GRACE DESIGN



m201 mk2

2 Channel Microphone Preamplfier

Owner's Manual Rev A

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303.823.8100 • www.gracedesign.com

Welcome

Thank you for purchasing the Grace Design m201mk2 microphone preamplifier. With incredible sonic performance and reliability, the m201mk2 is the ultimate, state of the art microphone preamplifier for any recording application.

We have designed the m201mk2 to be as easy and intuitive to use as possible. However, we strongly recommend that you read this manual thoroughly to familiarize yourself with the unique features and capabilities of the m201mk2.

Also, please do not hesitate to contact us directly if you have any questions, comments, or concerns with your new m201mk2 microphone preamplifier. Thanks for reading and happy recording!!

-The Grace Design Team

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Important Safety Information

GENERAL

- Indoor Use Only
- Ordinary Protection: This equipment should not be exposed to dripping or splashing.
- Avoid placing objects filled with liquids, such as vases or glasses, on this equipment.
- Class I Equipment (grounded type)
- Electrical rating: 100-240VAC 50-60Hz 10 Watts
- Mains supply voltage fluctuations are not to exceed ±10% of the nominal supply voltage.
- Pollution Degree 2
- Installation (Overvoltage) Category II for transient overvoltages.
- Maximum Relative Humidity: <80%
- Operation temperature range: 10 °C to 40 °C
- Storage and transportation temperature range –40 °C to 70 °C
- Maximum altitude: 3000m (9843 ft)
- Equipment suitable for continuous operation
- Weight: 4.6lbs (2.1kg)

SAFETY MARKING SYMBOLS



CAUTION: READ ACCOMPANYING DOCUMENTS
This symbol, located on the equipment and in this manual, refers to important instructions. Read this manual thoroughly before operating this equipment.



WARNING: ELECTRICAL SHOCK HAZARD
This symbol, located on the equipment and in this manual, indicates the potential for electrical shock hazard.

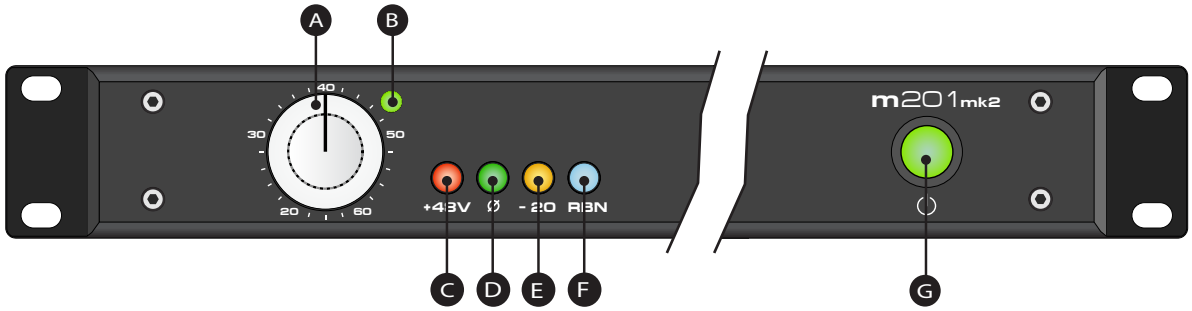
⚠ CALIFORNIA PROPOSITION 65 WARNING

This product may contain metallic nickel, a chemical known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

SERVICE INFORMATION

The Grace Design m201mk2 contains no user serviceable components. Contact Grace Design for repair and upgrade information. In the event that your Grace Design m201mk2 needs to be returned to the factory, contact us for a return authorization number.

Front Panel Controls



A 24 POSITION GOLD CONTACT GAIN SWITCH

Each gain control has 24 positions and adjusts the voltage gain from 18dB to 64dB in 2dB steps.

B BI-COLOR LED PEAK INDICATOR

The LED peak indicator, which monitors the output signal, turns green at -16dBu and switches to red at +16dBu (12dB before clipping). The threshold level for peak indication is adjustable on each channel (see page 8).

C 48V PHANTOM POWER SWITCH

The phantom power switch (labeled +48V) connects the +48V power supply to pins 2 and 3 on the XLR input connector. This switch illuminates red. A soft start circuit creates a +48V ramp up time of 1s to minimize microphone turn on transients.

D PHASE REVERSAL SWITCH

The phase reverse switch reverses the absolute polarity of the music signal at the input of the preamplifier. The switch illuminates green and provides power for a sealed gold contact relay located on the preamplifier circuit board. This eliminates signal wiring to the front panel and switch contact performance problems.

E -20 PAD SWITCH

The 20dB attenuator switch attenuates the input signal 20dB. The switch illuminates amber when engaged. Like the phase reverse switch, this switch controls a sealed gold contact relay on the preamplifier circuit board. With the -20 switch engaged, the effective gain range becomes -2dB to 44dB.

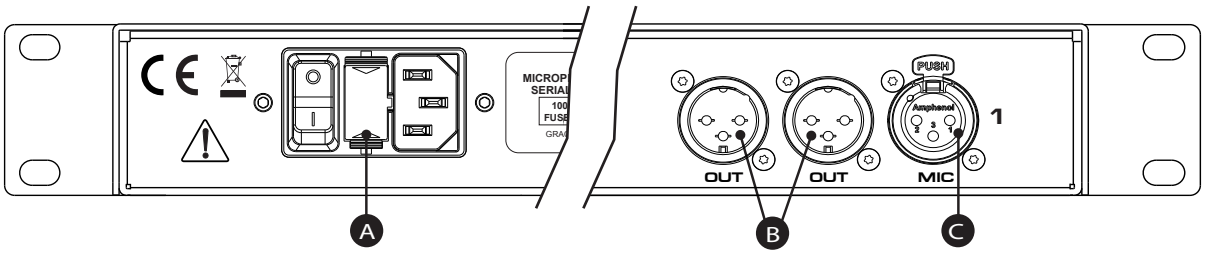
F RIBBON MIC MODE SWITCH

This switch activates a 10dB increase in overall preamplifier gain while simultaneously disabling the 48V phantom power circuit to protect ribbon microphones. As well, the input coupling capacitors are bypassed and input impedance is increased to 20k Ohms.

G STANDBY SWITCH

Turns power to the m201mk2 audio circuitry on and off. Will illuminate green when the power is on.

Rearpanel Connections



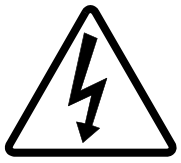
A IEC POWER INPUT, FUSE HOLDER AND POWER SWITCH
A 6' AC power cord is supplied to connect mains voltage (100-240 VAC) to the preamplifier unit. The power switch connects / disconnects the mains voltage to the preamplifier. Fuses are two T250mA 250V~ 5mm x 20mm Time Delay Fuses.

B XLR OUTPUT CONNECTORS (PARALLEL)
Output connections are made via male XLR connectors with pin 2 positive, pin 3 negative and pin 1 ground. An additional set of parallel XLR outputs are provided for sending line signals to additional recording devices or mixers.

C XLR MIC INPUT CONNECTOR
Input connections are made via female XLR connectors with pin 2 positive, pin 3 negative and pin 1 ground. 48V phantom power is supplied on pins 2 and 3.

Installation

POWER CONNECTION



The m201mk2 has a built-in universal power supply which accepts line voltages of 100 to 240VAC. We include power cable specified for the country where it was ordered, so it should be supplied correctly. If not, please contact your dealer or distributor for help. For safety, it is recommended that the AC power cable be connected to a grounded outlet. The Disconnect Device for the m201mk2 is the rocker switch on the AC power entry module. The Disconnect Device must remain accessible and operable.

TURNING THE POWER ON

The power switch is located on the rearpanel in the IEC 320-C14 power entry module. Switching the rocker switch to the **I** position turns the mains power on. Switching the rocker switch to the **O** position turns the mains power off. The front panel standby switch turns power to the m201mk2 audio circuitry on and off and will illuminate green when the power is on.

FUSES
The m201mk2 uses two T250mA 250V~ 5mm x 20mm Time Delay Fuses.

MOUNTING
The m201mk2 can be rack mounted in a standard 19" equipment rack and does not require any extra ventilation. 4 Rack screws are included in the box.

AUDIO CONNECTIONS
Microphone input connections are made via female XLR connectors with pin 2 positive, pin 3 negative and pin 1 ground. *Note: This will provide a signal of positive absolute polarity when the preamplifier is being used with a microphone which produces a positive voltage on pin 2 with positive air pressure on the front of the diaphragm. While a vast majority of microphones conform to this standard a few do not. Use the phase reverse switch to compensate if necessary.* 48V phantom power is supplied on pins 2 and 3.

Output connections are made via male XLR connectors with pin 2 positive, pin 3 negative and pin 1 ground. If the output is to be used unbalanced, pin 1 should be connected to signal ground and pin 2 to signal hot. Due to the nature of the balanced output stage, pin 3 should be left open for unbalanced operation. See the following **figure 1**.

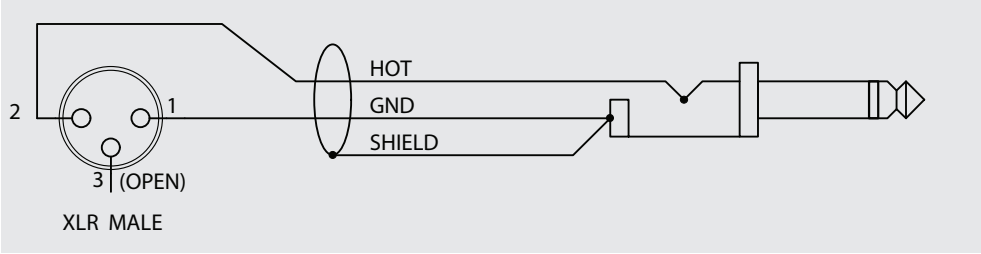


figure 1 - Unbalanced output cable termination

Preamplifier Operation

SETTING THE GAIN
First, turn the gain control fully counter-clockwise and check that the +48V phantom power is off. Connect a microphone and then turn on the phantom power if required. When sending a signal to a recorder, converter or interface that has fixed input levels, simply increase the gain until the optimum recording level is reached. If the peak indicator flashes red excessively with the gain control in the fully counterclockwise position, engage the -20dB attenuator.

When sending a signal to any recording device with an input attenuator, use the following procedure: With the sound source present, turn the gain control clockwise until the peak LED begins flashing red, then reduce the gain until the red stops flashing. Since red indicates a peak level which is 12dB

before preamplifier clipping, it is OK for it to come on periodically during recording. If peak indicator flashes red excessively with the gain control in the fully counterclockwise position, engage the -20dB attenuator. Now adjust the recorder input control for the optimum recording level.

RIBBON MIC MODE

Pressing the ribbon switch optimizes the m201mk2 channel for ribbon microphones by boosting the gain by 10dB while disabling 48V phantom power and increasing the input impedance. Before activating ribbon mic mode, make sure the channel's gain is fully down (counter-clockwise) and 48V phantom power is off. Now simply press the ribbon switch and turn the gain control upwards until the proper recording level is achieved.

If you press the 48V phantom switch while the ribbon switch is engaged, nothing will happen. If the 48V phantom power switch is turned off and then the ribbon switch is turned on the preamplifier will wait until the phantom power voltage has completely discharged and then the ribbon mode will activate automatically. An additional benefit of the ribbon mic mode is that the input DC blocking capacitors are relay bypassed to further simplify the m201mk2's signal path. Incidentally, the ribbon mode works very well with lower output dynamic microphones as well.

It is not recommended to use Ribbon Mode and the -20dB pad at the same time. This will cause the microphone to see a variable input impedance and will cause a low frequency response bump of up to 10dB depending on the microphone output impedance.

Maintenance

The model m201mk2 was designed to be maintenance free for many years. It is highly unlikely that your unit will require service. However, there are two adjustments that may need to be made from time to time. These procedures should be made only by a qualified service technician or the Grace Design factory.

PEAK LED ADJUSTMENT

The peak LED threshold levels may be adjusted to a user defined operating level. This circuit is set at the factory with the green threshold at -16dBu and the red threshold at +16dBu. The relationship between the two thresholds is fixed. The procedure for adjusting the greed / red threshold follows:

EQUIPMENT NEEDED

- **Sine wave audio signal generator or oscillator output from a mixing console.**
- **Audio level meter, RMS volt meter with dBu or dBm scale, or digital volt meter (DVM) with AC RMS measurement.**
- **Plastic alignment tool or small screwdriver**
- **Appropriate interconnect cables**
- **#2 phillips head screwdriver**

PROCEDURE

1. **With the power off, remove the 14 phillips head screws from the top cover and remove it.**
2. **Set all of the gain controls to the 30dB position**
3. **Connect the audio generator to the input of channel 1**
4. **Set the generator output level to approximately -20dBu (0.077vrms) @1KHz. If the generator has an unbalanced output, refer to figure 2 below for termination information.**

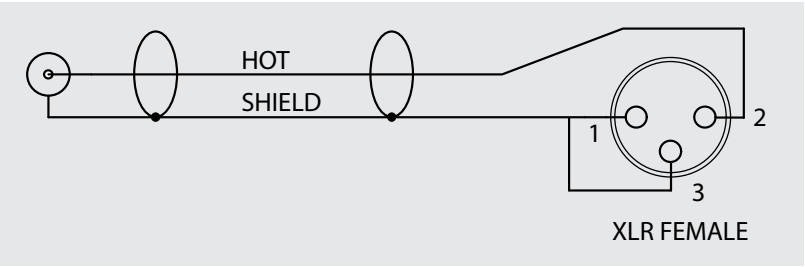


figure 2 - Unbalanced Output

5. **Connect the level meter or DVM to the output of channel 1.**
6. **If the level meter has an unbalanced input, refer to figure 3 (p. 9) for unbalanced output termination information.**
7. **Apply power to the generator, preamplifier, then the level meter.**
8. **Adjust the generator output level so that the preamplifier output level is at +16dBu (4.88VRMS) or another desired red threshold level. If the proper level can't be reached, adjust the preamplifier gain control.**
9. **Locate VR2 (see figure 3, p.9) on the channel 1 audio circuit board and adjust until the peak LED is between green and red. Repeat this procedure for channels 2 through 8.**
10. **If it is desired to calibrate the peak indicator to a specific AD converter input level, simply connect the output of the preamplifier to the converter. Adjust the signal generator so that the desired peak level is indicated on the converter and then adjust VR2 until the peak LED is between green and red.**

INPUT OFFSET ADJUSTMENT

The input amplifiers in the m201mk2 are ultra-precision laser trimmed devices which have a very low input offset. However, even the smallest differential offset at the input can result in an audible "click" when the gain control is turned. It should be noted that this type of click will be audible when no signal is present. With no signal present there is no signal amplitude to be changed unless input offset is present. This procedure nulls the input offset and minimizes the clicking sound with no signal present. In contrast, there will almost always be an audible click if turning the gain control while a signal is present. This is because the gain control, being a stepped control, will make an instantaneous change in amplitude when turned, which creates a transient signal.

EQUIPMENT NEEDED

- **DC Volt meter with at least 1mV sensitivity**
- **Plastic alignment tool or a small screwdriver.**
- **#2 phillips head screwdriver**

PROCEDURE

1. **Remove the 14 phillips head screws from the top lid but leave the lid in place.**
2. **Turn on the preamplifier and allow to warm up for at least 45 minutes. (go get a nice cup of coffee and do some stretches)**
3. **Set all of the preamplifier gain controls to minimum (fully counter clockwise).**
4. **Set all +48V, polarity reverse, pad, and ribbon mode switches to OFF**
5. **Remove the top lid and locate the DC offset test points TP7 and TP8 (figure 3) on the channel to be adjusted. Place the Volt meter probes into these holes and note the DC Volts. It should be in the range of +/- 0.02V.**
6. **Rotate the gain control to maximum (fully clockwise) and note the DC Volts.**
7. **Locate DC offset potentiometer VR1 and rotate it for a reading that matches the minimum gain reading. +/- 0.005V.**
8. **The objective is to get the minimum gain offset and the maximum gain offset to match as closely as possible.**
9. **The input offset does drift with temperature and having the lid off will allow the circuitry to cool. It is advisable to replace the lid and let the preamplifier warm up again (about 20 minutes) and then re-check your adjustments.**

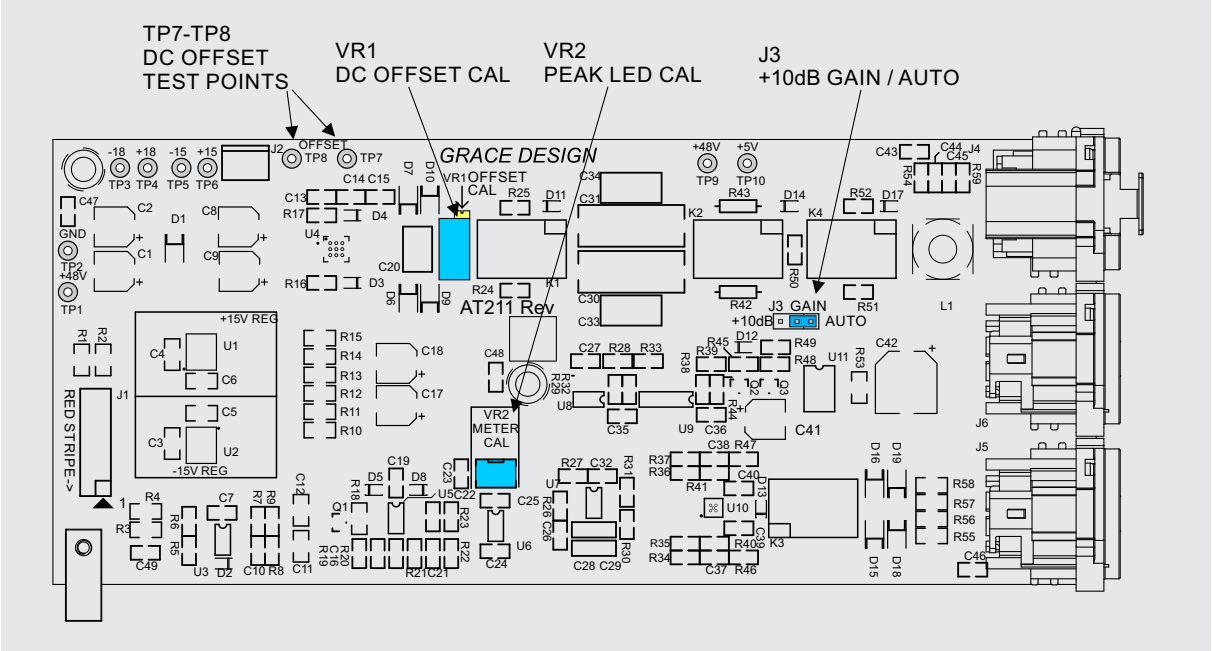
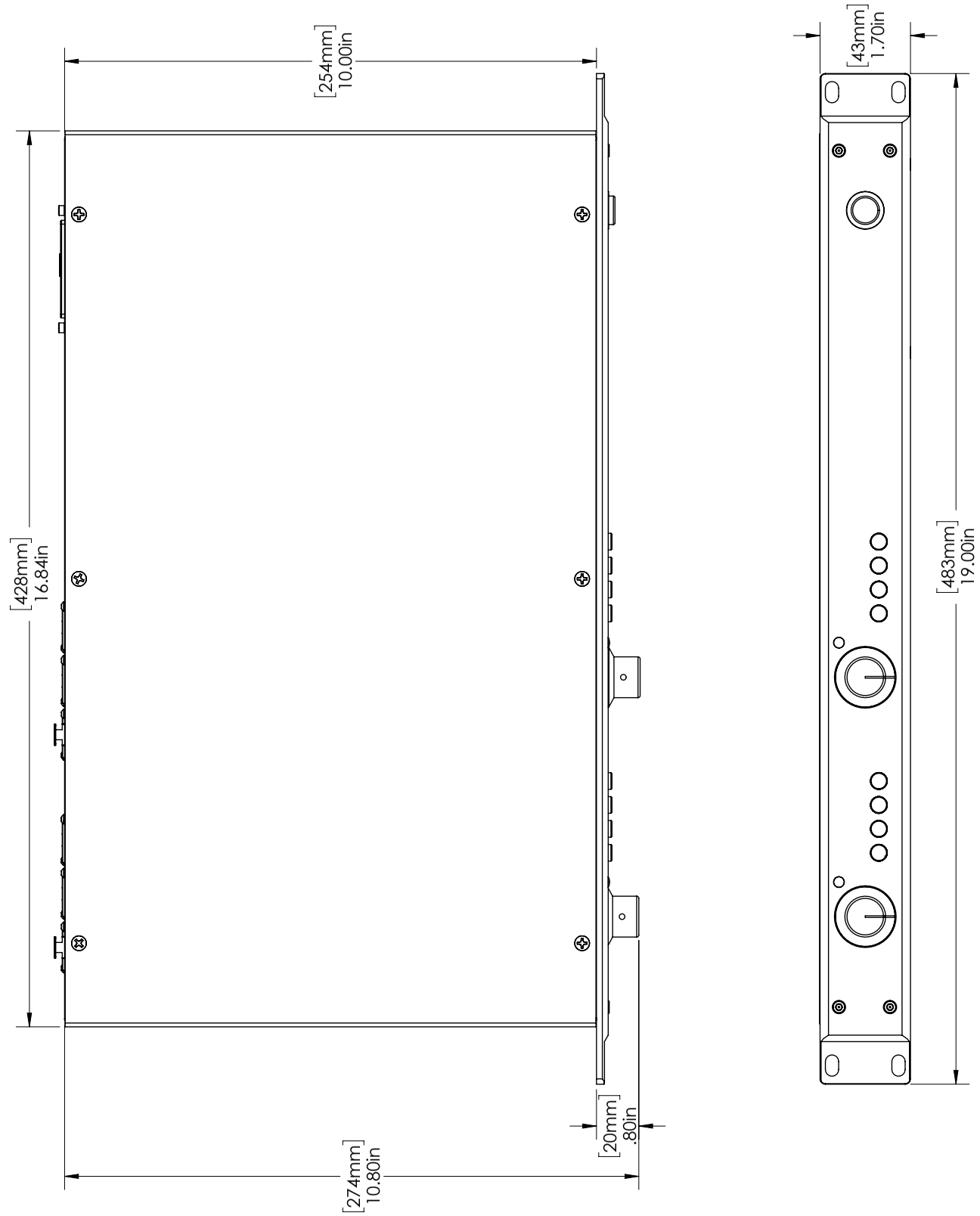


figure 3 - offset test point and peak LED adjust trimpots

Specifications

PREAMPLIFIER SPECIFICATIONS	
FREQUENCY RESPONSE	
@ 20dB gain ± 3dB 150Ω source	3.2Hz-530kHz
@ 20dB gain ± 0.2dB 150Ω source	14.8Hz-109kHz
@ 40dB gain ± 3dB 150Ω source	3.2Hz-500kHz
@ 40dB gain ± 0.2dB 150Ω source	15.4Hz-103kHz
THD+N	
@ 20dB gain +20dBu out, 1kHz	<.0008%
@ 40dB gain +20dBu out, 1kHz	<.0009%
@ 60dB gain +20dBu out, 1kHz	<.0070%
INTERMODULATION DISTORTION / @40dB GAIN +20dBu OUT	
SMPTE/DIN 1:1 (50Hz, 7kHz)	<.0007%
SMPTE/DIN 4:1 (50Hz, 7kHz)	<.009%
NOISE - REFERRED TO INPUT	
@60dB gain 50Ω source 22-22kHz	-130dB
@60dB gain 50Ω source A weighting	-133dB
@60dB gain 150Ω source 22-22kHz	-127dB
@60dB gain 150Ω source A weighting	-127.5dB
@40dB gain 50Ω source 22-22kHz	-127dB
@40dB gain 50Ω source A weighting	-130dB
@40dB gain 150Ω source 22-22kHz	-125dB
@40dB gain 150Ω source A weighting	-128dB
@20dB gain 50Ω source 22-22kHz	-117dB
@20dB gain 50Ω source A weighting	-120dB
@20dB gain 150Ω source 22-22kHz	-117dB
@20dB gain 150Ω source A weighting	-119dB
GAIN RANGE	
Default Mode	18-64dB, 2dB steps
Ribbon Mode	28-74dB, 2dB steps
PHASE DEVIATION	
@40dB gain 40Ω source 75Hz-45kHz	<3°
CROSSTALK	
Any Channel @40dB gain 1kHz	-140dB
Any Channel @40dB gain 10kHz	-130dB
CMRR	
@60dB gain, 3.5Vcm, 1KHz	>85dB
@60dB gain, 3.5Vcm, 10KHz	>75dB
PHANTOM POWER	
Voltage +48V	+/- 1.0V
6.8kΩ resistor match tolerance	+/- 0.1%
MAXIMUM OUTPUT LEVEL	
1kHz, 100KΩ load	+28dBu
PEAK LED	
Green Threshold	-16dBu Out
Red Threshold	+16dBu Out
IMPEDANCE	
Input Nominal	8100Ω
Input Ribbon Mode	20KΩ
Input Pad Engaged	1.3KΩ
Output	150Ω
DIMENSIONS	
Weight	4.6lbs (2.1kg)
Height	1.7" (43mm)
Width	19" (483mm)
Depth	10.8" (274mm)
POWER SUPPLY SPECIFICATIONS	
POWER CONSUMPTION	
100-240VAC 50/60Hz	10 Watts max

Dimensions


[254mm]
10.00in
[428mm]
16.84in
[274mm]
10.80in
[20mm]
.80in
[43mm]
1.70in
[483mm]
19.00in

Cleaning

Your m201mk2 amplifier chassis is constructed out of high quality aluminum. Under normal circumstances, virtually no maintenance is required to keep the unit looking shiny and new. However, if your unit becomes smudged or dirty, here are some cleaning tips: Apply a small amount of windex cleaner to a clean, dry, lint free cloth and gently wipe all surfaces, taking care not to allow the cleaning product to build up around the panel switches or knobs.

Warranty Information

The Grace Design EON limited warranty guarantees this product to be free of defective parts and workmanship for a period of twenty years.

- The Grace Design EON warranty period begins at either **a)** the date of original purchase - original customer proof of purchase required, or **b)** the date the product was originally shipped from Grace Design - if original customer proof of purchase is not available.
- This warranty is transferable to any person who may subsequently purchase the product during this time.
- This warranty excludes the following conditions: normal wear and tear, misuse, customer negligence, accidental damage, unauthorized repair or modification, cosmetic damage and damage incurred during shipment.
- During the time of this warranty, Grace Design will repair or replace, at its option, any defective parts or repair defective workmanship without charge, provided the customer has appropriate proof of purchase and that the product has its original factory serial number.
- Customers within the US are responsible for all inbound freight charges to Grace Design's facility, while Grace Design will pay for return freight charges via ground service. Customers outside the US must contact their distributor for warranty / product return details.
- In order for Grace Design to provide efficient and timely warranty service, it is important that you mail the completed warranty registration card enclosed with all of our products within 10 days of the original date of purchase. You may also register your product directly with Grace Design by telephone (303-823-8100 Monday-Friday 9:00am to 5:00pm MST), or you can register your product online at www.gracedesign.com.
- This warranty is in lieu of all other warranties whether written, expressed, or implied, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. In no event will Grace Design be liable for lost profits or any other incidental, consequential or Exemplary damages, even if Grace Design is aware of the possibility of such damages.
- In no event will Grace Design's liability exceed the purchase price of the product. This warranty gives the customer specific legal rights. The customer may also have other rights, which vary from state to state. Some states do not allow limitations on implied warranties or consequential damages, so some of the limitations of the above may not apply to a particular customer.

Manual Revisions

Revision	Page	Change	Date	Initials
A	all	initial release	04/29/20	edg