

KORG



O A S Y S PCI
Open Architecture Synthesis, Effects, and Audio I/O

User Guide

Welcome to the world of OASYS PCI !

The CD-ROM in this package contains the latest OASYS PCI software, new demo sound files (Multis), as well as audio file demos of OASYS PCI synth algorithms. In addition, there's a collection of drum, guitar and vocal audio files created for you to use with the OASYS PCI Effects processing, in Audio Streaming applications with digital audio programs. The algorithm demos and audio files are a perfect way to experience the power and versatility of OASYS PCI!

The OASYS PCI manuals and FAQ's are copies of the .pdf files that you OASYS PCI users can will find in the Manuals Folder, which is installed along with the OASYS PCI software.

Where do you begin?

First, install the OASYS PCI card and software in your computer. Then, configure your USB/Serial Port MIDI Interface and connect a MIDI keyboard/controller. You'll find all this information in the Installation Guide - located in the OASYS PCI box, along with the OASYS PCI card, software and breakout cables.

- **Read and carefully follow the steps in the OASYS PCI Installation Guide, pages 1-30.**

Once you've completed card and software installation, and connected a MIDI keyboard/controller, you can begin working with this **User Guide**. It begins with a feature overview, followed by a demonstration exercises that you can incorporate into your normal usage. The exercises and tips you'll find will get you on the fast track of OASYS PCI usage. Once you've gone through the guide, make sure to read the User Guide, and Patches and Effects Manuals, as well as the FAQ's. The manuals are well written and worth their weight in gold for OASYS PCI users, and anyone who wishes to explore and learn more about this great product! In fact, the manuals are so darn good, we've obligingly ripped off a few of the key sections and pasted them in this guide, thanks to Dan Phillips, OASYS Product Manager!

Note: Towards the end of this guide, you'll find in-depth overviews, including **demo multis and more on OASYS PCI synthesis and modeling**, as well as effects. The overviews were taken directly from the **korg.com** website.

OASYS PCI Users Guide

OASYS PCI Features	3
A Basic Understanding of the OASYS PCI File Types, Editor and Engine	4

The OASYS PCI Demonstration:

Let's Begin - Analog, MIDI connections, Launching OASYS PCI	5
Overview of the Catalog	6
Overview of a Mixer Channel	7
The Resource Monitor	8
Select and Demonstrate a few Demo Multis	8

Demonstrate how to create and work with a New Multi:

Open a new Multi and load a Program into a Mixer Channel	8
Overview the Program Edit Parameters	9
Overview and work with the Patch Control Panel	10
Overview and work with one of the Insert Effects for this Program	10
Overview and work with a Modulation Palette	11
Add another Program to the current Multi	11
Demonstrate how to create Layers and Splits in a Multi	11
Overview and work with the Send Busses	12
Overview and work with the Output Busses	14
Recap of the previous demo exercises	16

How to work with Audio Inputs and Streams:

The Audio Input Demonstration	16
The Audio Stream Demonstration	18

An Outline to Follow for your OASYS PCI Demonstrations

OASYS PCI User Guide References	20
Specific Reference Sections	21

Suggested Demo Multis	22
Suggested Effects	23

Positioning the OASYS PCI	24
----------------------------------	-----------

OASYS PCI overviews from the korg.com website:

OASYS PCI Overview	25
Overview: Synthesis 1 and 2	26
Overview: Effects	28
Advanced Tips: MIDI Tempo LFOs and Delays	30
Specifications	32

OASYS PCI Features

OASYS PCI integrates high-quality, open-architecture synthesis, effects processing, and audio I/O into a single, professional PCI audio card – the perfect complement to any MIDI sequencer or software-based digital audio workstation.

DSP Power

5 Motorola DSP chips onboard, providing a staggering 480 MIPS!

Audio and sync input and output

24-bit stereo analog, S/PDIF and ADAT optical input and output
BNC Word clock input and output
ADAT timecode input and output/through
Sample rates: 44.1kHz, 48kHz, external clock

Synthesizers

Synthesizers are plug-ins loaded from disk, allowing for easy future expansion
Initial release includes over 28 synthesis algorithms and hundreds of sounds, including modeled analog synthesizers, FM, tonewheel organ and rotary speaker, reed and tine pianos, physically modeled trumpet, trombone, sax, flute, guitar, bass, and vocals, analog percussion, tempo-based LFOs and analog-style sequencers, and more.

Effects

Effects are plug-ins loaded from disk, allowing for easy future expansion
Initial release includes over 135 unique effects algorithms. Most of the effects from the Trinity workstation are included as well as new effects including tempo delays, envelope and LFO-swept filters, modulation via MIDI-sync'd LFOs and analog-style sequencers analog EQ and reverb algorithms, an awesome 160 second maximum delay time, and more.

Submixer

12 channels, each of which may process synthesis programs, audio inputs, or hard disk audio tracks
Channel inserts may each have up to 4 effects
4 sends, each with up to 4 effects
6 stereo output busses, each with up to 4 effects

Compatibility

PCI 2.1-compliant
Audio I/O supports ASIO (Mac and PC) and standard Windows audio I/O
MIDI supports OMS, FreeMIDI, and standard Windows MIDI
Compatible with Korg-approved MacOS and Windows computers (available now for MacOS, with Windows support coming shortly)

A Basic Understanding of the OASYS PCI File Types

Multis

A single, complete setup for the OASYS PCI. Mixer windows, Programs, Patches and Effects all "live" in a Multi. Up to twelve channels - any combination of Programs, Patches and Effects make up a complete Multi.

Programs

The basic sounds of the OASYS PCI. Programs need to be placed on a Mixer Channel to be played. Each Program can have one or two Patches, which can be layered or split by key and velocity ranges. They also have up to four Insert Effects, which appear in the Mixer Channel. Programs store all Control Panel settings for their Patches and Effects.

Effects-Only Programs

These are just like Programs without Patches loaded. Instead, Effects-Only Programs store all the Insert Effects for a Mixer Channel, including Effects Control parameters. You can use them to load chains of Effects into a Mixer Channel, or store chains for use elsewhere. Unlike Programs, Effects-Only Programs can be used with any input source, including Audio Inputs, Streams, or even other Programs. You'll find them in the Korg factory Catalog, placed in the Programs section of the folder named "Korg FX Programs".

Patches

The basic units of sound creation on the OASYS PCI. They must be placed in a Program in order to be played. Each patch contains a synthesis algorithm, which may be quite different from one Patch to another. You can edit the Patch parameters in the Patch Control Panel.

Effects

Used to modify the sound of Patches, Audio Inputs, or Streams. They can be used as insert effects in the Mixer Channels and Output Busses, or as send effects via the Send Busses. Each effect contains its own audio processing algorithm. The Patch Control Panel allows you to edit the Effect parameters. The algorithms and edit parameters can be very different from one effect to another.

The OASYS PCI Editor

This application controls all of the sound production and audio processing aspects of OASYS PCI, including all mixer settings, loading of Programs and Effects, and all Program, Patch and Effects parameters. If you're using OASYS PCI in conjunction with a digital audio program, leave the OASYS PCI Editor running in the background, so that you can switch to it for editing Programs and Effects.

The OASYS PCI Engine

This controls sending and receiving MIDI, playing sounds, and so on. It's located in the System Extensions folder, and automatically starts up with OASYS PCI in being used. You don't actually interact with the OASYS PCI Engine itself; instead, you control it via the OASYS PCI Editor and any audio and / or MIDI software being used.

The OASYS PCI Demonstration

The following sections begin by covering the most basic interaction with OASYS PCI - using it as a stand-alone synthesizer and effects processor, without using OMS, FreeMIDI or digital audio sequencing programs. We suggest that you using the OASYS PCI in this way, by demoing the OASYS PCI sounds and effects, and finally by using the OASYS PCI in conjunction with digital audio programs like Digital Performer, Logic Audio, etc. Later in this guide, you'll learn how to use the OASYS PCI, used with a digital audio program, for inputting and streaming audio. The "flow" of this method will help you to understand and appreciate the power and versatility of OASYS PCI.

Let's get started by overviewing the **Catalog window** and the **Mixer**.

Note: If you haven't already configured your USB/Serial Port MIDI interface, and connected a MIDI keyboard/controller to the computer, see the OASYS PCI Installation Guide, page 16.

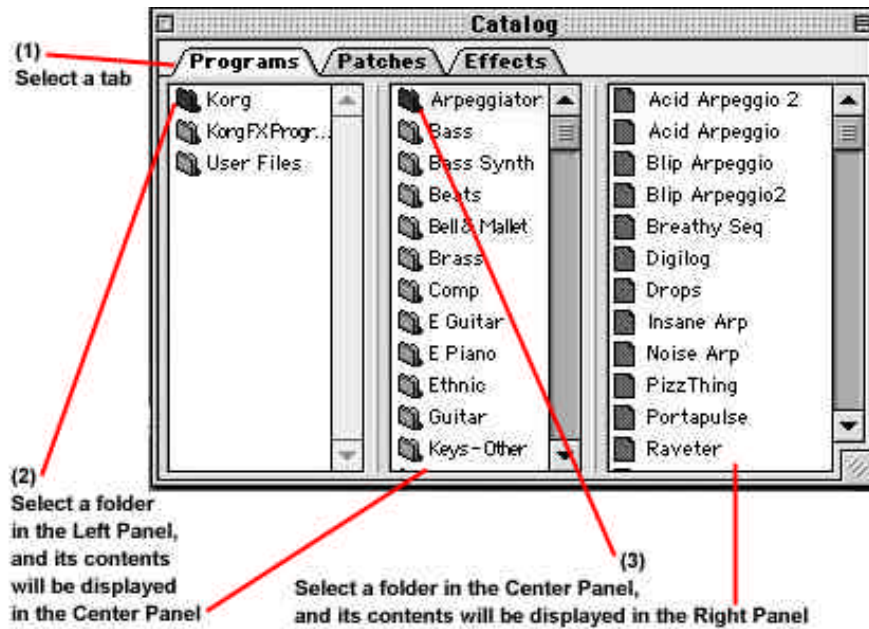
Let's begin:

1. Make sure that the **L/R Analog Outputs** of OASYS PCI are connected to your stereo monitoring system, and that your MIDI keyboard/controller is connected your computer, and set to transmit on MIDI channel 1. The preset Multis respond to MIDI channel 1, and play from the card's analog outputs.
2. The OASYS PCI installer program will have opened two folders on the desktop. Locate the folder named "**OASYS PCI Demo Multis**". This folder contains a number of demo sounds - a great way for you to start enjoying OASYS PCI in "all it's glory"!
3. Open one of the **Demo Multis**, by double-clicking its icon in the **MacOS finder**. The **OASYS PCI Editor** will open, and the selected **Multi** will appear, along with the **Catalog**.

Note: After you've worked through this guide, you'll find listings of suggested **Demo Multis** and **Effects** to use in your OASYS PCI.

The KORG logo is displayed in a large, bold, black, sans-serif font. The letters are thick and blocky, with a registered trademark symbol (®) at the top right of the letter 'G'. The logo is centered horizontally on the page.

Overview of the Catalog



View the Program tabs and folders:

1. Click once on the **Programs** tab (1), then click once on the **Korg** folder (2). Note that the Center Panel in the **Catalog** window lists the sound category folders from the Korg folder.
2. To view the Programs from each sound category, click once on any folder in the Center Panel (3). Note that the collective Programs from the sound category that you chose are now displayed in the Right Panel. The Center and Right panels include **scroll bars** to view and select additional sound categories, Programs, Effects-Only Programs, Patches and Effects.
3. Now click once on the **KorgFXPrograms** folder in the Left Panel. In the same way as Korg Programs, you'll see a multitude of Effect Program folders in the center panel. Click once on any **Effect Program folder**, and the Effect Programs from the selected folder are now displayed in the Right Panel.

Note: Organize your own Programs, Effects Programs, Patches and Effects in the **User Files** folder.

View the Patches and Effects tabs and folders:

1. Click to select the **Patches** tab, and view its contents in the same way as above. Note that the system stays the same - Patches reside in appropriately named folders. Clicking on a folder in the Center Panel brings up related Patches in the Right Panel.
2. Click to select the **Effects** tab, and you'll find an abundance of Effect folders in the Center Panel, with related Effects from each folder in the Right Panel.

Overview of a Mixer Channel

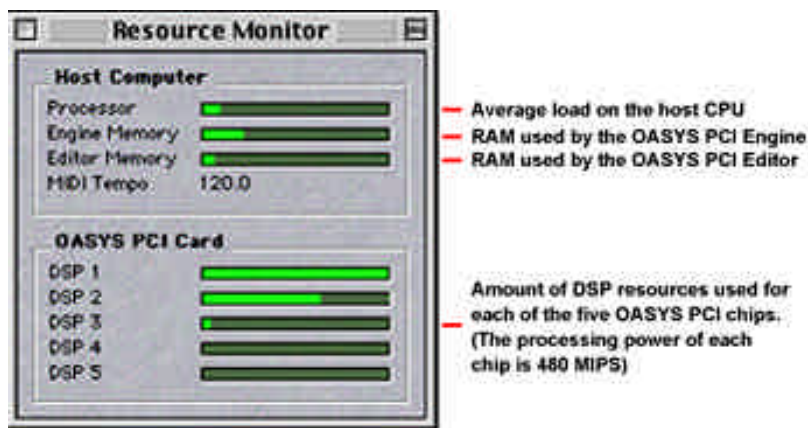
The **Mixer** is the heart of OASYS PCI. It's made up of **12 channels**, each of which can process **OASYS PCI Programs, Audio Inputs, and Streams** (from a digital audio program).



A	Send Bus A 1-4 - click and select Send Bus 1-4
B	Send Level A -click on and use mouse to set level
C	Send Bus B 1-4 - click and select Send Bus 1-4
D	Send Level B -click on and use mouse to set level
E	Send Mute A - click to mute/un-mute Send Bus Output
F	Pre/Post A - post-insert/pre-fader, or post-insert/post-fader
G	Send Mute B -click to mute/un-mute Send Bus Output
H	Pre/Post B - post-insert/pre-fader, or post-insert/post-fader
I	FX Auto-Load -when on, Effects will load automatically when a Program or Effects-Only Program is loaded
J	Insert Effect Slots (4) -pre-fader Insert Effect slots. Click on numbers to the left of slots to bypass each Effect (gray). (option-click to bypass all Effects)
K	Output menu -click and select from menu of Output Busses for Mixer Channel routing
L	Pan Knob -click on and use mouse to set placement
M	Pan indicator -click and manually set pan with computer keypad
N	Width -overall stereo placement. Click and set with keypad
O	Clip indicator -click to clear clipping indicator
P	Solo button -click to solo one or more Mixer Channels/Send Busses
Q	Mute button -click to mute output of Mixer Channel and FX sends
R	MIDI Channel (2 sets, A & B 1-16) -click and select from menu
S	Level Meter - post-FX output volume. Double click to monitor input and reset value to "111" (0dB)
T	Volume indicator -click and set volume with keypad
U	Mono / Stereo indicator for Programs or Audio inputs
V	In Type menu -click and select Input Type as Program, Audio In, Stream, Off
W	Input Slot -double-click Input Slot for Program Edit window
X	Menu button - click and select from Audio Inputs or Streams

The Resource Monitor

As you use the OASYS PCI, you can open the **Resource Monitor** from the **Windows menu** to view the resources being used. The Resource Monitor displays a summary of host processing power, memory, and DSP processing power, memory and busses. One of the key features to remember is that OASYS PCI uses its own DSP power for the majority of the work it does - with very little burden on the host CPU.



Note: As you view the DSP 1 indicator in the Resource Monitor, you'll notice that it's continually working at 100%. That's because DSP 1 is always "in charge" of the OASYS PCI system – DSP 2-5 are used as additional resources when you manage and make changes to the system.

Tip: By setting the OASYS PCI Sample Rate to 44.1k, you'll get about **8% more processing power** for OASYS PCI synthesizers and/or effects. Set the Sample Rate by opening the **Edit window** and selecting **Preferences**. Then click the **MIDI/Global tab**. In the **Global Settings**, select **44.1k**, then click the **Save** button. For more information, see the User Guide, page 85.

Select and demonstrate a few Demo Multis:

1. Make sure that the main **Mixer window** is in the foreground, then select **Close** from the file menu, to close the main Mixer window and the current Multi. If you've changed anything, a message will appear asking if you'd like to save your changes; press the **Don't Save** button.
2. Open the **Demo Multis** folder, and double-click on a Multi you'd like to check out and demonstrate.
3. As the shampoo bottles say, "repeat as desired". **Enjoy!**

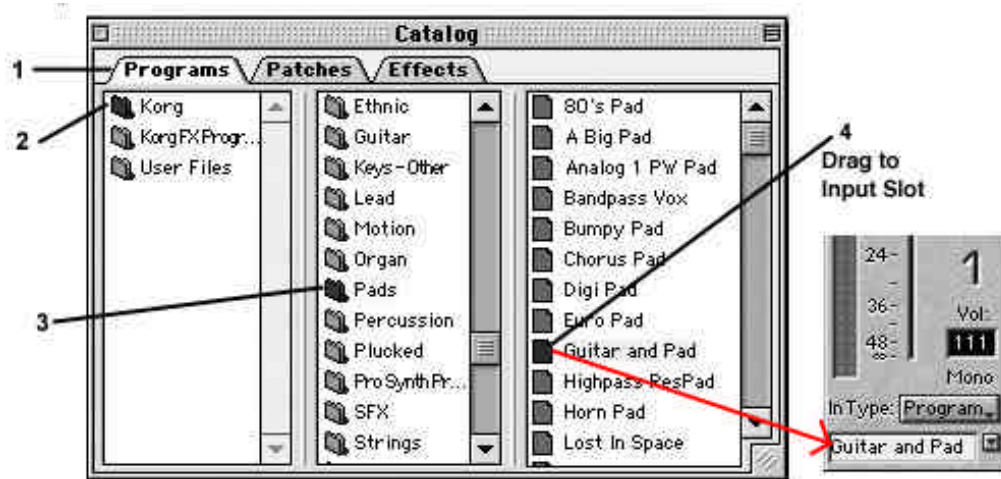
Note: You'll find listings of Demo Multis and Effects, suggested for your presentations of OASYS PCI, later in this guide.

Demonstrate how to work with a New Multi:

1. **Close** any current **Multis** on the desktop.
2. Select **New** from the **File menu**. This will create a new, empty Multi and open the Multi's **Mixer window**. Explain to your customer that he can then add Programs and Effects to the new Multi, and assign Mixer Channels to Audio Inputs or Streams.

Load a Program into a Mixer Channel:

1. Follow the steps in the diagram below, and drag Program "Guitar and Pad" from the **Right Panel** to the **Mixer Channel 1 Input Slot**. The Program will appear in the **Input Slot**. **Auto-Load FX** is on for the new Multi's Mixer Channel, and so the selected Program's Effects are loaded into the **Insert Effect Slot (s)** automatically.

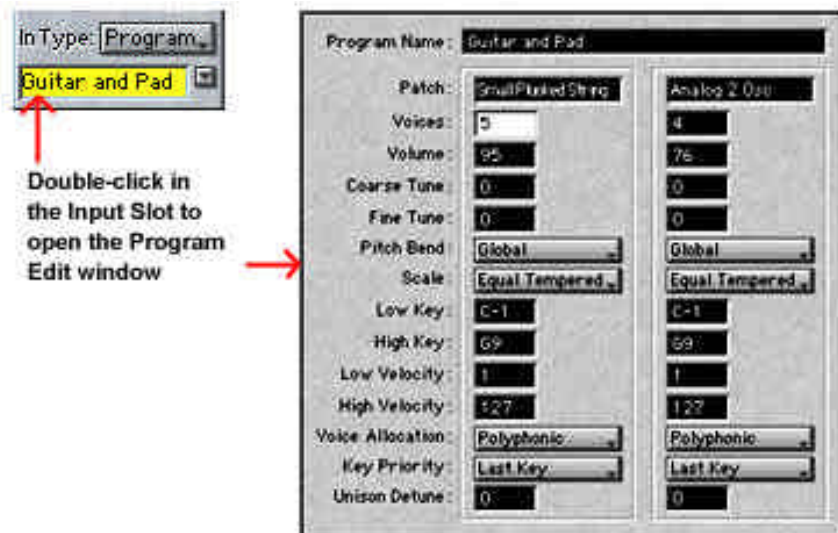


Tip: Another way to place **Effects** in **Insert Slots**, versus **dragging** them from the Catalog, is to **click once in an Insert Slot**, then **double-click the desired Effect** in the Right Panel of the **Catalog**. The selected Effect will then appear in the Insert Slot.

4. **Play the Program** to get an idea of how it sounds.

Overview this Program's Edit parameters:

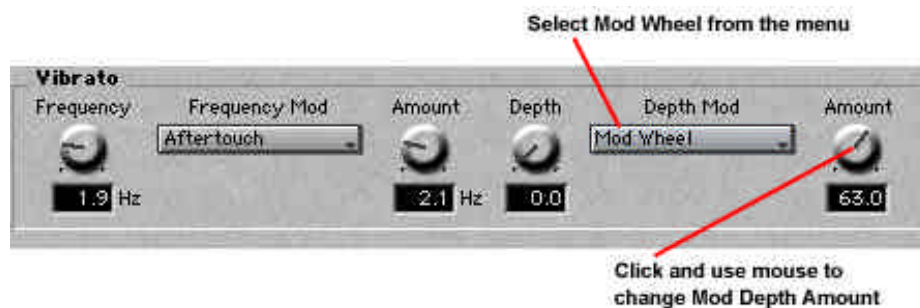
1. Double-click in the **Input Slot**, and the **Program Edit window** will open. Show your customer how the basic structure of a Program is created here, where you can bring in new Patches from the Catalog, set the amount of voices needed for each Patch, set tuning parameters, key and velocity zones, etc.



Tip: The **Connect / Disconnect** command, available in the **File menu**, allows you to temporarily pause OASYS PCI. Any edits you make, such as adding or removing Programs, adding several effects at once, changing Input Types, etc., require a certain amount of DSP processing. These "instructions" may take a few seconds to download. To speed up the process when making edits of this sort, first Disconnect (command-K), make your edits, then Connect (command-K) to download all your changes at once.

Work with the Patch Control Panel:

1. Double-click the "**Small Plucked String**" Patch **Input Slot** in the **Program Edit window**, to bring up the **Patch Control Panel**.
2. Click on one or two of the assigned **Mod Sources** (in red) to overview the **Modulation Palette** and assigned source of modulation for the selected parameters.
3. Click on the **Depth Mod** menu button (Aftertouch), and select **Mod Wheel** from the list.
4. Control the Vibrato **Depth** with your MIDI keyboard/controller's Mod Wheel or Joystick. Change the Amount of Vibrato Depth by clicking on the **Amount knob** and **moving the mouse**.



5. Close the **Patch Control Panel**, then close the **Program Edit window**. For more information on the Patch Control Panel, see pg. 58 in the Users Guide.

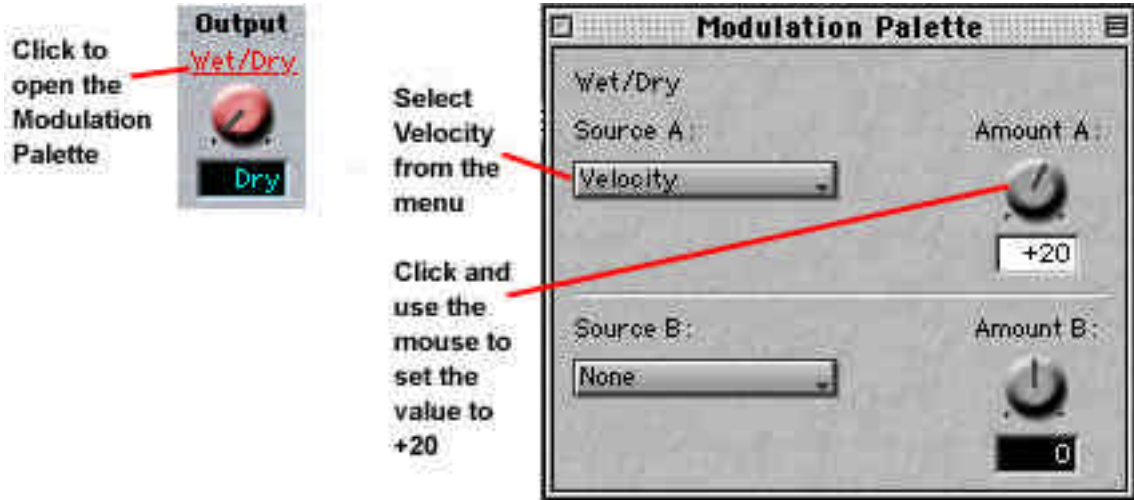
Note: You can easily copy Patches between Programs, by using drag and drop, or Copy and Paste commands from the Edit menu. For information, see the User Guide, page 11.

Note: All edits to a Program, including Program Edit, Patch and Effect Control Panel edits, are stored within the Multi. If you're editing a Program to use in a specific Multi, there's no need to save the Program as a separate file to disk; just save the Multi, and you're done. For more information on Programs and Patches, see the User Guide, pages 10-13.

Work with one of the Insert Effects for this Program:

1. Double-click on the **Insert Effect 2 – Insert Slot (Midi Delay)**, to open and overview the **Effect Control Panel**, where you can view, edit and set modulation sources for **any** parameter you choose.
2. In the **Output** section of the **Effect Control Panel**, click on **Wet/Dry** to open the **Modulation Palette** for this parameter.
3. In the **Modulation Palette**, click on the **Source A** menu, and select **Velocity** from the menu. Then click on the **Amount Knob** and use the **mouse** to set the **Amount A to +20** (or click in the Amount indicator, and enter +20 on the computer keypad), and note that the words **Wet/Dry** change to the color **red**, indicating that a Mod Source is active for this parameter.

4. **Play your MIDI controller** with varied degrees of velocity to control the new Wet/Dry modulation source, and point out that each Modulation Palette contains **two** available sources of modulation (A and B) for control of **every edit parameter in OASYS PCI**.
5. Lower the **Amount A** knob value to **0**, or set the **Source A** selection to **None**.
6. Close the **Modulation Palette** and the **Effect Control Panel**.
7. Again, point out that each Program can use up to **four Insert Effects**.



Add another Program to the current Multi:

1. From the **Program Catalog**, scroll up in the Center Panel and click on the **Bass** folder. Then select and drag **Analog Fretless2** from the Right Panel to the **Mixer Channel 2 Input Slot**. Again, point out that **FX Auto-Load** is enabled on this channel, so the Stereo Chorus Effect from this Program is also loaded when the Program is loaded into the Input Slot.

Set both Mixer Channels to the same MIDI Channel:

1. Click on the **MIDI menu button** in **Mixer Channel 2**, and select **A1** from the list. This layers the Programs on Mixer Channels 1 and 2. Point out that **two or more Programs can be layered in a Multi**.



Set up a Split in the Channel Parameters Window:

1. Select **Channel Parameters** from the **Windows menu**, and show your customer this well organized menu of various parameters for all the Programs in a Multi.
2. Click once in the **Channel 1 Low Key** edit field, then press **C4** (middle C) on your MIDI controller to set the Low Key value. (You can also enter this value on the computer keyboard)
3. Click once in the **Channel 2 High Key** edit field, then press **B3** on your MIDI controller to set the High Key value.
4. Close the **Channel Parameters Window**.
5. **Play your MIDI controller** to demonstrate the new split.
6. Be sure to point out that key and velocity settings can be made for **each Program in a Multi, and in addition, these settings can be made for Patches in a Program.**

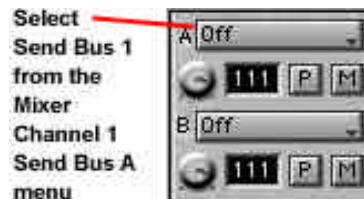


Note: For more information on Channel Parameters, and setting key and velocity windows in the Program Edit Window, see the User Guide, pages 55 and 70.

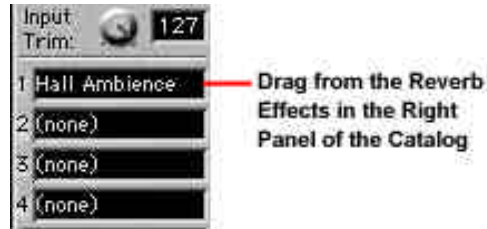
Tip: Keep your window sets simple and organized for your OASYS PCI presentations. As you demo, close windows you are finished working with - to optimize system resources. And resize the Multi, so that you are only working with the current number of Mixer Channels. This creates more room on the desktop to display additional windows, when needed.

Overview and work with the Send Busses:

1. Open the **Send Bus window** from the **Windows menu**, and drag it to fit next to the current **Multi**. Explain that OASYS PCI provides **four Send Busses**, and **each Mixer Channel can access up to two of these Send Busses simultaneously**. The Send Busses are useful for effects which are heard along with the original signal, such as reverbs, delays, and so on. This is opposed to inline effects such as compressors, EQs, distortion, etc., which are more appropriate for use as Insert Effects in the Mixer Channels.
2. From the **Mixer Channel 1 Send A menu**, select **Send Bus 1**, as shown in the diagram below:



- From the **Catalog**, click the **Effects** tab, then scroll down in the Center Panel and click the **Reverb folder**. The available Reverb Effects will appear in the Right Panel.
- Drag the **Hall Ambience** Effect from the Right Panel, to the **first insert slot in Send Bus 1**, as shown in the diagram below:



- Click and select **Master** from the **Send Bus 1 - Out:** menu, then **play** and demonstrate in the **upper range** of the keyboard.
- Click on the **Mixer Channel 1 – Send A Level knob**, and use the **mouse** to set the send level (you can also click in the Send Level indicator, and enter a value with your computer keypad).

Tip: Double-click on the knob to set the value to unity gain (111).

Tip: Another way to place **Effects** in **Insert Slots**, versus **dragging** them from the Catalog, is **to click once in an Insert Slot**, then **double-click the desired Effect** in the Right Panel of the **Catalog**. The selected Effect will then appear in the Insert Slot.

Apply an Effect to Send Bus 2:

- From the **Catalog**, scroll up in the Center Panel, and click the **Delay folder**, then locate and drag the **L-C-R Delay** from the Right Panel, into the first **Insert Slot** in **Send Bus 2**.
- Click and select **Master** from the **Send Bus 2 - Out:** menu.
- Click on the **Mixer Channel 1 – Send B Level knob**, and use the **mouse** to set the Send Level (you can also click in the Send Level indicator, and enter a value with your computer keypad).

Finish setting the Send Busses for this Multi:

- Click on the **Mixer Channel 2 – Send A Level knob**, and set the send level to a value of **60** or so. Then **play** in the **lower range** of the keyboard - you've just bussed the **AnalogFretless2** Program to **Send Bus 1** (Hall Ambience effect).

Note: To save a new or edited Multi to the User folder, select **Save as** from the **File menu**, navigate to the **OASYS PCI User Files folder**, open the **Multis folder**, and then rename and save the new Multi. Make sure to retain the **.oam** file extension at the end of the Multi name, so that you can also access the Multi in the PC version of OASYS PCI.

Tip:

The Send Busses can be used for overall effect processing, and that each of the Mixer Channels can access the Send Busses with two independent Send Levels. Use the previous demo to point out that resource management is an important part of OASYS PCI, and in situations where multiple Mixer Channels can share the same Send Busses, more DSP resources become free for additional Programs and Effects.

Example of DSP resource management:

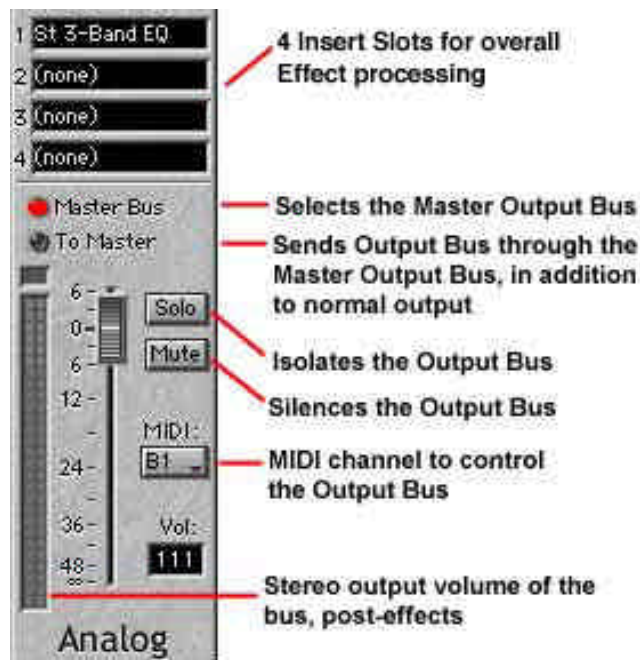
Using the current Multi as an example, each Mixer Channel has a Stereo Chorus Insert Effect, the same effect algorithm, but edited for each Program. If the parameter edits for both effects were similar, one of the effects could be dragged to a Send Bus Insert Slot, edited to suit, and then both Mixer Channels could be bussed to this new Send Bus Insert - with independent Send Levels. The Stereo Chorus Effects in the Mixer Channel Insert Slots could then be replaced with new Effects, if needed – just one benefit to good DSP resource management!

Tip:

OASYS PCI provides output Busses for each pair of audio outputs(6), giving you access to up to four more insert FX.

Overview and work with the Output Busses:

Mixer Channels and Send Busses are routed to Output Busses. Each pair of audio outputs (6) has a corresponding Output Bus. All audio going from the Mixer to an audio output pair goes through the Output Bus first. Direct outputs from digital audio programs bypass the Output Busses and go directly to the physical outputs.



Each of the Output Busses include four Insert Slots, a volume fader, and mute and solo control. You can use the Output Bus Insert Slots to apply overall effects like EQ and compression to groups of tracks.

Apply an Insert Effect to the Analog Output Bus:

1. Select **Output Busses** from the **Windows menu**.
2. From the **Catalog**, click the **Effects tab**, then locate and click on the **EQ folder** in the Center Panel.
3. Drag the **St 3-Band EQ** from the Right Panel, to the Analog Output Bus **Insert Slot 1** (see the previous diagram).
4. Double-click on the **Insert Slot**, to bring up the **St 3-band EQ - Effect Control Panel**.
5. Work with the EQ parameters as you play your MIDI keyboard/controller.
6. Close the **Effect Control Panel**.

Tip: Another way to place **Effects** in **Insert Slots**, versus **dragging** them from the Catalog, is **to click once in an Insert Slot**, then **double-click the desired Effect** in the Right Panel of the **Catalog**. The selected Effect will then appear in the Insert Slot.

Note: After you've completed the demo exercises in this guide, and you close the Multi that you've been working with, you'll be asked if you want to **Save Changes to Untitled Multi**. Select **Don't Save** from the menu.

Tip: Set MIDI Channel designations on Send Busses and Output Busses, to the same channel as your MIDI keyboard/controller. This way you can apply mod sources to the Effects you use in the Send and Output Bus Insert Slots.

Output Bus Tips

- You can use an Output Bus as a way to share Insert Effects between two or more channels. To do this, use an Output Bus instead of a Master Output, and use the Output parameter to assign the desired Mixer Channels to the same Output Bus. Then add the desired Effects to the Output Bus.
- To create a chain of more than four Effects, build your Effect Chains in the Mixer Channel or Send Bus as normal, then set the Output of the Mixer Channel or Send Bus to an unused Output Bus, and add more Effects to the Output Bus.
- To hear all of the OASYS PCI sounds through a single stereo pair, press the To Master button for the Output Bus. This routes the Output Bus to the Master output.
- The factory preset Multis are all set to use the Analog Output as the Master Bus. If in your demo area, you wish to use another output, such as S/PDIF or ADAT 1-2, you can set this up in the General Preferences, located in the Edit menu.

Tip: The **Connect / Disconnect** command, available in the **File menu**, allows you to temporarily pause OASYS PCI. Edits you make, such as adding or removing Programs, adding several effects at once, changing Input Types, etc., require a certain amount of DSP processing. These "instructions" may take a few seconds to download. To speed up the process when making edits of this sort, first Disconnect (command-K), make your edits, then Connect (command-K) to download all your changes at once.

Let's recap the previous demo exercises...

- Before we continue, let's take a look at what you've learned, and start to build an outline for the steps in your OASYS PCI demonstration:
1. **Launch OASYS PCI.**
 2. **Overview the Catalog - open and view the Programs, Patches, and Effects.**
 3. **Overview a Mixer Channel.**
 4. **Overview the Resource Monitor.**
 5. **Play and overview a few of the Demo Multis.**
 6. **Create a New Multi - load and demonstrate how to work with Programs, Patches, and Effects.**
 7. **Add another Program to the Multi - show how to layer and split Programs on the Mixer Channels.**
 8. **Overview, demonstrate and work with the Send Busses and Output Busses for the Multi.**
- **Good!** You're on your way to a pretty smooth OASYS PCI presentation! Now let's complete the demo exercises with sections on Audio Input and Streams.

The Audio Input Demonstration

Connect your source and create a new Multi:

1. Connect the **L/R audio outputs** of your source (mixer, synthesizer, guitar preamp, etc) to the **Analog L/R** inputs of the OASYS PCI **Analog Breakout Cable**.

Tip:

Use a microphone to try the OASYS PCI Effects on some Audio. You can apply Delay and Reverb Effects, as well as special effects such as Pitch Shifter, and then use your MIDI keyboard/controller to modulate Effect parameters as you speak into the microphone – a great way to hear the superb quality and versatility of the Effect Programs and Effects.

2. Close any current Multis (command-W), then select **New Multi** (command-N) from the **File menu**.
3. Resize the Multi so that **2 Mixer Channels** remain in the window.
4. Set the **Mixer Channel 1 - In Type** to **Audio In**. Mixer Channel 1's **Input Slot** will now indicate **Analog L-R In**.
5. **Play** your source instrument (or speak into the microphone), and adjust the **Input Level** for **Mixer Channel 1** (click and drag the **fader**), so that plenty of signal appears in the **Level Meter**, and **clipping does not occur** (watch the clipping indicator).
6. **Disable** your source instrument effects, if any, so that you are inputting a **dry** signal to the Mixer Channel.

Tip: If you use a MIDI keyboard's sequence (like the Korg Triton's preset drum patterns) as the source of your audio input. Use a looped drum (or other) pattern, This allows you to freely hear the OASYS PCI effects as the sequence plays, and the demo progresses. (Make sure to disable the source pattern's effects)

Apply an Effect Program to Mixer Channel 1:

1. From the **Catalog**, click the **Program tab**, then click the **KorgFXPrograms folder** in the Left Panel.
2. From the Center Panel, click an **Effects Program folder** that contains the type of effects you'd like to apply to the source instrument you're using in the demo.
3. In the Right Panel, locate and drag a desired **Effects Program** to the **Mixer Channel 1 Input Slot (Analog L-R In)**. The Insert Effects that make up this Effects Program will appear in the Mixer Channel's Insert Slot(s). Note that you can't drag an FX-Only Program into an Insert Slot – you must drag the FX-Only Program to an Input Slot.
4. **Play** your source instrument to demonstrate the applied **Effects Program**.
5. Open one of the **Insert Effects** (double-click the Insert Slot), then overview and work with the **Effect Control Panel** parameters.
6. Close the **Effect Control Panel**.

Tip: Another way to place **Effect Programs** in **Input Slots**, versus **dragging** them from the Catalog, is to **click once in an Input Slot**, then **double-click the desired Effect** in the Right Panel of the Catalog. The selected Effects will appear in the Insert Slots.

Apply an Effect to the Send Bus:

1. Open the **Send Busses window** from the **Window menu**, and position it next to the **Mixer window**.
2. Select **Master** from the **Send Bus 1 - Out: menu**.
3. From the **Catalog**, click the **Effects tab**, then click the **Korg folder** in the Left Panel.
4. From the Center Panel, locate and click an **Effects folder** that contains the type of effect you'd like to use in **Send Bus 1**. (Choose an overall processing effect like Reverb, Delay, EQ, etc.)
5. In the Right Panel, locate and drag the desired Effect to **Send Bus 1 - Insert Slot 1**.
6. From the **Mixer Channel 1 - Send Bus 1 menu**, select **Send Bus 1**.
7. **Play** your source instrument to demonstrate the Effects, then open, overview and work with the **Effect Control Panel** for the applied Send Bus Effect.
8. Close the **Effect Control Panel**.

Note: After you've completed the rest of the demo exercises in this guide, and you close the Multi that you've been working with, you'll be asked if you want to **Save Changes to Untitled Multi**. Select **Don't Save** from the menu.

Note: You can bounce all OASYS PCI synths and effects directly to disk, using any ASIO-compatible digital audio program. For more information on this, as well as recording the output of the OASYS PCI Mixer directly to a digital audio program, see the Users Guide, page 26.

Note: For information on zero-latency record monitoring and record monitoring with effects, see the User Guide, pages 26 and 27.

The Audio Stream Demonstration

OASYS PCI is designed for seamless use with all ASIO- (Audio Stream Input/Output) compatible programs, such as Cakewalk Metro, Cubase VST, Digital Performer, Logic Audio, Studio Vision Pro, and Vision DSP.

With any ASIO-compatible program, you can process up to **8 channels** of audio through the OASYS PCI's mixer channels and Effect Send Busses, and route an additional **12 channels** directly to the OASYS PCI's outputs.

- **When used with Audio Input and Streams, OASYS PCI becomes a very powerful combination of a 12-channel, 24-bit I/O card and an 8-input multi-effect processor!**

Note: See the Installation Guide, page 23, for more information on configuring ASIO Software. See the User Guide, page 24, for more information on Using ASIO Audio Programs.

Set up an Audio Stream in the Multi:

1. Open an **ASIO-compatible digital audio program**, and make sure that **OASYS PCI** is selected as the **ASIO device** in the digital audio program.
2. Load a dry audio sequence to an audio track in the digital audio program...
3. Assign the audio program's **track output** to **Stream 1** (if mono source), or Stream **1-2** (if stereo source).
4. Set the **Mixer Channel 2 - In Type:** to **Stream**, then select **Stream 1** (if mono source), or Stream **1-2** (if stereo source) from the Mixer Channel **In Type menu** (to the right of the Input Slot).
5. **Playback** the audio track, and adjust the **Input Level** in **Mixer Channel 2** (click and drag **fader**) so that plenty of input signal appears in the **Level Meter**, and **clipping does not occur** (watch the clipping indicator).

...or better yet:

Load one of the Digital Audio Sequencer files we have included on the 1.0.1 CD that came with your OASYS PCI Dealer Training Guide. We have included a number of dry drum loops, guitar phrases and vocal performances already set to stream down into the OASYS PCI. Simply choose the appropriate Digital Performer, Logic Audio, Cubase* or Vision DSP file and then use the included Audio Stream Multi, which is already set up to listen and effect the audio files!

*Note: Cubase required us to save multiple files, each containing different examples that are set to the same BPM, so choose whichever of the files you want to try.



Apply OASYS PCI Effects to the Audio Stream Input:

1. In the same way as the previous **Audio Input** exercise, for **Mixer Channel 1**, add a desired **Effect Program** (drag from the Right Panel to the Input Slot), or Effect(s) (drag from the Right Panel to Insert Slot(s)).
2. Apply an Effect (s) to the **Mixer Channel 2 - Send Bus 2**.
3. Overview and work with the Effects in both the **Mixer** and **Send Bus**, by opening the **Effect Control Panels**, and making edits/applying modulation sources.
4. Open the **Output Busses window** from the **Window menu**, then overview and work with the Analog **Output Bus** for this Multi - apply Effects to the Output Bus, etc.

Note: After you've completed the rest of the demo exercises in this guide, and you close the Multi that you've been working with, you'll be asked if you want to **Save Changes to Untitled Multi**. Select **Don't Save** from the menu.

Note: You can bounce all OASYS PCI synths and effects directly to disk, using any ASIO-compatible digital audio program. For more information on this, as well as recording the output of the OASYS PCI Mixer directly to a digital audio program, see the Users Guide, page 26.

Note: For information on zero-latency record monitoring and record monitoring with effects, see the User Guide, pages 26 and 27.

OASYS PCI User Guide References

Multis, Programs and Patches	Page
Removing a Program or Effect from a Multi	6
Copying Programs or Effects	6
Creating Velocity Splits between two or more Programs	7
Auditioning Multis through a specific Output Bus	7
Saving Multis	8
Editing a Program Name	10
Copying Patches between Programs	11
Creating Velocity Splits between two Patches	12
Saving Programs	13
Effects	
Sending a Stream to a Send Bus	15
Using Send Busses to conserve DSP resources	16
Using Output Bus Effects	16
Copying and Removing Effects	18
Using OASYS PCI Effects along with other plug-ins	18
Saving Effects-Only Programs	19
Modulation	
Fixed and Assignable Modulation Paths	20
Modulation on/off parameter control via MIDI	21
Editing and deleting modulation routings	21
Sysex Parameter Information	21
ASIO - related	
Routing Information	24
Recording from the OASYS PCI Inputs	25
Recording the Output of the OASYS PCI Mixer	26
Zero-latency Record Monitoring	26
Record Monitoring with Effects	27
Working with Files	
File Types and Folder Organization	28
Adding a new set of Korg or third-party sounds	29
File Names	30
Managing Resources	
Voice Allocation in the Program Edit window	31
Optimizing Physical Bus Usage	31
MIDI Parameter Changes and Control Panel Objects	32
Additional Resource Management Tips	33

Specific Reference Sections

Reference Topics	Page
Mixer	38
Send Busses	46
Output Busses	50
Channel Parameters	55
Program Edit	58
Control Panel	64
Modulation Palette	69
Resource Monitor	70
Catalog	73
File Menu	76
Edit Menu	78
Windows Menu	79
Preferences	80
ASIO Control Panel/Audio Settings	87
Scales	91



Suggested Demo Multis to Demonstrate

These Demo Multis are “sure bets” to impress you and your freinds! But remember, there are over 25 synthesis algorithms (and counting!) available in OASYS PCI. Use these Demo Multis as a beginning. Then explore the rest of the Multis in the Demo Multis and Korg Multis folders, for even more great sounds – then you can start creating your own Multis, using sounds from the Programs, Patches and Effects folders.

#	Category	Multi Name	Algorithm Features – Multi Highlights
	Pro Synth		Tailored filter res, poly mod, sync, simultaneous waves, just like the original Prophet™!
03		Unison Glide	Portamento and incredible resonant sweep
23		ModuDarkPad	Haunting Prophet™ with ModWheel surprises!
	Mini Synth		Specific modeling of hi/lo freq filter resonance, modeled Minimoog™ envelope and vca sections
02		MiniBass Cocoa	Vintage Minimoog™ bass, ModWheel-away!
12		Bright Lead	Screaming Minimoog™ lead, ModWheel heaven!
	Percussion Synth		Analog-modeled percussion synths, plus Electribe-inspired percussion sequencer that syncs to MIDI
10		DandB Aggressive Split	Insane Beat Box, VPM, Noise Synth, ModWheel/Aftertouch
22		KR-808	Analog drum kit – mapped and ready to sequence
	VPM Synthesis		Virtual Phase Modulation, complex timbres for digital bells, electric pianos, special effects
11		Tines 1	4 operator, ModWheel – LFO frequency and Chorus depth
32		Lunar Bells	VPM & Noise Synth, Delay, St Chorus and O-verb
	Tonewheel Organ model		Drawbars, key click, full 61-key polyphony, Korg G4 rotary speaker, mono percussion, perfect phase coherency
01		Big Organ	Vibrato Chorus, G4, tons of modulation sources!
17		Perc Organ OD4	Slammin! ModWh –G4, SW1 –OD, SW2 -Percussion
31		Pipe Organ 1	From the Z1, group additive synthesis, incredible realism!
	Electric Piano model		High polyphony, change pickup type and position, smooth velocity transitions from soft to overdrive
04		ModPan EP	Wurlitzer™, ModWheel –pickup “bite”, plus St Auto Pan
	Guitar & Slap Bass models		Adjust pickup type position/tone, pick type, morph from steel string to nylon, and more
05		Folk Guitar - Strum	Adjustable “pickup” position, damping, decay, dispersion
16		Dispersive Slap Bass	Ultimate punch & cut, nonlinear “hyper-slap”
21		Fretless and Pad Guitar	AcGuit/PW Strings/FretlessBass, beautiful split!
14		Zither Hard Hammer	Incredible and rich - great programming of Pluck String algorithm!
	Trumpet & Trombone models		Modeled lip embouchure, valve/slide/bell for rich tone, realistic “falls” and “rips”
08		Trumpet Jazz	ModWheel –Breath, P-Bend –Rip, turn on TalkMod Insert FX
25		Trombone 2	Mod Wheel-Breath, P-Bend –Scoops, AT/ModWh control
	Sax & Flute models		Breath pressure/MIDI response, sax features growl/fingering noise, flute is incredible!
06		Silver Flute	Can be “overblown” for puchy “chiff” breath noise, ModWheel/AT
41		EP & Tenor Sax	Split, Sax -Realistic growl, breath & fingering noise, ModWh/AT
	Vocal models		Physically-modeled human voice, control of noise components, vowel transition and more!
07		Soprano and Choir	Split, FX controllers – ModWheel, Aftertouch, P-Bend
20		Ambient Vox Pad	P-Bend for vowel control, and check out Patch Control Panel!
	Analog /303 models		Powerful and expressive analog and 303 synth models
13		LosAngeles Bell Pad	PWM strings & VPM, ModWheel/Aftertouch - filter
00		Dreamweaver	Great polyphonic layer of Analog1 and 2 oscillator models
15		KraZee 303	Mini filter, Overdrive, SubOsc, St MIDI Delay FX!!!

Suggested Effects to Demonstrate

The following is a listing of just a few of the superb Effects to demonstrate with OASYS PCI synth Programs, Audio Inputs and Streams. Included are brief descriptions of each Effect:

Category	Effect	Effect Highlights
Delay Folder	St Diffuse Delay	A smooth 8-second true stereo MIDI delay, high and lowpass filters, various feedback and stereo-related options, diffuser from the O-Verb
Flanger Folder	St Tempo Flanger	Stereo Flanger, Tempo LFO with 6 basic waveforms, LFO shape and smoothing
Phaser Folder	St Tempo Phase 2	Stereo Phaser, Tempo LFO with 6 basic waveforms, plus separate "Step" Tempo LFO
Chorus Folder	6-Tap Chorus	6 Chorus Delays, allowing a combination of Chorus and Delay effects
Filters Folder	Rez Filter Seq	Multi-mode, multi-pole resonant filter, plus analog-style sequencer
Organ FX Folder	Rotary Speaker	From the Korg G4 Rotary Speaker Effect, incredibly realistic Leslie™ sound and control, with overdrive
Reverb Folder	O-Verb XL	The amazing O-Verb, plus two smooth MIDI-synced Delays and 8 Early Reflection Delays, different diffusion options for the various delays allow for a combination of direct, mid, and distant delays for creating complex early reflection patterns

Understanding the OASYS PCI

The OASYS PCI is unique, how it relates to other card-based systems is as follows.

What are the other card-based systems? They can range from audio I/O card up through systems like the Creamware Pulsar and even DigiDesign ProTools.

So how does the OASYS PCI fit into this universe? The OASYS PCI is certainly a very capable I/O card, offering high-quality 24-bit audio with analog, S/PDIF and ADAT “lightpipe” audio paths. However, it is true that the customer looking for an inexpensive audio I/O card is not likely to start off with as complex and capable a system as we offer. It pays to qualify that customer, because if they are asking about an I/O card, they may also ask you later about getting plug-ins or even hardware devices which the OASYS PCI could offer them!

Looking at the OASYS PCI in relation to other cards which include synthesis and effects, you'll easily see that the quality of the algorithms that Korg is offering make all the difference. Korg has been in this business over thirty years, and that experience can be heard in every sound the OASYS PCI makes.

So the OASYS PCI sits at the high-end of the quality spectrum in the marketplace, and what customer doesn't want the best quality possible? It won't replace a large, multi-I/O audio card, but it can be used in conjunction with them. It is not a replacement for a ProTools system, but again, it can be used within one.

Note: In both of these instances you would be using the OASYS PCI as a synthesizer/effects processor, which just happens to be installed in your computer. You would run audio into it using the various 24-bit I/O options, and would record the output of it into your system again using hardware I/O rather than internal streams.

Next lets compare native plug-ins and soft synth applications.

versus the OASYS PCI solution. Here again, certainly the quality of the OASYS PCI's synths and effects can make a compelling answer all by themselves. But the real beauty of our system is that no matter how powerful your computer is, you will still be “hitting the wall” in DSP usage as they add more tracks and try to run more plug-ins. So adding an OASYS PCI card is adding more **power** to your computer, which translates into more synths and effects running at the same time. And who doesn't want more power?

The final subject we need to address is the cost/value of plug-ins versus the OASYS PCI card.

Many customers don't see this at first, simply thinking the card is expensive. But take a look at the current marketplace for synth and effect plug-ins and that perception can easily be changed. A decent quality synth plug-in or native application can run \$300, up to \$800 for a TDM-based synth algorithm. That's right – up to \$800 for a *single* algorithm! So what price do you put on over 28 high-quality synth algorithms. Even pricing them at \$200 a piece would say that the OASYS PCI could be worth \$5,000!

Looking at effects plug-ins, a single high-quality algorithm could run from \$99 up to \$400, and suites of effects can easily run up to \$800. So what price do you put on 135 effects algorithms? Again, let's be generous and price them at \$50 per (such a deal!). That's \$6,750. And add the cost of a 24-bit 12 in/12-out I/O card (let's say \$400), and you've got a system that might cost the user up to \$12,000. Crazy? The values we're using here are real-world, but since many audio applications give away a certain amount of plug-ins to get you started, and there are some shareware titles out there, let's be even more generous and cut this example in half and you've got a \$6,000 value. And once you've have heard the quality of the OASYS PCI sounds and effects it is easy to justify the system's value/performance. It is an amazing value for what you get. And did we remember to include the cost of the co-processing the card offers...

Note: The initial purchase of OASYS PCI includes over 28 synth algorithms and 135 effects algorithms. Korg's long-term commitment to the OASYS PCI project gives end-users a very valuable project “partnership” of their own: the ability to download new synth and effect algorithms from the korg.com website at no additional charge, as they become available!

OASYS PCI Overview (From korg.com)

Open Architecture Synthesis, Effects, & Audio I/O

OASYS PCI integrates professional-quality synthesis, effects processing, and computer audio input and output into a single, professional PCI audio card - the perfect complement to any MIDI sequencer or digital audio workstation. Much more than just an audio card, OASYS PCI offers a vast array of professional synthesis and effects processing tools, including some of the best synths and effects available at any price. Even better, it's fueled by a powerful system of dedicated DSPs, leaving your main CPU free to play back audio tracks and run host-based plug-ins.

State of the Art DSP Synthesis

OASYS PCI's synthesizer algorithms represent a continual evolution from Korg's legendary OASYS project. There are hundreds of sounds based on over 25 great-sounding synthesis algorithms, including modeled analog synths, VPM, tonewheel organ and rotary speaker, reed and tine pianos, physically modeled trumpet, trombone, sax, flute, guitar, bass, and vocals, pipe organ, analog percussion, and more.

Synthesis algorithms are plug-ins loaded from disk, allowing easy upgrades and expansion. This means that Korg and third-party sound developers can easily introduce new algorithms, or even entirely new types of synthesis.

Incredible Multichannel Effects Processing

Building on the award-winning Korg Trinity's effects algorithms, the OASYS PCI offers a stunning variety of high-quality effects - over 135 different algorithms in all. Included are everything from standard reverbs, choruses, flangers, phasers, overdrives, and amp simulations to unique effects such as random filter, stepped phaser, doppler shift, and talking modulator.

Additional new effects include tempo delays, modulation via MIDI-sync'd LFOs and analog-style sequencers, envelope and LFO-swept filters, new high-quality analog EQ and reverb algorithms, an awesome 160 second maximum delay time, and more.

These effects can process the onboard synthesizers, tracks from digital audio programs, and live audio inputs - simultaneously!

Using the built-in submixer, chains of up to 4 effects each can be used on up to 12 channels, 4 sends, and 6 stereo output busses. As with synthesis algorithms, all effects are plug-ins loaded from disk, allowing for easy expansion in the future.

Professional, Multi-format Analog and Digital I/O

The OASYS PCI features a total of 12 inputs and outputs: stereo analog, stereo S/PDIF, and eight-channel ADAT optical. Naturally, all inputs and outputs are 24-bit, and all can be used simultaneously with compatible multitrack audio software. Korg knows that in music, timing is everything, and so the onboard DSP processing power provides zero-latency record monitoring - even with effects!

Korg always keeps the needs of professional studios in mind, so we've provided Word clock and ADAT timecode I/O to ensure easy integration with other digital audio equipment.

Seamless Integration with MIDI and Digital Audio Software

The OASYS PCI supports all major audio and MIDI standards, for compatibility with virtually every audio and MIDI program. ASIO drivers for MacOS and Windows provide direct compatibility with Cakewalk Metro, Cubase VST, Digital Performer, Logic Audio, Vision DSP, Studio Vision Pro, and more. Standard Windows drivers provide compatibility with all popular Windows audio programs, including Cakewalk, Samplitude, SAW, Acid, Sound Forge, and more. OMS, FreeMIDI, and standard Windows MIDI drivers seamlessly connect the OASYS PCI to all MIDI sequencers.

Complete Automation via MIDI

Almost every parameter can be controlled via MIDI, allowing easy modulation and automation of mixing, synthesis, and effects from any MIDI sequencer or real-time MIDI controller.

OASYS PCI "Synthesis 1 & 2" (From korg.com)

Our analog synths are audibly superior to other "analog modeling" products. After listening to the OASYS PCI, we think you'll agree that other "virtual" analog synths sound...well...kind of virtual.

So, what should you listen for? To start with, our oscillators are rich, bright, and smooth, with extremely low jitter and aliasing. We've worked hard to eliminate the usual artifacts of digital oscillators.

The filters are warm and fat, with resonance extending to frequencies far above typical digital "analog" filters. They're flexible, too, with many algorithms offering a choice of poles and modes. There's also a special, fully modulatable comb filter, for sounds like you've never heard before!

Finally, the envelopes are punchy, smooth, and lightning-fast, and use audio-rate processing just like old-school analog envelopes.

Any parameter on any synth or effect control panel can be modulated by two MIDI controllers, each with their own mod amount.)

In addition to several flexible analog synth algorithms, which allow you to make your own balance between features and polyphony, we've included a few incredible re-creations of classic analog synths, as described below.

Prophet™ model

Our Pro Synth model features specifically tailored filter resonance, envelope shapes, and VCA output nonlinearity, along with poly mod, sync, and simultaneous waveforms, just like the original.

Minimoog™ model

Our Mini Synth model features specific and separate modeling of the synth's high and low frequency filter resonance, as well as its distinctive envelope shapes and VCA sound.

Percussion synth

This synth is optimized for analog-modeled percussion, with a hard-hitting, punchy sound. There are several versions of the percussion synth, including one coupled with an Electribe-inspired percussion sequencer.

The sequencer is modulatable in real-time - and syncs to MIDI clock, of course!

VPM synthesis

VPM stands for Virtual Phase Modulation, in which the phase of one oscillator (the Carrier) is modulated by another oscillator (the Modulator), producing a complex timbre. VPM is great for creating classic digital bells, electric pianos, and special effects, and OASYS PCI offers several different VPM synths to choose from.

Physical modeling - the future of synthesis arrives

OASYS PCI's analog synths are awesome - but they're only a small part of the story. Korg has been on the forefront of physical modeling research for almost a decade, and we're proud to present the fruits of that research in OASYS PCI.

OASYS PCI includes models of electro-acoustic instruments, such as organ and electric piano, along with models of physical instruments, such as guitar, slap bass, trumpet, trombone, flute, saxophone, and even human vocals.

Of course, traditional sample playback instruments also provide these sorts of sounds. So, why use physical modeling?

Expression

There are several reasons. To start with, physical modeling generates sound in real-time, by modeling the actual physical characteristics of the instrument and the player. This allows you to "reach inside" and play the model just as you would a real acoustic instrument, such as plucking a string gently or firmly, or blowing into a trumpet loudly or softly. Using this real-time control, you can shape phrases or even individual notes in natural, intuitive ways, for an unusual degree of musical expression.

Realism

Also, models respond to your playing in organic and sometimes unpredictable ways, just like real acoustic instruments. Pitch-bend the flute model, for instance, and it will slowly bend a bit, grow a little unstable, and then abruptly jump an octave. Play fast and loud on the trumpet, and the transitions between notes will sometimes include a subtle "blat" of instability; do a pitch-bend, and it "rips" through the harmonic series. Play hard on the acoustic guitar, and you'll sometimes hear a string "twang" brightly. These organic "imperfections" combine to give the player - and the listener - an uncanny sensation of reality.

Sound quality

Finally, modeling offers an edge in sound quality, as well. For instance, modeling all 91 tone-wheels in an organ means that they are all precisely in phase, resulting in the pure, powerful sound of the genuine article. Use vibrato on a guitar, and notice how satisfying it is to hear a string "stretching."

Tonewheel organ with rotary speaker

We're extremely proud of our tonewheel organ model. Its awesome sound starts with perfect tonewheel phase coherency, resulting in pure, powerful sounding chords, just like the real thing.

Then, we added subtle and sophisticated features such as complete drawbar control, fully programmable key click, and true mono percussion. Compare this model to sampled organs, with their fixed drawbar settings, out-of-phase chords, and percussion on every note, and you'll hear the difference immediately.

Best of all, the organ is fully polyphonic (61 notes at a time), and yet, even combined with both authentic vibrato and rotary speaker effects, it uses only half of the OASYS PCI's DSP power!

Naturally, with a B3 model this good, we had to have an equally impressive rotary speaker. So, we included the incredibly realistic rotary speaker model from Korg's acclaimed Toneworks G4.

Electric piano model

The electric piano model features natural, smooth velocity sensitive transitions from soft, sweet, and bell-like to loud, overdriven, and cutting. You can select the type of pickup, and the position of the pickup on the reed. As you move the pickup towards center, it hears more and more of the first harmonic.

Guitar and Slap Bass models

Our acoustic guitar model features fully adjustable string gauge, bridge rigidity, pick type and technique, pickup position and tone, and more, allowing you to morph from steel string to nylon string to a surreal "plucked iron girder" guitar.

On the other end of the spectrum, the slap bass offers a "SuperBass" synth patch for the millennium - the ultimate in punch and cut, with an over-the-top, nonlinear hyper-slap sound.

Trumpet and Trombone models

The physically modeled trumpet and trombone algorithms feature modeled lip embouchure, valves and slides, and bells, resulting in rich tone, magnificent expressiveness, and realistic "falls" and "rips."

Sax and Flute models

Our physically modeled woodwinds respond to breath pressure (or other midi controllers) with incredible realism. The sax model features realistic growl and fingering noise, while being free of the formant shifts characteristic of sampled saxophones.

The flute model is capable of everything from sweet, classical tones to edgy, breathy, chifty pop and ethnic timbres. Pitch-bend it for an authentic octave mode-jump.

Vocal model

With the physically modeled human vocals, you can control the shape of the glottal pulse, noise components, and transitions between vowels, to create other-worldly melodies, pads, and effects.

Microtuning

The OASYS PCI's Scales allow any incoming MIDI note to create any pitch, with a resolution of one cent (1/100 of a semitone). You can create stretch tunings, historic European tunings, scales with greater or fewer than 12 tones per octave, and more. Tuning can be specified separately for each of the 128 MIDI notes, and each Patch in a Program may have its own Scale. Scales are text files, so you can create and edit them using any standard text editing program, such as SimpleText. You can add as many custom Scales as desired.



OASYS PCI Effects Overview

(From korg.com)

Wide Variety of High-Quality Effects

Building on the award-winning Korg Trinity's effects algorithms, the OASYS PCI offers a stunning variety of high-quality effects - over 135 different algorithms in all.

For instance, in addition to the standard chorus effect, there's a harmonic chorus, two different step choruses (with rhythmic transitions instead of a smooth LFO), a two-band chorus with independent processing for high and low frequencies, four- and six-tap multitap chorus/delays, a bi-phase modulator with dual LFOs, tempo-synced choruses, and ensembles - many of which are true stereo, in and out.

With that selection of choruses, clearly there are a large number of more unusual effects, as well. For instance, there's the talking modulator, which processes any signal through sweeping, dynamic vowel shapes. The decimator, for adding low-fi grunge and attitude. The doppler shift, for making any source into a fly-by. Flangers and phasers with triggered envelopes and MIDI-synced LFOs. A MIDI gate with full envelope control, for punchy, lightening-fast rhythm effects. 160 seconds of MIDI-synced delays.

All of those effects and many, many more - overdrives, amp simulations, resonators, delays, auto-wahs, auto-panners, vibratos, early reflections, the rotary speaker from the Korg Toneworks G4, classic organ-style chorus-vibrato, a sub-oscillator, a ring modulator, a dynamic exciter, a stereo enhancer, a multi-band limiter, and still more, as described below. Even better, all effects are plug-ins loaded from disk, so it's easy for Korg or third-party developers to add new ones in the future.

Multichannel Processing

The effects can process the onboard synthesizers, tracks from digital audio programs, and live audio inputs - simultaneously! Using the built-in submixer, chains of up to 4 effects each can be used on up to 12 channels, 4 sends, and 6 stereo output busses.

High-Quality MIDI-Synced Tempo Delays

A bunch of recent synths and effects include MIDI-synced delays. With some of them, however, you might notice a tell-tale clicking when the tempo changes - or even when it's supposed to be completely steady!

In contrast, the OASYS PCI's MIDI-synced tempo delays are smooth, responsive, and click-free, due to several MIDI tempo innovations - including the unique Smoothing parameter.

They also offer delay times up to 40 seconds (and you can use up to four of these 40-second delays at once!), fine adjust of synced delay times to create "swing" rhythms, individual high and low cut filters per tap, and more.

There's also the special Diffuse Delay effects, which combine tempo delays with the diffusion section of the O-Verb reverb. The diffusion softens and blurs the delays, resulting in a unique effect well-suited to vocals, drums, and all sharp or percussive sounds.

MIDI-Synced LFO Effects

Chorus, flanger, phaser, resonant filters, auto-pan, tremelo, and vibrato effects are available with MIDI-synced tempo LFOs. The standard tempo LFO features six different basic waveforms, with continuous adjustment between logarithmic, linear, and exponential shapes, as well as parameterized smoothing - all of which can be modulated in real time. The LFO phase can be reset via MIDI, and the initial phase is fully adjustable, allowing you to create just the right feel to fit into a groove. For stereo effects, the LFO's Left/Right phase difference is also continuously adjustable.

Multi-mode resonant filter effects

The filters we developed for our analog synthesizers sounded so good, we knew that we had to make them into effects as well. So, we included a selection of multi-mode, multi-pole resonant filter effects, featuring modulation from triggered envelopes, MIDI-synced LFOs and analog-style sequencers, and more, available for processing any audio source - even other synthesizers. Happy tweaking!

New EQ and reverb

To inaugurate the release of the OASYS PCI, we've dramatically improved some of our meat-and-potatoes algorithms, as well. The new high-precision, analog-style EQ has smooth, balanced curves throughout the audible frequency range, in pleasant contrast to many digital EQs. And the completely new O-Verb reverb offers separate control of high, mid, and low reverb times, a lush, smooth tail, and up to ten fully parameterized, diffused delays, for creating complex early reflection patterns and tempo-based effects.

The KORG logo is displayed in a large, bold, black, sans-serif font. The letters are thick and closely spaced, with a slightly distressed or textured appearance. The 'K' and 'G' are particularly prominent due to their size and weight.

Getting MIDI Tempo LFOs to Groove

Use the LFO's MIDI Phase Reset

The OASYS PCI's MIDI-synced LFOs can be triggered via MIDI. This ensures that the LFO starts in phase with the music. You can include one or more triggers in the MIDI sequence, so that the LFO sounds the same every time. To do this:

1. Create a track in the sequence to use specifically for triggering the LFO. Assign it to the same MIDI channel as the Effect or Program that you'll be controlling.
2. In the control panel, assign a mod source for the LFO's Phase Reset. "Any Note Gate" works well, unless there's also a Program on the same MIDI channel. In that case, select another controller.
3. Enter a single MIDI event in the sequencer at the start of measure 2, using the mod source assigned to Phase Reset (from now on, we'll call this the "phase reset trigger"). If you like, you can duplicate the phase reset trigger at intervals at downbeats throughout the sequence (such as every 8 bars or so), so that you can start from the middle of the sequence and the phase will still be reset. This is similar, in some ways, to triggering a loop on a sampler.
4. Also, enter the phase reset trigger every time that the time signature changes.

Now, whenever the OASYS PCI receives the phase reset trigger, the LFO will reset to the position set by the Initial Phase parameter.

Note: You can trigger as many different LFOs as you like, using different triggers on different MIDI channels.

Adjust "Feel" using the Initial Phase Parameter

Using the LFO's Initial Phase parameter, you can start the LFO at any point of its waveform - at the peak, in the trough, at zero, or at any point in between. You can use this to subtly adjust the rhythmic feel of the LFO; this is especially useful for smooth waveforms, such as triangle, sine, and saw up.

Note: You can also set the Initial Phase to 180 to shift the waveform to the offbeat.

Also note the Shape and Smoothing parameter

Shape: Adjusts any sloped LFO shape (everything but S/H and Square) between logarithmic, linear, and exponential shapes. See page 367 of the Patches and Effects Guide for a diagram. This basically means that the LFO will spend more time "up" or more time "down."

Smoothing: Rounds out any rough edges on the LFO. It will turn a Square shape into almost a Sine, for instance. Both shape and smoothing can be modulated smoothly in real time.

To really hear the results, crank up the flanger or phaser feedback parameter. Or, use long LFO time - tempo-based times of 1/2 note and over, for instance. Otherwise, the difference can be more subtle.

Start on measure 2

We've found that triggering LFOs on the downbeat of the very first measure may not always work properly (probably because the sequencer sends the MIDI message triggering the phase slightly after the actual downbeat). This can result in the LFO being out of phase, so that it doesn't sit properly in the groove.

To avoid this, leave a blank measure at the start of the sequence. Start your MIDI data, and send the first LFO trigger, in measure 2.

More about Tempo Delays and MIDI

Reference Effects: St MIDI Delay and St Diffuse Delay

Tempo Delay Threshold (in Preferences)

This parameter reduces jitter for incoming MIDI Clock signals from sequencing programs etc. Programmable MIDI clock jitter suppression is an exclusive Korg feature. This is necessary because as far as we've seen, nothing outputs a jitter-free MIDI clock. This parameter sets the number of consecutive MIDI clock commands which must be received before changing the tempo.

More on the delay algorithms

Smoothing: This sets the amount of time that it takes the delay to slide to a new delay time setting. When syncing to MIDI clocks, this smoothes out the response of the delay to changing tempos. When smoothing is at 0, changes in tempo will cause clicks in the audio. (This is how most other "MIDI" delays sound!) A setting of 50 gives a fast response, but is smooth enough to prevent clicks. A setting of 80 or so will result in an audible glide time, like a tape machine speeding up or slowing down.

Fine Adjust: Allows you to adjust delay time by +/-10% to create swing rhythms, so that the delay matches the groove. (High feedback settings will interfere with this, however)

Note individual high and low filters per tap.

Diffuse delay effects create a cool, "smeared" sound by combining the delays with part of the O-Verb reverb.



OASYS PCI Specifications

Analog I/O

Converters

- 24-bit, 128x oversampling sigma-delta
- 24-bit, 128x oversampling sigma-delta, 8x digital filters

S/(THD+N) Ratio (A weighted)

- 92dB at -0.5dBFS
- 93.0 dB at -0.5 dBFS

Dynamic Range

- 98dB (typical) @IHF-A
- 108dB (typical) @IHF-A

THD+N (A weighted)

- 0.005% at 1kHz, +16dBu Input, 100kOhm load
- 0.002% at 1kHz, +16dBu Input, 100kOhm load

Frequency Response

- 20 Hz - 20 kHz, +/- 0.02dB, +4dBu Input, 100kOhm load
- 20 Hz - 20 kHz, +/- 0.09dB, -12.0 dBFS, 100kOhm load

Impedance

- 100kOhm (calculated)
- 50 Ohm (measured)

Nominal Level

- +4 dBu

Headroom

- 12 dB

Sample Rates

- 44.1 kHz, 48 kHz, external clock

Digital I/O

- * ADAT optical I/O: 24-bit
- * S/PDIF coaxial I/O: 24-bit
- * Word clock I/O: BNC
- * ADAT Timecode: Input and through

Synthesis

- * Synthesizers are plug-ins loaded from disk, allowing for easy future expansion.
- * Initial release includes over 28 synthesis algorithms and hundreds of sounds.

Effects Processing

- * Effects are plug-ins loaded from disk, allowing for easy future expansion.
- * Currently includes over 135 unique effects algorithms.

Submixer

- * 12 channels, each of which may process synthesis programs, audio inputs, or hard disk audio tracks
- * Channel inserts may each have up to 4 effects
- * 4 sends, each with up to 4 effects
- * 6 stereo output busses, each with up to 4 effects

General

- * DSP Processing MIPS: 480
- * PCI revision 2.1 compliant, full length, installable in any MacOS-compatible computer equipped with full-length PCI slots.
- * PCI Power Consumption: +5V = 1.875W, +12V = 0.294W, -12V = 0.117W
- * Audio I/O supports ASIO
- * MIDI supports OMS, FreeMIDI, and serial ports
- * Compatible with Korg-approved MacOS computers (initial release for MacOS, Windows support to follow shortly)