

General Description

Dedicated to the needs of the acoustic musician, the AP 13 Acoustic Preamplifier is a full-featured package specifically suited for instruments with two pickups. The AP 13 provides two signal processing paths: one optimized for piezo pickups and one for microphone pickups. The piezo path features very high input impedance for extended low bass response; while the mic processing channel offers two choices of phantom power voltages satisfying most electret condenser mic pickups. Additionally, either channel accepts dynamic pickups or line-level outputs from outboard preamps. A convenient front panel slide switch allows choice of which pickup is wired to the tip or the sleeve of the stereo 1/4" input jack. Handy Pickup Gain Trim controls feature large openings for quick changes using guitar picks, fingernails or coins. And separate pickup Overload indicators make gain set-up easy.

Each pickup signal path contains an Invert switch, an adjustable Low Cut filter, a 7-band graphic equalizer, a Pan control and a separate Level amplifier, all logically arranged along the front panel using smooth-acting oil-damped sliders for the ultimate in convenience and graphical feedback. The Invert switch solves the

annoying (and too common) problem of what to do with pickups wired out-of-phase. The sliding Low Cut filter helps eliminate troublesome thumping, rumbling, rubbing and other unwanted infrasonic frequencies. The graphic equalizers give you separate timbre control over each individual pickup. The Pan and Level controls mix both pickups into one smooth stereo signal ready to drive the Send/Return Effects Loop, or the in-line Inserts. Two pair of high-current cross-coupled balanced stereo line drivers, with Mono switch, complete the processing chain. Choose between the stereo 1/4" *line-level outs* for amplifier feed or the stereo XLR *mic-level outs* for direct console patching, or use them both.

A powerful Headphone amplifier and Master Mute switch allow private auditioning and practice. The Tuner Output lets you leave your tuner attached for quick checks or changes during performance. When an auxiliary output is necessary, the separate Piezo Output with Level control perfectly satisfies the need.

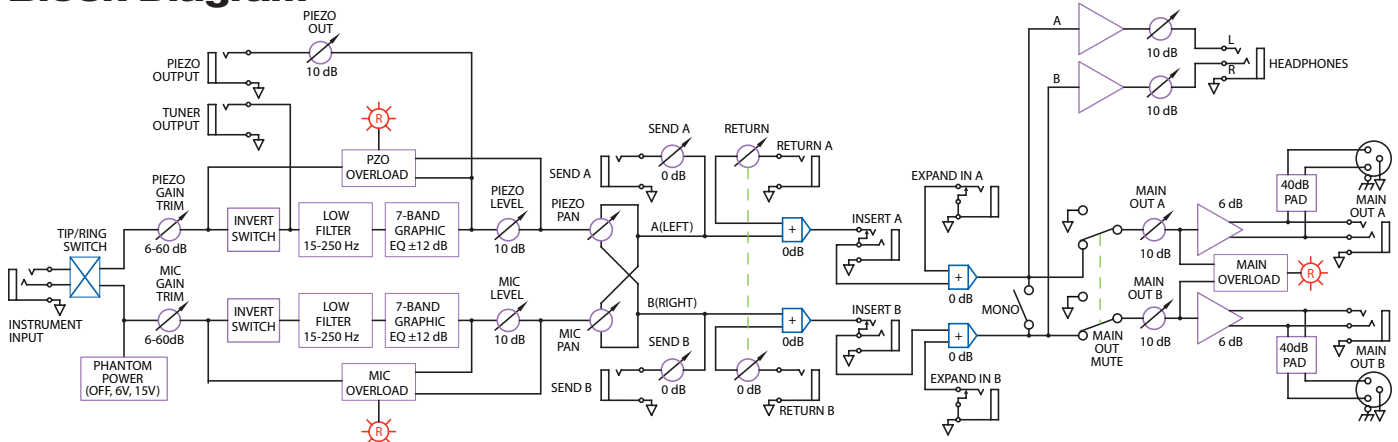
The AP 13 Acoustic Preamplifier is all you ever dreamed of for perfect control of your acoustic instrument (years of practice not included).

Features

- Advanced Preamp for Instruments Using Piezo & Mic Pickups
- Selectable Phantom Power Voltages for Condenser Mics
- Signal Processor for Each Pickup:
 - Low Cut Filter 15-250 Hz
 - 7-Band Graphic Equalizer
 - Phase Invert Switch
- Level & Pan Controls
- Stereo Send/Return and Insert Loops
- Switchable Tip/Ring Input Wiring
- Direct Tuner and Piezo Outputs
- Main Output Muting with Indicator
- Main Output Stereo/Mono Switch
- Fully Balanced Mic/Line Level Outputs
- Stereo Headphone Amplifier
- UL/CSA/CE and 100/120/230 VAC Remote Power Supplies

Parameter	Specification	Limit	Units	Conditions/Comments
Frequency Response	15-40 kHz	+0/-3	dB	Low Cut set minimum
THD+Noise	0.03	.01	%	+4 dBu, 20-20k Hz
Equivalent Input Noise (EIN)	120	2	dB	Inst Mic In to Send, 60 dB gain
	115	2	dB	Inst PZO In to Send, 60 dB gain
Signal-to-Noise Ratio	re +4 dBu, 20 kHz BW			
.....Return In to Main Out	88 / 81	2	dB	Unity/Max gain
.....Instrument In to Main Out	81	2	dB	Max gain except PU gains 50%
Crosstalk	greater than 70 at 2 kHz	min	dB	50 dB at 20 kHz
Mic Pickup Phantom Power	+6 or +15	5%	VDC	Switch on rear
Input Impedances: Mic Pickup	20k (1.8k w/Phantom Power)	1%	Ω	
.....PZO Pickup	5 Meg	min	Ω	1 kHz
.....All Others	20k	1%	Ω	Insert, Return & Expand
Maximum Input Levels				
.....Instrument Pickups	+12	1	dBu	(3.09 Vrms)
.....All Others	+22	1	dBu	(9.76 Vrms)
7-Band EQ: Center Frequencies	40/100/250/630/1.6k/4k/10k	3%	Hz	
.....Bandwidth	2.0	3%	oct	
.....Boost/Cut Range	± 12	1	dB	
Low Cut: Frequency Range	15-250	10%	Hz	Slope = 12 dB per octave
Maximum Available Gain				Input to Main Output (Line-level)
.....Instrument Pickups	86	2	dB	
.....Headphones	10	1	dB	
.....Return or Insert	16	2	dB	
Output Impedances				
.....Main Line-level	50	1%	Ω	Balanced
.....Main Mic-level	100	1%	Ω	Balanced
.....Headphones	90	1%	Ω	Unbalanced
.....Effect or Insert Sends	100	1%	Ω	Unbalanced
Maximum Output Levels				
.....Main Line-level	+22	1	dBu	Balanced into 600 Ω
.....Main Mic-level	-20	1	dBu	Balanced into 1 k Ω
.....Effect or Insert Sends	+22	1	dBu	Unbalanced into 2 k Ω
Headphones: Maximum Power	170	5%	mW	150 Ω headphones
	100	5%	mW	600 Ω headphones
.....THD + Noise	less than 0.015	max	%	150 mW / 150 Ω , 20-20 kHz
.....Crosstalk	greater than 80 @ 1 kHz	min	dB	60 dB, 20-20 kHz
Unit: Agency Listing				
.....120 VAC model	Class 2 Equipment UL & CSA			National Electrical Code Exempt Class 2 equipment
.....230 VAC model	CE-EMC CE-Safety			EMC directive 89/336/EEC Exempt per Art. 1, LVD 73/23/EEC
Power Supply: Agency Listing				
.....120 VAC model	UL CSA			Class 2 Equipment File no. E88261 File no. LR58948
.....230 VAC model	CE-EMC CE-Safety			EMC directive 89/336/EEC LV directive 73/23/EEC
.....100 VAC model	Built to JIS CE (safety)			Japan only LV directive 73/23/EEC
Power Supply Input	18 VAC w/center tap	10%	Vrms	Rane RS 1 (supplied)
Maximum Current Consumption	200		mA	
Unit: Size	1.75" H x 19" W x 5.3" D (1U)			(4.4 cm x 48.3 cm x 13.5 cm)
.....Weight	5 lb			(2.3 kg)
Shipping: Size	4.25" x 20.3" x 13.75"			(11 cm x 52 cm x 35 cm)
.....Weight	9 lb			(4.1 kg)
<i>Note: 0 dBu=0.775 Vrms</i>				

Block Diagram



Application Information

Several interesting things distinguish the AP 13 from other acoustic preamplifiers.

STEREO ¼" INPUT

Referring to the block diagram above, note the convenience of having an input switch that automatically reverses the role of tip and ring on the ¼" Input jack. This saves the trouble of having to rewire your plug just because it follows one tradition or another. Next, the three-position Phantom Power (T-Power) selector switch allows you to choose between 6 volts or 15 volts DC to power your electret or other condenser pickup. T-Power is similar to phantom power except only two conductors are required instead of three (voltage and hot are tied together). This should cover just about every case – check with the factory for your mic if in doubt, or read the RaneNote, “Microphones for the AP 13”. The Off choice lets this Input accommodate standard electric guitar type pickups (magnetic coil designs – humbucking or otherwise). In fact, *either* Input handles this type of pickup directly, or accepts the line-level outputs of outboard preamps (belt or instrument mounted).

TUNING

The fixed Tuner Output connects to the piezo processing side since that is the one that gives the most accurate tuning information. This output is not affected by the graphic EQ. The Piezo Output is similar except located post-EQ and has it's own Piezo Output Level control. Neither of these outputs are affected by the Piezo Level control.

EFFECTS LOOPS

Two different kinds of effects loops live in the AP 13. The first is the standard Send/Return loop used to mix a wet (processed) signal back with the dry (unprocessed) signal. Choose between stereo or mono Send and Return paths. Individual Send A/B controls exist along with a ganged stereo Return control. The second is the direct in-line type known as an Insert. Here all the signal exits, passes through the outboard processor and re-enters, all using the same ¼" TRS jack, wired per the Tip=Send, Ring=Return convention.

EXPANDING & OTHER INPUTS

The Expand Input jacks provide a means for either expanding the AP 13 to allow two instrument use, or as a means to mix line-level signals with that of the AP 13. Such things as drum machines and synthesizers often find themselves plugged into these jacks. Mono or stereo sources may be used.

MAIN OUTPUTS

The AP 13 uses high-current cross-coupled differential line drivers for each of its balanced outputs. Normal balanced line-level applications use the ¼" output jacks with 3-wire cable terminated with ¼" TRS plugs. Unbalanced line-level interconnection uses standard mono ¼" TS plugs without gain change or signal loss. For direct console connection, the XLR outputs provide a low-noise mic-level balanced signal.

Architectural Specifications

The Inputs shall contain two channels accomodating both a microphone and piezo instrument pickup, terminated in a single ¼" TRS (tip-ring-sleeve) connector. Switchable phantom power shall be provided for the microphone input. Each input shall have an overload LED, input trim control, phase invert switch, low cut filter, seven-band graphic equalizer, pan and level controls. The main outputs shall implement a stereo level control and mute switch, terminated in balanced 3-pin and ¼" TRS connectors. An output mono switch shall be provided.

Stereo send and return connectors with level controls shall be provided. A ¼" TS tuner output, ¼" piezo output, ¼" TRS insert connectors and ¼" TS expand input connectors shall also be provided. A headphone amplifier shall be built-in with it's own level control.

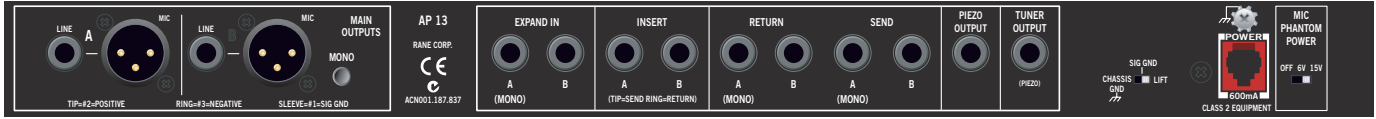
The unit shall be a Rane AP 13 Acoustic Preamplifier.

AP 13

ACOUSTIC PREAMPLIFIER

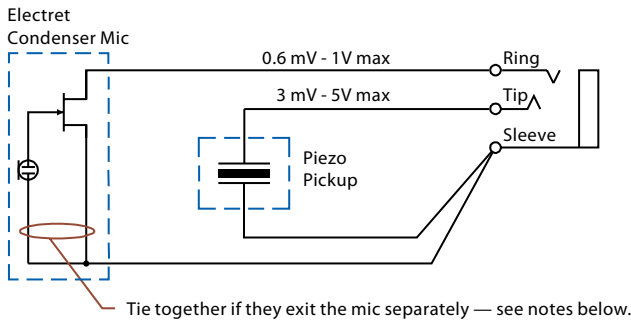


Rear Panel

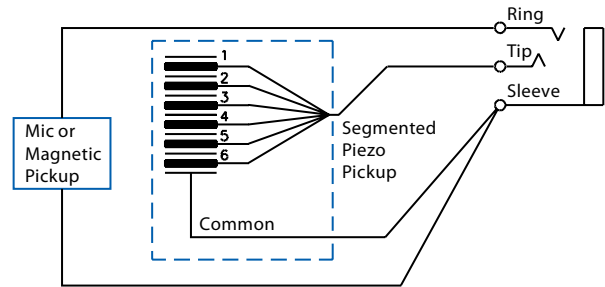


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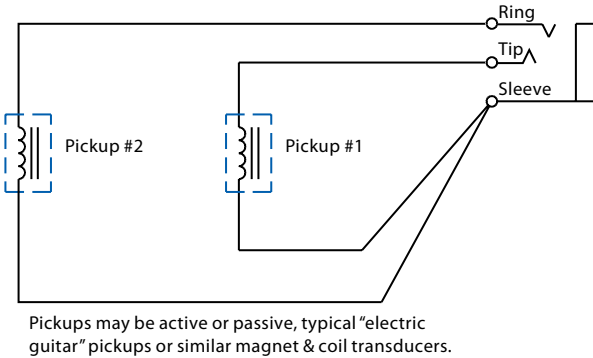
Basic Two Pickup System (no battery in guitar)



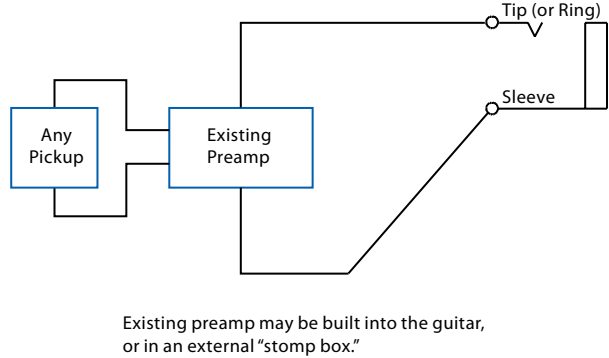
Two Pickup System with Separate Piezo Pickup for Each String



Two Electric Guitar Magnetic Pickups



Single Pickup with Preamp



Recommended Microphones

Almost any miniature dynamic or condenser mic may be used with the AP 13. Several compatible miniature microphones are made by AKG, Audio-Technica, Barcus Berry, Beyerdynamic, Countryman, Crown, CT Audio, Donnell, ElectroVoice, Fishman, Frap, Sennheiser, Seymour Duncan, Shure, Sony, and Telex. Consult the RaneNote, "Microphone Options for the AP 13," available at the Rane website: www.rane.com/ap13.html.

Mic Wiring in General: The red wire is usually the hot wire and should be connected to the tip or ring; the other wire and shield tie together at the sleeve. Consult the mic maker or Rane Tech Support for more specific information on wiring microphones from other manufacturers.

SP 13

The SP 13 is a version of the AP 13 optimized for Stick musicians. It is available exclusively from Stick Enterprises. www.stick.com