1. INTRODUCTION

The ESS 4 Channels PCI Audio Accelerator represents a new generation of architecture that not only meets the new demands of advanced Multimedia PC audio applications but also provide the latest 4 Channels surround sound and Sensaura 3D audio positioning technology. The sound card's functionality and interfaces are compliant with all major industry standards, including the Audio Subsystem Specification of PC97, DirectSound, DirectSound3D, DirectMusic, Windows Sound System, AC'97 CODEC Interface, and PCI 2.1 Bus Specification.

The Audio Accelerator supports full DOS games compatibility via PC/PCI, DDMA and TDMA hardware implementation methods.

1.1 Checklist

- ESS 4 Channels PCI Audio Accelerator
- CD Driver
- User Manual
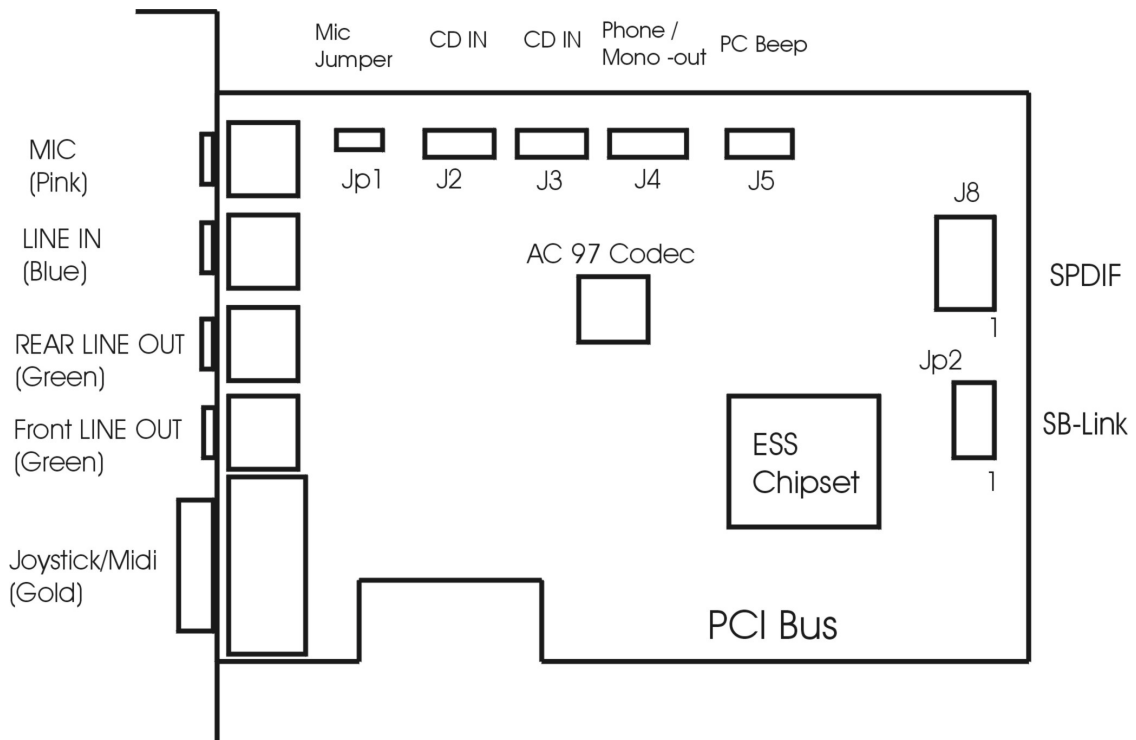
Minimum System Requirement:
- Microsoft Windows 95 OSR2 / 98
- Pentium MMX 166 Mhz or higher
- 16 MB memory or more
- 32 MB hard disk space
- PCI slot

- The Specification is subject to change without prior notice.
- All brand names and trademarks are the property of their respective owners.
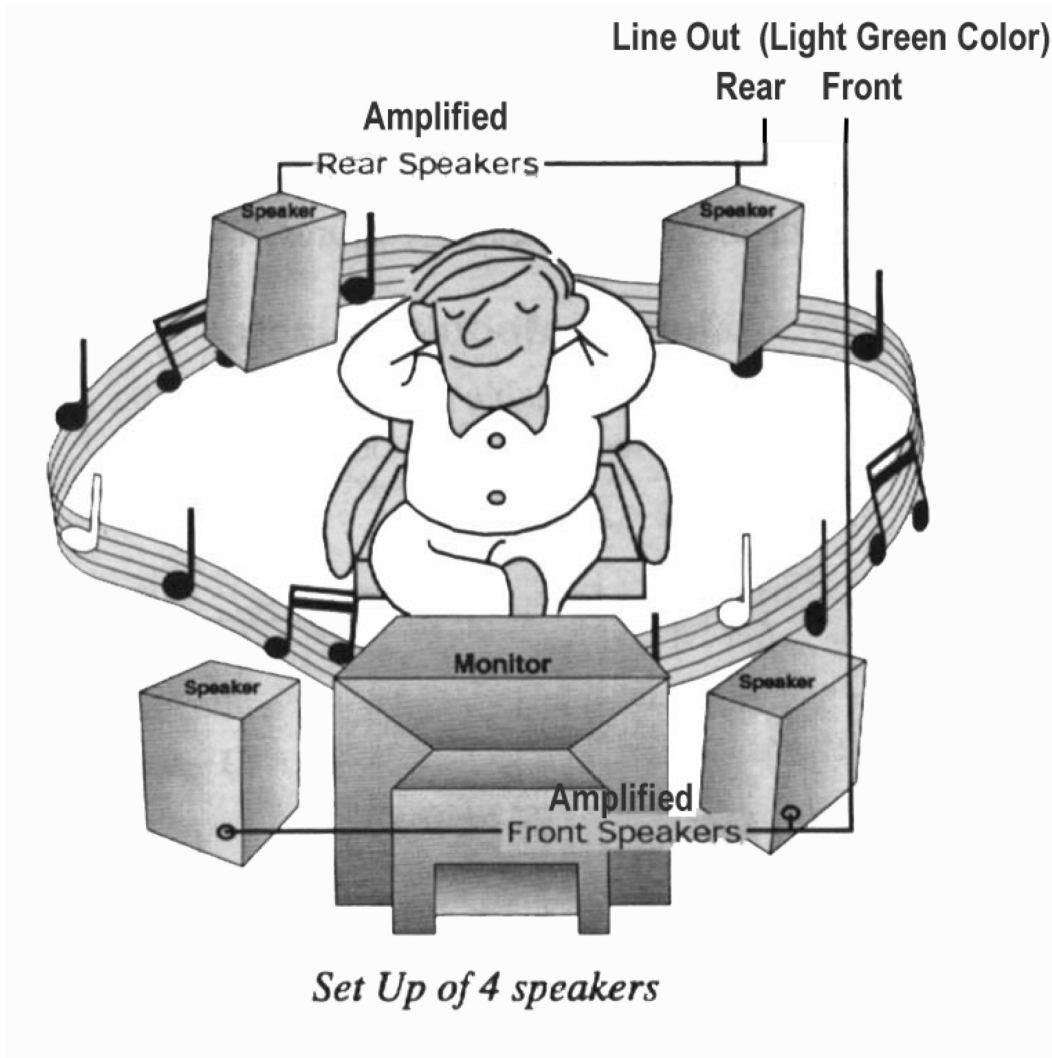
2   FEATURES

- ESS ES1898 Allegro chipset
- Support 4 channels surround sound
- High-fidelity AC'97 codec
- SPDIF output
- SB-Link connection
- Sensaura 3D audio positioning technology
- 32-bit PCI Bus Master, PCI 2.1 compliant
- < 0.5% PCI Bus Bandwidth for playing 16-bit/stereo/44.1KHz
- DirectSound, DirectSound3D and DirectMusic Hardware Acceleration
- Hardware sample rate convert to 48 kHz from any sample rate
- Sound Blaster Pro, OPL3 and MPU401 UART mode on Real Mode DOS
- MPU-401 interface with FIFO
- High-performance game port
- Full-duplex stereo operation for simultaneous record and playback
- 16-bit stereo ADC and DAC
- 48 kHz sample rate
- 4 stereo inputs for line-in, CD IN, Phone-in/mono-out
- One mono input for microphone and one line input
- Front & Rear Line output.
- Color phone jacks for easy identification.

3. INSTALLATION

Mic Jumper   CD IN   CD IN   Phone / Mono -out   PC Beep

MIC (Pink)

LINE IN (Blue)

REAR LINE OUT (Green)

Front LINE OUT (Green)

Joystick/Midi (Gold)

Jp1   J2   J3   J4   J5

AC 97 Codec

J8

SPDIF

Jp2

ESS Chipset

SB-Link

PCI Bus

Sound Card Layout

Remark: This sound card only supports amplified speakers.

Set Up of 4 speakers

J2	CD IN, Audio	1: Signal Input, Right 2: Ground 3: Ground 4: Signal Input. Left
J3	CD IN, Audio	1: Ground 2: Signal Input, Left 3: Ground 4: Channel Signal, Right
J4	Phone-in / Mono-out	1: Signal Output, Mono 2: Ground 3: Ground 4: Signal Input, Phone
J5	PC Beeper	Connect with PC beeper
JP1	Jumper for MIC compatibility The default jumper is 'OPEN' which is good for the most common type of microphone in the market. However, should you experience problems working with your microphone, then please change the jumper setting to 'CLOSE'	
JP2	SB-Link Connector	The SB Link cable is used to provide the connection between the Sideband Signal Interface Connector on the sound card and on some mainboard.
J8	SPDIF Out Connector	Connect with other audio device.
Connection Jack Mic (Pink) Line-in (Light Blue) Rear Line-out (Light Green) Front Line-out (Light Green)		 For microphone For audio line-in device For rear amplified speaker For front amplified speaker

4   DRIVER INSTALLATION

4.1   Installing Drivers for Windows 95 / 98

After the sound card is securely inserted into an available PCI slot, you can install the sound card 's drivers and utilities.

> *Note: Before installing the sound card you must delete all other sound card drivers by using their uninstall program. If they do not have their own uninstall program, then you must delete the driver in **Device Manager** which is located in the **System** option under **Control Panel.***

1. During the booting process, Windows 95 / 98 should detect the sound card and display a message such as "New Hardware Found". If Windows prompts you for the drivers of the "PCI Multimedia Audio Device", then select "Driver Disk Provided by the Manufacturer" or "Search the diskette and CD-ROM drivers".

2. Insert Driver CD-ROM into CD-ROM driver. The driver directory: D:\ES1989 4CH\WIN9X.
   (D:\ stands for CD-ROM drive.) Then click "OK" to proceed.

3. During the driver installation, when the Windows prompts for the disk labelled "Windows 95 or 98 CD-ROM', please insert the Windows 95 or 98 CD-ROM into the CD-ROM drive.

4. The driver installer will guide you through the driver installation process.

5. Install DirectX 6.0 or above   D:\DIRECTX6\SETUP.EXE

4.2   4 Channel Sound and SPDIF Out Setting

To enable the 4 Channel Sound and SPDIF Out, please follow the below procedures.

a. Click the "Volume" icon on the task bar.

b. Click "Options" and "Advance Control".

c. Click "Advance" under wave control bar.

d. Enable "4 Channel" and click OK.   4 Channel Sound is enabled now.

e. Click "Advance" under master-out control bar.

f. Enable "SPDIF" and click OK. SPDIF out is enable now.

g. Adjusting the master volume level will adjust the sound level of front and rear sound channel at the same time.

4.3   Installing Driver for Windows NT 4.0 and Windows 2000

Installing Driver for Windows NT4.0

Note : Install the Sound Card onto the motherboard only after the Windows NT 4.0 operating system software has been installed correctly to your system.

D:\ES1989 4CH\NT40   Driver for Windows NT 4.0

1. Install the Crystal PCI Sound Card on the motherboard, and power on the system.
2. Hit "start" , select "Setting" → "Control Panel" → "Multimedia" → "Devices",
3. then the "Devices" dialog box will appear.
4. Hit "Add" button , then select "OK " , the "Install Driver " dialog box will appear.
5. Insert the Driver CD into CD-ROM drive D:
6. Type "D:\ES1989 4CH\NT40" , click "OK" .
7. Click "OK" button in the "Add Unlisted or Updated Driver" , wait for "Restart" requirement.
8. Restart the computer.

Installing Driver for Windows 2000

D:\ES1898 4CH\WIN2000   Driver for Windows 2000

Follow the same Plug and Play procedure as in Windows 98.

5. TROUBLESHOOTING

Problem: **No sound During Normal Usage:**
Solution **A:** Audio accessories improperly connected. Check all audio accessories are plugged into the proper connectors.
Solution **B:** Volume control adjustment. Make sure that the volume control is not set too low.

Problem: **No Visual Activity on Volume Meter:**
Solution **A:** DMA channel conflict. Check that no audio accessories are attempting to use the same DMA channels, and change DMA channels accordingly. Check this by viewing the properties of the audio device(s) in the Control Panel - System - Device Manager - Sound, Video & Game Controllers - Properties - Resources.
Solution **B:** The Crystal PCI sound driver is removed.

Problem: **No sound or receive error messages during Windows starts:**
Solution **A:** Another Sound Card driver is installed. If you install more than one sound driver in windows, a conflict may arise. To solve this problem, you should remove all unnecessary drivers, and reinstall the Crystal PCI sound driver.
(Soundcard drivers are usually stored in the "system" folder (a sub-directory of the "windows" or "win95" folder).
Solution **B:** The Crystal PCI sound driver is removed.

Problem: **No sound in Windows:**
Solution **A:** Configuration problem. You should check the configuration by viewing the "properties" & "resources" of the sound card drivers (and other possible conflict item drivers) in Control Panel - System - Device Manager. See if all the drivers and utilities are working correctly, and reset any if necessary.
Solution **B:** Either the mother-board does not support PnP function or the PnP option of the motherboard's BIOS is not enabled. To clarify these, please contact your motherboard dealer or sales representative.

6. Driver Update

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