Before installing this Model # 23013 / 23063 ES1868 3D Sound Card, please read this manual carefully and retain it for future reference.

Trademark Acknowledgments:

- IBM is a trademark of International Business Machines Corporation.
- Sound Blaster PRO and Sound blaster are trademarks of Creative lab Inc.
- MS-DOS and WINDOWS are trademarks of Microsoft Corporation.
- ESS, AudioDrive and AudioRack are trademarks of ESS Technology Inc.
- Yamaha OPL3 is a trademark of Yamaha Corporation.
- Mitsumi is a trademark of Mitsumi Corporation.
- Sony is a trademark of Sony Corporation.
- Panasonic is a trademark of Panasonic Corporation.

NOTE : LOADING SOFTWARE FROM YOUR CD-ROM DRIVE..

You will notice in the instructions concerning installation of software drivers contained in this manual, references to the CD-ROM drive letter **'d'** (i.e. d:\eng\1868\win95) If this drive letter is not correct according to your system configuration, then please change as necessary.

1. Introduction

The Model # 23013 / 23063 *ESS ES1868 3D Sound Card* is a 16-bit Full Duplex sound card based on the *ESS* integrated digital sound controller chip which is compatible with Sound Blaster PRO. This sound card provides an integrated audio solution for business audio, education/entertainment, and multimedia applications.

The *ESS ES1868* Sound Card will let you run thousands of Sound Blaster and Sound Blaster PRO compatible games and applications, including a rapidly growing number of Windows business applications that are compatible with the Windows Sound System.

Included with full support for these PC popular sound standards, the *ESS ES1868* includes multiple audio cable interface for SONY, Mitsumi and Panasonic CD-ROM drives. Also, it has multiple input and output ports for recording and playback of stereo sound.

1.1 The ESS ES1868 3D Sound Card Features

The *ESS ES1868* is a fully featured sound card which includes the following :

- 16 bit full duplex stereo sound
- Record, compress and playback voice, sound and music simultaneously
- Integrated 16-bit A/D and D/A converters
- Supports on board 3D Sound Effect **(Model # 23063 only)**
- ADPCM as well as patented ESPCM compression for lower bit rates
- Maximum sampling rate up to 44.1KHz for recording and playback
- 6 channel mixer
- Software volume control for both record and playback (64 steps)
- Built in 2 watts per channel stereo power amplifier
- Connector for mic in, line in, line out, speaker out and wave table connector
- Game port for joystick or MIDI device
- Plug and Play Features

1.2 What is in your package ?

You should have the following items in your package :

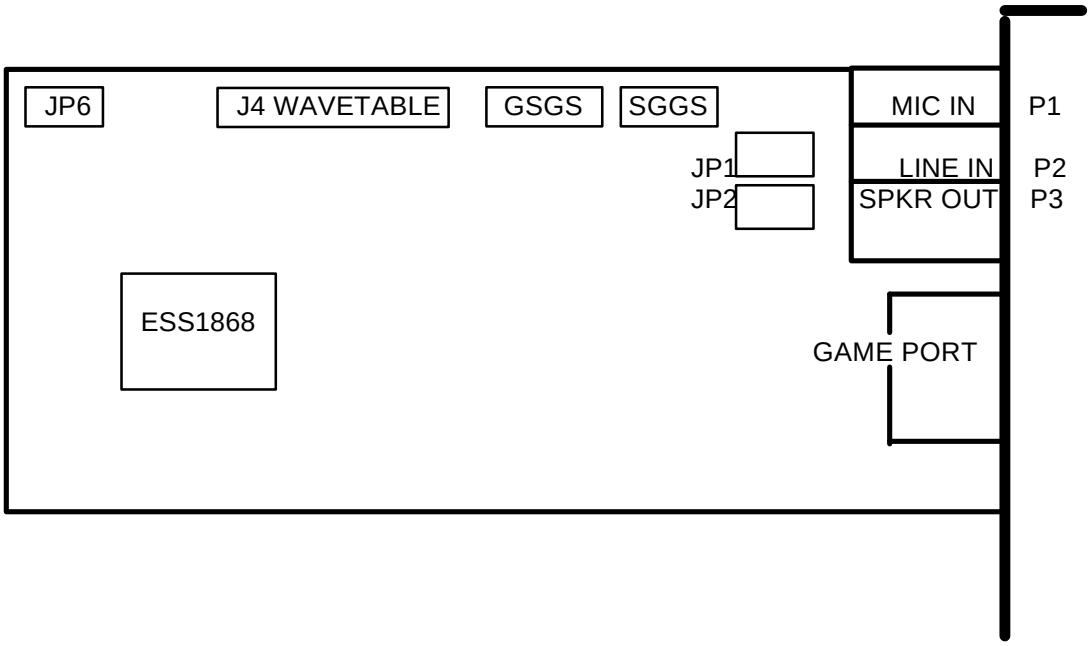
- *Model # 23013 or 23063 ESS ES1868* Sound Card
- MMCD CD-ROM with installation drivers, software utilities and manuals
- Hardware Installation, product layout & troubleshooting manual

1.3 System Requirements

The *ESS ES1868 Sound Card* is manufactured for IBM PC compatible components, software and related computer components :

- IBM-compatible computer models and compatibles with PnP BIOS
- At least 2MB RAM (4MB RAM for Windows 3.1 Applications)
- VGA or SVGA graphics adapter and monitor
- 2MB free on hard disk for installing all *ESS ES1868* software
- MS DOS version 3.3 or later
- Windows 3.1 for games and applications in Windows
- External speakers, microphone and headphones (optional)

1.4 Layout of ESS1868 3D Sound Card

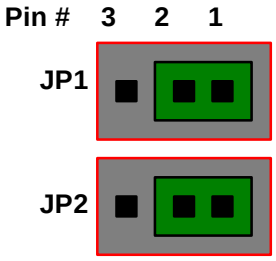


1.5 Jumpers and Connectors Description

JP1 & JP2 : On Board amplifier and Speaker Out / Line Out settings

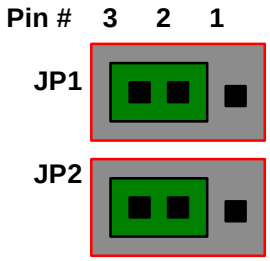
1-2 = Enable on board amplifier

This directs the signal through the on board amplifier to turn P3 connector in to a speaker out. This on board amplifier will also drive non-powered speakers .



2-3 = Disable on board amplifier

This disables the onboard amplifier and directs the signal to the P3 connector to act as a LINE OUT, where you can connect a cable to your home HI-FI or external amplifier.



Notes :
i) The factory default setting is 1-2
ii) Uses 1-2 setting - when connect the sound card to normal computer speakers
iii) Uses 2-3 setting - when connect the sound card to self-power devices
(e.g. Hi-Fi system, amplifier)

JP6 : Speaker In settings

The ESS1868 chipset has a unique feature whereby you can connect the cable from your motherboard here (this cable would usually connect to the system case internal speaker), and any system 'beeps' or sound messages can be routed through this sound card to the speakers or amplifier connected to P3.

GSGS / SGGS : CDROM to Sound Card Audio Cable connections

This card has audio connectors for Panasonic, Sony & Mitsumi standard Audio Cables...

Panasonic	=	connect to GSGS
Sony	=	connect to SGGS
Mitsumi (reverse cable on Panasonic)	=	connect (reverse) to GSGS

2.0 Software Driver Installation

2.1 DOS Driver Installation

1. Go to the MSDOS prompt
2. Insert the MMCD in to your CD-ROM drive. Log onto that drive, and change directories to go to the directory **d:\eng\1868\dos** Then type **setup**
3. The DOS driver installation program will appear.
4. Use the arrow keys to move the pointer **"[ ]"** to the parameter which you want to select and then press the "**RETURN**" or "**SPACE**" key to confirm the new setting.
5. If there is more than one parameter you want to change, please repeat the procedure #3 to make all the changing
6. After you have finished the changing, press the "**ESC**" key to leave the installation program. The system will prompt you a **"Make changes to CONFIG.SYS and AUTOEXEC.BAT (Y/N)?"** at this time, you must press the "Y" key to confirm the system update, otherwise the installation program will not install the *Sound Card* DOS driver for you.
7. Reboot your computer system.

Notes: If you use both of the DOS and MS Windows 3.1, you should skip the installation of the DOS driver of the Sound Card. Instead, you only need to install the Sound Card Window 3.1 driver which will work for both the DOS and Windows environment simultaneously.

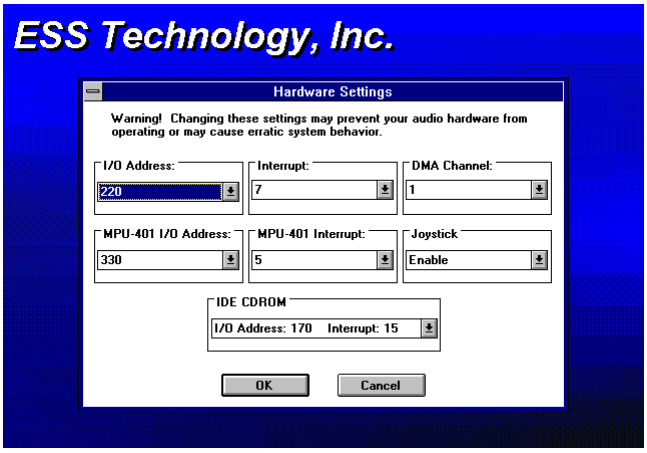
DMA - direct Memory Access (DMA) is the electronic channel for moving data directly between main storage and peripheral equipment without requiring processing of the data by the CPU.

IRQ - Interrupt request (IRQ) is the request for processing on a particular priority level. It is generated by the I/O device (the add-on cards).

Port address - is the address used to specify port connectivity parameters and to assign link addresses for the certain I/O device.

2.2 Windows 3.1 Driver Installation

1. After running the MMCD program, go to the ESS1868 3D Sound Card page and click on the button named **Windows 3.1x driver** under the 'Install' Section on the screen. This will automatically load the Windows 3.1 driver installation program.
2. When the Sound Card Windows 3.1 driver installation program appears, click "**Continue**" and then "**Driver Installation**" button to start the installation.
3. After that, you can modify the setting to what you want under the "**Hardware Setting"** dialog box shown below. Click the "**OK**" button when you finish the modification.



4. Then, click the "**Reboot System**" button to proceed.
5. Make sure that all floppy disk has been removed from the floppy disk drive then click the "**OK**" button, the Windows system will be updated automatically.

2.3 Windows NT 3.51 Driver Installation

1. After entering **WINNT** (Version 3.51). Double click on the "**Main**" → "**Control Panel**" → "**Drivers**" icons.
2. Click the "**Add...**" button
3. Select the "**Unlisted or Updated Driver**" item, and click the "**OK**" button.
4. Insert the MMCD in to your CD-ROM drive and then type **d:\eng\1868\winnt35** Then click the "**OK**" button.
5. Click the "**OK**" button again.
6. Under the "**ESS Base I/O Address**" dialog box, click the "**continue**" button.
7. After that, you can modify the setting to what you want under the "**ESS1868 Configuration**" dialog box. Click the "**OK**" button when you finish the modification.
8. For the new driver to take effect, you should click the "**Restart Now**" button.

2.4 Windows NT 4.0 Driver Installation

1. Double click **My Computer**
2. Double click **Control Panel**
3. Double click **Multimedia**
4. Click **Devices**
5. Click **Add**
6. Select **Unlisted or Updated Drivers** then click **OK**
7. Insert the MMCD in to your CD-ROM drive and type in the path into the command line **d:\eng\1868\winnt4**
8. Follow the instructions of the drivers (select I/O, IRQ, DMA etc)

2.5 Windows 95 Driver Installation

Note : Install the Sound Card into the motherboard only after the Windows '95 has already installed into the new HDD of the new system, then restart the system and follow the procedure below..

1. Install the Sound Card on the motherboard, and power on the system.
2. During the Windows 95 boot procedure, new hardware will be detected as shown below.

3. Select the "**Driver from disk provided by hardware manufacture** " item, and click the "**OK**" button.
4. Windows 95 will then prompt a "**Install From Disk**" dialog box.

5. With the MMCD already loaded into your CD-ROM drive, type the letter of your CD-ROM drive followed by **d:\eng\1868\win95** , then click "**OK**" button to install the relevant Windows 95 driver.
6. After that, the "**New Hardware Found**" dialog box window will appear for gameport joystick.
7. Select the "**Windows default driver**" item, and click the "**OK**" button to complete the installation of the game port driver.
8. In the same way, you can achieve the installation of the Standard IDE/ESDI Hard Disk Controller.
   Finally, Windows 95 will ask if you want to restart system for the new driver to take effect, you should click the "**YES**" button.

3.0 3D Sound &Binaura 3D Sound Technology explained

Everyone knows what stereo sound is. But how the brain perceives it, is important in order to better understand 3D sound. For example, if a piano sound is played through just the left speaker then we will perceive the sound as coming from the left side. If the same sound (and same level, or volume, of sound) is also passed through the right speaker then it will create the effect of the piano sound coming from the center of the two speakers - in essence from a "phantom" speaker. By manipulating the levels of the audio signals to the left & right speakers, and then adding 'effects' to them, it is possible to create up to two extra "phantom" speakers - thus giving us 3D Sound. Further to this we must then understand two more '3D terminology's' - **Sum and Difference**..

Sum describes the information of each monophonic audio signal sent to the left & right speakers (in other words - *the sound, and to which speaker)*. **Difference** is the information we have when we look at the left & right signals in terms of *level, timing/delay and frequency.* By subtracting the ***Difference*** of the right signal from the ***Difference*** of the left signal we come out with the all-important 'spatial' information which characterizes stereo program material - and it is this which can be manipulated to produce **3D** sound.

The type of 3D sound used on this sound card was developed by a company called *"Binaura"* . This 3D technology has been used extensively and successfully by Creative Labs on their range of Sound Blaster sound cards. This type of 3D is not dependent on a specific chipset (like the ES938 Spatializer Chipset) and software drivers, but more a mixture of sound card layout (the specific design of the routings of the audio signals, which are made when designing the PCB) and some passive components such as resistors and capacitors. This technology 'delays' and 'effects' the audio signals just enough in order to create the 'spatial' information so crucial to achieving good 3D Sound. The ensuing results of the *"Binaura"* design are an excellent quality of 3D sound which does not require software drivers, and is cheaper through design (not requiring expensive R&D & production investment in to core logic production). This type of technology is incorporated on the OPTi931 sound card, and ESS1868 3D Sound Card.

Useful E-Mail Addresses

If you find that the installation driver for your particular operating system is not included on this MMCD CD-ROM then please visit one of the following web sites for further information..

www.esstech.com

ESS Technology Home Page

www.mmcd.com

MMCD Home Page

Thank you