



**LOCOMOTIVE**

..... AUDIO .....

# **USER'S MANUAL**

**MODEL 286A**

**DUAL CHANNEL TUBE MIC PREAMP & DI**

*HANDMADE IN ST. LOUIS, MO USA*





## INTRODUCTION

Thank you for your purchase of the Locomotive Audio Model 286A! This hand-built vacuum tube dual mic preamp and DI is a product of so much time, research and development. Inspired by many beautiful pieces of equipment from the 50s and 60s, we were able to design a flexible circuit with high quality components and modern features for today's engineers. With proper treatment, our products will be able to give you many years of reliable service, so you can focus on being creative and making the best recordings possible! We thank you for your support of Locomotive Audio.

## BOX CONTENTS

**Your Locomotive Audio product should have been shipped with the following contents:**

- (1) 286A unit*
- (1) User's Manual*
- (1) IEC Power Cord*

## CONTACT INFORMATION

**LOCOMOTIVE AUDIO, LLC**

PO. BOX 21751

St. Louis, MO 63109

support@locomotiveaudio.com

314.282.0133



# DECLARATION OF CONFORMITY

**MANUFACTURED BY:**

Locomotive Audio, LLC.

**PRODUCT:**

286A Dual Channel Tube  
Mic Preamp & DI

**ADDRESS:**

P.O. Box 21751  
Saint Louis, Missouri 63109

**Year of Affixing CE marking:** 2014

**CONFORMITY:**

**Low Voltage Directive 2006/95/EC**

(EN 60065:2002/A1:2006 + A11:2008 + A2:2010 + A12:2011)

**EMC DIRECTIVE 2004/108/EC**

(EN 55103-1:2009 & EN 55103-2:2009)

A handwritten signature in black ink that reads 'Eric Strouth'.

Eric Strouth  
President

Locomotive Audio, LLC.  
November 1, 2014

## LEGAL NOTICES

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Manual Revision 286A-3

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## INSTALLATION

Vacuum tube equipment can get very hot, so thought and care should be taken in how it is installed. The 286A will fit in a 19" equipment rack, taking 2 units of space (2U). The chassis for the 286A has vents punched out of the top and sides for heat to escape. It is good practice to leave 1U of space above the unit for better ventilation.

The Locomotive 286A has its tubes and transformers installed on the outside of the unit. Route audio and power cords in a direction where they would be least likely to touch these components.

# WARNINGS & SAFETY

Before powering up your new Locomotive Audio unit for the first time, please understand the dangers of vacuum tube electrical equipment. The high voltages within the chassis and around the tubes can **SERIOUSLY INJURY OR KILL YOU.**

Before plugging your unit into the wall, please make sure all tubes are properly seated in their sockets. The base of the tube should be flush with the tube socket. Also be sure to mount your unit in a stable, secure rack to reduce the risk of movement and damage. The unit is grounded through the IEC power cord supplied in the box. Always use a properly grounded outlet and never use a ground lift plug adapter for a non-grounded outlet. Do not use unit near any liquid or excessive moisture. If liquid were to enter the unit, unplug IEC power cord from wall and wait at least 5 minutes before attempting to touch or clean the unit.

The user should not attempt to service this product beyond changing tubes. The 286A has a hinged front panel that allows for easy access of internal parts if issues were to arise. Only a trained technician should make modifications or adjustments as the voltages within the chassis are very dangerous!

## LINE VOLTAGE & FUSE

The unit is powered by 115v or 230v AC sources. The AC Voltage Slide Switch (page 8) is preset by Locomotive Audio before leaving production. Before using the 286A for the first time, please make sure the AC Voltage Slide Switch on the back of the unit (page 8) is in the correct position for your mains voltage. **If operated set to the incorrect voltage, harm to the unit may result.** With unit turned off, use a flat-head screwdriver to change the voltage selection if necessary.

All Locomotive Audio products contain a fuse in the IEC power entry module for protection of both YOU and the unit. In order to check or replace the fuse, a small flat-head screwdriver is needed to open the fuse drawer. Be sure to unplug the unit before beginning this procedure. Always replace the fuse with the same rating and type as specified for your mains voltage on back of the unit. If replacement fuses of the correct specifications consistently blow, there may be an issue with the unit and qualified service technician should be contacted. If within warranty period, please contact Locomotive Audio for instructions.

## POWERING UP

Once installed in a secure equipment rack and plugged into the AC mains power source, the user may then power the unit on by flipping the power switch on the front of the unit to the up position. At this point, the power lamp will light, and the unit will need at least 5–10 minutes for the tubes to warm up for best results.

## POWER LAMP & VU BULBS

The power lamp and backlit VU meter will illuminate after the unit is switched on. If either of these do not light, the bulb may be burned out or there may be another underlying issue. The first step would be to replace the bulb. If replacement is necessary, use a 14V .08A bayonet style bulb for the power lamp and a 12.6V .3A fuse style bulb for the VU meter.

# MAIN FEATURES

- **Microphone and high impedance instrument inputs**
- **One EF86 & one 12AY7 per channel**
- **Polarity reverse switch**
- **20dB pad switch**
- **100 Hz low cut filter switch**
- **Microphone load impedance switch**
- **Mic/DI selection switch**
- **+48v phantom power switch**
- **3-position VU meter switch: CH1 - Off - CH2**
- **Custom Sifam backlit VU meter**
- **XLR input and output connections**
- **Cinemag input and output transformers**
- **High-grade Solen capacitors in signal path**
- **Hand-built in USA with classic turret board technique**
- **Heavy 16 gauge steel chassis**
- **115v/230v AC mains option on rear**
- **Backed by 2-year limited warranty parts and labor**

# 286A SPECIFICATIONS

The technical data listed below may change without notice as we are consistently trying to improve our products

- **Microphone input load impedance:** 500 $\Omega$  or 1800 $\Omega$
- **Output impedance:** <600 $\Omega$
- **1/4" DI impedance:** 169k $\Omega$
- **66dB of gain**
- **Flat frequency response:** 20Hz-20kHz
- **THD+N:** <1%
- **S/N ratio:** >70dB
- **Dimensions:** 19"w x 3.5"h x 10"d (2u rackspace)
- **Shipping Weight:** 18 lbs.
- **Power Consumption (120/240VAC):** 25 watts

# ABOUT THE 286A

The dual channel 286A offers a huge sonic palette for engineers and producers to explore. Its single-ended Class A tube signal path is what makes this preamplifier so special. Inspired by the great vintage Ampex 601 vacuum tube tape recorder, the 286A features four tubes; there is one EF86 and one 12AY7 per channel. The 286A can play nice by acting clean and natural with gentle even-order harmonics for a smooth, sweet touch. Get more aggressive with the “Gain” knob and drive the first 12AY7 stage for a warm and colored thickening effect. Go all-out and slam the final 12AY7 stage and output transformer through the “Level” knob for a fully-driven, saturated tube amp sound! Clean and natural to overdriven and fuzzy warm; your choice!

Along with its classic tube gain stages, the 286A has been given the modern front panel features that allow for flexible interfacing with today's studio equipment.

## 286A SETTINGS

**At first glance, there are many features on the Model 286A which may be confusing, but in reality, the initial setup couldn't be easier.**

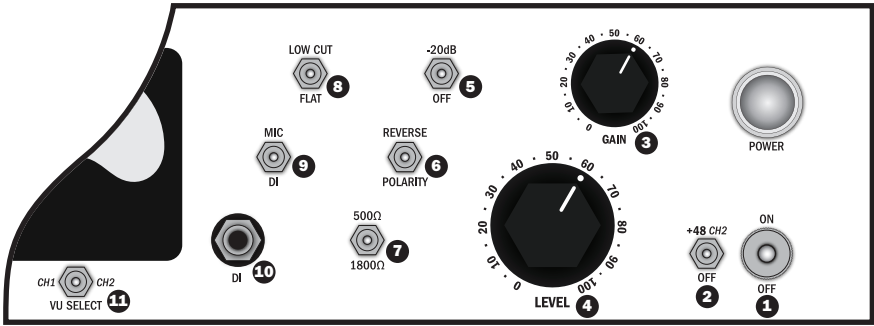
### GAIN & LEVEL SETTINGS

The 286A is a very lively preamplifier with a great deal of gain. A good place to start when looking for a clean sound, is with the **GAIN** positioned at a low setting and the **LEVEL** positioned at a high setting. If too much distortion is experienced at these settings, it is likely that the source is too hot. Drums, for instance, may benefit from switching the -20dB pad to the up position. Rotating the gain knob to a higher level will allow more signal to pass from the first tube (EF86) to the second tube (12AY7). This action will create more color and a general thickening to the final sound. Of course, play with these settings to achieve the effect you want. There is no right way. Be creative!



### IMPEDANCE SETTINGS

It was our goal to design a versatile preamplifier for many different sound sources. The impedance control allows the user flexibility in the microphone they choose and in crafting the sound they want. As a standard, microphones “favor” an input impedance 10x that of their own output impedance. Therefore, a common modern microphone with an output impedance of 150-200Ω will be “properly” loaded with the preamp set to 1800Ω. This will give the best overall frequency response for the microphone. Some low output/low impedance microphones will be better off with the 500Ω setting. By all means, experiment with these controls for the color/sound you are looking for!



# FRONT PANEL

The front panel of the 286A features two identical sets of channel controls.

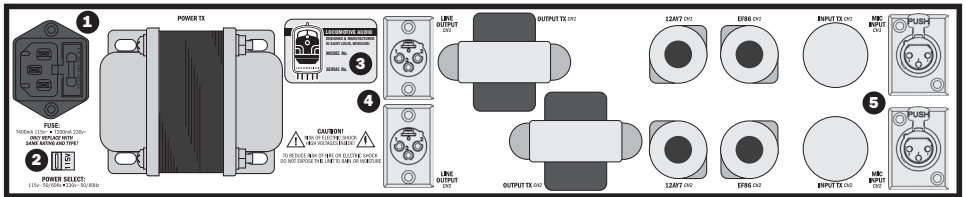
- 1. Power Switch:** Switches unit on. Illumination of the power lamp and VU meter will result.
- 2. +48 Switch:** Supplies 48-volt phantom power to the xlr input of channel. Use only with condenser microphones that require phantom power. Some microphones can be damaged if exposed to 48-volt phantom power, so it is a good idea to switch phantom power off after each session.
- 3. Gain:** This controls the amount of signal that passes from the first gain stage (EF806 Tube) to the second gain stage (12AY7-1)
- 4. Level:** This controls the amount of signal that passes from the second gain stage (12AY7-1) to the final gain stage (12AY7-2) and through the output transformer, followed by the next device in your signal chain.
- 5. -20dB Switch:** When in the up position, a resistive pad is switched in between the xlr input and the input audio transformer. This setting does not affect a DI source. The pad sets a 1500Ω load impedance for the mic to work into. The output impedance of the pad is 150Ω and should be used in conjunction with the 1800Ω setting for a flat frequency response.
- 6. Polarity Switch:** Also placed before the input transformer, this switch controls the polarity of the microphone signal and will not affect a DI source.
- 7. Impedance Switch:** This switch allows the user to select between a 500Ω and 1800Ω transformer load impedance on the microphone. Typically, users will choose a transformer load impedance that is around 10x the output impedance of their microphone for best frequency response. There are no rules, so please experiment with the tonal changes associated with this switch. This setting does not affect a DI source.
- 8. Low Cut Switch:** If switched to the up position, a 100Hz low frequency roll-off filter is placed on the signal for either the xlr mic input or DI. Use this control to filter our low frequency rumble or to combat proximity effect from a microphone.



**9. Mic/DI Switch:** Allows for selection of either the xlr mic input on the back of the unit or the DI jack on the front of the unit.

**10. DI:** The Direct Input jack is useful when connecting high impedance instruments such as guitars and bass. This 1/4" instrument jack loads the source with an impedance of 169kΩ.

**11. VU Select Switch:** The VU meter on the 286A is able to display the output signal level of either channel 1 or channel 2. If set to the center position, no metering of either channel will be displayed. This is especially useful when slamming the final gain stage and output transformer. An analog meter is expensive and can be damaged if not treated properly.



## BACK PANEL

**1. AC Power Entry Module:** Accepts standard IEC power cord (included) for 115v or 230v AC mains supply. A fuse is included with each unit for the voltage/current expected at the location being shipped to. Only use a fuse with the same rating and voltage as marked on back of chassis.

**2. AC Voltage Slide Switch:** Each unit is factory set to the voltage expected at the location being shipped to. If voltage does not match mains voltage at your location, switch to reveal the appropriate voltage. Do not operate unit set to incorrect voltage. Harm to the unit may result.

**3. Model/Serial# Tag:** When registering your product for your 2-year warranty, please use the hand stamped tag to obtain the serial number.

**4. Transformer Balanced XLR Line Outputs**

**5. Transformer Balanced XLR Mic Inputs**

## CHANGING TUBES

Each Model 286A will leave Locomotive Audio with a new set of tubes that should last for several years. We encourage you to utilize these tubes, but also experiment with with other brands of New Old Stock tubes to achieve your sounds! There are no rules with brands or age of tubes. But be sure to use only EF86s or EF806s and 12AY7 tubes in the appropriate tube sockets. This will prevent any issue with the performance of the 286A and damage to the unit.

# VU METER CALIBRATION

The VU meters in our units have been pre-calibrated. When needle is deflected to 0dB on the VU meter, a signal voltage of +4dBu will be present on the output of the unit. Turning the small calibration screw on the rear of the VU meter will allow a qualified technician to adjust display levels.

# WARRANTY

Each Locomotive Audio unit will be given a 60-day warranty from date of purchase covering parts and labor, excluding tubes purchased with unit. A 2-year warranty from date of purchase will be offered to original owners who register their product within the first 30 days of ownership.

Warranty is void if the product serial number has been removed or if the product has been damaged due to misuse, accident, unauthorized modification or repair. Locomotive Audio, LLC. reserves the right to determine when a problem or issue is eligible for warranty. Warranty is non-transferable and applies only to the original purchaser.

In no event will Locomotive Audio, LLC. be liable for any incidental or consequential damages resulting from any defect in the product, including lost profits, damage to property and, to the extent permitted by law, damage for personal injury, even if Locomotive Audio, LLC. has been advised of the possibilities of such damages.

# REGISTRATION

Email [support@locomotiveaudio.com](mailto:support@locomotiveaudio.com) the following info within 30 days of purchase to receive the full 2-year warranty from date of purchase.

- **Purchaser Name, phone number, email and mailing address**
- **Legible scan or photograph of the original sales receipt**
- **Serial # from stamped metal plate on back of unit**

# SUPPORT & SERVICE

In the unlikely situation that something would go wrong with your unit, we would be happy to fix it up for you! Please visit our support page to gain further instructions on how to contact us.

If it is determined your product requires repair, we'll let you know where to ship it and we'll also issue a Return Merchandise Authorization number (RMA). This number must be displayed on the outside of your shipping box. Most repairs take approximately 1 week. We will match the shipping method you used to get it to us. (If you shipped it to us UPS ground, we will ship it back to you UPS ground; if you overnight it to us, we will ship it back to you overnight). You pay the shipping costs to us; we ship it back to you free of charge.





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