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FCC Class B/European CE Compliance

WARNING: 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 contained in this manual, may cause harmful interference to radio and television 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 the receiver; 3) connect the equipment into an outlet on a circuit different from that of the receiver; 4) consult the dealer or an experienced audio television technician.

NOTE: Connecting this device to peripheral devices that do not comply with CLASS B requirements or using an unshielded peripheral data cable could also result in harmful interference to radio or television reception.

The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables.

FCC ID#: IMJDMAN

This product also complies with European CE requirements.

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Introduction

Congratulations on your purchase of a DMAN Digital Audio Card and welcome to the world of Digital Hard Disk Recording. Please take the time to read this manual before installing your new card. There is a lot of valuable information in here about installing your new card and getting it working. If you take the time now to familiarize yourself with the installation and features of the card, it can save a lot of time and frustration. We know that you're eager to get started recording so we'll try and cover the important stuff first!

What's in the Box?

Your DMAN box contains:

Instruction Manual DMAN Adapter Card MIDI Interface Cable 2 Disks for Windows 3.1x installation 1 Disk for Windows 95 installation Midiman Warranty Registration Card

IMPORTANT: It's very important that you fill out the included Warranty Registration Card and mail or fax it to us. Registering your DMAN will help us to give you the best possible service and support.

Quick Start Guide

Here's a list of the things you will need to do to get started:

- Physically install the card in your computer. (Hardware Installation) (DMAN Typical Setup)
- Install drivers and support software. (Windows 3.1x Software) (Windows 95 Software) (DOS Software)
- If things aren't working, run the diagnostic software. (DMAN Diagnostics Utility) (Troubleshooting) (DOS Troubleshooting)
- 4. Configure your digital recording software. (see your software manual)

About the DMAN

The DMAN is a full-featured, yet low-cost digital audio card with a built-in MPU401 interface and a header for an optional wavetable synthesis daughterboard. The DMAN features 16-bit stereo sampling at various frequencies from 5.53 to 48 kHz, fullduplex digital audio, 64 times oversampled D/A and A/D converters, and an onboard analog mixer.

The DMAN uses the world's first Plug-and-Play chip set for digital audio and includes a subset of the Windows Sound System 2.0 architecture. Also, the Windows '95 driver software fully supports DirectSound.

For those of you who don't speak digital audio tech (yet), we'll define some terms here:

A/D and D/A converters: A/D stands for Analog to Digital and D/A means Digital to Analog. The higher the bit rate and the greater the oversampling rate, the better the audio reproduction. DMAN specifications are equivalent to those of an audio CD.

Full duplex: the ability to record and playback at the same time. If you are using a multi-track digital recording program, such as Samplitude, SAW, or Cakewalk Audio, this is a very important feature. Full duplex would, for example, allow you to hear previously recorded vocal tracks while you're recording the harmonies.

MPU401 : a standard for MIDI interfaces, developed by Roland Corporation, back in the early days of MIDI. This is the most common PC MIDI interface under DOS. Under Windows, MPU type interfaces run in UART (sometimes called "dumb") mode.

Windows Sound System (WSS): Microsoft released the Windows Sound System audio adapter in 1992. Its features include a 16-bit stereo A/D converter, 16-bit stereo D/A converter, data compression and de-compression, analog audio mixing, microphone and line-level input, line-level output and a high-throughput system interface.

Digital Audio Features of DMAN

- 16 or 8 bit stereo digital audio recording and playback. Selectable sampling rates from 5.3 kHz to 48 kHz
- Interrupt and DMA driven simultaneous recording and playback.
- Dynamic range exceeding 80 dB with digital interpolation filter and dynamic filtering programmable according to sampling rate.
- 16-bit hardware ADPCM, µLaw and ALaw compression and de-compression.
- Software-selectable input source with individual mute and volume control. Mixing of various audio sources (Stereo Linein, Stereo Aux Input, Stereo Wave Synthesis music – via daughterboard connector, and Internal DAC) for recording.
- Software-controlled output mixing of all audio sources with individual volume controls.
- Master volume control with up to 64 dB of attenuation (in 64 attenuation steps of 1 dB each).
 - 6

About Plug-and-Play

The PC ISA bus architecture requires allocation of memory and I/O address spaces, DMA channels, and interrupt request (IRQ) lines among all peripherals, yet there are no defined hardware or software mechanisms for allocating these resources. As a result, configuration of ISA cards is typically done with DIP switches and jumpers that change the decode maps for memory and I/O space and steer the DMA and IRQ signals to different pins on the ISA bus. System configuration files usually need to be manually updated to reflect these settings for each peripheral device in the system.

Investigating the many device settings and properly configuring the system is no small task. Usually when new devices are added to the system, there are configuration conflicts that cause the computer to work erratically or not at all. Users typically resolve configuration conflicts by consulting complicated documentation provided with the each adapter card, contacting the supplier's technical support group, consulting a friend, or giving up in disgust. Even trained engineers can find the ISA configuration process unreliable and frustrating. Microsoft estimates that nearly half of its technical support calls relate to this type of hardware installation problem. As next generation expansion cards are introduced, including multi-function versions with wavetable music synthesis, hi-fidelity audio, MPEG audio/video & FAX/modem capabilities, more systems resources than ever before will be required, causing even more conflicts over system resources.

The Solution

In 1993 the Plug-and-Play (PnP) specification was proposed as a solution to the ISA resource conflict problem. PnP defines a means for the computer to communicate with its various installed devices and resolve any potential resource conflicts. In theory, with a working system PnP, adapter jumpers and DIP switches are a thing of the past and compliant hardware will be configured automatically or with little user intervention. PnP works with existing bus architectures and is widely supported by the industry. To gain the full benefits of PnP, you will need a PnP compliant operating system (Windows 95), system BIOS, motherboard, and adapter card(s). Older non-compliant ISA expansion cards (called "legacy" cards) will function in PnP systems as well, but will still require some manual configuration.

PnP Theory of Operation

Think of PnP as digital aspirin. Device configuration occurs transparently in an all-PnP environment. At bootup, the BIOS and the operating system detect changes and attempt to allocate resources, eliminating the need to manually configure resources such as IRQ lines, DMA channels, I/O ports and memory space. Peripheral adapter cards are put to "sleep" and are then individually queried regarding which resources are programmable and over what ranges they may be programmed. The PnP BIOS will then build a conflict-free resource assignment list for all PnP devices, update a stored working-configuration database, activate the peripheral devices, then start the operating system (Windows 95 for example) which loads the device drivers with the provided configuration information.

About Digital Recording

If you've only done analog recording before, you're in for a treat. If you have done digital recording before, you can skip over this section (our feelings won't be hurt).

As taught in high school science class, sound is composed of waves of changing pressure (level) and frequency (pitch). Analog recording captures these waves in their entirety and records them as variations in magnetic flux (tape) or variations in depth (good old fashioned vinyl). On playback, analog recording adds noise to the recorded sound at relatively high levels (tape has background hiss, vinyl has surface noise); it therefore causes a low signal-to-noise (S/N) ratio. Because this noise level is comparatively high, the dynamic range (soft to loud) of the recording is decreased.

On the other hand, digital recording samples the sound waves (typically 44,100 times per second or at a rate of 44.1 kHz) and records the sounds as digital data. This numeric data can be stored on a hard or floppy disk, DAT tape, CD, or any other common data storage media. During digital playback, no noise is added by the recording medium. This results in a much greater S/N ratio and greatly increased dynamic range over analog methods. The end result is cleaner, quieter recordings. The only noise present in the digital realm is any noise introduced by the D/A converter and this varies according to the quality of the converter or the board design. Using quality components and

design practices as in the DMAN, the only way to make a noisy digital recording is to add the noise yourself!

Digital Recording Dos and Don'ts

Meters are not meant to ever go into the red. Digital recording is very unforgiving of clipping. Unlike analog systems, where tape saturation gives a nice smooth compression, digital distortion sounds like someone is breaking a pane of glass in your ear. Make sure that you give yourself lots of headroom both when recording and mixing. You've got all that dynamic range -- use it.

Measure twice, cut once. With most hard disk recording software, like the version of Samplitude that is bundled with the DMAN Digital Studio, you will be doing your mixing in the program. Because you won't be able to run each track to outboard gear (effects, compression, etc.) when mixing, you want each track to sound right when you record it. Take your time to make sure that mic position, EQ, and effects settings are exactly what you want when tracking. "Fix it in the mix." hardly ever works, anyway.

Know your signal chain. Some programs set the levels internally, others use the Windows level controls. Make sure you know which is which. If you are not getting the levels you expect, retrace your signal chain and make sure that you are adjusting levels in the correct places.

Plan ahead. Think about tracking ahead of time and decide in what order you are going to record the tracks. Keep a track list. Use it to make notes when you are recording (where you might need to punch in and out, etc.). With hard disk recording you don't have to worry about the bass track bleeding into the vocal track or whether the heads have the same response on different tracks, but you still want to have a plan.

Back up your work. Sure, most editing functions with HDR systems are non-destructive, but some are not. If you are doing a lot of editing, (or even if you're not, but don't want to take any chances) back up your audio tracks. Audio takes up a lot of disk space, so you might want to have a large format removable drive (Iomega Zip or Jaz, Syquest EZ Flyer for example) on which to store audio files.

Optimize your disk often. Fragmented audio files can cause problems.

DMAN Connections (see DMAN Block Diagram below)

- 1. Aux Line Input A 10k ohm, stereo, line level ¹/8" jack. Handles input voltages up to 2 volts rms. Normal connections to this jack would be from the line level outputs of a mixer, mic preamp, the recording outs of an instrument amplifier or a CD player. The Aux Input is normally mixed with the line output and is not recorded when audio recording is enabled.
- 2. Line Input A 10k ohm, stereo, line level ¹/8" jack. Handles input voltages up to 2 volts rms. Normal connections to this jack could be from the line level outputs of a mixer, external mic preamp, the recording outs of an instrument amplifier or a CD player.
- 3. Mic Input An unbalanced, mono, 1/8" jack. The microphone input feeds a preamp with 18 dB signal boost, allowing for better dynamic range with microphones having low gain.
- 4. Line Output A stereo, line/headphone level ¹/8" jack which provides a maximum output voltage of 2 volts rms. Normally this jack would be connected to an external amplifier and speakers, self-powered multimedia speakers, a DAT or other stereo mixdown recorder or headphones.
- 5. **MIDI Interface** The included MIDI Interface Cable, when connected to the MIDI Interface connector on the DMAN board, provides standard MIDI In and MIDI Out (5-pin DIN) connectors. Normal these MIDI connections will go to a MIDI keyboard or tone module. Functionally, the MIDI interface operates as a standard MPU401 "UART mode" MIDI interface.



DMAN Block Diagram

Hardware Installation

To mechanically install the DMAN do the following:

- 1. Turn off your computer.
- 2. Remove the cover and position the computer so that you can easily access its ISA slots.
- 3. Select the ISA slot where you will install your DMAN card. Make sure it is a 16 bit ISA slot. If you don't know what "16 bit ISA slot" means, check the owner's manual for your computer. A 16 bit slot consists of two in-line edge-connectors instead of one.
- 4. Before removing the DMAN from its protective anti-static bag, touch the metal power supply case of the computer in order to dissipate any static electricity charge your body may have accumulated. You might want to pick up a grounding wrist strap (available from electronics stores like Radio Shack) if you want to be doubly sure you aren't carrying a static charge that could damage some of the chips on the card.
- 5. Remove the metal bracket that covers the access hole on the back of the computer. This bracket is usually fastened to the computer with a single screw.
- 6. Position the DMAN card over the target ISA slot and fit the card loosely over it with the DMAN card upright. Press the card gently but firmly downward into the slot until the card is completely and squarely seated in the slot. If the card seems difficult to seat, a slight rocking motion may help.
- 7. Screw the DMAN's metal bracket down into the screw hole on the back of your computer using the screw you removed in step 5 above.
- 8. Place the cover back on your computer.

DMAN Connections (see Typical Setup Diagram below)

- 1. Connect the Line Out from the DMAN to the tape return jack of your mixer, or to your amplifier, multimedia speakers, or whatever else you may be using to amplify the sound. To avoid a potential audio "pop", it is a good idea to turn off the amplifier or self-powered speakers before connecting to Line Out.
- 2. Connect the tape send of your mixer, or Line Out of another audio source, to the Line In jack of DMAN.

- 3. Connect the DMAN MIDI Interface Cable to the matching DMAN connector at the back of the computer. Use the thumb screws on the cable assembly to attach it securely to the DMAN. If you don't plan on using external MIDI, this step is not necessary.
- 4. Attach any MIDI devices you have by connecting the MIDI Out of your controller keyboard to the MIDI In of the DMAN and MIDI Out connector of the DMAN to the MIDI In on your keyboard or tone module. If you don't plan on using external MIDI, this step is not necessary.
- 5. Move your computer back to its original position. You may now turn on your computer.



DMAN Typical Setup

Daughterboard Installation (optional)

DMAN provides a (26-pin header) daughterboard connector (see diagram 2) for installation of an optional wavetable synthesis daughterboard. The daughterboard interface is compliant with most de facto industry-standard daughterboards. Adding this daughterboard will give you built-in General MIDI (GM) synthesis and enable you to combine (with the use of appropriate software) MIDI sequenced sound with digitally recorded audio produced by DMAN.

- 1. As above, turn off the computer, open the case, and make sure you are grounded.
- 2. Locate the DMAN card in your computer.
- 3. Remove the bracket screw that is holding the DMAN in place.
- 4. Gently pull the DMAN straight out of the slot. If it is a tight fit, once again use a slight rocking motion.
- 5. With DMAN in front of you, remove the daughterboard from its anti-static bag and carefully align the header socket on the daughterboard with the header pins on DMAN. Make sure that the daughterboard is properly oriented so it is "inboard" to the DMAN card. If any part of the daughterboard extends beyond the DMAN PC board boundaries you have put the board on backwards.
- 6. Following the instructions for Mechanical Installation, reinstall DMAN in your computer.

Once the daughterboard is installed, it will take MIDI data from the MPU401 section of DMAN. Choosing the DMAN MPU401 MIDI driver from your sequencing software (or MIDI Mapper) will direct MIDI output to the daughterboard. The same MIDI data will also appear at the DMAN MIDI Out connector.

Windows 3.1x Software

Driver and Utilities Installation

Included with DMAN is a set of Windows 3.1x Drivers and Applications diskettes which contain the Windows 3.1x drivers, Windows 3.1x utility applications, and DOS software utilities. The installation program on the first disk, SETUP.EXE, is run from Windows 3.1x and installs all the Windows and DOS software items. SETUP.EXE guides you through the installation process and assists in configuring the sound driver's parameters to match the DMAN hardware configuration. To install the Windows 3.1x drivers, Windows 3.1x utilities, and DOS utilities, please follow these steps:

- 1. Insert the Windows 3.1x installation Disk 1 into drive A: (or B:).
- 2. From within the Windows Program Manager, select the Run option from the File pull-down menu.
- 3. When prompted, type the drive, directory and name of the installation program to be run, for example:



- 4. Press the [ENTER] key or click on [OK]. The Setup program will now uncompress any files required for installation.
- 5. The DMAN files may be installed anywhere on your system. When prompted for a destination directory for your files (see diagram below), it is convenient to select the default of C:\MIDIMAN\DMAN as the directory. Then press the "Next>" button.





- 6. After you have selected the destination directory, the Setup program begins to copy the DMAN software there. As each software item is installed, its name is displayed. Also a percentage is displayed, indicating the percentage completion of the *total* installation.
- 7. Once all the files are installed from the first disk, Setup will prompt you for Disk 2. Remove Disk 1, insert Disk 2 and continue the installation by pressing the [ENTER] key. File installation will continue until the Setup program is ready to do its hardware configuration.



8. If your system *does not* have a PnP BIOS, you will be required to set the DMAN Windows driver parameters manually. Otherwise, if your system *does* have a PnP BIOS, skip this step.

<u>IMPORTANT</u>: Most sound card installation problems result from attempting to use system resources (address locations, IRQs and DMAs) already in use by other hardware or software in the system. See the "Troubleshooting" section for typical settings and conflicts.

After all files are installed, the configuration dialog is displayed for non-PnP systems. The default driver

configuration settings depicted below are typical settings. Yours may differ.

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Configuration Screen

This dialog allows you to set the following parameters:

WSS Address - This is the base address of the Windows Sound System controller (basically the controller for the D/A and A/D converters). Changing this Windows WSS setting will also change the related DOS WSS setting.

WSS Interrupt - This is the playback/capture IRQ used by the WSS controller. Changing this setting will also change the related DOS WSS setting.

WSS DMA Playback - This is the DMA channel used during playback through the WSS D/A converter. In order to use the full-duplex mode of operation (simultaneous playback/record), this DMA channel must differ from the WSS DMA capture channel. Changing this setting will also change the related DOS WSS setting.

WSS DMA Capture - This is the DMA channel used during capture (recording) through the WSS A/D converter. In order to use the full-duplex mode of operation (simultaneous playback and record), this DMA channel must differ from the WSS DMA playback channel. Changing this setting will also change the related DOS WSS setting.

MPU401 - This checkbox enables/disables the MPU401 compatible MIDI port on the DMAN. If desired, the MPU401 base address and IRQ may be changed later (see Windows 3.1x Driver Control Panel section).

CD ROM - DMAN does not include a CD ROM interface. This checkbox should be unchecked to disable CD ROM support.

FM Synthesis - Although the driver may support an FM synthesizer, there is no true FM synthesizer installed on the DMAN board. Ignore this field.

Game Port - DMAN does not include a Game Port. This checkbox should be unchecked to disable Game Port support.

SB Pro Address - DMAN emulates the digital audio portion of a Sound Blaster Pro card (however, it lacks the FM synthesizer present on SB Pro boards). You may have limited luck playing digital audio through the DMAN from DOS games supporting the SB Pro. This address applies to DOS applications only.

9. Setup creates a new Program Manager Group, Midiman Audio, which includes applications for controlling the DMAN input and output audio mixes, recording/playing DMAN inputs/outputs, and testing the card's .WAV file output.



- 10. In the background, Setup modifies your AUTOEXEC.BAT and CONFIG.SYS files. It inserts the board initialization utility CS4232C.EXE in CONFIG.SYS and also adds a CS32MIX.EXE call to AUTOEXEC.BAT, which initializes the DMAN audio mixer on bootup.
- 11. When Setup is complete, you are prompted to exit Windows and reboot the system; Setup changes will take effect only when the machine is rebooted and Windows is restarted. Upon re-entering Windows, you should hear the "Tah Dah" sound (or any other sound assigned to *Windows Startup* in the Windows Control Panel) -- if not, turn to the "Troubleshooting" section.

Windows 3.1x Driver Control Panel

After installation, various Windows 3.1x driver parameters may be altered via the *Drivers* applet of the Control Panel. To open the *Drivers* applet, first open the Control Panel (usually in the Windows 3.1x Main group), then open the *Drivers* applet from within the Control Panel. The DMAN actually installs and uses two separate drivers for its digital audio and MIDI. The "**DMAN Digital Audio** / **Mixer Driver**" handles the digital audio recording and playback, as well as the on-board audio mixer. The "**DMAN MPU 401**" controls the MIDI port (MPU401 "UART" mode compatible). A typical Drivers dialog is pictured below.



Windows 3.1x Drivers Applet

Audio Setup for Non-PnP Computers

If your computer has no PnP capability, or PnP is disabled, you may modify the Windows 3.1x audio driver settings through the *Drivers* Applet. First you must select the driver to set up by highlighting "**DMAN Digital Audio** / **Mixer Driver**" entry, then press the "Setup" button. The driver setup dialog will pop up.

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Windows 3.1x Driver Setup - No PnP

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You now have the option of modifying the following resource settings:

Duplex - Duplex modes determine whether DMAN can support simultaneous playback and capture (recording). *Half* duplex allows both playback or capture, but not at the same time. Choose this option if your machine has low-performance or there is only one DMA channel available for use. *Full* duplex is the default for the Windows 3.1x drivers and provides simultaneous capture and playback of audio data at the same sample rate. *Enhanced* full duplex allows simultaneous capture and playback with any combination of 11, 22.05, or 44.1 kHz files (requires higher-performance CPUs).

I/O~Address - This is the base address of the WSS controller (basically the controller for the D/A and A/D converters). Changing this Windows WSS setting will also change the related DOS WSS setting.

DMA Channel - These are the DMA channels used for playback and capture of digital audio. In half duplex mode, these channels will be the same. For full and enhanced duplex modes, these must be set to different values.

IRQ - This is the playback/capture IRQ used by the WSS controller. Changing this setting will also change the related DOS WSS setting.

Audio Setup for Computers with PnP

If your computer has a PnP BIOS and it is enabled, you may modify some of the Windows 3.1x audio driver settings through the *Drivers* Applet. First you must select the driver to set up by highlighting the "**DMAN Digital Audio** / **Mixer Driver**" entry, then press the "Setup" button. The driver setup dialog below will pop up.



Windows 3.1x Driver Setup - With PnP

For PnP systems, the Base I/O address, IRQ, DMA playback and capture channels are all determined through the PnP mechanism. However, you may select the duplex mode from this dialog. For more information regarding duplex modes, see the "Audio Setup for Non-PnP Computers" section.

MIDI (MPU401) Setup

You may modify the Windows 3.1x MIDI driver settings through the *Drivers* Applet. First you must select the driver to set up by highlighting the "**DMAN MPU 401**" entry, then press the "Setup" button. The driver setup dialog below will pop up.

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Windows 3.1x MPU401 Driver Setup

You now have the option of modifying the following resource settings:

Port - This sets the Base I/O Address of the MPU401 device.

Interrupt - This sets the IRQ used by MPU401 MIDI input. The typical IRQ is 2/9. Note that IRQ 6 is also assigned to the floppy drive but in some cases may be shared with the MPU. Use IRQ 6 as a last resort.

Windows 3.1x Utility Applications

The DMAN Windows 3.1x setup program creates a Windows Group called *Midiman Audio* which contains several sound utilities. In this section we will discuss these applications through which you control sound within your system:

- The Audio Input Control Panel
- The Audio Mixer Control Panel
- The Audio Transport
- The Sound Check Application

Audio Input Control Panel

The Audio Input control panel lets you control the source, amplitude and quality of sound coming into your system. Clicking on the Audio Input icon nested in the Midiman Audio group will present you with the Audio Input Control Panel shown here.



Audio Input Controls

Buttons and control features of the Audio Input Control Panel are as follows:

About - The About button brings up a window describing the applet and its version.

Mixer - This button opens the Audio Mixer Control Panel application.

Save - The Save button saves the current control settings to be used as the *initial* settings when Windows is loaded.

OK - This button exits the Input Control Panel and keeps the current device settings for the duration of the current Windows session.

Cancel - This button exits the Input Control Panel and restores the device setting values which were present when it was opened.

Input Boost - The input boost slider control sets the gain on the input audio signal to the Analog/Digital converter (this is basically your recording level adjustment). The left and right channels may be controlled separately or together by clicking on the **Gang** box beneath the slider.

Volume Meter - The volume meter displays the amplitude of the signal being controlled by the input boost slider control when the **VU On** box beneath the meter is selected.

Input Selector - By clicking on any one of the four diamonds below the Input Selector lets you select the source of the input signal to be controlled (this selects the recording/capture source). Only one source may be selected at a time. The four selections are:

Synth - Selects the wavetable synthesizer as the input source to the A/D, if the optional wavetable synthesizer is installed.

Line $\,$ - Selects the Line Input jack as the input source to the A/D.

Loop - Selects the internal loop back as the input source to the A/D, feeding the output of the audio mixer back into the A/D. This provides a mechanism for recording a mix of the Mic, Synth, Line In, and Aux In signals simultaneously.

Mic - Selects the microphone as the input source to the A/D.

Boost - Clicking on the Boost box beneath the Mic diamond adds 20 dB additional gain to the microphone input. Use this only with microphones that require it to maintain a good recording level.

AGC - Clicking on the AGC box adds automatic gain control for the microphone, adjusting its input gain automatically and dynamically. **Dither** - Clicking on the Dither box toggles dither on/off for 8-bit PCM audio. Dither improves 8-bit recordings.

<u>IMPORTANT</u>: To enable AGC and the Volume Meter at the same time, you should first turn the "Vu On" checkbox off. Next, turn the AGC on, then turn the Vu On back on.

Full Scale - The Full Scale window below the Dither box shows the maximum allowable input level to the Analog/Digital converter.

V rms/dB - Clicking on the V rms/dB button toggles the Full Scale window between voltage and decibel modes.

Audio Mixer Control Panel

The Audio Mixer control panel gives you control of the amplitude and quality of the sound leaving your system. Clicking on the Audio Mixer icon nested in the Midiman Audio group will present you with the Audio Mixer control panel shown below.



Buttons and control features of the Audio Mixer Control Panel:

About - The About button brings up a dialog window describing this version of the audio mixer program.

Inputs - This button opens the Audio Input Control Panel application.

Save - The Save button saves the current control settings to be used as the *initial settings* when Windows is loaded.

OK - **Exits the Audio Mixer control panel and keeps the current** device settings for the duration of the current Windows session.

Cancel - This button exits the Input Control Panel and restores the device setting values which were present when it was opened.

Master Volume - Controls the master volume for all audio inputs. When the *Gang* box is checked, both left and right channels are adjusted in tandem. When it is unchecked the left and right channels may be independently adjusted. When the *Mute* box is checked, all DMAN outputs are muted.

Rec Monitor - Sets the monitor level of the current source being recorded; the monitor path mixes the input source back into the output path. When the *Mute* box is checked, record monitoring is disabled.

Wave Mix - The Wave Mix sliders control the left and right mix for outgoing digital audio. When the *Gang* box is checked, both left and right channels are adjusted in tandem. When it is unchecked the left and right channels may be independently adjusted. When the *Mute* box is checked, the DMAN digital audio outputs are muted.

Synth Mix - The Synth Mix sliders control the left and right mix for audio coming from an optional wavetable synthesizer daughterboard. When the *Gang* box is checked, both left and right channels are adjusted in tandem. When it is unchecked the left and right channels may be independently adjusted. When the *Mute* box is checked, the wavetable synthesizer is muted.

NOTE: The inside of the computer is a very noisy place and noise from other computer components may leak into any audio sound card! For best signal-to-noise performance, mute or turn down the mix levels of input devices not currently in use, especially the "Synth Mix" if no optional wavetable synthesizer daughterboard is installed on the DMAN.

Line Mix - The Line Mix sliders control the left and right mix for audio present at the DMAN's Line In jack. When the *Gang* box is checked, both left and right channels are adjusted in tandem. When it is unchecked the left and right channels may be independently adjusted. When the *Mute* box is checked, the audio from the DMAN Line In jack is muted.

Aux Mix - The Aux Mix sliders control the left and right mix for audio present at the DMAN's Aux In jack. When the *Gang* box is checked, both left and right channels are adjusted in tandem. When it is unchecked the left and right channels may be

independently adjusted. When the *Mute* box is checked, the audio from the DMAN Aux In jack is muted.

The Audio Transport

The Audio Transport application allows you to record and playback digital audio files. Clicking on the Audio Transport icon nested in the Midiman Audio group will present you with the Audio Transport shown here. This section describes the buttons, controls, and displays on the Audio Transport control panel.



The left-side buttons of the Audio Transport Control Panel are:



Open File - Selects a file to play, or opens a new audio file for recording. It displays a Windows file open dialog box.



Access Audio Inputs - Opens the Audio Input Control panel.



Clipboard - Copies the current file to the Windows clipboard, from which the audio file can be placed into other applications.



User-defined - Goes to the application or utility of your choice. See "The User-defined Audio Transport Button" later in this chapter for instructions on how to define this button.

- 1

About - Displays the Audio Transport application information.

The Audio Transport control buttons are similar to those on a tape recorder:



From left to right, these buttons are:

Play - Plays the selected audio file.

Stop - Stops playback of the selected audio file.

Pause - Pauses play.

Record - Starts recording the selected audio file.

Beginning - Goes to the beginning of the selected audio file.

Rewind - Goes backwards in the selected audio file until it reaches the beginning of the file or until you stop the rewind.

Fast Forward - Goes forward in the selected audio file until it reaches the end of the file or until you stop the fast forward.

End - Goes to the end of the selected audio file.

The display areas of the Audio Transport are shown below:

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Audio Transport Displays

Their meanings are as follows (clockwise from upper right):

File Format Information - Displays the file audio format including: sample rate, encoding, stereo/mono, number of bits, and total length (in time) for the selected file.

Time Counter - Displays the current position (in time) in the file.

Current File Display - After you select a file with the *open file* command, the selected file is displayed in this window. When a dot is displayed in the WP box, you can overwrite the data in the file. When a dot is not displayed, the file is

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write protected and you cannot overwrite new data onto this file. Click on this box to toggle between write protection on/off.

Defining a New Audio File

When you select the open file button and specify a new audio file by entering a new filename, the Select Tape Format dialog box appears, allowing you to select the attributes of the new audio file. This section describes the file attribute options. Refer to "Select Tape Format Dialog Box" diagram below.

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Select Tape Format Dialog Box

The formatting you select depends upon what you are recording and your personal preferences. Higher quality recordings require more disk space; lower quality recordings require less disk space. If you are recording voice input, a lower quality recording generally plays back with acceptable quality. If you are recording high-fidelity input and desire the highest quality recording, select the highest quality recording attributes that your disk storage space can support.

With experience, you will learn what attributes best suit your recording needs. Refer to "Audio Formats" section for the disk space requirements of some typical recording formats. The following are descriptions of each field in the Select Tape Format dialog box:

Format - Selects the type of formatting to use during recording.

PCM - PCM is uncompressed audio and provides the best sound quality. It also consumes the most disk space.

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ADPCM - Provides 4:1 compression compared to 16-bit PCM format. The compression means this format uses less disk space but causes degradation in playback quality.

m-Law - Provides 2:1 compression compared to PCM format.

A-Law - Provides 2:1 compression compared to PCM format.

Channels - Mono requires half the disk storage space as stereo, and usually provides sufficient quality for voice recordings.

Sample Rate (kHz) - Higher sample rates provide better sound quality and require more disk storage space. Typical sample rates are 11.025 kHz (for voice), 22.05 kHz (for medium-fidelity), and 44.1 kHz (for high-fidelity CD quality recording). 48 kHz is what some professional digital recording systems use and offers the best fidelity of all, although only a marginal amount better than using a 44.1 kHz sample rate.

Bits - Determines the resolution of the data. The higher the resolution, the better the sound quality. Select 16-bit for higher quality recording. Recording in 8-bit format can sometimes cause distortion – or a hissing sound – during playback. The Dither option in the Audio Input Control panel may help reduce distortion caused by 8-bit recording.

The User-defined Audio Transport Button

The factory default application that runs when you press the user-defined Audio Transport button is the Windows NOTEPAD. To define some other application or utility to start up when you click the user-defined Audio Transport button, follow these steps:

- 1. Open the CSACBAT1.INI file (located in \Windows) with the DOS edit program, the Windows Notepad, or any other text processing program.
- 2. Under the [APPLETS] category, insert the following lines:

UserAppPath=pathname UserApp=filename

Where *pathname* is the path (drive and directory) of the application file, and *filename* is the name of the file to run.

3. Save and close the CSACBAT1.INI file.

The following is an example of the command lines in the CSACBAT1.INI file that would cause Windows Write to start up when you select the user-defined button:

[APPLETS] UserAppPath=C:\Windows UserApp=write.exe

Another good use of the button would be to run a .WAV file editor.

Sound Check Application

The Sound Check application verifies proper operation of digital audio playback. When executed, the application displays the following panel and plays back a short digital audio music bite.



The test audio should be high-quality 16-bit stereo at 44.1 kHz sampling frequency.



Driver Installation

Included with the DMAN is a Windows 95 diskette which contains the Windows 95 drivers and DOS software utilities. To install the Windows 95 drivers and DOS utilities, please follow these steps:

- 1. Previous sound card installations can interfere with the proper function of your new hardware. Consult the documentation for your previous soundcard, and remove all related driver software from the system prior to installing your new hardware.
- 2. After installation of the DMAN hardware, boot your system and start Windows 95. During the Windows 95 boot procedure, new hardware (DMAN!) will be automatically detected as shown here.



Windows 95 New Hardware Detection

- 3. Click OK to install the DMAN driver software from floppy.
- 4. When prompted for the Windows '95 Driver Disk, place it into the A: drive and click OK.



Windows 95 Installation Prompt Dialog Box

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- 5. While installing the Windows 95 drivers, the installer program also modifies your AUTOEXEC.BAT and CONFIG.SYS files. It inserts the board initialization utility CS4232C.EXE in CONFIG.SYS and also adds a CS32MIX.EXE call to AUTOEXEC.BAT, which initializes the DMAN audio mixer on bootup.
- 6. After completion of the driver installation, if your system has no PnP or PnP is disabled, Windows 95 will require you to restart Windows 95. If it does request a restart, remove the floppy disk from drive A: and respond "yes." The system will restart and your DMAN is ready for play!
- 7. If PnP *is* enabled and installation completes without any conflicts, the DMAN is ready for immediate use.

Windows 95 Driver Configuration

Windows 95 displays the DMAN driver status in the Device Manager page of the System Properties dialog box. The Systems Properties dialog is opened via the Windows 95 Start button. Select 'Settings, Control Panel' to open the Windows 95 Control Panel. Then select 'System' from the Control Panel to open the System Properties dialog. Below is an example view of the Device Manager device list.



System Properties - Device Manager



This example shows the Midiman DMAN and Midiman WINMAN 4x4/S (another Midiman product) entries in the Windows 95 Device Manager device list. The DMAN is properly installed with no conflicts. The WINMAN 4x4/S, however, is not properly installed and this is indicated by the exclamation point overlapping its icon. If an exclamation point is ever displayed for the Midiman DMAN, you may go into the Device Manager and manually make the adjustments necessary to get DMAN up and running. This should rarely be required and usually is the result of a non-PnP device being installed in the computer and conflicting with various PnP devices.

By double-clicking on the DMAN item with the problem, you will open up a properties sheet for that device. Selecting the *Settings* and *Resources* pages from within the properties sheet will allow you to manually adjust the DMAN resource settings.

NOTE: When resolving conflicts between PnP and non-PnP devices, it is usually easier to readjust the resource settings of the non-PnP device first. Windows 95 is only aware of the resource settings of the installed PnP devices and has no information available to it for adjusting the PnP devices around the non-PnP devices. The exception to this is when a non-PnP device has a true Windows 95 driver written for it; in that case Windows 95 is aware of the non-PnP device's resource requirements.

Windows 95 Mixer (WSS Mixer)

The DMAN audio playback and recording mixes are handled by the Windows Sound System mixer that ships with Windows 95. With the DMAN drivers properly installed, you should see a loudspeaker icon on the Windows 95 taskbar. Double clicking this loudspeaker icon accesses the WSS mixer. (Single clicks will access the Master Out volume only). An alternate method for opening the WSS mixer is to select '*Programs, Accessories, Multimedia, Volume Control*' via the Windows 95 Start button.

WSS Playback (Master Out) Mixer

The WSS playback mixer provides control over the output volume levels, mute states, and balances for audio playback. The Master Out (output) mixer is the default mixer when accessing the volume control. To use the mixer, simply drag the desired

controls with your mouse, or click on the Mute checkbox(es) to mute device(s).

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WSS Playback Mixer Window

WSS Properties Page

You may configure the playback window to display or not display the various DMAN output devices. To do so, select *Options, Properties* from the Master Out menu. The Properties dialog box will then pop up, as shown below.



WSS Audio Mixer Properties Dialog Box

In this case the Playback mixer has been selected by default when entering this window. The lower part of the window lists the devices that may be displayed/controlled by the playback mixer. If you do not want one or more of the devices to show up in the mixer window, uncheck the box for that specific device. By the way, PC Speaker does not apply to the DMAN and should be unchecked. Then select OK.



Note also that this dialog box is used to switch between playback and recording displays. Under "Adjust Volume For:", click on the radio button of the mixer you desire. Click the Recording button with the left mouse button to bring up the recording mixer. Shown are the devices that are allowed as inputs to the recording mixer. Again, unchecking a specific box will eliminate that device from the input mixer window, known as the "Wave Input" window. The "Wave Input" window is accessed when the "OK" button is clicked.

WSS Recording (Wave Input) Mixer

The WSS recording mixer controls the volume and balance of each DMAN input. One input at a time may be selected for recording by checking the "Select" box below the desired device. Here, the Line input has been chosen as the input device.



WSS Audio Input Mixer

The Mix Out input is a special input to the recording device; it is used to record the combination of sounds present at the DMAN Main Out. The relative mixes of the devices to be recorded is determined by the WSS playback mixer settings. Mix Out is the only way to record from the Aux In input to the DMAN board. It is much more convenient to record the Line In since it has its own record path into the DMAN.

The recording mixer pictured above has advanced controls disabled. Advanced controls for the microphone may be enabled by selecting 'Options, Advanced Controls' from the Wave Input menu. The "Advanced" button now appears in the Microphone

panel of the Wave Input mixer shown below. To access the microphone's advanced controls, click on the Advanced button.

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WSS Audio Input Mixer w/ Advanced Controls

The figure below shows advanced options available for microphone control. Although there are no Tone Controls on DMAN, the microphone does have a 20 dB gain boost block that may be enabled or disabled via this dialog box.

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Advanced Controls for Mic

Windows Sound Recorder

Windows 95 provides a mechanism for audio playback and recording using the Windows sound recorder. Select 'Start, *Programs, Accessories, Multimedia, Sound Recorder*' to bring up the sound recorder. make sure you select the input recording device from the Wave Input control panel also. The recorder comes with buttons to rewind, fast forward, play, stop and record.

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Win 95 Sound Recorder Applet

Additional features from the pull down menus include volume and speed adjustment, echo and reverse effects, and audio file insertion, mixing and sound quality conversion.



DOS Software Utilities

The DMAN DOS software utilities are installed as a part of the Windows 3.1x drivers and utilities, or the Windows 95 drivers.

IMPORTANT: The DOS utility programs must be run from the native DOS prompt, not from within Windows. For Windows 95 users, this means you should choose "Shutdown" from the Windows 95 *Start* menu and then select "Restart in MS-DOS mode" before running the DOS utilities. Windows 3.1x users should simply exit Windows to DOS before running the DOS utilities.

After installation of the Windows 3.1x drivers, you will find the DOS software utilities in the directory selected during installation (default is C:\MIDIMAN\DMAN). If installed with the Windows 95 drivers, the DOS software utilities will reside in the Windows 95 directory (C:\WINDOWS, on most systems).

DMAN Diagnostics Utility

As part of the DMAN Windows 3.1x or Windows 95 installation, the diagnostic program CS32DIAG.EXE is installed on your hard disk. This program runs a series of tests that you can use to verify proper DMAN operation. Once at the DOS prompt, take the following steps to run the DOS diagnostics program:

- 1. From the native DOS prompt, change to the subdirectory containing CS32DIAG.EXE on your hard drive by using the DOS "CD" (Change Directory) command. On a Windows 3.1x system, this will usually be "CD C:\MIDIMAN\DMAN" if you chose the default directory during installation. On a Windows 95 system, this will be "CD C:\WINDOWS" assuming that this is your Windows directory.
- 2. Type **CS32DIAG** and press the [ENTER] key. The DOS diagnostic software will now execute.

Diagnostics Parameters Box

The info box that is now in the center of your diagnostic screen displays hardware communication parameters for the DMA Channel, IRQ, and I/O address. These parameters will be used by the diagnostics program to check for proper installation/operation of your DMAN.

Diagnostics Test Box

Select the associated test button to test each option. The status of each test is displayed to the left of each test button. A "fail" result does not necessarily mean a sound card hardware failure. For instance, the DMAN does not have the FM synth or joystick port features which are included in the test. These tests will fail simply because these features are not present. If the diagnostic program accesses the hardware using the communication parameters listed the test will be graded "Fail".

<u>IMPORTANT</u>: When running CS32DIAG.EXE, the FM Synth and Joystick tests will fail because there is no joystick or FM synth hardware on DMAN. These failures *do not* mean that there is anything wrong with DMAN.

If you encounter any problems while running diagnostics or during normal DOS operations at a later date, refer to the "DOS Troubleshooting" section.

DMAN DOS Mixer Utility

As part of the DMAN Windows 3.1x or Windows 95 installation, the DOS sound mixer program CS32MIX.EXE is installed on your hard disk. This program is a DOS graphical interface and command line mixer utility that controls the same features as the Windows sound mixer utility. The program may also be run as a command line, with arguments, from the DOS prompt or in a DOS batch file. In fact, the DMAN Windows software installation will place a CS32MIX command in your AUTOEXEC.BAT file that is run at boot time to initialize the mix levels of your DMAN.

To run the program as a graphical interface, type **CS32DIAG** and press the [ENTER] key. The Mixer is then displayed in a graphical form that is controlled by the keyboard or mouse (if the mouse driver is installed.)

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DOS Sound Card Mixer

The easiest way to control the sound parameters is with a mouse. Simply drag the solid black "sliders" to their desired positions and click on the Line, Mic, and Aux "checkboxes" to select the input source. The various parameters may also be controlled by using hot keys (Alt + highlighted letter), and the tab and arrow keys to increase/decrease left/right channels for each input. Tab to the **Gang** option and press the spacebar to toggle off (unchecked); allowing the left and right channels to be adjusted separately. The **Default** button will reset inputs to the system default settings. The **Save** button will save the current mixer settings as the default system startup values. Settings are retained until the next time you change and save the settings. For temporary changes, the OK button will retain current changes for the duration of the current Windows session.

To use the DOS Mixer in command line mode, enter **CS32MIX** followed by one or more command line flags. Typing **CS32MIX** /? at the DOS prompt, followed by the [Enter] key, will display the command line flags available to you. The following options are available:

/M= (left), (right)	<0-15>	; Master Volume
/W= (left), (right)	<0-15>	; Wave Volume
/L= (left), (right)	<0-15>	; Line Volume
/X= (mono)	<0-7>	; Mic Volume
/F= (left), (right)	<0-15>	; Synth Volume
/C = (left), (right)	<0-15>	; Aux Volume
/I = (L, X or C)		; Input Select =Line, Mic or Aux
/D		; Use Default values
/S		; Show mixer settings

For example, to change the master volume by the same amount for both channels enter CS32MIX /M=8,8 or CS32MIX /M=8 at the DOS prompt.

DMAN with 3rd Party Applications

Sooner or later you will want to use DMAN with some of the advanced 3rd party applications currently available. It is with these applications that the DMAN becomes a true multi-track digital audio recording tool. Although there are various setup parameters built into Windows for selecting audio quality, etc., the 3rd party applications usually work around those settings.

<u>IMPORTANT</u>: 3rd party digital audio recording software often bypasses the general Windows settings and instead has its own means of setting up the DMAN record/playback sample rate, format, full- and half-duplex settings.

For example, you often select the sampling rate (22 kHz, 44.1 kHz, and even 48 kHz on some products) and format (16-bit stereo, 8-bit mono, etc.) directly from within that application. However, you usually select the recording source (Mic, Line In, Synth In, Mix In) from the mixer application supplied with Windows 95 (or the input mixer application we install in Windows 3.1).

In addition, the application may require you to explicitly select the audio device by name for the application to use. This also goes for MIDI applications -- they will require you to select the DMAN MPU401 device as the MIDI input/output device.

Please consult the user's manual that shipped with your 3rd party application for more specific information regarding its audio and MIDI configuration and setup.

Audio Formats

DMAN supports recording and playback in many audio formats. When selecting an audio format, you are usually trading off sound quality versus the amount of disk space the recorded audio will consume. In general, sound quality increases as the Sample Rate increases, as the number of bits used increases, as stereo is used instead of mono, and when the audio is not compressed (i.e., its format is PCM not ADPCM or A-Law). Sample Rate is the parameter most directly related to frequency response and should be chosen carefully (unless you have unlimited disk space available!). Choose a sample rate that is at least twice the frequency (this is called the Nyquist value) of the highest audio frequencies you want to record. For example, if your source material has a frequency range of 30 Hz to 10 kHz, you can record at a sample rate of 22 kHz. Increasing to 44.1 kHz is unlikely to improve the audio quality and it will take twice as much disk space to store the file. Below is a table of commonly used audio formats and the applications they are best suited for.

Hard-Disk Space Requirements for Typical Audio Formats					
Format	Channels	Sample Rate	Bits	Disk Space per Minute	Typical Use
РСМ	Stereo	48 kHz	16	11 MB	High-fidelity music - Pro quality
РСМ	Stereo	44.1 kHz	16	10 MB	High-fidelity music - CD quality
РСМ	Mono	44.1 kHz	16	5 MB	High-fidelity music - Mono CD quality
ADPCM	Stereo	44.1 kHz	4	2.5 MB	Music
ADPCM	Stereo	11 kHz	4	660 KB	Voice (mono is recommended)
ADPCM	Mono	11 kHz	4	330 KB	Voice

Disk Space Requirements for Typical Recording Formats

Troubleshooting

This section addresses potential problems that can occur in all operating system environments, with emphasis on hardware troubleshooting. Within the PC environment there is a limited number of hardware resources (addresses, IRQs, and DMA channels) available for use. Since audio cards require many resources, most audio card installation problems arise from improperly set IRQ and DMA values. The tables below list the IRQ and DMA channel assignments normally used in the PC environment. When you experience problems that indicate a resource conflict, you can compare the IRQ and DMA channels shown in the tables below with your current parameters, as listed in the Configuration screen.

Typical IRQ Assignments		
Interrupt	IBM PC Assigns This Interrupt To:	
IRQ2/9	Available	
IRQ3	COM2: Second Serial Port	
IRQ4	COM1: First Serial Port	
IRQ5	LPT2: Second Parallel Printer Port, usually available	
IRQ6	Floppy Disk Controller	
IRQ7	LPT1: 1st Parallel Printer Port, usually available	
IRQ8	Real Time Clock	
IRQ10	Available	
IRQ11	Available	
IRQ12	Pointing Device (PS/2 or bus type Mouse)	
IRQ13	Math Co-processor	
IRQ14	Hard Disk Controller	
IRQ15	Second Hard Disk Controller, usually available	

Typical DMA Assignments		
DMA Channel	IBM PC Assigns This Channel To:	
0	Available	
1	Available	
2	Floppy Disk	
3	Available	
4 (16-bit)	Hard Disk DMAN unable to use this channel.	
5 (16-bit)	DMAN unable to use this channel.	
6 (16-bit)	DMAN unable to use this channel.	
7 (16-bit)	DMAN unable to use this channel.	

Problem: No Sound. **Possible Cause 1:** Volume control adjustment. There are two volume controls that affect the sound level of each audio device (Mix Level and Master Volume) -- make sure neither is set too low.

Possible Cause 2: Improper connections of the audio accessories. Verify that the Line Out is properly connected to a headset or external mixer/amplifier. Also check your audio source and verify that its levels

are turned up and it is properly connected to DMAN. **Possible Cause 3**: There is a resource conflict with one or more other devices in your computer. This is more evident during the recording and playback of digital audio rather than the Line In, Mic In, and Aux In. Check the DMAN configuration (address, IRQ, and DMA channel(s)) against those of the other devices on your computer. If necessary, change the settings for the one or more of the devices.

Problem: Cannot Play/Cannot Capture Digital Audio. **Possible Cause:** DMA Channel conflict. Check that no other devices in your system are attempting to use the same DMA channel(s) as DMAN. Change DMA channels. You might also switch to half duplex mode, which requires a single DMA channel. If the condition subsides you will wave which DMA channel uses in conflict know which DMA channel was in conflict.

Problem: No visual activity on Audio Input volume (VU) meter. **Possible Cause 1:** Wrong input (mic, line, synth, loop) selected. Possible Cause 2: DMA Channel conflict. See above.

Problem: Repetitious Sound.

Possible Cause: Wrong IRQ. Often this will result in a small segment of sound (0.5 to 1 second) repeating itself over and over, sometimes completely locking up the computer. If this problem occurs in Windows, open the driver configuration dialog box and set the IRQ to match the current DMAN setting. If this problem is in DOS, reconfigure the IRQ in the DOS application itself to match that of DMAN.

DOS Troubleshooting

When you run DMAN DOS-based diagnostics application, each test passes or fails on the basis of meeting two criteria. Each test checks that DMAN can be contacted at the parameter in question, and also pauses for a period of time to ensure that no IRQ, DMA request, etc. is initiated by a device other than DMAN. Failing to reach DMAN or detecting the signal from another device will cause the test to fail.

To fix communication conflicts, you may need to edit the initialization file CS4232.INI which resides in the same directory as the other DMAN DOS applications. This is usually C:\MIDIMAN\DMAN if you chose the default during installation. CS4232.INI is a text file that may be edited manually using a text editor such as DOS's EDIT.COM or Windows' NOTEPAD.EXE. If you change any parameters in the CS4232.INI file you will need to run CS4232C.EXE located in that same directory. Running CS4232C.EXE will reconfigure DMAN to the changed settings.

IMPORTANT: The CS4232.INI file only affects non-PnP systems. Systems with PnP ignore the CS4232.INI file and automatically configure the devices in the system to what it believes are available addresses, IRQs, and DMA channels. In this PnP case, you will have better luck modifying the settings of the non-PnP (older ISA cards) devices to not clash with the DMAN settings.

The following settings may be edited in the CS4232.INI file:

SndBlstr Port Address: If the SndBlstr (Sound Blaster) test fails, you may have a port address conflict. Usually this will only happen if another Sound Blaster compatible card is installed in the computer. Change the SB Port Address setting indicated by the "SbIO=" line in the [PNP] section. Set it to either 220, 230 or 240.

SndBlstr Interrupt: If the SndBlstr (Sound Blaster) test fails, you may have an interrupt (IRQ) conflict. Change the line "WSSInt=" in the [PNP] section in the CS4232.INI file. Set it to 5,7,9,11,12 or 15.

SndBlstr DMA Channel Conflict: If the SndBlstr (Sound Blaster) fails, you may have a DMA playback channel conflict. Change the DMA playback channel setting in the CS4232.INI file. This is

specified in the "WssDmaPlay=" line of the [PNP] section. Possible settings are 0,1,3.

<u>NOTE</u>: Sound Blaster and WSS share the same interrupt and playback DMA channel. Therefore, a conflict error with SB will also affect WSS configuration settings.

CODEC Port Address: If the CODEC test fails, you may have a port address conflict. Change the I/O Port Address that the application is using to communicate with the sound card by changing the "WssIO=" line in the CS4232.INI file. Set it to 534, 608, E84 or F44.

CODEC Interrupt: If the CODEC test fails, you may have an interrupt (IRQ) conflict. Change the interrupt setting used to communicate with your sound card. The interrupt is set by the line "WssInt=" in the CS4232.INI file. Set it to 5,7,9,11,12 or 15.

CODEC DMA Channel Conflict: If the CODEC test fails, you may have a DMA capture or playback channel conflict. Change the DMA Capture or Playback Channel settings in the CS4232.INI file, which are specified in the "WssDmaCapture=" and "WssDmaPlay=" lines of the [PNP] section. Possible settings are 0,1 and 3. Set both to the same value for half-duplex operation and to different values for full-duplex.

MPU401 Port Address: If the MPU401 test fails, you may have a port address conflict. Change the I/O Port Address that the application is using to communicate with DMAN by changing the "MPU401IO=" line in the CS4232.INI file. Set it to 300, 320, 332, 338, 340 or 360. This value may have to be adjusted to match the acceptable values in the Windows 3.1x MPU401 driver.

MPU401 Interrupt: If the MPU401 test fails, you may have an interrupt (IRQ) conflict. Change the interrupt setting used to communicate with the MPU401 port. The interrupt is set by the line "MPU401Int=" in the CS4232.INI file. Set it to 5,7,9 or 11.

Windows 3.1x Troubleshooting

Problem: When starting Windows, you receive error messages such as "VSNDSYS.386 Not Found" or "CS32BA11.DRV Not Loaded". **Possible Cause 1**: Your DMAN Windows driver is not completely

Possible Cause 1: Your DMAN Windows driver is not completely installed or has been removed. Install/reinstall the DMAN audio drivers (see Windows 3.1x Software section). **Possible Cause 2:** You are experiencing a driver or resource conflict. If

Possible Cause 2 You are experiencing a driver or resource conflict. If you install the driver for some other sound card instead of the DMAN Windows drivers, or if more than one sound driver (e.g., *Creative Labs Sound Blaster 1.0/1.5* or *Media Vision Thunder Board*) is loaded in Windows, a conflict may arise. To solve this problem, you should remove all unnecessary drivers, and install/reinstall the DMAN audio drivers (see Windows 3.1x Software section).

drivers (see Windows 3.1x Software section). **Possible Cause 3:** Your Windows 3.1x driver settings do not match those of the DMAN hardware and must be changed to match those of the hardware.

Problem: The Windows Media Player does not play MIDI through the DMAN MIDI port or to the optional wavetable synthesizer daughterboard.

Possible Cause 1: The Windows MIDI Mapper is not configured to drive the DMAN MIDI (MPU401) port. Open the Windows Control Panel, then open the MIDI Mapper. Select the setup named "DMAN MIDI Port".

Possible Cause 2: The DMAN MIDI driver is not properly installed. The MIDI Mapper icon does not appear in the Windows Control Panel, then the DMAN MIDI driver is probably not installed at all. Install/reinstall all DMAN audio drivers (see Windows 3.1x Software section).

Possible Cause 3 The DMAN MIDI (MPU401) driver settings do not match those of the DMAN hardware and must be changed to match those of the hardware.

Problem: A 3rd party Windows digital audio program does not play or record to/from DMAN.

Possible Cause 1: The DMAN Audio driver is not properly installed. Install/reinstall all DMAN audio drivers (see Windows 3.1x Software section).

Possible Cause 2: You have not selected the DMAN audio driver from your application. Many 3rd party applications require you to select a specific driver (because there can be more than one in an advanced system) for use with the application. Select the driver named "DMAN Audio Device Driver" as your audio driver. The manner in which this selection is made is dependent on the application (each one is a little different).

Problem: A 3rd party Windows MIDI program does not play or record MIDI to/from DMAN. **Possible Cause 1:** You have not installed an optional wavetable synthesizer daughterboard or you do not have a MIDI keyboard or sound module attached to the MIDI interface adapter cable. **Possible Cause 2:** The DMAN MIDI driver is not properly installed. Install/reinstall all DMAN audio drivers (see Windows 3.1x Software section)

section).

Section). **Possible Cause 3**: You have not selected the DMAN MIDI driver from your application. Many 3rd party applications require you to select a specific MIDI driver (because there can be more than one in an advanced system) for use with the application. Select the driver named "Midiman DMAN MPU401" as your MIDI driver. The manner in which this selection is made is dependent on the application (each one is a little difforent) different).

Windows 95 Troubleshooting

If the installation has not been successful or if Windows '95 cannot resolve one or more hardware resource conflicts, the devices affected will be highlighted (note the exclamation mark in the icon) in the Device Manager page as discussed in the "System Properties - Device Manager" section of this manual. In theory, this should never happen in a fully-compliant, Plug & Play (PnP) system. However, there are a couple of circumstances in which it may:

- 1. There are not enough IRQs and/or DMA channels available in the system to support all the installed hardware.
- 2. Some legacy devices (older ISA cards that are not PnP compliant) may exist in the system. Because the PnP BIOS has difficulty in identifying and configuring these legacy devices, it cannot adequately configure and resolve conflicts between the PnP and non-PnP devices.

In (1) above, you usually have no choice but to remove one or more cards from the system. DMAN offers the PnP system some alternatives when resources are low. One is to run the digital audio in half-duplex mode instead of full-duplex. This reduces the DMAN DMA channel requirements from two channels to one. Also, the MPU401 device IRQ may be disabled. In this case you will lose your ability to receive MIDI input, but you may still use the MIDI output for playback.

In (2) above, you will need to do some detective work to find out where the conflicts are taking place, then modify the driver settings for the conflicting device. Double-clicking on the highlighted device will give more details as to the problem encountered. See the section on Windows 95 Driver Configuration for more information on this topic.

Problem: Can open the Windows 95 WSS record mixer but can't find the playback mixer or vice-versa. **Possible Cause**: Change between the two by selecting "Options,

Possible Cause: Change between the two by selecting "Options, Properties" from the mixer's menu. See the section on Windows 95 Mixer for more specific information.

Possible Cause 1: The DMAN Audio driver is not properly installed. Install/reinstall all DMAN audio drivers (see Windows 95 Software section).

Possible Cause 2: You have not selected the DMAN audio driver from your application. Many 3rd party applications require you to select a

Problem: A 3rd party Windows digital audio program does not play or record to/from the DMAN.

specific driver (because there can be more than one in an advanced system) for use with the application. Select the driver named "DMAN Audio Device Driver" as your audio driver. The manner in which this selection is made is dependent on the application (each one is a little different).

Problem: A 3rd party Windows MIDI program does not play or record MIDI to/DMAN.

Possible Cause 1: You have not installed an optional wavetable synthesizer daughterboard, or you do not have a MIDI keyboard or sound module attached to the MIDI interface adapter cable.

Possible Cause 2: The DMAN MIDI driver is not properly installed. Install/reinstall all DMAN audio drivers (see Windows 95 Software section).

Possible Cause 3: You have not selected the DMAN MIDI driver from your application. Many 3rd party applications require you to select a specific MIDI driver (because there can be more than one in an advanced system) for use with the application. Select the driver named "Midiman DMAN MPU401" as your MIDI driver. The manner in which this selection is made is dependent on the application (each one is a little different).

Problem: I'm getting some pops and clicks in my audio recording **Possible Solution**: Many accelerated graphics cards use enough system resources that the recording buffer can't keep up with demand. This can cause clicks in the recording. This is a software level problem, but can often be solved by turning off the graphics acceleration features of the graphics card. In Windows 95, this is accessed from Settings/Control Panel/System/Performance/Graphics (see figures below).

Put Figure POPS1.TIFF here

Put Figure POPS2.TIFF here

Appendix - Technical Specs

Channel Volume Controls

Over a range of 64 dB:	
Stereo Master Volume:	64 steps range
Stereo Aux In:	32 steps range
Stereo Line in:	32 steps range
Stereo Digital Audio:	64 steps range
Stereo Synth In:	32 steps range
Mono Mic-in:	32 steps range

External Audio Inputs

Mic Input	Level:	10 mV to 200 mV p-p max
-	Impedance:	600k ohms or 20k ohms
	Power supplied:	2.5V at 1 ma
Line Input	Level:	2 V rms max
•	Impedance:	10k ohms
Aux Input	Level:	2 V rms max
-	Impedance:	10k ohms

External Audio Outputs

Output Type:	Combined line/headphone out	t
Output Level:	Line output/headphone:	1.5 V rms
Load Impedance:	Line output:	32 ohms
Frequency Response:	20 Hz - 20 kHz (± 3 dB)	
Dynamic Range:	80 dB, typical 85 dB	
Signal to Noise Ratio (SNR):	Line output: >80 dB	
Total Harmonic Distortion (THD):	Line output: <0.015% @ 1 kF	Iz
Channel Separation:	> 65 dB	

Board Configuration

IRQ:	5,7,9,11,12,15
DMA:	0, 1, 3
CODEC Base Address:	120H - 3FCH in 4-byte increments
MPU401 Base Address:	330H - 360H in 8-byte increments

Limited Lifetime Warranty

MIDIMAN warrants that this product is free of defects in materials and workmanship under normal use so long as the product is: owned by the original purchaser; the original purchaser has proof of purchase from an authorized MIDIMAN dealer; and the purchaser has registered his/her ownership of the product by sending in the completed warranty card.

This warranty explicitly excludes power supplies any included cables which may become defective as a result of normal wear and tear.

In the event that MIDIMAN receives written notice of defects in materials or workmanship from such an original purchaser, MIDIMAN will either replace the product, repair the product, or refund the purchase price at its option. In the event any repair is required, shipment to and from MIDIMAN and a nominal handling charge shall be born by the purchaser. In the event that repair is required, a Return Authorization number must be obtained from MIDIMAN. After this number is obtained, the unit should be shipped back to MIDIMAN in a protective package with a description of the problem and the Return Authorization clearly written on the package.

In the event that MIDIMAN determines that the product requires repair because of user misuse or regular wear, it will assess a fair repair or replacement fee. The customer will have the option to pay this fee and have the unit repaired and returned, or not pay this fee and have the unit returned unrepaired.

The remedy for breach of this limited warranty shall not include any other damages. MIDIMAN will not be liable for consequential, special, indirect, or similar damages or claims including loss of profit or any other commercial damage, even if its agents have been advised of the possibility of such damages, and in no event will MIDIMAN's liability for any damages to the purchaser or any other person exceed the price paid for the product, regardless of any form of the claim. MIDIMAN specifically disclaims all other warranties, expressed or implied. Specifically, MIDIMAN makes no warranty that the product is fit for any particular purpose.

This warranty shall be construed, interpreted, and governed by the laws of the state of California. If any provision of this warranty is found void, invalid or unenforceable, it will not affect the validity of the balance of the warranty, which shall remain valid and enforceable according to its terms. In the event any remedy hereunder is determined to have failed of its essential purpose, all limitations of liability and exclusion of damages set forth herein shall remain in full force and effect.