



Fredenstein
Professional Audio

MAGIC PRE

Rev. A

Operating Manual

Fredenstein Magic Microphone Preamplifier

The MAGIC PRE microphone preamplifier's most obvious feature is the green glowing “magic eye” vintage vacuum tube for output level indication. The “Magic Eye” tube is perhaps the most attention grabbing visual feature of this preamp and something everybody notices in any rack. Besides being just fun and another way to impress clients, this visual treat complements the rich vintage character of the preamp. The “eye” closes near optimal output levels.

The preamp follows what may be thought of as a very traditional topology that uses both an input transformer and an output transformer. Both are high quality American made transformers. The steel-core output transformer in particular is a very important sound shaping component which helps produce a smooth vintage sound without being dark or just “mid-rangy” or mushy.

A single discrete amplifier is used for the active gain element and there are no chip based amplifiers in the signal path. To achieve an unusual high level of performance the circuit is based on our OPA2 discrete audio operational amplifier. As in all Fredenstein products, the OPA2 is not a copy of an older design, but is a completely new design manufactured in SMT technology with matched and integrated dual input transistors to guarantee vastly improved specifications compared to older designs. The OPA2, in the tradition of similar modules, is socketed and can be exchanged without tools. The industry standard pin-out makes it compatible with many other amplifier modules.

A 2 MOhms high impedance direct input is located on the front-panel, it accepts unbalanced signals, the rear microphone input is automatically disconnected when a plug is inserted in the DI connector.

The features include a maximum gain of 70 dB, a 20 dB Pad, and Phantom-Power support, plus a new feature simply labeled “Color”. The “Color” switch is intended to produce some tube-like harmonic content that, while not calling attention to itself, can bring some sounds to life and bring them forward in the mix and seem to make them sound more detailed and dimensional. While the color circuit does increase distortion, the audible effect is subtle enough that few people would ever describe the effect as “distorted”.

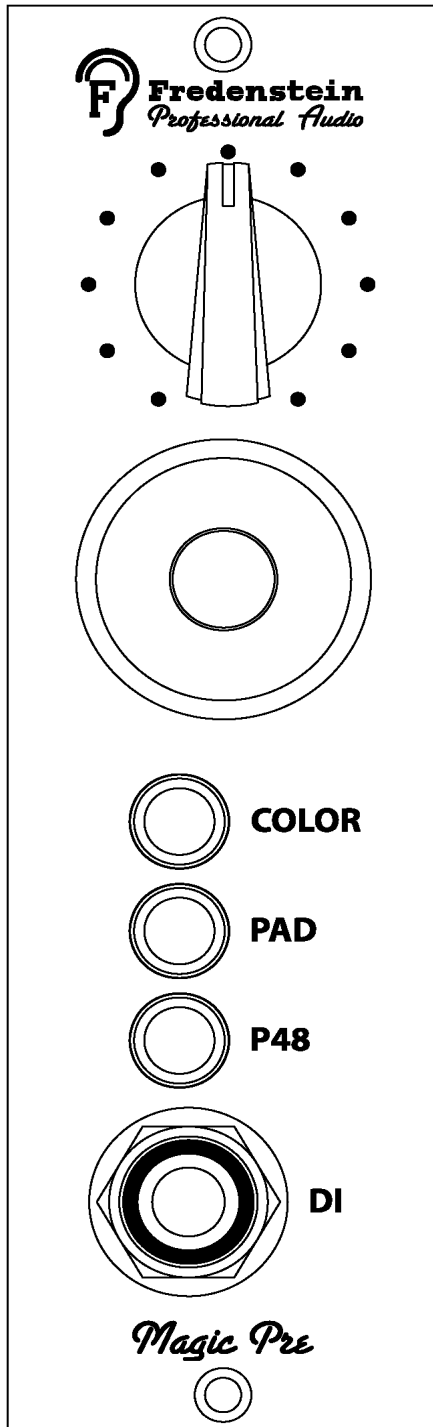
As all Fredenstein products, the Artistic Pre is designed by a German-American team and manufactured in Taiwan.

Installation:

Please power down your rack or box first before inserting the Artistic Pre. The power requirements are fairly demanding at a maximum of +100mA,-160mA and Artistic Pre may need to be mounted in racks capable of supplying sufficient power, such as the Fredenstein Bento series.

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Overview:



Rotary Control:

GAIN : Gain Control, minimum +15 dB (with PAD), maximum +70 dB

Magic Eye Level Indicator: -15 dBu to +15 dBu

Switches:

COLOR : when lit green, adds harmonics

PAD : -20 dB Input Attenuator when lit amber

P48 : +48 Volt Phantom Power when lit red

DI : High Impedance unbalanced Input

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Gain Control:

Microphone Preamplifier Gain Control, minimum +35 dB, maximum +70 dB without PAD engaged, minimum +15 dB, maximum +50 dB with PAD.

Magic Eye Level Indicator:

This is a vintage 6E5C vacuum tube that is designed to display optimum signal conditions. In this case, we use it to show the mic preamp output level. The “eye” is wide open (about 90 degrees unlit and 270 degrees softly glowing green) when there is no signal and begins moving 30 dB below DFS or clipping (-15 dBu output). The “eye” closes as the signal level increases and the two edges gradually approach each other until they overlap slightly. Where they don't quite overlap or where the “eye” closes completely represents +15 dBu typically and is analogous to a bar graph meter going into the yellow. This may be considered a near optimum level. When there is noticeable overlap, consider it similar to going into the red and maybe levels may be too hot. Keep in mind, that this indicator is not precise and for true precision you should rely on the meters of your A to D converter, and the Magic Eye indicator is a *visual* tool and for optimal *audio* performance one might be advised to always use one's magic ears. With a few minutes of practice, you should find the Magic Eye tube to be about as useful as most meters and more fun than most.

Color:

When lit (green), introduces a careful blend of added harmonic content into the signal path. This is somewhat intended to simulate the behavior of choice vacuum tube circuits. In this case, the balance of harmonics has been carefully tailored, beyond what tends to happen with tubes or valves. The overall amount of harmonics does depend on level (via the Gain Control knob) and the Magic Eye tube can be used to help dial in the amount that you tend to prefer. Of course, when you can, dis-engage the Color switch to compare and check by ear. It is like cooking with spice, somewhere between too little and too much is just the right amount, so use the Gain Control accordingly.

PAD – Input Attenuator:

Setting the PAD switch (orange light) activates a 20dB attenuator at the input allowing higher level signals to pass through the preamplifier (note: Pad is affecting the DI input as well). Many modern condenser mics have very hot output levels and the PAD can help prevent clipping. The minimum gain changes from +35 dB to +15 dB

P48 Phantom Power:

Most FET condenser microphones as well as some other microphones with built-in amplifiers require +48V Phantom Power. Setting the P48 switch (red light) enables +48V through the balanced microphone line. Please check your microphone documentation if you are not 100% sure. Enabling P48 on microphones not designed for P48 might cause severe damage to the microphone. The DI input is not supplied with Phantom Power.

DI – Direct Input:

The most common use for the DI input is to connect instruments like guitars directly to the Magic Pre. The input impedance is greater than 2 MOhms to insure compatibility with most instrument pickups. After inserting an unbalanced (Tip-Sleeve) plug, the balanced microphone input through the box or rack is automatically disabled.

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Technical Data:

Frequency Response :	20 Hz – 40,000 Hz, +/- 1 dB
Distortion 1kHz :	< 0.03% at +4 dBu output level < 0.015% at +20 dBu output level < 0.04% at +26 dBu output level (clips at +28 dBu)
50Hz :	< 0.08% at +4 dBu output level < 0.08% at +20 dBu output level
10kHz :	< 0.02% at +4 dBu output level < 0.05% at +20 dBu output level
Input Noise :	< -127 dB
Input Impedance :	> 1600 Ohms
DI Impedance :	> 2 MOhms
Max. Input Level :	+ 10 dBu, Pad activated
Max Input Level DI :	+ 18 dBu unbalanced
Output Impedance :	600 Ohms
Max. Output Level :	+ 26 dBu
Input Attenuator :	- 20 dB (switchable)
Maximum Gain (XLR) :	70 dB
Minimum Gain :	35 dB
Minimum Gain 20 dB PAD engaged :	15 dB
Maximum Gain (DI) :	42 dB
Minimum Gain :	8 dB
Minimum Gain 20 dB PAD engaged :	-12 dB
Current draw :	+100mA, -160mA
Color Engaged Distortion :	approximately 0.1% at -10 dBu output level approximately 1% at -5 dBu output level approximately 3% at 0 dBu output level approximately 4.5% at +24 dBu output level
Frequency Response :	20 Hz – 20,000 Hz, +/- 1 dB

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