

F(t) Forssell Technologies Inc

SMP-2Aa Microphone Preamplifier

User Manual

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Introduction

The Forssell Technologies Inc SMP-2A is a 2 channel, transformerless, Class A discrete JFET microphone preamplifier housed in a single space rack chassis. Each channel on the SMP-2A has front panel mounted controls for gain, output muting, polarity reverse, and phantom power on/off. The mute, polarity, and phantom power switches each have LED indicators which illuminate when the switch is pressed in to indicate that the switch is on. The gain control is variable from minimum to maximum gain in 24 stepped positions. Bicolor LED level indicators are also present for each channel. These LED indicators show green with the output signal level is above -5 dBu, and red when the signal level reaches $+24$ dBu, which is 2-3 dB prior to clipping. A power on/off switch and LED are also located on the front panel.

The rear panel contains the two input and one output XLR connectors per channel. All XLR connectors are wired Pin #2 hot. There is an input XLR for phantom powered mics (labeled P48), and one for non-phantom powered mics (DC) such as ribbon, dynamic, or externally powered condenser mics. There is also an IEC AC power connector and fuse holder on the back panel. The fuse holder is integrated into the IEC power connector and uses 5x25mm slow blow fuses. There is a spare fuse located within the fuse holder. The fuse type is 250 ma time-delay or time-lag fuse. If your preamp is wired for 230 VAC, then please use a 100 ma time-delay fuse.

An AC line voltage switch is located inside of the SMP-2A. Please refer the SMP-2A to a qualified technician to change the line voltage setting.

Operation

Operation of the SMP-2A is very simple and should be intuitive for most users. Microphones are connected to the SMP-2A preamplifiers via female XLR connectors to the rear panel, and

the preamplifier outputs are connected to male XLR connectors. Each channels input and output XLR connectors are located next to each other and correspond to the channels as laid out on the front panel.

Phantom power is applied to the P48 input XLR when the phantom power switch is pressed in. It is a good habit to apply phantom power AFTER a microphone is plugged into the XLR connector on the SMP-2A to prevent a voltage spikes appearing at the input of the preamp circuitry. The phantom power supply voltage on the SMP-2A is +48 VDC and is a high current robust design to provide consistent phantom power voltage to all inputs regardless of the number of phantom powered mics plugged into the SMP-2A.

No phantom power is present on the direct coupled input (DC) XLR even if the phantom power switch is pressed in on the front panel. PLEASE NOTE... only one of the two input XLR connector can be used at any given time. The unused XLR should have no cable plugged into it.

Gain control on the SMP-2A variable from a minimum of +6 dB to a maximum of +68 dB (or +74 dB if high gain option is installed) in 24 steps. The gain control use high quality Elma switches for long life and good signal switching qualities. The gain setting for each position are shown on the front panel graphics.

Ventilation

The SMP-2A circuitry uses Class A discrete JFET amplifiers. These amplifiers generate a lot of heat because of their Class A biasing, but the SMP-2A should not require extra space above or below the unit under most conditions. Should the SMP-2A be mounted above something that

generates a lot of heat (such as vacuum tube preamps), you should leave a 1U air space between the units. Further, if you have multiple SMP-2A preamps in a rack, it may be a good idea to place an 1U air space every 3 or 4 units.

Specifications

Minimum Gain = +6 dB

Maximum Gain = +68 dB or +74 dB (optional)

Input Impedance = 13k ohms

EIN (Max gain) = better than -128 dBu (22 Hz to 22 KHz, unweighted), typically -130 dBu

CMRR (measured at +45 dB gain) = better than 90 dB

Frequency Response = 5 Hz to 100 KHz +0, -0.5 dB

THD +N = better than .005%

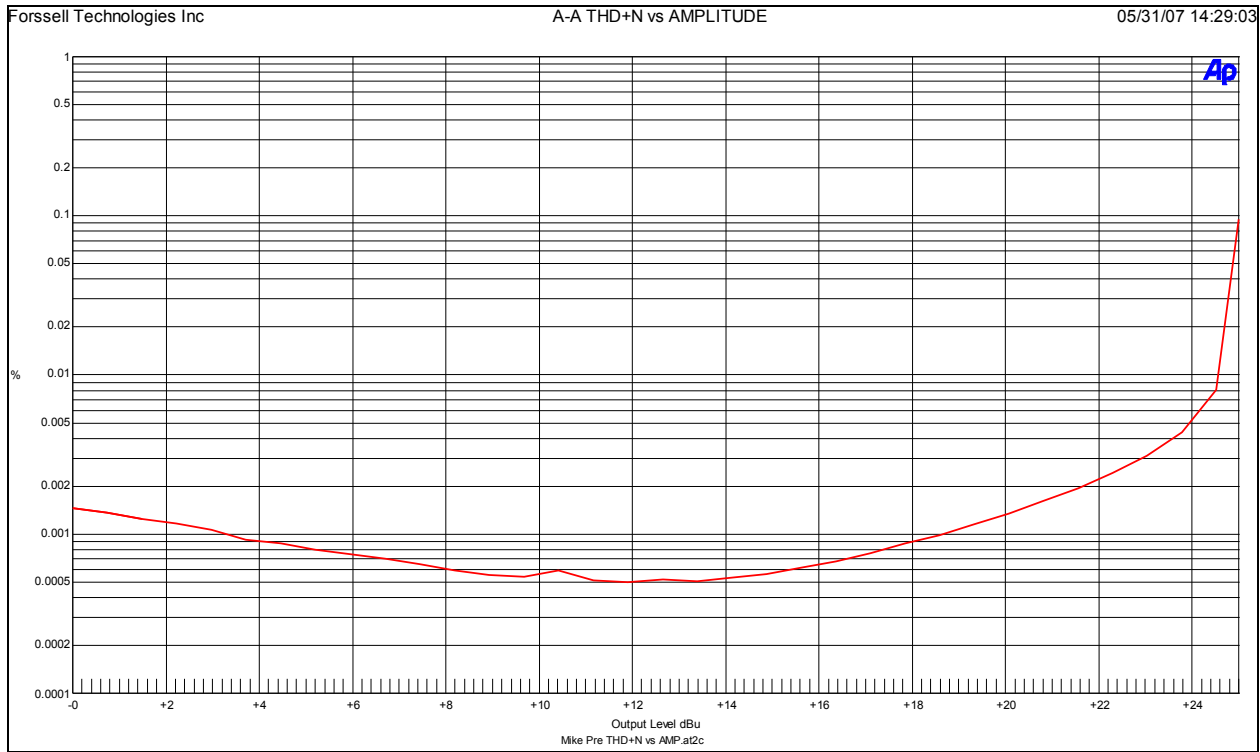
Maximum Output Level $\geq +27$ dBu

Recommended Load Impedance ≥ 600 ohms

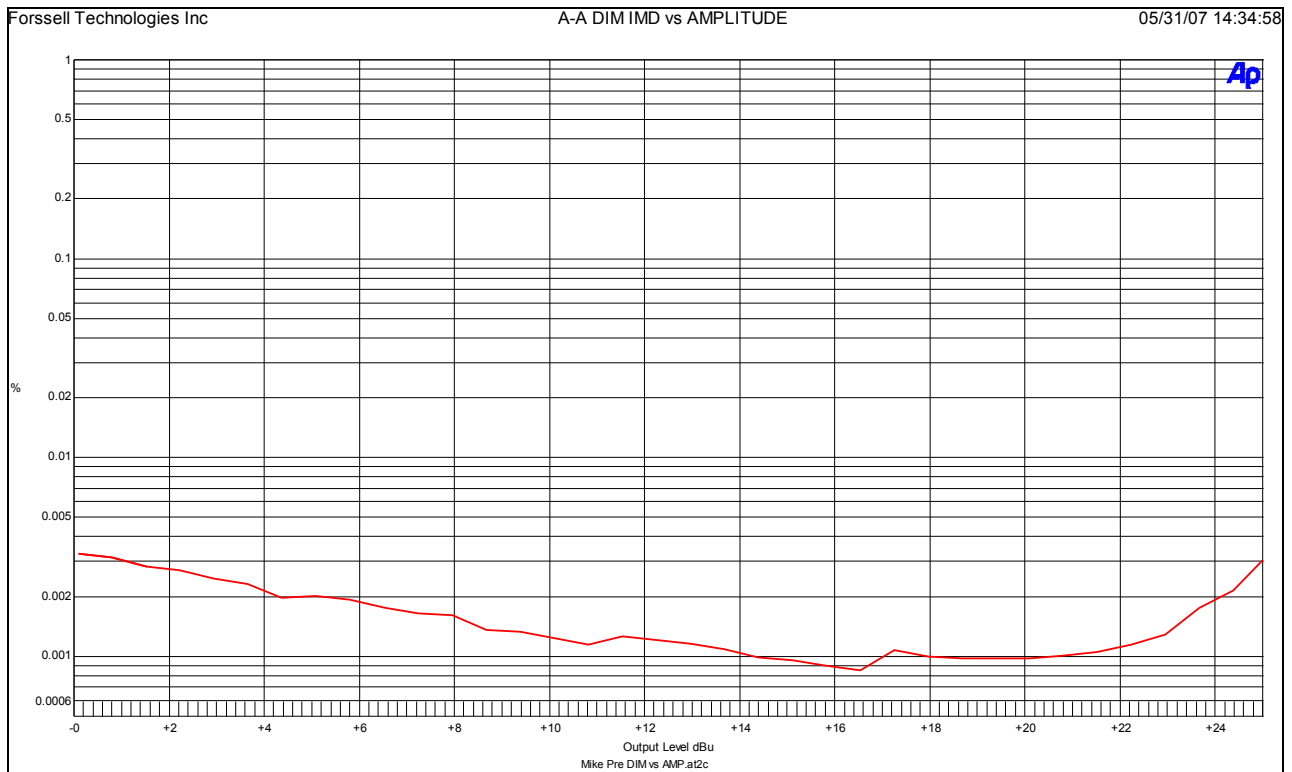
Preamp Output Impedance = 10 ohms

Power consumption = approx 13 watts

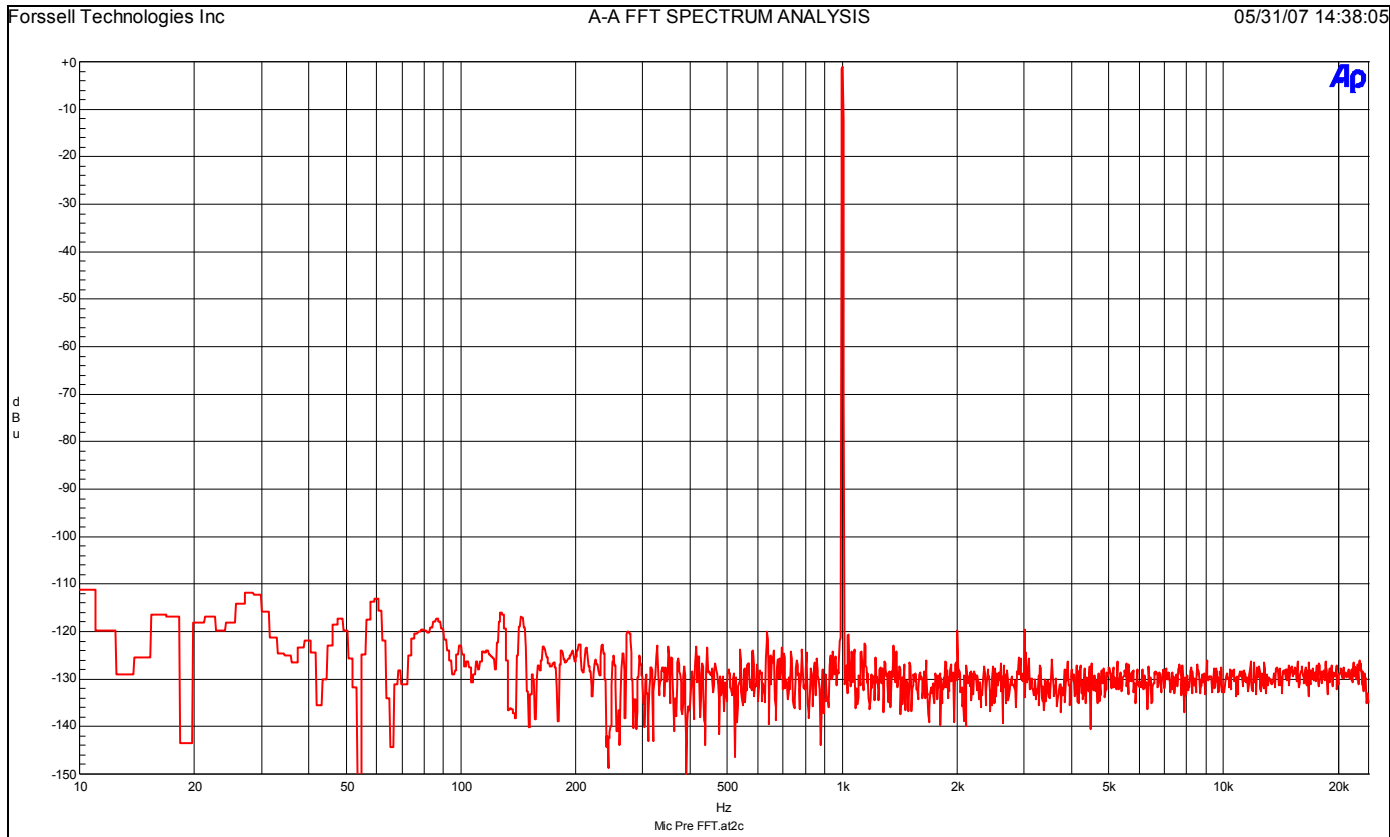
SMP- 2 Two Channel Discrete JFET Mic Preamp Test Data
 Unless otherwise specified all tests into 10k ohm || .001 mfd load



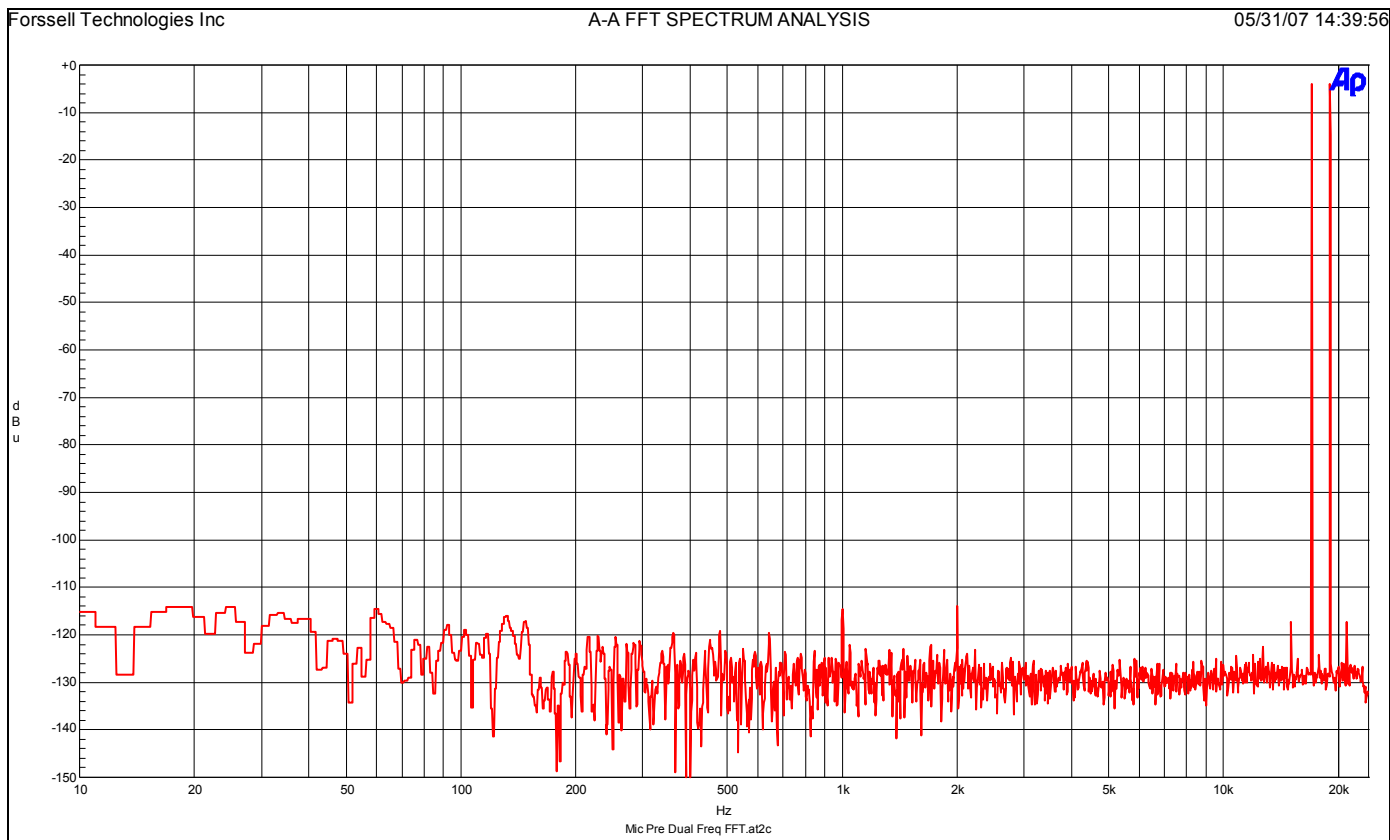
THD+N vs output voltage from 0 dBu to +25 dBu



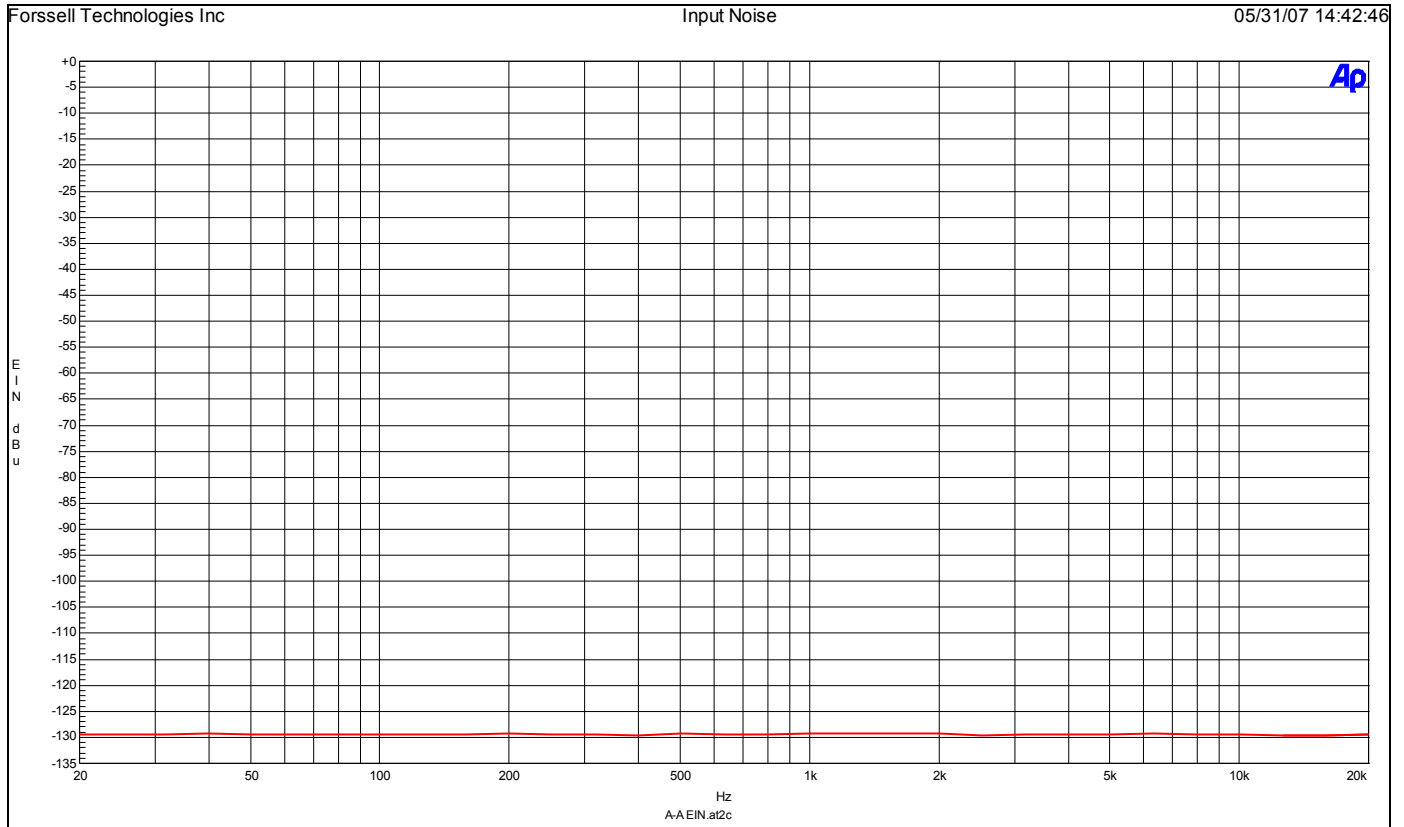
DIM vs output voltage



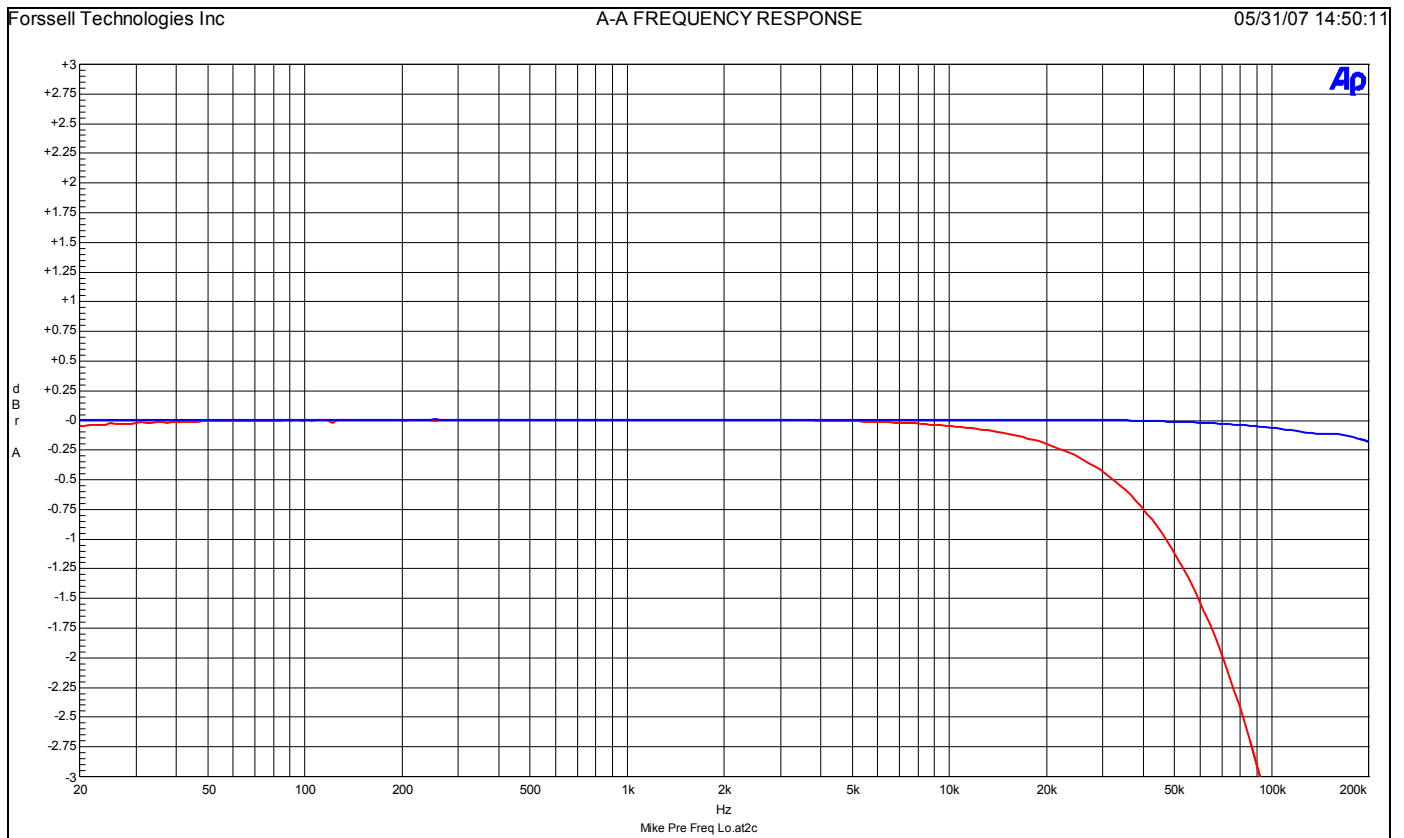
FFT plot 0 dBu output



Twin Tone (17KHz and 19KHz) FFT plot



EIN at max gain 20 Hz to 22 KHz



Freq Response at +6 dB gain (blue) and +60 dB gain (red)

Description

This microphone preamplifier is housed in a 1U rack mount chassis. It is a two channel mic preamp with individual controls for each channel.

Front panel controls include; Mute switch (mutes output), polarity reverse switch (relay), phantom power, 24 position rotary gain switch, and dual color LED signal level indicator (green @ -5 dBu, Red @ +24 dBu).

There are two inputs per channel. One (marked P48) has +48 volt phantom power supplied to it (when phantom power is switched on) and its signal passes through very high quality capacitors to block the phantom power DC voltage from the input stage of the preamplifier. The other input (marked DC) is connected directly to the input of the preamplifier, bypassing the phantom power blocking capacitors. You can use this “direct coupled” input when you are using microphone that do not require phantom power, such as vacuum tube mics, ribbon mics, and dynamic mics. You can only use of these inputs at a time. Do not connect the unused input to anything cable of microphone. The connector in the middle is the Direct Input. Input and Output connectors are XLR-3 wired pin #2 hot.

The front panel mounted bicolor LED will light green when an output signal level of -5 dBu or greater is present, and this LED will turn red when the output signal level reaches +24 dBu. This is approximately 2-3 dB before output clipping on the 2 channel preamp.

Circuit description

Class A discrete JFET front-end coupled to two discrete JFET opamps. The output stage of the SMP-2A is a cross-coupled, floating, balanced amplifier. The output can drive balanced or single-ended loads. The output signal must always be taken between pins #2 and #3 on the output XLR. Either of the output pins can be tied to ground (pin #1) if desired. The signal path is entirely DC coupled except for the phantom powered inputs. +48 VDC full current phantom power supply. +/- 18 VDC power supply rails.

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