



NTM

nightpro

EQ3TM Sound Enhancement System

High Definition AudioTM

by NTI

**Instruction / Owner Manual
&
Warranty**

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EQ3



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Congratulations!

You've just acquired one of the most innovative and useful audio tools you'll ever encounter. NTI's EQ3 is undoubtedly the most unique signal processor to come along in the last 2 or 3 decades. With its extremely wide frequency response, very low self-noise, and its special ability to add significant equalization without adding noticeable phase distortion, the EQ3 is in a class by itself.

Until now, analog equalizers produced a trade-off between image clarity and the tonal quality of the sound. These factors are due to phase shift and distortion, that have been inherent problems with conventional equalizers. The more EQ used, the greater the problem.

The new NTI EQ3 greatly reduces phase shift, image spread and the anomalies outlined above. A cursory listening will reveal unequivocally the truly remarkable clarity and musical quality of this extraordinary device, at a moment in time when many experts have written off analog signal processors.

The EQ3 solves problems in professional applications that couldn't be solved before. Some recording and mastering pros have preferred to avoid EQ rather than add the harsh distortion products most EQ's add. Now, they have a tool that can do what they want; the advantages without the disadvantages.

In home theater and other discerning hi-fi applications, the EQ3 brings a dimension of excitement and realism to playback that was definitely missing before.

Light Technologies International

Here's what the pro's say:

From the professional ranks of recording, radio broadcasting, TV production, movie theater sound reproduction, and others in the competitive business of making high-quality sound for the masses, NTI has won more credits, accolades, and endorsements for a single product than perhaps any other hardware manufacturer. And that product is EQ3."

Home Theater Magazine, Jan 1995

I just keep coming back to this box. It adds something that can't be duplicated by any other device. It's a "live" feeling, of being there. Music composed must co-exist within a complex environment of dialogue and effects. The NTI EQ3 lets the music be heard."

David Schwartz

Composure for Northern Exposure

The EQ3 is the only inanimate object I've ever addressed as "Ooooooh Baby!"

Denny Purcell

Owner, Georgetown Masters

EQ3 is not just another EQ device; it is my audio signature."

Bob Whyley

Audio Director

NBC Tonight Show

As you begin to familiarize yourself with the EQ3 in your own system, we think you'll have some pretty good things to say, too.

Remember, the EQ3 is unlike any other equalizer. It is actually easier to adjust and far more "musical" in its application.

If you're like most of us, you'll want to read all the technical stuff later, and get right to hooking it up. Just take a look at the "Quick Start" instructions on page 3, and you'll be able to get going.

Quick Start

Hookup and Adjusting the EQ3 Air Band Equalizer

Hooking up the EQ3 is pretty straight-forward: The inputs are balanced, but can easily be hooked up unbalanced. If you are connecting a device with balanced output up to the input of the EQ3, you only need to know that pin #2 of the input XLR connector on the EQ3 is "hot" (+). If your connecting device is unbalanced out, just hook the hot lead to pin #2, and the ground to pin # 1 of the EQ3's input XLR.

Note: You can also use the supplied XLR to RCA connectors on the input, which tends to simplify things.

There are both XLR and 1/4 inch phone jacks on the EQ3 for output connectors. In either event, the output is unbalanced.

See the "Set-up and Operation" section beginning on page 9 for more hookup details.

Adjusting the EQ3 controls: The EQ3 is by its technical nature a little different than any other EQ you've used. Take just a moment to look over these instructions for adjusting the EQ3 and you'll be off and running. For more detailed instructions, see the "Set-up and Operation Instructions" beginning on page 10.

Start with the large (outer) knobs number 1 — 6 in the 12 o'clock straight up position. Knob # 6, the air band control, is just beginning to make an audible difference in this position.

The 6 smaller inner knobs provide fine tuning in 1/4 dB steps, to the associated outer knobs. Set all the smaller knobs in the fully CLOCKWISE position.

When equalizing the high frequency spectrum, a technique that works well is to adjust bands 5 and 6 to achieve desired brightness without overloaded or overbearing high end.

Normal Settings": Most folks normally end up with the 2.5 kHz control (band # 5) set at 12 o'clock or 1 o'clock, and the air band control set at about 12 o'clock or 1 o'clock. If you move the air band control past 12 o'clock (where you really begin to hear its effect), you may want to compensate by moving the 2.5 kHz control to the left (CCW) one or two clicks. The reason for this is that these bands overlap. If you add in enough air band control while keeping the 2.5 kHz band flat, you actually end up with a little bump in the response at 3 kHz or so, due to the overlapping.

Above all, keep in mind that the EQ3 is best adjusted by *listening*. It is so transparent that it doesn't add its own character to the sound. Rather, it "opens up" the sound. With many other EQ devices you adjust them by listening to what the EQ is doing to the signal. The EQ3 allows you to concern yourself only with the signal, not what the EQ is doing to it.

Duke Ellington said it all:

*"If it sounds good
it is good!"*

Applications

Audio Sessions: There are as many uses for the EQ3 in the studio as there are things going on in a studio. Professional users tell us that the EQ3 is incredibly good at sweetening vocals, adding “air” to strings and cymbals, lending depth and character to bass and drums. If you have a problem in need of fixing, put a channel of the EQ3 on the track in question and experiment.

Don't be afraid to add significant amounts of EQ as you experiment. The EQ3 will not close down your sound, it will open things up.

Mastering: One of the most-used applications for the EQ3 is in mastering. After all is said and done in the studio sessions, mastering is where the final product is defined. In the mastering process a number of subtle things can be done to make the recording come even more alive. Opening up the high end with the EQ3's air band, and tightening the bass with the two lowest bands on the EQ3 can make a significant difference.

It is important to note that the EQ3's incredibly clean and transparent interaction with the audio signal means you can use the process in original recording sessions, and then use it again in the mastering process. Since the EQ3 adds so little phase shift, there is little or no cumulative effect of using it on certain tracks in the sessions, and then using it again in mastering.

Playback and Post: In post production situations of all types, whether radio, T.V., recording, etc., the EQ3 can be used to sweeten the signal, open up the high end, add real punch and tighten the low end. You can use the EQ3 to adjust the signal to match your standard.”

Broadcast: Network and local engineers, audio directors, program directors, and managers can easily note the improvement to their signal when using the EQ3. The effect on low end, voice, product “punch” and high end open-ness can be heard clearly over car stereo

speakers. In broadcast, just as in recording, the quality of your product" is what you're judged by. The highly competitive atmosphere in both networks and local-markets means that the quality of audio that is put on the air is extremely important. The EQ3 can give that "extra edge" on the competition.

Motion Pictures: In motion picture sound tracks there is a unique combination of music, sound effects, and dialogue. Recent improvements in motion picture sound track recording and reproduction have been able to bring the realism of digital sound (wide dynamic range, wider frequency response) to the big screen. The sound in motion picture reproduction can almost always be significantly improved by selective adjustment with an EQ3.

One potential "problem" created by the new digital sound in motion pictures is the very wide dynamic range. With sound effects sometimes louder than before, and dialogue often softer than before, the dramatic effect is sometimes very exciting. But with loud sound now louder and soft sounds now softer, the dialogue is sometimes hard to understand. And you can't just turn up the over-all volume because the loud sounds rapidly become too loud.

The EQ3 can "touch up" the dialogue and bring it right out in front of the screen with a simple adjustment or two. The lack of phase shift in the EQ3 also means that the complex processed imaging of motion picture audio signals will not be affected at all.

Discerning Home Hi-Fi: As with the rest of audio applications today, home systems are becoming more and more sophisticated. Newer and better components make it possible to have better sound at home than ever before. And as digital storage media, processing and playback have come into the home, users have become more sophisticated in their tastes. The EQ3 can do more to enhance a good home playback system than any other single component.

Home Theater: Perhaps the ultimate in home audio experiences can come from the home theater. Multi track front and rear imaging, high quality sound and wide dynamic range all add up to a very moving listening experience in the home. As with Hi-Fi, the EQ3

can add a great deal to the listening experience, with one significant added benefit. Many of the audio tracks now available on tape and laser disk offer multi track encoding that brings live surround-sound to the home theater. The EQ3's ability to add EQ without phase shift allows it to be inserted in the signal path prior to decoding *without affecting imaging*; so the full effect of the EQ can be heard in *all channels* of the surround sound without adding an equalizer to each of the channels.

Live sound: One of the fastest emerging uses for the EQ3 is in live sound. Major groups on tour, as well as smaller groups with discerning tastes in sound, are finding that the EQ3 opens up and enhances lead vocals, back-up vocals, drums, etc. Used either on a channel-by-channel basis, or as over-all EQ, the EQ3 can add definition to live sound.

In large touring sound systems, over-all level and the mix of many effects can keep the vocals covered up and can make the high end seem dull and cramped. The EQ3 opens up the high end and gives it air, and it can bring the vocals right out in front of the rest of the mix without adding the phase distortion products that so often come with added EQ.

Set-up and Operation

Hook-up:

The EQ3's inputs are balanced. XLR connectors are provided for the inputs. However, the input may be connected to either a balanced or unbalanced source. See table 1 below for pin connections.

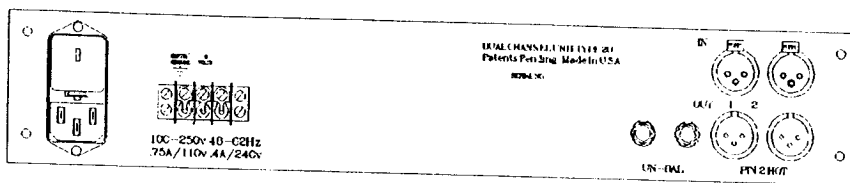
The EQ3's outputs are unbalanced. However, both balanced and unbalanced lines can be connected to the EQ3 outputs. Both XLR connectors and 1/4 phone jacks are provided for output hook-up. See tables 1 and 2 below for XLR pin connections. Table 3 provides instructions for phone jack hook-up of outputs.

EQ3 XLR convention is always pin # 2 hot (+).

Balanced Input and/or Output Connections (XLR)	
Pin	In / Out
1	Ground
2	High
3	Low

Unbalanced Input and/or Output Connections (XLR)		
Pin	In	Out
1	Ground	Ground (signal low)
2	High	High
3	Ground (signal low)	Ground (signal low)

Unbalanced Output Hook-up (phone jack)
Tip = high Sleeve = ground and/or signal low



Operating Instructions

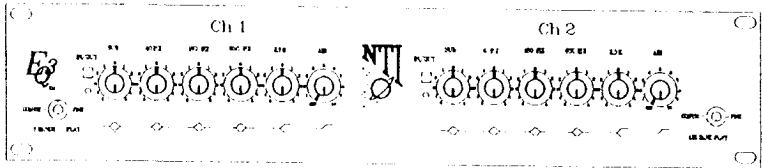
The EQ3 takes a very different approach to tonal adjustments. In conventional analog equalizers, whether they are shelving, sweepable, graphic or parametric types, various sections of the audio spectra are boosted or attenuated by adding or subtracting bandpasses. In the EQ3, frequency shaping is achieved by summing bandpasses. There are five broad, overlapping, interacting bands: 10, 40, 160, 650, and 2.5 k Hz, along with the "air band" control, which is an HF boost-only control.

As a result, you may need to take a little time and "play around" with the controls on the EQ3 before you can make intuitive adjustments.

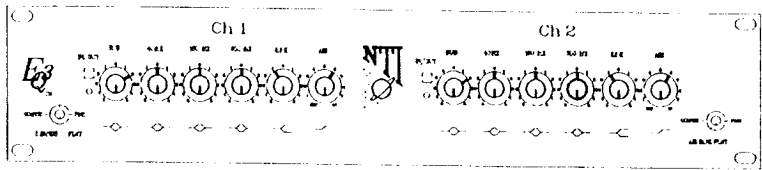
When using the EQ3, remember that the bands are broad, approximately 2 octaves. They overlap one another. For example: When boosting the 10 kHz *air band* to a +6 position on the coarse knob, to keep the response flat through in 2.5 kHz region you should rotate the 2.5 kHz coarse knob to about a -1 position. The amount you back off the 2.5 kHz control should, of course, be set by ear. Following this kind of procedure will accomplish a more airy sound, with much more clarity.

You can accomplish the same thing for the low frequency response by applying the same principles. The EQ3 will reach further into your recording than you've ever heard before with *no phase distortion*.

Once you have the EQ settings you like, you can reduce or increase output gain without losing the slopes or EQ you hear. If you move coarse knobs down 1 click, you will have precisely the same EQ contour, but you will have dropped the output level exactly 3 dB. The fine knobs will accomplish the same in 1/4 dB steps.



EQ3 Adjusted for "flat" response



EQ3 adjusted for "starter curve"

Special effect: The EQ3 offers unusually fine control and adjustment in almost all applications. However, in unusual situations for special needs, it is possible to narrow the individual filters in the EQ3. In certain applications an engineer may desire a little longer enhancement of a vocal track, a bass track, etc. In this case, the two channels of the EQ3 may be connected in series for a single channel that has narrower filters and a more dramatic EQ effect.

Connecting two channels of EQ3 in series is done with external cables. Connect the output of channel one to the input of channel two. Care must be exercised to assure that the connections are

proper as you connect the unbalanced output of channel one with the balanced input of channel two. Follow the general hookup guidelines on page 9 to assure proper connection.

❗**Note**❗ When connecting two EQ3 channels in series, it is essential to keep the EQ band control knobs of both channels set the same. If you wish to adjust the 2.5 kHz band for example, adjust both channel one and channel two knobs so that they are at the same setting. This will maintain symmetrical filter slopes and avoid any additional phase shift insertion.

The In / Out buttons of the front panel allow you to bypass the EQ contour you have set up with the front-panel knobs. These In / Out buttons are not a hard-wire bypass, but they have the same effect as bringing all controls to a "flat" position.

International voltages: The EQ3 is shipped adjusted to operate at 120 volts, 50-60 Hz. The unit can easily be set to operate at A.C. voltages anywhere between 100 V and 240 V. To adjust for a different voltage, simply lift the release latch and remove the gray cover located over the A.C. cord / plug (see drawing, p. 10). The gray cover has a small window in it, in which you can see the voltage the unit is set for. Under the gray cover you will find a small "connection wheel" which can be removed and rotated to allow for operation at several voltages. Choose the voltage setting closest to your need, and securely push the fuse holder back into place. Snap the gray cover back in position.

[When operating at 220 volts or 240 volts, the existing .75 amp fuse should be replaced with a .4 amp fuse]

❗**Note of Caution**❗ Because the EQ3 is capable of adding very considerable amounts of high and low frequency energy to the signal *without the usual accompanying phase distortion*, special attention must be paid when adjusting equalization contours so that under high level playback and reinforcement conditions other components, especially loudspeaker systems, do not sustain damage.

Specifications[~]

Frequency Response	± 0.5 dB, 10 Hz — 125 kHz -3 dB points, 7 Hz & 330 kHz
Nominal Input Impedance	20 k Ω
Nominal Output Impedance	50 Ω
Self Noise	.031 mV @ 1 kHz
Signal to Noise, flat	90 dB re 1V/1 kHz
Headroom	+25 dBm
Maximum Phase Shift*	30°
Musical Max. Phase Shift**	10°
THD + Noise	> 0.005%
Total Harmonic Distortion + Noise	
Line Voltage Requirements	100—250 V, 50—60 Hz
Dimensions:	
Front Panel:	3 ½ " x 19 "
Rack Depth:	10" (2U x 254 mm)
Rack Weight:	13 lbs. — 5.9 kg

One control maximum, other set flat
Adjusted for average musical compensation

Specifications subject to change without notice . . .

Trouble Shooting

Problem	Possible Solution
No signal through unit	Check all wiring to see that the unit is installed correctly. Check to see that the unit has power.
With the EQ3, I get extra high end with the unit set flat.	The <i>Air Band</i> control. Control must be turned fully counter-clockwise to the "off" position.
There is a slight loss when the EQ is put in the circuit.	The small knobs must all be set to maximum (fully clock-wise) to obtain flat response and unity gain.

Emergency Service — Technical Support

If for any reason your EQ3 malfunctions, NTI will replace the total unit within 24 hours, whenever possible. If the malfunction is due to mishandling of the equipment by the client, NTI will still replace the unit(s), but charge accordingly for repairs and shipping.

Normal Business Hours, Mountain Time (9:00 a.m. — 6:00 p.m.) If you have need for technical support or have an emergency, please call:

801-375-9288