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# User Reference Manual

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# NY-2A

stereo vacuum tube optical compressor

**Manual Notice:**

This manual is provided as both a guide for instruction, as well as a reference to be kept near by to aid you in everyday use. In it you will find general information, regarding the NY-2A Compressor as well as instructions for setup, use and suggested operating procedures. This manual is subject to change without notice. Electro-Harmonix is not liable for errors—direct, indirect, coincidental, or as a consequence of material contained within this manual.

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# GREETINGS FROM MIKE MATTHEWS

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## NY-2A Optical Vacuum Tube Compressor by Electro-Harmonix

Thank you for selecting the Electro-Harmonix NY-2A, a professional compressor that was designed to meet the demanding requirements necessary to attain the highest level of audio quality for recording and professional mastering.

We have learned, through our years as the world's leading manufacturer of vacuum tubes (used by every leading audiophile and musical instrument company) as well as our 30 plus years as the world leader in quality and creative instruments (used on countless recordings and performances) that it is the components that are the foundation of quality sound. When each component is critical, there are no second best choices. We use the best.

We are proud to present you with a superior audio tool that is the result of brilliant designers, access to the finest components and a company that cares about sonic excellence. Your investment in the NY-2A will last a lifetime.

We came up with the best compressor ever made.

Rock and Roll,

Mike Matthews

## PRECAUTIONS FOR SAFE USE

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Please read the manual carefully, as it was written to help you understand the capabilities and system requirements of your new instrument. Carefully review the safety precautions as they not only ensure long and trouble-free life of your NY-2A, but also ensure your own long and trouble-free life. Instead of neatly tossing it to the side once it comes out of the box, keep your manual in a convenient place for quick reference.

The following instructions, on this page, are **WARNINGS** that must be followed:

- 1. Fluids and moisture:** Do not operate this, or any, electrical instrument near a water source. This is an instrument; do not place drinks or fluids on top of it. If any fluid is spilled into the NY-2A, immediately remove power and do not reapply until checked by a responsible service person.

# PRECAUTIONS FOR SAFE USE (Continued)

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- 2. Placement and ventilation:** The NY-2A is a rack-mount instrument and thus may be placed in a 3-space rack location. In this type of installation, it is recommended that a minimum of one rack space be left above the unit for ventilation. It may also be placed on a support or table that is designed to handle the weight, while still leaving an unobstructed space for proper ventilation. Proper ventilation ensures long life and far less stress on other nearby rack-mounted instruments. Vacuum tubes normally get hot and this is essential to their operation. Many other types of studio equipment can be far less heat-tolerant. Placement must be balanced and even. Rack fans may be necessary in highly populated racks. Again, keep all fluids away from the storage location. All bracket mountings must be able to bear the weight of the NY-2A as its minimum rating (26 lbs.). **Because there are 8 vacuum tubes used in the NY-2A, it is not only recommended but also seriously suggested that a minimum of one rack space (two if possible) be left open above the top of this instrument. The NY-2A gets hot on the surface. This is not a problem; as it is the result of the audio tubes utilizing their full voltage potential.**
- 3. Cleaning:** Extreme care must be taken when cleaning both the exterior and interior of the NY-2A. The exterior may be wiped down with a damp sponge and an extra mild detergent. Damp means slightly moist but not wet or saturated. Internal cleaning can best be done with a soft brush (such as a watercolor brush), and/or very focused and light suction. Dust-OFF, also works very well. **BE GENTLE** with **ALL** of the interior components, as if you were dusting priceless china. **UNPLUG THE INSTRUMENT** before any cleaning, exterior or interior.
- 4. Heat:** As suggested in note #2 above, the NY-2A generates heat because of the vacuum tubes and voltage regulation circuitry used within it. It gets hot! This does not impact the operation of the NY-2A if all precautions are adhered to. Covering the ventilation holes or enclosing the rack in a sealed cabinet will increase the ambient temperature significantly. If this occurs, the safety shutdown in the high voltage regulator will terminate power to the unit until the temperature returns to a normal operating range. In addition, the heat generated by this unit is most likely more of a problem for nearby equipment than it will ever be for the NY-2A. Proper ventilation will insure trouble-free operation.
- 5. Power Sources:** Utilize a grounded wall connector. When the unit remains unused for extended periods, disconnect the 3-pronged power cable from the outlet. Be careful that the power cord is out of the way and specifically away from traveled areas. When connecting or disconnecting the cable, grasp the plug firmly and push or pull. Do not pull from the cable. Make sure that your hands are dry with no moisture.
- 6. Service Situations:** The following situations must be **immediately** addressed when encountered.
  1. Damage to the power cord. Immediately shutdown and disconnect the power cable.
  2. Water or any fluids or material (any amount) that has fallen on the surface or the interior of the NY-2A. Immediately shutdown.
  3. Exposure to natural elements such as rain.
  4. Sudden impact of the instrument, such as dropping or a hard external impact.
  5. Sudden and noticeable differences in performance and consistency.
  6. Functional change where a marked difference in operation is noticed.

**In the event that any of the above occurs, do not attempt to restart until any potential damage is either found or ruled out.**

**Note: All electrical failures must be handled by an authorized service technician. Do not attempt user service. A qualified technician will handle it swiftly, accurately and correctly. For your safety and proper repair, call: Electro-Harmonix at 718-937-8300. Ask to speak with a service representative and you will be instructed on how to proceed. You must call in order to receive correct and prompt service.**

# SPECIFICATIONS

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- **Gain Reduction:** 45dB
- **THD+ Noise:** 20hz .437%, 100HZ .370%, 1K .383%, 10K .388% 25K .384%
- **Bandwidth:** 15hz- 40Khz
- **Gain:** max gain 53dB
- **Signal to Noise ratio:** greater than 65dB @ 0 dBu in / 0dBu out, greater than 80db @ 10dBu in/ +20dBu out.
- **Attack Time:** Depending on Light Source and De-emphasis, 10mS, 30mS, 50mS and 100mS
- **Decay Time:** Dependent on Light Source
- **Input Impedance:** 10K Ohms Balanced
- **Output Impedance:** 600 Ohms Balanced
- **Panel Size:** 19" x 5-1/4"
- **Chassis Depth:** 14.25"
- **Weight:** 25.7 pounds
- **Panel Controls:** Pre Gain, Compress, Post Gain, Light Source Select (x2), link, attack, squash, bypass, gain reduction, meter calibration, trim (x2), power
- **Metering:** Output Level (dBu), Gain Reduction / Magic Eye rapid ballistic EM-80 tubes
- **Tubes:** EH-1 (x2), EH-2 (x2), EH-3 (x2), EM80 (magic eye) metering tubes

# USING YOUR NY-2A

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## IMPEDANCE MATCHING FOR OPTIMAL PERFORMANCE:

In many situations the issue of impedance matching will not be a problem, however there are many home studios, (which may be first rate and professional in almost every aspect) that may not be set up for the correct 600 Ohm impedance that the NY-2A requires. All transformer-coupled equipment needs to be correctly terminated in order to get the best and most predictable performance. Peaking or “loading-down” of the NY-2A can result from ignoring this advice. This can add distortion, high frequency grunge, or ringing.

## INPUT

The input impedance is 10K Ohms and this easily connects to most professional and low-cost recording/musical equipment. Some “prosumer” and low cost signal processors, including “pedals” and mic preamps, are actually high impedance equipment (greater than 10K output impedance) and will be “loaded down” trying to drive the NY-2A. This will make for a distorted result with attenuated bass. A “line amp” or active direct box will be needed to best match this kind of equipment to the input of the NY-2A.

## OUTPUT

The output must also be terminated correctly in order to avoid peaking or spurious noise anomalies or distortion. The NY-2A has a nominal output impedance of 600 Ohms. This allows for long cable runs and good immunity from external noise sources.

The home recording studios of today have elevated to a level of sophistication that allows music to be created with excellent and professional sounding results. However, in many situations, even for those who use serious professional and semi professional equipment, an impedance mismatch problem is very possible. Many of today’s home mixers and equipment, in general, are not set up for a 600 Ohm load and indeed are made up of a random group of impedances. The vast majority of today’s equipment is op-amp coupled, often with higher impedances both at the input and output and “false” or “fake” balance (not actual balanced i/o). This can cause a variety of problems with the NY-2A. We suggest that the 600 Ohm load be switched in (this is located on the rear panel) if there is any doubt about termination. If your recording chain is already carefully matched and terminated, you will not want to do this as loading the NY-2A twice (two 600 Ohm loads in parallel will load the NY-2A down with 300 Ohms) can also cause some problems. Although chances are you won’t hear them!

## WHY IS THIS NECESSARY?

If the load on the transformer is too low (i.e., less than 600 Ohms), then the output transformer will be forced to source more current than the tubes are capable of delivering. This affects the frequency extremes and increases harmonic distortion. Less treble and bass, as well as a compressed (!) sound are the result.

# USING YOUR NY-2A (Continued)

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If the load impedance is too high, the transformer is under-damped. Some of the energy supplied by the tubes is stored in the transformer and released later at higher frequencies (this is called “peaking”). This will place an unwanted resonance in the signal path, which can and most likely WILL show up as audio artifacts, including distortion. The peaking not only adds a crispy edge but can also exaggerate clicks and pops when using the “BYPASS” switches. The NY-2A does not cause pops. That is one advantage of transformer-coupled equipment. But if there was a small DC offset in a previous piece of equipment (hard disk recorders and converters often have small amounts), that energy can be stored in the transformer coils only to be “peaked” into the following equipment when switching between the effect and true-bypass. This is pretty unlikely under most circumstances but it is still annoying if it happens to you. Terminating the output transformer with the 600 Ohms it is looking for will help prevent any of this.

A careful and correct impedance match will guarantee full bandwidth sound with the gorgeous compression that the NY-2A can produce.

## LEVEL MATCHING

Another important consideration for setting up your new compressor is making sure the NY-2A is getting the right amount of signal—neither too much or too little—to do its job. One of the problems for today’s recording work is that there are several formats and they are changing almost daily. The old “line level” or 0.707 VRMS for “0 VU,” still exists on some new consoles and most older ones. The 1.22VRMS “0dBu” format is of course the most common on analog boards from recent times. However, digital recorders and converters often put out 2-4 VRMS and up to 10VRMS (+18dBu). How does anyone accommodate such a wide range of input level? Once again, a quick look at the rear panel of the NY-2A will reveal switches for a 20dB input pad (10:1). If you are coming from a hard disk recorder, chances are you will want to make sure these switches are IN (in the up position).

The first gain stage in the NY-2A is a tube voltage amplifier (gain of 10) with a bias of not less than 2.2 Volts. This means that an RMS input voltage of greater than 1.6 Volts AC (2.2 V peak) will clip the output. You will notice that this bias level is perfect for the “line level” of the past, but a horror show if you were to try and squeeze the output of a converter in there. The close match is necessary for getting maximum gain on weaker signals, but easy to clip if you don’t pay attention. If you are using the NY-2A and hear a problem, please check to make sure the level matching is correct before assuming something is going wrong with the compressor.

# THEORY OF OPERATION

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The Electro-Harmonix NY-2A belongs to a class of signal processors known as “optical compressors.” Like any other compressor, the basic function is to provide a relatively constant output for a varying input. This description can be extended to include a certain timing to the onset and conclusion of the effect. This would be called the attack/decay time constant. Together, a range of dynamic changes can be added to a signal in order to limit or accentuate the relative amplitude. A Compressor reduces “dynamic range” so that a more consistent or more “forward” quality is added to a recording or performance. It can also add a percussive edge or soften the glare of plucked, struck or resonant instruments or voices.

As the signal level increases, the overall gain of a compressor decreases. In most modern circuits, a variable gain amplifier (VGA), an “active” design, is used to achieve this compression effect. This is most often accomplished by the use of a variable element in the feedback loop of a high gain amplifier. One difficulty for such circuits is that they have maximum gain at zero or at very small signal levels. Noise is also a small signal and it becomes amplified by the full gain of the VGA when no other signal is present. This makes for hiss (amplified white or “Johnson” noise), or occasionally even whoosh or rumble (amplified 1/f noise). Another problem is that the variable feedback element, the “active” part of the circuit, which controls the gain in the VGA, takes some finite amount of time to adjust itself. This means that short, quick transients are not handled equally as long, continuous phenomena. Basically, VGA based compressor designs often do not compress the high frequency signal content as much as the low frequency content. The larger the amount of compression, the more sibilance is added to the output. This in turn requires complicated “de-essing” circuitry to counter-balance the effect. In summary, many popular VGA based compressors sound very different between low and high amounts of compression.

The “optical compressor” takes another route to achieve the compression effect. The heart and soul of this approach employs two simple components that together create a passive attenuator, much the same as a volume control. These components are the photocell and the lamp. Photocells are components that exhibit a resistance to the flow of electric current dependent upon how much light they are exposed to: more light means lower electrical resistance, less light means more resistance. By closely arranging a light source to a photocell and then isolating the pair from ambient light, we create a third new component known as an “opto-coupler.”

A passive attenuator made with an opto-coupler is like a volume control with light twisting the knob instead of your fingers. In an optical compressor, we combine an opto-coupler/attenuator together with a lamp driver and a fixed gain amplifier. As the signal level increases, the lamp driver illuminates the photocell. The resistance of the photocell decreases, shunting more of the signal away to ground. This, in turn, lowers the output. A varying signal varies the amount of attenuation in inverse proportion to the input. The combined effect is that the signal level is kept more or less constant. Because all attenuators possess some insertion loss, we need some gain to make up for the loss. This is achieved by a fixed gain amplifier, which, unlike a VGA, behaves the same for any signal level.

The characteristics of the photocell/light source combination are what determine the attack/decay time of the attenuation and any frequency dependent changes to the signal. The Electro-Harmonix NY-2A has three selectable opto-couplers, which present the user with a range of options. The LED opto-coupler has the fastest attack time (about 10mS) and a flat frequency response. It can be saturated so that some bite can be added if desired. The Incandescent lamp opto-coupler has the slowest attack time and also



# THEORY OF OPERATION (Continued)

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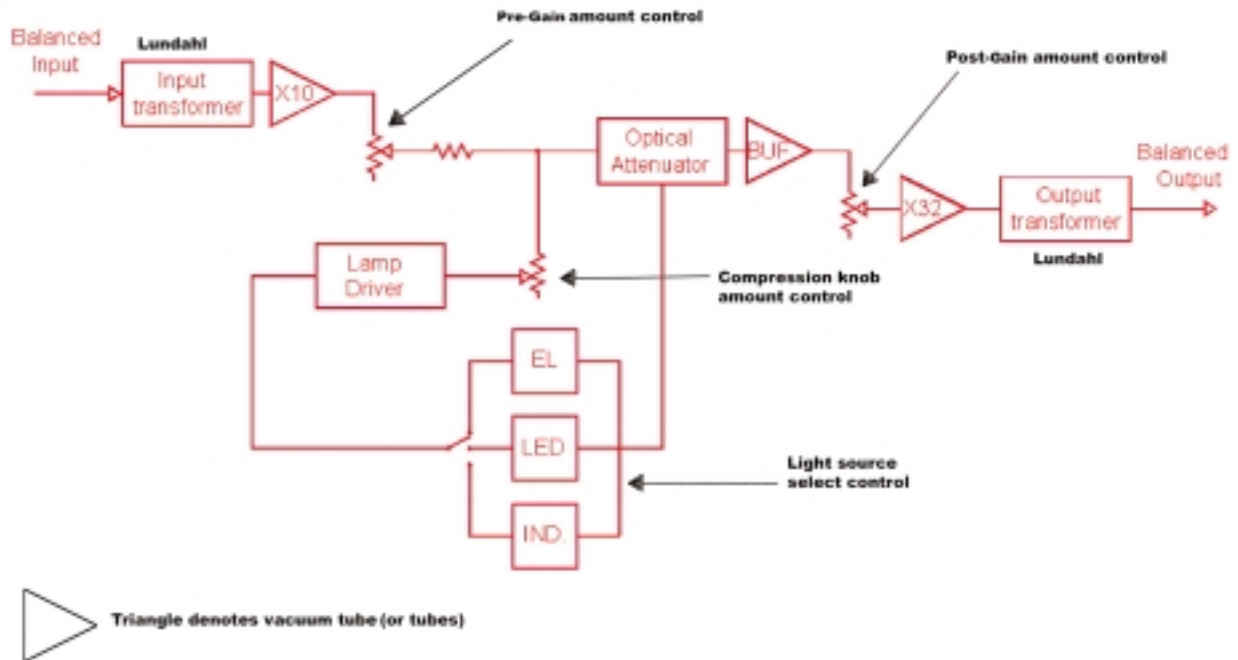
has a little kink in the response. By switching in the attack selector, this can be slowed down a bit more. It responds slower to higher frequency signals than the LED, thus adding some brightness to the result. It is difficult to saturate and very clean, unless intentionally overdriven. Finally, the Electro-luminescent panel optocoupler has an interesting frequency dependent characteristic. EL lamps change color with frequency. Photocells have a range of sensitivity but most chemistries peak in either the red/yellow range or in the blue/ultraviolet. Most EL lamps go from yellow green at low frequencies (30 – 60 Hz) to blue (300 – 600 Hz) to purple (2 to 20 KHz). Additionally, EL lamps produce less light at low frequencies, more in the middle, and most at the top until the capacitance of the lamp lowers the impedance to a short circuit somewhere around 80KHZ. The right choice of lamp, together with a spectrum sensitive photocell, will create a natural “de-essing” circuit that compresses high frequencies more than low. This is excellent for vocals and for loud blaring electric guitar. The EL opto-coupler in the NY-2A has 2 settings: normal, which is generally flat except for a small bump in the bass, and squash, which compresses the top more.

The point at which the compression effect begins is known as the threshold. In the NY-2A, this is controlled by two means: the pre-gain control and the compression control. When the signal level is below the threshold, the unit behaves as an amplifier with a fixed gain. Above the threshold, the gain reduction begins, peaking just before the saturation of the photocell at maximum opto-coupler illumination. The NY-2A has a FIXED THRESHOLD and a VARIABLE INPUT. This is crucial to understanding how to best adjust your compressor to get the right amount of effect where you need it.

The fixed gain amplifier in the NY-2A is, in some ways, a classical tube preamp architecture. However, the components used are very special. The noise level and linearity are optimized without the use of any error correction or negative feedback at all. This makes for high-performance, beautiful sound while maintaining an inherently stable gain block that gives new meaning to the idea of “the sound of tubes.” We could not have achieved this with standard tubes or transformers. The overall level is adjusted with the post-gain control on the front panel. This gain block is completely independent of the opto-coupler attenuator and will not change its characteristics unless intentionally overdriven. We have left that possibility for creative use of the distortion in special circumstances.

# INPUT TO OUTPUT FLOW CHART

Block Diagram flow chart from input to output of one channel of the NY-2A



## One Channel

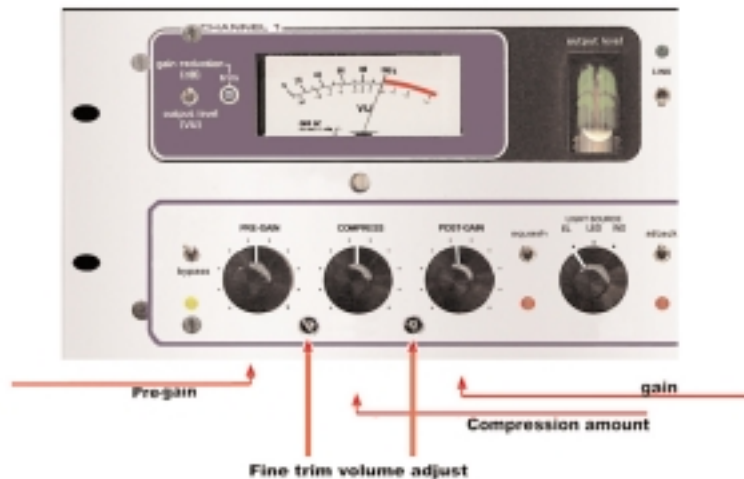
The balanced signal enters into the input transformer (Lundahl) where it is converted to a single ended signal, which is then amplified by a factor of 10 by the first section of tube (EH1), which is a dual triode.

The signal can then be adjusted with the **Pre-Gain** knob on the front panel. At this point the signal is then split and sent to the lamp driver and the optical attenuator. The **Compress** knob determines the amount of signal applied to the lamp driver. The three-way switch (light source) allows for the selecting of the opto-coupler of your choice.

After the optical attenuator, the signal is buffered by the second section of the **EH1** vacuum tube. The signal is then matched to the fixed gain block with the **Post-gain** control knob and its resultant adjustment determines the amount of signal to the final pre-amp tubes (**EH2 and EH3**). It then enters the Lundahl output transformer from where it exits the instrument stage left.

# FRONT PANEL

The NY-2A is a two-channel compressor that can be used independently or in stereo.



## Controls and Switches

**PRE-GAIN:** This control establishes the signal level applied to the gain reduction circuit. Together with the various opto-coupler combinations, this will adjust the amount and threshold of compression. It is possible to add more gain than necessary for the extreme settings of this control and thereby limit or even add some distortion for some unusual effects. However, more conventional use will match the input level to achieve the desired amount of compression.

**COMPRESS:** This control is as obvious as it sounds. Set at the maximum counter-clockwise rotation, it applies a minimum of gain reduction. Set at the maximum clockwise rotation, the opposite occurs. Together with the **Pre Gain** Control, this will adjust both the threshold and the total amount of compression.

**POST-GAIN:** This control operates completely independently of the gain reduction circuitry. It is used to match the input level and gain reduction to an appropriate output level for recording or further signal processing.

**LIGHT SOURCE SELECT:** This control gives the option of three different opto-coupler (light source/photocell) combinations. The NY-2A is unique in this respect as no other "Optical Compressor" currently on the market offers this flexibility. An **Incandescent** lamp, an **LED** and an **Electro-luminescent** lamp can be selected via this rotary switch.

**TRIM ADJUST SCREWS:** These two controls are found on the lower right of the Pre-gain control and the lower left of the Post-gain control pots. These allow for fine-tuning the absolute balance between the amounts and present the ability for absolutely perfect balance between the setup of the left output and the right output. Absolutely necessary for mastering and all critical audio applications.

# FRONT PANEL (Continued)



**BYPASS:** This switch activates a relay near the input XLR connectors that bypasses the compressor channel selected and routes the input directly to the output. The NY-2A is true “straight-wire” bypass.

**SQUASH:** This switch activates the high frequency shelving for the **EL panel**.

**ATTACK:** This switch activates the longer time constant for the **Incandescent lamp**.

**LINK:** This switch activates the stereo link feature.

**GAIN REDUCTION/OUTPUT LEVEL:** This switch chooses between metering functions.

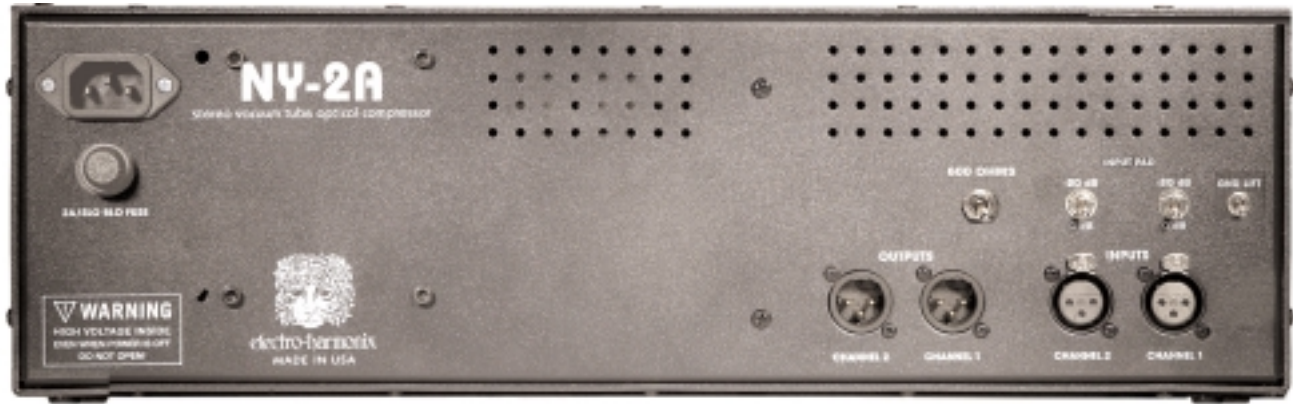
**GAIN REDUCTION TRIM:** This control adjusts for differences in input/output level for visually monitoring compression via the analog meter.

**VU/GAIN REDUCTION METER:** The ballistics for this meter are classic “VU.” Full scale is 1.22 VRMS (balanced out) across 600 Ohms (100dBu). This is calibrated at the factory internally and can be readjusted periodically for tube changes or preference (some have adjusted it for +4dBu). In the gain Reduction mode, the meter shows relative compression (non-calibrated). The ballistic, like all VU meters, is much, much slower than the actual response time for the compressor. However, as a visual aid for “seeing” how little or much work the compressor is doing, it is very useful.

**OUTPUT LEVEL “MAGIC EYE”:** This classic but highly practical metering aid only shows output level. It is also calibrated to “close” at 100 dBu. However, the ballistic is much faster than the VU meter so that the actual response of the compressor can be monitored. This will show short instantaneous clipping or overload conditions the meter will not.

**POWER:** This switch powers up the compressor.

# BACK PANEL



The back panel offers balanced XLR input and output jacks. The input XLR jacks are accompanied by a pair of switches that may be set to allow the selection of a 20 dB pad or to the default 0 dB position.

The upper switch on the upper right lifts the ground of the NY-2A.

The upper left hand switch allows you to switch out of the 600 ohm (default termination) allowing the serious home studio user a termination that is more compatible to mixed equipment that was not designed for the professional studio.



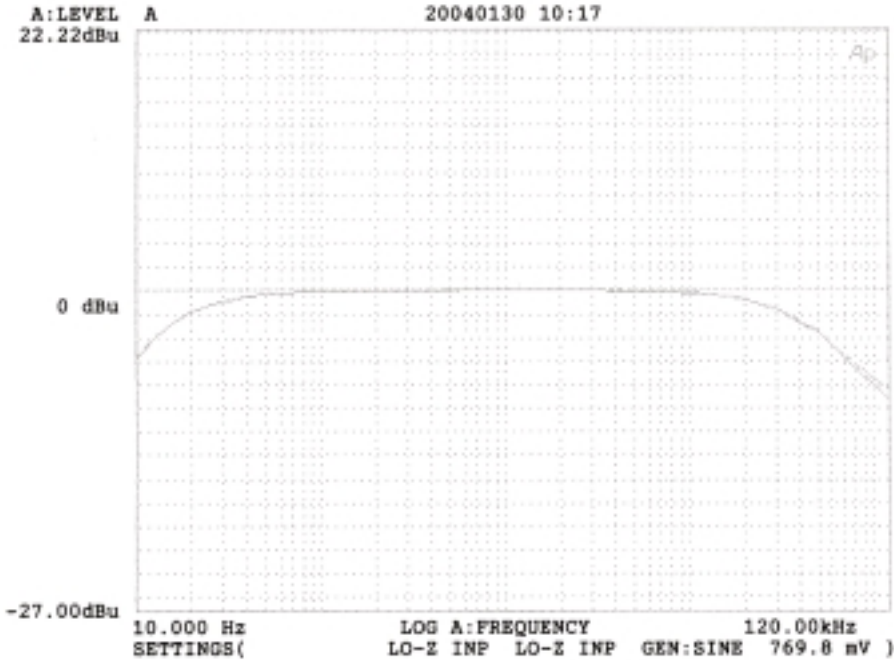
The back panel also contains a fuse holder (2 amp SloBlo) as well as a switch to operate the ground lift. The power connector is a standard 3 pin male plug.

# AUDIO PRECISION GENERATED SPEC GRAPHS

All specifications were done on the Audio Precision model Portable One Dual Domain test measurement instrument. The following graphs and specifications were developed by randomly removing one instrument after assembly.

## Frequency Response

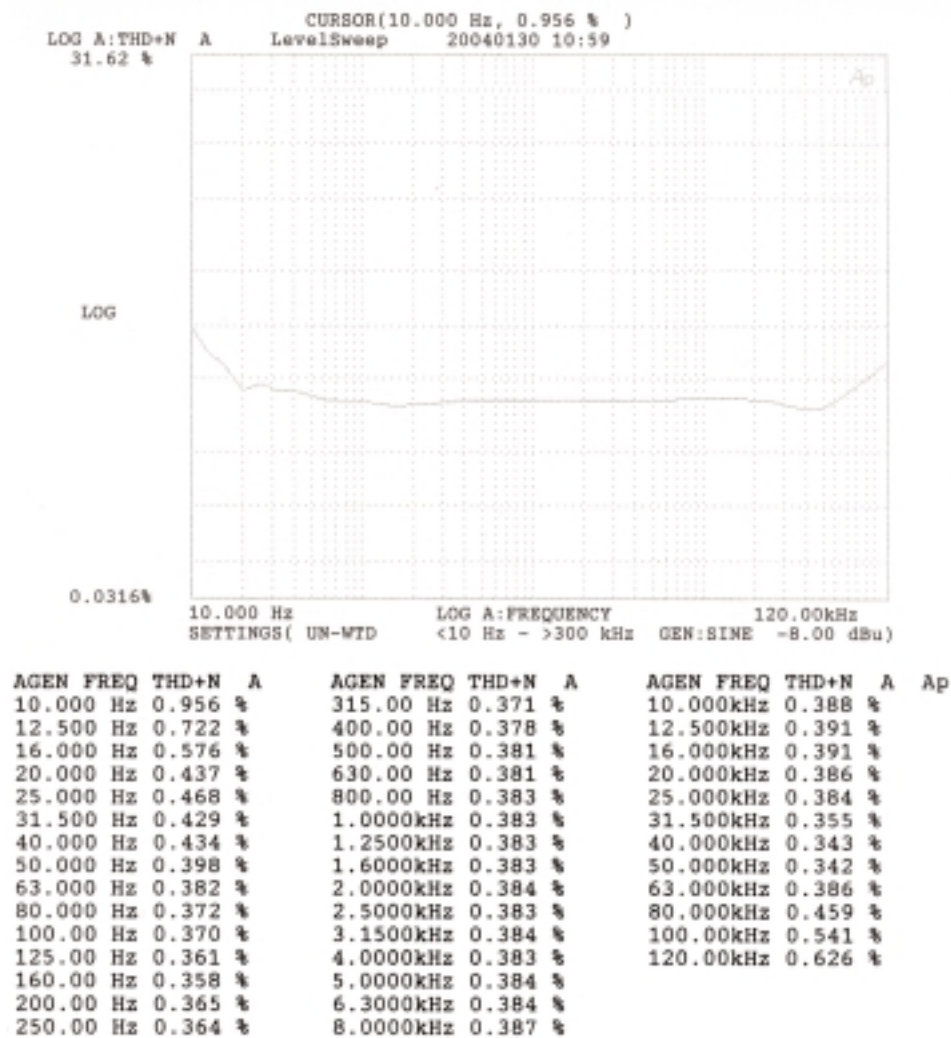
Bandwidth was determined by sweeping a frequency shift from 10hz to 120khz into 600-ohm impedance.



AGEN FREQ	LEVEL	A	LEVEL	B	AGEN FREQ	LEVEL	A	LEVEL	B	Ap
10.000 Hz	-5.84	dBu	-5.74	dBu	1.6000kHz	0.00	dBu	0.00	dBu	
12.500 Hz	-4.04	dBu	-3.97	dBu	2.0000kHz	-0.01	dBu	0.00	dBu	
16.000 Hz	-2.64	dBu	-2.59	dBu	2.5000kHz	-0.01	dBu	0.00	dBu	
20.000 Hz	-1.78	dBu	-1.75	dBu	3.1500kHz	-0.02	dBu	-0.01	dBu	
25.000 Hz	-1.19	dBu	-1.18	dBu	4.0000kHz	-0.03	dBu	-0.02	dBu	
31.500 Hz	-0.79	dBu	-0.77	dBu	5.0000kHz	-0.06	dBu	-0.04	dBu	
40.000 Hz	-0.52	dBu	-0.51	dBu	6.3000kHz	-0.09	dBu	-0.07	dBu	
50.000 Hz	-0.35	dBu	-0.35	dBu	8.0000kHz	-0.15	dBu	-0.12	dBu	
63.000 Hz	-0.24	dBu	-0.23	dBu	10.000kHz	-0.22	dBu	-0.20	dBu	
80.000 Hz	-0.17	dBu	-0.17	dBu	12.500kHz	-0.34	dBu	-0.31	dBu	
100.00 Hz	-0.12	dBu	-0.12	dBu	16.000kHz	-0.54	dBu	-0.51	dBu	
125.00 Hz	-0.09	dBu	-0.09	dBu	20.000kHz	-0.81	dBu	-0.77	dBu	
160.00 Hz	-0.07	dBu	-0.07	dBu	25.000kHz	-1.22	dBu	-1.15	dBu	
200.00 Hz	-0.05	dBu	-0.06	dBu	31.500kHz	-1.82	dBu	-1.72	dBu	
250.00 Hz	-0.04	dBu	-0.05	dBu	40.000kHz	-2.74	dBu	-2.55	dBu	
315.00 Hz	-0.03	dBu	-0.04	dBu	50.000kHz	-3.55	dBu	-3.60	dBu	
400.00 Hz	-0.03	dBu	-0.03	dBu	63.000kHz	-4.94	dBu	-4.94	dBu	
500.00 Hz	-0.02	dBu	-0.03	dBu	80.000kHz	-6.52	dBu	-6.18	dBu	
630.00 Hz	-0.01	dBu	-0.02	dBu	100.00kHz	-8.06	dBu	-7.46	dBu	
800.00 Hz	-0.01	dBu	-0.01	dBu	120.00kHz	-9.26	dBu	-8.38	dBu	
1.0000kHz	-0.01	dBu	-0.01	dBu						
1.2500kHz	0.00	dBu	-0.01	dBu						

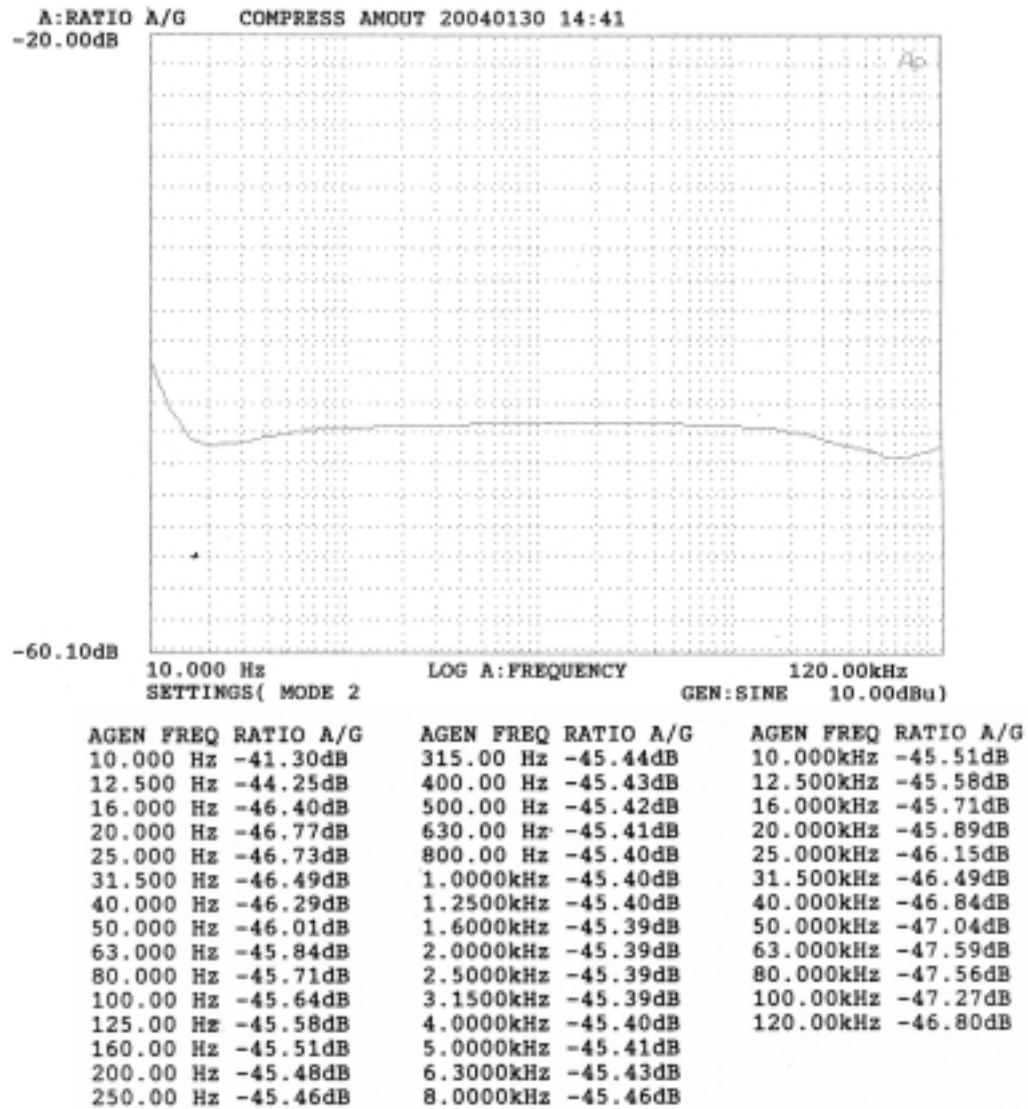
# THD (Total Harmonic Distortion)

The THD was determined by a 10hz to 120Khz sweep at 0db in to the NY-2A



# Compression Amount

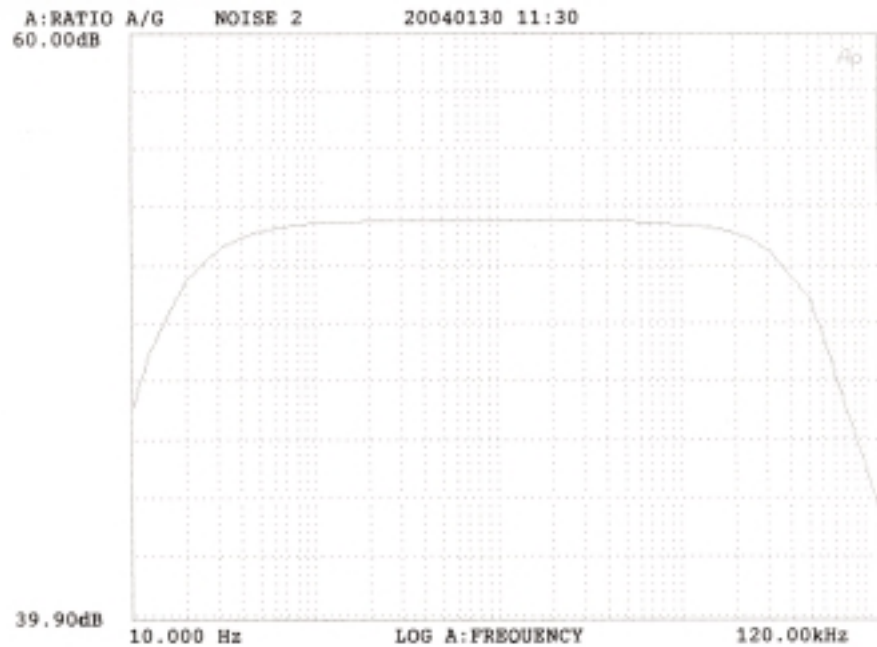
Compression amount in dBs. 10hz to 120Khz sweep +10dBu into the NY-2A





## Maximum Gain

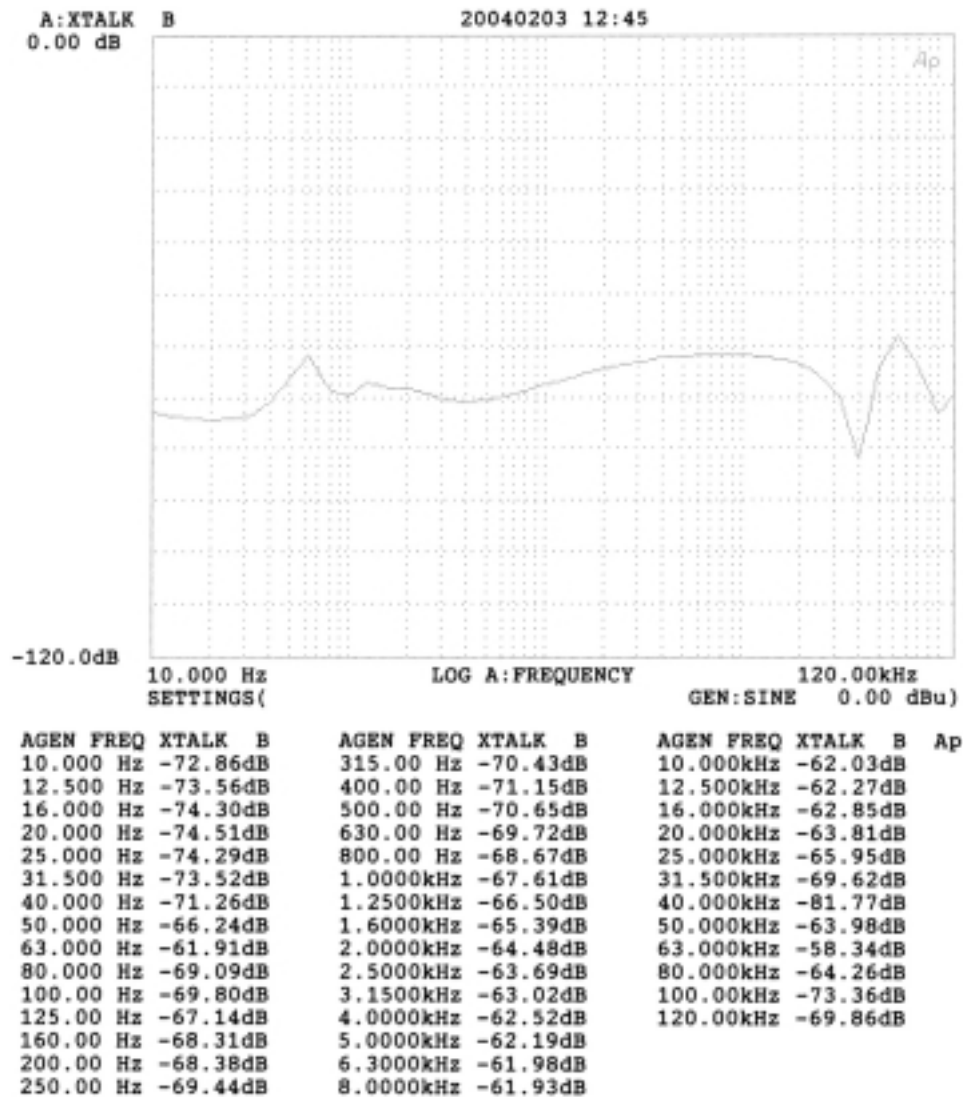
Maximum gain through the NY-2A with pre-amp volume at max and Post-gain volume at max with the compression off.



AGEN FREQ	RATIO A/G	AGEN FREQ	RATIO A/G	AGEN FREQ	RATIO A/G
10.000 Hz	47.03dB	315.00 Hz	53.51dB	10.000kHz	53.40dB
12.500 Hz	48.91dB	400.00 Hz	53.51dB	12.500kHz	53.34dB
16.000 Hz	50.46dB	500.00 Hz	53.52dB	16.000kHz	53.23dB
20.000 Hz	51.45dB	630.00 Hz	53.52dB	20.000kHz	53.08dB
25.000 Hz	52.14dB	800.00 Hz	53.52dB	25.000kHz	52.83dB
31.500 Hz	52.62dB	1.0000kHz	53.52dB	31.500kHz	52.41dB
40.000 Hz	52.94dB	1.2500kHz	53.53dB	40.000kHz	51.59dB
50.000 Hz	53.14dB	1.6000kHz	53.52dB	50.000kHz	50.88dB
63.000 Hz	53.28dB	2.0000kHz	53.52dB	63.000kHz	49.19dB
80.000 Hz	53.36dB	2.5000kHz	53.51dB	80.000kHz	47.18dB
100.00 Hz	53.42dB	3.1500kHz	53.51dB	100.00kHz	45.15dB
125.00 Hz	53.45dB	4.0000kHz	53.50dB	120.00kHz	43.57dB
160.00 Hz	53.47dB	5.0000kHz	53.49dB		
200.00 Hz	53.49dB	6.3000kHz	53.47dB		
250.00 Hz	53.50dB	8.0000kHz	53.44dB		

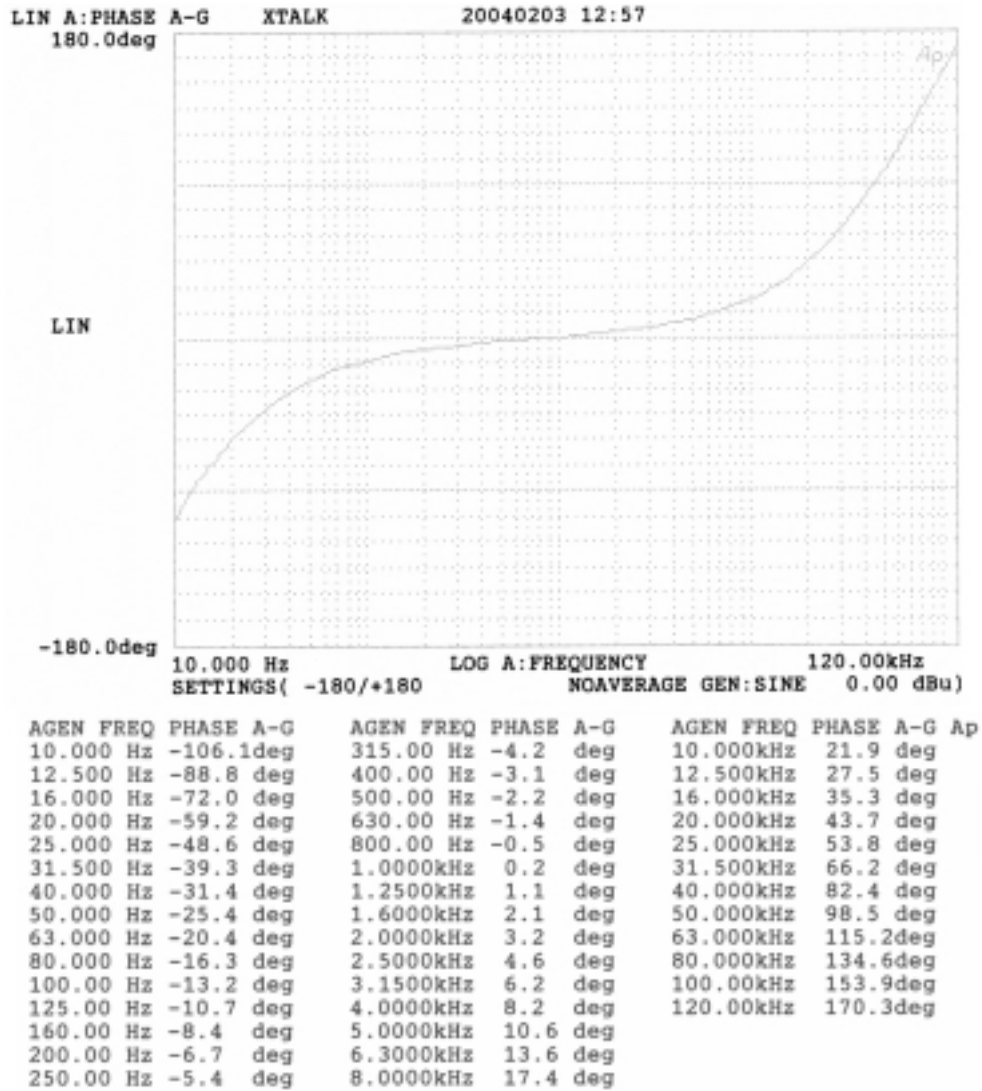
# Cross-Talk Measurement

Measured at 0 dB at the input and the output off.



# Phase Response

Phase measurement Channel 1 output compared to generator's output.



## Regarding Tests

When the Audio Precision allowed for stereo testing it was done in that mode. When it could only be done by using a single channel at a time, both left and right were done independently. For the purpose of manual space, in those situations only one side of the test is shown. We did this because the differences of test results were in the .000 range. We will be happy to provide you with channel one and two test graphs on request. Additionally, every applicable test parameter was done. If you would like test graphs that display parameters not listed here, then upon request, they will be provided.

# TROUBLESHOOTING TIPS

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Some of the most common difficulties we have seen users experience with the NY-2A are explained below. As with any new piece of equipment, it takes time to learn how to use and miss-use the capabilities to their fullest. Patience and careful re-reading of this manual can help you avoid most problems.

- 1. Hum:** Please check the cables and source equipment first. Once you have eliminated them as the problem, try switching the ground lift switch (located on the rear panel) in or out and see if this has a positive effect. You may need to ground the first piece of equipment in the recording chain and lift each following unit using a 3-prong to 2-prong AC adapter (available at any hardware store). If the hum can be isolated to the NY-2A, have a qualified technician check it out. Because the audio inputs and outputs are transformer-coupled, it is very unlikely the NY-2A will cause hum in other equipment unless there is an internal power problem, something that will require a skilled repair.
- 2. Noise or distortion:** First of all, check to be sure that a loading mismatch or level mismatch is not responsible for the problem. Does the 600-Ohm Load need to be switched in or out? Is the source equipment clipping the front end with too much signal? Is the input pad switched in or out? Try each one of these steps before blaming the compressor. It is easy to forget one “dumb” switch. If none of the above fixes the problem, its time to suspect the cables and the source. Try switching the cables. If the problem is only in one channel, and it moves with the cables, there is your problem. If you can isolate the problem to the NY-2A, it is best left to a qualified technician.
- 3. High frequency glare or resonance:** This is, almost guaranteed, a loading mismatch or clipping the front end. Make sure the 600 Ohm switch is “in” and that the input level is not clipping the front end.
- 4. No compression effect:** Is there enough signal to get above the threshold? To test this, start with all of the controls at minimum (completely counter-clockwise). Make sure the Bypass switch is OFF (no green LED). Make sure the meter switches are on “VU.” Switch the Light Source selector to LED. Turn the Pre-Gain control to maximum (completely clockwise). Then, turn the Post Gain control three or four clicks (roughly 8 o’clock). Put some signal through the compressor and make sure there is a good solid deflection of the meter somewhere around 0VU (more or less). Then, turn the Compress knob to maximum (completely clockwise). Do you see a large reduction in gain? Yes means the compressor works fine. Change to the other light sources. Does the gain reduction decrease some? Good! All? No good. If one of the light sources has no gain reduction, contact a qualified technician. If they all work, start over and set up your levels properly to get the required effect.
- 5. Too “hot” input, or, “the knobs are always either almost completely on or off to get the correct effect”:** Depending upon where the threshold is and how much compression you use, it may be a trivial thing, and correct besides, for the Pre gain and Compress knobs to be nearly full on or almost off. There is a strange prejudice in the business of audio gadgets to imagine the knobs always set to “true north,” “12 o’clock noon,” “middle of the pot,” etc... Also, if you are using a small amount of compression, it makes perfect sense that the make up gain required (set by the Post Gain control) would be small. Don’t worry about where the knobs wind up if you get the effect you need! The easiest way to work with the NY-2A is to set up the compressor with the rough levels using only the Pre Gain and Compress knobs, and then add make up gain with the Post Gain control. In other words, start with the Post Gain down LOW. Make sure that your hands are dry with no moisture.

# TROUBLESHOOTING TIPS

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- 6. I hear a mechanical hum coming from the NY-2A, even though there is no hum in the audio signal:** The NY-2A is a vacuum tube device. Vacuum tubes have very different power requirements than solid-state designs and almost invariably have a power transformer to produce the various currents and voltages required. Those familiar with older tube equipment will be very aware of this. One of the big differences between the way the NY-2A is designed and most other tube equipment made these days is that it runs the tubes hard... with a high quiescent operating current. Deep Class A, as we say. There are six vacuum tubes run this way in the NY-2A, plus the “magic eye” indicators. The heater currents drawn by eight tubes, plus the mains currents, all add up – to somewhere close to a typical tube power amp! Not your everyday compressor, in other words. This puts demands on the power transformer. The power transformer in the NY-2A is not a cheap piece of bumper steel. It is made with M6 lams and is a beast. However, no matter the degree of beastliness, high current, wire and iron will still produce a physical effect known as "magnetostriction." This causes the wire windings to move at the frequency of the alternating current, 60Hz in the States and 50Hz in much of Europe. That is the source of the mechanical hum you hear in the NY-2A. If the unit is mounted in a rack, you will not hear it, most likely. But if the unit is sitting on top of the mixing console, chances are you will. This will not add anything to the signal, but can still be annoying if you are sitting next to it. Please consider this when installing the NY-2A
- 7. I hear a ringing sound when I operate the switches:** A tube that has “gone microphonic” causes this. All tubes are somewhat microphonic and you can hear this by lightly tapping the tubes with your fingernail or a ballpoint pen (this is the correct way to test for microphonics). But there is a relative level of acceptable noise. If it is causing a problem, you can change the tube. Sometimes this noise can be damped by adding a 7/8" Neoprene, “O” ring, available at most car parts stores. This is a cheap and sensible addition to any tube preamp and there are many other kinds of more expensive and fancier after-market vibration dampers if this seems too simple. Neoprene, by the way, is a high temperature synthetic and has no problem handling the heat.

**JC Morrison**  
**Senior design engineer**  
**Electro-Harmonix**

# USER SHEETS FOR PRESET STORAGE

Please photocopy for your own reference.

DATE \_\_\_\_\_

ARTIST/TRACK \_\_\_\_\_

ENGINEER \_\_\_\_\_

PRODUCER \_\_\_\_\_

