



User's Manual



FilterBank
Every EQ Ever Made

McDowell Signal Processing, LLC

McDSP FilterBank plug-in Manual

**McDSP
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from the entire McDSP development team.

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Introducing FilterBank

Congratulations on purchasing FilterBank, the Equalizer that distinguishes itself among EQs by giving you the most power and flexibility to emulate any other or create your own custom EQ.

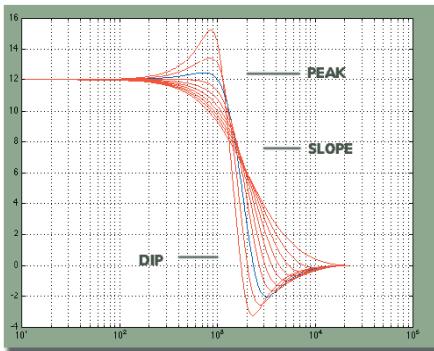
- Consider first the number of configurations you get in this one plug-in: High and Low Shelf EQ, Parametric EQ, High and Low pass Filters, Band Pass and Band Reject Filters all in stereo and mono versions in 2,4, and 6 band configurations.
- Consider next, the maximum independent controls available to the user to define the EQ response curve. Our design philosophy is “maximum user control,” and here is the proof of our concept:
- High and Low Shelving EQs: Most other EQs only allow control Frequency and Gain; a few EQs may even allow you limited control of Peak and Dip (also known as Q). Only FilterBank gives you independent control of Frequency, Gain, Peak, Slope, and Dip. No other EQ gives you so many controls and allows as much flexibility (largest range) of these controls.
- Parametric EQ: frequency control range covers nearly the entire audible spectrum (20-21000 Hz).The parametric bell is up to 5 octaves wide. Constant-Q technology closely models analog parametric responses. There are 4 parametric Q modes for even greater flexibility and control.
- Low and High Pass Filters: adjustable slope and resonant peak greater than 24 dB.
- Band Pass and Band Reject Filters: frequency control range covers nearly the entire audible spectrum (20-21000 Hz).
- Double Precision Arithmetic which keeps the noise floor at -138 dB. In contrast, it is possible in a single precision arithmetic product for the noise floor to rise significantly above the -138 dB you would expect from a 24 bit TDM bus. (See our FAQ for more information of double precision).
- Analog Saturation Modeling that prevents digital clip (See our FAQ for more information on analog saturation modeling), and a minimum of 22 bands of EQ/Filters per dsp chip - compared to the typical 4-6 per hardware box!
- FilterBank is compatible with ProTools and other DAW applications that support TDM, RTAS, and Audiosuite plug-in formats. The McDSP FilterBank plug-in operates on Mac OS X and Windows XP systems.

Just how many configurations are there? High and Low Shelf EQ, Parametric EQ, High and Low pass Filters, Band Pass and Band Reject Filters all in stereo and mono versions in 2,4, and 6 band configurations for a total of 17 different plug-in types. See the Reference section for a complete listing of all FilterBank configurations and their specifications.

FilterBank's Innovative P-S-D (Peak-Slope-Dip) Control

PSD Control gives you independent control of peak, slope, and dip. By adjusting these controls, you can emulate the response curve of every Shelving EQ ever made!

The typical low shelf analog EQ response shown in blue. Some of the many low shelf EQ responses from FilterBank are shown in red.



We would like to thank you for purchasing FilterBank and wish you happy signal processing!

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System Requirements

Operating System

FilterBank is compatible with both Mac OS X 10.4.x and Windows XP.

Configurations

FilterBank is available in TDM, RTAS, and AudioSuite configurations.

Applications

Pro Tools™ 7.x or higher is required for TDM, LE, and M-Powered systems. Additionally, a Third Party software application that supports the Digidesign TDM, RTAS, or AudioSuite plug-in Standard may be supported. Additionally, FilterBank HD is compatible with VENUE D-SHOW systems.

See http://www.digidesign.com/developers/plugin_info/ for more information.

McDSP plug-ins are compatible with the entire Pro Tools™ 7 product line.

Hardware

McDSP plug-ins support any Digidesign or approved Third Party hardware supported in Pro Tools™ 7.x. This includes HD, HD Accel, 002, and Mbox host based systems. See <http://www.digidesign.com/compato/> for more specific information.

The McDSP Mac versions are compatible with both Intel and PowerPC based computers.

The McDSP XP versions require an Intel Pentium 4 or greater processor.*

** Our XP test machines are chosen to follow the Digidesign recommended systems guide, which currently is the Dell Precision™ Workstation 670 with 2.79 GHz Xeon processor. All products are guaranteed to run on that system. Older Intel processors (i.e. Pentium III and predecessors) and AMD processors are not officially supported, although some users have had limited success with newer AMD processors (i.e. Dual Opteron 1.79 GHz, Athlon 64 2.20 GHz, and Athlon 64 XP 3700). None of our XP product line will work with Pro Tools™ 5.x. Also note that our XP product line does not support MIX, although RTAS versions will work if they exist and the rest of your system (i.e. Pro Tools™ version and processor) is compatible.*

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Installing the plug-ins

Installation on Mac OS X

Each individual plug-in Package installer, either online or boxed, includes this manual, ReadMe, Release Notes, and a folder of presets specific to the plug-in being installed. Two copies of the plug-in's Licensing Agreement are included - one as a pdf manual and a second as a separate text file. The plug-in manual requires that Adobe Acrobat reader (or similar .pdf reader) is installed.

Installing the plug-in and presets with the Installer:

The online version of the plug-in package has been prepared for Internet delivery, and is transmitted as a compressed file in zip format (.zip). In Mac OS X 10.4.x, simply double click the *.zip file to unpack the installer. The boxed plug-in package purchased at your local dealer will be on CDROM. As with the online version, these 'physical' versions of the FilterBank plug-in package should be copied into a local folder on your system

- Insert the McDSP 'HD Disk,' 'Native Disk,' or 'LE Disk' CDROM onto an available CDROM drive.
- Navigate to the folder of the plug-in you purchased on the CDROM - the installer application is contained therein.
- Run the Installer application to install (copy) the plug-in, presets, and documentation to a local folder on your system. The plug-in will be placed in the 'plug-ins' folder, and the presets will be placed in the 'plug-ins Settings' folder.
- If a previous version of the plug-in (or other HD, Native, or LE version) was already in the plug-ins folder, it will automatically be updated (or replaced) by the installer.

Re-installing a McDSP plug-in presets manually:

If you wish to restore the factory default presets, it may be useful to know how to manually re-install just the presets.

- Go to the 'plug-in Settings' folder:
- Root->Library->Application Support->Digidesign->plug-in Settings
- Open another window and go to the appropriate McDSP plug-in folder
- Root->Applications ->McDSP->plug-in
- Locate the parent folder containing folder named 'Presets.'
- Drag the parent folder into the plug-in Settings folder. The presets are now viewable (after restarting Pro Tools™) from the settings popup menu bar at the top of the plug-in user interface.

Note: it may be necessary to re-start Pro Tools™ in order for the newly added 'Presets' folder to be viewable from the Settings popup inside the plug-in window toolbar.

Installation on Windows XP

Each plug-in installer includes the plug-in, a user's manual, ReadMe, Release Notes, and a folder of presets specific to the plug-in being installed. Two copies of the plug-in's Licensing Agreement are included - one in the user's manual and another as a plain text file. Note that the user's manual requires Adobe Acrobat reader (or similar .pdf reader).

Both online and boxed versions will automatically install the plug-in and its presets on your system. Note that authorization of the plug-in is still required after running the installer, and those steps are detailed in the following sections.

Installing the plug-in and presets with the Installer:

The plug-in package purchased at your local dealer will be on CDROM and contain a Windows self extracting executable (.exe) similar to the online package prepared for Internet delivery. Both the boxed and online versions of the plug-in executable file will automatically install the plug-in and its presets on your system. Double click the file to launch the installer which will install the plug-in, presets, and documentation. At any time after installation, you may access the documentation from the Windows 'Start Menu' under the 'McDSP' group.

Authorization of the plug-in is still required after running the installer, and those steps are detailed in the following sections. Note that after installing new versions of the PACE iLok drivers with the plug-in installer, you will be prompted to reboot your system. If you are not prompted by the installer, there is no need to reboot.

- Insert the McDSP 'HD Disk,' 'Native Disk,' or 'LE Disk' CDROM onto an available CDROM drive.
- Navigate to the appropriate installer on the CDROM.
- Run the plug-in Installer application to install the plug-in, presets, and documentation to a local folder on your system. The plug-in will be placed in the 'plug-ins' folder, and the presets will be placed in the 'plug-ins Settings' folder.
- If a previous version of the plug-in (or other HD, Native, or LE version) was already in the plug-ins folder, it will automatically be updated (or replaced) by the installer.

Re-installing the plug-in presets manually:

If you wish to restore the factory default presets, it may be useful to know how to manually re-install only the presets.

- Go to the plug-in Settings folder:
- C:\Program Files\Common Files\Digidesign\DAE\plug-in Settings\
- Open another window and go to the appropriate McDSP plug-in folder
- C:\Program Files\McDSP\plug-in\
- Locate the parent folder containing folder named 'Presets.'
- Copy the parent folder into the plug-in Settings folder. The presets are now viewable (after restarting Pro Tools™) from the settings popup menu bar at the top of the plug-in user interface.

Note: it may be necessary to re-start Pro Tools™ in order for the newly added 'Presets' folder to be viewable from the Settings popup inside the plug-in window toolbar.

Installing the plug-in on VENUE D-SHOW systems

The FilterBank plug-in Package for VENUE D-SHOW systems includes presets for the FilterBank plug-in and the FilterBank plug-in. The FilterBank Licensing Agreement is displayed when installing the product on D-SHOW. The pdf manual can be obtained by running the Mac OS X or Windows XP version of the FilterBank Pro Tools plug-in installer on any available computer.

Both online and boxed versions will come with a VENUE compatible installer that will automatically install the FilterBank plug-in and its presets on your system. The authorization of the FilterBank plug-in is still required after running the installer, and those steps are detailed in the following sections.

Note that Analog Channel HD, Channel G HD, CompressorBank HD, FilterBank HD, MC2000 HD, and ML4000 HD are the only McDSP products currently compatible with VENUE systems.

Installing the FilterBank plug-in and presets on VENUE with the 'HD Disk':

The boxed FilterBank plug-in package purchased at your local dealer will contain a CDROM titled 'HD Disk' that is specially formatted to work with your VENUE console. The VENUE installers are also available online as a compressed zip file download, however you will have to take additional steps to create your own VENUE installer CD-R, see additional instructions below before proceeding with these instructions. Both the boxed and online versions of the FilterBank installer are the same and will install both the plug-in and its presets on your system.

Note that after installing new versions of the PACE iLok drivers with the FilterBank plug-in installer, you will need to reboot your system. You will not be prompted to reboot, and if you don't you may see an error message saying "TPk driver required, and a reboot. Please reboot or reinstall the software." If you see this message, simply reboot the console and try again.

- Insert the McDSP 'HD Disk' CDROM onto the CD drive. Note that neither the McDSP 'Native Disk' nor the 'LE Disk' contains VENUE compatible installers.
- Ensure your system is in 'CONFIG' mode, you cannot install plug-ins in 'SHOW' mode.
- Navigate to the 'OPTIONS' page and then select the 'Plug-ins' tab.
- You should now see the FilterBank plug-in available on the left hand side.
- Select the FilterBank plug-in and select 'INSTALL.'
- If a previous version of the FilterBank plug-in was already installed, it will be updated by the installer.

Important note for FilterBank HD and CompressorBank HD on VENUE D-SHOW consoles: The first time you instantiate either of these plug-ins, a dialog box will appear asking you to choose a user interface preference. Choose the Knobs interfaces, as some of the Slider interfaces are too large for the VENUE display.

Creating a VENUE D-SHOW Installer CD-R from the online zip file:

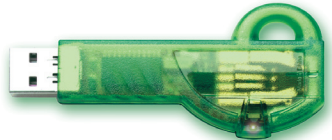
If you do not have a boxed copy of FilterBank with the included 'HD Disk' CDROM, you can still obtain a copy of the VENUE compatible installers from the www.mcdsp.com website. Once you have located and downloaded the latest VENUE compatible installers from the McDSP website, you will have to take several additional steps to create a VENUE compatible Installer CD-R. For your convenience, all VENUE compatible products are located in the same downloadable zip file, so you will only have to create one CD-R to install all compatible McDSP products.

- Unzip the downloaded file and locate the folder named "TDM Plug-ins" inside the unpacked folder.
- Using any CD-R burning application, burn this folder and its contents to an ISO format CD-R. It is recommended that you use a brand new CD-R for this, and do not rewrite an older CD-R.
- Once you have burned this folder to a CD-R, you should see it at the root level of the disk (i.e. "D:\TDM Plug-ins"). Important: If the "TDM Plug-ins" folder is not located at the root level of the CD-R or has been renamed, the VENUE console may not properly recognize the installer disk.
- At this point, you can follow the 'HD Disk' installation instructions above to complete the installation.

Authorizing your McDSP plug-ins

Authorizing with a pre-programmed iLok Smart Key

McDSP bundles such as the Classic Pack come with a pre-programmed iLok Smart Key. Simply insert the iLok into any available USB port on your computer. The iLok's indicator light will illuminate when the iLok has a proper connection. The plug-ins included in the bundle require no further authorization steps. As with any iLok on your system it is recommended that your iLok be registered and synchronized with iLok.com



Authorizing with an iLok License Card

All McDSP plug-ins require that a valid authorization is present on your iLok USB Smart Key. McDSP Plug-ins that are purchased individually provide this authorization on a plastic License Card (about the size of a credit card), with a small punch-out iLok License Chip. After being separated from the License Card, this iLok License Chip is to be inserted into the 'key slot' of the iLok USB Smart Key in order to transfer the authorization from the License Card to the iLok USB Smart Key. Note that each License Card holds ONE plug-in authorization. The following instructions detail this process



Important Note: The Authorization Wizard will prompt the user to register their iLok USB Smart Key at iLok.com. iLok.com is a service offered by PACE Anti-Piracy, Inc. and this step is recommended but NOT REQUIRED by McDSP to complete the authorization of the plug-in. If you choose to register your iLok USB Smart Key at iLok.com, care must be taken to record your iLok.com account information (i.e. write down your User ID and Password in a safe place). If your iLok.com account information is lost, the iLok cannot be registered to another account and unfortunately there is nothing McDSP can do to help you. See iLok.com for more details about the benefits of using PACE's iLok.com service.

Note: Images in this section are for illustration only, the actual product and screens will be the name of the product you are authorizing.

Authorizing a McDSP plug-in from a License Card with the Authorization Wizard:

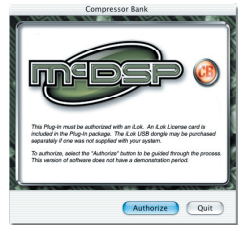
The Authorization Wizard is used to install an authorization from a License Card to the iLok USB Smart Key. To use the Authorization Wizard for the plug-in you purchase, perform the following steps:

- Insert your iLok USB Smart Key into an available USB port.
- On a Mac :Locate and launch the 'Authorizer' application found in the 'Authorize' folder in the plug-in package for the McDSP plug-in you purchased on the CD-ROM.
- On Windows XP, just launch Pro Tools™ to authorize the individual McDSP plug-in you purchased.

Note: When authorizing the plug-in on Windows XP with a new iLok USB Smart Key, you must insert the iLok USB Smart Key and complete the Windows 'Found New Hardware Wizard' before attempting to authorize the plug-in.

- Select the 'Authorize' button to be guided through the Authorization Wizard.

Note: Selecting the 'Quit' button at any time will not authorize the plug-in or allow it to be used for a trial period. If 'Quit' is selected, the plug-in will not be available in the Pro Tools™ insert menu.

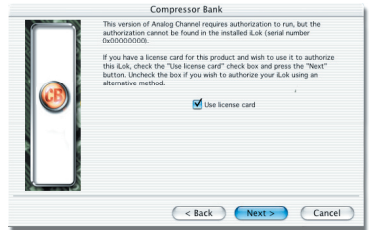


- McDSP plug-ins require that the user personalize their copy of the plug-in. A dialog is displayed soliciting this information.

Note that the product registration card enclosed with the plug-in MUST ALSO be filled out as well and returned to McDSP via mail (or fax to 707-220-0994). This additional mail-in registration will entitle the user to future upgrades and advance information from McDSP.

- Once the plug-in is personalized, click the 'Next' button to continue.
- Check the 'Use License Card' box and press the 'Next' button (figure 2.3).

Note: Although the Authorization Wizard may appear to allow authorization by challenge response, that method is currently NOT SUPPORTED McDSP plug-ins.



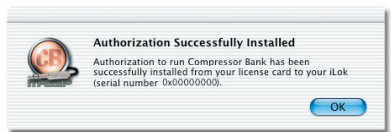
- Separate the small punch-out iLok License Chip (the removable metal and plastic tab) from the License Card by pushing the cutout up and out with your thumb. Do not force your finger downward.



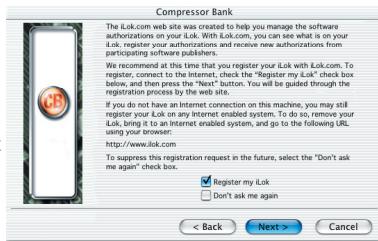
- The iLok License Chip may now be inserted into the 'key slot' of the iLok USB Smart Key (figure 2.6). If the iLok USB Smart Key does not appear to be present on the system, ensure the iLok USB Smart Key is connected to a valid USB port and that the green LED is lit inside the iLok USB Smart Key. To insert the License Chip into the iLok USB Smart Key, orient the iLok USB Smart Key's USB end to the left, and the loop end to the upper right. Insert the metal chip end of the iLok License Chip (the License Chip tab should have the metal chip side facing up towards you, not down). You should be able to visually verify that the License Chip makes contact with the iLok USB Smart Key metal card reader.



- The green LED in the iLok USB Smart Key will light when it is ready to receive and transmit data.
- Upon inserting the iLok License Chip, a message will be displayed indicating the authorization was installed successfully. Click 'Ok' in the message dialog.
- Once the authorization is installed on the iLok USB Smart Key, a dialog



is displayed prompting the user to register their iLok USB Smart Key at the www.ilok.com website. The iLok.com website was created to allow users to manage the software authorizations on their iLok USB Smart Key. **THIS STEP IS NOT REQUIRED TO COMPLETE THE AUTHORIZATION OF MCDSP SOFTWARE.** The registration of the iLok USB Smart Key to an iLok.com account can be bypassed by clearing the checkbox. The user may also choose to not be asked to register again. While iLok.com is a great resource for the iLok USB Smart Key, your iLok USB Smart Key may only be linked to one iLok.com account. That is, an individual iLok USB Smart Key can only be registered to one account at a time--but a single account can have multiple iLok USB Smart Keys. If the iLok.com account information is lost, the iLok USB Smart Key cannot be registered to another account. However, an iLok USB Smart Key may be transferred between accounts if all the authorizations have been transferred off the iLok USB Smart Key. Register the iLok USB Smart Key to an iLok.com account only when you are ready to retain all the needed iLok.com account information (User ID and Password).



- A 'Finished' dialog is displayed showing what authorization method was used.
- Click 'Finish' to exit the Authorization Wizard.

Authorizing with iLok.com

Required for demo, upgrade, and replacement authorizations only

iLok.com can be accessed from any Macintosh or PC with an Internet connection. You can do this at home, a friend's, or at the office as long as there is an internet connection to access iLok.com--note that you don't have to use your ProTools system computer! You simply use this computer to connect to iLok.com and transfer authorizations to your iLok Smart Key. The iLok Smart Key can then be moved to your ProTools system to complete authorization of your plug-in.

You will need:

- A computer with an Internet connection. Either a Macintosh running OS 9.2 to OS 10.3 or a PC running Windows 98, ME, 2000, or XP
- An iLok USB Smart Key
- A valid iLok.com account. Visit www.iLok.com and set up a free account, if you have not already done so.

- 1) Download and install the required client software from iLok.com.
- 2) Download the desired McDSP plug-in Installer from:
<http://www.mcdsp.com/support/updating.html>
- 3) To receive an upgrade or replacement authorization, send email your iLok.com account information to: support@mcdsp.com
To receive a demo authorization, email your iLok.com account information to: authorize@mcdsp.com

Insert your iLok Smart Key into an available USB port and ensure that the indicator light is lit. Once your demo, upgrade, or replacement authorization is available for transfer, your iLok.com account will display the notice saying "You have licenses" on the upper left. Begin by selecting that link.

The next page will display the pending licenses available for

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Welcome Bob!
You are logged into the new, improved iLok.com. New features with this version include:

- Support for [moving licenses](#) between iLoks.
- Optional [Zero Downtime coverage](#) for your critical iLoks.
- Secure [transfer of ownership](#) between iLok.com account holders.
- Improved browser compatibility, including support for Apple's Safari browser.
- Improved automated [help and support](#).

From this account section you can see a summary of your account, [edit your account profile](#), and [review your iLok.com history](#). In addition, this section will provide you with important messages regarding your account.

To manage your iLoks, including viewing your iLok contents, receiving licenses from software vendors, or moving licenses between iLoks, click [here](#).

download. This page will also display the name of the plug-in, its manufacturer, the type of authorization (demo, Not For Resale, or License), the date the authorization was deposited, and the date when the authorization will no longer be available for download from the server.

Pending licenses available for download:

Product	Company	Type	Deposited	Expiration	
Analog Channel	MCDSP	Demo	09/14/2004	03/14/2005	
Chrome Tone	MCDSP	License	09/14/2004	09/28/2004	
Compressor Bank	MCDSP	NFR	09/14/2004	09/14/2005	
Fitterbank	MCDSP	License	09/14/2004	03/14/2005	
MC2000	MCDSP	Demo	09/14/2004	03/14/2005	
Synthesizer One	MCDSP	License	09/14/2004	09/28/2004	

Before any transfer of authorizations can take place, you must synchronize your iLok Smart Key with iLok.com. This may take a moment to process depending on your internet connection.

Once you have synchronized your iLok, you can select the authorization(s) you wish to transfer to your iLok.

Insert your iLoks and synchronize:

Before downloading licenses, you must insert one or more iLoks as needed and press the "Synchronize" button. Once your iLoks are synchronized with your account, you will be able to select the licenses to download and the target iLok to receive the licenses.

Note that the synchronization process may take some time. Please press the button only once, don't remove or insert your iLoks, and don't touch your browser until the process completes. A progress page should be displayed within a few seconds of pressing the button.

Step 1 - Select the pending licenses to download:

Product	Company	Type	Deposited	Expiration	
<input type="checkbox"/> Analog Channel	MCDSP	Demo	09/14/2004	03/14/2005	
<input checked="" type="checkbox"/> Chrome Tone	MCDSP	License	09/14/2004	09/28/2004	
<input type="checkbox"/> Compressor Bank	MCDSP	NFR	09/14/2004	09/14/2005	
<input type="checkbox"/> Fitterbank	MCDSP	License	09/14/2004	03/14/2005	
<input type="checkbox"/> MC2000	MCDSP	Demo	09/14/2004	03/14/2005	
<input type="checkbox"/> Synthesizer One	MCDSP	License	09/14/2004	09/28/2004	

If you have multiple iLoks connected to your computer, it is important to select the correct iLok you wish the authorizations to be transferred to. Then click "Download Licenses" to begin the process. Again, this may take a moment depending on your internet connection.

Step 2 - Select an iLok to receive the licenses:

Select which iLok should receive the licenses, then press the "Download Licenses" button.

Note that the download process may take some time. Please press the button only once, don't remove or insert your iLoks, and don't touch your browser until the process completes. A progress page should be displayed within a few seconds of pressing the button.

Select an iLok

If the iLok1 (0x000110531) is not in the list above, insert the iLok now and click [here](#).

When the transfer finishes you will be asked to confirm the completion of the transaction, thereby letting you know that the transfer was successful.

If you wish to go back into your account and visually confirm the transaction for yourself, select "View iLoks" Then select the iLok you had the authorizations transferred to.

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[View iLoks](#) | [Download Licenses](#) | [Transfer Licenses](#)

Download Licenses Complete

The selected licenses have been downloaded to "iLok1".

That's it! Don't forget to log out and move the iLok Smart Key to your ProTools System if you are using another computer for Internet access. Also, you may need to install a different version of the plug-in if you are upgrading or replacing.

Transferring Authorizations with iLok.com

You may freely transfer any authorization within your iLok.com account between any of your registered iLok Smart Keys. If you wish to transfer an authorization out of your iLok.com account to a different user, it will require additional support from PACE Anti-Piracy, Inc and may be subject to a service fee or limited by manufacturer restrictions. Check the www.ilok.com website for updates and developments regarding iLok USB Smart Keys and the Pace Interlok Copy Protection system.

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View the contents of your iLoks

From here you can see what's on your iLok, register your iLok, synchronize your iLok license contents with your account, and identify which iLoks are installed on your machine.

You have 1 registered iLoks. 0 are covered by Zero Downtime, 1 are not covered. [Sign up for Zero Downtime here.](#)

If your iLok does not appear in the list below, insert it now and press the "Synchronize" button. To identify which iLoks you currently have inserted, press the "Identify" button. Inserted iLoks will have a green button by them in the "Inserted" column.

Name	# Licenses	Last sync	Inserted	Covered
▶ iLok1	5	09/14/2004		No

Note that the synchronize and identify processes may take some time. Please press the button only once, don't remove or insert your iLoks, and don't touch your browser until the process completes. A progress page should be displayed within a few seconds of pressing the button.

Registering your McDSP plug-ins

To register your McDSP plug-in, fill out and return the product registration card enclosed with the boxed plug-in package by mail or fax 707-220-0994. Registering your product entitles you to future upgrades and advance information from McDSP. Each individual product must be registered (even if you have multiple copies), and the product must be registered to an individual, not an entity. If you represent a company it is your company's responsibility to notify McDSP in writing if the individual who registered the plug-in is no longer with the company. The Company must also be able to supply matching registration information to successfully transfer ownership of the plug-in.

Using your McDSP plug-ins

Starting a McDSP plug-in:

Follow the installation, authorization, and registration instructions above, Launch Pro Tools™, and the McDSP plug-in and its presets are ready for use. Refer to the Digidesign™ Pro Tools™ Reference Guide for details on general plug-in operation such as automation.

Exiting a McDSP plug-in

A McDSP plug-in is exited by clicking on the desktop or other window in the DAE application running the plug-in, closing the plug-in window, or de-instantiating the plug-in. Pro Tools™ sessions will save instantiated plug-in configurations and their settings. Refer to the Digidesign™ Pro Tools™ Reference Guide for details on general plug-in operation.

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Quick Start to FilterBank

Getting Started

Start Pro Tools™ and Instantiate FilterBank plug-in

- Launch Pro Tools™ and Open a Pro Tools™ Session.
- Verify the Display-> Mix Window Shows->Inserts View option is checked.
- In one of the inserts, select the **E6 FilterBank** plug-in.
- If the inserts selection does not show FilterBank plug-ins, verify that FilterBank has been installed correctly.
- For more information on starting Pro Tools™ and working with plug-ins, see Digidesign's™ Pro Tools™ Reference Guide

FilterBank E6 Overview

The E6 FilterBank configuration includes:

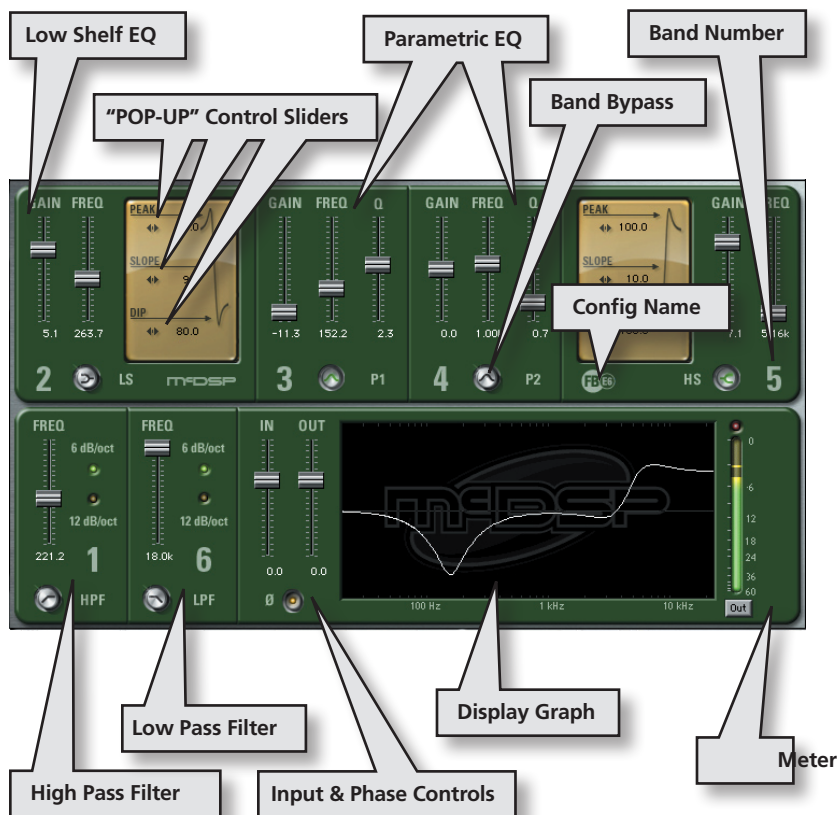
Band 1: High Pass Filter

Band 2: Low Shelf EQ


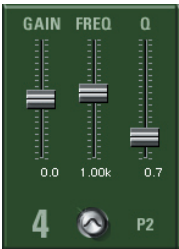

Bands 3&4: Parametric EQs

Band 5: High Shelf EQ

Band 6: Low Pass Filter



The Controls

Specifications of Each EQ and Filter:	
<p>Low and High Shelf EQs:</p> <p>Gain: +/- 12 dB (up to 17 dB at full peaking) Freq: 20-5000 Hz (LS), 5000-21000 Hz (HS) Peak: 0-100% (up to 5 dB of peak) Slope: 0-100% (6 dB/oct to 12 dB/oct) Dip: 0-100% (up to 5 dB of dip)</p>	<p>Band2: Low Shelf EQ:</p> 
<p>Parametric EQ:</p> <p>Gain: +/- 12 dB Freq: 20-21000 Hz Q: 0.2- 4.0</p> <p>The Parametric configurations (P2, P4, and P6) have different Q modes: Normal (original), Notch, Gain-dependent, and 5x Q.</p>	<p>Band4: Parametric EQ:</p> 
<p>Low and High Pass Filters:</p> <p>Freq: 20-21000 Hz Slope: -6, -12 dB/oct</p>	<p>Band1: High Pass Filter:</p> 

To adjust any of the controls with **sliders** (including the pop-up sliders for Peak, Slope, and Dip), you can:

- Click and drag the sliders, or
- Hold the <Command> key while dragging the slider for fine control, or
- Click on the text box to highlight and edit the numeric value to get precise control (if a value outside the valid range is input, the control will default to the nearest allowed value when enter is hit) and hit <Enter>, or
- Click on the text box to highlight the numeric value and then use the arrow keys to increase or decrease the numeric value, or
- Use the <Option> key to bring all the controls to their default values, or
- Use hardware controller surfaces supported by FilterBank including the Mackie HUI and Digidesign's ProControl™ and Control-24

To adjust any of the controls with **knobs** (see the following sections about User Interface preferences to find out more about the alternate knob based UI), you can:

- Click and drag the knobs (note the knob will respond to left/right or up/down mouse movement, and will lock to the left/right or up/down movement once the mouse is dragged beyond the knob graphic - this significantly reduces control jittering commonly found in knob controls), or
- Hold the <Command> key while dragging the knobs for fine control, or
- Click on the text box to highlight and edit the numeric value to get precise control (if a value outside the valid range is input, the control will default to the nearest allowed value when enter is hit) and hit <Enter>, or
- Click on the text box to highlight the numeric value and then use the arrow keys to increase or decrease the numeric value, or
- Use the <Option> key to bring all the controls to their default values, or
- Use hardware controller surfaces supported by FilterBank including the Mackie HUI and Digidesign's ProControl™ and Control-24

High and Low Pass Filters Slope Control: click the radio buttons to select a slope (dB/oct).

Bypass Control Button for each EQ/Filter: this is a toggle control that takes the EQ/Filter 'in' or 'out' of the audio processing path.

- The green light indicates the EQ/Filter is in;
- The red light indicates the EQ/Filter is disabled by the Pro Tools™ master

bypass button and cannot be changed without the Pro Tools™ master bypass being toggled.

- When the light is off, the EQ/filter is bypassed.

Control Linking

To Link Right and Left Controls of Stereo Versions:

- Hold the <Shift> key while adjusting any one of the left controls (or right controls); note how the right control automatically adjusts with the left control, or
- to link controls without holding the <Shift> key, select the Stereo radio button in the Input section. Adjust one of the left controls and note how the right control automatically adjusts to be equal with the left control (for example, if you adjust the left gain to be equal to 6 dB, the right gain will equal 6 dB too), or
- to link controls without holding the <Shift> key, select the Link radio button in the Input section. Adjust one of the left controls and note how the right control automatically adjusts relative to the left control (for example, if you adjust the left gain to increase by 2 dB, the right gain will increase by 2 dB. Unlike the Stereo radio button, this type of linking will allow the left and right controls to have different values). Note: frequency is measured on a logarithmic scale; this means the relative adjustments are not computed on a 1:1 ratio.
- To disable automatic linking, select the Dual radio button in the Input section.

To Link Like-Controls (for example, to link the Slope Controls of the High Shelf and Low Shelf EQ):

- Hold the <Control> key on Mac, <Windows> key on Windows XP, while adjusting the one of the controls of the Low Shelf EQ; note how the corresponding control of the High Shelf EQ automatically adjusts.

You can link Right/Left Stereo Controls while linking Like-Controls by holding the <Shift> and <Control> key on Mac, <Shift> and <Windows> key on Windows XP, while adjusting controls.

A table listing all the control linking capabilities is provided in the reference section at the end of this manual.

User Interface Preference Setting

FilterBank comes with two User Interface (UI) sets. The original slider based UI is the default settings preference. The other is a knob based UI. These UI preferences are discussed in further detail in the sections below.

When FilterBank is loaded during ProTools launch - a dialog is displayed asking the user what is to be the UI preference for FilterBank. There is also a "Don't Ask Again!" box that can be checked, and the UI preference dialog will no longer appear. The dialog can be re-displayed at will (even if the "Don't Ask Again" box was previously checked) by holding the <U> and <I> keys (together) while instantiating the FilterBank plug-in (any configuration).

When the session is closed, the FilterBank plug-in saves which UI type was last used as a preference.

Alternate Knob User Interface

FilterBank also comes with a complete set of knob based UIs. The knobs can be operated by clicking and dragging the mouse left/right or up/down. Note the mouse movement is 'locked' to the left/right or up/down movement once the mouse position goes outside of the knob graphic. This reduces control 'jitters' significantly, and allows the knob to be functionally equivalent to a slider. As with the sliders, holding the <command> key on Mac or <Ctrl> key on Windows XP while adjusting the knob will allow fine control, and clicking the knob while holding the <option> key on Mac or <Alt> key on XP will return the knob to its default value.

The Display Graph

The Display Graph represents the entire frequency response of all enabled EQ/filter bands. To toggle the frequency vs. dB grid displayed with the graph, hold the <Control> key on Mac, <Windows> key on Windows XP, while clicking on the graph.

The Meter

Each white hash mark represents a change of 3 dB; the top hash mark represents 0 dB. Click on the button below the Meter to select which band is monitored. The default is "out" which meters the final output. The Peak Meter lights when the signal is about to clip. The peak meter can be cleared by clicking on it with the mouse.

Automation

All FilterBank Controls are completely automatable. See the Digidesign™ Pro Tools™ Reference Guide, Automating plug-ins section.

Here are a few tips about automating the stereo versions of FilterBank configurations:

- If stereo or linked automation is desired for a left/right control pair, you only need to automate ONE of the left/right control pair. The stereo or link offset is preserved during automation playback. You may automate both left and right controls simultaneously, however the automation data is simply duplicated in the left and right control pair.
- If discrete automation is desired for a left/right control pair, then the FilterBank control mode should be set to 'Dual'. This will allow each left/right control to operate independently, and not also send automation events to each other as is the case when the FilterBank control mode is set to 'Stereo' or 'Link'.

Using presets and making your own

The FilterBank presets are inspired by EQs such as the Neve 1084™, Avalon 2055™, GML 8200™, Manley™ and Pultec™. The presets can be accessed from the Pro Tools™ "plug-in Librarian" and "plug-in Settings" pop-up menus.

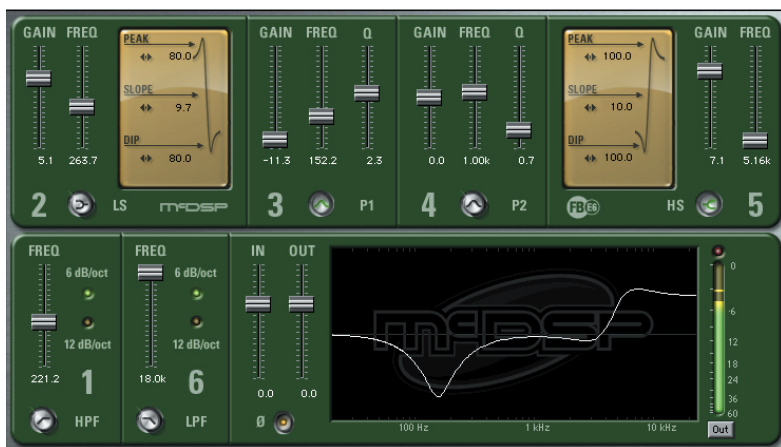
To make and save your own presets, see the "plug-in Librarian Functions" section of Digidesign™'s DigiRack plug-ins Guide.

A Word on Preset Compatibility: Presets for the E, F, and P configurations are interchangeable between the 2, 4, and 6 band configurations but are not cross-compatible with each other. For example, a preset created with an E2 can be used in E4 and E6 (mono and stereo), however, it cannot be used in a P or F configuration (such as P2, P4, P6). If an incompatible preset is used, FilterBank will display a warning message in the version text in the FilterBank UI accompanied by a system beep.

For more information, see Chapter 4: Modeling Analog Equalizers.

**All Trademarks are property of their respective owners. Neve 1084™ is a trademark of AMS Neve; Avalon 2055™ is a trademark of Avalon Design; GML 8200™ is a trademark of George Massenberg Laboratories; Manley™ is a trademark of Manley Laboratories Incorporated; Pultec™ is a trademark of Pulse Technologies, Inc.; Pro Tools™ is a registered trademark of Digidesign, Inc. While FilterBank emulates the sounds of these equalizers and filters, McDSP makes no representation or warranty that FilterBank is identical to or duplicates these equalizers and filters.*

Using Filter Bank



Low and High Shelving Equalizers

The 'E' FilterBank configurations (E2, E4, E6) are the only configurations that have shelving equalization. In addition to having the typical gain and frequency controls, FilterBank shelving equalizers come with the unique and innovative Peak-Slope-Dip (P-S-D) control section. The P-S-D controls allow the user to model a wide variety of vintage and contemporary shelving equalizers, or customize their own shelving response.

- **Gain:** The gain control adjusts the amount of boost or cut applied to the signal in the shelved portion of the response.
- **Freq:** The frequency control adjusts the point in the frequency spectrum where the shelf band gain is applied. The signal amplitude at the frequency set by this control is equivalent to the amplitude set by the gain control. This control is also referred to as the shelved band frequency.
- **Peak:** The peak control adjusts the amount of added punch in the shelved portion of the response. The peak in the shelved portion of the response gives the shelving equalizer additional brightness or emphasis near the shelved band frequency. The effective gain at the shelved band frequency can exceed the range of the gain control when used at its maximum setting. Peak and dip controls are interactive - as the peak control is increased, the overall dip in the shelved response is decreased, and vice versa.

- **Dip:** The dip control adjusts the amount of warmth added in the non-shelved portion of the response. The dip in the non-shelved response reduces the amplitude of signals whose frequencies are just outside of the shelved portion of the response. Dip and peak controls are interactive - as the dip control is increased, the overall peak in the shelved response is decreased, and vice versa.
- **Slope:** The slope control adjusts the gradient (aka slope) of the shelved response. The more gentle the transition between the shelved and non-shelved bands, the smoother the equalizer sounds. Steeper slopes can give the shelving equalizer more definition and clarity. Note that as the slope control is decreased, so are the effects of the peak and dip controls. At the minimum slope setting, peak and dip do not alter the shelving response at all.

Parametric Equalizer

Parametric equalization is available in the 'E' and 'P' configurations (E2, E4, E6, P2, P4, P6) of FilterBank. The flexibility and wide control range of the FilterBank parametric sections provide the user maximum control.

- **Gain:** The gain control adjusts the amount of boost or cut applied to the signal.
- **Freq:** The frequency control adjusts the point in the frequency spectrum where the parametric band gain is applied. The signal amplitude at the frequency set by this control is equivalent to the amplitude set by the gain control. All parametric sections are completely overlapping - the frequency range of each extends to the top and bottom of the frequency spectrum.
- **Q:** The width of the parametric band, the bandwidth, is controlled by the Q control. $Q = 1/\text{bandwidth}$. Large values of Q correspond to narrow bandwidth, small values of Q correspond to wide bandwidth. FilterBank Q ranges meets or exceeds most other parametric equalizer implementations. FilterBank Q

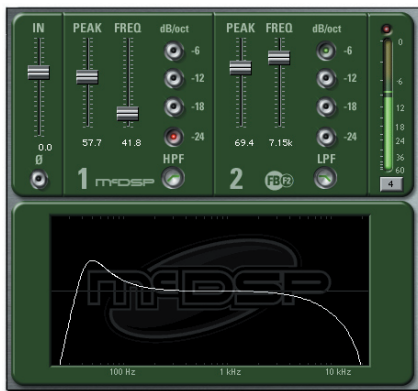


uses proprietary constant-Q technology to maintain an analog response through the entire frequency spectrum. Also note when the Q control is set to its lowest setting (0.2, i.e. 5 octave bandwidth), the equalizer response approaches that of a very smooth low or high shelf filter when the frequency control is set to extreme low and high frequency settings. This is a common characteristic in high-end parametric equalizers.

- **Mode:** As of version 3.2, FilterBank offers different Q modes for the P2, P4, and P6 configurations:
 - **Normal** (original) - the Q values range as described above
 - **Notch** - the Q values increase 5x for negative gain, and negative gain extends down to -24 dB (vs. the normal -12 dB). This mode is designed for post and broadcast applications, where the ability to cut narrow portions of the frequency spectrum is necessary in many productions.
 - **Gain** (gain dependent) - the Q values increase with increasing gain. This aids the mixer when large amounts of gain are applied. The EQ intelligently narrows the bandwidth of the cut/boost to reduce the potential broad effects of a wider Q.
 - **5x Q** - as the name implies, the displayed Q value is multiplied by 5 for an even tighter Q value (1.0 to 20.0).

Low and High Pass Filters

Low and high pass filters are provided in 'E' and 'F' configurations (E2, E4, E6, F1, F2) of FilterBank. These sections can be used to band-limit material, or put a final touch on a track. The 'E' configurations have 2nd order high and low pass filters capable of -6 and -12 dB/oct attenuation. The 'F' configurations have 4th order high and low pass filters capable of -6, -12, -18, and -24 dB/oct attenuation. The 'F' configuration high and low pass filters also have resonance (aka peak) control.



- **Peak:** The peak control adjusts the amount of resonance at the cut-off frequency of the high and low pass filter. This can be used to mask the effect of band-limiting by emphasizing the signal content at frequencies just before the cut-off frequency. Up to 24 dB of peaking can be realized (with -24 dB/oct slope selected). Note that no peaking (resonating) will occur for a slope selection of -6 dB/oct.
- **Freq:** The freq (frequency) control adjusts the frequency at which the low pass or high pass filter attenuation begins. It is commonly known as the cut-off frequency.
- **Slope:** FilterBank high and low pass filters all have adjustable slope, in -6, -12, -18, and -24 dB/oct increments.

BandPass-BandStop Filters

FilterBank comes with a super notch filter configuration called B1. This is a one-band filter, switchable between notch (band stop) and band-pass operation. As a band-stop, B1 can eliminate 60 Hz hum and other localized noise, or be used at wider Q settings to create special effects and other signal separation results. As a band-pass, B1 can band-limit signal content, or identify what the band-stop is removing.



- **Freq:** The freq (frequency) control adjusts the frequency at which the band-stop or band-pass filter operates.
- **Q:** The width of the band-stop or band-pass band, the bandwidth, is controlled by the Q control. $Q = 1/\text{bandwidth}$. Large values of Q correspond to narrow bandwidth, small values of Q correspond to wide bandwidth. FilterBank Q ranges meets or exceeds most other parametric equalizer implementations. Q setting on the B1 can be as narrow as a semitone ($Q = 12.0$) for hum removal with minimal impact to desired signal data.

Input Control

Every FilterBank configuration is equipped with a input trim control and phase control.

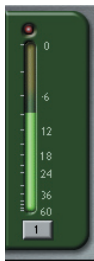
- **Input:** The input control adjusts the amplitude of the signal fed into the equalizer/filter sections of each FilterBank plug-in.
- **Phase (Ø):** Input signal phase can be altered by 180 degrees from the original by clicking the phase button in each FilterBank input section.



Metering

Each FilterBank configuration is capable of metering any one of its bands. The user can evaluate the signal level at each stage of equalization/filtering by selecting the input to any one of the numbered bands, or the final output 'out' of the FilterBank configuration.

Each equalizer/filter section is numbered - the number corresponds to the number in the metered band popup selector. This enumeration also corresponds to the order in which the signal is routed thru the various equalizers/filters in each FilterBank configuration.



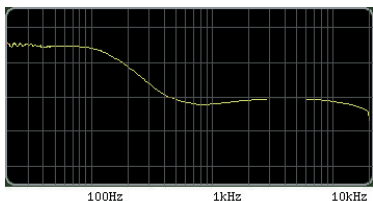
Modeling Analog Equalizers with FilterBank

FilterBank models a wide variety of vintage and contemporary equalizer and filter implementations. This chapter highlights how FilterBank is used to model some of these analog implementations. The user is additionally directed to various presets included in the FilterBank plug-in package. Each of the following sections contains graphs representing the frequency response of analog gear, as measured by the engineering staff at McDSP. Although the names of other equalizer manufacturers are mentioned in this chapter, they are in no way affiliated with McDSP. All trademarks are property of their respective owners. While FilterBank emulates other manufacturers' equalizers and filters, McDSP makes no representation or warranty that FilterBank is identical to or duplicates these equalizers and filters.

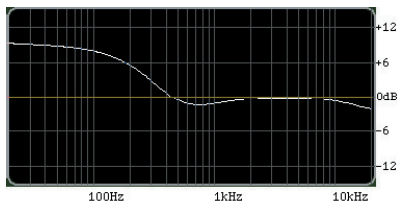
Neve™ and FilterBank's E-classic1 preset

The Neve 1084™ is a classic solid state equalizer with high and low pass filters, high and low shelving, and a parametric equalizer. The soft response and overall warm sound for which the Neve™ is known, are the inspiration for FilterBank E-classic1.

Note the Neve 1084™ 's response curve below (in gold) and the gentle roll-off in the upper frequency spectrum. This roll-off contributes to the "softness" of the Neve 1084™. Note how FilterBank E-classic1's response curve below (in white) emulates the gentle-roll off character:



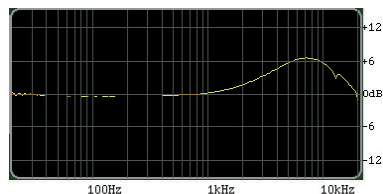
n1084 low shelf response as measured by McDSP



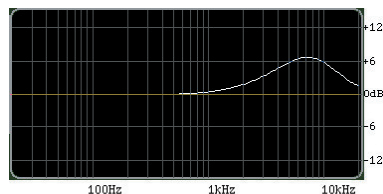
FilterBank's preset E-classic1 low shelf response

The E-classic1 preset makes use of all 6 bands of an E6 FilterBank configuration. The low shelf section is setup with a nominal slope and maximum dip for a smooth warm sound. To best emulate the Neve high shelf response, a parametric section (band 4) is used. The overall response is finalized by a subtle dip produced by the first parametric section (band 3), and a gentle roll-off is controlled by the high shelving section. Low and high pass filters, at the -6 dB/oct slope setting, can be engaged to approximate the imperfect frequency response of different input/output stages.

The Neve 1084™ parametric response is affected by the soft top shown in the low shelf response. Note the subtle dip seen in the lower frequencies of the Neve 1084™ response curve below (in gold). What is surprising is the notch seen at approximately 13kHz. Note how FilterBank's E-classic1 response curve below (in white) emulate these response characteristics:



n1084 parametric response as measured by McDSP

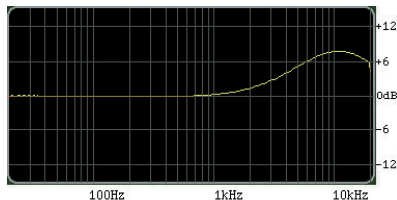


FilterBank's preset E-classic1 parametric response

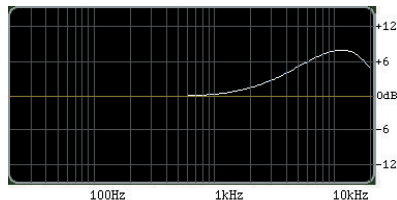
* The Neve 1084™ is a trademark of AMS Neve and is property of AMS Neve.

Avalon 2055™ and FilterBank's P-classic2 preset

The Avalon 2055™ is a more contemporary implementation designed to emulate the sound of tube and other vintage equalizers. The Avalon 2055™ has four parametric bands (F1,2,3,4) that are known for their large control ranges. FilterBank's parametric configurations give you control ranges that either meet or exceed the Avalon 2055™ :

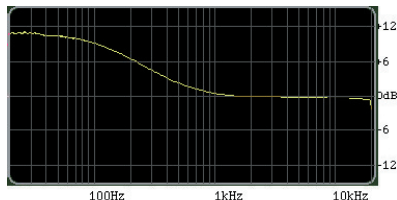


Avalon 2055 parametric (wide bandwidth) response as measured by McDSP

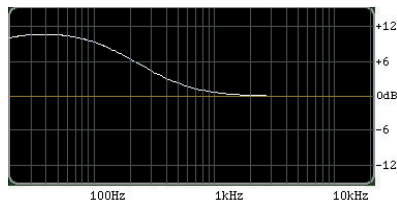


FilterBank's preset P-classic2 parametric (wide bandwidth) response

Additionally, the Avalon 2055™ high and low bands can be switched from parametric modes to shelving modes by using extremely low Q values. FilterBank provides Q values as low as 0.2; to best emulate the Avalon 2055, a Q value of 0.3 was used in preset P-classic2 (in bands 1 and 6 of the P6 configuration).



Avalon 2055 low shelf response as measured by McDSP



FilterBank's preset P-classic2 low shelf response

* The Avalon 2055™ is a trademark of Avalon Design and is property of Avalon Design.

GML8200™ and FilterBank's P-classic3

The George Massenberg Labs 8200™ is configured with five parametric bands; the lowest and highest are switchable from parametric operation to low and high shelving.

Many users of GML equipment have noted the equipment's ability to handle a large amount of gain without producing unwanted distortion. Such characteristics are usually not found in digital equalizers - they tend to produce digital clips in the audio stream and ruin mixes. All FilterBank's equalizer and filtering sections have an analog saturation modeling circuit to prevent digital clipping from occurring, and simulate the over-driven sound of analog gear.

To best emulate the GML 8200™ shelving equalizers, a low Q value of 0.2 was used in preset P-classic3 (in bands 1 & 6 of a P6 configuration).

** The GML8200™ is a trademark of George Massenberg Labs and is property of George Massenberg Labs.*

FilterBank's Smooth Tubes 1 & 2 presets

Inspired by the gently sloped tube equalizers from manufacturers such as Manley™ and Pultec™* (Pulse Technologies), these presets were created to emulate the smooth warm shelving response of these vintage boxes. Preset 'E-smooth-tube-1' has a gradual slope with maximum dip in the non shelved portion of the response. Preset 'E-smooth-tube-2' has the most gradual slope possible. Note peak and dip controls have no effect at this minimal slope setting.

**Manley™ is a trademark of Manley Laboratories Incorporated and is property of Manley Laboratories Incorporated. **Pultec™ is a trademark of Pulse Technologies, Inc.*

FilterBank Presets

Also Include ...

- B1-60HzKiller: super notch at 60 Hz effective in removing hum
- B1-BandLimiter: band-pass filtering
- F1-Resonator: low pass filter with a large amount of resonance
- F2-BandLimiting+Mask: high pass and low pass filters with mild peaking to hide band-limiting
- F2-SynthFat: beef-up your synthesizer sound with low-end boost and resonant low pass filtering
- F2-EarthShake: massive peaking at 20Hz - don't mix your next space ship without it
- E2-BritishLowShelf, E2-British1, E2-British2: more interpretations on some classics
- E2-BigAndBoomy: extreme peak and dip creating thick bass sound
- E2-TimeCapsule: a quick history of analog EQs via the slope control- click and drag the slope control while holding the <control> key on Mac, <Windows> key on XP to affect both slopes in low and high shelving filters. As the slope gets steeper, the response moves gradually from c.1950 to c.1980
- E2-LowShelfPeaker: extremely bright low shelving with maximum peak and 0 dip

Several other presets are included in your FilterBank package. Have fun!

FilterBank Configurations and Specifications

FilterBank comes with the following configurations:

E2 Mono & Stereo

E4 Mono & Stereo

E6 Mono & Stereo

F1 Mono & Stereo

F2 Mono & Stereo

F3 Mono & Stereo

P2 Mono & Stereo

P4 Mono & Stereo

P6 Mono & Stereo

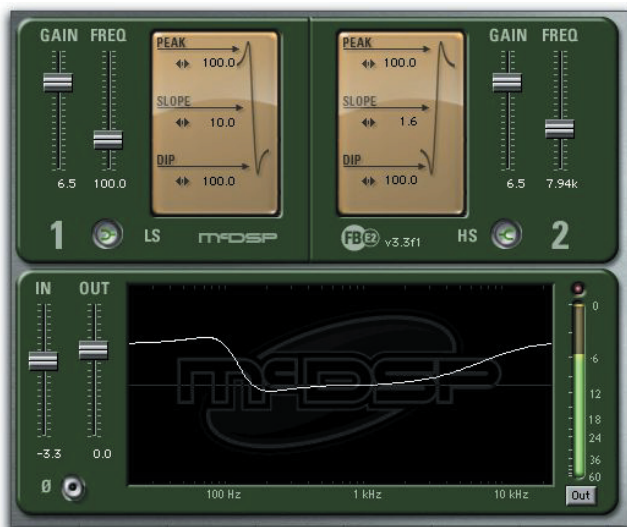
B1 Mono

Screen shots show both mono knob and sliders with plot view options.

Specifications for E2 Mono & Stereo:

PARAMETER	SETTINGS	FUNCTION
INPUT	-24 to +24 dB	Amount of gain applied to input signal before processing
OUTPUT	-24 to +24 dB	Amount of make-up gain applied to master signal
Ø (PHASE)	ON/OFF	Polarity (phase) of the final output. When yellow LED is lit, signal is 180 degrees out of phase from the original
INPUT OR OUTPUT METERS	-60 to 0 dB	Output level of band. Red LED's are lit to indicate output has clipped. Click LED to clear
LOW SHELF (1) & HIGH SHELF (2)		
GAIN	-12dB to +12dB (+17 dB)	The amount of boost or cut in dB for each EQ band (up to 17 dB at full peaking)
FREQUENCY	20-5000 Hz (LS) 5000-21000 Hz (HS)	The center frequency of the filter
PEAK	0-100%	Adjusts the amount of added punch in the shelved portion of the response - up to 5 dB of peak
SLOPE	0-100%	Adjusts the gradient (aka slope) of the shelved response - 6 dB/oct to 12 dB/oct
DIP	0-100%	Adjusts the amount of warmth added in the non-shelved portion of the response - up to 5 dB of dip

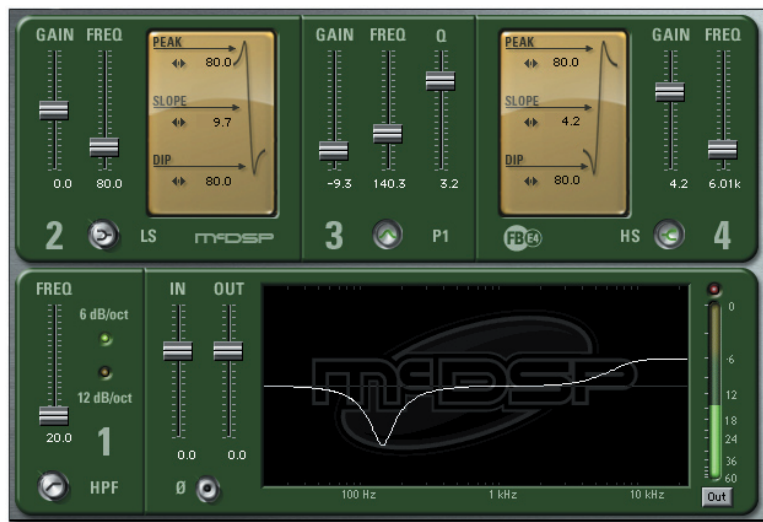
Visual Reference for E2



Specifications for E4 Mono & Stereo:

PARAMETER	SETTINGS	FUNCTION
INPUT	-24 to +24 dB	Amount of gain applied to input signal before processing
OUTPUT	-24 to +24 dB	Amount of make-up gain applied to master signal
Ø (PHASE)	ON/OFF	Polarity (phase) of the final output. When yellow LED is lit, signal is 180 degrees out of phase from the original
INPUT OR OUTPUT METERS	-60 to 0 dB	Output level of band. Red LED's are lit to indicate output has clipped. Click LED to clear.
HIGH PASS FILTER (1)		
FREQ	20Hz to 21kHz	Adjusts the frequency at which the low pass or high pass filter attenuation begins
SLOPE	-6, -12 dB/oct	Selects the gradient (aka slope) of the low pass or high pass filter
LOW SHELF (2) & HIGH SHELF (4)		
GAIN	-12dB to +12dB (+17 dB)	The amount of boost or cut in dB for each EQ band (up to 17 dB at full peaking)
FREQUENCY	20-5000 Hz (LS) 5000-21000 Hz (HS)	The center frequency of the filter
PEAK	0-100%	Adjusts the amount of added punch in the shelved portion of the response - up to 5 dB of peak
SLOPE	0-100%	Adjusts the gradient (aka slope) of the shelved response - 6 dB/oct to 12 dB/oct
DIP	0-100%	Adjusts the amount of warmth added in the non-shelved portion of the response - up to 5 dB of dip
PARAMETRIC EQ (3)		
GAIN	-12dB to +12dB	The amount of boost or cut in dB for each EQ band
FREQUENCY	20Hz to 20kHz	The center frequency of the filter
Q	0.2 to 4.0	The width of the parametric EQ bell, 1 = One full Octave

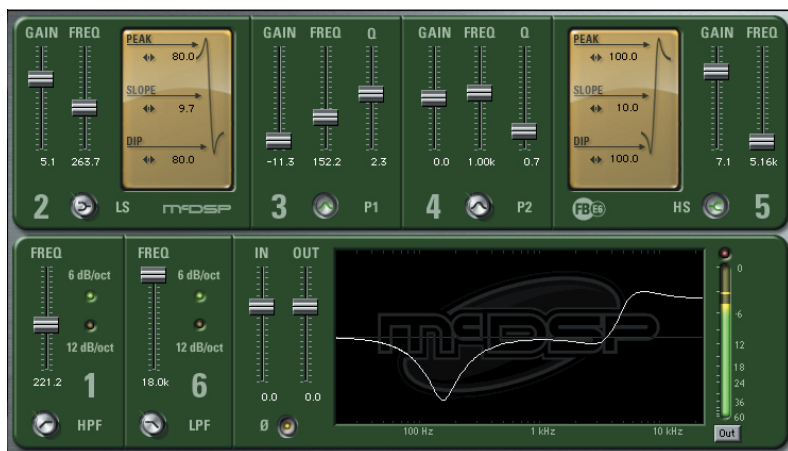
Visual Reference for E4



Specifications for E6 Mono & Stereo:

PARAMETER	SETTINGS	FUNCTION
INPUT	-24 to +24 dB	Amount of gain applied to input signal before processing
OUTPUT	-24 to +24 dB	Amount of make-up gain applied to master signal
Ø (PHASE)	ON/OFF	Polarity (phase) of the final output. When yellow LED is lit, signal is 180 degrees out of phase from the original
INPUT OR OUTPUT METERS	-60 to 0 dB	Output level of band. Red LED's are lit to indicate output has clipped. Click LED to clear
HIGH PASS FILTER (1) & LOW PASS FILTER (6)		
FREQ	20Hz to 21kHz	Adjusts the frequency at which the low pass or high pass filter attenuation begins
SLOPE	-6,-12 dB/oct	Selects the gradient (aka slope) of the low pass or high pass filter
LOW SHELF (2) & HIGH SHELF (5)		
GAIN	-12dB to +12dB (+17 dB)	The amount of boost or cut in dB for each EQ band (up to 17 dB at full peaking)
FREQUENCY	20-5000 Hz (LS) 5000-21000 Hz (HS)	The center frequency of the filter
PEAK	0-100%	Adjusts the amount of added punch in the shelved portion of the response - up to 5 dB of peak
SLOPE	0-100%	Adjusts the gradient (aka slope) of the shelved response - 6 dB/oct to 12 dB/oct
DIP	0-100%	Adjusts the amount of warmth added in the non-shelved portion of the response - up to 5 dB of dip
PARAMETRIC EQ (3 & 4)		
GAIN	-12dB to +12dB	The amount of boost or cut in dB for each EQ band
FREQUENCY	20Hz to 20kHz	The center frequency of the filter
Q	0.2 to 4.0	The width of the parametric EQ bell, 1 = One full Octave

Visual Reference for E6



Specification for F1 Mono & Stereo:

PARAMETER	SETTINGS	FUNCTION
INPUT	-24 to +24 dB	Amount of gain applied to input signal before processing
Ø (PHASE)	ON/OFF	Polarity (phase) of the final output. When yellow LED is lit, signal is 180 degrees out of phase from the original
OUTPUT METER	-60 to 0 dB	Output level of band. Red LED's are lit to indicate output has clipped. Click LED to clear.
LOW PASS FILTER		
FREQ	20Hz to 21kHz	Adjusts the frequency at which the low pass filter attenuation begins
SLOPE	-6, -12, -18, -24 dB/oct	Selects the gradient (aka slope) of the low pass filter

Visual Reference for F1



Specification for F2 Mono & Stereo:

PARAMETER	SETTINGS	FUNCTION
INPUT	-24 to +24 dB	Amount of gain applied to input signal before processing
∅ (PHASE)	ON/OFF	Polarity (phase) of the final output. When yellow LED is lit, signal is 180 degrees out of phase from the original
OUTPUT METER	-60 to 0 dB	Output level of band. Red LED's are lit to indicate output has clipped. Click LED to clear.
HIGH PASS FILTER (1) & LOW PASS FILTER (2)		
FREQ	20Hz to 21kHz	Adjusts the frequency at which the low pass or high pass filter attenuation begins
SLOPE	-6, -12, -18, -24 dB/oct	Selects the gradient (aka slope) of the low pass or high pass filter

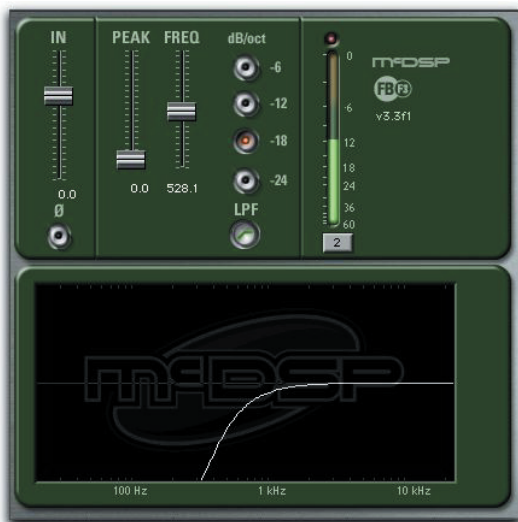
Visual Reference for F2



Specification for F3 Mono & Stereo:

PARAMETER	SETTINGS	FUNCTION
INPUT	-24 to +24 dB	Amount of gain applied to input signal before processing
Ø (PHASE)	ON/OFF	Polarity (phase) of the final output. When yellow LED is lit, signal is 180 degrees out of phase from the original
OUTPUT METER	-60 to 0 dB	Output level of band. Red LED's are lit to indicate output has clipped. Click LED to clear.
HIGH PASS FILTER		
FREQ	20Hz to 21kHz	Adjusts the frequency at which the high pass filter attenuation begins
SLOPE	-6,-12, -18, -24 dB/oct	Selects the gradient (aka slope) of the high pass filter

Visual Reference for F3



Specifications for P2 Mono & Stereo:

PARAMETER	SETTINGS	FUNCTION
INPUT	-24 to +24 dB	Amount of gain applied to input signal before processing
OUTPUT	-24 to +24 dB	Amount of make-up gain applied to master signal
Ø (PHASE)	ON/OFF	Polarity (phase) of the final output. When yellow LED is lit, signal is 180 degrees out of phase from the original
INPUT OR OUTPUT METERS	-60 to 0 dB	Output level of band. Red LED's are lit to indicate output has clipped. Click LED to clear.
PARAMETRIC EQ (1 & 2)		
GAIN	-12dB to +12dB	The amount of boost or cut in dB for each EQ band
FREQUENCY	20Hz to 20kHz	The center frequency of the filter
Q	0.2 to 4.0	The width of the parametric EQ bell, 1 = One full Octave
Q MODES		
NORMAL		Default value
NOTCH		Q values increase 5x for negative gain, extends down to -24 dB / Positive gain bell operates as normal
GAIN		Q values increase with increasing gain.
5X		Q value is multiplied by 5 for an even tighter Q value (1.0 to 20.0)

Visual Reference for P2



Specifications for P4 Mono & Stereo:

PARAMETER	SETTINGS	FUNCTION
INPUT	-24 to +24 dB	Amount of gain applied to input signal before processing
OUTPUT	-24 to +24 dB	Amount of make-up gain applied to master signal
Ø (PHASE)	ON/OFF	Polarity (phase) of the final output. When yellow LED is lit, signal is 180 degrees out of phase from the original
INPUT OR OUTPUT METERS	-60 to 0 dB	Output level of band. Red LED's are lit to indicate output has clipped. Click LED to clear.
PARAMETRIC EQ (1-4)		
GAIN	-12dB to +12dB	The amount of boost or cut in dB for each EQ band
FREQUENCY	20Hz to 20kHz	The center frequency of the filter
Q	0.2 to 4.0 - Variable	The width of the parametric EQ bell, 1 = One full Octave
Q MODES		
NORMAL		Default value
NOTCH		Q values increase 5x for negative gain, extends down to -24 dB / Positive gain bell operates as normal
GAIN		Q values increase with increasing gain.
5X		Q value is multiplied by 5 for an even tighter Q value (1.0 to 20.0)

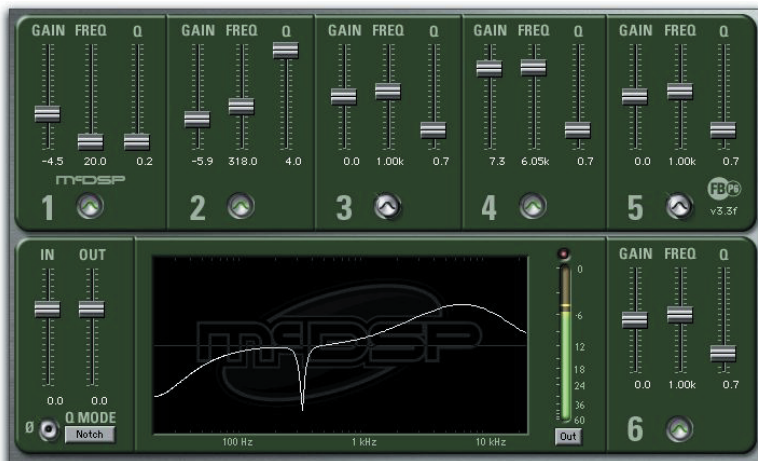
Visual Reference for P4



Specifications for P6 Mono & Stereo:

PARAMETER	SETTINGS	FUNCTION
INPUT	-24 to +24 dB	Amount of gain applied to input signal before processing
OUTPUT	-24 to +24 dB	Amount of make-up gain applied to master signal
Ø (PHASE)	ON/OFF	Polarity (phase) of the final output. When yellow LED is lit, signal is 180 degrees out of phase from the original
INPUT OR OUTPUT METERS	-60 to 0 dB	Output level of band. Red LED's are lit to indicate output has clipped. Click LED to clear.
PARAMETRIC EQ (1-6)		
GAIN	-12dB to +12dB	The amount of boost or cut in dB for each EQ band
FREQUENCY	20Hz to 20kHz	The center frequency of the filter
Q	0.2 to 4.0	The width of the parametric EQ bell, 1 = One full Octave
Q MODES		
NORMAL		Default value
NOTCH		Q values increase 5x for negative gain, extends down to -24 dB / Positive gain bell operates as normal
GAIN		Q values increase with increasing gain.
5X		Q value is multiplied by 5 for an even tighter Q value (1.0 to 20.0)

Visual Reference for P6



Specifications for B1 Mono & Stereo:

PARAMETER	SETTINGS	FUNCTION
INPUT	-24 to +24 dB	Amount of gain applied to input signal before processing
Ø (PHASE)	ON/OFF	Polarity (phase) of the final output. When yellow LED is lit, signal is 180 degrees out of phase from the original
OUTPUT METER	-60 to 0 dB	Output level of band. Red LED's are lit to indicate output has clipped. Click LED to clear.
BAND PASS / BAND STOP FILTER		
FREQ	20Hz to 21kHz	Adjusts the frequency at which the high pass filter attenuation begins
Q	0.2 - 12.0 (5 octaves to 1 semi-tone)	The width of the parametric EQ bell, 1 = One full Octave

Visual Reference for B1



FilterBank Linked Control Table

FilterBank provides a variety of linked control functionality in its many configurations. The table below lists all the linking capabilities as of the 1.02 version of FilterBank. For more information on control linking, see the Control Linking section of the Quick Start Tour.

LINKED CONTROLS	LINK ACTION	LINK TYPE
All Left/Right control pairs	<Shift> key, mode control set to 'stereo'	Absolute
All Left/Right control pairs	Mode control set to 'link'	Relative
Low and High Shelf Peak, Slope, and Dip controls	<Control> key on Mac <Windows> key on Windows XP	Absolute
Peak and Dip controls	<q> key	Absolute
HPF and LPF freq controls	<Control> key on Mac <Windows> key on Windows XP	Relative

Note the above keys may be used concurrently to enable multiple kinds of control linking. For example, the <q> and <shift> keys could be used on an E2 configuration to link the Peak and Dip controls of both the Low and High shelf equalizers.

FilterBank DSP Usage Table

The TDM versions of the FilterBank plug-in configurations use a varying amount of dsp resources based on the number of bands the FilterBank configuration has. The table below is a listing of these dsp usages. The DSP Allocator utility provided by Digidesign™ can be used to display dsp resource allocation when Pro Tools™ is running.

CONFIGURATION (MONO)	# INSTANTIATIONS PER DSP HD SYSTEMS	# INSTANTIATIONS PER DSP HD ACCEL SYSTEMS
B1	32	64
F1	23	46
F2	13	26
E2, P2	23	46
E4, P4	13	26
E6, P6	9	18

Note the instantiation counts above are for mono configurations. Stereo configurations, using twice the dsp processing power, will get half the amount of instantiations listed above. For HD systems, all higher sample rates are supported. The instance count is reduced by roughly 2 @ 96 kHz, and roughly 4 @ 192 kHz sample rates.

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FilterBank Frequently Asked Questions

For an updated list of Frequently Asked Questions, see our website:

www.mcdsp.com/FAQ.html.

How is FilterBank different from other EQs?

- Filter Bank gives you the most power and flexibility to emulate any other EQ or create your own custom EQ.
- Consider first the number of configurations you get in this one plug-in: High and Low Shelf EQ, Parametric EQ, High and Low pass Filters, Band Pass and Band Reject Filters all in stereo and mono configurations in 2,4, and 6 bands.
- Consider next, the maximum number and ranges of the independent controls available to the user to define the EQ response curve. Our design philosophy is maximum user control, and here is the proof of our concept:
 - Shelving EQs: most EQs only allow control Frequency and Gain. A few EQs may even allow you limited control of Peak and Dip (also known as Q). Only Filter Bank allows you independent control of Frequency, Gain, Peak, Slope, and Dip. No other EQ gives you so many controls and allows as much flexibility (largest range) of these controls.
 - Parametric EQ: frequency control range covers nearly the entire audible spectrum (20-21000 Hz). The parametric bell is up to 5 octaves wide (we actually can go up to 10, but at this excessive level, you may want to consider using the volume control instead!).
 - Low and High pass Filters: adjustable slope and Resonant Peak greater than 24 dB.
 - Band Pass and Band Reject Filters: frequency control range covers nearly the entire audible spectrum (20-21000 Hz).
- Filter Bank is a high-end EQ with:

- Double Precision Arithmetic which keeps the noise floor at -138dB. In contrast, it is possible for single precision arithmetic products to raise the noise floor significantly above -138 dB.
- Analog Saturation Modeling that prevents digital clip, and
- Up to 64 bands mono, 32 bands stereo of EQ/Filters per HD Accel dsp chip - compare this to the typical 4-6 per hardware box!

What is Peak-Slope-Dip Control and how does it affect shelving EQ responses?

- Peak, Slope, and Dip are 3 of the critical engineering parameters that define the response curves of shelving EQs. By adjusting these values, you can emulate the response curve of any shelving EQ ever made.
- Peak: amount of emphasis in the shelved band. Adds 'punch' or 'brightness' to sound.
- Slope: rate of change in the transition band.
- Dip: amount of de-emphasis in the non-shelved band. Adds 'warmth' to sound.

FilterBank's Double Precision Arithmetic and why it is important?

The TDM bus is a 24 bit audio-signal path with a dynamic range of -138 dB. FilterBank's internal double precision (48 bits) keeps the noise floor of its outputted signal at -138 dB. In contrast, with single precision (24 bit) arithmetic, the noise floor of a digital EQ can be raised dramatically higher than the -138 dB noise floor you would expect from a 24 bit data path. Such adverse affects would be seen as DC offset in output meters, even when there was no audio being processed. Small amounts of such noise reduce the quality of 24 bit audio data.

FilterBank's Analog Saturation Modeling and why you want it?

Analog Saturation Modeling prevents pure digital clip that can ruin a mix. Instead, analog saturation modeling will approximate the sound of an analog box driven to a clipping state.

You can test Filter Bank's saturation modeling by overlapping two bands of EQ and applying the maximum gain of each band to a relatively hot signal. This choice of input and setting creates ideal conditions for digital clipping. However, note that Filter Bank will not produce clip, but will instead saturate and sound

like an overloaded analog EQ. The point of this example is that even with extreme input, Filter Bank will not produce a digital clip and will emulate the analog sound.

What FilterBank presets are available?

Presets emulating a number of popular EQ sounds are shipped with Filter Bank, and are found in the 'Presets' folder in the FilterBank package.

Technical Support

Trouble Shooting

How do I authorize the plug-in?

- McDSP plug-ins can be authorized via a license card and an iLok. Refer to the installation details provided in Chapter 2: Installing McDSP Plug-ins.
- McDSP Plug-in demos can be requested from www.mcdsp.com when an iLok.com account user name is provided. Demo authorizations are then placed in your account for transfer to your iLok. More detailed information is provided in Chapter 2: Authorizing with iLok.com in the Initialization section.

The plug-in does not appear in Insert popup.

- Check your installation of the individual plug-in or plug-ins you purchased.
- The plug-in will not appear in an insert popup if its trial period has expired or is not authorized.

plug-in automation does not respond.

- Automation requires ProTools™ version 6.2.3 or higher.

Preset does not affect plug-in controls.

- A Word on Preset Compatibility: In most cases presets for different configurations of the same Plug-in are NOT interchangeable. Make sure that the presets being selected are specifically for the instantiated configuration you are using. Should a preset from a different configuration be imported the new preset settings will not affect the current controls, and a warning message and system beep alert the user to the error. The control settings

before the preset was applied are retained.

DAE Error -7450 While Processing Audio with AudioSuite version.

- The stereo AudioSuite versions of the plug-ins are capable of mono or stereo processing. If stereo processing is selected on a mono file, DAE will report an error indicating the right channel is not available for processing. Mono files should be processed/previewed in mono processing mode, or a mono AudioSuite version of the plug-in.

Presets do not appear in plug-in settings folder.

- Pro Tools™ will automatically create a plug-in settings folder when you run a plug-in in a Pro Tools™ Session. If no presets are created and saved in this folder, Pro Tools™ will delete it. To 'install' the presets shipped with you McDSP plug-in, simply copy the Presets folder from the plug-in package folder into Root->Library->Application Support->Digidesign->plug-in Settings. Note running the installer (even a second time) will add the plug-in presets to the appropriate location as well.

Bypass button does not respond.

- Verify the Pro Tools™ master bypass is off. Refer to Digidesign's™ ProTool's Reference Guide for detailed description of plug-in operations in Pro Tools™.

On Windows XP, when starting ProTools I get a 'Initialization Error' message box saying 'Updated driver required. The driver version is incompatible with this product and requires updating,' How do I fix this?

- If you just installed McDSP plug-in for the first time, you need reboot your PC and relaunch ProTools. If you just upgraded ProTools or installed a different company's plug-in, most likely an older version of PACE's driver was incorrectly installed. To resolve this, re-run any recent McDSP plug-in Installer and select Repair, reboot your PC, and relaunch ProTools. Alternatively, you may run the latest Pace InterLok drivers installer which is available from the 'Driver download page' at www.paceap.com/dldrvr.html

McDSP Technical Support

McDSP technical and customer support is available via the Internet, e-mail, and fax. McDSP technical and customer support is a free service offered Monday through Friday, 8:00 am - 5:00 pm (PST).

If you have purchased your product through a dealer, please be sure to submit your product registration form to McDSP. By registering your McDSP product you will be eligible to receive upgrades and advance information about new McDSP products. Certain services are not provided until the registration card has been received.

Email: info@mcdsp.com or help@mcdsp.com

World Wide Web: www.mcdsp.com

Fax: (707) 220 0994 (USA)



www.mcdsp.com

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