

ClassAmp[®] M-2

UNIQUE AMONG MICROPHONE / TRANSDUCER PREAMPLIFIERS
REVOLUTIONARY IN DESIGN, UNEXCELLED IN PERFORMANCE



An exciting breakthrough: the remote controlled precision microphone preamplifier. Pristine analogue preamplification for critical applications with optimal transfer of audio signals over hundreds of meters.

- ♪ Massively improved signal transmission from microphone transducer to mixer or recorder
- ♪ Ideal for multi-channel & surround recording
- ♪ Precision remote controlled gain, phase and bypass
- ♪ Unique non-VCA remote gain control which guarantees pristine audio quality
- ♪ Proprietary design utilizing discrete enhanced Class A circuits
- ♪ Wide impedance selection allows optimal matching to any microphone or transducer
- ♪ Superb symmetrical balancing of signal lines
- ♪ Superb interference and RF rejection of 100dB(!) over full frequency range
- ♪ Entirely crafted with hand-matched and listener selected semiconductors
- ♪ Six ClassAmp[®] M-2's can be controlled by a single FM 120 ClassAmp[®] remote control unit (which also provides current and phantom power)
- ♪ Excellent headroom reserve (+26dBu)
- ♪ Immune to usual cable loading effects and loading induced by the following stages. The ClassAmp[®] M-2 drives audio signals perfectly, even when extremely long cables are connected
- ♪ Output level capability of +28dBu
- ♪ Instant automatic bypass. Operation continues even with accidental power supply disconnection or mains dropout
- ♪ 180° polarity inversion switch (perfect phase inversion without any additional circuitry)
- ♪ Phantom supply is precision stabilized for optimal performance of microphones; "better phantom supply = better sound"
- ♪ Specially-made, shielded multicore cable provides remote control signals, power, phantom supply, true balanced audio signal and guarantees optimal transfer in a single, compact and highly flexible cable
- ♪ Ideal for critical industrial applications

Usual remote controlled microphone preamplifiers use VCA's, relays, photocouplers, IC's, etc. all of which detract from audio quality. A tremendous improvement is now possible with the *ClassAmp*[®] M-2, which provides full remote facilities without compromising audio quality.

The microphone preamplifier remains a weak link in the signal chain. Most are made of an op-amp and sometimes a couple of transistors. The sound quality is less than satisfactory, yet they are found in many of today's preamplifiers and mixing desks.

FM ACOUSTICS follows a different approach: Sophisticated, totally discrete, balanced circuits based on FM ACOUSTICS' proprietary enhanced Class A technology to achieve a breakthrough in microphone preamplification. The result is the most accurate preamplifier available in the industry.

The Remote Control Unit comes in a 19" rack convenient for the engineer, or in the studio, or on stage etc. The *ClassAmp*[®] M-2 itself is located almost invisible, close to the microphone. This provides massive advantages.

No compromises are tolerated in the design and manufacturing of the *ClassAmp*[®] M-2. Results include absolute transparency, much cleaner amplification and high level signal transfer, better RF rejection, perfect signal balancing and practical elimination of cable loss.

By essentially rendering the microphone to mixer/recording system immune to interference, hum and noise, an astounding improvement in definition is achieved.

All of this comes with the inclusion of precision remote gain, phase and bypass and other facilities.

The *ClassAmp*[®] M-2 also excels in further areas:

Features and characteristics of the *ClassAmp*[®] M-2

- Ultra low noise results in truly quiet, perfectly-linear pre-amplification with superior signal-to-noise performance (semiconductors are selected via the exclusive listening-test procedure).
 - The *ClassAmp*[®] M-2 is free from the low frequency noise and DC offset which can be part of microphone preamplifiers. This allows wideband, phase coherent signal preamplification without the usual requirement for filtering low frequencies.
 - Balanced as well as unbalanced microphones and transducers can be connected. Unbalanced sources are automatically balanced right at the input.
 - The *ClassAmp*[®] M-2 is absolutely stable, even at 0 dB gain - unlike other preamplifiers. The gain is selectable in 4dB steps from 0 to 60 dB.
 - Accurate, phase coherent, discrete enhanced Class A circuitry is used in every single stage of the *ClassAmp*[®] M-2.
 - The *ClassAmp*[®] M-2 can perfectly drive most difficult loads (even high capacitive and/or inductive loads) without loss of performance. Long cable runs do not present a challenge on the *ClassAmp*[®] M-2's performance.
- Even cable lengths in excess of a hundred meters can be driven by the *ClassAmp*[®] M-2 with absolutely superb interference rejection, and this at levels of up to +28 dB!
- This allows higher signal levels to be transferred down the microphone/transducer cables with corresponding massive improvements in signal-to-noise ratio, better immunity to interference.
- The *ClassAmp*[®] M-2 provides a standard of balancing previously unheard of.

- Usual electronically balanced inputs are somewhat simplistic and many are not truly balanced, with the inverting and non-inverting paths not having identical impedances and not employing exactly the same electronics.

The *ClassAmp*[®] M-2's unique true balanced circuitry avoids the disadvantages of both the usual electronically balanced, as well as transformer-coupled microphone pre-amplifiers (phase errors, hysteresis, distortion, bandwidth limitation, saturation)*, etc.

- A remote controlled 180° polarity inversion switch allows for quick remedy of polarity issues.
- To avoid switch-on thumps the FM 120 Remote control Unit provides delayed turn-on to all connected *ClassAmp*[®] M-2's.
- The power supply's output voltages remain absolutely stable even with strongly varying mains voltage. Large reserve margins and supply voltage detector circuits guarantee safety with both under- and overvoltage. No instability or potentially dangerous DC fluctuations can occur.

If *extremely low* mains voltage occurs or if the mains drop out, the bypass function instantly activates for protection of the subsequent equipment from potential hazardous DC voltage and instability.

- "Better phantom supply = better sound".**
The phantom supply uses individual precision stabilizers and allows the most demanding microphones to be supplied with plenty of reserve. Thanks to this, optimal microphone performance is guaranteed, even at lower than usual mains voltages.
- The *ClassAmp*[®] M-2 can also be used as an ultimate precision line driver, as it operates stably even at 0dB gain and guarantees an unprecedented headroom of +26dB together with line drive capability over hundreds of meters.

* Many so-called "balanced" outputs are not truly balanced at all. All that is done in such "balanced" output circuits is that an inverting stage is added (a circuit that inverts the output signal by 180° and then feeds it to a second signal line). This is **not** a true symmetrical or "balanced" output and will **not** give the same performance!

- The FM 120 Remote Control Unit - housed in a single height 19" rack - can control up to 6 *ClassAmp*[®] M-2. For each channel it provides remote gain control, a 180 degree phase inversion switch, a bypass switch, "Signal Presence" LED's as well as fast acting "PEAK" LED's with precision peak and hold detectors. It also provides the power and the specially stabilized phantom voltages to the M-2's.**

- The *ClassAmp*[®] M-2 finds applications in any situation where signals from microphones or transducers must be *pristinely* amplified with guaranteed optimal results. This includes applications in concert halls, operas, theatres, critical live performances, home recordings, film recording, broadcasting as well as stage pre-amplification and as a transducer for pre-amplifiers, etc.

- Each FM 120 controls up to 6 *ClassAmp*[®] M2's and make up an ultra efficient multi channel recording system of unmatched quality.

- Specially enticing is the use of the *ClassAmp*[®] M-2 for highest quality preamplification of acoustic musical instruments, such as acoustic guitars, bass, etc. It provides a quality unmatched by any other method of preamplification.

- The *ClassAmp*[®] M-2 automatically switches to bypass in case of the Remote Control Unit being switched off or unplugged from the power supply. "The show can go on".

- The *ClassAmp*[®] M-2 is deal for various industrial applications where highest-accuracy and lowest noise signal pre-amplification is required. Special versions for other applications i.e., measuring microphones, high- and low-frequency transducers, etc., may be available on special order. Please contact us for specific requirements.

** Because of the general simplicity of the principle, it is very often assumed that all phantom powering is the same. It is **not**. The way the microphone is supplied with phantom voltage, the maximum current capability of the phantom line, the smoothing capability and the stability of the phantom voltage with varying mains voltages are all factors that are of high importance to the performance of the microphone and are rarely mentioned. The *ClassAmp*[®] phantom supply guarantees that all microphones operate optimally.

Fig. 1:
Total harmonic distortion
at +20 dB out

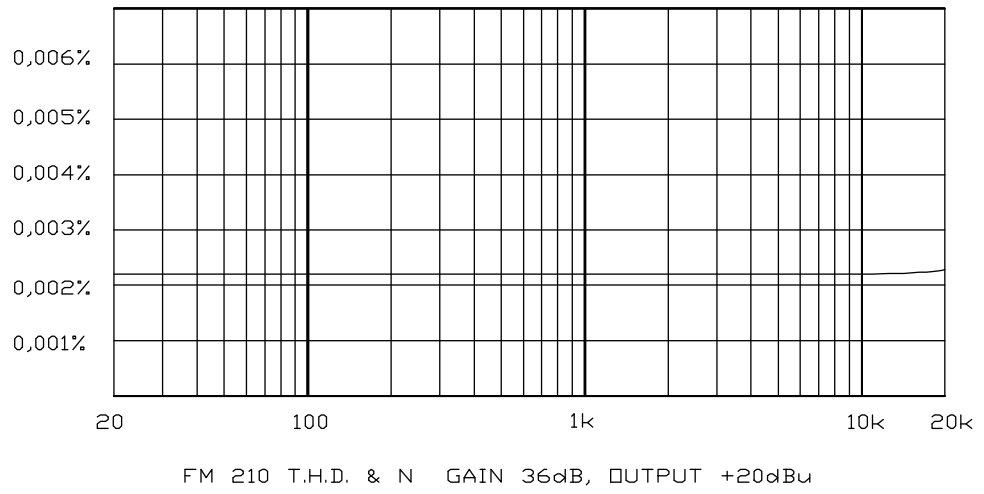
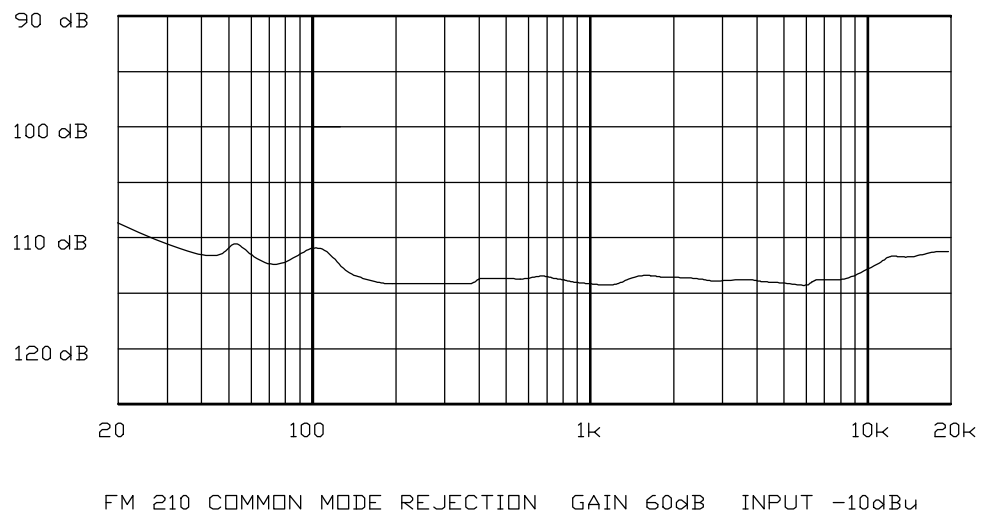


Fig. 2:
Interference Rejection



SPECIFICATIONS *ClassAmp*[®] M-2

Microphone Preamplifier

When choosing a product do not simply compare specifications sheets. Specifications are often misused, misunderstood, or utilised only to sell a product instead of indicating its actual performance capabilities.

“Typical” specifications will not tell you much about the true value of a certain component. Only guaranteed minimum specifications as indicated below, together with most carefully controlled listening tests, will show the differences and permit you to make the correct choice.

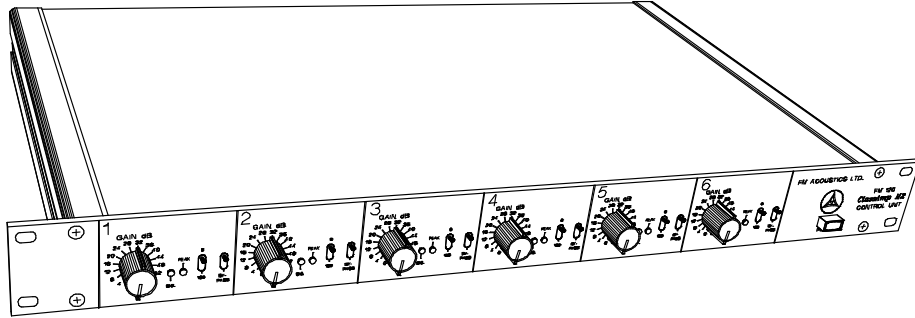
The guaranteed specifications below indicate the absolutely unique standard of this preamplifier and show those performance aspects that can be measured. But words cannot describe the truly breathtaking difference in musical accuracy between the *ClassAmp*[®] M-2 and all other microphone preamplifiers. Only a controlled audition will reveal these facts.

All specifications are guaranteed minimum figures for every single *ClassAmp*[®] M-2 that leaves the factory.

Circuitry:	Proprietary, discrete, enhanced Class A circuitry using hand-selected semiconductors. These are individually analysed, selected and then subjected to FM ACOUSTICS' unique listening selection process.	Frontpanel:	4mm, brushed and hand-polished aluminium, anodized lettering, XLR input connector.								
Input features:	Symmetrical, electronically balanced discrete Class A circuitry, non-inverting or inverting connection possible; gives perfect results with any balanced or unbalanced source. Unbalanced sources are automatically balanced right at the input.	Backpanel:	4mm, brushed and hand-polished aluminium, anodized lettering. Phantom power switch, remote control data & balanced audio signal output connector.								
Interference Rejection Ratio:	better than 100dB 10Hz - 20kHz	Connectors:	Input: <i>ClassAmp</i> [®] M-2 female XLR 3-pin <table border="0" style="width: 100%;"> <tr> <td style="padding-right: 20px;">non-inverting:</td> <td>inverting:</td> </tr> <tr> <td style="padding-right: 20px;">Pin 1: ground</td> <td>Pin 1: ground</td> </tr> <tr> <td style="padding-right: 20px;">Pin 2: return</td> <td>Pin 2: send</td> </tr> <tr> <td style="padding-right: 20px;">Pin 3: send</td> <td>Pin 3: return</td> </tr> </table> remote controlled phase switch allows instant phase selection	non-inverting:	inverting:	Pin 1: ground	Pin 1: ground	Pin 2: return	Pin 2: send	Pin 3: send	Pin 3: return
non-inverting:	inverting:										
Pin 1: ground	Pin 1: ground										
Pin 2: return	Pin 2: send										
Pin 3: send	Pin 3: return										
Input impedance:	Adjustable; absolutely linear over full frequency band.	Output:	Electronically symmetrical, balanced, discrete Class A, ultra stable circuitry.								
Headroom:	+26 dBu (15.5V ^{rms}) at 0 dB gain	Maximum Output Level:	+28 dBu (19.5V ^{RMS} into 4,7kΩ) balanced load, of +20 dBm (15,5V ^{RMS} into 600Ω) in pure Class A operation								
Gain:	Switchable in 4 dB steps from 0 to 60dB. The <i>ClassAmp</i> [®] M-2 remains absolutely stable at any gain setting.	Distortion:	At +22 dBu, 30 dB gain: 0.003% At +22 dBu, 60 dB gain: 0.007% Up to clipping level no higher order harmonics at all								
Bandwidth:	1Hz - 400kHz 20Hz - 20kHz ± 0.04dB	Phantom Power:	48V, switchable								
Phase accuracy:	at 20 Hz: <1°, at 20 kHz: <4°	Dimensions & Weight:	160 x 40 x 40 mm & 0.3 kg								
Step response:	Perfect without ringing	Multicore Cable:	made to request, max. length 300m								
Overshoot:	None										
Rise & fall time:	0,5 uSec.										
Equivalent Input Noise:	better than -137dBV, true RMS, 20Hz - 20kHz										

SPECIFICATIONS FM 120 Remote Control Unit for *ClassAmp*[®] M-2

The FM 120 Remote Control Unit - housed in a single 19" rack - can control up to 6 *ClassAmp*[®] M-2. Ergonomically laid out, it provides remote gain control, a 180 degree phase inversion switch, a bypass switch, "SIGNAL PRESENCE" LED's that activate at -20dBu, as well as fast acting "PEAK" LED's with precision peak and hold detectors for each channel.



Peak Indicator:	Full wave rectified, factory set at +22 dBu	Average Life expectancy	38 years (at 25°C ambient, 10h per day, 365 days per year)
Mains Voltage:	Switchable 115V/230V, 50-60 Hz	Front panel:	4mm, brushed and hand-polished aluminium, letters anodized so they can never wear off. Mains power switch and mains indicator. For each channel: swiss made precision gain control switch, signal presence LED, peak LED, phase inversion, bypass switch.
Mains Overvoltage:	Max. short-term: 150% V ^{nominal} Max. long-term: 115% V ^{nominal}	Backpanel:	4mm, brushed and hand-polished aluminium, lettering anodized so it can never wear off. Mains voltage selector and mains fuse. For each channel: multicore input from <i>ClassAmp</i> [®] M-2, male XLR 3 pin output.
Mains Undervoltage:	80% V ^{nom} before output muting protection circuitry activates. Stable operation within a voltage range of: 95 V - 140 V (in 115 V setting) 190 V - 280 V (in 230 V setting)	Power consumption:	15 W continuous
Operating temperature:	-20°C to +40°C	Connectors:	Input: special multicore connector Output: male XLR 3-pin
Operating humidity:	Long term: 0-85% non condensing Short term: 0-95% Continuous high humidity may somewhat shorten lifetime of certain components	non-inverting:	inverting:
Burn-in time at factory:	1000 thermal cycles, minimum 200 hours	Pin 1: ground	Pin 1: ground
Vibration test at factory:	50'000 vibration cycles, minimum 60 minutes	Pin 2: return	Pin 2: send
		Pin 3: send	Pin 3 :return

Spare parts availability: 10 years guaranteed availability of 99% of all parts ex stock.

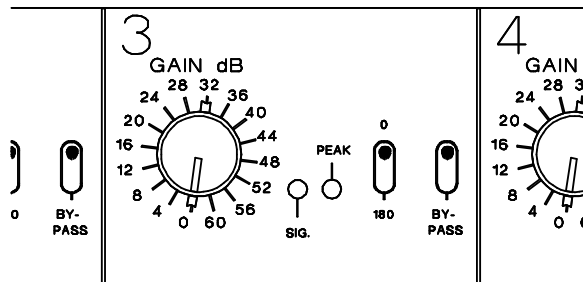
Dimensions: FM 120 Remote Control Unit = 482 x 295 x 44 mm (19"), 1 unit high

Weight: FM 120 Remote Control Unit = 4 kg

Applications: For recording studios, remote & film recording, laboratory, live performances, broadcasting, stage pre-amplification & precision microphone & transducer amplification for samplers and musical instruments; for institutional and a variety of other professional and industrial applications. Special versions for industrial applications available.

IEC, DIN and MIL (military) standards of components used:

IEC 68 = 55/155/56	DIN 384-4	MIL-R-STD 202 method 101,
IEC 68 = 55/085/21	DIN 40040	103, 106, 204, 213, 301
IEC 144/IP 65	DIN 40046	MIL-R-11804/2B/G
IEC 40/100/56	DIN 40050 P 54	MIL-R-22097
IEC 115-1	DIN 41332 TYPE II	MIL-R-10509
IEC 384-4	DIN 44061	MIL-R-55182
IEC 384-9	DIN 44112	MIL-VG-95-295
IEC 384-8 IB	DIN 44356	MIL-R-22684
IEC 68: 2-6	DIN 45910 PART 1201	MIL-R-23285
IEC 68: 55/085/56	DIN 45921-107	MIL-R-45204 TYPE 2
IEC 68: 55/200/56		MIL-C-19978 B
		MIL-S-23190 R.I.N.A. Nr. 5/206/85



"You've never heard it so good"

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