

THE PRE-MIX

Once you have placed the music and finished designing and editing your effects you are ready to pre-mix your soundtrack.

The pre-mix is your opportunity to listen to all the audio components of your film together, set the proper levels, process sounds to create specific effects (such as making ADR sound natural, or applying a telephone effect) and clean up problematic sound (hiss, camera noise...)

NOTE: Ideally you have been setting the correct relative levels for your sound since you started the dialogue editing process on your film.

A good pre-mix will allow you to focus on artistic issues during your final mix.

What Needs to be Done Before Pre-Mixing

Before you start pre-mixing make sure you have done the following steps that are outlined in the dialogue editing section:

- 1- You have set up a "Master Fader"
- 2- You have a meter active on the Master Fader.
- 3- You have a reference tone set to "-0 db" on the meter bridge.
- 4- You have labeled all your tracks (Prod Dial 1, Efx 1, Music 1, ADR 1, etc...) and placed each sound in its corresponding track.
- 5- You have dialogue edited your sound. This includes:
 - a. Checkerboarded tracks
 - b. Balanced and properly adjusted levels
 - c. Seamless transitions from shot to shot
- 6- You have created and properly label tracks for all the sounds that you would like to process during the pre-mix. (ie., "camera noise", "source music", "telephone effect", "a.c. hum", "too bassy"...))
- 7- You have edited all your sound effects including ambiences and foley sounds.
- 8- You have placed and edited the music.

Where to Pre-Mix?

Ideally you want to pre-mix your film in rooms 161, 163 or 167. There are 2 reasons why these rooms should be used for pre-mixing:

1. They are equipped with a monitoring system (speakers and amplifier) that allow you to clearly hear your sound track.

Note: It is very difficult to set proper levels with headphones!

2. The computers in all 3 rooms are equipped with an additional 2 sets of plugin bundles which should give you more control over your signal processing. These bundles are:
 - a. The Waves Restoration plugin bundle includes noise, crackle, hum, and click reduction.
 - b. The Waves Platinum plugin bundle which includes a whole array of processing tools such as EQ, Compressor, Limiter, etc. ...

These Waves plugin are more powerful and of greater quality than the equivalent standard plugins that come with pro tools.

Setting Levels

1. Setting levels for dialogue:

Begin the process by “muting” all the tracks except for your “dialogue tracks”.

Play back your dialogue tracks and check to make sure all the dialogue levels are set correctly.

The proper levels for dialogue are between -10 db and 0 db on the VU meters.

The levels for an average conversation should be between -7 db and -3 db.

If someone is yelling, the levels can exceed 0 db, but should not go over +3 db.

No sound should go over +3 db!

If someone is speaking in a quiet voice, the levels can be closer to -10 db.

ADR, because it has been recorded clean, sounds better at a lower level.

Sometimes it might even sound better below -10 db.

Setting levels is also an art.

As long as you are within the right range on the meters, go with what sounds good.

If you have 2 characters, one with a low bassy voice and the other with a higher voice, the one with the bassy voice should have higher levels than the other because the human ear does not perceive bassier sounds as well as mid range sounds

You might also have to tweak the dialogue levels again once you turn on the other audio components.

Once you have set all your dialogue levels, un-mute all the other tracks.

You will now be mixing all your other audio elements in relation to the dialogue that has already been pre-mixed.

2. Setting levels for music and effects:

There are no “proper” levels for music and effects, except that they should not exceed + 3db.

Levels for music and effects should be set in relationship to the dialogue.

This means that the dialogue should always be clearly audible over the effects and music.

In some cases you even might want to raise the dialogue levels a little to compensate for the loudness of the other elements.

Remember, this is the pre-mix, so if you can't figure out the proper level for something, we can deal with it in the final mix.

SIGNAL PROCESSING

The Plugins

All plugins in Pro Tools can be used in 2 ways:

You can use them in “real time” or in “non-real-time”

Real Time Plugins: They are called “real time” because the settings you select are not permanent, and can be modified. They can also be modified while you are listening to the audio clip, allowing you to hear the effect in real time.

“Real time” plugins can be applied to a specific track (thereby affecting all the audio on that track) or to the whole mix (as discussed below in the “compression” section).

There are 2 kinds of Real Time Plugins:

- 1) **RTAS plugins:** (Real Time Audio Suite) a plugin that uses the computers processing power. These plugins are available on all Pro Tools stations.
- 2) **TDM plugins:** A plugin that uses the dedicated Pro Tools processing card. They are only available on the HD system in room 177.

You can access the “real time” plugins by:

1. Clicking on the “Edit Windows Show” button” on the upper left hand corner of your Pro Tools window (See #1 below).
2. Select “Insert View” (#2) and the “Inserts View Window” will open at the head of your tracks (#3).
3. Click on one of the small tabs in the inserts view window at the head of the track on which you want to place a plugin (#4).
4. Select the plugin that you want use (#5)
Note: You can use up to 5 plugins per track. The sound travels through the plugins from top to bottom.
5. Double click on plugin label to access plugin settings (#6).
6. As soon as you change the default settings on the plugin, it will apply those settings to all the audio clips on that given track.

#1 “Edit Windows Shows” button

#2 Select “Inserts View”

#3 “Inserts View” window opens

#4 Click on tab.

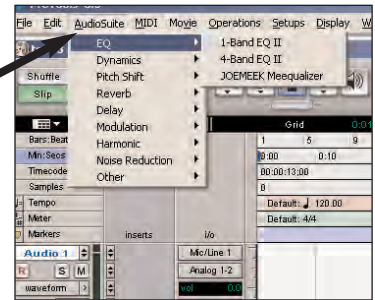
#5 Select plugin.

#6 Double click on plugin label to access plugin settings

Non-Real-Time Plugins/Audio Suite Plugins: They are also called “destructive plugins” because when used, your audio clips are rendered to create a new clip to which your processing settings have been permanently applied.

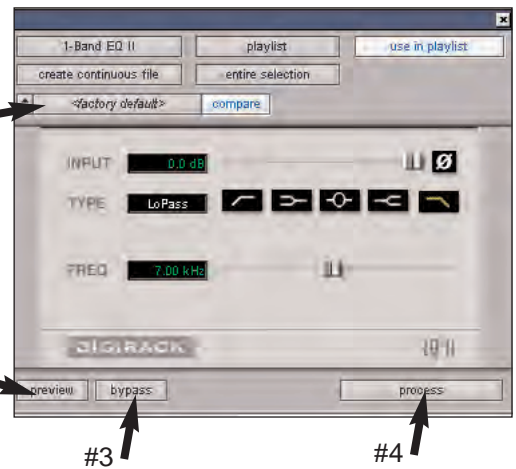
While it replaces your original “dry” clip with a rendered “wet” clip, it is important to understand that your original clip has not been deleted, but will still be on your hard drive, in your “Audio Files” folder, in case you would need to retrieve it later.

In Pro Tools these “destructive” plugins are called Audio Suite plugins. They are accessible from the “Audio Suite” menu on the top menu bar.



In order to use a Audio Suite plugin, you need to:

1. Highlight the clip or area on the clip you want to process.
2. Set your plugin to the desired settings.
All plugins have default settings that you can access either through the “Factory Default” (#1) menu or, for the Wave plugins, through the “load” menu.
3. Listen to the affect of the plugin on your audio selection by clicking on the “Preview” button (#2).
4. By clicking on the “Bypass” button (#3) while you are previewing you can listen to what the audio clip sounds without the plugin.
5. When you are satisfied with the processing, click on “process” and it will render out a new processed file.



IMPORTANT: We highly recommend that when working with “non-real-time” plugins that you copy and mute (control- m) your original clip on another track, so that if in the future, if you would like to change its settings, it is easily accessible.

Using the Signal Processing Plugins

The Equalizer (a.k.a. “EQ”)

The equalizer is the most commonly used processor used in pre-mixing. It is designed to lower or raise designated areas of the frequency spectrum. It is used for 2 purposes:

1. It can be used to **reduce noise** (ie, “clean bad audio”) by, for example, stripping out the bass on a dialogue track that is made unintelligible due to the presence of traffic noise on it.
2. It can be used to create a special audio effect such as making normal dialogue sound like it is coming from a telephone, or to make studio recorded ADR sound like it is production sound.

There are three types of EQ plugins in our system.

- 1- The Digidesign **1-band EQ** (Available on all stations.)
- 2- The Digidesign **4-band EQ** (Available on all stations.)
- 3- The Wave’s **Paragrophic Q-10 EQ** (Only available in 161,3,7, and 177)

Note: There is also the **Joe Meek EQ** which works well, but we do not think it is as effective as the above EQ’s. You are obviously more than welcome to use it by applying the settings in the “recipes” listed below.

The 1-band EQ Modes and Settings

The High pass filter (#1): This mode allows you to filter out the frequencies below the designated threshold (#2).

By moving the “Freq” slider (#3) to the left or right you can lower or raise the threshold.

In this case the slider is set to 130, which means that the plugin is filtering out all the frequencies under 130 hz.

The Low Shelf filter (#1): Same as above except that you can control the amount of filtering by setting the “Gain” (#2) up or down.

In this case we are reducing all the frequencies below 130 hz by 7 db.

The Notch filter (#1): This filter is used to lower or raise a given range of frequencies by a set amount.

Use the “gain” (#2) to set the amount in db that you want to raise or lower.

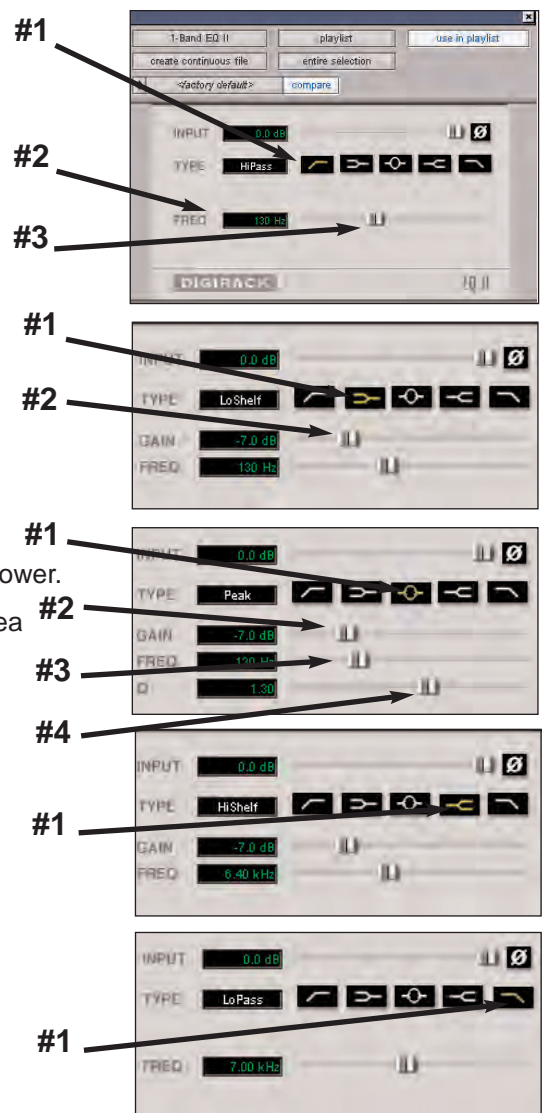
By moving the “Freq” slider (#3) to the left or right you can set the area of the frequency spectrum you want to affect.

The “Q” (#4) determines the width of your notch.

A lower “Q” will give you a wider notch.

The High Shelf filter (#1): Same as the Low Shelf except that you are filtering the high frequencies.

The High Pass filter (#1): Same as the Low Pass except that you are filtering the high frequencies.



The 4-band EQ Modes and Settings

The 4-band EQ lets you use up to filters at a time.

It combines a High Shelf filter (#1), 2 Notch filters (#2), and a Low Shelf filter (#3).

It is used for such things as processing ADR or to create audio effects such as the “telephone effect”. (These processes and effects are described below.)



Reducing Noise

NOTE: Before you start dealing with noise reduction, check to make sure that the noise you are hoping to eliminate has not been introduced during the post process. You can verify this by checking your original audio media (Dat or Nagra tapes).

If your original media does not have the noise on it, we suggest you replace the noisy sound with the clean original audio.

WARNING: Don't expect Pro Tools to be able to get rid of all types of noises. It can get rid of certain sounds, attenuate others, but sometimes this attenuation comes at the expense of the quality of your production audio. Loud AC, generator noise, traffic, is almost impossible to get rid of. If you have some these types of noises, and you care about what your film sounds like, we suggest ADR.

The two tools you can use to reduce noise are an EQ plugin and/or a Noise Reduction plugin.

Though Noise Reduction can be the most effective tool to get rid of noise, it uses up a lot of computer processing power. We therefore recommend that you first try to EQ your sound.

Hiss

Use the **Low Pass filter** and begin rolling off the highs by dragging the slider to the left until you hear an attenuation of the hiss.

Make sure it does not adversely affect your dialogue. If it does, you should back off on the roll off.

If you are not satisfied with the effects of the filter on the hiss, you might want to try one of the Noise Reduction plugins (see below)

Bassy Noise (ie., Traffic)

Use the **High Pass filter** and begin rolling off the lows by dragging the slider to the right until you hear an attenuation of the hiss.

Make sure it does not adversely affect your dialogue. If it does, you should back off on the roll off.

If you are not satisfied with the effects of the filter on the bass, you might want to try one of the Noise Reduction plugins (see below)

Camera Noise, Hum or Buzz

Use the **Notch Filter**.

Drag the “notch” by dragging on the slider back and forth until you hear the greatest reduction in the noise.

The wider the “Q” on the “notch”, the broader the reduction will be, and the more likely you will affect the quality of your dialogue.

So once you are satisfied that you have achieved the best noise reduction with the “notch”, check to make sure it does not affect your dialogue too much.

If it does, try reducing the size of the notch by raising the “Q”.

If you are not satisfied with the notch, try Noise Reduction.

A. C. or Generator Noise

The problem with these types of noises is that they are broad band noises: they span a large part of the frequency spectrum and it is not easy to isolate them from the dialogue.

The best remedy for this type of noise is Noise Reduction, but first try to get rid of it using the following settings on the EQ:

Roll off the lows and highs, and perhaps even create a notch.

As you can imagine, this will probably dramatically affect your dialogue. If it does, try Noise Reduction or ADR.

ADR

The trick about processing ADR is that you want to take sound that has been recorded in perfect conditions (a recording booth) and make it sound like something that has been recorded in imperfect conditions (ie, in the field).

Note: There is no definite formula for processing ADR. You will need to experiment until it sounds good.

It is especially to process ADR that you are trying to match with production sound within the same scene.

Outdoor ADR

Use the **4-band EQ**:

First roll off the lows and the highs.

If it still does not sound quite right, create a notch filter (#a), and move it around (between 1500 and 3k) until it sound ok.

Indoor ADR

Use the **4-band EQ**:

First roll off the lows.

If you find that your ADR is too dry and does not reflect the room it is in or the production sound you are trying to match, you might want to add a little bit of reverb.

SPECIAL EFFECTS PROCESSING

Telephone Effect

Use the High Shelf and Low Shelf on the “4-band EQ”. Set the gain to -12 db and start by rolling off the lows below 300 hz and rolling off the high around 6 k. Experiment with the setting until it sounds right.

You can also experiment with the Cosmonaut plugin.

AM Radio Effect

Same as Telephone effect but less drastic on the filtering.

You can also add some compression to reduce the dynamic range of the sound and some reverb if the sound is coming from indoor.

Sound in Next Room

Roll off the highs and compress.

Distant Outdoor Sounds

Roll off the highs until it sounds right.

Source Music

Similar to the AM Radio Effect.

Removing Reverberation

Sorry, but you cannot get rid of reverb. The only thing you can do is roll off the bass. (see above)

NOISE REDUCTION

The Noise Reduction plugins work well to remove constant background noise such as camera noise, generator noise, and any other sort of consistent hum or hiss.

Note: The NR plugins are not a miracle noise remover! They only “reduce” noise. If the noise you are trying to remove is of equal or greater volume than your dialogue, it can be difficult if not impossible to clean up without some resulting audible side effects. In this case, we suggest ADR.

There are 2 types of NR plugins on our system:

1. **Digidesign’s BNR** (Broad Noise Reduction) which is an Audio Suite plugin (non-real-time) that is available on all the systems.
2. **The Waves Restoration** plugin bundle that includes the following plugins:
 - **x- hum:** removes hum
 - **x- crackle:** removes crackle
 - **x- click:** removes clicks (digital pops)
 - **x- noise:** standard noise remover.

The Waves Restoration plugin bundle is available both in Audio Suite (non-real-time) and RTAS (real time) formats. It is only available in rooms: 161, 163, 167, and 177.

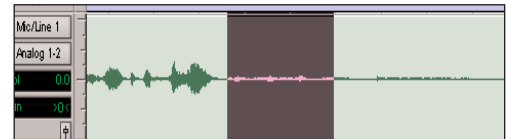
Note: When used in real-time the Wave restoration plugins are processor hungry (ie., if you use it too often you will run out of processing power and you will not be able to use other plugins). We therefore recommend that you use it as much as possible in a “non-real-time” mode.

HOW TO USE BNR:

The BNR is located under the “Audio Suite” menu in the Noise Reduction folder.

1. Open the plugin
2. Go to the clip in the timeline and highlight a sample of the noise you are trying to reduce.

- Make sure the section you highlight is a section that only has a sample of the noise. Pick a section between words, and be careful not to include a breath if possible.
- You do not want any other sounds in there if not it will affect your ability to successfully noise reduce the clip.

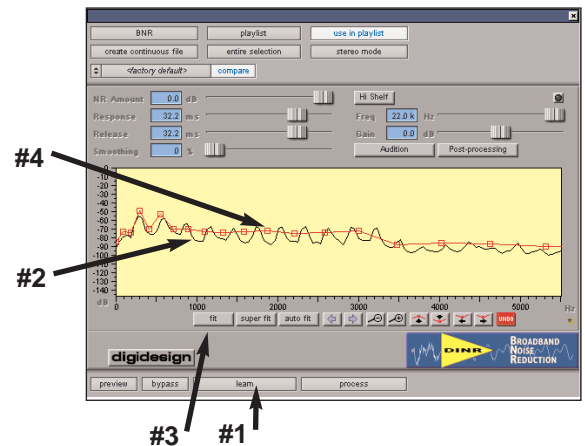


3. Click on the bottom button that says “Learn” (#1)

This should produce a “noiseprint” of your noise (# 2)

4. Click on the “Fit” button (# 3).

This should produce a series of key points in the “Noise print window” (# 4)



5. Highlight the whole clip that needs to be noise reduced.



6. Set the “smoothing” to about 90%, and the “attack” and “release” settings to about 5 ms (#1).

Make sure you are in “Loop Playback” mode (Cntl+ Shift +P).

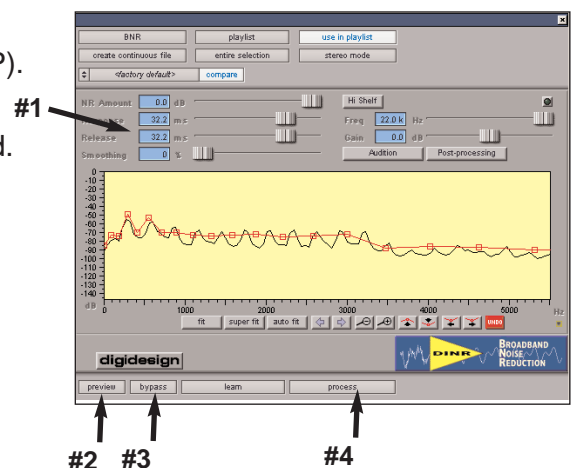
Click on the “Preview” (#2) button and start sliding the “NR Amount” slider to the left as you listen back to the sound.

- As soon as you start hearing some strange artifacting, usually a flanging of the sound, you have gone to far.
- The art of noise reduction is to get rid of as much noise as possible while avoiding artifacting.

By turning the “Bypass” on and off while listening back you can compare the effect of NR with the original audio.

When you get close to an acceptable sound, you can tweak your noise reduction by experimenting with the “Smooth”, “Attack” and “Release” settings.

Once you are satisfied with the NR, click on the “Process” button.



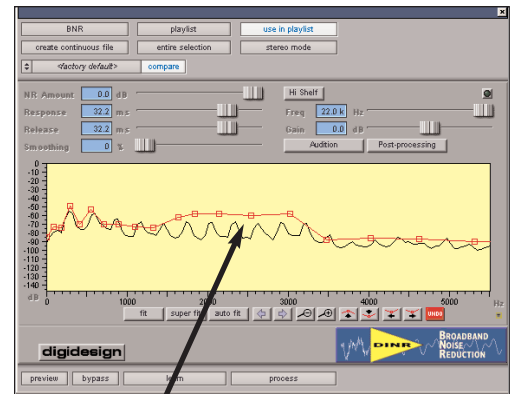
Adjusting the key points:

You can also further tweak your noise reduction by raising or lowering the “**key points**” in selected areas of the frequency spectrum.

By raising the key points a selected area of the noiseprint you are lessening the effect the noise reduction in that given range of frequencies (#1).

For example, if you are trying to remove some AC noise from a dialogue track, but whatever you do, it is making the dialogue sound bad, then you can raise the key points in the mid range where the dialogue is, so that it will not be affected by the noise reduction.

Using the keypoints is kind of like cutting a hole in the noise reduction to let some sound through.



#1