FilterBank

Every EQ Ever Made

User Manual

McDOWELL SIGNAL PROCESSING, LLC

McDSP FilterBank Plug-in Manual

McDSP
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from the entire McDSP development team.

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Getting Started with FilterBank

Each McDSP plug-in is delivered inside an installer application, and uses the Interlok copy protection software to authorize each plug-in. This section describes how to install and authorize a McDSP plug-in. General system requirements are also described.

System Requirements

McDSP HD and Native plug-ins are compatible with Pro Tools™ HD, Pro Tools™ LE and Pro Tools™ M-Powered systems as well as Audio Unit compatible DAWs including Logic, Digital Performer (DP) and Ableton Live. Additionally, a third party software application that supports the TDM, RTAS, or AudioSuite plug-in standard may be supported.

McDSP plug-ins support Mac OS 10.5.x (Leopard), 10.6.x (Snow Leopard), Windows XP, Vista, and Windows 7. Supported versions of Pro Tools ™ include 7.4.x and 8.x or greater. Supported versions of Audio Unit compatible DAWs including Logic, Digital Performer (DP) and Ableton Live must be versions that support the Mac OS 10.5x (Leopard) or 10.6x (Snow Leopard).

McDSP plug-ins require an iLok USB Smart Key for authorization.

Supported Plug-in Formats

McDSP plug-ins are available in TDM, RTAS, AudioSuite, and Audio Unit (AU) formats.

Hardware

McDSP plug-ins support any Avid (Digidesign) or approved third party hardware supported in Pro Tools™ 7.4.x and 8.x or greater, including HD and HD Accel hardware and interfaces, 002, 003, the Mbox product line, and M-Audio interfaces. McDSP plug-ins also support approved hardware for DAWs supporting Audio Units (AU) including Apogee, MOTU, and RME.

All McDSP HD plug-ins, except Synthesizer One, also support the Avid (Digidesign) VENUE D-SHOW systems.

The McDSP Mac versions are compatible with both Intel and PowerPC based computers. The McDSP Windows versions require an Intel Pentium 4 or greater processor.*

** McDSP Windows test machines are chosen to follow the Avid (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).*

Please visit mcdsp.com for the latest information about compatibility.

Installing the FilterBank Plug-in

Installation on Mac OS X

The FilterBank plug-in package includes this manual, ReadMe and Release Notes, a folder of presets for the FilterBank plug-in, and the FilterBank plug-in. Two copies of the FilterBank Licensing Agreement are included - one in this pdf manual and a second as a separate text file. The FilterBank plug-in manual requires that Adobe Acrobat reader (or similar .pdf reader) is installed.

Both online and boxed version will come with a FilterBank 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.

Installing the FilterBank plug-in and presets with the Installer:

The online version of the package has been prepared for Internet delivery, and is transmitted as a compressed file in zip format (.zip). In Mac OS X, 10.5.x or 10.6.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 FilterBank plug-in folder on the CDROM - the installer application is contained therein.
- Run the FilterBank plug-in Installer application to install (copy) the FilterBank 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 FilterBank 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.

Installation on Windows XP and Vista

The FilterBank plug-in package includes this manual, ReadMe and Release Notes, a folder of presets for the FilterBank plug-in, and the FilterBank plug-in. Two copies of the FilterBank Licensing Agreement are included - one in this pdf manual and a second as a separate text file. The FilterBank manual requires that Adobe Acrobat reader (or similar .pdf reader) is installed.

Both online and boxed version will come with a FilterBank 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.

Installing the FilterBank plug-in and presets with the Installer:

The FilterBank plug-in package purchased at your local dealer will be on CDROM and contain a Windows self extracting executable (.exe) similar to the online FilterBank plug-in package prepared for Internet delivery. Both the boxed and online versions of the FilterBank 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 FilterBank 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 FilterBank 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 FilterBank plug-in installer, you will be prompted by the FilterBank plug-in installer 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 FilterBank plug-in folder on the CDROM - the installer application is contained therein.
- Run the FilterBank plug-in Installer application to install the FilterBank 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 FilterBank 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.

Installation on VENUE D-SHOW systems

The FilterBank plug-in package for VENUE D-SHOW systems includes presets for 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/Vista 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 all McDSP HD plug-ins, except Synthesizer One support the Digidesign VENUE D-SHOW system.

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 "TPkd 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.*

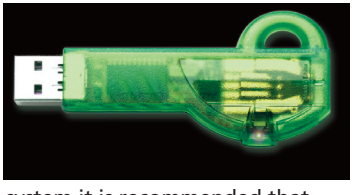
Creating a VENUE D-SHOW Installer CD-R from the online zip file:

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 Emerald 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 purchased, perform the following steps:

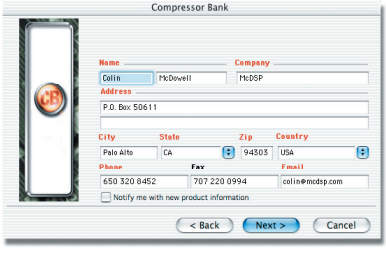
- Insert your iLok USB Smart Key into an available USB port.
- On a Mac: Locate and launch the 'Authorizer' application found in the 'Authorize' folder in the plug-in package for the McDSP plug-in you purchased on the CD-ROM.
- On Windows XP or Vista, just launch the DAW host to authorize the individual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

Note: When authorizing the plug-in on Windows XP or Vista 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.

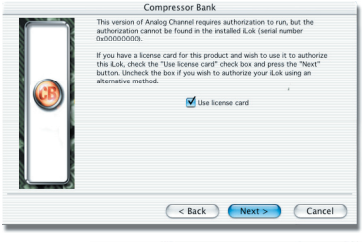
Note: Selecting the 'Quit' button at any time will not authorize the plug-in or allow it to be used for a trial period. If 'Quit' is selected, the plug-in will not be available in the DAW host insert menu.

- 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.

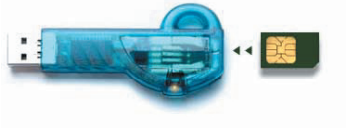
- Once the plug-in is personalized, click the 'Next' button to continue.
- Check the 'Use License Card' box and press the 'Next' button.



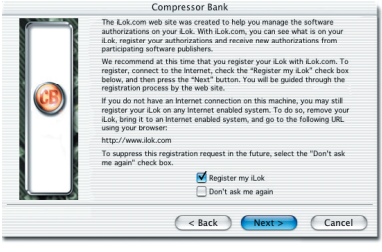
Note: Although the Authorization Wizard may appear to allow authorization by challenge response, that method is currently NOT SUPPORTED McDSP plug-ins.

- 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. 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 DAW host 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 DAW host to complete authorization of your plug-in.

You will need:

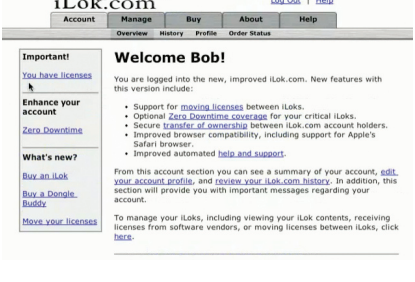
- A computer with an Internet connection. Either a Macintosh running OS 9.2 to OS 10.5 or a PC running Windows 98, ME, 2000, XP, or Vista
- An iLok USB Smart Key
- A valid iLok.com account. Visit www.iLok.com and set up a free account, if you have not already done so.

1) Download and install the required client software from iLok.com.

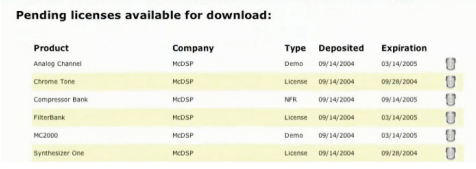
2) Download the desired McDSP plug-in Installer from: http://www.mcdsp.com/support/updating.html

3) To receive an upgrade or replacement authorization, 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.

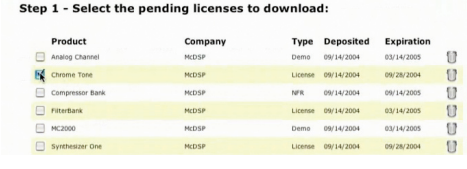


The next page will display the pending licenses available for download. This page will also display the name of the plug-in, its manufacturer, the type of authorization (Demo, Not For Resale, or License), the date the authorization was deposited, and the date when the authorization will no longer be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

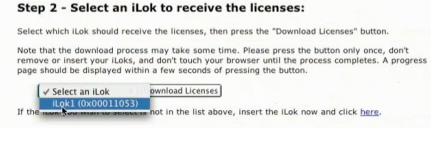


Before any transfer of authorizations can take place, you must synchonize your iLok Smart Key with iLok.com. This may take a moment to process depending on your internet connection.

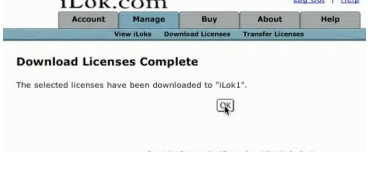
Once you have synchronized your iLok, you can select the authorization(s) you wish to transfer to your iLok.



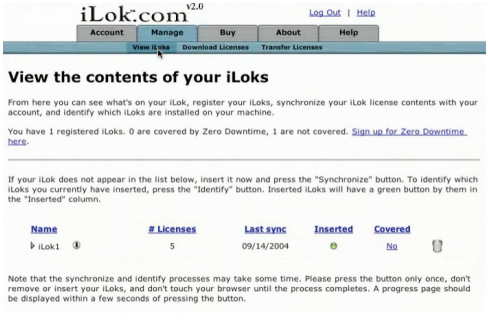
If you have multiple iLoks connected to your computer, it is important to select the correct iLok you wish the authorizations to be transferred to. Then click "Download Licenses" to begin the process. Again, this may take a moment depending on your internet connection.



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.



That’s it! Dont forget to log out and move the iLok Smart Key to your DAW host 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.

Registering your McDSP Plug-in

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 your DAW host, and the McDSP plug-in and its presets are ready for use. Refer to your DAW User Manual for details on general plug-in operation.

Exiting a McDSP Plug-in

A McDSP plug-in is exited by closing the plug-in window, or de-instantiating the plug-in. Your DAW host sessions will save instantiated plug-in configurations and their settings. Refer to your DAW User Manual for details on general plug-in operation.

FilterBank

The delay incurred by any of the FilterBank plug-in configurations is 3 (THREE) samples on HD systems. This is the absolute minimum number of delay samples a TDM plug-in can have. The McDSP plug-ins are designed in this manner to provide the user with the closest analog mixing console experience possible (analog inserts such as EQ and compression do not cause a processing delay when inserted into a track).

FilterBank is three plug-ins - the E606 equalizer, the P606 parametric equalizer, and the F202 filter set. Many of FilterBank's features remain unique - such as the Peak-Slope-Dip shelving EQ control, while others are industry firsts - such as Analog Saturation Modeling (available on many other McDSP plug-ins as well).

Features:

- Shelving and Parametric EQ
- High and Low pass filters with resonance control
- Unique Peak-Slope-Dip shelving EQ parameters
- Analog saturation modeling
- Double precision processing
- Ultra low latency
- Mono and stereo versions

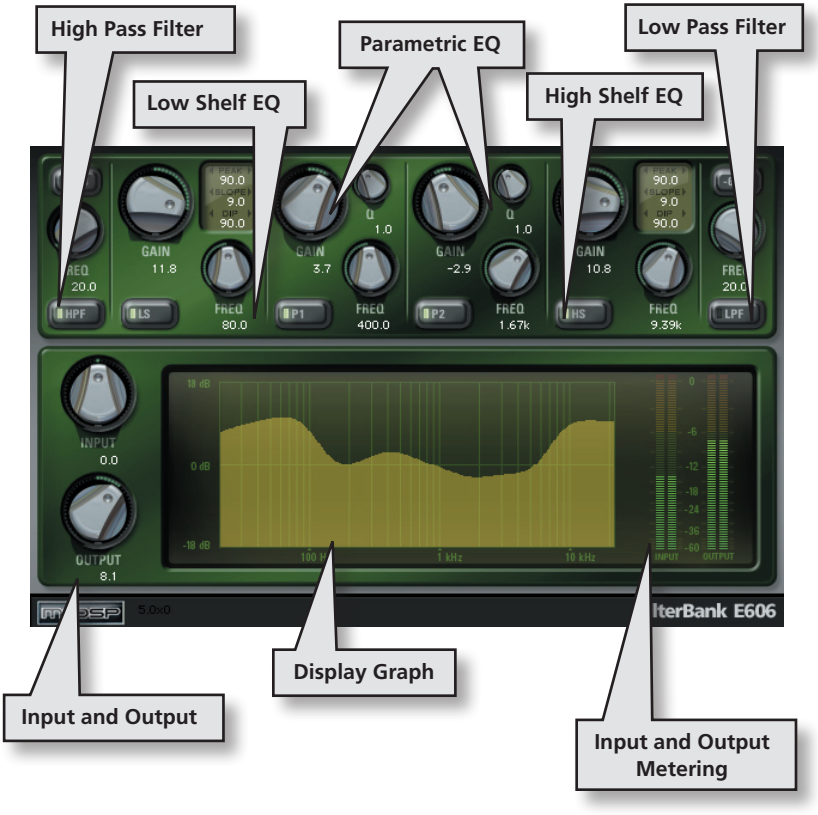
The Quick Start Tour: The FilterBank Plug-in

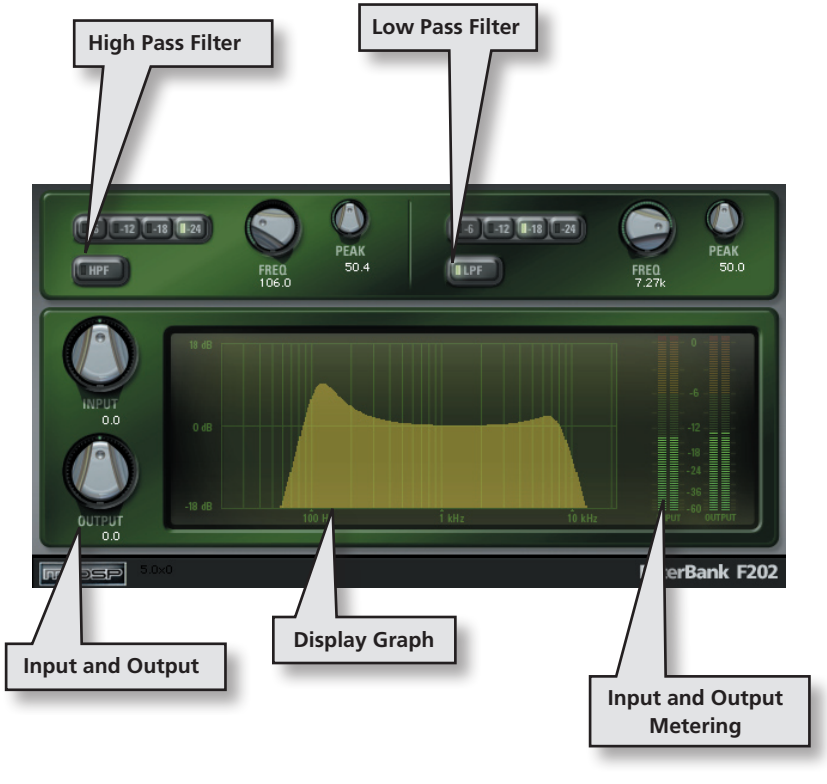
Start the DAW host and instantiate the FilterBank plug-in

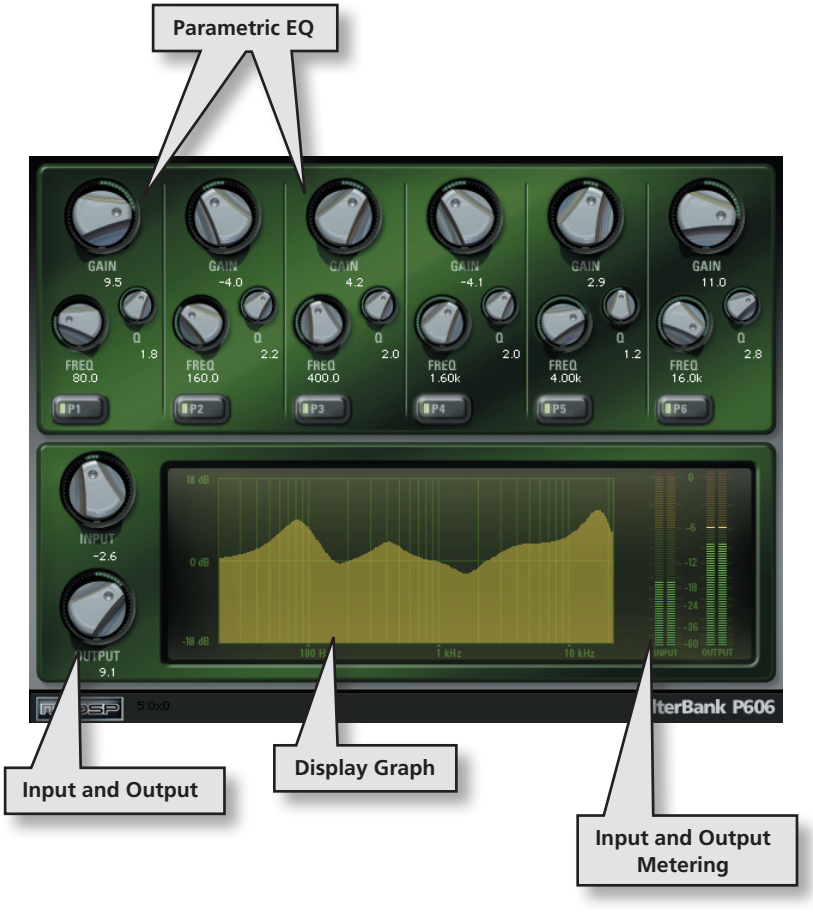
- Launch the DAW host and Open a Session.
- Verify the Display-> Mix Window Shows->Inserts View option is checked.
- In one of the inserts, select the **E606 FilterBank** plug-in.
- If the inserts selection does not show FilterBank plug-ins, verify that FilterBank has been installed correctly.
- For more information on starting your DAW host and working with plug-ins, see the Reference Guide provided by your preferred DAW.

FilterBank E606 Overview

The E606 FilterBank configuration includes high and low pass filters, low shelf EQ, high shelf EQ, and two parametric EQs.


High Pass Filter
Low Shelf EQ
Parametric EQ
High Shelf EQ
Low Pass Filter
GAIN
11.8
FREQ
80.0
GAIN
3.7
FREQ
400.0
GAIN
-2.9
FREQ
1.67k
GAIN
10.8
FREQ
9.39k
20.0
HPF
LS
P1
P2
HS
LPF
INPUT
0.0
OUTPUT
8.1
18 dB
0 dB
-18 dB
100 Hz
1 kHz
10 kHz
0
-6
-12
-18
-24
-36
-60
INPUT
OUTPUT
5.0x0
lterBank E606
Input and Output
Display Graph
Input and Output Metering


High Pass Filter
Low Pass Filter
HPF
FREQ
106.0
PEAK
50.4
LPF
FREQ
7.27k
PEAK
50.0
INPUT
0.0
OUTPUT
0.0
18 dB
0 dB
-18 dB
100 Hz
1 kHz
10 kHz
Input and Output
Display Graph
Input and Output Metering


Parametric EQ
GAIN 9.5
Q 1.8
FREQ 80.0
P1
GAIN -4.0
Q 2.2
FREQ 160.0
P2
GAIN 4.2
Q 2.0
FREQ 400.0
P3
GAIN -4.1
Q 2.0
FREQ 1.60k
P4
GAIN 2.9
Q 1.2
FREQ 4.00k
P5
GAIN 11.0
Q 2.8
FREQ 16.0k
P6
INPUT -2.6
OUTPUT 9.1
18 dB
0 dB
-18 dB
100 Hz
1 kHz
10 kHz
INPUT
OUTPUT
5.0x0
lterBank P606
Input and Output
Display Graph
Input and Output Metering

Controls

Input and Output Section

- **Input Gain** - the amount of signal level increase (or decrease) before the EQ
- **Output Gain** - the amount of signal level increase (or decrease) before the EQ

Low and High Shelf EQ

- **Gain** - the amount of signal level increase (or decrease) at the selected frequency
- **Freq** - the frequency at which the gain amount is applied
- **Peak** - the amount of overshoot, or 'peak', in the shelf portion of the EQ response
- **Slope** - the rate of transition, or 'slope' of the EQ shelf
- **Dip** - the amount of undershoot, or 'dip', in the shelf portion of the EQ response

Parametric EQ

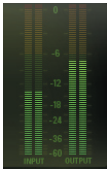
- **Gain** - the amount of signal level increase (or decrease) at the selected frequency
- **Freq** - the frequency at which the gain amount is applied
- **Gain** - the amount of signal level
- **Q** - the width (bandwitdh) of the parametric EQ boost (or cut)

Low and High Pass Filters

- **Freq** - the frequency at which the filter is applied
- **Slope** - the rate of transition, or 'slope' of the filter response

Displays

Meters



The FilterBank plug-in has meters showing input and output signal levels.

General Information

To adjust any of the FilterBank controls the user can:

- 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 your DAW host such as the Mackie HUI and Digidesign's ICON™, ProControl™ and Control 24.

Control Linking

There is no control linking capability in FilterBank at this time.

Automation

All FilterBank controls are completely automatable. See your DAW User Manual for automating plug-ins section.

Presets: Using the Presets and Making Your Own

The FilterBank preset library demonstrates the wide range of applications FilterBank can be used. No preset will suit every application, and they have been provided as a guide for the user, and will hopefully inspire new ideas and ways to use this sophisticated plug-in.

Refer to your DAW User Manual for accessing and saving plug-in presets.

A Word on Preset Compatibility

Presets for the E606, P606, and F202 presets will be interchangeable.

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. Note only settings that affect related controls will be updated. If, for example, a F202 preset with highly resonant high and low pass filter settings, is copied into a P606 plug-in instance, only the input and output gain values from the F202 preset will be copied over to the new configuration.

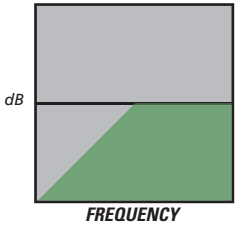
Using the FilterBank Plug-in

FilterBank is one of the most widely used plug-ins in the McDSP product line. The three plug-ins included with FilterBank - the E606, P606, and F202 - all have a variety of equalizer and filtering features described in the following sections.

Basics

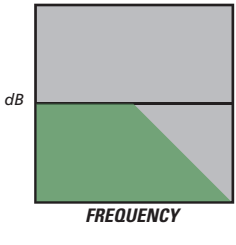
High Pass Filter (HPF)

High pass filters remove signals below the selected frequency, and pass the signals above the selected frequency unaffected (hence the term high pass). High pass filters have a slope measured in the amount of signal reduction (in dB) per frequency octave. Typically these values are in multiples of 6 dB/Oct. At the exact selected frequency of the high pass filter the signal reduction is usually - 3 dB, however this can change based on filter design.



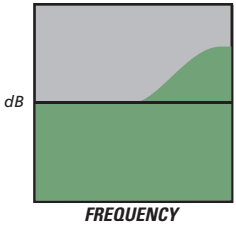
Low Pass Filter (LPF)

Low pass filters remove signals above the selected frequency, and pass the signals below the selected frequency unaffected (hence the term low pass). Low pass filters have a slope measured in the amount of signal reduction (in dB) per frequency octave. Typically these values are in multiples of 6 dB/Oct. At the exact selected frequency of the low pass filter the signal reduction is usually - 3 dB, however this can change based on filter design.



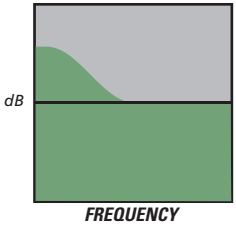
High Shelf EQ

High shelf EQ increases (or decreases) signal levels at and above the selected frequency. Shelving EQ can have a slope, or Q control, that determines the shelving EQ shape.



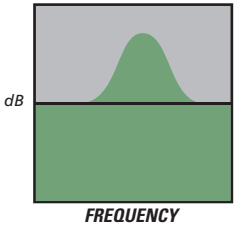
Low Shelf EQ

Low shelf EQ increases (or decreases) signal levels at and below the selected frequency. Shelving EQ can have a slope, or Q control, that determines the shelving EQ shape.



Parametric EQ

Parametric EQ increases (or decreases) signal levels at the selected frequency. Parametric EQ can have a Q control that determines the parametric EQ width. A Q of 1.0 is about one frequency octave. A Q of 12.0 is about 1/12 a frequency octave, or one semi-tone.

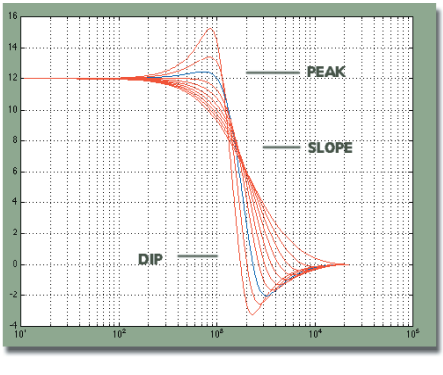


A Closer Look

Low and High Shelving Equalizers

FilterBank's E606 plug-in has high and low pass filters, two parametric equalizers, and the most flexible low and high shelving equalizers found in any hardware or software EQ. 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.

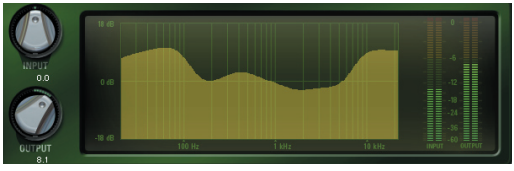
Low and High Shelving Equalizers

Parametric equalization is available in the FilterBank E606 and P606 plug-ins. 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/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.

Low and High Shelving Equalizers

Low and high pass filters are provided in the FilterBank E606 and F202 plug-ins. These filters can be used to band-limit material, or put a final touch on a track. The E606 plug-in has high and low pass filters capable of -6 or 12- dB/Oct attenuation. The F202 plug-in has high and low pass filters capable of -6, -12, -18, or -24 dB/Oct attenuation. The F202 plug-in additional offers resonance (peak) control of the filter shapes - useful for creating synth-like filter sweeps.



- **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.

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.

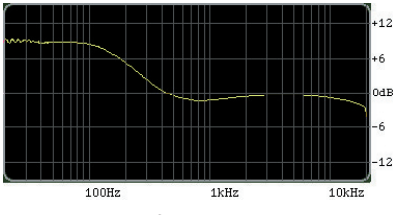
Neve™ and FilterBank's E-classic1 Preset

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.

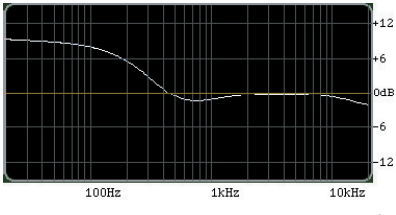
Note the Neve 1084™ 's response curve below (in gold) and the gentle roll-off in the upper frequency spectrum. This roll-off contributes to the "softness" of the Neve 1084™. Note how FilterBank E-classic1's response curve below (in white) emulates the gentle-roll off character:

The E-classic1 preset makes use of all 6 bands of an E606 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 low shelf response as measured by McDSP



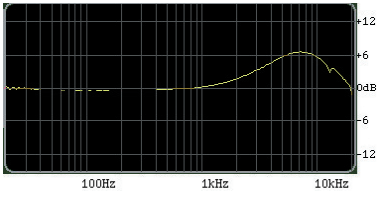
FilterBank's preset E-classic1 low shelf response

Avalon 2055™ and FilterBank's P-classic2 Preset

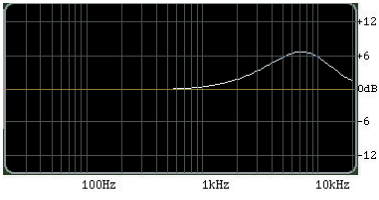
The Avalon 2055™ is a more contemporary implementation designed to emulate the sound of tube and other vintage equalizers. The Avalon 2055™ has four parametric bands (F1,2,3,4). that are known for their large control ranges. FilterBank's parametric configurations give you control ranges that either meet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

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 P606 configuration).



n1084 parametric response as measured by McDSP



FilterBank's preset E-classic1 parametric response

*

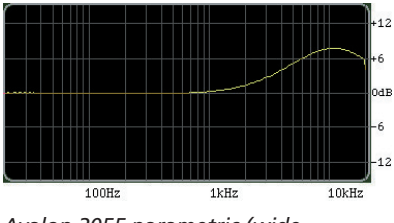
The

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

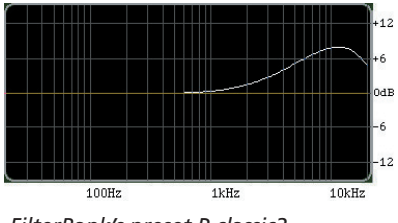
Avalon 2055™ is a trademark of Avalon Design and is property of Avalon Design.

GML8200™ and FilterBank's P-classic3 Preset

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.



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

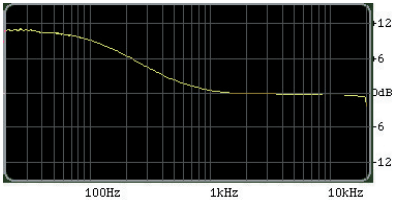


FilterBank's preset P-classic2 parametric (wide bandwidth) response

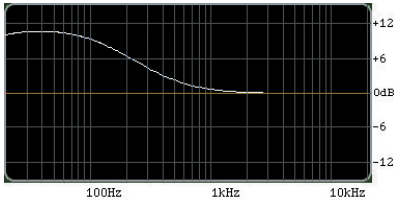
Many users of GML equipment have noted the equipment's ability to handle a large amount of gain without producing unwanted distortion. Such characteristics are usually not found in digital equalizers - they tend to produce digital clips in the audio stream and ruin mixes. All FilterBank's equalizer and 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.*



Avalon 2055 low shelf response as measured by McDSP



FilterBank's preset P-classic2 low shelf response

Applications

Vocals

FilterBank's E606 is best suited for dealing with vocal and dialog tracks.

For plosive removal (reduction of the low frequency parts of speech from sounds like 'thhh' and 'sssp'), use the high pass filter, at its steepest setting (12 dB/Oct), around 80 to 120 Hz. Similar plosive reduction can be accomplished using the low shelf of the E606. Note increasing the Dip control, with a negative amount of gain, will actually produce a slight gain boost in the frequency range just above the shelf. This smaller gain boost could mask what has been removed by the shelf, making the vocal or dialog sound 'less filtered'.

The remaining parametric and high shelf EQ bands in the E606 are great to adjust the tone of the vocal - allow it stand to out against the rest of the band (or explosions, gun fire, and screaming).

Drums

The classic separation of the kick and snare via EQ is readily accomplished using FilterBank E606 and the unique Peak, Slope, and Dip controls.

Boost the low shelf EQ gain significantly, and maximize the Peak, Slope and Dip values. Then update the frequency until the kick drum is 'found' (i.e. the EQ frequency is approximately equal to fundamental frequency of the kick). Now adjust the Slope control from max to min. Note how a gentler EQ shelving curve (Slope near min value of 0.0) gives a more 'rounded' boost of the kick drum, and also begins to apply some of its EQ boost to the snare. On the other hand, a steep EQ shelving curve (Slope near max value of 10.0) isolates the boost of the kick significantly, while leaving the snare less effected.

Varying the slope of a high shelf boost in FilterBank E606 also reveals the variety of sounds you can get out of the unique Peak, Slope and Dip controls. A high hat or cymbal ride sounds very different with a gentle or steep slope. Add some Peak or Dip to the EQ curve and the tone can be very customized.

Bass

Similar to the use of the kick and snare separation with the low shelf EQ, varying the slope of a low shelf EQ boost on a bass guitar track can create a variety of tones. Some use of the high pass filter will also get rid of extreme low end frequencies caused by finger picking and slapping. Experiment with the mid range of the bass guitar - scoop out significant portions between 800 and 8 kHz to see if that helps the bass sound 'warmer' and easier to mix in with the rest of the tracks. And while it is a bass guitar, sometimes a little high shelf EQ (just a few dB) brings back some of the 'good sounding' fret play you liked when you were originally tracking.

FilterBank Plug-in Reference Guide

Specifications for E606 Mono & Stereo:

Parameter	Range	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 (Band 1) & Low Pass Filter (Band 6)		
FREQ	20Hz to 20kHz	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 (Band 2) & High Shelf (Band 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	40 to 160 Hz (LS) 4k to 16 kHz (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 (Bands 3 & 4)		
GAIN	-12dB to +12dB	The amount of boost or cut in dB for each EQ band
FREQUENCY	40 to 4 kHz (P1) 80 to 8 kHz (P2)	The center frequency of the filter
Q	0.2 to 4.0	The width of the parametric EQ bell, 1 = One full Octave

Specification for F202 Mono & Stereo:

Parameter	Range	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 (Band 1) & Low Pass Filter (Band 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

Specifications for P606 Mono & Stereo:

Parameter	Range	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 (Bands 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

DSP Delay

The delay incurred by any of the FilterBank plug-in configurations is 3 (THREE) samples on HD systems. This is the absolute minimum number of delay samples a TDM plug-in can have. The McDSP plug-ins are designed in this manner to provide the user with the closest analog mixing console experience possible (analog inserts such as EQ and compression do not cause a processing delay when inserted into a track).

DSP Usage

Pro Tools™ HD and HD Accel DSP hardware

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 DSO usages. The DSP Allocator utility provided by Avid™ (Digidesign) can be used to display DSP resource allocation when Pro Tools™ is running.

Maximum Instantiation Counts at 48kHz

Configuration (mono)	# Instantiations per DSP HD systems	# Instantiations per DSP HD Accel systems
F202	15	52
E606	11	36
P606	10	36

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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