apollo

HIGH-RESOLUTION INTERFACE
with Realtime UAD Processing

Software Manual

Version 6.1.1

UNIVERSAL AUDIO

Customer Service & Technical Support:
+1-877-MY-UAUDIO (+1-877-698-2834)
International: +1-831-440-1176
www.uaudio.com

Universal Audio, Inc. End-User License Agreement

By installing the software and clicking through this these pages, you confirm your acceptance of the Universal Audio and third-party End User License Agreements, as well as the Universal Audio terms of service and privacy policy, all of which can be found at:

http://www.uaudio.com/eula

This Universal Audio End-User License Agreement ("Agreement") is between Universal Audio, Inc. ("Universal Audio"), and you. IMPORTANT - PLEASE READ THIS LICENSE AGREEMENT CAREFULLY BEFORE INSTALLING THIS SOFTWARE. By using the Universal Audio software ("Universal Audio Software" or "Software"), you accept these terms. The Universal Audio Software may be distributed with software or components from third-parties ("Third-party Software") that are subject to different terms which can be found at: http://www.uaudio.com/eula and also in the provisions of Section 12 below.

If you do not accept these terms, do not use the Software or Third-Party Software provided with this installation. Instead, return the Universal Audio Software or Third-Party Software to the reseller for a refund or credit or, if you purchased your software license directly from Universal Audio, contact Universal Audio for information at 877-MY-UAUDIO (877-698-2324). For a list of authorized resellers, see: http://www.uaudio.com/where-to-buy.html.

1. Limited Use License. **The Universal Audio Software is licensed, not sold, by Universal Audio to the original end user for use only on the terms set forth in the Agreement.** If and only if your Software is purchased through a Universal Audio Authorized Dealer or Distributor, Universal Audio, as Licensor, grants you, as an end user Licensee, a non-exclusive license to use the Software (which includes computer software, updates and any bug fixes subsequently delivered and associated media, printed materials and "online" or electronic documentation) with a single computer unit at a single location.

2. Title. The Software is owned by Universal Audio or its suppliers and is protected by copyright laws and international treaty provisions, as well as other intellectual property laws and treaties. Universal Audio retains title to and ownership of the Software and all copies thereof in any form. Universal Audio retains all rights in the Software not specifically granted to the Licensee. This Agreement only gives you certain rights to use the Software and related documentation, which may be revoked if you do not follow these terms.

3. Limited Rights to Install and Use the Software.

(i) Permitted use and restrictions. You may install the Software into the memory of a single computer for your internal business use or your own personal enjoyment, but may not redistribute or electronically transfer the Software to someone else's computer or operate it in a time-sharing or service-bureau operation. Additionally, you may only use the Software on a computer that contains a maximum of eight (8) UAD Devices, specifically four UAD-1 devices and four UAD-2 devices. "UAD Devices" includes UAD-1 and UAD-2 cards, as well as the UAD-Xpander, UAD-2 Satellite and Apollo products. The sole exceptions are—if you are a licensee of the UAD-2 Solo/Laptop card, UAD-2 Satellite or Apollo, you may link those devices to an existing computer previously registered.

(ii) Reverse engineering and copying limitations. You may make one copy of the Software for backup purposes only (and replacement backup copies in the event of loss of or damage to a backup copy), provided you include all copyright notices contained on the original media on the backup copy. You may not modify, translate, adapt, reverse engineer, decompile, create other works from, or disassemble the Software or any portions thereof (except and to the extent that applicable law expressly permits reverse engineering, decompilation or disassembly). Similarly, you may not copy, modify, adapt, transfer, or create other works based upon the printed materials and "online" or electronic documentation accompanying or published for use with the Software (the "Documentation").

(iii) Technical limitations. The Software may include technological measures, whether in the Software or in bundled hardware or both, that are designed to prevent or detect unlicensed use of the Software. Circumvention of these technological measures is prohibited, except and only to the extent that applicable law expressly permits, despite this limitation. Any attempt to circumvent technical limitations may render the Software or certain features unusable or unstable, and may prevent you from updating or upgrading the Software.

(iv) No reconfiguration. The Software is licensed for installation and use only in the manner it was provided to you, as configured by an automated installation program provided with the Software, or as described in Universal Audio's Documentation. You may not separate the components contained in the Software or otherwise reconfigure the Software to circumvent technical limitations on the use of the Software or to otherwise exceed the scope of your license.

(continued)

4. Export, Renting and Transfer Restrictions. You may not export, convey, rent, sublicense, or otherwise distribute the Software or any rights therein to any person or entity. You may, however, transfer the Software license, but only under the following limited terms and conditions:

(i) Eligible transferees. You may transfer the license to a transferee:

for whom you have provided registration details (your name, hardware ID(s), user e-mail ID, buyer's name and buyer's e-mail address) to Universal Audio at info@uaudio.com in advance of such transfer; and (b) who has agreed to be bound by the terms of this license by registering with Universal Audio at my.uaudio.com and confirming such agreement during installation of the Software. Any such permitted transferee may not subsequently transfer this license and the limited 90 day warranty set forth in Section 5 shall expire upon such permitted transfer.

(ii) Eligible products. The Software may only be transferred in connection with up to four (4) UAD-1 devices and four (4) UAD-2 devices per user account. Special exceptions may arise where the use of more than eight (8) UAD Devices is required. These cases are generally related to areas of education and multi-room facilities, and require advanced approval if requesting to sell or transfer over eight (8) UAD Devices per account. If you have questions or are seeking an exception, please contact customer support at 877-MY-UAUDIO (877-698-2324).

5. Limited Warranty. Universal Audio grants solely to you a limited warranty for a period of ninety (90) days from the original purchase date that the media on which the Software is distributed shall be substantially free from material defects. Your exclusive remedy, at Universal Audio's option, is to return and have replaced the inaccurate media containing the Software programs or receive a refund of the price paid within the warranty period. UNIVERSAL AUDIO DOES NOT WARRANT THAT THE SOFTWARE WILL MEET YOUR REQUIREMENTS OR THAT ITS OPERATION WILL BE UNINTERRUPTED OR ERROR-FREE. EXCEPT AS SPECIFIED HEREIN, UNIVERSAL AUDIO MAKES NO WARRANTIES OR REPRESENTATIONS, EXPRESS OR IMPLIED, REGARDING THE SOFTWARE, DOCUMENTATION, OR MEDIA, AND HEREBY EXPRESSLY DISCLAIMS THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. FURTHERMORE, UNIVERSAL AUDIO DOES NOT WARRANT OR MAKE ANY REPRESENTATIONS REGARDING THE USE OR THE RESULTS OF THE USE OF THE SOFTWARE OR DOCUMENTATION IN TERMS OF THEIR CORRECTNESS, ACCURACY, RELIABILITY, OR OTHERWISE. NO ORAL OR WRITTEN INFORMATION OR ADVICE GIVEN BY UNIVERSAL AUDIO OR A UNIVERSAL AUDIO-AUTHORIZED REPRESENTATIVE SHALL CREATE A WARRANTY OR IN ANY WAY INCREASE THE SCOPE OF THIS WARRANTY. EXCEPT AS SPECIFIED HEREIN, SHOULD THE SOFTWARE PROVE DEFECTIVE, YOU (AND NOT UNIVERSAL AUDIO OR A UNIVERSAL AUDIO-AUTHORIZED REPRESENTATIVE) ASSUME THE ENTIRE COST OF ALL NECESSARY SERVICING, REPAIR, OR CORRECTION. SOME JURISTICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

6. Excluded Products. Universal Audio gives NO warranty for Third-Party Software or Software provided by Universal Audio, free of charge, including Software designated as "limited release," "pre-release," "loan," "beta" or "test. " This Software is provided "AS IS," unless the third-party manufacturer offers a different warranty. Please see Section 12 below for more information about Third-Party Software.

7. Limitation of Liability. UNIVERSAL AUDIO SHALL HAVE NO LIABILITY TO YOU OR ANY THIRD PARTY, WHETHER IN CONTRACT, TORT, NEGLIGENCE OR PRODUCTS LIABILITY, FOR ANY CLAIM, LOSS, OR DAMAGE, INCLUDING BUT NOT LIMITED TO LOST PROFITS, LOSS OF USE, BUSINESS INTERRUPTION, LOST DATA, OR LOST FILES, OR FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER ARISING OUT OF OR IN CONNECTION WITH THE USE OF OR INABILITY TO USE THE SOFTWARE OR DOCUMENTATION, OR THE PERFORMANCE OR OPERATION OF THE SOFTWARE, EVEN IF UNIVERSAL AUDIO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN NO EVENT SHALL UNIVERSAL AUDIO'S TOTAL LIABILITY TO YOU FOR ALL DAMAGES, LOSSES, AND CAUSES OF ACTION WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE) OR OTHERWISE EXCEED THE AMOUNT PAID BY YOU FOR THE SOFTWARE.

8. Termination. To the extent permitted by law, and without prejudice to any other rights Universal Audio may have, Universal Audio may terminate your license if you materially breach these terms and conditions. Upon termination by Universal Audio, you will return to Universal Audio, at your expense, the Software, including Documentation, and any copies thereof.

(continued)

9. Notice to U. S. Government End Users. The software is a "commercial item" as that term is defined in 48 CFR. 2.101 (Oct. 2005), consisting of "commercial computer software documentation," as such terms are used in 48 CFR. 12.212 (Sept. 2005). Consistent with 48 C.F.R. 12.212 and 48 CFR. 227.7202-1 through 227.7202-4 (June 2005), all U.S. Government End Users acquire the software with only those rights set forth herein. All software provided to the U.S. Government pursuant to solicitations issued prior to December 1, 1995 is provided with "Restricted Rights" as provided for in FAR, 48 CFR 52.227-14 (June 1987) or DFAR, 48 CFR 252.227-7013 (Oct. 1988) as application. This provision does not apply if you are not affiliated with the government of the United States of America.

10. Export restrictions. The Software is subject to United States export laws and regulations. If you are subject to U.S. laws, you must comply with these laws, which include restrictions on destinations, end users and end use. For further information, please see http://www.bis.doc.gov.

11. Consent to Use Data. Universal Audio may collect and use technical information about the Software and hardware devices you use in connection with the Software in a manner that does not personally identify you. Universal Audio may use this information to improve our products or to provide customized services or technologies. Universal Audio may also disclose this information to third parties so that they may improve the way their products or services interact with the Software.

12. Third Party Software; Third Party Information. Your installation and use of Third-Party Software is subject to different terms, which can be found on the media on which the Third-Party Software is provided, or at: http://www.uaudio.com/eula. Nothing in this Agreement limits rights granted to you by third parties, which may include rights under free software or open source software licenses. Additionally, Universal Audio may include information about third party products and services, including links to Web sites run by others. Universal Audio is not responsible for, and does not endorse or sponsor, this third-party information.

13. Miscellaneous. This Agreement shall be governed by and construed in accordance with the laws of the United States and the State of California, as applied to agreements entered into and to be performed entirely within California between California residents. If for any reason a court of competent jurisdiction finds any provision of this Agreement or portion thereof to be unenforceable, that provision or part thereof shall be enforced to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement shall continue in full force and effect. This Agreement constitutes the entire agreement between the parties with respect to the use of the Software and Documentation, and supersedes all prior or contemporaneous understandings or agreements, written or oral, regarding such subject matter. No amendment to or modification of this Agreement will be binding unless in writing and signed by a duly authorized representative of Universal Audio.

Should you have any questions concerning this Agreement, please contact Universal Audio at 1700 Green Hills Road, Scotts Valley, CA, 95066-4926 USA, +1-831-440-1176 voice, +1-831-461-1550 fax, www.uaudio.com web.

Copyright

Trademarks

Universal Audio, the Universal Audio "diamond" logo, UAD, UAD Series, UAD-1, UAD-2, UAD-2 SOLO, UAD-2 DUO, UAD-2 QUAD, "Powered Plug-Ins", 1176LN, 1176SE, Teletronix, LA-2A, LA-3A, LA-610, LA-610MkII, 2-1176, 2-610, 6176, 710 Twin-Finity, 2192, 4-710d, Cambridge EQ, DreamVerb, Plate 140, Precision Limiter, RealVerb Pro, Precision Buss Compressor, Precision De-Esser, Precision Maximizer, Satellite DUO, Satellite QUAD, Apollo and "Analog Ears | Digital Minds," are trademarks or registered trademarks of Universal Audio, Inc. Other company and product names mentioned herein are trademarks of their respective owners.

EULA Last Updated February 1, 2012

Manual v120217

Table Of Contents

Tip: *Click any section to jump directly to that page.*

Chapter 1: Introduction 7

The Apollo System 7
Software Features 9
System Requirements 10
Documentation Overview 11
Apollo Software Overview 13
Technical Support 15

Chapter 2: Software Installation 16

Installation Overview 16
Software Installation Procedure 17
Registration & Authorization 17

Chapter 3: Console Application 18

Console Overview 18
The Console Mixer Window 21
Channel Input Strips 24
Channel Input Controls 26
Inserts 28
Auxiliary Section 35
Aux Return Strips 35
Monitor Section 37
Insert Effects 37
Headphone Master 1, 2 39
Input View 40
Monitor Controls 40
Recall 42
Console Settings Window 44
Window Title Bar 48
Application Menus 49

Chapter 4: Console Recall Plug-In 50
Console Recall Overview 50
Console Recall Controls 51
Synchronize 52

Chapter 5: Workflows 54
Apollo Setups Overview 54
About UAD Powered Plug-Ins Processing 55
Using Apollo as an Audio Interface 57
Using Apollo with Console (without a DAW) 59
Using Apollo Without A Computer 60
Using Apollo with a DAW (without Console) 61
Using Apollo Concurrently with a DAW and Console 63
Routing Console Outputs Into the DAW for Recording 64

Chapter 6: Device Drivers 66
Apollo Drivers Overview 66
Driver I/O Labels 67
Delay Compensation with Apollo 69
Input Delay Compensation in Console 69
Latency Basics 72

Chapter 7: Glossary 75

Chapter 8: Index 82

Chapter 1: Introduction

The Apollo System

Class-Leading 24-bit/192 kHz Sound Quality

Designed to play a central role in a modern Mac-based studio, Apollo incorporates a true "no compromise" approach to audio quality. Building upon decades of UA's analog hardware heritage, it offers extremely high-resolution sonics, with the lowest THD and highest dynamic range in its class. Apollo's premium mic preamps, top-end converters — and UA's meticulous attention to circuit design — translate into greater accuracy and depth in your recordings, from tracking and overdubbing, to mixing and mastering.

Realtime UAD Plug-In Processing for Tracking, Mixing and Mastering

While Apollo's "natural" sound is exceedingly open and transparent, it can quickly deliver a wide range of classic analog tones and color via its Realtime UAD Processing. Available with either DUO Core or QUAD Core processing onboard, this onboard DSP Acceleration allows for recording and mixing through UAD Powered Plug-Ins — with as low as sub-2ms latency — so that producers can quickly monitor, audition, and "print" audio using classic analog emulations from Ampex, Lexicon, Manley, Neve, Roland, SSL, Studer, and more.**

Want to place multiple 1176 compressors on your drum inputs, or record vocals through a classic Neve 1073 EQ, or even track the entire band through a Studer A800 tape machine in real time? No problem. With Realtime UAD processing, Apollo's sonic options are virtually endless.

*** All trademarks are recognized as property of their respective owners. Individual UAD Powered Plug-Ins sold separately.*

Thunderbolt™ I/O: The Next Generation of Connectivity

Apollo offers compatibility with Intel's new Thunderbolt technology, as found on the newest iMacs, MacBook Pros, and MacBook Airs.

Available via a user-installable dual-port Thunderbolt I/O Option Card (not included), Thunderbolt provides lower latency, reduced audio buffer size, improved performance, and greater UAD plug-in instances versus FireWire. And because Thunderbolt offers many times the bandwith of FireWire, it allows music producers to connect numerous devices in series with the Apollo interface — including hard drives, processors, and additional computer monitors — all with fast, flawless performance.

Deeper Integration with Pro Tools, Logic, Cubase and more

Apollo's Core Audiow drivers ensure compatibility with all major DAWs, including Pro Tools, Logic Pro, Cubase, Live, and more. Beyond this basic compatibility, Apollo's included Console application and companion Console Recall plug-in (VST/AU/RTAS) provide control and recall of all interface and UAD plug-in settings within individual DAW sessions, even months and years later. Read more about Apollo's included software here.

Elegant Hardware Design and Workflow

One key feature of Apollo isn't really a "feature" at all. It's the numerous design details that give you a fast, natural workflow — and better results. There are physical front-panel controls for all the most commonly used features, including Preamp and Monitor level knobs, channel selection, mic pad and low cut, phantom power, and even dual headphone outs with independent level control. Smart Hi-Z inputs on the front panel detect when you've connected your guitar or bass, and automatically enable hardware and software monitoring.

Sonically, Apollo's Mic inputs and Monitor outputs are digitally controlled analog, so you don't lose audio resolution when you adjust gain. High-resolution/high-contrast metering, derived from UA's legendary 2192 interface, is designed to be viewable at nearly any angle. Finally, standalone operation means that you can use Apollo's audio connections, and last-used DSP mixer settings, even without a computer connected.

Software Features

Note: *For the complete list of hardware features, see the Apollo Hardware Manual.*

Console Application

General:

- Remote control of all Apollo hardware features and functionality
- Analog-style mixer for realtime monitoring and tracking with UAD plug-ins
- Enables Realtime UAD Powered Plug-Ins processing on all inputs
- Console settings can be saved/loaded for instant recall of any configuration

Realtime UAD Processing:

- Up to four UAD plug-ins can be serially "stacked" on each input and aux return
- UAD insert processing can be monitored "wet" while recording wet or dry
- Sub-2ms round-trip latency with four stacked UAD plug-ins at 96 kHz sample rate

Channel Inputs:

- 18 inputs (8 analog, 8 ADAT, 2 S/PDIF)
- Level, pan, solo, and mute controls on all inputs
- Four plug-in inserts per input for Realtime UAD processing
- Two stereo headphone sends with level and pan controls on all inputs
- Two stereo auxiliary sends with level and pan controls on all inputs
- Adjacent input pairs can be linked for convenient stereo control
- Sample rate conversion is available on S/PDIF inputs

Dual Auxiliary Buses:

- Two stereo auxiliary returns with level, mute, and mono sum controls
- Four plug-in inserts per auxiliary return for Realtime UAD processing
- Auxiliary mixes can be routed to main monitor mix and/or headphone outputs
- Auxiliary mixes can be routed to any Apollo output

Monitoring:

- Stereo monitor mix bus with level, mute, solo clear, and source select controls
- Two stereo headphone mix buses; or headphones can be switched to monitor mix
- Independent mono-sum controls for monitor, auxiliary, and headphone mix buses
- S/PDIF outs can mirror the monitor mix for connecting to speakers with digital inputs

Metering:

- Signal level meters with peak hold and clip indicators on all inputs
- Dual pin-style peak meters with signal peak LEDs display monitor bus levels
- Input meters are globally switchable to display pre or post fader signal levels
- Independently selectable peak/clip hold times with global clear button
- DSP meters for monitoring UAD-2 resources and FireWire bandwidth

Console Recall plug-in

- Convenient access to Console's monitor controls via DAW plug-in
- Saves complete Apollo configurations inside DAW sessions for easy session recall
- VST, RTAS, and Audio Units plug-in formats

UAD Powered Plug-Ins

- Award-winning audio plug-ins for monitoring, tracking, mixing, and mastering
- UAD plug-ins can be used simultaneously within Console and/or DAW
- All UAD plug-ins include fully-functional 14-day demo period
- Complete UAD plug-ins library is available online 24/7 at www.uaudio.com

UAD Meter & Control Panel application

- UAD Control Panel configures global UAD-2 and UAD Powered Plug-Ins settings
- Convenient access to plug-in license authorizations and firmware updates
- UAD Meter monitors Apollo's UAD-2 DSP resources and FireWire bandwidth

Device Drivers

- 32-bit and 64-bit device drivers for Mac OS X
- Supports multi-device aggregation and multi-client output
- All hardware inputs and outputs can be individually addressed by DAW
- Console's monitor, auxiliary, and headphone mix buses can be routed to DAW inputs for recording

System Requirements

- Intel-based Mac computer
- Mac OS X 10.6.8 Snow Leopard or 10.7.2 Lion (or higher)
- Available FireWire 800 port
- 1024 x 900 minimum display resolution
- 1 GB available hard drive space
- CD-ROM drive or Internet connection for software installation
- Internet connection for registration, UAD plug-in authorization, & updates

Documentation Overview

Documentation for all Apollo components is extensive, so instructions are separated by area of functionality, as detailed below. All documentation is on the disk included in the retail package and is copied to the computer during software installation (Apollo documentation can also be downloaded from our website).

After software installation, all Apollo documentation can be found on the computer here:

- Startup Disk/Applications/Powered Plug-Ins Tools/Documentation

Apollo Hardware Manual

The Apollo Hardware Manual (available in print and PDF) contains complete information about the audio interface hardware. Included are detailed descriptions for all Apollo hardware features, control functions, and connections. Refer to the Hardware Manual to learn all about interfacing the hardware with other devices, operating the panel controls, clocking, specifications, and related information.

Apollo Software Manual

The Apollo Software Manual (PDF only) is the companion guide to the Apollo Hardware manual. It contains detailed information about how to configure and control Apollo-specific software features using the Console application and Console Recall plug-in. Refer to this Software Manual to learn how to operate these software tools and integrate Apollo's audio interface functionality into the DAW environment.

Hyperlinks

Hyperlinks to other pages in the same file and web pages are highlighted in blue text. Click a hyperlink to jump directly to the linked item.

> ***Tip:*** *Use the "back" button in the PDF reader application to return to the previous page after clicking a hyperlink.*

UAD System Manual

The UAD System Manual (PDF only) is the complete operation manual for Apollo's UAD-2 functionality and applies to the entire UAD product line. It contains detailed information about installing and configuring UAD devices, the UAD Meter & Control Panel application, how to use UAD Powered Plug-Ins within a DAW, obtaining optional plug-in licenses at the UA online store, and more. It includes everything about UAD except Apollo-specific information and individual UAD Powered Plug-In descriptions.

UAD Plug-Ins Manual

The features and functionality of all the individual UAD Powered Plug-Ins is detailed in the UAD Plug-Ins Manual (PDF only). Refer to this document to learn about the operation, controls, and user interface of each plug-in.

Host DAW Documentation

Each host DAW application has its own particular methods for configuring audio interfaces and using plug-ins. Refer to the host DAW documentation for specific instructions about using audio interface I/O and plug-in features within the DAW.

Information & Software Updates

The latest technical information and software for Apollo is posted on the Universal Audio support website. Our support pages may contain updated, late-breaking information that is not available in other publications. Please visit the Apollo support page at:

- uaudio.com/support/apollo

Terminology

This manual uses technical terms and acronyms that may be unfamiliar. Refer to "Chapter 7: Glossary" beginning on page 75 for the definitions of many of these terms.

Apollo Software Overview

Apollo has several software components that comprise the complete Apollo system. A brief description of each component is provided below, along with a link to complete details about the component.

Console Application

The Console application is Apollo's primary software interface. Its main function is to control the hardware unit and its digital mixing and monitoring capabilities. The Console mixer is where Realtime UAD processing using UAD Powered Plug-Ins is configured.

For complete details, see "Chapter 3: Console Application" beginning on page 18.

Console Recall Plug-In

Console Recall is a DAW plug-in supplied in VST, RTAS, and Audio Units formats. Console Recall offers additional convenience when using Apollo and/or the Console application in conjunction with a DAW. It also enables a method to store complete Console configurations within the DAW session file.

For complete details, see "Chapter 4: Console Recall Plug-In" beginning on page 50.

UAD Powered Plug-Ins

UAD Powered Plug-Ins are the plug-in files that are loaded within a host application for processing on Apollo's integrated UAD-2 DSP accelerator (Console and DAWs are host applications). Each UAD plug-in contains a graphical user interface ("GUI") and various control parameters that can be manipulated to achieve the desired sonic results.

Typical UAD plug-in window

Apollo includes numerous UAD Powered Plug-Ins in the "Analog Classics" bundle. Optional UAD plug-ins can be evaluated without functional limitations for 14 days in demo mode. Optional plug-in licenses can be purchased 24/7 at the UA online store.

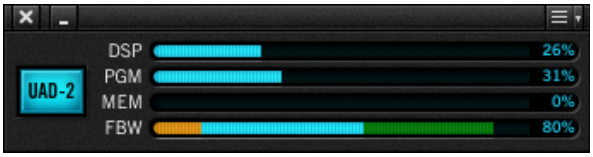
For additional details about how UAD Powered Plug-Ins are used with Console and DAWs, see "About UAD Powered Plug-Ins Processing" on page 55. For general UAD Powered Plug-Ins usage instructions, see the UAD System Manual. For complete details of individual UAD Powered Plug-Ins, see the UAD Plug-Ins Manual.

UAD Meter & Control Panel Application

The UAD Meter & Control Panel Application is used to configure global functionality that pertains to all UAD-2 devices in the same system (the same application is used for all UAD-2 products). All UAD-2 global system settings are set within this application. The application consists of two components: The UAD Meter and the UAD Control Panels.

UAD Meter

The UAD Meter window (at right) displays the current DSP, memory, and FireWire status of all active UAD-2 hardware (including multiple devices). These meters are also present in Console (beneath the main output meters).



UAD Control Panels

The UAD Control Panel window has multiple panels that display, and enable control of, the various UAD-2 system, plug-in, and global configuration parameters.

The screenshot at right shows the System Info panel, one of five control panel windows in the UAD Meter & Control Panel application.

Accessing UAD Meter & Control Panel

The application can be accessed (after software installation) from the Mac OS X Dock or under the UA icon in the Mac OS X Menu Bar at upper right of screen (page 20).

Detials About This Application

Complete documentation for the UAD Meter & Control Panel application is in the UAD System Manual.

Apollo Device Drivers

The Apollo device drivers are the low-level system software files that instruct the computer's operating system on how to communicate with the Apollo hardware. The drivers are loaded during system startup so whenever Apollo is connected, the interface is ready to accept instructions from the OS and audio applications.

For complete details, see "Chapter 6: Device Drivers" beginning on page 66.

Technical Support

Universal Audio provides free customer support to all registered Apollo users. Our support specialists are available to assist you via email and telephone during our normal business hours, which are from 9am to 5pm, Monday through Friday, Pacific Standard Time.

Telephone

USA toll-free: +1-877-MY-UAUDIO (1-877-698-2834)
International: +1-831-440-1176
FAX: +1-831-461-1550

Online Support

To request online support via email, please visit the main support page at uaudio.com/support/apollo, then click the "Submit Support Ticket" button on the right side of the page to create a help ticket.

Or simply click the link below for a direct link to the help ticket form:

- uaudio.com/my/support/index.php?pg=request

Chapter 2: Software Installation

Installation Overview

Simplified procedures for software installation, registration, and authorization are in this chapter. For complete and detailed procedures, refer to the UAD System Manual. For hardware installation notes and diagrams, refer to the Apollo Hardware Manual. If you need technical assistance, contact technical support (page 15).

The UAD Installer places all the software necessary to configure and use Apollo and UAD Powered Plug-Ins onto the computer's boot disk. It also installs the Apollo hardware device drivers so the audio interface can communicate with the host computer. Therefore the UAD Installer must be run even if you intend to use Apollo without the use of Console or UAD Powered Plug-Ins functionality.

Apollo installation, registration, and authorization consists of four main steps:

1. UAD software installation: Run the installer from download or included disk.
2. Connect Apollo to the host computer (and other gear): See example setups in the Apollo Hardware Manual.
3. Apollo device registration: Add the device to your my.uaudio.com account.
4. UAD plug-in authorization: Download and apply the UAD authorization file.

If you are updating to a newer version of Apollo software or installing additional UAD devices, it is not necessary to remove the previous UAD software or hardware from the system.

System Requirements

Ensure the System Requirements are met before installing the Apollo hardware or software.

Software Updates

The software in the retail package may not contain the latest Apollo software; the latest version is recommended. If the software is already installed, the UAD Meter & Control Panel application has a convenient button that check for the most recent version. Please check our website for software updates at:

- uaudio.com/support/uad/downloads.html

Preparation

Close all open files and applications before starting the installation procedure. Specifically, make sure the Console, UAD Meter & Control Panel, and DAW applications are quit.

> ***Important:*** *Verify the computer system date and time are set correctly before installing the software and/or launching the UAD Meter & Control Panel or Console applications for the first time.*

Software Installation Procedure

Important: *Software for Apollo and other UAD-2 devices (if any) must be installed at the same time – software for these devices cannot be installed separately.*

1. Launch the software installer. It's on the included disk or it can be downloaded at uaudio.com/support/uad/downloads.html
2. The installer will guide you through the installation procedure.
3. Connect Apollo to the computer with a FireWire cable and power it up (if not already done). See example setups in the Apollo Hardware Manual.
4. Software installation is complete; proceed to "Registration & Authorization."

Registration & Authorization

Apollo must be registered and authorized at my.uaudio.com to unlock its UAD-2 functionality. Apollo can be used as a normal audio interface (without UAD Powered Plug-Ins) without registration and authorization. Unlicensed UAD-2 plug-ins can be used in demo mode for 14 days without authorization.

Registration only needs to be completed once, however authorization must be completed each time the UAD software is updated. Apollo, like all UAD-2 devices, stores its authorization and UAD licenses in the device itself, so the unit can be connected to a different computer without repeating the authorization process.

Important: *Registration and authorization can only be accomplished after successful software installation.*

Registration & Authorization Procedure

Registration is part of the initial authorization process (it's not a separate procedure). The following steps require an Internet connection to the host computer. To authorize from a system that is not online, see the UAD System Manual.

1. Ensure that the Apollo software is installed and Apollo is powered up and connected to the computer via FireWire or Thunderbolt (the hardware and software systems must be communicating properly).
2. Open the UAD Meter & Control Panel application (it can be accessed from the Mac OS X Dock or under the UA icon in the Mac OS X Menu Bar at upper right of screen).
3. Open the Plug-Ins panel. The panel can be accessed from the drop menu in the UAD Meter window titlebar or by typing Cmd-P (⌘-P) when in the application.
4. Click the "Authorize Plug-Ins..." button to begin the registration/authorization process. Follow the onscreen instructions.
5. Double-click the authorization file that is automatically downloaded. The authorization is loaded into Apollo, and after a few seconds the "Authorizations Updated Successfully" window appears.

Registration and authorization is complete and Apollo is ready for use.

Chapter 3: Console Application

Console Overview

The Console application is Apollo's primary software interface. Console's analog-style workflow is designed to provide quick access to the audio interface features most commonly needed by the user in a familiar, easy-to-use interface.

Console's main function is to control the hardware unit and its digital mixing and monitoring capabilities. The Console Mixer is where Realtime UAD processing using UAD Powered Plug-Ins is configured.

Console's application icon

Console can be used simultaneously with a DAW for front-end processing and monitoring functionality. Complete Console setups can be saved as presets for easy recall of the entire configuration. Console can also be used to configure Apollo's audio interface I/O settings such as sample rate, clock source, and reference levels.

Note that the Console application is a remote interface to the digital mixing and signal processing functions that are performed within the Apollo interface. Although Console runs on the host computer, the computer's CPU is not performing these audio functions.

The Console Mixer window

Console Functions

Console enables the following functionality when used with Apollo:

- **Hardware control.** Apollo's front panel hardware controls (except headphone volume) can be controlled using Console, facilitating easy hardware control even if Apollo is installed in a location out of reach of the host computer operator.
- **Buffer-free monitoring.** Using Console eliminates DAW I/O buffering and its associated latency that makes monitoring and recording difficult for the performer. By removing the DAW and its "software monitoring" from the monitoring signal flow altogether, buffering and latency become non-issues.
- **Realtime UAD processing.** UAD Powered Plug-Ins can be inserted into all Console inputs and/or auxiliary returns (within available DSP resources), for the ultimate sonic experience while monitoring and/or tracking live performance. All processed (or unprocessed) mix buses, including the monitor, auxiliary, and headphone mixes, can be optionally routed into the DAW for recording.
- **Flexible, independent monitor mixing and tracking.** Console has two stereo auxiliary buses, with independent send levels per input, for grouped signal processing (conserving DSP resources) or routing to alternate hardware outputs. Two stereo headphone mix buses with per-input (and per-aux return) sends ensure individual performers can hear "more me" if desired.
- **Session management.** Complete Console configurations can be saved and loaded to/from disk as presets, for convenient and unlimited session management.

Global Settings

Settings are available within Console for configuring various global behaviors:

- **Hardware.** Global Apollo interface settings such as sample rate, clock source, reference levels, and S/PDIF mirroring are controlled within Console.
- **Software.** Global software settings for Console such as meter and plug-in window behaviors are configured within Console.

Interactions Between Console and Apollo

Console's settings mirror the Apollo hardware; changes made to one will be made on the other, and vice versa. If changes are made to Console when Apollo is not connected, when Apollo is subsequently connected, the Console settings are sent to the hardware.

> ***Important:*** *If Console is launched after changes are made to Apollo using the front panel hardware controls, the current Console settings will overwrite the changes made using the hardware controls.*

When To Use Console

The Console application can be used without a DAW, simultaneously in conjunction with a DAW, or not at all. These scenarios are covered in greater detail in "Chapter 5: Workflows" beginning on page 54.

Console without DAW. Console can be used by itself without the use of a DAW or any other audio software. Using Console without a DAW provides access to all Apollo functionality and simplifies the use of Apollo's digital mixing, monitoring, and Realtime UAD processing features when a DAW's recording and playback features are not needed.

Console with DAW. Console is used at the same time as a DAW when low-latency monitoring and/or recording of Apollo's inputs with (or without) Realtime UAD processing is desired. In this scenario, Console is used to control input monitoring when recording, and the DAW's software monitoring feature is disabled. This workflow completely eliminates the I/O buffering latencies associated with using software monitoring via the DAW.

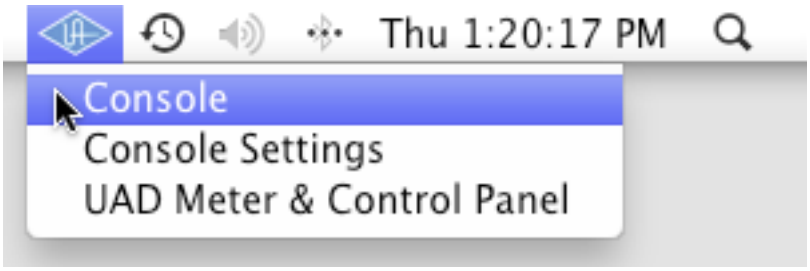
> ***Important:*** *To eliminate doubled signals, software monitoring in the DAW should be disabled when Console is used for monitoring.*

UAD plug-ins can be used within Console and the DAW simultaneously. In this scenario, Apollo's DSP resources are shared between the two applications. Realtime UAD processing is available via Console, and buffered (non-realtime) UAD processing is available via VST, RTAS, or Audio Units plug-ins within the DAW. See "UAD Powered Plug-Ins: Console versus DAW" on page 54 for more details about this scenario.

Accessing Console

Console can be launched or quit at any time, whether or not a DAW is already running. There are several ways to launch the Console application:

1. Select "Console" under the UA icon the Mac OS X Menu Bar, or
2. Click the Console application in the Mac OS X Dock, or
3. Double-click the Console application, which is installed to:
   Startup Disk/Applications/Powered Plug-Ins Tools/Console.app

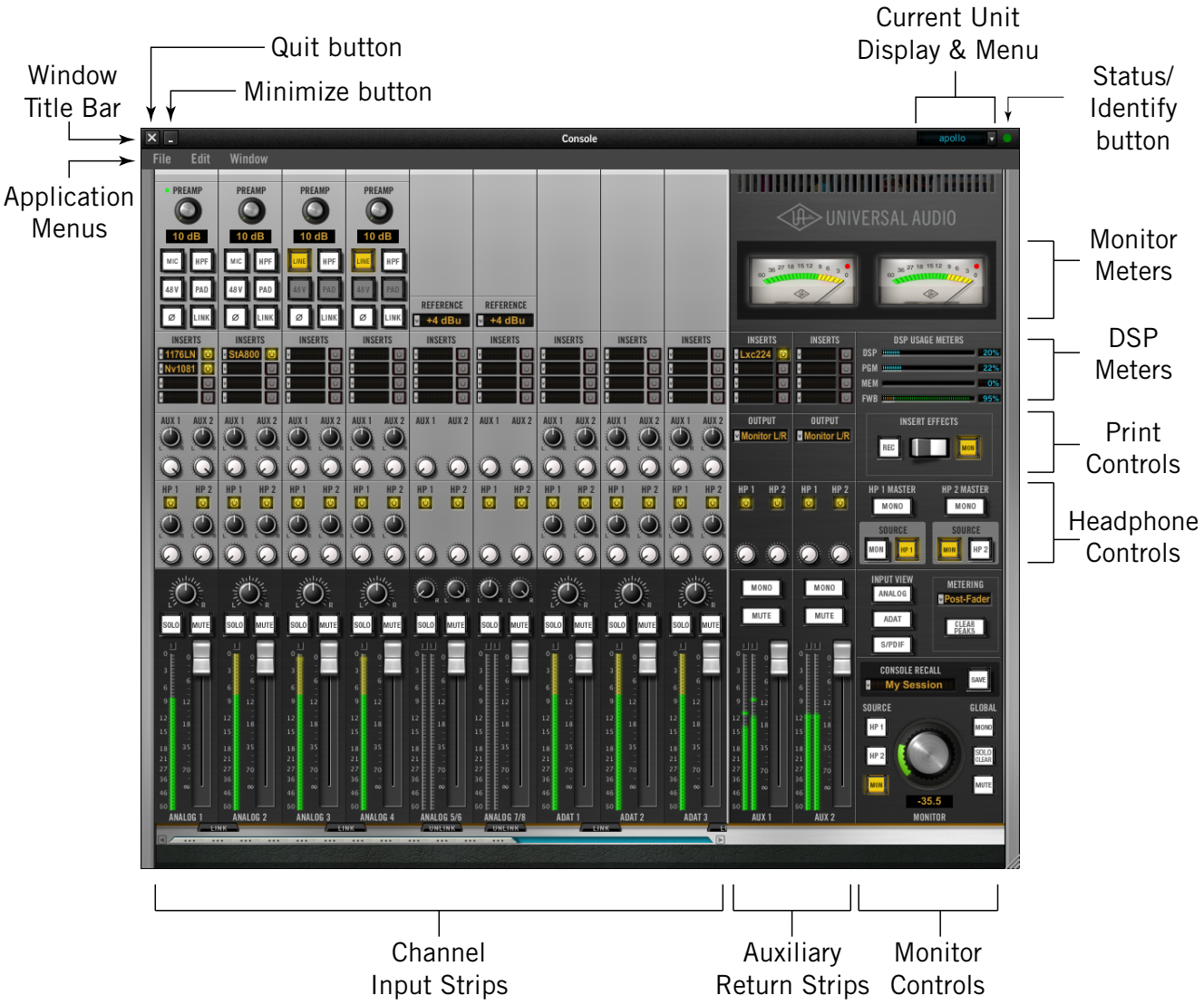


Accessing Console from the Mac OS X Menu Bar

The Console Mixer Window

Control Groups

Console controls are grouped according to functionality, with a layout similar to that found on most analog mixers. The layout of these groupings is shown below. Detailed explanations of all the Console control functions are similarly grouped and presented later in this chapter.



The Console Mixer window and controls layout

Sizing the Console Mixer Window

The size of the Console Mixer window can be horizontally adjusted by dragging the lower right corner of the window. Reducing the Mixer width will reduce the number of visible inputs. Use Scrolling (below) to view the hidden inputs. The vertical size of the window cannot be adjusted.

Scrolling

When the Mixer window is sized to display fewer channels than are currently active, the window can be scrolled horizontally to bring the hidden channels into view.

Console Mixer window's scroll bar

To scroll the Mixer window, either:

1. Drag the scroll bar with the mouse, or
2. Click the scroll arrows at either end of the scroll bar, or
3. Hover over the scroll bar and use the scroll function of the input device (scroll wheel, trackpad, etc).

Note: *Console is automatically sized to fit within the available horizontal resolution of the primary display monitor; therefore scrolling is required to view all available input strips if the horizontal display resolution is less than 1800 pixels.*

Adjusting Console Controls

Console parameter values are modified using typical computer GUI techniques.

2-state buttons, switches, and checkboxes: Click to toggle the state.

Knobs: Click-drag to adjust, or use the shortcuts below. Console's rotary controls (and UAD plug-in knobs) can respond to Linear, Circular, or Relative Circular adjustments modes. This preference is set in the UAD Meter & Control Panel application; full details are in the UAD System Manual.

Faders: Click-drag to adjust, or use the shortcuts below.

UAD Plug-Ins: Most UAD plug-in controls use the same methods as above. However, some plug-in parameters may have custom controls that are unfamiliar or not obvious. All custom controls are detailed for individual plug-ins in the UAD Plug-Ins Manual.

Console Shortcuts

Several shortcuts are available to simplify Console control adjustments:

Scroll Wheel: Continuous controls (knobs and faders) can be adjusted by using the mouse scroll wheel (if available). Hover the cursor over the control and adjust the scroll wheel to modify the parameter value.

Adjust All: If the Option key is held down while modifying any control, the same control on all inputs (or aux returns) will be simultaneously adjusted. The relative difference is maintained between the same controls until any control reaches its minimum or maximum value.

Return To Default: If the Command ("⌘" or "apple") key is held when a control is clicked, the control will return to its default value. Command+Option+Click will return all controls of the same type to their default value.

Mute/Solo All Toggle: Option-click a Mute or Solo button to toggle the state on all channels.

Button Toggle via Return: When a button has focus, it can be toggled with the Return or Enter keys on the computer keyboard. A button has focus after it is clicked.

Drop Menus: Menus continue to display after a single click. The mouse button does not need to be held down to view the menu.

Channel Input Strips

Each Console input strip controls the corresponding Apollo hardware input. The output of all Console channel input strips are always fed to Console's monitor outputs.

Console's inputs can be routed to different Apollo hardware outputs by using the auxiliary buses; the auxiliary returns can be optionally routed to any physical output on Apollo.

Console's channel input strips are essentially the same for all inputs, however there are some differences among the analog and digital inputs as noted below. Detailed descriptions of all controls begin on page 26.

Input Types

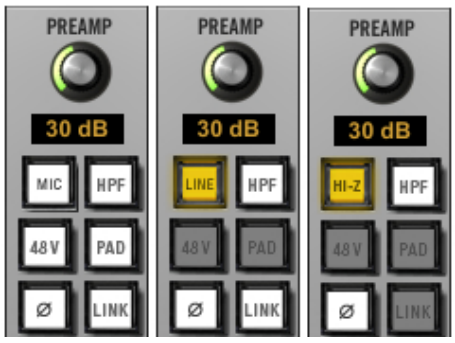
Console has a total of 18 channel input strips, consisting of 8 analog inputs, 8 digital ADAT inputs, and 2 digital S/PDIF inputs. The controls that are available in each strip depends on the type of input.

Analog Inputs

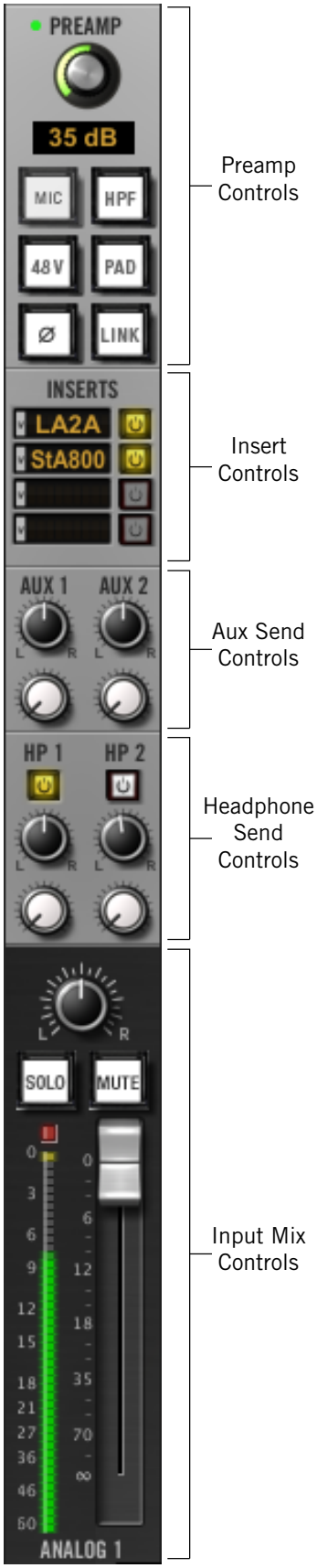
Console's 8 analog inputs reflect the 8 *channels* of A/D conversion that are available in Apollo. Since there are actually 14 analog *inputs* on the interface, the analog inputs are switched depending on the analog source (like an analog mixing console with multiple inputs per channel).

Preamp Inputs

Preamp channels 1 – 4 are switched between Mic and Line inputs manually via Console or Apollo's front panel. Channels 1 – 2 are automatically switched to Hi-Z inputs when a ¼" mono (tip-sleeve) cable is connected to Apollo's front panel Hi-Z input jack.



Console's preamp modes: Mic (left), Line (center), and Hi-Z (right)



Console's Channel Input Strip

Digital Inputs

Console's ADAT and S/PDIF inputs work just like the analog inputs, except they don't have the extra the preamp and reference level settings that are only available on the analog inputs.

S/PDIF Sample Rate Conversion

Apollo can perform realtime sample rate conversion ("SR Convert") on the S/PDIF inputs. This feature eliminates audio artifacts (clicks, distortion, etc) that can occur when the sample rate of external digital devices connected to Apollo's S/PDIF inputs do not match Apollo's sample rate.

To enable realtime sample rate conversion on Apollo's S/PDIF inputs, click the SR Convert button in Console's S/PDIF channel strip. The feature is active when the buttons are yellow.

Sample Rate Conversion notes:

- SR Convert is available on the S/PDIF 1 & 2 inputs only.
- SR Convert applies to both S/PDIF inputs (they cannot be individually enabled).
- SR Convert functions on both S/PDIF inputs whether they are stereo linked or not.
- SR Convert cannot be enabled when Apollo's Clock Source is set to S/PDIF.

Input View

The Input View buttons (in the Monitor Controls section) provide a convenient way to hide channel strips of a particular type from view. This feature reduces required screen space and/or the need for scrolling (if the window size is reduced), or when particular input types are not being used.

Clicking any Input View button will hide all the channel input strips of that type (Analog, ADAT, and/or S/PDIF) from view. Clicking the button again will restore the inputs for viewing. A hidden channel type does not appear when scrolling.

Note: *All input channels remain active even if they are hidden from view.*

Channel Input Controls

Preamp Controls

Console's preamp controls on channels 1 – 4 correspond to the equivalent preamp controls on the Apollo front panel (Apollo has preamps on channels 1 – 4 only). Adjusting Apollo's front panel will update Console (and vice versa); see "Interactions Between Console and Apollo" on page 19 for details.

Gain

The channel's preamp gain is adjusted with this control. The input to be adjusted (Mic, Line, or Hi-Z) is determined by the state of the channel's Mic/Line switch or Hi-Z input (if connected).

Rotating the knob clockwise increases the preamp gain for the channel. The available gain range for preamp channels 1 – 4 is 10 dB to 65 dB for the Mic, Line, and Hi-Z inputs.

Gain Amount

The specific amount of preamp gain in decibels is displayed beneath the Gain control. The relative amount of preamp gain is indicated by the green "LED ring" surrounding the Gain control.

Front Panel Channel Selection Indicator "Dot"

The green "dot" that appears to the left of the PREAMP text indicates the preamp channel that is currently selected on Apollo's front panel (Apollo's channel selection is changed using the front panel).

Gain on non-preamp channels

Only analog inputs 1 – 4 have input gain adjustment via the mic preamp controls. To adjust signal levels for inputs 5 – 18, use the output level controls of the devices that are connected to those inputs. Alternately, additional gain can be added to input signals by inserting UAD plug-ins and adjusting the gain structure within the UAD plug-in(s).

Mic/Line

This button switches between the Mic and Line inputs on Apollo's rear panel. The button text and color depends on the preamp input selection (see examples on page 24).

The Mic/Line button has no affect if the channel's Hi–Z input is connected because channels 1 & 2 are automatically switched to Hi-Z inputs when a ¼" mono (tip-sleeve) cable is connected to Apollo's front panel Hi-Z input jack.

Low Cut Filter

When enabled, the channel's input signal passes through a low cut (high pass) filter. This 2nd-order coincident-pole filter has a cutoff frequency of 75 Hz with a slope of 12 dB per octave.

The Low Cut filter affects the Mic, Line, and Hi-Z inputs. Low Cut is typically used to eliminate rumble and other unwanted low frequencies from the input signal.

48V

When enabled, the 48V button is red and 48 volts of phantom power is supplied to the Apollo channel's rear panel Mic input. Most modern condenser microphones require 48V phantom power to operate. This option can only be activated when the Mic/Line switch is set to Mic.

> ***Note:*** *Depending on the current configuration of the Apollo and Console, there may be a delay when changing the 48V state to minimize the clicks/pops that are inherent when engaging phantom power. The +48V LED on Apollo's front panel will blink rapidly during any delay.*

Pad

When enabled, the PAD button is yellow and the channel's microphone input signal level is attenuated by 20 dB. Pad does not affect the Line or Hi-Z inputs.

Pad is used to reduce signal levels when overload distortion is present at low preamp gain levels, such as when particularly sensitive microphones are used on loud instruments, and/or if the A/D converter is clipping.

Polarity

When enabled, the polarity (aka "phase") button is yellow and the input channel's signal is inverted. Polarity affects the Mic, Line, and Hi-Z inputs.

Polarity inversion can help reduce phase cancellations when more than one microphone is used to record a single source.

Link

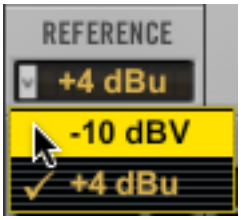
This button links the controls of adjacent preamp channels together (1 & 2, or 3 & 4) to create stereo input pairs. When channels are linked as a stereo pair, the Link button is yellow and any preamp control adjustments will affect both channels of the stereo signal identically.

Only the same type of inputs can be linked (Mic/Mic or Line/Line), and the Hi-Z inputs cannot be linked.

This button has the same function as the Link button which is available on all Console inputs. See "Stereo Link" on page 34 for more detail.

> ***Note:*** *For channels 1 – 4, input pairs can also be stereo linked and unlinked via Apollo's front panel.*

Reference Level



The signal reference level for Apollo's analog line inputs 5 – 8 can be switched between –10 dBV and +4 dBu with this drop menu. The setting controls an attenuation pad for the input channel.

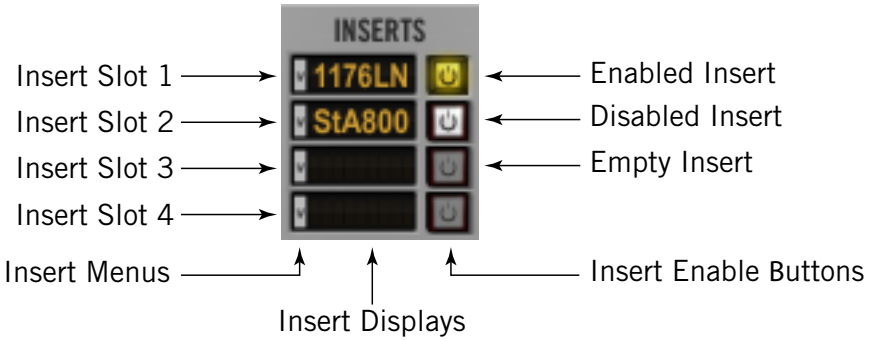
When set to +4 dBu, the pad is engaged and the channel can accept a higher signal level before the A/D converter clips. Select –10 dBV when lower input signal levels are used.

The reference level for channels 5 & 6 and 7 & 8 are linked in Apollo's hardware; therefore the reference level in Console can only be switched according to these stereo pairs.

Inserts

The Inserts section is where UAD Powered Plug-Ins are selected and used for Realtime UAD Processing. Four insert slots are available per Console strip; therefore up to four UAD plug-ins can be stacked (chained) per input within the constraints of available DSP resources.

General UAD Powered Plug-Ins usage instructions are in the UAD System Manual. See the UAD Plug-Ins Manual for complete details about individual UAD Powered Plug-Ins.



Console's Insert controls

Insert Menu

Clicking the Insert Menu on any insert slot will display the list of available UAD Powered Plug-Ins, and the options sub-menu, for that slot. Click an item in the displayed list to select the item.

Access UAD plug-ins by clicking an Insert Menu

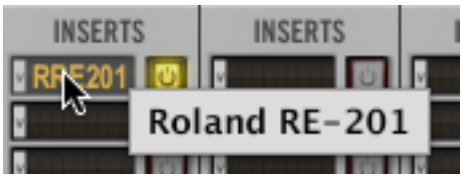
Selecting a plug-in from the list will load the plug-in into the insert slot; selecting an item from the options sub-menu will perform that function.

If the slot does not already contain a plug-in, clicking anywhere in the Insert Display will show the list (the area is dark when no plug-in is loaded). If a plug-in is already loaded in the slot, clicking near the "v" drop-menu indicator on left of the Insert Display will show the list.

> ***Tip:*** *Right-click (or Ctrl-click) the slot to display the Insert Menu even if a plug-in is already loaded in the slot (you don't need to click near the "v" drop-menu indicator to display the list in this case).*

Insert Display

The Insert Display shows the name of the currently loaded plug-in (if any). An abbreviated name is shown for longer plug-in names due to space constraints.



> ***Tip:*** *Hovering the mouse over the Insert Display shows the full plug-in name in a pop-up window.*

Insert Disable

The Insert Disable button can be used to disable/re-enable the plug-in that is in the slot. It performs the same function as turning off the plug-in within its interface.

When the plug-in is active, the button is yellow. When disabled, the button is white.

Insert Options

The Insert Options menu is displayed when the mouse is hovered over the "Options" text (at the top-left of the plug-ins list) in all insert menus.

The available options vary depending on the state of the insert and the copy/paste clipboard. Each Option function is described below.

> ***Note:*** *All copy/paste functions also copy/paste the current settings of the plug-in.*

Show Channel Strip Editor – This innovative feature groups and displays the interfaces of all plug-ins currently loaded in the inserts of a strip in a single window, offering a convenient method of organizing channel plug-in windows. The single window, containing up to four plug-in GUIs, can be moved and arranged on screen as desired in a single motion.

> ***Tip:*** *To open the Channel Strip Editor, command-click any Console insert slot containing a UAD plug-in.*

The Channel Strip Editor

Copy "Plug-In Name" – Copies the plug-in that is in the slot so it can be pasted into another slot via the Options menu "Paste" command. This option does not appear if a plug-in is not loaded in the slot.

Copy "Plug-In Name" To This Insert On Visible Inputs – Copies the plug-in that is in the slot into the same slot of all visible inputs. This option does not appear if a plug-in is not loaded in the slot.

> ***Note:*** *In the above context (and those below), "Visible Inputs" means all Console inputs that are currently displayed via the Input View buttons.*

Copy "Plug-In Name" To This Insert On All Inputs – Copies the plug-in that is in the slot into the same slot of all inputs (visible or not). This option does not appear if a plug-in is not loaded in the slot.

Paste "Plug-In Name" – Pastes the plug-in (that was previously copied) into the slot. This option does not appear if a plug-in was not previously copied via the Options menu.

Paste "Plug-In Name" To This Insert On Visible Inputs – Pastes the plug-in (that was previously copied) into the same slot of all visible inputs. This option does not appear if a plug-in was not previously copied via the Options menu.

Paste "Plug-In Name" To This Insert On All Inputs – Pastes the plug-in (that was previously copied) into the same slot of all inputs (visible or not). This option does not appear if a plug-in was not previously copied via the Options menu.

Bypass All Plug-Ins On This Channel – Disables all plug-in processing in all slots of the channel.

Enable All Plug-Ins On This Channel – Enables all plug-in processing in all slots of the channel.

Bypass All Plug-Ins – Disables all plug-in processing on all channels.

Enable All Plug-Ins – Enables all plug-in processing on all channels.

Remove All Plug-Ins On This Channel – Unloads all plug-ins from all insert slots in the channel.

Remove All Instances of "Plug-In Name" On This Insert On All Inputs – Unloads all plug-ins that have the same name from all slots in the channel (if any).

Remove All Plug-Ins – Unloads all plug-ins from all slots in all channels.

Auxiliary Sends

Each Console input strip has two stereo auxiliary ("aux") sends with independent pan and level controls. The aux sends route the channel's input signal to the two aux bus returns in Console.

Console's aux buses can be used to create reverb or delay returns for performance monitoring or independent mixes that can be routed to any Apollo output.

> ***Note:*** *See the "Auxiliary Section" on page 35 a complete overview of Console's aux design.*

Aux Pan 1, 2

The Aux Pan controls adjust the input's position in the stereo field of each aux bus. These knobs are not displayed when the input is in Linked mode, because Link forces the stereo channels to automatically pan hard left/right.

Aux Level 1, 2

The Aux Level controls adjust amount of signal sent to each auxiliary bus. The aux sends are post-fader and post-mute (the main channel fader must be up and not muted to send to the aux bus, and the aux send levels will reflect changes to the channel fader).

Headphone Sends

Each Console input strip and aux bus return has two headphone sends with independent enable, pan, and level controls. The headphone sends route the channel's input signal to the two independent stereo headphone buses in Console and are used to create independent mixes for Apollo's two headphone outputs.

> ***Important:*** *The Headphone Sends are not heard when the Headphone Master's Headphone Source 1, 2 is set to MON.*

Headphone Enable 1, 2

These switches are used to independently enable and disable the two headphone sends. When the headphone send is active, the button is yellow.

Headphone Pan 1, 2

These controls adjust the input's position in the stereo field of each headphone mix bus. The knobs are not displayed when the input is in Linked mode (Link forces the stereo channels to automatically pan hard left/right).

Headphone Level 1, 2

These controls adjust the amount of signal sent to each headphone bus. The headphone sends are pre-fader and mute; the main channel fader does not need be up or not muted to send to the headphone bus, and the headphone send levels do not reflect changes to the channel fader.

> ***Note:*** *These controls have no affect when the Headphone Master's Headphone Source 1, 2 for the bus is set to MON.*

Input Pan

This control adjusts the input's position in the stereo panaramic field of the monitor mix bus.

When the input is in Linked mode, two pan knobs appear for the channel – one for each of the left and right channels – enabling independent panning for both the left and right channels. When Link is activated the default position of the dual pan knobs are hard left/right.

Input Pan, Solo, & Mute

Input Mute

Mute stops the input channel's signal from being routed to the monitor mix bus and the aux buses. The channel is muted when the mute button is red. The input meter is still active when the channel is muted for a visual reference that there is still a signal coming into the channel even though it isn't heard in the monitor mix.

> ***Tip:*** *Option-click the Mute button to toggle mute on multiple channels.*

If Solo is activated on the same channel when muted, the mute state is overridden and the channel is heard in the monitor mix.

> ***Note:*** *Input Mute does not affect the channel input headphone sends.*

Input Solo

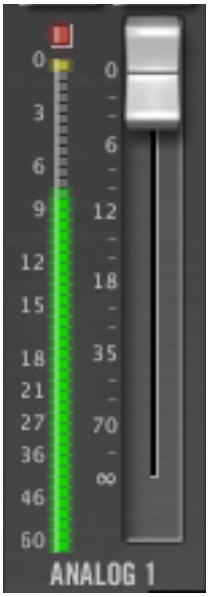
Solo mutes all input signals, except for any inputs in Solo mode. Solo is used to highlight individual channels in the mix without having to modify other channels.

> ***Tip:*** *Option-click the Solo button to toggle mute on multiple channels.*

The channel is solo'd when its Solo button is yellow. Activating Mute on a channel has no affect if the channel is in Solo mode.

> ***Note:*** *Input Solo does not affect the channel input headphone sends.*

Channel Fader



Input Meter & Channel Fader

This is the channel's main signal level control for the Console monitor mix. It always affects the channel's level in the monitor mix bus (the monitor outputs) and both aux mix buses (the aux outputs). Changes to this control are reflected in the channels level meter.

Fader Scale

The numerical labels represent the amount of attenuation applied by the fader. "0" represents 0 db of attenuation.

Fader Level Hover

If the mouse is hovered over the fader "handle" its current decibel value is displayed in a pop-up window.

Channel Meter

The Channel Meter displays the signal level of the channel. Depending on the state of the Input Metering option (post-fader or pre-fader), this meter will display the level going into the monitor mix bus (post-fader), or the level at the channel's hardware input (pre-fader).

> ***Note:*** *When recording into a DAW, it's generally better to keep the Channel Meter "pre-fader" so it accurately represents the signal level being sent to the DAW.*

Input Level Scale

The numerical labels represent digital signal levels. "0" represents 0 dBFS (digital full scale, the maximum level before undesirable A/D clipping). If the level at the Apollo input exceeds 0 dBFS, the meter's clip indicator illuminates.

These meters also have a peak hold feature, which "holds" signal peak values for a specified period of time. The clip and peak hold times can be adjusted in the Console Settings Panel.

Input Label

The name of the input is displayed beneath the channel's Fader and Meter. The input label text cannot be modified.

Stereo Link

Adjacent channels can be linked to create stereo input pairs by clicking this button. When channels are linked as a stereo pair, any control adjustments will affect both channels of the stereo signal identically.

Before and after engaging LINK

Activation

Stereo pairs are created by clicking the LINK button at the bottom of each channel strip. For analog channels 1 – 4, clicking the LINK button within the preamp controls performs the exact same function (as does the LINK button on Apollo's front panel).

> ***Important:*** *All channel strip controls and plug-in settings in the right channel are lost when Link is activated.*

When Link is activated:

- The "LINK" button text changes to "UNLINK"
- One set of controls is available for the stereo channel (except Pan, as noted below)
- All current control settings of the left channel are copied to the right channel (except Pan, as noted below)
- All inserted plug-ins in the left channel are converted to stereo (parameter values are retained)
- The input pan knob changes to dual pan knobs (one for each channel)
- Pan values are forced to hard left and hard right for the stereo channel
- The aux and headphone pan knobs are hidden from the interface (pans are forced hard left/right the aux and headphone sends)
- The Channel Meter changes to a stereo level meter.

Deactivation

The stereo pair is separated back into individual channels by clicking the "UNLINK" button. When Link is deactivated, all current control settings and inserted plug-ins for the stereo channel are copied to both channels (except Pan, which is centered for both channels).

Link Limitations

- Odd-numbered channels can only be linked to the next even-numbered channel (for example, Analog 1 can be linked to Analog 2, but Analog 2 cannot be linked to Analog 3)
- Only the same type of inputs can be linked (for example, an ADAT input can only be linked to an ADAT input)
- For the preamp channels 1 – 4, only the same input jacks can be linked (for example, a Mic input cannot be linked to a Line input)
- The Hi-Z inputs cannot be linked.

> ***Note:*** *Stereo Link can be activated and deactivated on all channels simultaneously by option-clicking the stereo link button. However, use caution with this feature so all right-channel settings are not unintentionally lost.*

Auxiliary Section

Overview

Console has two stereo auxiliary (“aux”) mix buses. Signals are sent to the aux mix buses via the aux sends in Console’s channel input strips; Console’s aux returns then control and process the signals that are received from those sends.

The controls in Console’s aux return strips are similar to the channel input strips, but instead of controlling a channel input, they control the output of the aux mix bus. Both stereo aux returns have four insert slots for Realtime UAD processing.

The aux buses in Console are designed primarily for send/return processing using UAD plug-ins. Using aux buses for effects is a great way to conserve UAD DSP resources. For example, by using an aux for reverb processing, only one reverb plug-in is needed on the aux return instead of putting a reverb plug-in on each individual channel.

Console’s aux buses can also be used to create mixes that are different than the main monitor mix, for routing to any Apollo hardware output. This feature is convenient for sending alternate mixes with Realtime UAD processing to other audio devices.

> ***Note:*** *Aux 2 does not function at sample rates of 176.4 kHz and 192 kHz due to limited mix DSP resources.*

Console’s Auxiliary Return Controls

Aux Return Strips

Both of Console’s aux return strips are identical. Many of the controls have identical functionality as their equivalent control in the channel input strips. In these cases, cross-references to the same control in the channel strips are provided instead of repeating the description.

Aux Inserts

The aux insert slots, insert menu, insert display, and insert disable buttons all have identical functionality as the channel insert controls in the input strips. See "Inserts" on page 28 for complete descriptions of the Insert controls.

Aux Output

This drop-menu specifies which Apollo hardware outputs the aux bus signals are routed to. By default, the Monitor outputs are selected.

> ***Note:*** *To route the aux bus to the headphone outputs, use the aux headphone sends.*

Aux Headphone Sends

The aux headphone enable and send controls are identical to those in the channel input strips. The only difference is there is no headphone Pan knob on the aux returns, because the aux returns are stereo. See "Headphone Sends" on page 31 for complete descriptions of these controls.

> ***Note:*** *When Headphone Source 1, 2 is set to HP, aux returns must be sent to the headphone mix bus via these controls for the aux to be heard in the headphones.*

Aux Mono

This button sums the left and right channels of the stereo aux output into a monophonic signal. The aux return output is stereo when the button is white and mono when the button is yellow.

Aux Mute

Mute stops the aux return's signal from being routed to the output assigned in the Aux Output menu. The aux is muted when the mute button is red.

> ***Note:*** *Aux Mute does not affect the aux return headphone sends.*

Aux Fader

This is the main signal level control for the aux output. It changes the level in the aux output. It does not affect the aux headphone sends. Changes to this control are reflected in the aux level meter.

Aux Meter

The Aux Meter displays the signal level of the aux bus return. The "0" label represents 0 dbFS (digital full scale, the maximum level before undesirable D/A clipping). If the level at the aux output exceeds 0 dbFS, the meter's clip indicator illuminates (reduce the levels feeding the aux if clipping occurs).

The Aux Meters have a peak hold feature, which "holds" signal peak values for a specified period of time. The clip and peak hold times can be adjusted in the Console Settings Panel.

Monitor Section

Controls in this section are related to the monitoring of Console's various signals, including audio, meters, and resources.

DSP Usage Meters

The four DSP usage meters in Console (DSP, PGM, MEM, FWB) reflect the current state of the global (system-wide) DSP, Program, Memory, and FireWire Bandwidth resources. The DSP meters apply to all UAD-2 devices currently in use (including, but not limited to, Apollo).

These meters are identical to those in the UAD Meter & Control Panel application's Meter window. They are provided in Console so that application does not need to be open to monitor these resources.

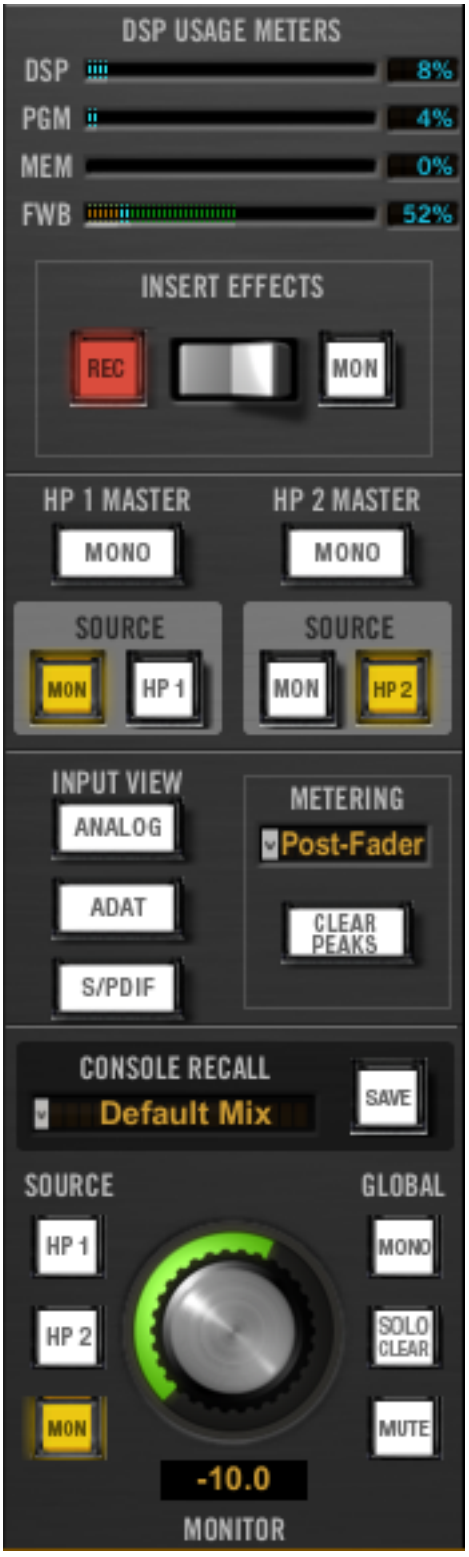
For complete details about the DSP meters, please refer to the "UAD Meter & Control Panel" chapter in the UAD System Manual.

Insert Effects

Overview

Console's primary function is to control Apollo's input monitoring features. Using Console, Apollo's inputs can be recorded without signal processing ("dry") or with Realtime UAD processing ("wet") via the Insert Effects switch.

By using Console to monitor live audio, the artist can record the Realtime UAD Processing either dry or wet without any I/O buffering and the latencies associated with software monitoring via the DAW.



Console's Monitor section

Function of the Insert Effects Switch

The Insert Effects switch determines if the DAW records Console's inputs with or without Realtime UAD Processing, regardless of the actual wet or dry state of the monitor mix. This is accomplished by routing Console's inputs into the DAW from before the plug-in inserts (dry recording) or after the plug-in inserts (wet recording).

> ***Note:*** *Recording into a DAW with or without Realtime UAD Processing via the Insert Effects switch is a global function.*

Record With Effects

When Record With Effects is active, Apollo's hardware input signals are processed by Console's UAD plug-in inserts before routing into the DAW.

In this mode, the post-insert (wet) state of all Console inputs with Realtime UAD Processing is routed to the DAW inputs.

Record With Effects is active when the Insert Effects REC button pulses red.

> ***Note:*** *This setting is used to record wet with Realtime UAD Processing.*

Monitor With Effects

When Monitor With Effects is active, Apollo's hardware input signals are routed directly into the DAW before being processed by Console's UAD plug-in inserts.

In this mode, the pre-insert (dry) state of all Console inputs is routed to the DAW inputs, even if Realtime UAD Processing is occurring in the monitor mix.

Record With Effects is off when the Insert Effects MON button is yellow.

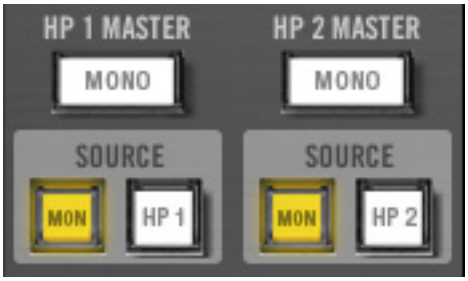
> ***Note:*** *This setting is used to record dry when Realtime UAD Processing is active.*

Routing Console Outputs Into the DAW for Recording

Any or all of Console's mix buses (monitor, aux, and/or headphones) can be recorded into a DAW using Console's "virtual" outputs via Apollo's device drivers. This is accomplished by selecting Console's bus outputs as the source for a DAW's audio channel input. See "Routing Console Outputs Into the DAW for Recording" on page 64 for details.

> ***Important:*** *To eliminate doubled signals, software monitoring in the DAW should be disabled when Console is used to monitor Apollo's inputs. Refer to the DAW documentation for specific instructions on how to defeat software monitoring in the DAW.*

Headphone Master 1, 2



Overview

Apollo has two stereo headphone outputs on its front panel. Each headphone output is individually addressable by Apollo's device drivers.

Because their signal paths are separate from the monitor and line outputs, the headphone outputs can be configured to contain unique mixes that are completely independent from other Apollo hardware outputs.

By default, both headphone outputs mirror Apollo's stereo monitor outputs, which receive their signals from Console's main monitor mix bus.

Each headphone output can be configured have its own unique mix via Console's dedicated headphone mix buses. Additionally, any DAW outputs can be routed into the headphone mix buses via Apollo's device drivers (see "Routing Console Outputs Into the DAW for Recording" on page 64 for more info).

Headphone Source 1, 2

This button determines the source of the headphone bus mix. Note that a headphone output can only use its own mix bus (or the monitor mix) as its source. For example, you can't select HP 2 as the source for HP 1, and vice versa.

MON 1, 2

When set to MON, the headphone source is Console's main monitor mix, summed with all DAW buses that are routed to Apollo's monitor outs (if applicable). Console's faders, mutes and solos are reflected in the headphone output in this mode.

HP 1, 2

When set to HP, the headphone source is the dedicated headphone mix bus, summed with all DAW outputs that are routed to Apollo's headphone outputs (if applicable). In this mode, the mix of the this bus is determined by the Headphone Send controls in the input channel strips and the aux return strips.

Console's faders, mutes, and solos are *not* reflected in the headphone output in this mode (Console's headphone sends are pre-fader).

> ***Note:*** *When Headphone Source 1, 2 is set to HP, aux returns must be sent to the headphone mix bus (via the aux headphone sends) for the aux to be heard in the headphones.*

Headphone Mono 1, 2

This button sums the left and right channels of the stereo headphone output into a monophonic signal. The headphone output is stereo when the button is white and mono when the button is yellow.

Input View

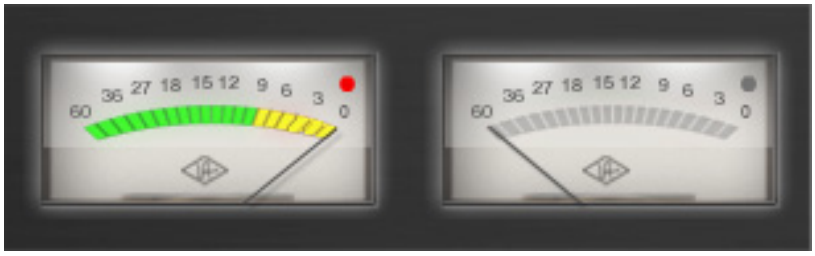
The Input View buttons provide a convenient way to hide channel strips of a particular type from view. This feature reduces required screen space and/or the need for scrolling (if the window size is reduced), or when particular input types are not being used.

Clicking any Input View button will hide all the channel input strips of that type (Analog, ADAT, and/or S/PDIF) from view. Clicking the button again will restore the inputs for viewing.

Note: *All input channels remain active even if they are hidden from view.*

Monitor Controls

Monitor Meters



Console's Monitor Meters are twin pin-style peak meters that always display the stereo signal levels at Apollo's monitor outputs. Levels displayed here match the Monitor 1 – 2 LED meters on Apollo's front panel.

Meter Source

When the monitor output signals are changed with the Monitor Source buttons, the levels displayed here reflect the changed monitor outputs source signal.

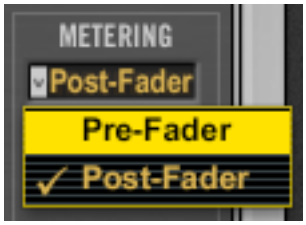
Meter Level Scale

The meter numbering represents the digital level of the monitor channel, where "0" is 0 dBFS. Both meters include a clip LED that illuminates when the level at the monitor outputs exceed 0 dBFS (when D/A converter clips). The clip LED hold time can be adjusted in the Console Settings Panel.

Important: *Reduce the monitor output levels by reducing levels of the channels feeding the monitor mix bus if clipping occurs to eliminate undesirable D/A clipping distortion.*

Input Metering

Pre/Post Menu



This drop-menu affects the Channel Meters of Console's channel inputs only. It does not affect the Aux Meters or the Monitor Meters.

Post-Fader

When set to Post-Fader, changing an input's Channel Fader will affect the Channel Meter.

Pre-Fader

When set to Pre-Fader, an input's Channel Meter indicates the level at the Apollo input, regardless of the Channel Fader setting, and changing the fader level will not affect the Channel Meter.

Clear Peaks

Clicking this button clears all clip indicators and peak hold indicators on all meters.

Monitor Output

Monitor Source

The Source buttons define which signal bus is routed to the Apollo's monitor outputs. The active monitor source is indicated by a yellow button.

Headphone 1, 2

When "HP" is selected, the Headphone bus (the mix created from the HP sends on Console's inputs and/or DAW outputs assigned to the HP outputs) is routed to the monitor outputs. To prevent a feedback loop, HP cannot be selected when Headphone Source 1, 2 is set to MON.

Monitor

When MON is selected, the main Console mix bus is routed to the monitor outputs.

Monitor Global

Mono

This button sums the left and right channels of the stereo monitor output into a monophonic signal. The monitor output is stereo when the button is white and mono when the button is yellow.

Solo Clear

Whenever Solo is engaged on any channel input, the Solo Clear button blinks yellow. Clicking the Solo Clear button deactivates the Solo function of any/all channel inputs. Clicking Solo Clear again will return all channels to their previous Solo state.

Monitor Mute

This button mutes Apollo's monitor outputs. The monitor outputs are muted when the button is red. This button performs the same function as pressing the MONITOR knob on Apollo's front panel.

Monitor Level

This is the master level control for Apollo's monitor outputs; it performs the same function as the MONITOR knob on Apollo's front panel.

The specific monitor output level is displayed in decibels beneath the Monitor Level control. The relative monitor output is indicated by the green "LED ring" surrounding the Level control, like the MONITOR knob on Apollo's front panel. When the monitor outputs are muted, the "ring" is red.

Recall

Overview

The Recall controls provide a method for managing complete Console configurations as session (preset) files. When a Console session file is saved, the current Console configuration is written to disk.

Console session files contain almost all Console settings, including all knob, slider, and menu values, all inserted UAD plug-ins, settings contained within the plug-ins, and many global settings in Console Settings window. The only settings that are *not* saved are Monitor Gain, Clock Source, Sample Rate, and S/PDIF Mirroring.

When a session file is subsequently reloaded, Console is returned to the exact same configuration state, regardless of any changes to Console that were made in the interim.

Default Session Files Location

By default, session files are saved to, and loaded from, the user's home folder at:

- ~/Documents/Universal Audio/Sessions/

Although session files can be saved to (and loaded from) any location on disk, using the default location provides the most convenience because Console always uses this location for the Open/Save dialogs presented by the operating system.

> ***Note:*** *Session files must reside in the default location to appear in the sessions list within the Recall Menu.*

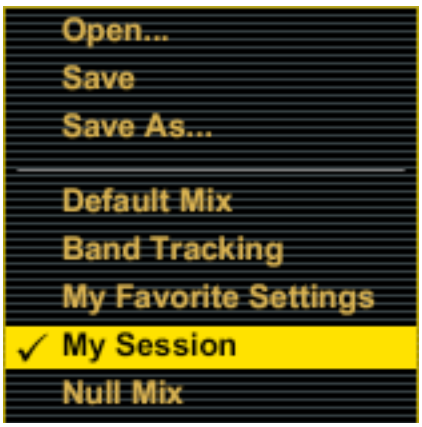
Session Files Suffix

Console's session files have the ".uadmix" suffix. The suffix is added to session files automatically when saving to disk. Without the suffix, the session files will not be visible in the "Open" dialog windows or the Recall menu.

Session Name

The name of the current session is displayed in this area. Session names are created when the file is saved, or they can be renamed in the Mac OS X Finder.

Recall Menu



Clicking the Session Name display opens the Recall Menu. This menu contains the session file management options and a list of existing session files.

Open...

This option opens a standard "Open File" dialog window for loading existing session files. The default location will be empty until a session file is saved there.

> ***Important:*** *Opening a session file overwrites the current Console settings.*

Save

If a session file was previously saved, selecting this option writes the current configuration to the file with the same name, overwriting the previously saved file. If the current session has never been saved, a new session file is created.

Save As...

This option creates a new session file on disk.

Sessions List

Existing session files that reside in the default location are displayed in this list. Select a session from the list to load it.

> ***Important:*** *Loading a session from the Sessions List overwrites the current Console settings.*

Console Settings Window

Global parameters for Apollo and Console are configured in the Console Settings window.

Interface and Console Panels

The Settings window has two control panels: Interface and Console. The Interface panel contains settings that pertain to the Apollo hardware; settings in the Console panel pertain to the Console application.

Accessing the Console Settings Window

Access the Console Settings Window by selecting “Settings” from the “Edit” menu within the Console application (upper left of application window), or select “Console Settings” under the “UA” icon in Mac OS X Menu Bar (upper right of screen).

Info Box

The Interface and Console panels each contain an Info box at the bottom of the panel. The Info box displays informative text about the parameters in each panel when the mouse is hovered over the parameter.

The Interface panel in the Console Settings window

Interface Settings Panel

The Interface panel is used to configure Apollo’s system-level audio interface I/O settings such as sample rate, clock source, and output reference levels. These settings are used by host applications when they are configured to use Apollo as the audio interface. Even when Console is not open, these settings are stored by the Apollo drivers and will be used by other host applications.

Unit Selection

Unit Select is used when multiple Apollo units are connected to the same host computer simultaneously. Unit Select determines which Apollo is being actively controlled by the Console application.

> ***Important:*** *Multiple Apollo units are not currently supported. Please visit our support website for information and/or updates to this functionality.*

Multiple Apollo units cannot be controlled concurrently by the Console application; only one hardware unit is controlled at a time. To control a different unit, the Unit Select setting must be switched.

> ***Note:*** *Unit Selection can be set in both the Interface Settings Panel and the Console Mixer's Window Title Bar.*

Select Unit

When multiple Apollo units are connected, the Select Unit drop menu specifies which Apollo unit is being controlled by Console. If the UAD Link is inactive, only "None" is available.

When only one unit is connected, the single unit appears in this menu, providing a method to confirm that the Apollo drivers are properly communicating with the Apollo hardware.

> ***Note:*** *Custom names can be entered for each device. To change the default name, double-click the device name and type a new name.*

Identify

Clicking the Identify button will cause the currently selected unit's front panel LEDs to flash in a pattern. This identifies the unit that is currently being controlled by Console. The current unit is changed with the Select Unit menu.

Global Interface Settings

These settings define the active sample rate and clock source for Apollo when Console is the only host application.

Because these settings are part of the device drivers, when using a host DAW, these values are usually changed from within the DAW. If the settings are changed from within the DAW, the Console Settings window values are updated to reflect the changes.

Sample Rate

This setting defines the sample rate that will be used for Apollo A/D and D/A conversion and UAD Powered Plug-Ins processing.

> ***Note;*** *When using UAD Powered Plug-Ins, higher sample rates require more DSP resources.*

When Apollo is used with a DAW, the sample rate is set within the DAW application. In this scenario, the sample rate setting in Console is updated automatically to match the DAW's value (the value within Console does not need to be configured manually to match the DAW setting).

Clock Source

Apollo's master clock source for A/D and D/A conversion is set here. Internal clock or external clock from S/PDIF, ADAT, or Word Clock input can be specified.

Only one device in a system can be the master clock. This setting must match the host DAW setting or audio glitches and/or distortion could occur. For more information about clocking, see "Digital Clocking Basics" in the Apollo Hardware Manual.

Line Outputs 1 – 8 Reference Level

The reference level for line outputs 1 – 8 can be set to –10 dBV or +4 dBu in adjacent pairs with these drop menus. The value is usually set to match the nominal input level of devices connected to these outputs (a setting of +4 dBu outputs a higher signal level than –10 dBV).

> ***Note:*** *Input reference levels for Apollo's analog line inputs are set in Console's Channel Input Strips.*

S/PDIF Mirrors Monitor 1–2

This setting configures Apollo's S/PDIF outputs to mirror the Monitor 1 & 2 outputs. This feature can be useful when connecting to the stereo inputs of other devices with digital S/PDIF inputs such as a speaker system, stereo recorder, or external D/A converter.

When Mirror mode is active, the Monitor Level knob will control the S/PDIF output level (the S/PDIF output is post-fader when mirrored).

> ***Note:*** *When this box is checked, any DAW outputs (including Console aux outputs) that are routed to the S/PDIF ports will not be heard, because the S/PDIF ports are switched to output the monitor bus instead.*

Input Delay Compensation

Input Delay Compensation (IDC) maintains phase alignment across Console's analog and digital inputs when upsampled UAD plug-ins are used. See "Input Delay Compensation in Console" on page 69 for a complete explanation of this feature.

Input Delay Compensation Values	
Setting Name	**Extra Delay (samples)**
Off	0
Short	100
Medium	200
Long	1000

When enabling IDC, it's usually best to start with the Short value (100 samples) to minimize latency if DAW software monitoring is used concurrently with Console.

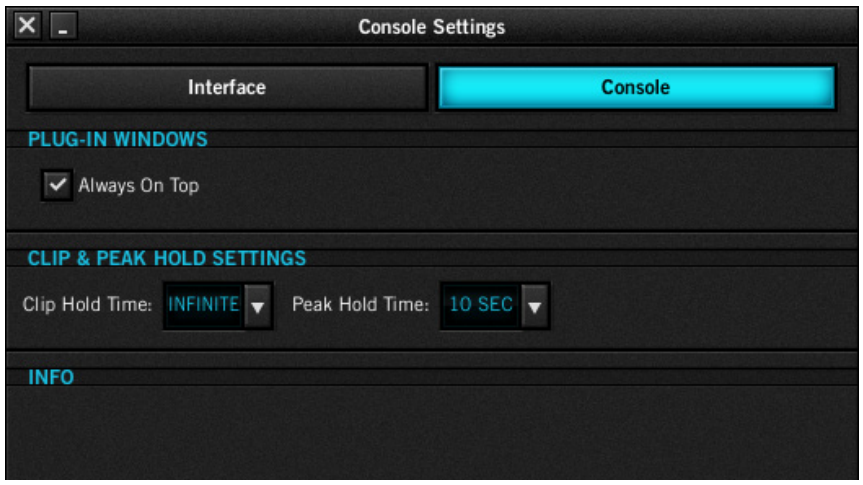
A dialog will appear in Console if the compensation amount is exceeded on a channel. If this occurs, either increase the IDC value or reduce upsampled plug-ins usage on the channel to maintain phase alignment.

Console Input Delay Compensation is enabled with the value of Short (100 samples) by default.

> ***Note:*** *Changes to this setting do not always take effect until the DAW is restarted.*

Console Settings Panel

The Console panel is used to configure the global behavior of the Console application.



Always On Top

Normally, a UAD plug-in window can be covered by the Console Mixer window when Console is the foreground application.

When this box is checked, UAD plug-in windows always "float" on top of the Console Mixer and Settings windows (when Console is the foreground application), so they can always be seen and adjusted.

> ***Note:*** *This setting only affects UAD plug-in window behavior within Console; it does not apply to UAD plug-ins when they are used in other host applications.*

Clip & Peak Hold Settings

The Clip and Peak indicators can be cleared at any time with the Clear Peaks button.

Clip Hold Time

This drop menu sets the duration that the red signal clip indicators in the input, aux, and monitor meters are displayed before turning off.

The available values are None, 1 second, 3 seconds (default), 5 seconds, 10 seconds, or Infinite.

Peak Hold Time

This drop menu sets the duration that the signal peak indicators in the input and aux meters are displayed before turning off. The available values are None, 1 second, 3 seconds (default), 5 seconds, and 10 seconds.

Window Title Bar

The Window Title Bar is the topmost strip in the Console Mixer window, as shown in "The Console Mixer window and controls layout" on page 21.

Quit

The Quit button quits the Console application. Console's current configuration is saved to disk when quit; when Console is subsequently launched, that configuration is uploaded to Apollo.

Minimize

The Minimize button reduces the window to the Mac OS X Dock. The window can be restored by clicking the minimized window in the Dock, or any "Accessing Console" method detailed on page 20.

Unit Selection

The Unit Selection functions in the Window Title Bar are identical to those provided in the Interface Settings Panel; they are duplicated here for convenience. The functions are described in detail in "Unit Selection" on page 44 .

Console Link & Identify

This button has a dual purpose. The button is solid green when Apollo is connected to (and properly communicating with) the host computer system via FireWire or Thunderbolt, and solid red when Console cannot communicate with Apollo.

The button is also a duplicate of the Identify button in the Interface Settings Panel.

Application Menus

The Applications Menus are contained within the second strip from the top in the Console Mixer window (see "The Console Mixer window and controls layout" on page 21).

File Menu

Items under the File menu (Open Session, Save Session, Save Session As) perform the exact same functions as those in the Recall Menu within the Console Mixer window. See page 43 for complete details about these functions.

Edit Menu

Undo

When a parameter value in the Console Mixer window is edited, the change can be reverted with the Undo command. Only the last edit performed can be reverted with this command.

Redo

When the Undo function (above) is executed, the original edit can be restored with the Redo command. Only the last Undo performed can be restored with this command.

> ***Note:*** *Undo/Redo are unavailable for plug-in instantiations and parameter edits within plug-in windows, and also when using key modifiers to link/unlink channel parameters (including linear and discrete controls).*

Settings

Selecting this option opens the Console Settings window, where various global parameters are configured. See "Console Settings Window" on page 44 for details about the window.

Window Menu

Show Mixer Window

Brings the Console Mixer window to the foreground.

Show Plug-In Editor Windows

Brings all open UAD plug-in windows to the foreground (if any).

Close All Plug-In Editor Windows

Closes all open UAD plug-in windows (if any).

Chapter 4: Console Recall Plug-In

Console Recall Overview

The Console Recall plug-in

Console Recall is a DAW plug-in supplied in VST, RTAS, and Audio Units formats. It is instantiated and used within any VST/RTAS/AU host DAW like any other plug-in.

Many Apollo features can be controlled directly from within the DAW using Console Recall.

When To Use Console Recall

Console Recall can be used to:

- Change Apollo's Monitor Controls without having to leave the DAW
- Engage Console's Insert Effects to record Realtime UAD Processing in a DAW (print wet)
- Save/Load Console configuration files with the Recall menu
- Store Console's configuration inside a DAW session via the Synchronize function

Note: *Console Recall is not required to use the Apollo interface hardware, the Console application, or a DAW.*

How To Use Console Recall

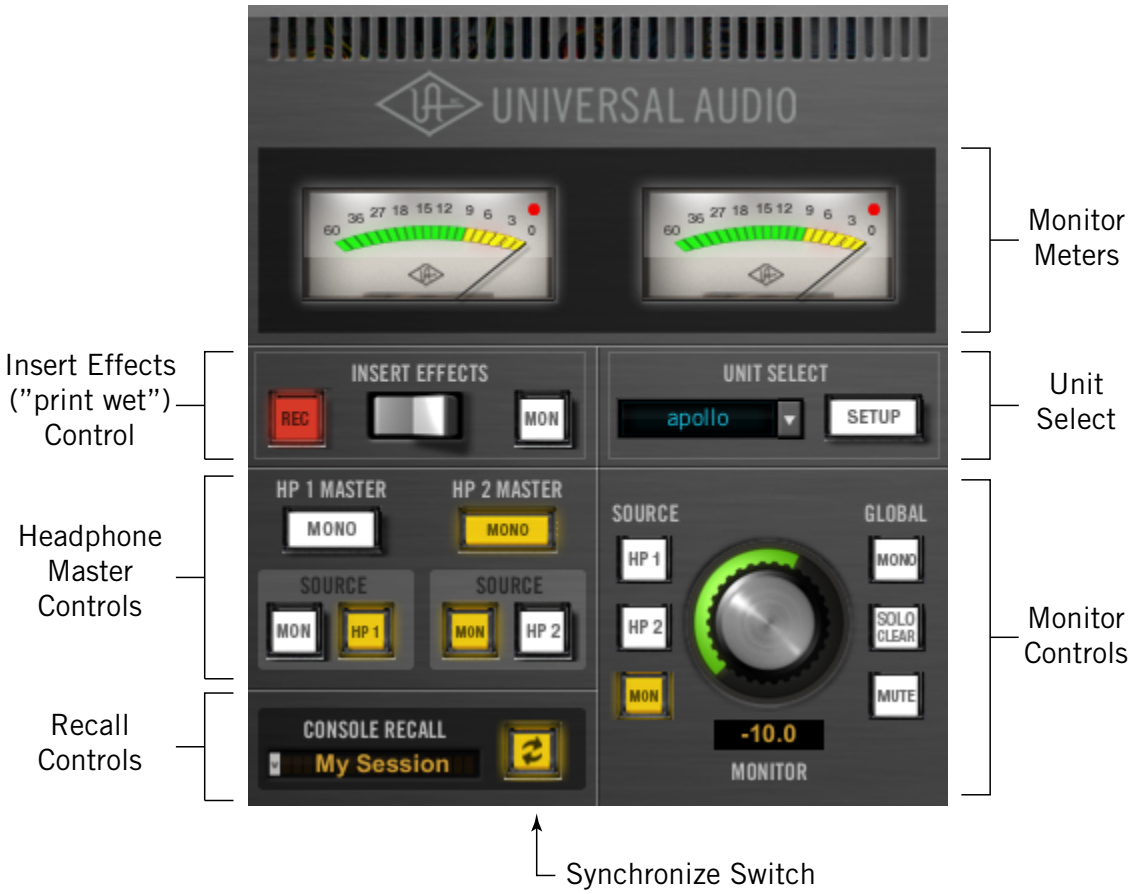
To use Console Recall, simply place **one** instance of the plug-in into any insert slot in the DAW session.

Important: *Do not insert more than one occurrence of the Console Recall plug-in within any single DAW session file. Doing so could cause unpredictable results.*

Because the plug-in does not process audio in any way, the insert location isn't important. Although it can be placed on any audio track, virtual instrument track, aux bus, output, etc, we recommend placing it on the master output for consistency since sessions usually contain an output channel.

Upon instantiation, the Console Recall plug-in simply mimics the equivalent controls in the Console application. Activating Synchronize causes the Console configuration to be stored in the session file when the file is saved in the DAW. See "Synchronize" on page 52 for complete details about this feature.

Console Recall Controls



Console Recall Controls Layout

All Console Recall plug-in controls are duplicates of those found in the Console application, with the exception of the Synchronize button, which is detailed beginning on page 52.

Because the exact same text descriptions in the Console application apply to the Console Recall plug-in controls, please refer to the Console application chapter for descriptions of the duplicated controls. Hyperlinks to those descriptions are provided for quick access.

Control Groupings

The diagram on page 51 illustrates the control groupings in Console Recall. These are the same groupings detailed in the Console chapter; click the hyperlinks below to jump to that section.

- **Monitor Meters** – Refer to page 40.
- **Insert Effects** – Refer to page 37.
- **Headphone Master** – Refer to page 39.
- **Recall Controls** – Refer to page 42.
- **Unit Select** – Refer to page 44.
- **Monitor Controls** – Refer page 40.

Synchronize

The Console Recall plug-in has a button called "Synchronize" that is not present in the Console application. When a DAW session containing Console Recall is saved and Synchronize is active, the current state of the Console application is stored within Console Recall.

When the DAW session file is subsequently reloaded, Console is automatically restored to the previous configuration state, regardless of any changes to Console or Apollo that were made in the interim.

This feature ensures the session will sound exactly the same when reloaded at a later date, even if Console contains a customized configuration that might affect the audio, such as cue mixes, signal routings, and/or Realtime UAD Processing.

The Synchronize button in Console Recall

Activating Synchronize

When Console Recall is first loaded, Synchronize is inactive. The function is active when the button is yellow, and inactive when the button is white.

Activating Synchronize does not change the Console configuration; Synchronize doesn't do anything until the DAW session file is reloaded.

> ***Note:*** *Synchronize saves the Console configuration within the DAW file, not the Console application. Therefore the DAW session file must be saved to disk to retain the Console configuration in the session.*

Loading Synchronized DAW Sessions

If Synchronize was active when a DAW session file containing Console Recall was saved, then loading that session will load the saved Console configuration, and the Console configuration that was active before the session was loaded is overwritten by the settings contained within Console Recall.

If Synchronize was inactive when a DAW session file containing Console Recall was saved, then loading that session will *not* change the Console configuration that was active before the session was loaded.

> ***Important:*** *Loading a DAW session that has Synchronize engaged will overwrite the current Console configuration.*

Preventing data loss when loading synchronized sessions

To prevent loss of Console data when loading sessions containing an active Synchronize setup, simply save the Console configuration via the Console application's Recall Menu before loading the DAW session file. The saved configuration can then be recalled at any time via the Recall Menu in the Console application or Console Recall plug-in.

Chapter 5: Workflows

Apollo Setups Overview

Apollo is a powerful and flexible audio interface that can be used in many ways. This chapter explains how to apply Apollo in various digital audio environments.

Although the exact techniques for configuring and using Apollo will vary according to needs, its application will generally fall within one of the main categories below. Each application is detailed later in this chapter.

Audio interface without DSP

Apollo functions like other non-DSP audio interfaces when it is used without the Console application, the Console Recall plug-in, or UAD Powered Plug-Ins. See "Using Apollo as an Audio Interface" on page 57 for details.

Digital mixer with Console

Apollo and Console can be used without a DAW or any other audio software, providing access to all Apollo features and its realtime DSP cue mix functionality. See "Using Apollo with Console (without a DAW)" on page 59 for details.

Standalone use without computer

Apollo can be used as a digital mixer (with limited functionality) without Console or any connection to a host computer. See "Using Apollo Without A Computer" on page 60 for details.

With a DAW (without Console)

When Apollo is used with a DAW but without the Console application (or Console Recall plug-in), the DAW controls all signal I/O routing, software monitoring, and UAD-2 DSP-accelerated UAD Powered Plug-Ins processing. See "Using Apollo with a DAW (without Console)" on page 61 for details.

With Console and a DAW

Console is used concurrently with a DAW when low-latency monitoring and/or recording of Apollo's inputs with (or without) Realtime UAD processing is desired. This workflow completely eliminates the I/O buffering latencies associated with software monitoring. See "Using Apollo Concurrently with a DAW and Console" on page 63 for details.

UAD Powered Plug-Ins: Console versus DAW

There are some fundamental differences when UAD Powered Plug-Ins within Console or within a DAW. See "About UAD Powered Plug-Ins Processing" on page 55 for details.

About UAD Powered Plug-Ins Processing

Two Distinct Methods with Apollo

Apollo features two distinct methods for using UAD Powered Plug-Ins: The "Console processing method" for low-latency monitoring and tracking with Realtime UAD Processing via the Console application, and the "DAW processing method" for DSP-accelerated UAD-2 processing via VST, RTAS, and Audio Units plug-ins in DAW applications.

These two methods are not a switched mode, but instead simply depend on which application (Console or DAW) the UAD plug-ins are loaded into. Both methods can be used simultaneously for extremely powerful and flexible signal monitoring, routing, and processing.

Console Processing Method

UAD Powered Plug-Ins run in realtime only when used within Console. Using Realtime UAD Processing in Console is optimum for artists and engineers that need to monitor and capture performances without DAW I/O buffering latency and its associated distractions.

The special Realtime UAD functionality is achieved via Apollo's unique ultra-low latency DSP+FPGA+Console design. Although every audio interface has undetectable latency that is inherent to the A/D-D/A process, routing Apollo's input signals through UAD Powered Plug-Ins within Console does not add to this inherent latency.

Up to four UAD plug-in instances can be inserted serially ("stacked" or "chained") on each of Console's analog/digital inputs and/or auxiliary buses simultaneously, without adding to the inherent I/O latency.

> ***Note:*** *Upsampled UAD plug-ins add latency when used within Console or a DAW. See "Upsampled UAD Plug-Ins" on page 73 for more information.*

Console inputs with Realtime UAD processing can be routed into the DAW via Apollo's device drivers, and optionally recorded as either processed (wet) or unprocessed (dry) audio using the Insert Effects function in Console (or Console Recall).

DAW Processing Method

When UAD Powered Plug-Ins are used within compatible VST, RTAS, or Audio Units host DAW applications, I/O buffering is used for plug-in processing (because the data must be shuttled back and forth between the DAW and Apollo). In this scenario, Apollo behaves like other UAD-2 devices such as UAD-2 Satellite and UAD-2 PCIe cards.

The I/O buffering adds latency that is compensated by the host DAW's automatic delay compensation during mixing (i.e., all tracks remain time-aligned). However, at larger buffer sizes this latency makes software monitoring while tracking with UAD Powered Plug-Ins less practical. Using Apollo Concurrently with a DAW and Console eliminates this latency during tracking because software monitoring is not used.

> ***Note:*** *See "Latency Basics" on page 72 for detailed information about latency.*

Latency is not an issue during mixdown in a DAW; realtime processing is not necessary because the performances are already captured. The benefits of using Apollo's integrated DSP acceleration during mixing include the off-loading of plug-in processing from the host CPU, and the sonic rewards of UAD Powered Plug-Ins, which run exclusively on the UAD-2 and Apollo.

Concurrent use of UAD Plug-Ins in Console and a DAW

UAD Powered Plug-Ins can be used within Console and a DAW simultaneously. In this scenario, Apollo's DSP resources are shared between the two applications. Realtime UAD processing is available via Console, and buffered (non-realtime) UAD processing is available via VST, RTAS, or Audio Units plug-ins in the DAW. See page 54 for complete details.

> ***Note:*** *Apollo, like other UAD-2 devices, can only load UAD Powered Plug-Ins which are specifically designed to run on UAD-2 DSP accelerators. "Native" plug-ins cannot run on the UAD-2 DSP.*

Using Apollo as an Audio Interface

Apollo functions like other (non-DSP) audio interfaces when it is used without the Console application, the Console Recall plug-in, or UAD Powered Plug-Ins. Apollo's Core Audio drivers enable it to be used for computer audio I/O routing with any Core Audio-compliant audio software, including DAWs, music players (e.g., iTunes), podcast recorders, system software alert sounds, and similar applications.

Accessing Apollo I/O via Core Audio

Audio is routed to and from Apollo via its Core Audio devices drivers. Audio software accesses Core Audio interfaces directly via the audio settings/preference panel in the software, or it just uses the audio device set as the preference in the OS.

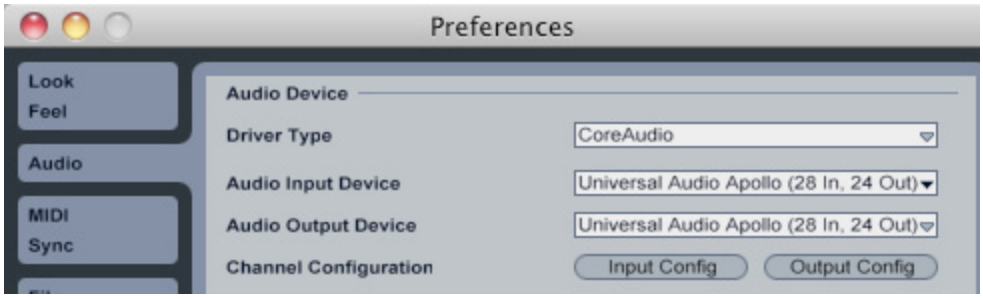
Apollo I/O Driver Names

Each Apollo input and output has a channel number and name provided by the Apollo drivers to Core Audio. If an audio software application can access Core Audio devices directly, it may be possible to designate specific inputs and/or outputs within the application.

The Apollo Driver I/O numbers and names are listed in "Driver I/O Labels" on page 67. Use these values to designate specific inputs or outputs to be used by an application.

Setting the I/O in the audio software application

To access Apollo's I/O for an audio software application that can select Core Audio devices directly, look for a setting in the audio software application's preferences called "audio setup" or "output device" or similar. Each application is different; consult the software application documentation for specifics.



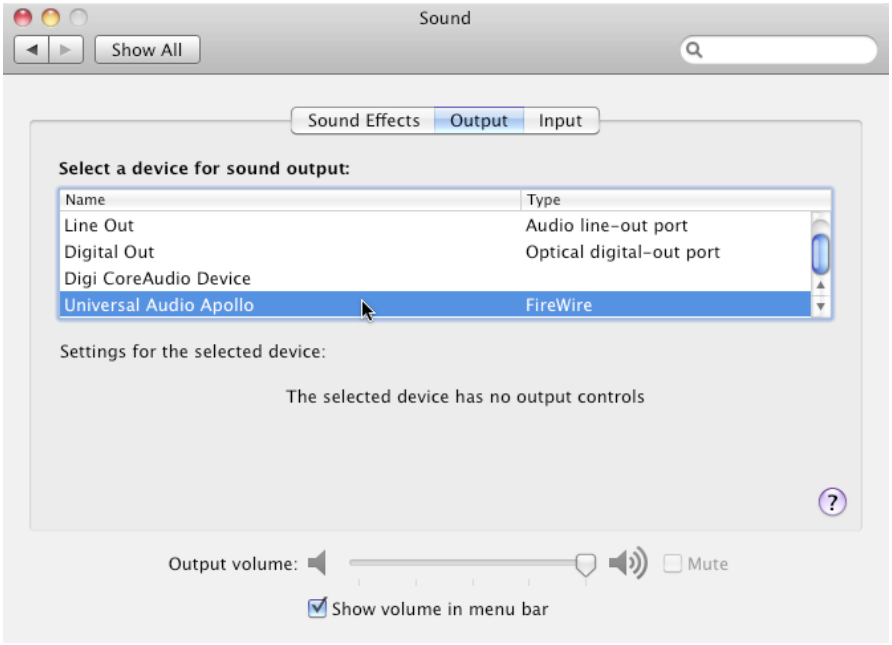
Apollo selected as I/O device in Ableton Live preferences

Setting the I/O in Mac OS X System Preferences

If a software application doesn't have its own setting for accessing a Core Audio device directly, it typically uses the device specified in the Mac OS X "Sound" panel in Applications/Utilities/System Preferences. This sets the device for all system sounds, and any other device that uses the system device for audio I/O.

In the System Preferences "Sound" panel, set the Input and/or Output device to use "Universal Audio Apollo" to route the system sound to/from Apollo.

This setup will assign system audio to the Apollo's default channels (1 & 2), which are routed to Apollo's left & right monitor outputs.



Apollo selected for system audio output in System Preferences

Using Apollo with Console (without a DAW)

Apollo and Console can be used without a DAW or any other audio software. Using Console without a DAW provides access to all Apollo functionality and simplifies the use of Apollo's digital mixing, monitoring, and Realtime UAD processing features when a DAW's recording and playback features are not needed.

Apollo has an internal DSP cue mixer for realtime mixing and monitoring of Apollo inputs, with optional Realtime UAD Processing using UAD Powered Plug-Ins. The software interface for this functionality is the Console application, but the actual mixing and signal processing occurs inside Apollo.

Using Console by itself

To use the Console Mixer by itself for input monitoring and Realtime UAD Processing, there aren't any special considerations; just launch Console and start using it. Full explanations of all Console features and functionality are in "Chapter 3: Console Application" beginning on page 18.

Using Console with other audio applications

System Audio

When the OS is set to use Apollo for system audio (page 58), the system audio is routed to Console's monitor outputs and mixed with Apollo inputs (if any).

Apollo's input levels can be adjusted with Console's input channel faders, while the system's audio level at the monitor outputs is determined by the volume settings of the audio software using the system outputs. The system volume level is not adjusted in the Console Mixer.

With a DAW

DAWs have their own audio mixer. Understanding the interactions between Console and the DAW will help to ensure an optimized workflow in this scenario. See "Using Apollo Concurrently with a DAW and Console" on page 63 for details.

Using Apollo Without A Computer

Standalone Use

Although the Console application and/or a DAW are required to unleash the full power of Apollo, the unit can be used as a standalone digital mixer with limited functionality without any FireWire or Thunderbolt connection to a host computer.

Console settings that are saved

All currently active I/O assignments, signal routings, and monitor settings are saved to internal firmware when Apollo is powered down, and recalled when power is re-applied. Therefore the last-used settings are always available even when a host computer is not used.

Standalone use with UAD plug-ins

Power cycling

UAD Powered Plug-In instantiations are not retained on power cycle, because the plug-in files reside in the host computer, not Apollo.

Disconnecting

If UAD plug-ins are active when Apollo's connection to the host system is severed, Console's current UAD plug-in configurations remain active for Realtime UAD Processing until Apollo is powered down.

Using Apollo with a DAW (without Console)

When used with a DAW but without the Console application (or Console Recall plug-in), the DAW controls all signal I/O routing, software monitoring, and DSP-accelerated UAD Powered Plug-Ins processing.

> ***Note:*** *Apollo, like other UAD-2 devices, can only load UAD Powered Plug-Ins which are specifically designed to run on UAD-2 DSP accelerators. "Native" plug-ins cannot run on the UAD-2 DSP.*

Using a DAW without Console is a typical workflow during mixdown, where low-latency monitoring is not required and buffering latency is not an issue because the tracks are already recorded. When recording new tracks, the DAW+Console workflow (below) is recommended.

In this configuration, Apollo functions as two "separate" devices: an audio interface, and a UAD-2 DSP accelerator:

1. **Audio Interface –** The DAW accesses and routes Apollo's audio interface I/O via the Core Audio device drivers. Audio I/O latency is determined by the DAW's I/O Buffer Size setting.
2. **UAD-2 DSP Accelerator –** The DAW controls Apollo's internal UAD-2 via UAD plug-ins (in VST, RTAS, or Audio Units format), that are loaded within the DAW. Buffering is used for UAD-2 plug-ins because data from the DAW must be shuttled over FireWire/Thunderbolt to/from Apollo's DSP.

Accessing Apollo's I/O in a DAW

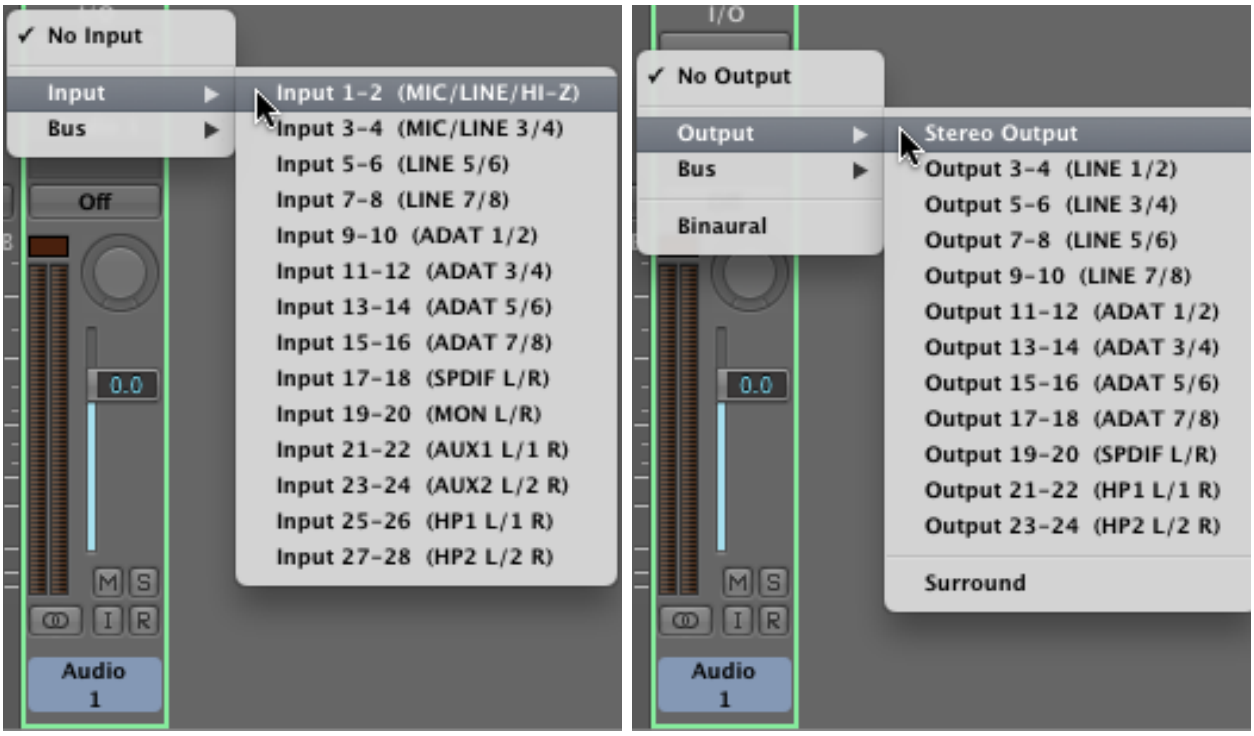
Specifying the audio interface device

To access Apollo's I/O within a DAW, the DAW's audio engine must be configured to use Apollo as the audio interface device. Specific instructions vary by DAW (consult the DAW documentation for specifics). The I/O Buffer Size setting, which determines the overall DAW I/O latency, is usually set in the same window.

See "Setting the I/O in the audio software application" on page 57 for an example.

Selecting Apollo's Inputs and Outputs

When the DAW is configured to use Apollo as the audio interface device, the DAW's audio input and output channels can be routed to/from Apollo's hardware I/O.



Apollo's inputs (left) and outputs (right) as they appear when configuring stereo I/O in Logic Pro

Default Outputs

The main stereo outputs of a DAW usually output to I/O channels 1 & 2 by default. Therefore, since channels 1 & 2 correspond to Apollo's monitor outputs, the DAW's main outputs are sent to Apollo's monitor outputs by default. The channels used for output can usually be changed in the DAW.

Apollo I/O Driver Names

Each Apollo input and output has a channel number and name provided by the Apollo drivers to Core Audio. The DAW uses these numbers or names to designate the specific inputs and/or outputs within the DAW.

The Apollo Driver I/O numbers and names are listed in "Driver I/O Labels" on page 67. Use these values to designate specific inputs or outputs to be used by an application.

Using Apollo Concurrently with a DAW and Console

Console is used concurrently with a DAW when low-latency monitoring and/or recording of Apollo's inputs with (or without) Realtime UAD processing is desired. This workflow completely eliminates the I/O buffering latencies associated with software monitoring.

In this scenario, Console is used to control all input monitoring and Realtime UAD Processing when recording, and the DAW's software monitoring feature should be disabled.

Software Monitoring versus Hardware Monitoring

Software monitoring (listening to live inputs) via a DAW has discernible latency due to audio interface I/O buffering. Hardware monitoring via an audio interface's internal DSP cue mixer (e.g., Console application) does not have discernible latency, because the live audio is internally routed directly from the inputs to the outputs without DAW buffering (see "Latency Basics" on page 72 for detailed explanations).

Disable Software Monitoring in the DAW when using Console

Since Console is used for live input monitoring when used with a DAW, the DAW's software monitoring feature should be disabled when Console is active. If it isn't, phasing and/or doubling of the monitored signal(s) will occur, because the input signal is being heard twice; first from the low-latency cue mix (Console) and shortly thereafter from the higher-latency software mix (DAW).

> ***Important:*** *To eliminate doubled signals, software monitoring in the DAW should be disabled when Console is to monitor Apollo's inputs. Refer to the DAW documentation for specific instructions on how to defeat software monitoring in the DAW.*

Cue Mixing with Console

The primary function of Console is monitoring of Apollo's inputs during live performance, with (or without) Realtime UAD Processing. When used with a DAW, Console is used as a monitor mixer that functions separately from the DAW's software monitoring mixer.

Routing and Recording Console Mixes

Recording Apollo inputs

This functionality is covered in "Accessing Apollo's I/O in a DAW" on page 61.

Recording Console mix buses

Console's "virtual" output buses (monitor, auxiliary, headphone) can be routed into the DAW for recording Console's active mixes. See "Routing Console Outputs Into the DAW for Recording" on page 64 for details.

Recording Realtime UAD Processing

When monitoring Apollo's inputs with Realtime UAD Processing, those inputs can be recorded with processing (wet) or without processing (dry). This function is accomplished with the Insert Effects switch. See "Insert Effects" on page 37 for full details.

Routing Console Outputs Into the DAW for Recording

Any or all of the Console Mixer's output buses (monitor, auxiliary, headphone) can be recorded into the DAW via Apollo's device drivers. This is accomplished by selecting Console's "virtual" software outputs as the input source(s) for a DAW's audio channel input(s).

Console Output Channels and Names

Console's virtual output channels are carried on the Apollo driver channels listed in the table at right. Select these channels as track inputs to record the virtual mix bus. For example, to record Console's main stereo monitor mix, select channels 19 – 20 or MON L/R as a stereo audio track's input device.

Console's "Virtual" Software Channels	
"Input" Channel	**Console Output Name**
19	Monitor 1 (Left)
20	Monitor 2 (Left
21	Auxiliary 1 (Left)
22	Auxiliary 1 (Right)
23	Auxiliary 2 (Left)
24	Auxiliary 2 (Right)
25	Headphone 1 Left
26	Headphone 1 Right
27	Headphone 2 Left
28	Headphone 2 Right

Numbers vs. Names

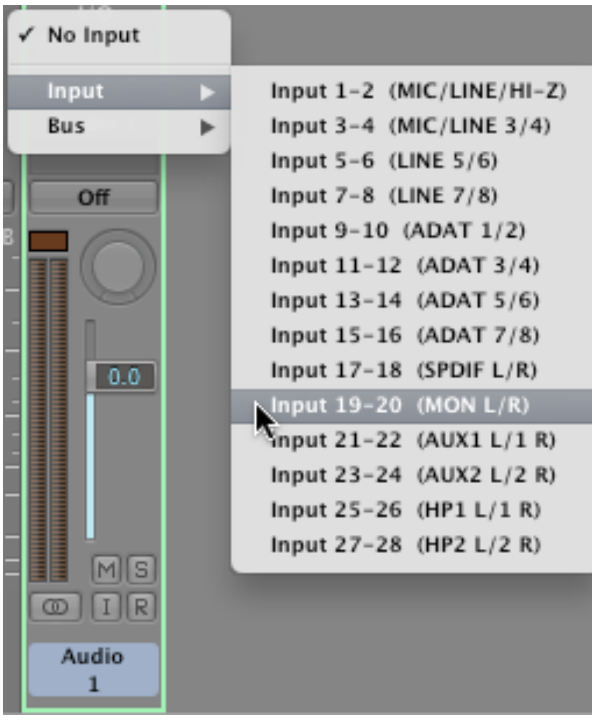
Apollo's drivers describe all I/O channels by name and number, but what is actually displayed depends on each particular DAW (names are not displayed by all DAWs).

Outputs as Inputs

Although channels 19 – 28 represent Console's virtual *outputs*, these outputs are actually carried on Apollo's driver *inputs*. This incongruity results because the virtual outputs must be represented as Apollo's virtual inputs so they can be routed as a DAW input source.

Wet or Dry?

Console inputs with Realtime UAD Processing can be recorded "wet" or "dry" depending on the state of the Insert Effects setting in Console (and Console Recall). See "Insert Effects" on page 37 for complete details.



At right: Selecting Console's monitor outputs as the input to a track for recording the cue mix. The aux and headphone mixes are also available.

Console with the Console Recall Plug-In

When the Console Recall plug-in (page 50) is loaded in a DAW session that is open at the same time as Console, all Console controls are mirrored in the Console Recall plug-in, and vice versa (changing a value in one changes the other as well).

The only exception to this behavior is when Console is open then a session is loaded containing Console Recall where the "Synchronize" function is active. In this scenario, the stored Console settings within the newly-loaded DAW session will overwrite the current settings in Console. See "Synchronize" on page 52 for complete details.

> ***Important:*** *Loading a DAW session that has Synchronize engaged will overwrite the current Console configuration.*

Latency Compensation

Some latency is inevitable in complex digital audio environments such as when running a DAW with Console. Fortunately, when these applications are properly configured and operated, latency is not a deterrent because it is negligible during low-latency monitoring via Console, and automatically managed for time-alignment of recorded tracks via the DAW's automatic delay compensation feature.

See "Delay Compensation with Apollo" on page 69 for more information.

Recording multiple inputs simultaneously

Console's Input Delay Compensation feature should be enabled to maintain phase alignment when monitoring and/or recording simultaneous multi-channel sources (such as a drum kit or multi-mic'd guitar amp) when Realtime UAD Processing is active in Console and some (or all) of the UAD plug-ins in Console are upsampled. See "Input Delay Compensation in Console" on page 69 for complete details.

Latency Basics

For a complete overview of latency in a digital audio system, see "Latency Basics" on page 72.

Chapter 6: Device Drivers

Apollo Drivers Overview

The Apollo device drivers are the low-level software files that instruct the computer's operating system on how to communicate with the Apollo hardware. The drivers are loaded during system startup so that whenever Apollo is connected, the device is ready to accept instructions from the OS. Apollo's drivers control Apollo's audio interface, Console Mixer, and UAD-2 functionality.

Core Audio

Apollo's audio drivers use the Core Audio API under Mac OS X. Apollo's normal (non-DSP) audio interface features are simply seen as a Core Audio device; therefore any Core Audio-compliant device can use Apollo for audio I/O.

UAD Mixer Engine

The Console application and Console Recall plug-in don't actually communicate directly with Apollo. Instead, they communicate with the *UAD Mixer Engine*, which is the central hub for all Console and Console Recall functionality.

The UAD Mixer Engine behaves as a server for Apollo's internal DSP mixer that runs in the background, so Console does not have to be open for Console Recall to function, and vice/versa.

The UAD Mixer Engine is a system-level application; it does not appear in application menus or the Mac OS X Dock. It is automatically launched during system startup and is always running during normal operation.

Driver I/O Labels

Each Apollo input and output has a channel number and name provided by the Apollo drivers; these values are shown in the tables below.

DAWs use these values when routing audio signals into and out of the DAW. The DAW determines how the I/O values are displayed; some DAWs display I/O channel numbers only, and others display the full or abbreviated name.

Apollo Driver Outputs

Apollo driver output channel numbers 1 – 24 represent the physical hardware outputs (14 analog, 10 digital) of Apollo. These values are used to route signals from the DAW to Apollo's hardware outputs.

Apollo's monitor outputs (one stereo or two mono) and headphone outputs (two stereo, or four mono) can each be individually addressed by the DAW, which increases routing flexibility.

APOLLO DRIVER OUTPUTS		
Channel Number	**Driver Name**	**Apollo Output**
1	MON L	Monitor 1 (Left)
2	MON R	Monitor 2 (Right)
3	LINE 1	Line Output 1
4	LINE 2	Line Output 2
5	LINE 3	Line Output 3
6	LINE 4	Line Output 4
7	LINE 5	Line Output 5
8	LINE 6	Line Output 6
9	LINE 7	Line Output 7
10	LINE 8	Line Output 8
11	ADAT 1	ADAT Output 1
12	ADAT 2	ADAT Output 2
13	ADAT 3	ADAT Output 3
14	ADAT 4	ADAT Output 4
15	ADAT 5	ADAT Output 5
16	ADAT 6	ADAT Output 6
17	ADAT 7	ADAT Output 7
18	ADAT 8	ADAT Output 8
19	SPDIF L	S/PDIF Output 1 (Left)
20	SPDIF R	S/PDIF Output 2 (Right)
21	HP1 L	Headphone 1 Left
22	HP1 R	Headphone 1 Right
23	HP2 L	Headphone 2 Left
24	HP2 R	Headphone 2 Right

Apollo's Output Driver Channel Names

Apollo Driver Inputs

Hardware Inputs

Apollo driver input channel numbers 1 – 18 represent the physical hardware channels (8 analog, 10 digital) of Apollo. These values are used to route signals into the DAW from Apollo's hardware inputs.

Software Inputs

All of the Console Mixer's monitor, auxiliary, and headphone bus outputs can each be individually routed into the DAW (page 64), which increases recording flexibility.

Apollo driver input channel numbers 19 – 28 represent the "virtual" software channels (2 monitor, 4 auxiliary, 4 headphone) of Console's bus outputs.

> ***Note:*** *These are the channels used to route signals from the Console Mixer bus outputs into a DAW (e.g., to record performances that are monitored via Console).*

Outputs as Inputs

Although channels 19 – 28 represent Console's virtual *outputs*, these outputs are actually carried on Apollo's driver *inputs*. This incongruity results because the virtual outputs must be represented as Apollo's virtual inputs so they can be routed as a DAW input source.

APOLLO DRIVER INPUTS		
Channel Number	**Driver Name**	**Input Name**
1	MIC/LINE/HI-Z 1	Mic/Line/Hi-Z 1
2	MIC/LINE/HI-Z 2	Mic/Line/Hi-Z 2
3	MIC/LINE 3	Mic/Line 3
4	MIC/LINE 4	Mic/Line 4
5	LINE 5	Line Input 5
6	LINE 6	Line Input 6
7	LINE 7	Line Input 7
8	LINE 8	Line Input 8
9	ADAT 1	ADAT Input 1
10	ADAT 2	ADAT Input 2
11	ADAT 3	ADAT Input 3
12	ADAT 4	ADAT Input 4
13	ADAT 5	ADAT Input 5
14	ADAT 6	ADAT Input 6
15	ADAT 7	ADAT Input 7
16	ADAT 8	ADAT Input 8
17	SPDIF L	S/PDIF Input 1 (Left)
18	SPDIF R	S/PDIF Input 2 (Right)
19	MON L	Monitor 1 (Left)
20	MON R	Monitor 2 (Left
21	AUX1 L	Auxiliary 1 (Left)
22	AUX1 R	Auxiliary 1 (Right)
23	AUX2 L	Auxiliary 2 (Left)
24	AUX2 R	Auxiliary 2 (Right)
25	HP1 L	Headphone 1 Left
26	HP1 R	Headphone 1 Right
27	HP2 L	Headphone 2 Left
28	HP2 R	Headphone 2 Right

Apollo's Input Driver Channel Names

Wet or Dry?

The main monitor mix can be recorded wet or dry depending on the state of the Insert Effects setting in Console (and Console Recall). See "Insert Effects" on page 37 for complete details.

Delay Compensation with Apollo

System Latency Overview

System latency encapsulates all latencies induced within the typical digital audio workstation environment. See "Latency Basics" on page 72 for a detailed overview of where, when, and how latency is induced in this environment.

Driver Reporting

Any system latency that is induced by Apollo's I/O, Console, and/or UAD Powered Plug-Ins is reported by Apollo's device drivers to the host audio software that is using the device.

The host software uses this reported device latency for its automatic delay compensation (ADC) engine. When properly configured, ADC maintains phase coherency (time alignment) throughout the recording, overdubbing, and mixing process.

Automatic Delay Compensation in the DAW

Generally speaking, ADC should be enabled in the DAW when using Apollo, regardless of whether or not Console is used concurrently. The DAW's ADC will perform the necessary housekeeping to keep tracks phase-aligned, regardless of the latency source (if any).

Input Delay Compensation in Console

Console has automatic Input Delay Compensation (IDC), which is controlled by the Input Delay Compensation menu in Console Settings.

What IDC does

Console IDC maintains phase alignment across Console's analog and digital inputs when Upsampled UAD Plug-Ins are used in Console.

How IDC works

IDC works by automatically adding small amounts of delay to each Console input that is *not* delayed by upsampled plug-ins, so all Console inputs are still phase aligned.

For specific delay values, see "Upsampled UAD Plug-Ins Table" on page 71.

When to use Console IDC

Console IDC is required to maintain phase alignment only when **both** of these conditions are active:

1. Monitoring and/or recording simultaneous multi-channel sources (such as a drum kit or multi-mic'd guitar amp) when Realtime UAD Processing is active in Console, **and**
2. Any of those UAD plug-ins in Console are upsampled.

Console IDC is not needed when the UAD plug-ins in Console are not upsampled.

Affect of Console's IDC setting

In Console

In Console, the amount of delay added by the IDC engine is automatic. Only the minimum amount of delay actually required to compensate the input(s) is applied (up to the maximum value of the setting), maintaining the lowest possible latency for phase alignment at all times.

For example: When the IDC value is Short (100 samples – the default value) and only 31 samples is actually required to compensate, then only 31 samples of delay will be applied to the other Console inputs.

In the DAW

In the DAW, the amount of delay added by Console's IDC engine is static. The extra samples are always added to all inputs in the DAW, *even if no upsampled plug-ins are active*. However, this overall additional input latency is reported by Apollo's drivers, so it is automatically compensated by the DAW's ADC.

Input Delay Compensation Values	
Setting Name	**Extra Delay (samples)**
Off	0
Short	100
Medium	200
Long	1000

For example: When the IDC value is Short (100 samples – the default value) and only 31 samples is actually required to compensate, 100 samples is still added to all inputs in the DAW. If using software monitoring via the DAW, the extra (unnecessary) delay could be detected.

> ***Note:*** *Console Input Delay Compensation is enabled with the value of Short (100 samples) by default.*

Software monitoring with Console IDC

When software monitoring via the DAW and Console IDC is enabled, the lowest effective Console IDC setting is recommended to minimize monitoring latency. If using Console for monitoring and software monitoring via the DAW is disabled, the IDC value isn't as critical because Console will dynamically deliver the lowest possible monitoring latency.

Special Cases: UAD Precision Multiband and UAD Ampex ATR-102

These two upsampled UAD plug-ins have extra latency values that exceed the capacity of Console's IDC engine even at the maximum setting (Long). These plug-ins are designed to be used on outputs of a DAW during mixdown, where latency is not a consideration. If using these plug-ins in Console, the Input Delay Compensation feature may need to be disabled or ignored.

Upsampled UAD Plug-Ins Table

The table below lists the additional latency produced by upsampled UAD plug-ins.

	Sample Rate (kHz)					
UAD Powered Plug-In	**44.1**	**48**	**88.2**	**96**	**176.4**	**192**
Pultiec EQ/Pultec-Pro	31	31	13	13	0	0
Precision Limiter	64	69	129	140	259	281
Neve 33609 FATSO Jr./Sr. Massive Passive Studer A800	55	55	55	55	88	88
Precision Maximizer	67	67	67	67	42	42
Helios Type 69 Harrison 32C Neve 1073, 1081, 31102 Precision EQ SSL E Channel Strip Trident A-Range	31	31	13	13	0	0
Precision Multiband	15,360	16,896	30,720	33,792	61,440	66,048
Moog Filter	55	55	55	55	N/A	N/A
Little Labs IBP	32	32	14	14	1	1
Lexicon 224	84	79	90	97	107	116
EMT 250* (see note)	75	11	85	24	107	50
Ampex ATR-102	2262	2455	4408	4798	8818	9598
MXR Flanger/Doubler	31	31	0	0	0	0

Latency Basics

Latency (delay) is an inherent factor in digital audio systems because of A/D-D/A conversion, I/O buffering in the DAW, plug-in signal processing, and other aspects.

Although there are ways to mitigate latency (such as delay compensation and/or low-latency monitoring), it always exists to some degree when working with systems that combine analog and digital audio. These concepts are explained in greater detail below.

Audio Interface Latency

Every audio interface that performs A/D and/or D/A conversion induces latency as a result of the conversion process. This inherent A/D-D/A latency is essentially undetectable. A/D-D/A latency usually depends on the sample rate, with higher sample rates inducing less latency (higher rates = less time required for conversion).

An audio interface's "analog I/O round-trip latency" specification refers to how long it takes for an analog signal at an interface input to reappear at the same interface's analog output after both A/D and D/A conversion. Apollo's audio interface "analog I/O round-trip latency" is 1.1 milliseconds at a sample rate of 96 kHz.

Console Mixer Latency

Apollo's Console Mixer is used for low-latency monitoring (cue mixing) of Apollo's analog and digital inputs. Using Console to monitor Apollo's inputs may or may not add to the inherent analog I/O round-trip latency, depending on how it is configured:

Console without UAD plug-ins – When Console is used without UAD plug-ins, monitoring Apollo's inputs via Console does not add any latency. In this configuration, Apollo's analog I/O round-trip latency is still 1.1 milliseconds at 96 kHz.

Console with Realtime UAD Processing – When Console is used for Realtime UAD Processing with UAD Powered Plug-Ins that are not upsampled, monitoring Apollo's inputs via Console *does not add any latency*.

In this configuration, Apollo's analog I/O round-trip latency is still 1.1 milliseconds at 96 kHz, even if up to four UAD (non-upsampled) plug-ins are serially "stacked" (chained) on a single Apollo analog and/or digital input.

Multiple Apollo inputs can have up to four UAD (non-upsampled) plug-ins each (up to the limit of available DSP resources); this configuration also *does not add any latency*.

> ***Note:*** *Upsampled UAD plug-ins add latency when used in Console or a DAW. See "Upsampled UAD Plug-Ins" below for details.*

Console Auxiliary Buses – The outputs of the auxiliary buses in Console have 32 samples of additional latency. This is necessary to maintain the lowest possible input latency.

Upsampled UAD Plug-Ins

Some UAD Powered Plug-Ins are "upsampled," meaning their internal sample rate is increased in order to accomplish sonic design goals. Depending on the session sample rate, upsampled UAD plug-ins can add additional latency when used in the Console Mixer and/or a DAW.

Although latency added by upsampled UAD plug-ins is negligible (depending on the plug-in and sample rate) it can affect phase coherency (track alignment) in a session. However, phase is managed automatically by Input Delay Compensation in Console and Automatic Delay Compensation in the DAW.

Note: *For specific values, see "Upsampled UAD Plug-Ins Table" on page 71.*

DAW Latency

Most DAWs use I/O buffering to shuttle audio data back and forth between the audio interface and the DAW. This I/O buffering induces additional latency with any audio interface (not just Apollo).

I/O Buffer Size

The amount of DAW latency is usually determined by the DAW's I/O interface "buffer size" setting. Low buffer sizes reduce latency, but increase host CPU loading. If the buffer size is set too low, host CPU overloads and/or audio artifacts such as clicks, distortion, or dropouts can occur.

Monitoring Live Performance During Recording

DAW latency can be a problem during recording when "software monitoring" via the DAW's mixer, because the buffering delay is a distraction; an artist cannot hear their performance in realtime. DAW latency when recording with Apollo is mitigated by using the Console Mixer for live performance monitoring, where buffering latency does not apply.

Time-Alignment Of Newly-Recorded Tracks And Previously-Recorded Tracks

Dealing with latency is also important with DAWs for time-alignment of newly-recorded tracks and previously-recorded tracks which are inevitably shifted from the I/O buffering process.

The solution is to use the automatic delay compensation ("ADC") feature of the DAW. Most modern DAWs, including Console, have automatic delay compensation. For more information about system latency and its compensation, see "Delay Compensation with Apollo" on page 69.

UAD-2 DSP Latency

When UAD Powered Plug-Ins are used within a DAW (not Console), I/O buffering is used to shuttle audio data back and forth between the UAD-2 inside Apollo and the DAW, which induces additional latency.

This UAD-2 DSP "DAW processing method" latency is determined by the I/O Buffer Size setting. This latency is unrelated to the (indiscernible) audio interface I/O latency (they are separate processes).

UAD-2 DSP latency makes tracking through UAD plug-ins in the DAW via software monitoring problematic for the performer because again, an artist cannot hear their performance in realtime.

The issue of UAD-2 DSP latency when recording with Apollo is eliminated by using the Console Mixer for live performance monitoring with optional Realtime UAD Processing, where buffering latency does not apply.

Does all this latency stuff really matter?

With Apollo, not really. Performance latency is not a factor because of Console's low-latency cue mixing, and recording (track alignment) latency during recording, overdubbing, and mixing is automatically compensated by Console and the DAW.

Chapter 7: Glossary

A/D An acronym for “Analog to Digital,” which refers to the conversion of analog signals to digital data.

Acronym A word formed from the first letters of other words (e.g., GUI, ADAT, TRS, etc.).

ADAT An acronym for “Alesis Digital Audio Tape.” ADAT was the name given to the Alesis-branded products of the 1990s which recorded eight tracks of digital audio on a standard S-VHS video cassette. The term now generally refers to the 8-channel optical “Lightpipe” connection that is used in a wide range of digital products from many manufacturers.

AES (sometimes written as “AES/EBU“) The name of a digital audio transfer standard jointly developed by the American-based Audio Engineering Society and the European Broadcast Union. Designed to carry two channels of 16-, 20- or, 24-bit digital audio at sampling rates of up to 192kHz, the most common AES physical interconnect utilizes a 3-conductor 110 ohm twisted pair cable, terminating at standard XLR connectors. (See “Dual Wire” and “Single Wire”)

Analog Literally, an analog is a replica or representation of something. In audio signals, changes in voltage are used to represent changes in acoustic sound pressure. Note that analog audio is a continuous representation, as opposed to the quantized, or discrete “stepped” representation created by digital devices. (See “Digital”)

API Acronym for Application Programming Interface. A software layer between an operating system and third-party hardware (such as an audio interface) and/or software (such as a DAW). For example, a computer OS’s audio API enables audio hardware and audio software from different vendors to communicate with the OS and each other.

Balanced Audio cabling that uses two twisted conductors enclosed in a single shield, thus allowing relatively long cable runs with minimal signal loss and reduced induced noise such as hum.

Bit A contraction of the words “binary” and “digit,” a bit is a number used in a digital system, and it can have only one of two values: 0 or 1. The number of bits in each sample determines the theoretical maximum dynamic range of the audio data, regardless of sample rate being used. Each additional bit adds approximately 6 dB to the dynamic range of the audio. In addition, the use of more bits helps capture quieter signal more accurately. (See “Sample” and “Dynamic range”)

Bit Depth (See “Bit Resolution”)

Bit Resolution Often used interchangeably with "bit depth," this is a term used to describe the number of bits used in a digital recording. Apollo converts analog audio and transmits digital audio with a resolution of 24 bits (thus yielding a theoretical dynamic range of approximately 145 dB), the highest audio interface resolution in common use today. (See "Dynamic Range")

BNC A bayonet-type coaxial connector often found on video and digital audio equipment, as well as on test devices like oscilloscopes. In digital audio equipment, BNC connectors are normally used to carry word clock signals between devices. BNC connectors are named for their type (Bayonet), and their inventors, Paul Neil and Carl Concelman. (See "Word Clock")

Buffer, buffers, buffering The transference of data in small batches instead of continuously. Buffering induces latency (delay) and is inherent in most digital audio systems.

Bus A signal path that carries more than one signal, e.g., a mix bus, auxiliary bus, headphone bus, etc.

Channel Input Strip A group of controls that pertain only to the functions contained within a particular mixer input channel. In most mixing consoles, the "strips" are duplicated for each input.

Class A One design technique used in electronic devices such that their active components are drawing current and working throughout the full signal cycle, thus yielding a more linear response. This increased linearity results in fewer harmonics generated, hence lower distortion in the output signal.

Condenser Microphone A microphone design that utilizes an electrically charged thin conductive diaphragm stretched close to a metal disk called a backplate. Incoming sound pressure causes the diaphragm to vibrate, in turn causing the capacitance to vary in a like manner, which causes a variance in its output voltage. Condenser microphones tend to have excellent transient response but require an external voltage source, most often in the form of 48 volts of "phantom power."

Clock In digital audio or video, a clock serves as a timing reference for a system. Every digital device must carry out specified numbers of operations per period of time and at a consistent speed in order for the device to work properly. Digital audio devices such as Apollo normally have an internal clock, and are also capable of locking to external clock routed from other digital devices. In order to avoid signal degradation or undesirable audible artifacts, it is absolutely critical that all digital devices that are interconnected in a system be locked to the same clock.

Clock Distribution Refers to the process of routing a master clock signal (either from an internal clock or an external source) to multiple devices by means of multiple outputs, thus removing the need to cascade the clock through external devices, which can degrade the signal.

Core Audio The audio API for Mac OS X.

D/A Acronym for "Digital to Analog," which refers to the conversion of a digital data to an analog signal.

DAW Acronym for "Digital Audio Workstation" – that is, any device that can record, play back, edit, and process digital audio.

dB Abbreviation for "decibel," a logarithmic unit of measure used to determine, among other things, power ratios, voltage gain, and sound pressure levels.

dBm Abbreviation for "decibels as referenced to milliwatt," dissipated in a standard load of 600 ohms. 1 dBm into 600 ohms results in 0.775 volts RMS.

dBV Abbreviation for "decibels as referenced to voltage," without regard for impedance; thus, one volt equals one dBV.

DI Acronym for "Direct Inject" or "Direct Input," a recording technique whereby the signal from a high-impedance instrument such as electric guitar or bass is routed to an input. DI into mixer or tape recorder inputs often employ use of a "DI box," which raises the signal to the correct voltage level at the right impedance.

Digital Information or data that is stored or communicated as a series of bits (binary digits, with values of 0 or 1). Digital audio refers to the representation of varying sound pressure levels by means of a series of numbers. (See "Analog" and "Bit")

Dither Minute amounts of shaped noise added intentionally to a digital recording in order to reduce a form of distortion known as "quantization noise" and aid in low level sound resolution.

Dry Refers to a signal that is unprocessed, e.g., recording a dry signal. The antonym of a "wet" signal.

DSP Acronym for "Digital Signal Processing" (or "Digital Signal Processor.")

DSP Accelerator A device dedicated to digital signal processing. UAD-2 devices are DSP accelerators.

Dynamic Microphone A type of microphone that generates signal with the use of a very thin, light diaphragm which moves in response to sound pressure. That motion in turn causes a voice coil which is suspended in a magnetic field to move, generating a small electric current. Dynamic mics are generally less expensive than condenser or ribbon mics and do not require external power to operate.

Dynamic Range The difference between the loudest sections of a piece of music and the softest ones. The dynamic range of human hearing (that is, the difference between the very softest passages we can discern and the very loudest ones we can tolerate) is considered to be approximately 120 dB. (See "Bit resolution")

EQ Abbreviation for "Equalization," a circuit that allows selected frequency areas in an audio signal to be attenuated or boosted.

External Clock A clock signal derived from an external source. (See "Clock")

FET Acronym for "Field Effect Transistor." A type of transistor that relies on an electric field to control the shape, and hence the conductivity, of a "channel" in a semiconductor material.

Firmware Software that is embedded in hardware.

FPGA Acronym for "Field Programmable Gate Array." A type of integrated circuit that can be programmed after manufacturing ("in the field") to perform specialized functions.

Front End Refers to a device that provides analog and digital input/output (I/O) to a digital audio workstation (DAW). Apollo is a front end.

Graphical User Interface A software window, panel, or screen containing controls where parameters are adjusted by the user. (See "GUI")

GUI Acronym for Graphical User Interface.

Hi-Z Abbreviation for "High Impedance." Apollo's Hi-Z input allows direct connection of an instrument such as electric guitar or bass via a standard unbalanced ¼" jack.

High Resolution In digital audio, refers to 24-bit signals at sampling rates of 88.2 kHz or higher.

Hz Abbreviation for "Hertz," a unit of measurement describing a single analog audio cycle (or digital sample) per second.

Impedance A description of a circuit's resistance to a signal, as measured in ohms, thousands of ohms (Kilohms), or millions of ohms (megohms).

Internal Clock A clock signal derived from onboard circuitry. (See "Clock")

I/O Acronym for "input/output."

kHz Abbreviation for "kiloHertz" (a thousand Hertz), a unit of measurement describing a thousand analog audio cycles (or digital samples) per second. (See "Hz")

JFET Acronym for Junction Field Effect Transistor, a specific type of FET which has some similarities to traditional bipolar transistor designs that can make it more appropriate for use in some audio circuit designs. (See "FET")

Jitter Refers to short-term variations in the edges of a clock signal, caused by a bad source clock, inferior cabling or improper cable termination, and/or signal-induced noise. A jittery signal will contain spurious tones at random, inharmonic frequencies. Usually, the jitter will be worse with higher signal frequencies. The internal digital clock of Apollo was designed for extreme stability and jitter-free operation, and its onboard phase aligned clock conditioner circuitry removes jitter from external sources, so conversion quality is unaffected by clock source.

Lightpipe A digital connection made with optical cable. This was a phrase coined by Alesis to make a distinction between the proprietary 8-channel optical network used in their ADAT products and standard stereo optical connectors used on CD players and other consumer products.

Line Level Refers to the voltages used by audio devices such as mixers, signal processors, tape recorders, and DAWs. Professional audio systems typically utilize line level signals of +4 dBm (which translates to 1.23 volts), while consumer and semiprofessional audio equipment typically utilize line level signals of -10 dBV (which translates to 0.316 volts).

Low Cut Filter An equalizer circuit that cuts signal below a particular frequency. Same as "high pass filter."

Mic Level Refers to the very low level signal output from microphones, typically around 2 millivolts (2 thousandths of a volt).

Mic Preamp The output level of microphones is very low and therefore requires specially designed mic preamplifiers to raise (amplify) their level to that needed by a mixing console, tape recorder, or digital audio workstation (DAW).

Mute "Turn off the signal." Mute stops the signal from being routed.

Native Refers to computer-based digital audio recording software controlled by the computer's onboard processor, as opposed to software that requires external hardware to run.

OS Acronym for Operating System. The OS is the software used to control the computer hardware, such as OS X (Mac) and Windows (PC).

Pan Abbreviation for "Panorama" or "Panoramic." A pan control determines a monophonic signal's positioning in the stereo field.

Patch Bay A passive, central routing station for audio signals. In most recording studios, the line-level inputs and outputs of all devices are connected to a patch bay, making it an easy matter to re-route signal with the use of patch cords.

Patch Cord A short audio cable with connectors on each end, typically used to interconnect components wired to a patch bay.

PDF Acronym for "Portable Document Format." PDF is the standardized file format used for distribution of documentation in electronic form. Various applications can open PDF files; one such "reader" application is available for free at www.adobe.com.

Plug-In Software components that are added to host software applications to enhance their functionality and/or performance.

Powered Plug-Ins High-quality audio processing plug-ins, developed and sold by Universal Audio, that run exclusively on UAD DSP accelerator products.

Quantization Noise A form of digital distortion caused by mathematical rounding-off errors in the analog to digital conversion process. Quantization noise can be reduced dramatically by dithering the digital signal. (See "Dither")

Realtime UAD Processing Universal Audio's DSP + FPGA technology that enables UAD Powered Plug-Ins to run with latencies in the sub-2ms range. Realtime UAD processing provides the ultimate sonic experience while monitoring and/or tracking. Realtime UAD processing is a special function that is available only within the Console application.

Ribbon Microphone A type of microphone that works by loosely suspending a small element (usually a corrugated strip of metal) in a strong magnetic field. This "ribbon" is moved by the motion of air molecules and in doing so it cuts across the magnetic lines of flux, causing an electrical signal to be generated. Ribbon microphones tend to be delicate and somewhat expensive, but often have very flat frequency response.

Sample A digital "snapshot" of the amplitude of a sound at a single instant in time. The number of samples taken per second is determined by the device's sample rate. (See "Sample rate")

Sample Rate The number of samples per second. In digital audio, there are six commonly used sample rates: 44.1 kHz (used by audio CDs), 48 kHz, 88.2 kHz (2 x 44.1 kHz), 96 kHz (2 x 48 kHz, used by DVDs), 176.4 kHz (4 x 44.1 kHz), and 192 kHz (4 x 48 kHz). The higher the sample rate, the greater the frequency response of the resulting signal; however, higher sample rates require more storage space. (See "kHz")

Sample Rate Conversion The process of altering a digital signal's sample rate to a different sample rate.

S/MUX (sometimes written as "S-MUX") Abbreviation for Sample Multiplexing. S/MUX is a method for transmitting two channels of high sample rate (88.2, 96, 176.4, or 192 kHz) 24-bit digital audio over a legacy optical "lightpipe" ADAT connection, which was originally designed to carry eight channels of 16-, 20- or 24-bit audio at 44.1 kHz or 48 kHz sampling rate. (See "ADAT" and "Lightpipe")

SPDIF (sometimes written as "S/PDIF") An acronym for "Sony/Philips Digital Interface Format," a digital audio transfer standard largely based on the AES/EBU standard. Designed to carry two channels of 16-, 20- or, 24-bit digital audio at sampling rates of up to 192 kHz, the most common SPDIF physical interconnect utilizes unbalanced, 75 ohm video-type coaxial cables terminating at phono (RCA-type) connectors. (See "AES")

Superclock A proprietary format used by some early Pro Tools systems to distribute clock signal running at 256x the system's sample rate, thus matching the internal timing resolution of the software. (See "Clock" and "Pro Tools")

Transcoding Converting one type of digital signal to another (i.e, from AES to SPDIF, or from ADAT to AES).

Transformer An electronic component consisting of two or more coils of wire wound on a common core of magnetically permeable material. Audio transformers operate on audible signal and are designed to step voltages up and down and to send signal between microphones and line-level devices such as mixing consoles, recorders, and DAWs.

Transient A relatively high volume pitchless sound impulse of extremely brief duration, such as a pop. Consonants in singing and speech, and the attacks of musical instruments (particularly percussive instruments), are examples of transients.

Transimpedance Preamplifier A transformerless solid-state preamplifier utilizing a transistor configuration that employs current feedback for ultra-low distortion and the highest possible quality of signal from input to output. The transimpedance design allows audio from 4 Hz to 150 kHz to pass through without altering the phase relationships between

fundamental frequencies and overtones. Noise and distortion are kept to near-theoretical minimums so critical signals may be generously amplified without degrading the quality or character of the sound source.

TRS Acronym for Tip-Ring-Sleeve. A ¼" phone connector with three conductors, typically used for balanced signal connections (e.g., I/O) or carrying two unbalanced signals (e.g., headphones).

TS Acronym for Tip-Sleeve. A ¼" phone connector with two conductors, typically used for unbalanced signal connections. Note that TS, like TRS and XLR, denotes the connector only and does not necessarily indicate the signal level of the connection. TS/TRS/XLR cables are used for both low-level (e.g., microphones and instruments) and line-level connections.

UAD Acronym for "Universal Audio Digital." Used in reference to digital products created by Universal Audio.

UAD-2 A line of DSP accelerator products developed and manufactured by Universal Audio.

Wet Refers to a signal that is processed, e.g., recording a wet signal. The antonym of a "dry" signal.

Word Clock A dedicated clock signal based on the transmitting device's sample rate or the speed with which sample words are sent over a digital connection. (See "Clock")

XLR A standard three-pin connector used by many audio devices, with pin 1 typically connected to the shield of the cabling, thus providing ground. Pins 2 and 3 are used to carry audio signal, normally in a balanced (out of phase) configuration.

Chapter 8: Index

Symbols

48V 27

A

Accessing Apollo I/O via Core Audio 57
Accessing Apollo's I/O 61
Always On Top 47
Analog Inputs 24
Apollo as a digital mixer (without a DAW) 54
Apollo as an Audio Interface 57
Apollo Concurrently with a DAW and Console 63
Apollo Hardware Manual 11
Apollo I/O Driver Names 57
Apollo Setups Overview 54
Apollo System 7
Apollo with a DAW (without Console) 61
Apollo with Console (without a DAW) 59
Apollo Without A Computer 60
Application Menus 49
Audio Interface Latency 72
Authorization 17
Automatic Delay Compensation in the DAW 69
Aux Fader 36
Aux Headphone Sends 36
Auxiliary Section 35
Auxiliary Sends 31
Aux Inserts 36
Aux Level 31
Aux Meter 36
Aux Mono 36
Aux Mute 36
Aux Output 36
Aux Pan 31
Aux Return Control Strips 35

C

Channel Fader 33
Channel Meter 33
Channel Strip Editor 30
Clear Peaks 41
Clip Hold Time 47
Clip & Peak Hold Settings 47
Clock Source 45
Close All Plug-In Editor Windows 49
Console Application 9, 13, 18
Console Controls 22
Console Functions 19
Console Link & Identify 48
Console Mixer 21
Console Mixer Latency 72
Console Overview 18
Console Recall Controls 51
Console Recall Menu 42
Console Recall Overview 50
Console Recall Plug-In 13, 50
Console Settings Panel 46, 47
Console Settings Window 44
Control Groupings 52
Copyright 4
Core Audio 66
customer support 15

D

DAW Documentation 12
DAW Latency 69, 73
Default Outputs 62
Delay Compensation 69
Device Drivers 10, 14, 66
Digital Inputs 25
Documentation 10
Driver Channel Names 67, 68
Driver Inputs 68
Driver I/O Labels 67
Driver Outputs 67
Driver Reporting 69
Drivers 66
Drivers Overview 66
DSP Usage Meters 37

E

Edit Menu 49
End-User License Agreement 2

F

Fader 33, 36
Fader Scale 33
Features 9
File Menu 49

G

Gain 26
Global 41
Global Interface Settings 45
Glossary 75

H

Hardware Inputs 68
Hardware installation 16
Hardware Manual 11
Hardware Monitoring 63
Headphone Enable 32
Headphone Level 32
Headphone Master 39
Headphone Mono 39
Headphone Pan 32
Headphone Sends 31, 36
Headphone Source 39
HP 39
HPF 26

I

IDC 46
Identify 45
Info Box 44
Input Controls 26
Input Delay Compensation 46, 69, 70
Input Driver Channel Names 68
Input Metering 41
Input Mute 32
Input Pan 32
Input Solo 32
Input Strips 24
Input Types 24
Input View 25, 40
Insert Disable 29
Insert Display 29
Insert Effects 37
Insert Menu 28
Insert Options 29
Inserts 28
Installation Overview 16
Interface Latency 72
Interface Settings 45
Interface Settings Panel 44
Introduction 7
I/O Buffer Size 73
I/O Driver Names 57
I/O in Mac OS X System Preferences 58
I/O in the audio software application 57
I/O Labels 67

L

Label 33
Latency Basics 72
Latency Compensation 65
Level Hover 33
Level Scale 33
Line Outputs 1 – 8 Reference Level 46
Link 27, 34
Link Limitations 34
Low Cut Filter 26

M

Meter 33, 36
Metering 41
Meter Scale 40
Meter Source 40
Mic/Line 26
Minimize 48
MON 38, 39
Monitor Controls 40
Monitor Global 41
Monitor Level 42
Monitor Meters 40
Monitor Mute 42
Monitor Output 41
Monitor Section 37
Monitor Source 41
Monitor With FX 38
Mono 36, 39, 41
Mute 32, 36, 42

O

Output Driver Channel Names 67
Outputs 62

P

Pad 27
Pan 32
Peak Hold Settings 47
Peak Hold Time 47
phase 27
Plug-Ins Manual 11
Polarity 27
Preamp Controls 26
Preamp Inputs 24
Pre-Fader 41
Pre/Post Menu 41

Q

Quit 48

R

REC 38
Recall 42
Recall Menu 43
Record With FX 38
Redo 49
Reference Level 27, 46
Registration & Authorization Overview 17
Registration & Authorization Procedure 17
Routing Console Outputs Into the DAW for Recording 38, 64

S

Sample Rate 45
Sample Rate Conversion 25
Scrolling 22
Select Unit 45
Session Name 42
Settings 49
Shortcuts 22
Show Mixer Window 49
Show Plug-In Editor Windows 49
Software Features 8
Software Inputs 68
Software Installation 16, 17
Software Manual 11
Software Monitoring 63
Software Overview 13
Software Updates 12, 16
Solo 32
Solo Clear 41
Source 41
S/PDIF Mirrors Monitor 1–2 46
SR Convert 25
Standalone Use 60
Stereo Link 33
Synchronize 52
Synchronized DAW Sessions 53
System Latency Overview 69
System Manual 11
System Requirements 10, 16

T

Technical Support 15
Terminology 12
Trademarks 4

U

UAD-2 DSP Latency 73
UAD Meter & Control Panel 10
UAD Mixer Engine 66
UAD Plug-Ins Manual 11
UAD Powered Plug-Ins 10, 13
UAD Powered Plug-Ins Processing 55
UAD System Manual 11
Undo 49
Unit Selection 44, 48
Upsampled UAD Plug-Ins 73
Upsampled UAD Plug-Ins Table 71
Using Apollo Concurrently with a DAW and Console 63
Using Apollo with a DAW (without Console) 61
Using Apollo with Console (without a DAW) 59

W

Wet vs. Dry 68
Window Menu 49
Window Title Bar 47, 48
Workflows 54

Universal Audio, Inc.
1700 Green Hills Road
Scotts Valley, CA 95066-4983 USA
Customer Service & Technical Support:
+1-877-MY-UAUDIO (+1-877-698-2834)
International: +1-831-440-1176
www.uaudio.com