUND PCM1 pro
Hardware & Software

User's Manual



FCC Compliance Statement

For your own safety

Shielded cables should be used for a composite interface. This is to ensure continued protection against radio frequency interference.

FCC Warning Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Shielded interface cable must be used in order to comply with the emission limits.

Label Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Dear miro User,

Congratulations for purchasing the miroSOUND
PCM1 pro card!

Please read the miroSOUND hardware manual before
you start installing the software. We recommend to
install the sound card into your system, and only then
install and configure the sound card's software.

This supplied software can be configured best when
you first install the hardware according to the
description given on the following pages.

Your miroTEAM

miroSOUND PCM1 pro.

Hardware & Software Manual.

Version 1.0/GB. July 1994.

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miroSOUND PCM1 pro
Hardware & Software
User's Manual

This miro manual was printed on chlorine-free paper.



Introduction

Congratulations for purchasing your new **miroSOUND PCM1 pro** sound card! Using state-of-the art technology, this sound card is a valuable member of the miro product family, known all over the world for graphics cards, video cards, and monitors.

Your **miroSOUND PCM1 pro** includes the new OPL4 chip by Yamaha, offering built-in PCM sounds of excellent quality, and compatibility with the earlier OPL3 and OPL2 chips. This ensures that your sound card will support the widest selection of DOS and Windows applications.

Your **miroSOUND PCM1 pro** is compatible with all major sound standards, including AdLib, Sound Blaster, Sound Blaster Pro II version 3.01, Microsoft Windows Sound System, and Roland MPU-401 for Windows. The MIDI sound patches are compatible to the General MIDI standard and with its ability to record and playback high quality 16-bit, 44.1 KHz stereo sound, the card exceeds the multimedia specifications MPC1 and MPC2.

In order for you to start using unique features of your sound card immediately, we bundled a number of high-performance applications for Windows 3.1 and later:

- **HQ-9000 by U-Lead** is a home stereo rack on your Windows screen, featuring modules for CD audio, MIDI, playing, editing, and recording samples, and with a mixer for recording and playing of all the card's sound sources.
- **Sound Forge by Sonic Foundry** is an effect software application for editing samples, that leaves nothing more to wish even for the advanced user.
- **Ballade Lite by Dynaware** is the Windows MIDI sequencer you have been waiting for, featuring lots of options for every musical taste.

The new miro "plug & play" technology allows you to configure the card's settings exclusively by software – once installed, you will never need to uninstall the hardware to change the settings! The only time to open your computer case will be the moment you decide to install a CD-ROM drive with your **miroSOUND PCM1 pro**. You can choose between a wide selection of drives:

Introduction



the sound card has built-in interfaces for the CD-ROM standards Sony, Mitsumi, and Panasonic, as well as an interface for the coming IDE CD-ROM drives.

The **miroSOUND PCM1 pro** establishes the new jumper-free miro "plug & play" software configuration for the widely common PC-AT bus system, enabling you to take advantage of this new technology without having to upgrade to a PCI-bus computer.

In this user's manual you will find the following sections:

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Caution: Your sound card's hardware can be damaged by static discharge, like all modern electronic components. Reduce the possibility of any damage to your sound card by following these safety precautions:

- Switch off your PC before you start the installation.
- If your PC is connected to a grounded outlet, touch a metallic surface of your PC to discharge any static charge from your body.
- Pull the sound card out of the antistatic bag only, when you are ready to install it immediately.
- Only hold the sound card at the borders. Avoid touching the electronic components on the card.

Package Contents

With your **miroSOUND PCM1 pro** you get these parts:

- Sound card
- Installation disk(s)
- miro warranty card
- this manual
- additional applications with disks and manuals

Installing the Sound Card

Your **miroSOUND PCM1 pro** comes with factory default settings, this should enable trouble-free operation in almost any PC system. Install the hardware this way:

1. Switch off your PC and all connected peripherals.
2. Open your PC's cover.
3. Install the sound card into any free 16-bit slot.

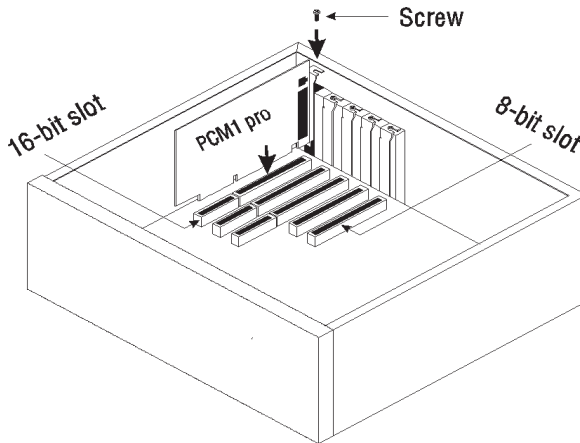


Figure: Installing the sound card into a 16-bit slot

4. If you have a CD-ROM drive that can be used with this sound card, you can connect it to the sound card now. For installation instructions see the section about CD-ROM drives.
5. Tighten the card bracket with the screw.
6. Replace the PC cover.

Installing the Sound Card

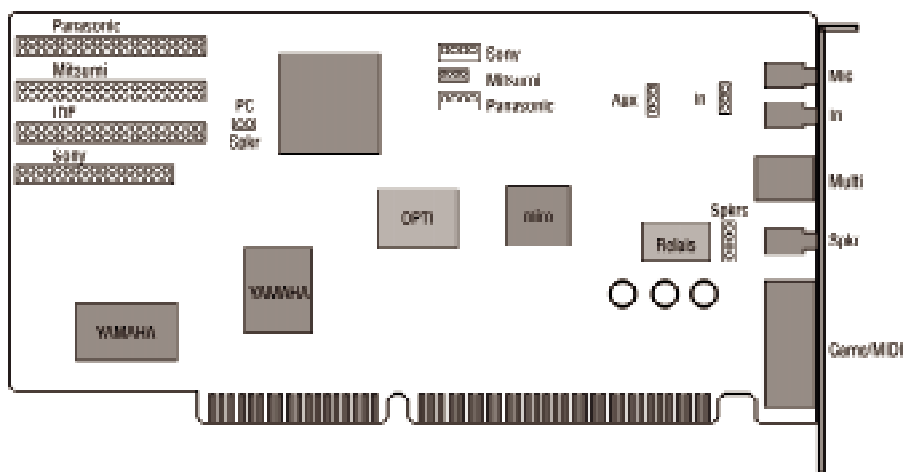


Figure: Layout with connectors

Installing the Sound Card

Software Installation

The supplied INSTALL program automatically installs software, utilities and drivers.



Note: If you have installed any sound drivers in Windows before, first uninstall them and restart Windows before you try to install the miro software.

1. Start **Windows** and insert the Installation Disk into floppy drive **A** or **B**.
2. In the **Program Manager** select **File/Run...**
3. Enter **A:\Install** or **B:\Install** and click on **OK**.
4. Now follow the instructions in the installation program on your screen.

Mark the options you wish to install. You can select several options at once and click an option with the mouse.



Figure: Installation program - Selecting options



Figure: Installation program - CD-ROM selection

The Install program installs the selected drivers for DOS and Windows and creates a new Program Manager group for the miroSOUND Windows applications.

During the installation you will be asked if you want to output the sounds through either non powered speakers or powered speakers, headphones, or a home stereo amplifier.

The **miroSOUND PCM1 pro** can be adapted to the output device by a built-in relais - speakers are very different devices than headphones, speaking of electronic terms. If you decide to use another output device later, you can switch the relais by a small DOS program called **SETAMPEXE**. It is located in the miro directory, which is named C:\MIROSND, if you did not change this name in the installation.

At the DOS prompt enter **SETAMP ON** to enable the sound card's amplifier. Now you can utilize the 4 Watt output power on each channel to connect a pair of non powered speakers with 4 or 8 Ohms. If you want to switch to headphones or your home stereo amplifier or powered speakers later on, just enter **SETAMP OFF** to disable the built-in amplifier. This ensures an optimized sound output for any device connected to your sound card.

Software Installation



Always keep in mind to use the right setting for your output device! A mismatch can result in not enough power to hear anything, or even in damage to the output device in case of too much output power.

If you decide to remove the **miroSOUND PCM1 pro** from your system, first run the install program from the miro Installation Disk and select the deinstall option. After that you can then safely remove the sound card from your system.

DOS Environment Strings

The Sound Blaster compatible DOS applications often look for a DOS environment string named BLASTER. In this variable string they find information about I/O address, IRQ line, DMA channel, and the type of sound card used. The string should be updated after every change in any of these values. If you have changed settings of the Sound Blaster compatible module on your sound card, inspect your Autoexec.bat file, and rewrite the

SET BLASTER=A220I7D1T4

line if necessary to reflect the new settings.

Another DOS environment string called SOUND16 is needed by some miro DOS applications. It should contain the full path to the miroSOUND software. The string in the Autoexec.bat file is initially set to ***SET SOUND16=C:\MIROSND***. Note that there must be no space character directly before and after the = sign.

Testing and Configuring the Card

The **miroSOUND PCM1 pro** is configured via software and without any any jumper. The DOS program for configuring the sound card is **SNDINIT.EXE** and can be found in the miroSOUND directory, by default named C:\MIROSND. The Install program enters a line into your AUTOEXEC.BAT file to initialize the sound card after every system start. The program downloads the configurable data, as stored in the file *Sound16.cfg*, to the sound card and exits after that. The program does not stay resident, and will not take away any valuable RAM from your main memory.



Figure: The DOS configuration program SNDINIT.EXE

You can control all settings of IRQ's, DMA channels, I/O addresses, and other settings in the configuration program. The screen with the available settings looks different according to your selected options.

The files CONFIG.SYS and AUTOEXEC.BAT are edited to reflect the selected options, if necessary. Your original files are backed up with the extensions .MIR.

On first installation of the software under Windows you will see a configuration dialog window like the one shown in the illustration below (details may be different according to your configuration):

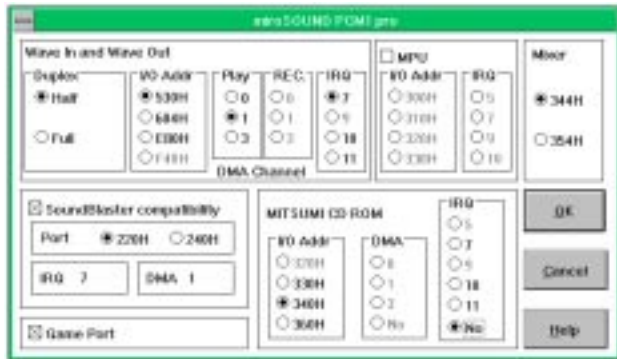


Figure: The first configuration dialog window

Enter here the values for I/O addresses, IRQ's and DMA channels, if you prefer other than the default settings. As a beginner in the art of configuring devices in a PC system, you should stay with the given values, however. These values should be the right ones for almost every PC system. (Only the free DMA channels cannot be detected due to the PC system hardware, but the installation software will do a estimation based on the most probable values.)

Later on you can change the configuration in Windows by running Control.exe and double click on the *drivers applet*. In the list of all installed drivers, do a double click on the **CS31BA11 driver** (*Crystal Systems Business Audio Driver*). You will see a window like the one shown below, where you can find the current settings of your sound card, and where you can edit them.



Figure: Configuring the card in Windows

If you double click on **Roland LAPC1** in Control.exe, you will see this window, where you can change the MPU-401 address and IRQ:

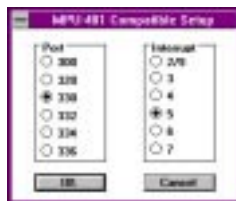


Figure: Setting the Roland options

At last there is another item in the drivers applet list of Control.exe to configure the OPL4 chip with the name **Yamaha OPL4 Driver**.



Caution: Do not edit the values in this dialog window.



Figure: OPL4 parameter - do not edit

Tests and Configuration

In this dialog window the topmost options should be selected - please do not edit.

If you want to control the OPL4 chip's FM synthesis, (and you can control quite a lot of parameters here), then click at the new OPL4

icon in Control.exe: 

You will see a dialog windows like this:



Figure: Dialog window to set the OPL4 FM parameters

Here you can toggle your sound card from PCM sounds using the Wave Table ROM to the older FM synthesis. Select the appropriate option called *Synthesis Type*. In the list *FM Voice Mode* you can define how to share the 20 voices available in FM mode between melodic and percussive instruments. The exact number of available instruments and drum sounds depends on the quality, e.g. 2 operator mode or 4 operator mode. Just leave the *Synthesis Type* as *PCM*, and you will hear instruments and drum sounds in optimal quality. Click on *Help* to display more information about these options.

In Control.exe's driver list you will find another driver called **miroSOUND PCM1 pro Aux driver**. This one is necessary for volume control and CD-ROM drive support. It cannot be configured; do not delete it.

Tests and Configuration

Installation and Configuration of a CD-ROM Drive

You can control CD-ROM drives by Panasonic, Mitsumi, and Sony from your **miroSOUND PCM1 pro** and the new IDE compatible drives.

On your sound card you will find the matching pin connectors to connect the data cable and a 4-pin audio cable. Only use the interface connectors for your brand of drive.

Locate the pin 1 position for each cable. It is marked on the sound card (rounded edge) and on the drive (nearest to the power connector). The (red) marked wire of the data cable must be connected to pin 1 on each end.

Refer to the CD-ROM manufacturer's installation guide to install the drive into your system. Only mount the drive in horizontal orientation. Do not forget to secure the drive using the supplied screws and to connect a spare power connector from your PC's power supply.

When your CD-ROM drive is installed and connected to the **miroSOUND PCM1 pro**, run again the Install program from the miro Installation diskette to install the matching CD-ROM drivers into the files CONFIG.SYS and AUTOEXEC.BAT.

The miro Installation software enters the **miro CD-ROM Interface Setup driver** into the Config.sys file. If you install e.g. a Sony CD-ROM drive, the following line is inserted into the file Config.sys:

```
DEVICE=C:\MIROSND\cdsetup.sys /T:S /P:340 /I:10 /D:3 (line 1)
```

Below this line you should enter the line to start your CD-ROM Sys driver, which is supplied with your CD-ROM drive, e.g. as:

```
DEVICE=c:\xxxxxxx.SYS /D:MSCD001 /P:340 (line 2)
```

In this example the Sony CD-ROM is configured to use address 340. The miro CD-ROM Interface Setup driver (line 1) is set up by the miro installation program. In line 2 you must enter the address yourself, if it differs from the manufacturer's default address for his drive. In the example shown above, the parameter /P:340 entered the address. Other drivers may need the parameter /B:340 instead. Refer to the drive's documentation, when the CD-ROM installation using default values does not succeed.

CD-ROM Drives



In the line calling the Sys driver of your CD-ROM drive you must give a logical name for the drive, as shown in the above example. There the name is MSCD001, but you may enter any name with up to 8 characters. The /D:MSCD001 parameter enters this name into the PC's RAM, where it can be found later by Microsoft's MSCDEX.EXE driver. Both names, in the line in the Config.sys and in the line calling MSCDEX in the Autoexec.bat, must be identical.

Please note the installation software of your **miroSOUND PCM1 pro** has done all this already. In your file AUTOEXEC.BAT there is a line like this:

```
C:\DOS\MSCDEX.EXE /D:MSCD001
```



Since MS DOS Version 6 and later the MSCDEX.EXE is part of the DOS files; use that file from your DOS directory. If you use an older version of DOS, then copy the driver MSCDEX.EXE from the disk that was supplied with your CD-ROM drive into your DOS directory.

The parameter /M:xx can speed up the CD-ROM drive access. A line like this

```
C:\DOS\MSCDEX.EXE /D:MSCD001 /M:16
```

will reserve 16 buffer blocks in the PC's RAM, that will buffer the last read data from the CD-ROM. The data will be immediately available, if a program wants to read them again and if the data is still in the buffer memory.

You can see more options for MSCDEX, as for most DOS programs, if you call it with the parameter /?.

MSCDEX.EXE should be called above SMARTDRV.EXE in your Autoexec.bat file, because then Smartdrv (starting with DOS 6) can buffer the CD-ROM read access for an improved reading speed on data that are read at least twice.

The Mixer

The **miroSOUND PCM1 pro** contains a miro custom designed multi-channel mixer chip. This chip gives you the power of controlling seven independant stereo channels for playback and recording!

You can also record and playback at the same time. So you may play a MIDI file using the crystal clear PCM sounds and simultaneously record these sounds as a sample WAV file to your hard disk. You can even sing into a microphone and record these sounds together with the MIDI music.

The Windows mixer utility is called **Miromix.exe**. You will find an icon in the **miroSOUND** group in the Program Manager. Double click on it to open the mixer window:

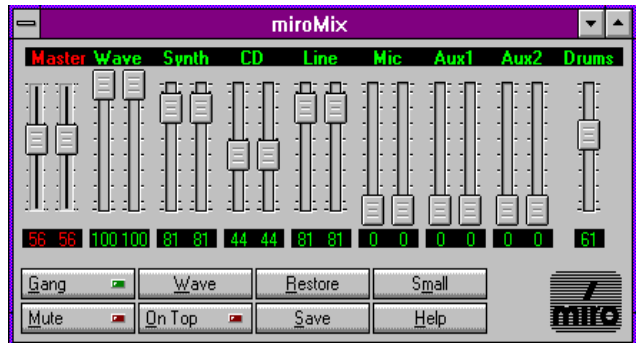


Figure: The Windows Mixer

All sliders can be controlled by dragging the mouse. With *Gang* you can lock the left and right stereo channels, so you can control both channels by just dragging one of the sliders.

With *Save* you can save the current values to disk and load them back later with *Load*.

With your **miroSOUND PCM1 pro** you can control the volume of the MIDI drum channel separately from the other volume values. This enables you to set your favorite drums volume setting for all your MIDI files at once, without having to edit each and every MIDI file itself.

You may want to toggle between Wave Table music and FM synthesized music with the button *Wave/FM* while playing a MIDI song. You will hear the difference at once, because you have purchased one of the most advanced Wave Table sound cards.

The Mixer

The *Mute* button mutes all output channels of your sound card. Click this button again to restore all volume settings to their former values.

The *On Top* button will cause the Windows mixer application to be visible on top of all other open windows on your screen. This way you can control the volumes any time you want. The button *Small/Big* will help in this case, it toggles the display from a small to a big one and back:

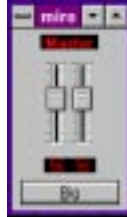


Figure: The small Windows mixer screen

In the DOS environment you can control the sound card's volumes by the program **MIROVOL.EXE**. It is located in the directory of your miro sound software, by default C:\MIROSND.

The DOS program displays the following screen:



Figure: The DOS mixer utility MIROVOL.EXE

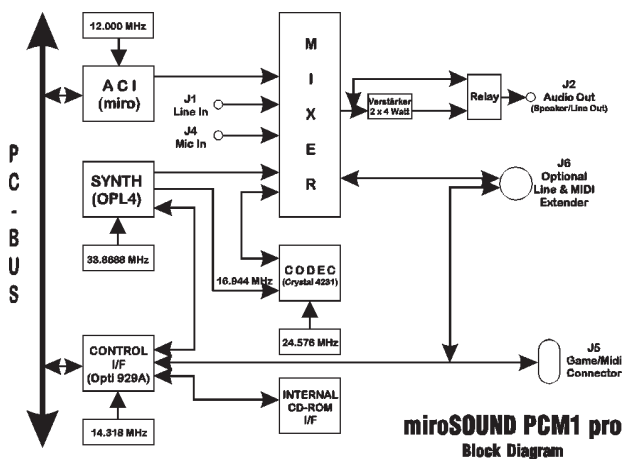
Control the volumes with your mouse or with your PC keyboard. Click on the cursor buttons, or use the keyboard's cursor buttons and the PageUp / PageDown keys.

The DOS configuration program **SDNINIT.EXE** has an option to permanently control and store the volume settings of your sound card.

The Mixer

Your Sound Card's Wave Table Technology

As you have noticed with your own ears in the Wave/FM toggle example above, your **miroSOUND PCM1 pro** has two built-in technologies to generate musical sounds: the formerly common and still wide-spread FM synthesis and the new Wave Table sample technology. Both kinds of music are generated by Yamaha's OPL4 chip. This new chip is not only backward compatible to the older OPL3 and OPL2 chips, avoiding any problems with older DOS applications, but it can also generate the optimal sound for all modern applications and for Windows using PCM Wave Table samples.



The OPL4 chip in the **miroSOUND PCM1 pro** has access to a Wave Table ROM with 2 MB size, which holds in compressed form all 128 instruments and 47 drums of the General MIDI standard. When you start playing a MIDI music file, the OPL4 chip receives a number of MIDI commands like "Start playing note number 24 using the instrument sound number 21!" (MIDI says it in a somewhat shorter way and compresses this command into 2 bytes.)

The Wave Table Technology



The OPL4 chip collects the sample sound number 21, an accordion sound, from the Wave Table ROM, and plays it in the pitch number 24. Many instruments have been sampled more than once, because the low notes with low pitch sound often quite different from the higher notes of the same instrument. The generated sound is best, when the recording engineers have defined well the transfer points between these samples and the looping points for long notes. You will confirm, that your **miroSOUND PCM1 pro** really sounds great!

These are the instruments of the General MIDI standard:

0 Acoustic Grand Piano	33 Electric Bass (fingered)
1 Bright Acoustic Piano	34 Electric Bass (picked)
2 Electric Grand Piano	35 Fretless Bass
3 Honky-Tonk Piano	36 Slap Bass 1
4 Electric Piano 1	37 Slap Bass 2
5 Electric Piano 2	38 Synth Bass 1
6 Harpsichord	39 Synth Bass 2
7 Clavi	40 Violin
8 Celesta	41 Viola
9 Glockenspiel	42 Cello
10 Music Box	43 Contrabass
11 Vibraphone	44 Tremolo Strings
12 Marimba	45 Pizzicato Strings
13 Xylophone	46 Orchestral Harp
14 Tubular Bells	47 Timpani
15 Dulcimer	48 String Ensemble 1
16 Drawbar Organ	49 String Ensemble 2
17 Percussive Organ	50 SynthStrings 1
18 Rock Organ	51 SynthStrings 2
19 Church Organ	52 Choir Aahs
20 Reed Organ	53 Voice Oohs
21 Accordeon	54 Synth Voice
22 Harmonica	55 Orchestra Hit
23 Tango Accordeon	56 Trumpet
24 Acoustic Guitar (nylon)	57 Trombone
25 Acoustic Guitar (steel)	58 Tuba
26 Electric Guitar (jazz)	59 Muted Trumpet
27 Electric Guitar (clean)	60 French Horn
28 Electric Guitar (muted)	61 Brass Section
29 Overdriven Guitar	62 SynthBass 1
30 Distortion Guitar	63 Synth Bas 2
31 Guitar Harmonics	64 Soprano Sax
32 Acoustic Bass	65 Alto Sax

General MIDI

66 Tenor Sax	99 FX 4 (atmosphere)
67 Baritone Sax	100 FX 5 (brightness)
68 Oboe	101 FX 6 (goblins)
69 English Horn	102 FX 7 (echoes)
70 Bassoon	103 FX 8 (sci-fi)
71 Clarinet	104 Sitar
72 Piccolo	105 Banjo
73 Flute	106 Shamisen
74 Recorder	107 Koto
75 Pan Flute	108 Kalimba
76 Blown Bottle	109 Bag Pipe
77 Shakuhachi	110 Fiddle
78 Whistle	111 Shanai
79 Ocarina	112 Tickle Bell
80 Lead 1 (square)	113 Agogo
81 Lead 2 (sawtooth)	114 Steel Drums
82 Lead 3 (calliope)	115 Wood Block
83 Lead 4 (cliff)	116 Taiko Drum
84 Lead 5 (charang)	117 Melodic Tom
85 Lead 6 (voice)	118 Synth Drum
86 Lead 7 (fifths)	119 Reverse Cymbal
87 Lead 8 (bass + lead)	120 Guitar Fret Noise
88 Pad 1 (new age)	121 Breath Noise
89 Pad 2 (warm)	122 Seashore
90 Pad 3 (polysynth)	123 Bird Tweet
91 Pad 4 (choir)	124 Telephone Ring
92 Pad 5 (bowed)	125 Helicopter
93 Pad 6 (metallic)	126 Applause
94 Pad 7 (halo)	127 Gunshot
95 Pad 8 (sweep)	
96 FX 1 (rain)	
97 FX 2 (soundtrack)	
98 FX 3 (crystal)	



These are the 47 drums of the miroSOUND:

35 Acoustic Bass Drum	59 Ride Cymbal 2
36 Bass Drum 1	60 Hi Bongo
37 Side Stick	61 Low Bongo
38 Acoustic Snare	62 Mute Hi Conga
39 Hand Clap	63 Open Hi Conga
40 Electric Snare	64 Low Conga
41 Low Floor Tom	65 High Timbale
42 Closed Hi-Hat	66 Low Timbale
43 High Floor Tom	67 High Agogo
44 Pedal Hi-Hat	68 Low Agogo
45 Low Tom	69 Cabasa
46 Open Hi-Hat	70 Maracas
47 Low Mid Tom	71 Short Whistle
48 Hi Mid Tom	72 Long Whistle
49 Crash Cymbal 1	73 Short Guiro
50 High Tom	74 Long Guiro
51 Ride Cymbal 1	75 Claves
52 Chinese Cymbal	76 High Wood Block
53 Ride Bell	77 Low Wood Block
54 Tambourine	78 Mute Cuica
55 Splash Cymbal	79 Open Cuica
56 Cowbell	80 Mute Triangle
57 Crash Cymbal 2	81 Open Triangle
58 Vibraslap	

The drum instruments in MIDI channel 10 are represented by the respective notes: the low B to the left is number 35, the C next to it is 36 and so on to the A for number 81.

If you cannot imagine what instrument is meant with uncommon names, just try to play them! **Ballade Lite** is the best program for this purpose. Play some long notes with the effect instruments - you will be surprised to hear the fantastic sounds included with your sound card.

Specifications

Sound Prozessor	Yamaha OPL4, 24 PCM Wave voices
Wave Table ROM	2 MB, 128 instruments, 47 drums
Compatibility	AdLib, Sound Blaster, Sound Blaster Pro II, Microsoft Windows Sound System, Roland MPU-401 (in Windows)
Sampling	16-bit stereo, 44.1 kHz, maximum 44 simultaneous voices, record and playback at the same time, oversampling
MIDI interface	Sound Blaster compatible, 8 byte FIFO, MIDI time stamp, MPU-401 compatible (in Windows), General MIDI instrument set, optional expansion box with additional MIDI In , MIDI Out and MIDI Thru connectors
CD-ROM interfaces	Sony, Mitsumi, Panasonic, IDE
Mixer	miro mixer chip for 7 channel stereo mixer for playback and recording
Amplifier	Relais controlled 2 x 4 Watt power amplifier
Sizes	Normal size 16-bit card, 210 x 105 mm
Connectors at the back	Stereo microphone input, stereo line-in, 9-pin line & MIDI extender connector for 2 x Aux-In, Line-Out, MIDI In, MIDI Out, MIDI Thru , switchable stereo loudspeaker / Line-Out output, combined standard Game Port/MIDI connector
Connectors on board	40pin CD-ROM for Panasonic, Mitsumi, and IDE, 34pin CD-ROM Sony, CD audio for Panasonic, Mitsumi, and Sony, internal PC speaker input, stereo Aux input, stereo line-in, internal MPC stereo loudspeaker output
Electrical	Microphone input 600 Ohms Line-In, CD audio, Aux inputs 47 kOhms Line-Out 220 Ohms

You can connect the optional **miroSOUND Line & MIDI Extender** to the 9pin connector at the rear of your sound card, featuring additional connectors for MIDI In, MIDI Out and MIDI Thru, plus 2 Aux-In and Line-Out.

Specifications





