

Santa Cruz™

DSP-Enhanced Six-Speaker Sound Card



Software Product ID Number

The software **Product ID Number** can be found on the software CD sleeve. You will need this number when you install the software, for technical support and to register your software. Please copy this number below and keep it in a safe place so you will have it for future reference. (Note: The number may have either three or four digits in the last group):

Product ID Number _____

□	□	□	□	□	□	-	□	□	□	□	□	□	-	□	□	□	□
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

WWW.TURTLEBEACH.COM

Notices

Santa Cruz Users Guide; Version 2.4 October, 2002

Software and documentation copyright © 2001-2002 Voyetra Turtle Beach, Inc. All rights reserved. No part of this publication may be reproduced or transmitted by any means or in any form, without prior written consent from Voyetra Turtle Beach, Inc. ("VTB").

In no event will VTB be liable for direct, indirect, special, exemplary, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. In the interest of continued product development, VTB reserves the right to make improvements to this manual and the products it describes at any time, without notices or obligation.

Turtle Beach, the Turtle Beach Logo, Santa Cruz, VersaJack, AudioSurgeon, MusicWrite, Recording Station, Digital Orchestrator and SoundCheck are trademarks of VTB. AudioStation and Voyetra are registered trademarks of VTB. Microsoft and Windows are registered trademarks of Microsoft Corporation. Dolby Digital, Dolby Pro Logic and AC-3 are registered trademarks of Dolby Laboratories, Inc. Pentium is a registered trademark of Intel Corporation. Sensaura is a trademark of CRL, Ltd. All other trademarks are the properties of their respective companies and are hereby acknowledged.

Use of this software is subject to the terms and conditions of the End-User Software License Agreement.

Santa Cruz is a product of:

Voyetra Turtle Beach, Inc. 5 Odell Plaza, Yonkers, NY 10701 USA

www.turtlebeach.com

Technical support

Santa Cruz FAQ and Knowledge Base: Go to the Turtle Beach web site (www.turtlebeach.com) and click on "Support" then "Knowledge Base". Scroll down to the "S" section and click on "Santa Cruz". This will bring up the list of articles.

The "FTP Files Download Area" in the Support section contains the latest driver releases and other support files available for download.

E-mail Tech Support: support@TurtleBeach.com

Many issues can be resolved via email. Please allow at least 2 – 3 business days for a response. Please include your name, product name, and product ID/serial number.

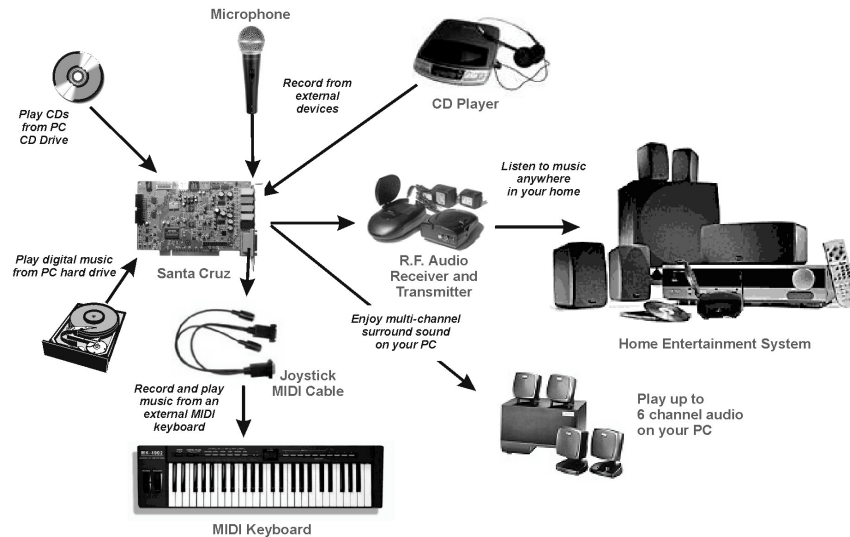
Fax Tech Support: 914-966-1093

Fax a description of your problem to the above number, and please be sure to include your name, product name, and product ID/serial number.

Contents

INTRODUCING SANTA CRUZ	1
System Requirements	2
SANTA CRUZ CD	3
Santa Cruz Program Suite	3
SANTA CRUZ CONNECTORS.....	6
INSTALLING SANTA CRUZ.....	8
Installing the Santa Cruz Board	8
CD-ROM Analog Audio Input	9
CD-ROM Digital Audio Input	10
Installing the Drivers and Software	10
Windows 98/ME	10
Windows 2000 Professional	11
Windows XP	11
To uninstall Santa Cruz	12
Testing Santa Cruz with SoundCheck	12
CONTROL PANEL TAB FUNCTIONS	13
TWO SPEAKER CONFIGURATION.....	15
FOUR SPEAKER CONFIGURATION.....	16
SIX SPEAKER CONFIGURATION.....	17
6-Speaker Mode Controls	18
VERSAJACK DIGITAL MODES	19
Digital 4.1 Configuration	19
Dolby Digital® AC-3 Configuration	19
HARDWARE WARRANTY	20
FCC Declaration of Conformity	20
EMC DECLARATION OF CONFORMITY.....	21

INTRODUCING SANTA CRUZ



Santa Cruz represents the latest generation in DSP-accelerated, multi-channel PC audio and provides the following key features:

- DVD Playback with full 6 speaker surround sound.
- Realistic, DSP-enhanced surround sound effects can be added to a wide variety of audio sources.
- Surround sound playback of standard stereo audio sources such as MP3s, CDs and Wave files.
- Direct digital connections to the latest high-tech home entertainment equipment, for the highest fidelity with lowest noise audio reproduction possible.
- Cirrus Logic SoundFusion® DSP technology with 420 MIPS of digital audio processing power.
- Headphone, 2, 4, and 6-speaker support.
- >95 dB signal to noise ratio with high resolution 18-bit analog to digital converters for recording and 20-bit digital to analog converters for playback.
- 10 band graphic EQ with digital display.
- More than 1000 MIDI synthesizer voices (depending on CPU speed).

Whether you're playing PC games, watching DVD movies, using voice applications, listening to music or even recording your own, the Turtle Beach Santa Cruz handles it all.

SYSTEM REQUIREMENTS

Computer	IBM PC or compatible with one available PCI 2.1-compliant expansion slot
Processor	Pentium® 200 MHz with MMX™ technology or higher (Celeron™ 400 for Windows XP and 2000)
RAM	64 MB System RAM (128 MB recommended for Windows XP/2000)
Hard Drive	Approximately 25 MB free space is required during the driver installation process. Additional space required for software applications installation.
Display	800x600 High Color (16-bit)
Operating Systems	Windows® 98, 98SE, Millennium, Windows 2000 Professional, Windows XP
CD-ROM Drive	Quad-Speed CD-ROM or DVD-ROM drive required for software installation CD-R or CDR/W for AudioStation CD burning feature. A DVD drive, a compatible software DVD player application, and a high quality 5.1 Surround speaker system (five powered speakers plus a powered subwoofer) are required for playing back Dolby® Digital (AC-3) audio from DVD movies with the Santa Cruz.
Speakers	Santa Cruz works with 2-speaker, 4-speaker, 6-speaker and 5.1 speaker setups, or with headphones. High quality stereo (2-speaker) sound system, stereo powered speakers or headphones are recommended to properly hear the Santa Cruz high-quality stereo audio playback. A high quality, four-speaker sound system is necessary for 4-Speaker surround sound playback.
System Resource Requirements	In all supported operating systems, the following resources are set automatically when the Santa Cruz setup is run: <ul style="list-style-type: none">▪ One IRQ for the PCI Audio Accelerator/DSP▪ One IRQ and DMA channel for the Game Device (Windows 98 only)▪ Several I/O and memory address ranges <p><i>NOTE:</i> The Santa Cruz Game Device may be enabled or disabled from within the Santa Cruz Control Panel. Disabling the Game Device may help resolve resource conflicts in systems with limited available resources (Windows 98 only).</p>

SANTA CRUZ CD

The Santa Cruz CD includes the following components:

Santa Cruz Drivers	Audio drivers for Windows 98/Me/XP/2000.
Santa Cruz Control Panel Software	A convenient utility for controlling the Santa Cruz audio features. A video tutorial provides a quick overview.
SoundCheck™	Audio diagnostic utility that can help you test and troubleshoot Santa Cruz audio features.
Software Suite	A versatile suite of music software, described in the next section.
Sample Music Files	Songs that can be used to try AudioStation's music library features after you've installed the program.
Video Tutorials	Video tutorials for many of the programs on the CD.
Adobe® Acrobat® Reader	A limited version for use with the reference manuals.
PDF Reference Manuals	PDF versions of software reference manuals that can be viewed and printed with the Adobe Acrobat program included on the CD.

SANTA CRUZ PROGRAM SUITE

The Santa Cruz CD includes a suite of versatile programs for controlling Santa Cruz and working with digital audio, CD audio and MIDI music files:

SANTA CRUZ™ CONTROL PANEL



- Control Santa Cruz speaker configurations.
- Set recording levels and source.
- Mix playback levels of sound sources.
- Control effects settings.
- Control wavetable synthesizer.
- Control other Santa Cruz features.

AUDIOSTATION® LE



- Limited demo edition of Voyetra's powerful music jukebox program.
- Record and play music from audio CDs.
- Encode and play MP3, Windows Media™ (WMA) and WAV files.
- Manage your PC Music Library.
- Listen to Internet radio broadcasts.
- Burn audio and data music CDs.

AUDIOSURGEON™ DEMO



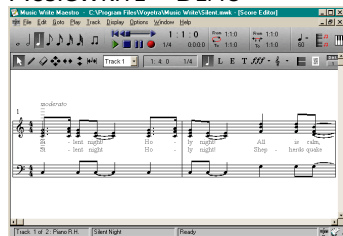
- Clean, Edit and Convert your MP3s with the demo version of Voyetra's digital audio editor.
- Turn your vinyl record collection into digital music files, then remove pops, clicks and hiss from the original recordings
- Split large files into smaller files for CD tracks or individual listening.
- Convert between MP3, WAV, and Windows Media™ formats.
- Burn your edited tracks to CD-R so your music sounds exactly the way you want!

RECORDING STATION™



- An easy-to-use, MIDI and digital audio recording studio.
- Record up to 10 MIDI tracks with your MIDI keyboard to create songs with multiple MIDI instruments.
- Record 2 digital audio tracks to add vocals or acoustic instruments.
- Import MIDI files and create your own variations.

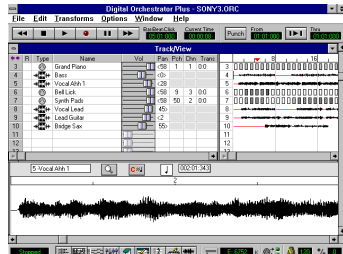
MUSICWRITE™ DEMO



- Demo version of Voyetra's versatile music notation program.
- Record music from a MIDI keyboard and see notation appear on the PC screen.
- Edit music notation with your mouse.
- Video tutorial included.

DIGITAL ORCHESTRATOR™ PRO

DEMO



- Demo version of Voyetra's powerful music composition program.
- Record, edit and play MIDI music from an external MIDI keyboard.
- Record and edit digital audio tracks along with MIDI tracks.
- Edit MIDI song data in piano roll and event list formats.



- Check and troubleshoot MIDI and digital audio features on Santa Cruz.



- Customize 3D headphone effects settings to conform to the acoustic characteristics of your ears.
- Multiple settings can be saved for different users.
- Maximize audio effects for the latest 3D gaming standards.



For the latest AudioStation updates, as well as user tips, Knowledge Base articles and information on other Turtle Beach and Voyetra products, please visit www.Turtle-Beach.com and www.Voyetra.com.

SANTA CRUZ CONNECTORS



Turtle Beach

Santa Cruz™

DSP-Enhanced Six-Speaker Sound Card

Connector	Function
VersaJack™	Operates in three modes (selected on the Santa Cruz Control Panel Main Tab): Analog line output mode: Allows 6-speaker playback for analog (decoded) 5.1 audio. Can also be configured as a Front L/R audio signal for headphones. Digital output Mode: For connection to digital speakers and Dolby Digital decoders. Not transformer coupled. Secondary stereo analog line input mode: Allows recording to Secondary analog input.
Microphone Input (Monaural)	For condenser or dynamic microphone. Low-noise preamplifier provides wide range input sensitivity (10mV – 200mV). Mic gain (+20dB or +40dB) is set in the Santa Cruz Control Panel Mixer Tab using button labeled “...” under Mic volume slider.
Line-In L/R (stereo)	Stereo line level source for recording from external CD players, tape decks, etc.

Front Speakers channels 1 & 2	Front Speakers and Back Speakers outputs can drive headphones or powered speakers.
Back Speakers channels 3 & 4	Use Front channel for stereo playback. Use Front and Back channels for 4-channel playback. Stereo or 4 channel setting is selected on the Santa Cruz Control Panel Main Tab.
Joystick/ MIDI connector	D-SUB 15 pin connector for external joystick and MIDI input/output. Supports analog, digital and Direct Input™ game devices. Supports MIDI input and output with optional MIDI adapter cable available at www.turtlebeach.com .
TAD In/Out (Monaural)	For internal modem audio. Pin configuration: Pin 1 - Audio input Pin 2 - Ground Pin 3 - Ground Pin 4 - Audio output
CD L/R In (Stereo)	For internal analog CD audio. Pin configuration: Pin 1 - Left (white) Pin 2 - Ground (black) Pin 3 - Ground (black) Pin 4 - Right (red)
Aux L/R In (Stereo)	For internal analog audio from 2 nd CD or DVD. Pin configuration: Pin 1 - Left (white) Pin 2 - Ground (black) Pin 3 - Ground (black) Pin 4 - Right (red)
CD Digital Input (Stereo)	Connects to the two-pin Digital output on some CD-ROM drives. Pin configuration: Pin 1 - signal Pin 2 - ground
Wavetable Header	For use with synthesizer daughter cards. Lets you use the Santa Cruz DSP synthesizer with a second MIDI synthesizer.

INSTALLING SANTA CRUZ

If your system already has a sound card, you will need to remove its drivers and if possible, physically pull out the card or disable it after removing the drivers. Generally, drivers can be removed in the **Add/Remove Programs** option, located in the **Windows Control Panel**. However, you should consult the sound card manufacturer's documentation for complete instructions on removal.



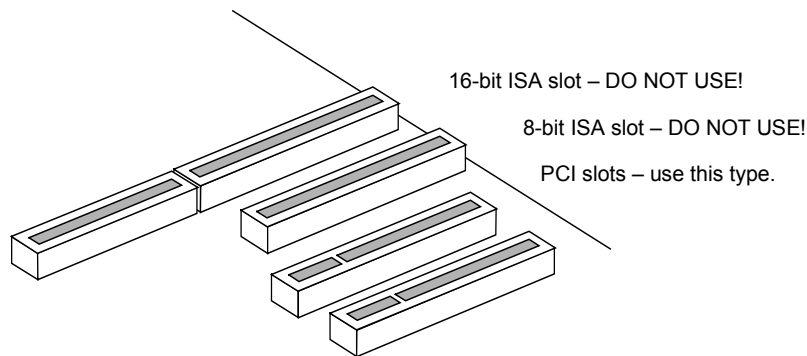
IMPORTANT! Read the warranty information included with your PC before you open its case to remove the old sound card and/or install the Santa Cruz. Turtle Beach cannot be held responsible for loss of warranty coverage or other damages incurred as a result of modifications to the computer system by unauthorized personnel.

INSTALLING THE SANTA CRUZ BOARD

1. Turn off your PC and any connected peripherals and unplug the system. Before handling components, touch the computer chassis to discharge any static electricity build-up. Remove your PC's cover.
2. Consult your motherboard documentation to locate the unshared PCI expansion slots. Select one that is empty for installing the card. We recommend installing the card next to another empty expansion slot in case you wish to install an upgrade daughter card in the future. Also, you should position the Santa Cruz card as far away as possible from the video card and power supply.

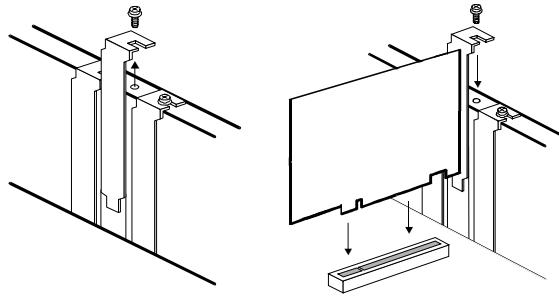


Motherboards with five or more PCI slots will have two or more slots that share the same IRQ (interrupt request line). Please be sure to install the Santa Cruz in a PCI slot that has its own, unshared IRQ. If you find that your computer locks up after you have installed the Santa Cruz, move the Santa Cruz card to a different, unshared PCI slot.



WWW.TURTLEBEACH.COM

1. Remove the selected expansion slot cover by unscrewing its securing screw. Save the screw to secure the Santa Cruz to the chassis later.
2. Align the Santa Cruz's gold-striped edge connector with the selected PCI expansion slot socket. With a gentle back-and-forth rocking motion, press the Santa Cruz firmly into the slot until it snaps in place.
3. Secure the Santa Cruz to the chassis with the expansion slot cover screw you removed earlier.



CD-ROM ANALOG AUDIO INPUT



In Windows XP, this connector is not needed, as the digital CD signal is sent directly through the PCI bus.

The CD audio header is a black plastic, four pin connector located at the top center of the Santa Cruz card. When connecting a CD-ROM audio cable, the audio cable should be plugged into the CD-ROM drive first; then the other end of the cable should be plugged into the appropriate connector on the Santa Cruz sound card.

CD-ROM DIGITAL AUDIO INPUT



In Windows XP, this connector is not needed, as the digital CD signal is sent directly through the PCI bus.

Santa Cruz features a CD-ROM Digital Input header for connecting to the digital audio output on the latest CD-ROM drives. Using this connector lets you make digital audio data transfers from the CD-ROM drive to the Santa Cruz card, which reduces the small amounts of noise and distortion introduced by unnecessary digital to analog conversions. The optional 2-pin Internal Digital CD cable used for this connection can be purchased from Turtle Beach.

Use the keyed, two-pin, black plastic plug into the CD-ROM Digital Input header, located at the upper right of the Santa Cruz card to connect the CD-ROM drive digital output to the internal CD-ROM Digital Input on the Santa Cruz. Connect the keyed, two-pin, black plastic connector at the other end of the cable into the digital audio output on your CD-ROM drive. Be sure to follow the CD-ROM drive manufacturer's instructions for connecting the digital output.

INSTALLING THE DRIVERS AND SOFTWARE

After inserting Santa Cruz into a free PCI slot, install the drivers and software by following these instructions for the version of Windows installed on your PC:



The Santa Cruz CD will launch automatically only if the Auto-Insert Notification option is enabled for your CD-ROM drive. If the installation menu does not appear after inserting the CD into your CD ROM drive, browse to the root of the Santa Cruz installation CD, run 'SETUP.EXE', then return to the installation instructions.

WINDOWS 98/ME

1. Connect your powered speakers, microphone, and any other audio peripherals to the appropriate inputs and outputs on the Santa Cruz.
2. Turn on your PC. When Windows has booted, the system will report, "**New Hardware found: PCI Multimedia Device**" and prompt for the location of the necessary files on the CD-ROM. Click on the Cancel button to end this process. **NOTE: You must click on Cancel at this screen to properly install the Santa Cruz.**
3. Insert the Santa Cruz installation CD into your CD-Rom drive. When the Santa Cruz installation menu appears, select "**Santa Cruz Setup**". From the setup page select "**Install Santa Cruz Drivers**". Follow the instructions that appear during the install, selecting the options that best match your audio setup. Once the installation process has completed, the Santa Cruz will be ready for use.

WINDOWS 2000 PROFESSIONAL

1. Connect your powered speakers, microphone, and any other audio peripherals to the appropriate inputs and outputs on the Santa Cruz. Turn on your PC and allow Windows to boot up to the desktop.
2. Log in with Administrator privileges to install new hardware.
3. *Service Pack 2 and DirectX 8 are recommended (Required for multi-channel analog and digital audio from DVD movies).*
4. Windows will automatically have loaded its Crystal SoundFusion drivers. When Windows prompts you to restart, select '**No**'.
5. Insert the Santa Cruz CD into your CD-Rom drive. When the Santa Cruz installation menu appears, select "**Santa Cruz Setup**". From the setup page select "**Install Santa Cruz Drivers**".
6. Follow the instructions that appear during the install, selecting the options that best match your audio setup. If prompted, reboot the system. Once you have rebooted, the Santa Cruz will be ready for use.



While preparing for reboot, the PC may appear to be temporarily "frozen". Do not interrupt the computer at this time. Wait a few minutes for the installation to complete. The wait time will vary depending on the speed of your PC. Please wait for the system to reboot to properly complete the installation.

WINDOWS XP

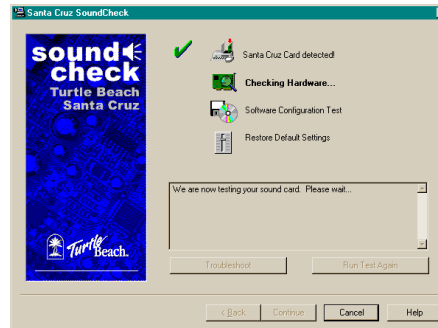
1. Connect your powered speakers, microphone, and any other audio peripherals to the appropriate inputs and outputs on the Santa Cruz.
2. Turn on your PC. When Windows has booted for the first time after installing the Santa Cruz hardware in your computer, Windows will report new hardware found. This message box may appear as '**Sound Fusion**', '**Turtle Beach Santa Cruz**' or '**Multimedia Audio Controller**'; select the cancel button on the "New Hardware Found" window to close and return to the Windows desktop. **NOTE: You must click on Cancel at this screen to properly install the Santa Cruz.**
3. Insert the Santa Cruz installation CD into your CD-Rom drive.
4. When the Santa Cruz installation menu appears, select "**Santa Cruz Setup**". From the setup page select "**Install Santa Cruz Drivers**". Follow the instructions that appear during the install, selecting the options that best match your audio setup. If prompted, reboot the system.

TO UNINSTALL SANTA CRUZ

1. Open the Windows **Control Panel** (**Start** → **Settings** → **Control Panel**).
2. Open the **Add/Remove Programs** applet (**Add or Remove Programs** in Win XP). Select **Turtle Beach Santa Cruz** and click on the **Add/Remove button** (**Change/Remove** in Win XP) to the lower right of the screen.
3. Shut down your PC, remove the Santa Cruz board, then reboot your PC.

TESTING SANTA CRUZ WITH SOUNDCHECK

SoundCheck provides an easy way to test and troubleshoot the digital audio and MIDI features on Santa Cruz. A series of displays takes you through the testing process step-by-step. If, for some reason, one of the functions on Santa Cruz is not working properly, SoundCheck provides troubleshooting tips to help you get it running again.



Please note that the first time a MIDI file is played using the internal synthesizer of the Santa Cruz after each reboot, the default sound bank will need to load before the MIDI file starts to play. This process may take up to 20 seconds to complete. This will only happen the first time the Santa Cruz internal synthesizer is accessed – after that, MIDI files will play back without delay.



Because SoundCheck plays a series of test tones during the Hardware Test, you should not wear headphones while SoundCheck is running. You should also lower the volume control on your speaker system before running SoundCheck.

CONTROL PANEL TAB FUNCTIONS

The Santa Cruz Control Panel provides controls for using the advanced audio features. Click on the [?] at the top right for the online Help that provides a detailed description of all the controls. To save your settings as a preset, click on the "Preset" button at the top left.

MAIN TAB



Controls speaker mode, VersaJack, recording source, recording level and output volume. The output pan control sets the relative level of L/R speakers in stereo mode. When 4 speaker and 6 speaker modes are active, additional pan controls will appear in this area, so you can adjust the balance among multiple speakers.

MIXER TAB



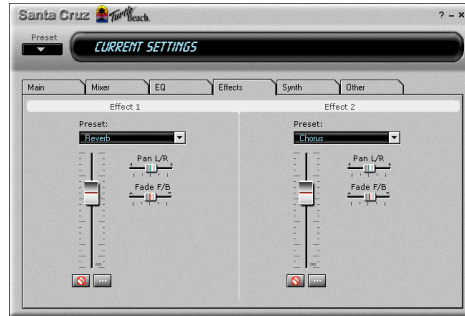
Controls levels of playback sources, including WAV audio, wavetable synthesizer, aux input, CD input, line input, mic input and TAD input. Mute the inputs with the buttons below each slider. Pan the inputs L/R (and Front Back in 4 or 6 speaker modes) with the small sliders above. Select CD digital or analog input with the "... " button below the CD slider.

EQUALIZER (EQ) TAB



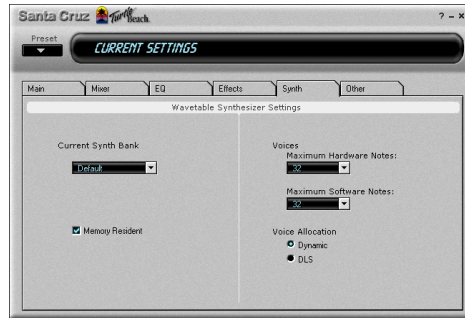
Controls the frequency boost and cut for the equalizer. Buttons at the top provide presets. Volume level meters at the right show the intensity of audio in each frequency band. Enable the Equalizer with the button above the level meters. Save custom EQ settings by clicking the Preset button on the top left.

EFFECTS TAB



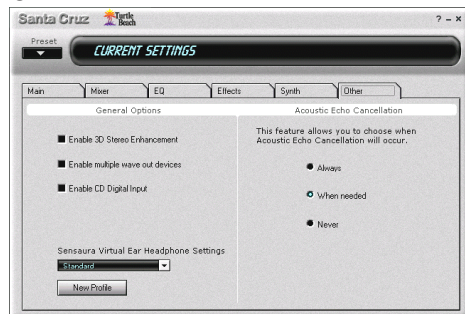
Controls the dual effects processors. Select the effect with the pull down menu above the slider and set the depth with the slider. In 2-speaker mode, effects can be positioned L/R. In 4 and 6-speaker modes they can also be positioned Front and Rear. The “...” button lets you further set the depth of effect on each source.

SYNTHESIZER TAB



Controls the wavetable MIDI synthesizer settings. For details on the individual settings, see the control panel help file (press [?] at the top right of the screen.)

OTHER TAB

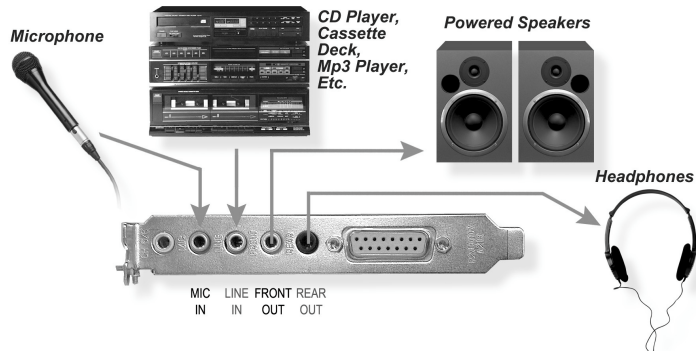


Controls misc. settings for stereo 3D enhancements and headphone virtual 3D settings. To access the customized headphone settings, press “New Profile”. For multitrack playback/record you must enable multiple wave out devices. For details on other settings, see the control panel help file (press [?] at the top right of the screen.)

TWO SPEAKER CONFIGURATION

Setting the Control Panel speaker mode to “**2 Speaker**” lets you keep your stereo speakers and headphones connected all the time, without the hassle of reaching around the back of your computer and plugging and unplugging cables. This mode is useful for listening to stereo audio sources and **HRTF** (Head Related Transfer Function), which is 3D audio that simulates four speaker positional audio with two speakers.

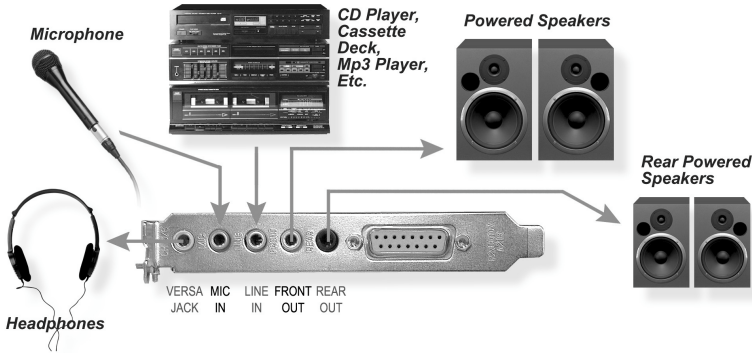
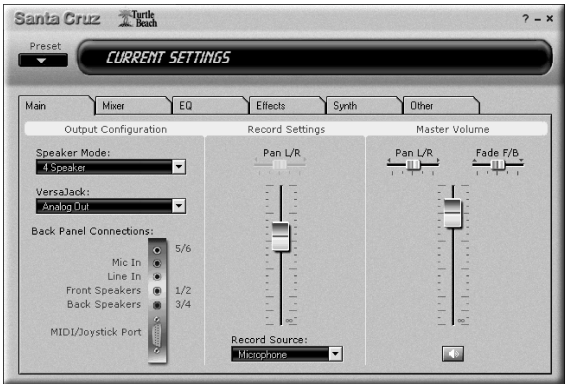
The headphones can also be set to play the emulated rear channel audio in games with 3D audio capability. To turn off the speakers and listen only with headphones, set the Control Panel Speaker Mode to “**Headphones (Rear)**”.



FOUR SPEAKER CONFIGURATION

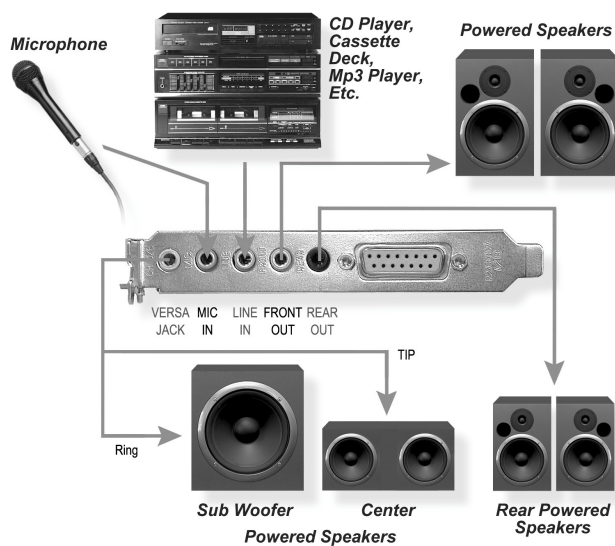
Setting the Speaker Mode to the “**4 Speaker**” configuration lets you use both front and rear speakers and keep your headphones connected. This mode is useful for listening to normal and enhanced Stereo, quad panning of stereo input signals and 4-channel audio for 3-D games.

To turn off the speakers and listen only with headphones, set the Control Panel Speaker Mode to “**Headphones (VersaJack)**”.



SIX SPEAKER CONFIGURATION

Setting the Speaker Mode to the “**6 Speaker**” configuration is useful for listening to normal stereo, enhanced stereo (using effects), quad playback of stereo material, 4-channel audio for 3-D games, 4-channel audio with Virtual subwoofer and center channels and playback of decoded AC-3 5.1 from DVD (requires a compatible software DVD decoder). In this configuration, the VersaJack is set to “**Analog Out**” to drive a powered center channel and subwoofer speakers.



6-SPEAKER MODE CONTROLS

The following controls appear when in 6 Speaker mode only :

Center	Controls the volume level of the center speaker.
Sub	Controls the volume level of the sub woofer speaker.
Virtual 5.1	When playing games containing 3-D audio with a 6-speaker setup, Center and Subwoofer outputs are synthesized from the 4-speaker surround signal to provide a 6-speaker experience. When Virtual 5.1 is enabled, Center and Subwoofer channels are derived from the front and rear channels. Channel 5 (VersaJack tip) carries the Center channel signal, which is a summed mono signal of the front outputs (Front L+R). If Virtual 5.1 is not enabled, the Center and Subwoofer will only be active when playing 6-channel content (i.e. a software-decoded Dolby Digital soundtrack from a DVD or the output of a high-end audio application capable of accessing multiple outputs). It is therefore recommended that you leave Virtual 5.1 off when playing software-decoded Dolby Digital movie soundtracks.

When using PC games with 3-D Positional Audio, turn off Virtual 5.1. Or when enabling Virtual 5.1, turn the Center channel all the way down. The latter will give you the Subwoofer effects but will not interfere with the surround sound positional information.

When Virtual 5.1 is enabled, Channel 5 (VersaJack tip conductor) carries the Center channel signal, which is a summed mono combination of the Front Left and Front Right signals (Front L+R). Channel 6 (VersaJack ring conductor) carries the subwoofer signal, which is a summed mono combination of the Front Left + Front Right + Rear Left + Rear Right signals. This Channel 6 subwoofer signal is full range, meaning that no low pass filter (treble roll-off) has been applied. The subwoofer speaker itself will have the necessary crossover circuit built in.

VERSAJACK DIGITAL MODES

DIGITAL 4.1 CONFIGURATION

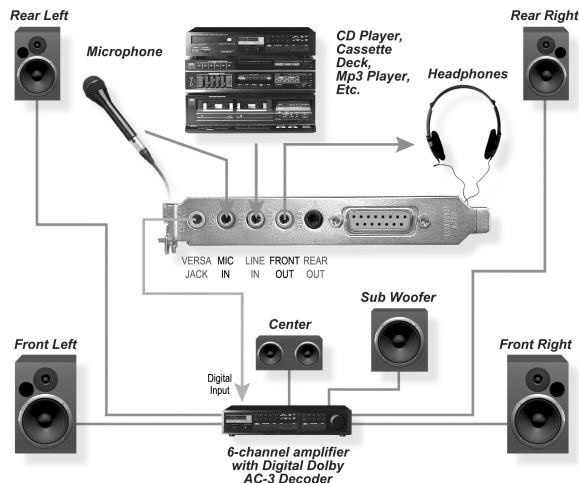
The VersaJack **Digital 4.1** setting is a hybrid digital/analog output mode designed for speaker systems equipped with a digital input for the Front Speaker pair and an analog input for the Rear Speaker pair. These speaker systems are designed to reproduce both Dolby Digital 5.1 surround sound and audio for 4-channel games. When playing anything other than Dolby Digital from a DVD, Digital 4.1 mode sends the Front L/R audio signals in digital format to the VersaJack tip and ring conductors and the Rear L/R audio signals in analog format to the Back Speakers, so you don't have to unplug the digital input when switching between Dolby Digital and four channel audio.

DOLBY DIGITAL® AC-3 CONFIGURATION

Dolby Digital Surround (also known as "AC-3") is a proprietary encoding technology from Dolby Labs that compresses 5.1 surround information into a stereo digital data stream. There are also AC-3 modes for 4-speaker setups, with or without a subwoofer.

When the VersaJack output is set to digital mode, playing a DVD encoded with Digital Dolby AC-3 multi-channel audio automatically sends the digital AC-3 signal to the VersaJack ring conductor. This signal should be connected to an amplifier, receiver or speaker system with a digital input and AC-3 decoder so the AC-3 decoder in the amplifier will convert it into 5.1 surround sound.

Dolby Digital AC-3 Configuration



HARDWARE WARRANTY

Voyetra Turtle Beach, Inc. ("VTB") warrants to the original end-user purchaser ("Purchaser") that the Turtle Beach Santa Cruz ("Product") will be free of defects in materials and workmanship for a period of one (1) year from the date of purchase by Purchaser ("Warranty Period"). If a defect should occur during the Warranty Period, the Purchaser must obtain a Return Merchandise Authorization ("RMA") from VTB. Purchaser will be responsible for all costs incurred in returning the defective Product to and from an authorized VTB service center, or to the repair facility located at VTB's corporate headquarters. The Product must be returned in a static-proof bag, and in the original packaging. A copy of the dated proof of purchase must be included with the defective Product. The RMA number must be clearly indicated on the outside of the package. Packages without an RMA number will be returned to Sender. In the event of a defect, Purchaser's sole and exclusive remedy and VTB's sole liability are expressly limited to the correction of the defect by adjustment, repair, or replacement of the Product at VTB's sole option and expense. This warranty does not cover, and VTB is not responsible for, damage caused by misuse, neglect, fire, acts of God, or unauthorized modification of the Product or damage resulting from the use of the Product with hardware or software programs not provided or specifically recommended by VTB. Except as specifically provided herein, there are no other warranties expressed or implied, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose. In no event shall VTB be liable for indirect, incidental, consequential, or other damages including personal injury, lost profits and damages to property arising out of any breach of this warranty or otherwise. All software including operating systems or applications programs are provided on an "As Is" basis without warranty. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you. This warranty gives you specific legal rights. You may also have other rights, which vary from state to state.

FCC DECLARATION OF CONFORMITY

PRODUCT NAME Turtle Beach Santa Cruz
MODEL NUMBER TB400-2541-02
FCC RULES TESTED TO COMPLY WITH FCC PART 15, CLASS B
OPERATING ENVIRONMENT FOR HOME OR OFFICE USE

FCC COMPLIANCE STATEMENT: This device complies with part 15 of the FCC rules. Operation is subject to the following 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.

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

PARTY RESPONSIBLE FOR PRODUCT COMPLIANCE Voyetra Turtle Beach, Inc., 5 Odell Plaza, Yonkers, NY 10701
Tel: (914) 966-0600 Fax: (914) 966-1102

INFORMATION TO USER: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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: (1.) Reorient or relocate the receiving antenna. (2.) Increase the separation between the equipment and receiver. (3.) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. (4.) Consult the dealer or an experienced radio TV technician for help

EMC DECLARATION OF CONFORMITY

Manufacturer's Name Voyetra Turtle Beach, Inc.
Manufacturer's Address 5 Odell Plaza, Yonkers, NY 10701

Declares that this product

Product Name Turtle Beach Santa Cruz
Model Number TB400-2541-02
Year of Manufacture 2000

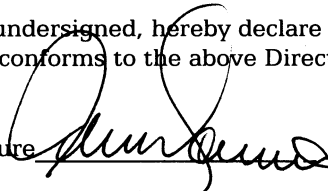
Conforms to the following Product Specifications

EMC EN55022 (CISPR:1993) CLASS B
EN50082-1 (1992):IEC801-2 (1981)
EN50082-1 (1992):IEC801-3 (1984)
EN50082-1 (1992):IEC801-4 (1988)

ECCN EAR99

Supplemental Information The product herewith complies with the requirement to the EMC Directive 89/336/EEC.

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

Signature 

Date 6/26/00

Printed Name: Frederick Romano

Place: Yonkers, NY USA

Title: Executive Vice President