



miroSOUND PCM20 radio

USER'S GUIDE

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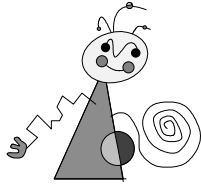
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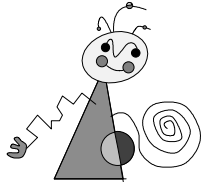
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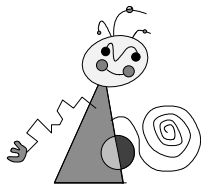
For your own safety

In the interest of your own safety and the flawless functioning of your new product and computer system please note the following:

- ♦ Before opening the computer make sure that the power plug is disconnected from the main socket.
- ♦ Computer components are sensitive to static charge. Discharge any electrostatic energy from your person before touching the components with your hands or any tools.



For changes that have occurred after the manual has been printed, refer to the README file/s on the disk/s supplied with your system! In the Windows File Manager or the Windows 95 Explorer double-click the README file to get the latest information.



About the manual

This manual explains how to install, to configure, and use the miroSOUND PCM20 radio hardware and software.

Subheadings In the margins are subheadings to help you quickly find your way through this manual.



Important text passages are marked with the “notepad” and this format.

Numbers mark step by step instructions:

1. Start Windows.

Bullets mark instructions for optional steps the order of which is not important:

- Connect the miro board to the microphone.

All keyboard commands appear in this font:

install <↵>

<↵> represents the enter key.

Menus, commands, options or buttons which the user can select are written in *italics*.



Overview

Congratulations on purchasing the miroSOUND PCM20 radio sound board!

FEATURES

With miroSOUND PCM20 radio miro offers the following features:

☐ *Integrated VHF tuner*

The miroSOUND PCM20 radio sound board includes an integrated VHF tuner. The tuner has RDS functions which provide for user-friendliness.

☐ *OPL4*

Your miroSOUND PCM20 radio includes the OPL4 chip from Yamaha, offering PCM sounds of excellent quality, and compatibility with the earlier OPL3 and OPL2 chips.

☐ *Compatibility*

Your miroSOUND PCM20 radio is compatible with all major sound standards, including AdLib, Sound Blaster, Sound Blaster Pro, Microsoft Windows Sound System, and Roland MPU-401 for Windows and DOS. The MIDI sound patches are compatible with the General MIDI standard and with its ability to record and playback high quality 16-bit, 48 KHz stereo sound, the board exceeds the multimedia specifications MPC1 and MPC2.

☐ *Sampling rate*

miroSOUND PCM20 radio allows sampling rates of up to 48 kHz.

☐ *Playing back and recording simultaneously*

miroSOUND PCM20 radio allows simultaneous play back and recording of sound.

☐ *Upgradeability*

You can upgrade the miroSOUND PCM20 radio board with a Waveblaster module which adds more PCM sounds to your board.

☐ *HQ-9000*

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.

☐ *Cubase LITE/Sound Forge*

Together with the miroSOUND PCM20 radio board you have purchased the sound editing programs Cubase LITE and Sound Forge.



Before you begin



Sound boards are sensitive to static charge. To avoid damage that may occur by static charge, leave the sound board in its antistatic packaging until installation. Keep the packaging for possible future transportation.

PACKAGE CONTENTS

Before beginning the miroSOUND PCM20 radio installation, please make sure your miroSOUND PCM20 radio package is complete*:

- ♦ miroSOUND PCM20 radio board[†],
- ♦ installation disk(s) with the driver software and miroSOUND applications for Windows 3.11,
- ♦ installation disk(s) for Windows 95 with the driver software, miroSOUND applications and HQ-9000,
- ♦ installation disk(s) for HQ-9000 under Windows 3.11,
- ♦ antenna,
- ♦ adapter for the antenna connection (F connector for the coaxial connector),
- ♦ Y adapter for the joystick connector (15-pin D-type 3 rows/2 rows),
- ♦ documentation,
- ♦ Sound Forge and Sound Forge documentation,
- ♦ Cubase LITE and Cubase LITE documentation,
- ♦ *optionally*:
miroSOUND Line & MIDI Extender Box.

SYSTEM REQUIREMENTS

To install miroSOUND PCM20 radio, your computer system has to meet the following requirements:

- ♦ at least a 386 computer or compatible with a free 16-bit ISA or EISA slot,
- ♦ if you want to use miroSOUND PCM20 radio to play back CDs, an IDE CD-ROM drive and an audio cable.

* Depending on the delivery scope, the package contents may vary from the contents listed in this manual.

[†] For model and serial number of your miro board, refer to the label on the sound board.

WHAT DO YOU NEED FOR THE INSTALLATION?

To install your miroSOUND PCM20 radio board you need in addition to components included in the package contents:

- ♦ a screwdriver;
- ♦ connecting cables for the audio devices;
- ♦ miroSOUND Line & MIDI Extender Box, if you want to connect the MIDI devices to the MIDI connector on the miroSOUND PCM20 radio board, the miroSOUND Line & MIDI Extender Box can be obtained from miro,
- ♦ a MIDI adapter, if you wish to connect MIDI devices to the MIDI/joystick connector on the miroSOUND PCM20 radio board.

Hardware installation

INSTALLING THE SOUND BOARD

To install the miro sound board in your computer, proceed as follows:

1. **Turn off the computer, disconnect the cables.**
Turn off your computer and all peripheral devices. Disconnect the computer from the power supply and all necessary components.
2. **Open the computer.**
Loosen the screws of the computer's cover and remove it.
3. **Locate a slot.**
Locate a free 16-bit ISA or EISA slot.
4. **Remove the slot's cover.**
Remove the slot's cover at the back of the computer. Save the screws of the cover.
5. **Discharge yourself of static charge.**
Discharge yourself of static charge by touching the power unit casing.
6. **Unpack the board.**
Take the board out of its packaging.
7. **Insert the board.**
Carefully insert the sound board into the ISA or EISA slot by holding the board at the top and gently pushing both ends into the slot at the same time. Press onto the upper edge of the board to make sure it is firmly seated in the slot.



Don't force the board into the slot! You run the risk of bending the contacts. If the board does not fit easily, pull it back out, and try again.

8. *If you want to connect your CD-ROM drive and/or other devices to the internal connectors on the miroSOUND PCM20 radio board, read the "Connecting the CD-ROM drive" and "Further internal connections" sections.*
9. **Close the computer.**
Put the cover back on the computer and reconnect the peripheral devices.

CONNECTING THE CD-ROM DRIVE

miroSOUND PCM20 radio allows the control of IDE compatible CD-ROM drives.

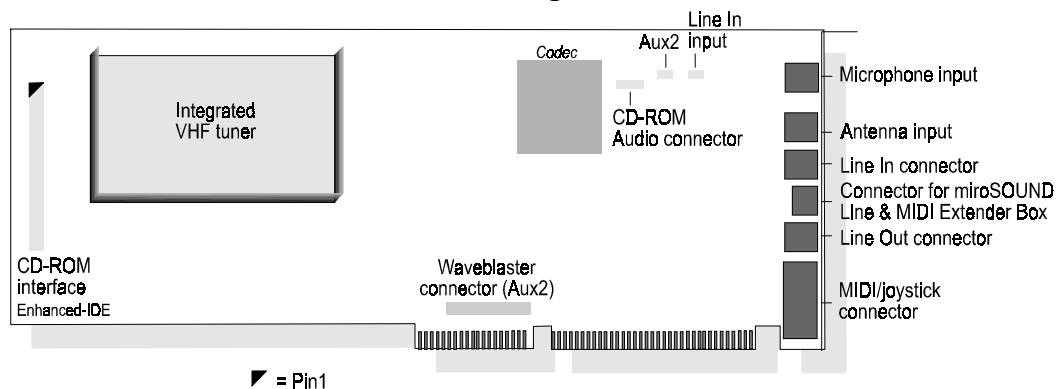
If your CD-ROM drive is already connected to a CD-ROM controller in your computer, it is not necessary to connect the ribbon cable (data cable) of your CD-ROM drive to the miroSOUND PCM20 radio board. If you do connect the data cable of your CD-ROM drive to the

miroSOUND PCM20 radio CD-ROM interface, however, remove an already existing CD-ROM controller or disable an onboard IDE controller. If you want to play back audio CDs via miroSOUND PCM20 radio, connect the audio cable to miroSOUND PCM20 radio.



If an Enhanced-IDE controller is installed in your computer, which supports up to 4 hard disks, you cannot connect the IDE-CD-ROM drive to your miroSOUND board. In this case, connect your CD-ROM drive directly to your hard disk controller. If you connect your CD-ROM drive to the hard disk controller, please make sure that you set the jumper of your hard disk to “MASTER/SLAVE PRESENT”. For further information, refer to the documentation of your hard disk and your CD-ROM drive.

For connecting the CD-ROM cables there is one connector for the data cable and another connector for the audio cable on the board. For the location of the connectors, refer to the diagram below.



CD-ROM audio connector

The CD-ROM audio connector has the appropriate pin allocation for IDE drives. Because the pin allocations vary even for drives of one manufacturer, it is absolutely necessary that you check the pin allocation of your CD-ROM drive's audio connector before connecting the CD-ROM drive's audio connector to the miroSOUND PCM20 radio audio connector. If necessary, adapt the audio cable to the pin allocation. For information on the pin allocations, refer to the Appendix.

FURTHER INTERNAL CONNECTIONS

Line In input If a second multimedia board (e.g. miroVIDEO 10/20TD live) is installed in your computer, miroSOUND PCM20 radio allows the connection of the audio output of this multimedia board to the miroSOUND PCM20 radio Line In input. The sound is output via miroSOUND PCM20 radio. For information on the pin allocation and the position of the Line input, refer to the Appendix.

Aux2 To the Aux2 connector attaches a further audio input device, e.g. a tape deck.

Waveblaster connector You can connect a waveblaster module to the waveblaster connector. This waveblaster module offers further PCM sounds. If you connect a waveblaster module then you cannot connect a further audio input device to the Aux 2 connector.

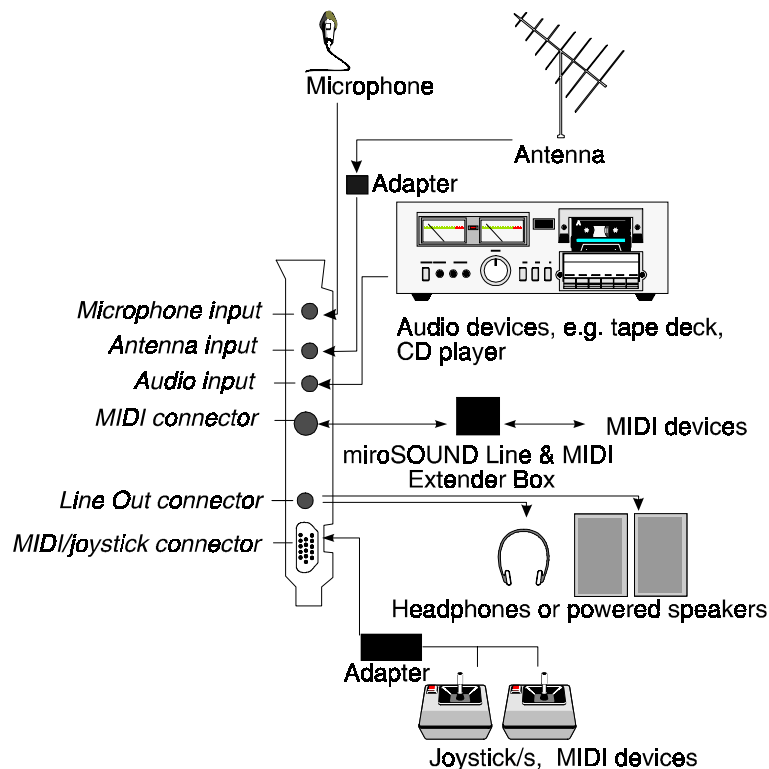
CONNECTING EXTERNAL DEVICES

After having installed the miroSOUND PCM20 radio board and connected the internal devices, you can connect the peripheral devices you want to use with miroSOUND PCM20 radio.



The miroSOUND PCM20 radio package does not contain the cables for connecting the audio devices/joysticks. You can obtain cables and adapters from electronic stores. The miroSOUND Line & Extender Box is optionally available from miro.

The following diagram shows the connections:



Connect the devices you want to use with the miroSOUND PCM20 radio board to the corresponding connectors.

- **Connect miroSOUND PCM20 radio to the antenna.**
If you want to use the VHF tuner, connect the F socket of the adapter provided for the connection of the antenna to the antenna input of the miroSOUND PCM20 radio board. Connect the supplied antenna or any other VHF antenna to the coaxial socket of the adapter.

- **Connect miroSOUND PCM20 radio to the microphone.**
If you want to use a microphone, connect the microphone to the microphone input of the miroSOUND PCM20 radio board.
- **Connect miroSOUND PCM20 radio to a CD player or a tape deck.**
Connect a CD player or a tape deck to the audio input of the miroSOUND PCM20 radio board.
- **Connect powered speakers or headphones to miroSOUND PCM20 radio.**
Connect powered speakers or headphones to the audio output of miroSOUND PCM20 radio.
- **Connect miroSOUND PCM20 radio to MIDI devices.**
If you want to connect MIDI devices to the MIDI connector of the miroSOUND PCM20 radio board, first connect the miroSOUND Line & MIDI Extender Box to the MIDI connector of the miroSOUND PCM20 radio board. The miroSOUND Line & MIDI Extender Box is optionally available from miro. Then connect the MIDI devices to the miroSOUND Line & MIDI Extender Box.
If you want to connect the MIDI device to the joystick/MIDI connector, first connect the Y adapter supplied with the miroSOUND PCM20 radio board to the MIDI/joystick connector on the miroSOUND PCM20 radio board and then connect the MIDI device to the adapter. Please note that you can only connect MIDI devices to joystick connector 1 of the adapter.
- **Connect miroSOUND PCM20 radio to joystick/s.**
If you want to connect one or two joystick/s to miroSOUND PCM20 radio, first connect the Y adapter supplied with miroSOUND PCM20 radio to the MIDI/joystick connection of miroSOUND PCM20 radio board. Then, connect the joystick/s to the adapter.



Software installation

... FOR WINDOWS 3.1X

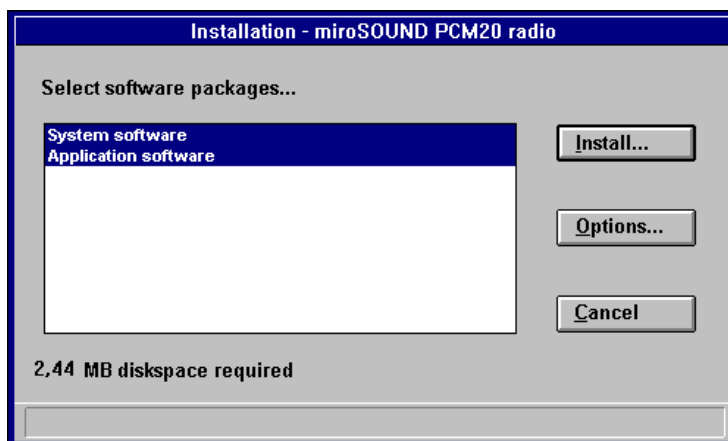


If you have installed any sound drivers in Windows before, first uninstall them and restart Windows before you try to install the miro software.

To install the software, proceed as follows:

1. If you have not done so already, start Windows 3.1x.
2. Insert the installation disk for your miro sound board into your disk drive.
3. In the Program Manager select the *File* menu and the *Run...* command.
4. Depending on your disk drive, enter **a:\install** or **b:\install** and click on *OK*.
5. After starting the installation program the *Language Selection* menu. If this has not been done already, select *English*.
6. Click *Install*.
7. Select the items you want to install.

System software is the basic software you need to operate the sound board. Application software are the miro sound applications (miroMIXER, RDS tuner, miroEQUALIZER).



8. Click *Install* to go on with the installation.
9. Confirm the message that follows.

Result of the installation

The installation program installs the drivers for DOS and Windows and creates the *miroSOUND PCM20 radio* Program Group in the Program Manager.

Configuration The configuration of your miroSOUND PCM20 radio board under Windows 3.1x depends on whether your computer has a Plug & Play-BIOS or not. If your computer has a Plug & Play-BIOS, the sound board gives out a message during the system start-up.

If your computer has no Plug & Play BIOS...,
you can configure the miroSOUND PCM20 radio software after the installation under DOS using the SNDINDOS.EXE program. You can start SNDINDOS.EXE from the MS-DOS Prompt. The configuration is not absolutely necessary but should, however, be done in case you use your miroSOUND board as CD-ROM interface or you want to connect a joystick to your miroSOUND PCM20 radio board. In case problems occur with the miroSOUND PCM20 radio board, you can re-allocate resources (addresses, interrupts, DMA channels) using this program.

If your computer has a Plug & Play BIOS...,
you can enable the CD-ROM interface and the game port under DOS using the SNDINDOS.EXE program. You can start SNDINDOS.EXE from the MS-DOS Prompt.

Please read the “Configuring the miroSOUND PCM20 radio software under DOS” section.

CD-ROM drivers If you have not done so already, do not forget to install the drivers supplied with your CD-ROM drive after you have completed the miroSOUND PCM20 radio software configuration. Please refer to the “Configuring the CD-ROM drive” section.

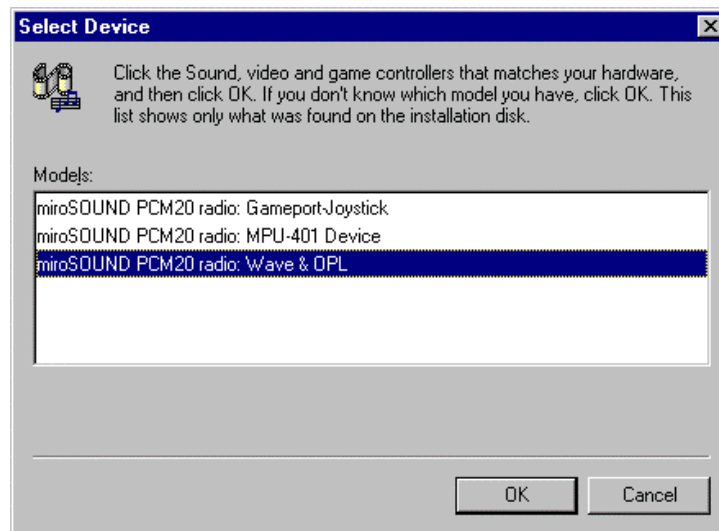
... FOR WINDOWS 95

1. If you have not done so already, start Windows 95.
2. Select *Settings* and *Control Panel* from the *Start* menu.
3. Select *Add New Hardware*. Click *Next*.
4. When being requested to start the Search New Hardware process, select *No* and click *Next*.
5. Select *Audio, Video and Game Controller* and click *Next*.



6. Select *Have Disk...* and click *OK*.

The following window appears:



Under Windows 95 it is not possible to install all drivers in one step. You have to select and to install each component individually. We recommend to install *miroSOUND PCM20: Wave&OPL* first.

7. Select *miroSOUND PCM20: Wave&OPL* and click *Next*.

Now, the selected files will be copied to your hard disk.

If you have not installed any sound board in your computer before, you will be requested to insert the Windows 95 CD-ROM.

8. When requested to do so, insert the Windows 95 CD-ROM. Click *Browse*. When the driver has been found, click *OK* to confirm.
9. After all the files have been copied, restart the computer.

Now the miro installation program is started automatically.

10. Select the software components you want to install.

11. Click *OK*.

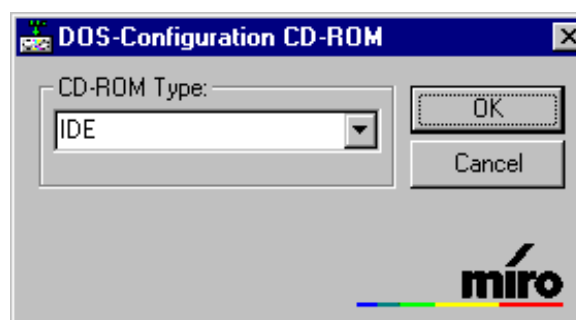
When the software has been installed, install the other components as described above (*miroSOUND PCM20: MPU-401 Device* and *miroSOUND PCM20: Gameport Joystick*).

CD-ROM interface

If you want to use your *miroSOUND* board as CD-ROM interface, you have to enable the CD-ROM interface on the *miroSOUND PCM20* radio board.

To enable the CD-ROM interface on the *miroSOUND PCM20* radio board,

1. start the *miroSOUND CD-ROM Config* program from the *miroSOUND PCM20* Program Group.
2. Select IDE from the list box and click *OK*.



3. Restart the computer.

If you have not done so already, do not forget to install the drivers supplied with your CD-ROM drive after you have completed the miroSOUND PCM20 radio software configuration. Please refer to the “Configuring the CD-ROM drive” section.

CONFIGURING THE CD-ROM DRIVE

Installing the miro CD-ROM Interface Setup driver

After your CD-ROM drive has been installed and connected to the miroSOUND PCM20 radio, and you have enabled the CD-ROM drive (using the *miroSOUND CD-ROM Config* program under Windows 95 and the SNDINDOS.EXE program under Windows 3.1x), the configuration software enters the miro CD-ROM Interface Setup driver into the CONFIG.SYS file. The following line is inserted into the file CONFIG.SYS:

DEVICE=C:\MIRO\SOUND\cdsetup.sys /T:I (*line1*)

Installing CD-ROM drivers

Below the above mentioned line there has to be a driver to start your CD-ROM driver (*.SYS), which is supplied with your CD-ROM drive, e.g.:

DEVICE=c:\xxxxxxx.SYS /D:MSCD001 (*line 2*)

The line calling the *.SYS driver has to include the logical drive name (e.g. MSCD001). The /D:MSCD001 parameter enters this name into the PC's RAM, where it is found by the Microsoft MSCDEX.EXE driver.

Speeding up the CD-ROM drive access

The miroSOUND PCM20 radio installation program has entered the following line into the AUTOEXEC.BAT file:

/M:xx 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 execute it with the parameter /?.



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

DEINSTALLING THE miroSOUND PCM20 RADIO SOFTWARE

Windows 3.1x If you want to uninstall your miroSOUND PCM20 radio software, proceed as follows:

1. If you have not done so already, start Windows.
2. Insert the installation disk in your disk drive.
3. In the Program Manager select *File* and the *Run...* command.
4. Depending on your disk drive, enter **a:\install** or **b:\install** and click OK.
5. After starting the installation program the *Language Selection* menu. If this has not been done already, select *English*.
6. Click *Deinstall*.

The installed files are deleted and the entries for the miroSOUND board are deleted from the system files (AUTOEXEC.BAT, CONFIG.SYS and SYSTEM.INI). The original files are saved under with the extension .BK!.

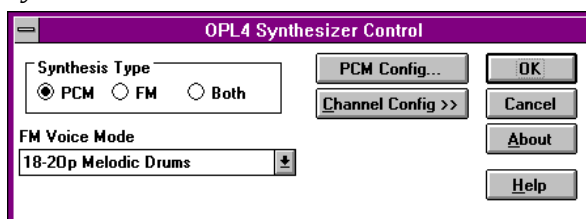
Windows 95 To uninstall the miroSOUND PCM20 radio software under Windows 95, use the *Device Manager*. Please consult your Windows 95 documentation.

RECONFIGURING miroSOUND PCM20 RADIO

... under Windows 3.1x

To change the miroSOUND PCM20 radio configuration under Windows 3.1x, proceed as follows:

- Under Windows open the *Main Group* and the *Control Panel*.
- If you want to control the OPL4 chip's sound synthesis, click at the *OPL4 Synth* icon in the *Control Panel*:



Here you can toggle your sound board 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.

3. Click *OK/Cancel* to go back to the *Control Panel*.

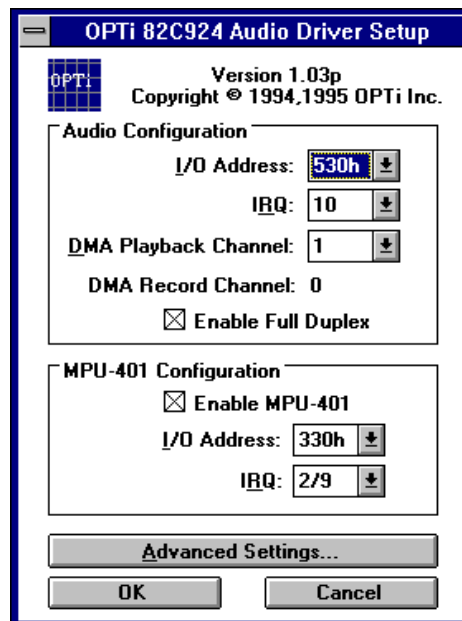
Wave settings • To change the Wave parameters, double-click the *Drivers* icon.



If you open the *miro OPL4 Synth* by double-clicking the driver **please do not change** the values. In this dialog box the topmost options have to be selected.

- In the list of all installed drivers, double-click on the *Opti 82C924 Audio Driver Setup*.

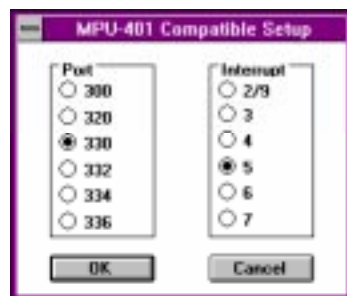
The following window appears, where you can find the current settings of your sound board, and where you can edit them.



The *Advanced Settings* button allows you further settings.

MPU compatibility

To change the address and/or the interrupt, double-click on *Roland LAPC1* in the driver list. If necessary, change the address and/or the interrupt.



... under Windows 95

To reconfigure the miroSOUND PCM20 radio board under Windows 95, proceed as follows:

1. Select *Settings and Control Panel* from the *Start* menu.
2. Select *System* and the *Device Manager*.
3. Select *Audio, Video and Game Controller* and double-click the module you want to configure.

Under *Ressources* you can change the settings for the miroSOUND PCM20 radio board.

Configuring the software under DOS

If you want to use games under DOS or you want to re-allocate the resources, such as the addresses, interrupts, and DMA channels (this is not possible if your computer has a Plug & Play-BIOS or if Windows 95 is installed), you can configure the miroSOUND PCM20 board under DOS using the SNDINDOS.EXE program. If your computer has a Plug & Play-BIOS or if Windows 95 is installed, you can use this program to enable the Game Port (for the joystick) and the IDE-Port (CD-ROM interface).

To start the DOS configuration program from the DOS level:

- Enter **sndindos /c <.>**.

Use the arrow keys to switch between the individual options.

miro Computer Products AG INITSOUND PnP V1.1

SB-Port 220 [J] 240 []	MPU-401 enable []	Mix-Port 344 [J] 354 []	Gameport enable []
SB-IRQ 7 [] 10 [] 5 [] none [J]	MPU-Port 330 [J] 320 [] 310 [] 300 []		IDE-Port enable [J]
SB-DMA 1 [] 0 [] 3 []	MPU-IRQ 9 [J] 10 [] 5 [] 7 []		

Cursor keys move, SPACE=toggle, ESC=exit, Enter=save, M=mixer, R=Radio

SB-Port

The I/O address for the wave input and output is automatically detected.

SB-IRQ

The interrupt for the wave input and output is automatically detected.

SB-DMA

If you want either to play back or to record sound, select one DMA channel. This DMA channel is then used for the input and the output. If you want to play back and to record simultaneously, select two DMA channels.

MPU-401

MPU is an interface for external MIDI devices, e.g. keyboards, sequencers etc. If you wish to connect external MIDI devices, enable the MPU interface. The port and the interrupt used by the MPU interface are detected automatically.

MPU-Port

The MPU address is detected automatically.

MPU-IRQ

The MPU interrupt is detected automatically.

Mix-Port

If problems occur in your system with the address 344h, you can select another address here.

Gameport

If you wish to connect a joystick to your sound board, enable the game port. If your system has already a game port integrated, do not enable the game port here because only one game port can be active at a time.

IDE-Port

Enable *CD-ROM* if you use the miro sound board as CD-ROM interface, that is if you connected the wide data cable of your CD-ROM drive to the miroSOUND PCM20 radio CD-ROM interface.



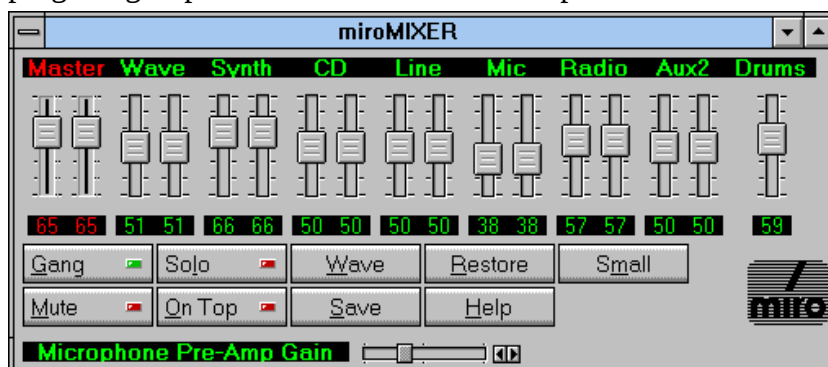
Using miroSOUND PCM20 radio

USING miroSOUND PCM20 RADIO UNDER WINDOWS

miroMIXER

You can control the volume of the sound board using the miroMIXER application. You will find the miroMIXER icon in the miroSOUND program group. Double-click this icon to open the miroMIXER window.

Windows 3.1x



Windows 95



Sliders All sliders can be controlled by dragging the mouse

Under Windows 3.1x you can move the sliders by pressing the left mouse key and dragging the slider to the desired volume.

To move the sliders under Windows 95, use the left mouse key to increase the volume. To decrease the volume, use the right mouse key.

Buttons *Gang*

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

Mute

Mute immediately mutes all sound outputs at once. Click this button again to switch on the sound again.

Solo

miroSOUND PCM20 radio offers the possibility to record WAV files and play back others simultaneously. When recording, however, the sound of the played back file is mixed with the recorded sound. The *Solo* function avoids this effect (Karaoke).

On Top

The *On Top* button will cause the miroMIXER 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.

Wave

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

Save

With *Save* you can save the current values to disk.

Restore

Restore allows you to load the last values which have been saved.

Help

Provides help for using the miroMIXER.

Small/Big

The *Small/Big* button will help in this case, it toggles the display from a small to a big one and back.

Drums

With your miroSOUND PCM20 radio 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.

Microphone Pre-amp gain

Four-level microphone pre-amplification.

Special miroMIXER functions under Windows 95:

Mixer/EQ:

Toggles between the mixer and the equalizer function.

Under Windows 95 you can save presets. To do so, select a preset number in the miroMIXER/miroEQUALIZER and adjust the settings. When quitting the mixer/equalizer the settings are automatically saved.

Playing CDs under Windows

If you want to play back CDs under Windows 3.1x, the MCI CD Audio driver has to be installed. If this is not the case, install the driver as follows:

1. If you have not done so already, start Windows.
2. In the *Main Group* open the *Control Panel*.
3. Click on *Driver*.
4. Click on *Add* and *[MCI] CD-Audio*.
5. Click *OK* and *Close*.

To play back CDs, you can use the CD-Player HQ-9000 included in the miroSOUND PCM20 radio package or the *Media Player* under Windows. For information on HQ-9000, refer to the corresponding manual.

To use the *Media Player*:

1. select *Media Player* from the *Accessories* group.
2. Under *Device* select *CD Player*.
3. Click on the play-back button (right arrow).

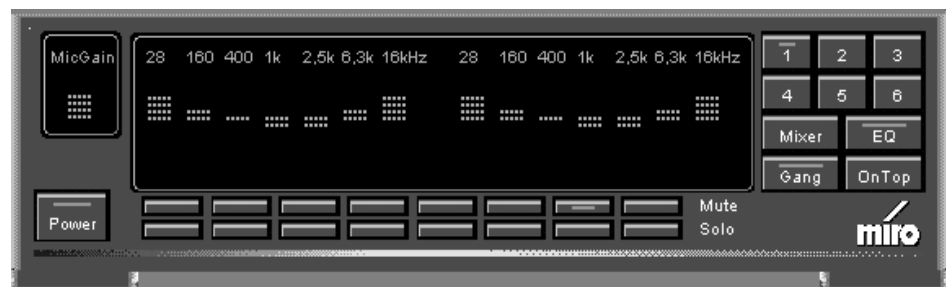
miroEQUALIZER

The miroEQUALIZER allows you to increase/decrease the volume for certain frequency ranges. The functions of the buttons are the same as the functions of the miroMIXER buttons. For Windows 95 the special functions provided by the miroEQUALIZER are also available.

Windows 3.1x



Windows 95



miroSOUND PCM20 radio (RDS tuner)

The RDS tuner of miroSOUND PCM20 radio offers you all functions of a VHF board with RDS functions.



Buttons Use these buttons to do the following settings:



Switches the tuner off.



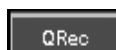
When pressing this button the time received by the tuner is transmitted to the PC. This function only works if the tuner has received the time signal via RDS which is indicated by a star beside the time indicator in the display window.



Switches between mono and stereo playback.



Switches the sound off.



Records sound from the radio to the hardware.



Scans for the previous station.



Scans for the next station.

0-9

Select the presets.

-/+

- selects the previous station (according to the preset number), + selects the next station (according to the preset number).

Setting the volume

To set the volume,

- move the mouse cursor into the display area under *Vol.* Clicking the left mouse button increases the volume, clicking the right mouse button turns the volume down.
- You can also use the keyboard. Pressing the arrow up key increases the volume by one step. Clicking the arrow down key decreases the volume by one step. Clicking the PageUp key increases the volume by four steps, clicking the PageDown key decreases the volume by four steps.

Changing the display mode

To change the display mode, move the mouse cursor into the upper left corner of the display window. The display window displays the following information:

Frequency: current frequency, e.g. FFN,

PTY: program type: e. g. POP, NEWS, CLASSIC,

Radio text: scrolls the text in the display window.

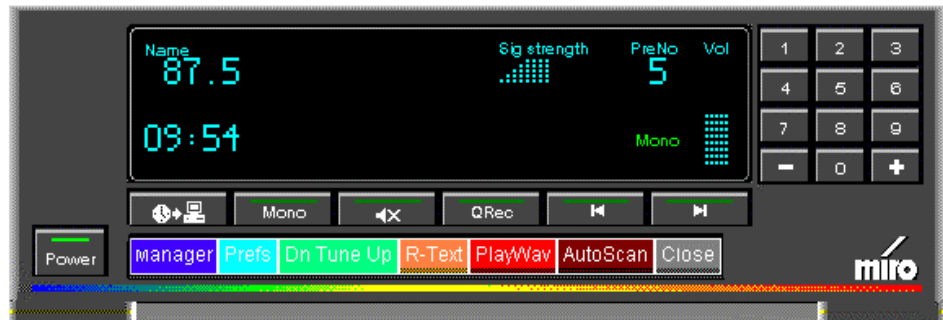
Info: In the station manager the user can enter a note of up to 64 characters for each station.

The text will be scrolled in the display window.

miro logo

Clicking the miro logo displays information about the tuner.

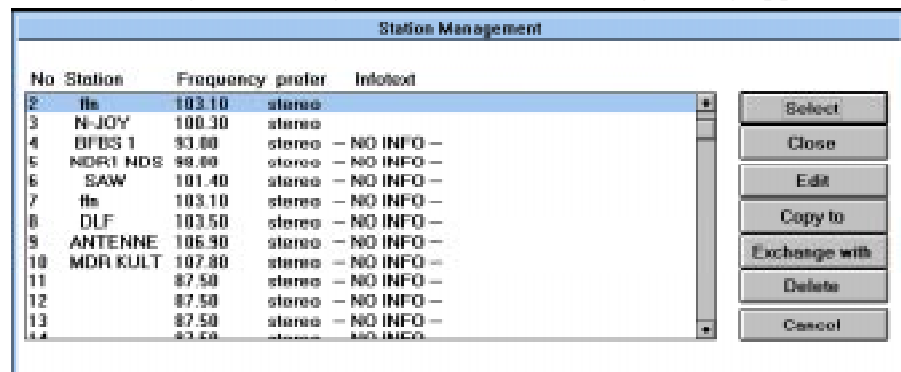
Hidden buttons



Behind the flap of the RDS tuner to the right of the *Power* button, there are further buttons. To open the flap, click on it using the mouse.

Manager

When clicking the *Manager* button, the following dialog appears:



The list shows all saved stations. To edit the information for a preset, mark the desired line in the list with the left mouse button and click the *Edit* button. A further dialog appears which allows you to change the frequency of the station, to rename the station, or to enter a name if it could not be received by the RDS function, and to enter an info text with up to 64 characters.

To select another preset,

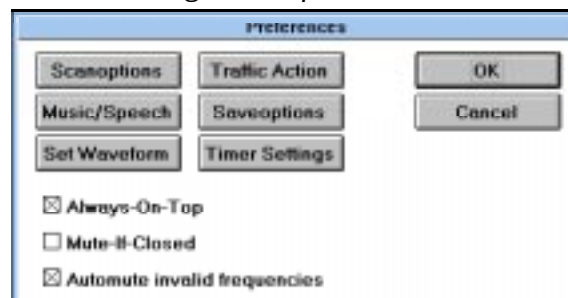
- double-click the preset or mark it and click *Select*.

To allocate another preset number to a station,

- click *Copy to* and select the number you desire. To exchange two stations, use the *Exchange with* button.

Prefs

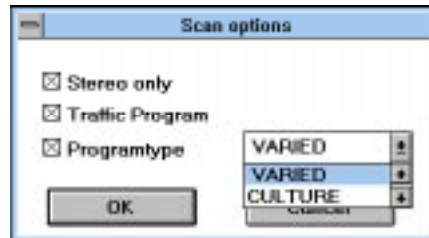
When clicking the *Prefs* button the following dialog appears:



- ♦ *Always-On-Top*:

When activating this option the tuner is always on top of all other windows.

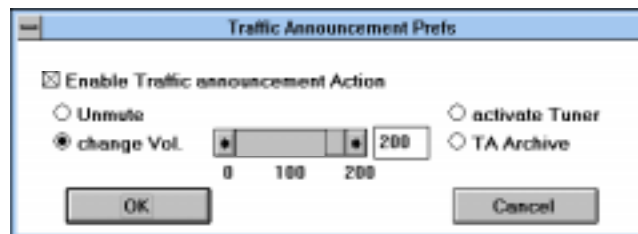
- ♦ *Mute-If-Closed:*
This option determines whether the tuner will be muted after leaving the application or not.
- ♦ *Automute invalid frequencies:*
When enabling this option the tuner is muted when no station is available for the selected frequency meaning that there is no noise between the stations.
- ♦ *Scan options:*
When clicking *Scan options*, the following dialog appears:



Here you can select the requirements a station has to meet to be accepted in the presets list during automatic scanning, e. g. stereo (*Stereo only*), traffic announcements (*Traffic Program*), or a special program type (*Program type*).

The following program types are available: News, Pop-Music, Current Affairs, Rock-Music, Information, Easy Listening, Sport, Light Classics, Education, Serious Classics, Drama, Other Music, Culture, Varied.

- ♦ *Traffic Action:*
For traffic announcements you can do certain settings.



Enable Traffic announcement Action: Enables the settings for the traffic announcements.

Unmute: When enabling *Unmute*, the muting function is switched off for traffic announcements.

change Vol: Sets the volume for traffic announcements in relation to the volume of the station.

activate Tuner: When this option is enabled, other sound sources except the tuner are turned down when a traffic announcement is transmitted.

TA Archive: The tuner can record up to a hundred traffic announcements. To do so, select the *TA Archive* button. You can select the recording quality using the *Set Waveform* button.

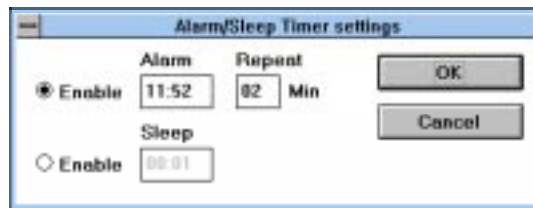
- ♦ *Music/Speech:*
When clicking *Music/Speech* in the *Preferences* dialog, a dialog box appears allowing you to set the volume of music and speech individually. The volume of the speech is selected in relation to the volume of the music.
- ♦ *Saveoptions:*
When clicking *Saveoptions* in the *Preferences* dialog, a dialog appears

allowing to determine which data you want to save when quitting the application.

♦ *Set waveform:*

Click the *Waveform* button in the *Preferences* dialog, a dialog appears which allows you to set the recording quality for the QuickRecord function. Please note that a high recording quality (stereo, 44.1 kHz, 16 bits) requires a lot of memory and lowers the maximum time of the recording considerably. QuickRecord does not save to hard disk, the maximum recording time depends on the free RAM space.

♦ *Timer settings:*



Allows you to set an alarm clock and to set the time after which the tuner shall be switched off (*Sleep*).

R-Text (Radio-Text-History)

This button shows you the last hundred radio text messages.

DnTuneUp

Selects the frequency in steps of 50 kHz.

PlayWav

Lets you select and play a wave file or a traffic announcement.

AutoScan

Automatically scans for stations. To select the search options, select *Prefs* and *Scanoptions*.

Close

Closes the tuner flap.

**Programming
stations**

After starting the tuner for the first time, no presets are available. You can use the RDS tuner of the miroSOUND PCM20 radio board to set up to 40 stations. To select stations, you can scan automatically or manually or you can enter a frequency directly.

Automatical scanning:

To scan for stations automatically, proceed as follows:

- Click the *AutoScan* key under the tuner flap.

If you have not programmed any station yet, the stations are allocated to the presets starting with 0. The complete frequency range is searched for stations, the valid frequencies are saved until all presets are used.

If you have programmed stations already, the following presets are used starting with the preset you have currently selected. If you selected the preset 0 for a station with a frequency of 87.7 MHz, the presets 1, 2 etc. are allocated to stations of the next higher frequency.

Manual scanning:

To search for stations manually, proceed as follows:

- Press a number in the RDS tuner, e.g. 1.

- Press  to search for the previous station or  for the next station. If a station has been found, the search procedure stops for a short time. Then press the button again.

Then the station is programmed and you can call it up using the preset number.

Selecting a frequency using the keyboard:

To select a frequency directly, proceed as follows:

- Press the key on the numerical block of your keyboard.

In the display of the tuner *Prog* appears.

- Enter the frequency.

To enter the frequency 92.1, press the keys 9, 2, and 1. You must not enter the decimal point.

- After having entered a valid frequency, you quit the program mode automatically. Pressing again, you leave the program mode.

Calling up a station

To call up one of the following ten stations, use the left mouse key, to click one of the number buttons 0 - 9.

To call the other programs, click on the tuner with the right mouse key. Then a list box opens showing all saved stations. When you double-click a station, it is called up.

Recording radio programs

To record radio programs, proceed as follows:

- Start a recorder application, e.g. the HQ-9000 recorder and press the Rec key of the recorder,
or
- press the *QRec* key of the RDS tuner.

To record sound with an application other than the RDS tuner, close the tuner application first to enable the other recording device.

Please note that a high recording quality (stereo, 44.1 kHz, 16 bits) requires a lot of memory and lowers the maximum time of the recording considerably. QuickRecord does not save to hard disk, the maximum recording time depends on the free RAM space.

Minimizing

To minimize the RDS tuner, move the mouse cursor on the tuner. When the mouse cursor converts into a cross, perform a double-click.

USING miroSOUND PCM20 RADIO UNDER DOS

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 the I/O address, the IRQ, the DMA channel, and the type of sound board used. The string should be updated after every change in any of these values. If you have changed the settings of the Sound Blaster compatible module on your sound board, inspect your AUTOEXEC.BAT file, and rewrite the

SET BLASTER=A220 I7 D1 T4

line if necessary to reflect the new settings.

Another DOS environment string called PCM20INIT 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 PCM20INIT=C:\WINDOWS.



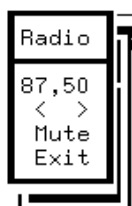
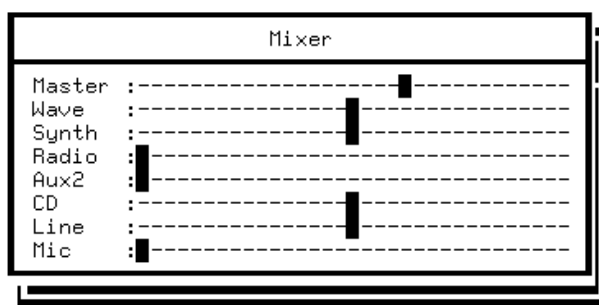
Note that there must be no space character directly before and after the = sign.

miroMIXER/miroSOUND PCM20 radio (RDS tuner)

The P20DOS.EXE DOS program allows you operate the 7-channel mixer and the RDS tuner also under MS-DOS.

To start the miroMIXER or miroSOUND PCM 20 radio (RDS tuner) under DOS, proceed as follows:

1. Enter **sndindos** <↵> under DOS.
2. In the next screen enter **m** for mixer or **r** for radio.



To operate the miroMIXER use the following keys:

Action	Keys
Selecting a channel	arrow up/arrow down
Volume +	arrow right
Volume -	arrow left
sliders in a middle position	<↵>
Max. volume	End
Mute	Pos1 or <↵>
Quitting the mixer	Esc

YOUR SOUND BOARD'S WAVE TABLE TECHNOLOGY

**FM synthesis/
Wave Table** As you have audibly noticed in the Wave toggle example above, your miroSOUND PCM20 radio 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.

**Wave Table
ROM** The OPL4 chip in the miroSOUND PCM20 radio has access to a 2 MB Wave Table ROM, which holds 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 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 optimally the transfer points between these samples and the looping points for long notes.

THE INSTRUMENTS OF THE GENERAL MIDI STANDARD

0 Acoustic Grand Piano	64 Soprano Sax
1 Bright Acoustic Piano	65 Alto Sax
2 Electric Grand Piano	66 Tenor Sax
3 Honky-Tonk Piano	67 Baritone Sax
4 Electric Piano 1	68 Oboe
5 Electric Piano 2	69 English Horn
6 Harpsichord	70 Bassoon
7 Clavi	71 Clarinet
8 Celesta	72 Piccolo
9 Glockenspiel	73 Flute
10 Music Box	74 Recorder
11 Vibraphone	75 Pan Flute
12 Marimba	76 Blown Bottle
13 Xylophone	77 Shakuhachi
14 Tubular Bells	78 Whistle
15 Dulcimer	79 Ocarina
16 Drawbar Organ	80 Lead 1 (square)
17 Percussive Organ	81 Lead 2 (sawtooth)
18 Rock Organ	82 Lead 3 (calliope)
19 Church Organ	83 Lead 4 (cliff)
20 Reed Organ	84 Lead 5 (charang)
21 Accordeon	85 Lead 6 (voice)
22 Harmonica	86 Lead 7 (fifths)
23 Tango Accordeon	87 Lead 8 (bass + lead)
24 Acoustic Guitar (nylon)	88 Pad 1 (new age)
25 Acoustic Guitar (steel)	89 Pad 2 (warm)
26 Electric Guitar (jazz)	90 Pad 3 (polysynth)
27 Electric Guitar (clean)	91 Pad 4 (choir)
28 Electric Guitar (muted)	92 Pad 5 (bowed)
29 Overdriven Guitar	93 Pad 6 (metallic)
30 Distortion Guitar	94 Pad 7 (halo)
31 Guitar Harmonics	95 Pad 8 (sweep)
32 Acoustic Bass	96 FX 1 (rain)
33 Electric Bass (fingered)	97 FX 2 (soundtrack)
34 Electric Bass (picked)	98 FX 3 (crystal)
35 Fretless Bass	99 FX 4 (atmosphere)
36 Slap Bass 1	100 FX 5 (brightness)
37 Slap Bass 2	101 FX 6 (goblins)
38 Synth Bass 1	102 FX 7 (echoes)
39 Synth Bass 2	103 FX 8 (sci-fi)
40 Violin	104 Sitar
41 Viola	105 Banjo
42 Cello	106 Shamisen
43 Contrabass	107 Koto
44 Tremolo Strings	108 Kalimba
45 Pizzicato Strings	109 Bag Pipe
46 Orchestral Harp	110 Fiddle
47 Timpani	111 Shanai
48 String Ensemble 1	112 Tickle Bell
49 String Ensemble 2	113 Agogo
50 SynthStrings 1	114 Steel Drums
51 SynthStrings 2	115 Wood Block
52 Choir Aahs	116 Taiko Drum
53 Voice Oohs	117 Melodic Tom
54 Synth Voice	118 Synth Drum
55 Orchestra Hit	119 Reverse Cymbal
56 Trumpet	120 Guitar Fret Noise
57 Trombone	121 Breath Noise
58 Tuba	122 Seashore
59 Muted Trumpet	123 Bird Tweet
60 French Horn	124 Telephone Ring
61 Brass Section	125 Helicopter
62 SynthBass 1	126 Applause
63 Synth Bas 2	127 Gunshot

Drums These are the 47 drums of the miroSOUND PCM20 radio

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! *Cubase Lite* is the best program for this purpose. Play some long notes with the effect instruments—you will be amazed to hear the fantastic sounds included with your sound board.



Troubleshooting

INSTALLATION

Files or components cannot be found.

If any files or components cannot be found during the installation or when the software is installed, there is an I/O address, DMA, or an interrupt conflict.

In this case, use SNDINIT.EXE program under Windows 3.1x or the *Device Manager* under Windows 95 to set the address, DMA channel, or the interrupt to values which are not used. (Network adapters often occupy the values which sound board use).

Driver software is not detected.

If you have problems with the detection of the driver software under Windows 95, please use the *Control Panel* to make different settings. In case of questions, first consult the Windows 95 help.

The Wave & OPL device is not active.

For some mainboards it may happen that the Wave & OPL device is inactive after the installation. This can be avoided by selecting *Use automatic settings* in the *Device Manager*. Open *Settings, Control Panel* and *System*. In the *Device Manager*, double-click *Audio-, video- and game controller*. Double-clicking the *miroSOUND PCM20 radio WAVE & OPL* device opens the *Properties* windows where you can select *Resources*. There you can select the *Use automatic settings* option.

CD-ROM

CD-ROM drive cannot be found.

If you use the miroSOUND PCM20 radio board as a CD-ROM interface, check to make sure that the data cable connected to the CD-ROM drive is connected to the CD-ROM interface on your miroSOUND PCM20 radio board.

The CONFIG.SYS file has to include the following entries:

```
DEVICE=C:\MIRO\SOUND\CDSETUP.SYS /T:I
```

```
DEVICE=C:\xxxxxxx.SYS /D:MSCD001
```

The AUTOEXEC.BAT file has to include the following entry:

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

Audio CD cannot be played back.

Make sure that the CD-ROM drive has been installed correctly. To play back Audio-CDs under Windows 3.1x, the *MCI CD-Audio* driver has to be installed.

Make sure that the sliders in the miroMIXER application are not set to *Mute*. Check to make sure that the pin allocation of the miroSOUND PCM20 radio CD-ROM audio output is the same as the one on the CD-ROM drives audio output. See also “Pin allocations” in the Appendix.

IDE-CD-ROM drives

If an Enhanced IDE controller is installed in your computer which supports up to 4 hard disks, you cannot connect the IDE-CD-ROM drive to the miroSOUND board. In this case, connect the CD-ROM drive directly to the hard disk controller. If you connect the CD-ROM drive to the hard disk controller, please check to make sure that the jumper on your hard disk is set to “MASTER/SLAVE PRESENT”. For further information, refer to the documentation of your hard disk and your CD-ROM drive.

Windows does not start because your computer has a mainboard with an integrated IDE interface which cannot be disabled and you enabled the CD-ROM button in the configuration program.

In this case, you have to restore your original SYSTEM.INI file. Rename the backup file of your SYSTEM.INI file SYSTEM.SND which has been created by the configuration program into SYSTEM.INI and restart Windows. Start the miroSOUND PCM20 configuration program and deactivate the CD-ROM interface.

ONBOARD GAME CONTROLLER

On some Plug & Play motherboards problems may occur with onboard game controllers although they have been switched off in the motherboard BIOS. After having installed the sound drivers, a hardware conflict may occur because Windows 95 finds this connector nevertheless although it has actually been switched off. Check the hardware which Windows 95 has detected in the Control Panel (the disabled game port appears as unknown device). This is an hardware fault of the motherboard.

WAV FILES

WAV files are played back too fast or are distorted.

Possibly the ISA bus clock is not 8.33 MHz (default). In this case, set the ISA bus clock in the BIOS of your computer to 8.33 MHz.

DEINSTALLING THE SOFTWARE (WINDOWS 3.1x)

To deinstall the miroSOUND PCM20 software completely make sure that the following entries from the AUTOEXEC.BAT, CONFIG.SYS, and SYSTEM.INI files have been removed:

AUTOEXEC.BAT SET PCM20INIT=\WINDOWS
SET BLASTER=A220 I7 D0 T4
C:\WINDOWS\SNDDINDOS.EXE

CONFIG.SYS DEVICE=C:\MIRO\OPT\CDSETUP.SYS

SYSTEM.INI [386Enh]
DEVICE=SND924.386
DEVICE=VOPL4.386

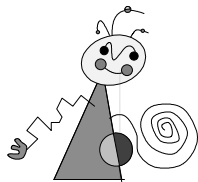
[drivers]
aux=miropcm1.drv
midi=mpu401.drv
midi1=opl4.drv
mixer= snd924.386.drv
wave= snd924.386.drv
aux1=opl4.drv

the complete sections
[OPL4.drv]
[miropcm1.drv]
[sndport.drv]
[mpu401.drv]



Technical data

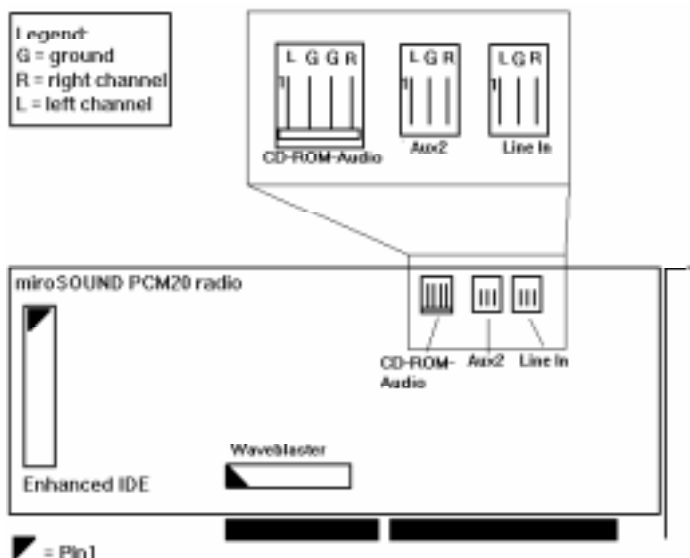
Sound processor	Yamaha OPL4, 24 PCM wave voices, 20 FM voices, RDS VHS stereo tuner
Bus system	16-bit ISA
Wave Table ROM	2 MB, 128 instruments, 47 drums, maximum 44 simultaneous voices
Compatibility	AdLib, Sound Blaster, Sound Blaster Pro II, Microsoft Windows Sound System, Roland MPU-401 (Windows and DOS)
Sampling	16-bit stereo, 48 kHz, , record and playback at the same time
MIDI interface	Sound Blaster compatible, 8 byte FIFO, MIDI time stamp, MPU-401 compatible (Windows and DOS), General MIDI instrument set
CD-ROM interface	IDE
External connectors	Stereo microphone input, antenna input, stereo Line In, connector for miroSOUND Line & Extender Box, Line Out output, combined standard Game Port/MIDI connector
Further connectors	stereo Line In
Electrical characteristics	Microphone input 600 Ohms Line In, CD audio, Aux inputs 47 kOhms



PIN ALLOCATIONS

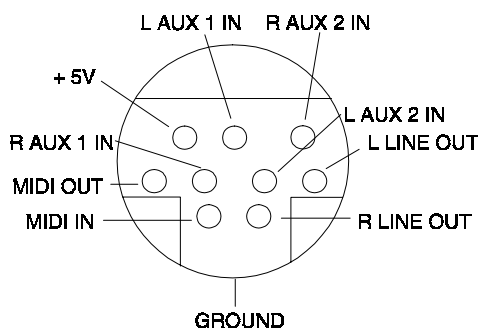
The following diagrams shows the pin allocations of the miroSOUND PCM20 radio connectors:

Internal connectors

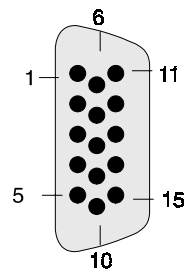


When connecting the internal miroSOUND PCM20 radio connectors (e.g. the CD-ROM connector), please make sure that you connect the right (left) channels to the right (left) channels and the ground channels to each other. If necessary, modify the cable.

MIDI connector



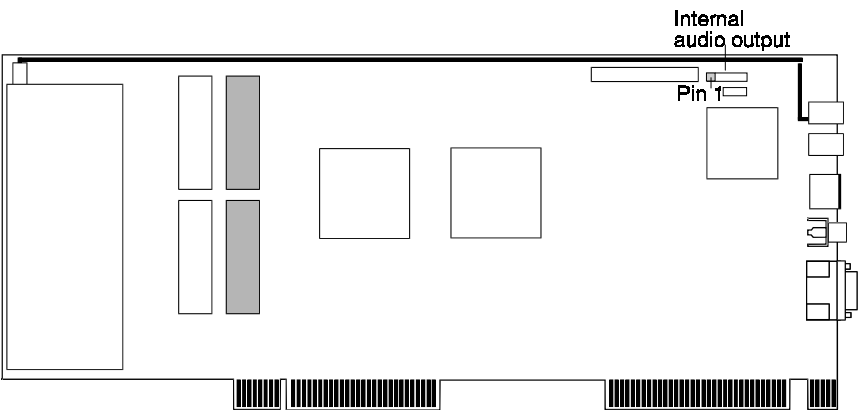
MIDI/joystick connector



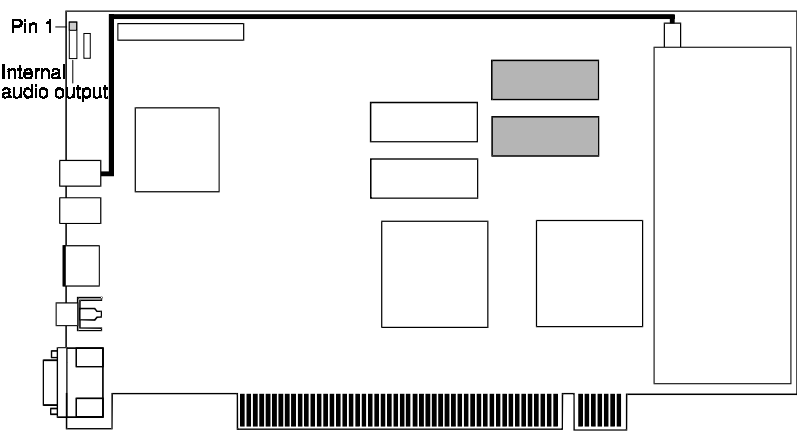
Pin number		
1	+5V	
2	In4	key1
3	IN0	
4	ground	
5	ground	
6	In 1	
7	In 5	key2
8	+5V	
9	+5V	
10	In6	key3
11	In2	
12	MIDI Out	
13	In3	
14	In7	key4
15	MIDI In	

INTERNAL AUDIO OUTPUT ON miroVIDEO 10/20TD LIVE

The following illustrations show the internal audio output on the miroVIDEO 10/20TD live board.



miroVIDEO 10/20TD live/VL



miroVIDEO 10/20TD live/PCI

The following tables show the pin allocation of the internal audio connector on the miroVIDEO 10/20TD live board and the Line In input of the miroSOUND PCM20 radio board.

miroVIDEO 10/20TD live

Pin	Allocation
1	Left channel
2	Ground
3	Right channel
4	Ground

miroSOUND PCM20 radio

Pin	Allocation
1 (left)	Left channel
2	Ground
3	Right channel



If you connect the Line Out input of the miroVIDEO 10/20TD live board with the Line In input of the miroSOUND PCM20 radio board, make sure that you connect the right (left) channels to the right (left) channels and the ground channels to each other. You do not have to connect the ground channel on the miroVIDEO 10/20 TD live board.

WHAT IS RDS?

RDS stands for Radio Data System and is a system which was developed 1977 by the EBU (European Broadcasting Union) and is being used since 1987.

Many radio stations broadcast additional information together with the radio programmes, such as the name of the station (PS), alternative frequencies (AF), traffic programmes (TP), and a special code for traffic announcements (TA).

Further pieces of information are:

CT: clock time and date.

DI: decoder identification, detects whether a programme is broadcast in stereo or in mono.

EON: Enhanced Information Concerning Other Networks), informs about all other programmes of a radio station.

M/S: music/speech, distinguishes between music and speech programmes.

NWS: National Warning System, code for warning messages, which cannot be switched off and switches your auto radio from cassette operation to radio reception.

PIN: program item number, corresponds to the television VPS function.

PTY: program type, gives information about the type of radio programme, e.g. sports, pop, classics etc.

RP: radio paging, transmission of missing person announcements.

RT: radio text, consists of up to 64 characters, in this way news, interpreter or song titles.

GLOSSARY

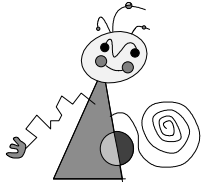
This glossary explains the most important terms occurring in this manual and in the field of sound boards in general. Cross-references are marked by this icon .

Address	All memory positions in a computer have numbers (addresses). Through these addresses each memory position can be addressed directly. Some addresses are reserved for certain hardware components and must not be used. If two hardware components use the same address, there is a address conflict.
AdLib	Standard for generating  FM sounds. Adlib—originally a sound board manufacturer—was the first sound board standard for PCs.
Analog	Opposite of  digital. Analog signals can take on continuous values.
AUTOEXEC.BAT	A special DOS  batch file which is processed automatically after the computer has been started. The file contains among other things commands which load the country-specific keyboard driver ( Driver), set the time or load programs automatically.
Batch file	A  DOS file where a sequence of commands is processed one after the other ( AUTOEXEC.BAT).
CD-ROM	C ompact D isk- R ead O nly M emory. CD-ROMs are mass storage media for digital data which are read by a laser beam.
Chorus	For the chorus effect a delayed copy of the sound which is mixed with the original sound. In this way string instruments have a fuller sound.
Codec	Device for c oding and d ecoding signals. A codec converts analog signals into digital signals (coding) and converts digital signals back into analog signals (decoding).
CONFIG.SYS	A  DOS configuration file which is processed automatically when the system is starting. The CONFIG.SYS file includes  drivers which control the output to the monitor and the keyboard and the mouse.
Controller	All drives in a PC (floppy disk drives, hard disk drives, CD-ROM disk drives) require a controller which serves as an electrical link between the PC and the drive and which controls the drive's functions (e.g. positioning the head on the disk).
Digital	Literal meaning: represented by numbers. Opposite of  analog. In data processing technology numbers are usually represented by binary signals. Binary signals can take on only two values 0 and 1.
DMA channel	Through D (irect) M (emory) A (ccess) channels data is transferred between hardware components (e.g. expansion boards) and the computer's memory directly and rapidly avoiding the CPU. Each DMA channel has a number and can be used by only one hardware component.
DOS	D isk O perating S ystem. The most common operating system for PCs. MS-DOS is Microsoft's DOS version.
Driver	Programs which integrate the hardware in the computer (e.g. drivers for CD-ROM drives) and which adapt the software to the hardware (e.g. drivers for graphical user interfaces, such as Microsoft Windows).
Dynamic microphone	In dynamic  microphones a diaphragm is attached to a small coil which swings in a magnet. The power generated by the coil is amplified.

Electret microphone	In electret  microphones, the diaphragm consists of electrically polarized matter (electret).
FM	Frequency modulation. Modulation technique used for example for broadcasting VHF radio programs. The signal to be transmitted modulates the frequency of a constant amplitude carrier signal. On sound boards, instrumental sounds are generated synthetically using the FM technique.
Frequency modulation	 FM.
General MIDI	Standard, specified by the synthesizer manufacturer Roland, which ensures that MIDI sound files are compatible with each other. The General MIDI standard assigns fixed MIDI instrumental numbers to real instruments ( MIDI). GM files should sound the same on any output device.
GS	General Synthesizer , extension of the  General MIDI standard developed by the synthesizer manufacturer Roland. The GS standard includes additional instruments and special effects, such as Hall and  Chorus.
IDE	Common standard for connecting CD-ROM and hard disk drives.
Interface	Link between two parts of a system or between two systems where information, pulses and signals are adapted in a way that the receiving part can understand the sending part. For example, signals which the computer sends to the printer have to be adapted by an interface so that the printer “understands” what it has to print.
Interrupt	An interrupt is a signal used by expansion boards and other hardware components to request the CPU. Each hardware component should use a separate interrupt.
I/O address	 Address.
IRQ	 Interrupt.
Joystick	Input device mainly used for computer games which converts the movements of a handle into movements on the screen.
Microphone	A microphone is an electroacoustic converter, which converts acoustic vibrations taken up by a diaphragm into electrical power ( electret microphone,  dynamic microphone).
Microsoft Windows Sound System	Sound standard by Microsoft.
MIDI	Musical Instruments Digital Interface : standardized  interface developed by synthesizer manufactures in 1983 for the data transfer between electronical musical instruments, computers etc. MIDI devices interconnect via 5-pin MIDI connectors. In a computer, music is often stored in the MIDI format. The MIDI files consist of command sequences, e.g. “select instrument 4”, “note A on”, “note A off”. The sound generated depends on the synthesizer of the sound board.
MIDI adapter	Adapter which allows to connect MIDI devices to the 15-pin joystick connector on sound boards. Sound boards usually do not have 5-pin MIDI connectors. To connect a MIDI device to the MIDI/joystick interface on sound boards, a MIDI adapter is therefore required.
MIDI-In connector	A MIDI device receives signals through the MIDI-In connector.

MIDI-Out connector	A MIDI device sends signals through the MIDI-Out connector.
MIDI sequencer	Software for editing MIDI files which operates like a multi-channel studio mixer.
MIDI songs	As opposed to  samples, MIDI songs consist of the individual notes of a musical piece. To play the music back correctly, MIDI devices or sound boards have to assign the correct instruments to the notes.
MIDI-Thru connector	The MIDI-Thru connector loops through signals which are received through the MIDI-In connector.
MPC	M ultimedia P C standard developed by Microsoft which specifies the minimum equipment of a multimedia PC. A PC complying to the MPC standard is able to run MPC multimedia applications and CDs without any limitations.
MPU-401	Originally a MIDI interface developed by Roland. Acronym for M usic P rocessing U nit. Today: standard for most sound applications and games running under MS-DOS. Under  DOS and Windows the MPU-401 interface transfers MIDI signals (for the most part General MIDI signals) to the Wavetable module. To be able to generate Wavetable sound for games and sequencers ( MIDI sequencer) running under DOS and supporting General MIDI, the MPU-401 support under DOS is essential.
MSCDEX.EXE	So-called High-Level driver for CD-ROM drives which prepares the data and the CD-ROM file system for MS-DOS. MSCDEX.EXE is supplied by Microsoft and is identical for all CD-ROM drives. As opposed to the High-Level driver, the Low-Level driver transfers the data between the PC and the CD-ROM controller and calls the control functions for the drive. The Low-Level driver is supplied by the manufacturer of the drive or the  controller.
Operator	Sine oscillator which either generates the carrier signal or modulates the frequency of a second operator ( FM). To reproduce the sound of a musical instrument, a sound board needs at least two operators. Percussion instruments (e.g. drums) require only one operator.
OPL2	First sound chip by Yamaha for sound boards which generates  FM sounds. OPL2 could generate 11 mono voices (6 instruments, 5 drums) simultaneously. Each voice consist of 2  operators.
OPL3	OPL3 is a 16-bit stereo chip and can generate 20 voices consisting of 4  operators.
OPL4	OPL4 is a 16-bit stereo wavetable chip and can generate 44 voices. There are 24 Wavetable voices (PCM samples) and 20 FM voices consisting of 4  operators (OPL3). The 44 voices can be played back simultaneously ( Wavetable,  PCM,  Sample).
Patch	In computer technology, patching means modifying data which normally are fixed. In the field of sound boards patches are modifications of basic sounds.
PCM	Pulse Code Modulation. Modulation technique for converting analog into digital data.
Powered speakers	Powered speakers have a built-in amplifier and require a power supply or, more frequently, batteries. In most cases, powered speakers are used to amplify output signals of sound boards.

Sample	Digitized audio signals which can be processed by computers. A sample consists for example of a complete musical piece with all voices and instruments. Processing a sample is restricted to cutting, inserting and playing back individual parts of a sample. Individual voices cannot be deleted. This is only possible for  MIDI songs with the help of  MIDI sequencers.
Sampling	Digitizing audio signals. Sampling converts sound into digital signals which computers can process.
Sampling rate	Number of  samples generated per second when digitizing ( sampling) analog signals (sound). The lower the sampling rate is, the lower is the sound quality of the played back digital audio signals. The higher the sampling rate is, the closer the digitized data stands to the original. The sampling rate for CDs is 44.1 kHz in stereo (2 x 44,100 samples per second).
Sound Blaster compatibility	The Sound Blaster is a sound board developed by Creative Labs. It has established itself as a standard as the result of its widespread use. A distinction is made between Soundblaster and Soundblaster Pro compatibility. Soundblaster Pro-compatible boards are fully capable of generating stereo sound.
Synthesizer	Here: generates artificial sound on a sound board.
WAV	File format for sound files. "WAV" stands for wave form.
Waveblaster connector	Small connector on the sound board to which a wavetable module attaches. Waveblaster is originally an add-on board by Creative Labs.
Wave Table	Digital recording of a natural instrument sound in the ROM (read-only memory) of a sound board. The original sounds are taken from the memory and are not reproduced artificially as with  FM. The larger the Wave Table ROM, the higher the sound quality.



FCC Compliance Statement

FOR YOUR OWN SAFETY

NOTE: 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.



KONFORMITÄTSERKLÄRUNG DECLARATION OF CONFORMITY

Geräteart: Soundboard
Type of equipment: Sound board

Produkt / Product : **miroSOUND PCM20 radio**

Das bezeichnete Produkt stimmt mit den Vorschriften folgender EU-Richtlinie(n) überein:
The aforementioned product complies with the following European Council Directive(s):

89/336/EWG (geändert durch 91/263/EWG und 92/31/EWG) / (changed by 91/263/EWG and 92/31/EWG)
Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die
elektromagnetische Verträglichkeit
Council Directive 89/336/EEC on the approximation of the laws of the Member States relating
to electromagnetic compatibility

Zur vollständigen Einhaltung dieser Richtlinie(n) wurden folgende Normen herangezogen:
To fully comply with this(these) Directive(s), the following standards have been used:

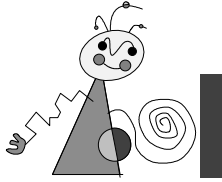
EN 55022 : 1987
EN 50082-1 : 1992
EN 55013 : 1990
EN 55020 : 1988

Dieser Erklärung liegt zugrunde: Prüfbericht(e) des EMV-Prüflabors
This certification is based on: Test report(s) generated by EMI-test laboratory

Aussteller / Holder of certificate : **miro Computer Products AG**
Carl-Miele-Str. 4
D - 38112 Braunschweig

Braunschweig, 28.10.1995
(Ort / Place) (Datum / Date)

.....
(Rechtsgültige Unterschrift / Legally Binding)



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