



SA200 USERS' GUIDE

VERSION 3.0

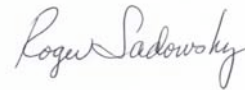
I am pleased to announce the SA200 All Tube Bass Amplifier.

Designed for the discriminating bassist, the 200-Watt SA200 took three years of design and prototyping to produce an integrated bass amplifier that sets a new benchmark for tone.

At a time when the market is moving toward sacrificing sonic quality for light weight, questionable features, and reduced cost, the SA200 is a return to quality and simplicity above all other concerns.

The SA200 truly defines “plug and play.”

Sincerely...



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Safety Precautions and Warnings

Please read and observe the following safety precautions and warnings, which are included here for your protection:

- To turn on the SA200 safely, refer to the section “Turning on the SA200.”
- Never turn on or operate the SA200 without having it connected to a speaker cabinet! This can seriously damage the amplifier, and such damage will not be covered by your warranty.
- Ensure adequate airflow around and through the chassis (front and back) at all times, especially if the amplifier is to be rack mounted.
- Do not touch any vacuum tubes while they are hot.
- Use only replacement vacuum tubes that are approved by Sadowsky Audio for this amplifier.
- Always ensure the chassis is connected to ground; do not disable the grounded plug; ensure grounding conforms to the standards in your area.
- Disconnect the power cable if the amplifier is to be stored or shipped or if vacuum tubes are to be replaced.
- If lightning is in your area, do not operate the amplifier.
- Connect this amplifier only to an AC source that meets the specifications of the amplifier.
- Dangerously high voltages are present inside the amplifier chassis: these voltages can be present even after power is turned off.

Warning! To prevent electrical shock, injury, or death, do not open the underside of the chassis for any reason. Refer all service to a Sadowsky-approved technician!

- Aside from the vacuum tubes, there are no user-serviceable parts inside the amplifier.
- The amplifier is capable of high sound-pressure levels (SPLs): use hearing protection when operating the amplifier at high volume.

Warning! Permanent hearing damage or loss could result from prolonged or inappropriate exposure to the high SPLs that the amplifier can produce.

- Clean the chassis exterior with a soft cloth and the chassis interior with compressed air. Do not expose the chassis exterior or interior to liquids of any kind.
- If replacing a fuse, use only the same type and rating.
- Ensure the amplifier is never exposed to extremes of weather, including temperature, moisture, humidity, or direct sunlight.
- Read and follow all instructions for proper use of the amplifier; failure to do so could lead to damage that might void the amplifier's warranty.

Caution! If you replace *any* vacuum tubes in your SA200 with tubes that are not Sadowsky approved, you *will* void your warranty and you *might* damage the amplifier.

Feature Overview

The Sadowsky SA200 is a single-channel integrated bass amplifier that incorporates an all-tube Class AB pentode design using three preamp tubes¹ and six EL34s. This power-tube complement allows the SA200 to provide 210 Watts of output power.

The SA200's toroidal transformers (output and power) are designed for low noise and high reliability, and all the components used in the SA200 are of the highest quality available, as you will immediately hear every time you use the SA200.

The SA200's chassis is heavy-gauge steel, and the chassis is rack mountable via rack ears that are included (or you can attach rubber feet, which are also included). In addition, the bold white lines on the large black control knobs make for easy adjustments on darkened stages.

The input signal from your bass first passes through the Input Switch, which provides 6 dB of attenuation.

Note: We recommend no attenuation for all basses, including active basses; however, in the event that the output of your bass is high enough to cause clipping or distortion, engage the 6 dB attenuation switch.

The signal continues through the Fat/Clean switch and the Gain control, which work together to begin the SA200's powerful tone-shaping.

The SA200's equalizer section is simple to understand and intuitive to operate and provides you with total control of your sound via five practical and usable center frequencies. The Master Volume control simply allows you to increase or decrease the level of the overall sound you've achieved via the input and tone controls.

You will quickly see and hear that subtle adjustments of the SA200's shelving-type tone controls² will yield equally subtle variations of tone you just cannot get with other bass amplifiers. Refer to section "Front-Panel Layout and Controls" for a complete description of the SA200's controls.

If you've ever used a classic tube amplifier, you'll immediately recognize the Standby and Power switches, which allow you to turn the SA200 on and off safely and to extend tube life as well. (See the section "Turning on the SA200.")

The rear panel on the SA200 provides access to the fuses, the Speaker Outputs and Impedance Selector switch, the Tuner Output and mute-to-tune footswitch jack, and the Direct Output jack and the various controls related to this output.

In summary, these features were all designed to allow you to relax and concentrate on your playing, which really is the most important thing, after all, isn't it?

1. Refer to the section "Specifications" for a complete description of the SA200's tube complement.

2. A shelving tone control affects the frequencies just above and just below the control's center frequency.

Turning on the SA200

To turn on the SA200 safely, do the following:

1. Attach the power cable between the SA200 and the appropriate AC source. (See the section “Rear-Panel Layout and Controls.”)
2. Connect a speaker cable between the SA200 and an appropriate speaker cabinet. (See the section “Speaker Connections.”)

Caution! Never operate the SA200 without it being connected to a speaker cabinet! This can seriously damage the amplifier, and such damage will not be covered by your warranty.

3. Based on the speaker cabinet you are using with the SA200, set the Impedance Selector to the proper impedance. (See the section “Rear-Panel Layout and Controls.”)
4. Place the Standby Switch in the position marked **O**.
5. Place the Power Switch in the position marked **I**.

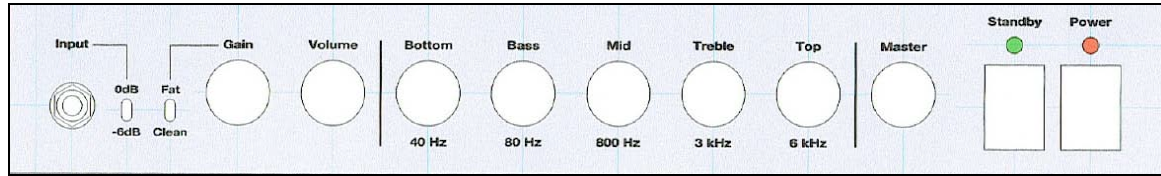
Note: The SA is now in Standby Mode, which means the tubes are warming to their proper operating temperature and no sound is possible.

6. Wait approximately 3 minutes for the tubes to reach their proper operating temperature then place the Standby Switch in the position marked **I**.

Note: You might hear a mild thumping sound from your speaker(s) as you set the Power Switch as indicated above; this sound is normal.

The SA200 is now in its full operating mode.

Front-Panel Layout and Controls



Switches & Controls

Descriptions

Input Switch

Provides 6 dB of attenuation. We recommend no attenuation for all basses, including active basses; however, if your bass's output is high enough to cause clipping or distortion, engage the 6 dB attenuation switch.

Fat/Clean Switch, Gain, & Volume

In Clean Mode, and with the Gain control at a level below that of the Volume control, a clean signal is produced; however, as you turn the Gain control past the level of the Volume control, small amounts of clipping distortion are introduced into the signal.

In Fat Mode, the signal level through the preamp section is raised in order to introduce second-harmonic distortion, which allows the Gain and Volume controls to work together to determine the amount of this second-harmonic distortion. A fatter tone can be achieved by increasing the gain of the first preamp stage (by turning up the Gain control) and simultaneously decreasing the volume after the preamp (by turning down the Volume control).

Note: We strongly encourage you to experiment with these five tone controls to determine how they'll best work for you, but we remind you that a little EQ goes a long way. See the section "Sample Settings."

Bottom

Active control that provides 12 dB of boost and cut at 40Hz

Bass

Passive control that provides 4 dB of boost and 10dB of cut at 80Hz

Mid

Passive control that provides 5 dB of boost and 14dB of cut at 800Hz

Treble

Passive control that provides 10 db of boost and 6 dB of cut at 3kHz

Note: The relative levels of the three passive tone controls are directly proportional to the output level of the amplifier. No output is available with these three controls turned full counter-clockwise. Further, the relative level of the Bass control directly influences the effect the Bottom control has, and the relative level of the Treble control directly influences the effect the Top control has. Think of the Bass, Mid, and Treble controls as rotary equalizers.

Top

Active control that provides 10 dB of boost and cut at 6kHz

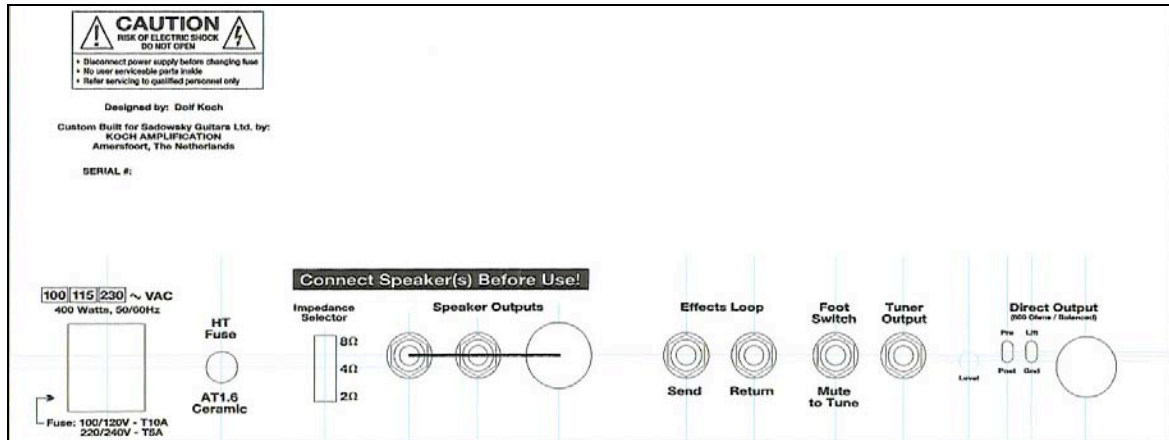
Master Volume

Controls the overall level of all preamp functions that precede it.

Power Switch & Standby Switch

Power Switch applies power to the tubes so they can reach proper operating temperature. Standby Switch applies high voltage (HT) to the tubes after they have reached proper operating temperature.

Rear-Panel Layout and Controls



Features & Controls

Descriptions

Fuses, Mains & HT

Mains fuse is located inside the AC receptacle; high-voltage (HT) fuse is located to the right of the AC receptacle.

Cooling Fan

Function is automatic; no interaction is required other than periodic cleaning.

Impedance Selector

SA200 can operate at 2-, 4-, and 8-Ohm loads. (Refer to the section “Speaker Connections.”)

Caution! To avoid damaging the output transformer, ensure speakers are connected to the speaker outputs before turning on the power, and make certain the Impedance Selector is in the correct position.

Speaker Outputs

Connections to speaker cabinets provided by two ¼-inch tip-shield (TS) jacks and one Speakon jack.

Effects Loop

Send and Return connections (to and from outboard effects) provided by two ¼-inch TS jacks.

Foot Switch Input

Mute-to-tune function provided by one ¼-inch TS jack and a foot switch.

Tuner Output

Connection to a remote tuner provided by one ¼-inch TS jack.

Direct Output (D.O.)

600-Ohm balanced output provided by an XLR jack.

Level for D.O.

Controls the level of the direct output’s signal.

Pre-Post for D.O.

Allows the direct output’s signal to be derived from before or after the EQ and Master Volume control.

Lift-GND for D.O.

Allows the D.O. ground to be lifted to eliminate ground-induced hum.

Speaker Connections

The SA200's speaker outputs are wired in parallel.

Caution! We recommend that you use only the speaker cabinet combinations listed below. Do not attempt to operate the SA200 below 2 ohms or above 8 Ohms.

The SA200 operates with impedance loads of 2, 4, or 8 Ohms, which provide a great deal of flexibility for connecting speaker cabinets to the SA200.

The impedance (Z) calculation for parallel connections is as follows:

$$1 / (1/Z_1 + 1/Z_2 + 1/Z_n) = Z_{\text{Parallel}}$$

Example with two 4-Ohm cabinets:

$$Z_{\text{Parallel}} = 1 / (1/4 + 1/4) = 1 / (0.25 + 0.25) = 1/0.5 = 2 \text{ Ohms}$$

Example with four 16-Ohm cabinets:

$$Z_{\text{Parallel}} = 1 / (1/16 + 1/16 + 1/16 + 1/16)$$

$$Z_{\text{Parallel}} = 1 / (0.0625 + 0.0625 + 0.0625 + 0.0625) = 1/0.25 = 4 \text{ Ohms}$$

You can safely connect the SA200 to...

One 8-Ohm speaker cabinet

One 4-Ohm speaker cabinet

One 2-Ohm speaker cabinet

Two 16-Ohm speaker cabinets — two 16-Ohm cabinets in parallel = 8 Ohms
(set the Impedance Selector to **8**)

One 16-Ohm speaker cabinet and one 8-Ohm speaker cabinet = 5.34 Ohms
(set the Impedance Selector to **4**)

Two 8-Ohm speaker cabinets — two 8-Ohm cabinets in parallel = 4 Ohms
(set the Impedance Selector to **4**)

Four 16-Ohm speaker cabinets — four 16-Ohm cabinets in parallel = 4 Ohms
(set the Impedance Selector to **4**)

One 8-Ohm speaker cabinet and one 4-Ohm speaker cabinet = 2.67 Ohms
(set the Impedance Selector to **2**)

Two 4-Ohm speaker cabinets — two 4-Ohm cabinets in parallel = 2 Ohms
(set the Impedance Selector to **2**)

Four 8-Ohm speaker cabinets — four 8-Ohm cabinets in parallel = 2 Ohms
(set the Impedance Selector to **2**)

Tube Maintenance

The tubes used in the SA200 should provide hundreds of hours of trouble-free operation under normal conditions; however, preamp and power tubes do wear out and have to be replaced to maintain the SA200's peak performance.

Tubes behave like strings in that they lose highs, lows, and dynamics after a period of time and must be replaced. Although stating exactly when tubes need to be replaced is impossible, if you play almost every day, change your tubes once each year; and if you play once or twice a week, change your tubes every two to three years.

Things to Consider When Replacing Tubes

Should you need to replace tubes, we strongly urge you to read and consider the following:

- Replacing any tubes in the SA200 with the appropriate Sadowsky-approved tubes does not require any special adjustments to your SA200.
- Preamp-tube replacement is typically indicated by the following:
 - Microphonic whistling, ringing, or squealing
 - Low or no amplifier volume
 - Excessive noise

Note: If you need to replace preamp tubes, contact Sadowsky Audio so that you can order the correct replacement(s).

Caution! Even though your SA200 will operate with octal power tubes other than EL34s (i.e., 6L6GCs, KT66s, KT88s, or 6550s) replacing *any* tubes in your SA200 with tubes that are not Sadowsky-approved tubes *will* void your warranty and *might* damage the amplifier.

- Power-tube replacement is typically indicated by the following:
 - Blowing fuses, either intermittently or regularly
 - Loud crackling that is not affected by the front-panel controls
 - Unusual amplifier distortion
 - Hum

Note: Sadowsky-approved EL34 power tubes are coded by type and by bias-class number, which enables you to replace individual power tubes—or a full set of tubes—*without* any bias-current adjustment. If you need to replace any number of EL34 power tubes, contact Sadowsky Audio with the numerical code (shown on each tube) so that you can order the correct replacement(s).

Tube Replacement

In-depth troubleshooting measures and maintenance procedures are beyond the scope of this document and should only be undertaken by a Sadowsky-approved technician.

For this procedure you will need the appropriate replacement tube(s) approved by Sadowsky Audio and a Number 1 Phillips screwdriver.

To replace tubes in your SA200, do the following:

1. Turn off power to the amplifier and disconnect the power cable. (No special action is required to drain dangerous voltages from the SA200's capacitors before removing the amplifier's cover. Simply turning off the Power Switch is sufficient.)

Note: The green LED slowly dims to indicate that the HT power supply slowly loses power; when the green LED is completely off, no high voltage is present in the amplifier.

2. Place the disconnected amplifier on a surface that is approximately waist high, which will allow you easy access to the amplifier's interior.
3. Allow hot tubes to cool before removing the amplifier's cover.
4. Remove the amplifier's cover by...
 - A) Removing the eight Number 1 Phillips screws located on the cover, and
 - B) Removing the three Number 1 Phillips screws located along the top edge of the rear panel. (Set all 11 screws aside in a safe place.)

Warning! To prevent electrical shock, injury, or death, do not open the underside of the chassis for *any* reason. Refer all internal chassis service to a Sadowsky-approved technician.

Caution! Except for on-the-job emergencies, we strongly recommend that you not replace just a single power tube. Ideally, if you need to replace any power tubes, you should replace them all at once because a closely matched sextet of power tubes is vital for the proper operation of your SA200.

5. Locate the tube(s) you wish to replace by referring to the tube layout diagram located on top of the chassis.

Caution! Replace tubes *only* with tubes approved by Sadowsky Audio. Using any other manufacturers' tubes *or* any other tube types *will* void the warranty and *might* damage the amplifier.

6. According to the tube layout diagram and to your needs, remove and replace the appropriate tube(s). (Each power tube has a metal harness holding it in place; carefully move the harness out of the way before you remove each old tube then replace it after you've installed each new tube.)
7. Reattach the power cable between the SA200 and the AC source and reattach the speaker cable between the SA200 and your speaker cabinet. (Ensure the Impedance Selector is in the correct position; see the section "Speaker Connections.")

Warning! The following two steps ask you to turn on power to the SA200 with the amplifier's top off; proceed carefully!

8. Place the Standby Switch in the position marked **O** then place the Power Switch in the position marked **I**. The SA is now in Standby Mode.
9. Wait approximately 3 minutes for the tubes to reach their proper operating temperature then place the Standby Switch in the position marked **I**. The SA200 is now in its full operating mode.
If the amplifier powers up as you expect, turn off power to the amplifier and proceed to Step 10; however, if the amplifier does not power up as you expect, do the following:
 - A) Repeat Step 1,
 - B) Repeat Step 3,
 - C) Check that all tubes are seated correctly, and
 - D) Repeat Steps 7 through 9.
10. Replace the amplifier's cover by...
 - A) Properly positioning the cover on top of the amplifier,
 - B) Reinstalling the three Number 1 Phillips screws along the top edge of the rear panel, and
 - C) Reinstalling the eight Number 1 Phillips screws in the top panel.

This completes the procedure for replacing tubes in the SA200.

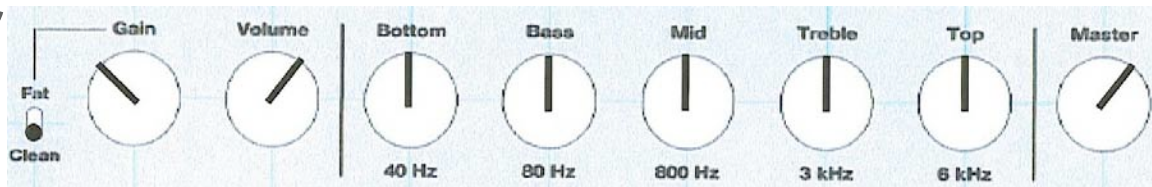
In-depth troubleshooting measures and maintenance procedures are beyond the scope of this document and should only be undertaken by a Sadowsky-approved technician.

Sample Settings

Here are some sample settings—and the rationales for each—to get you started using the SA200; please note, however, that these settings will be affected by the following: whether you use 4-string versus multi-string basses; the typically higher output of active basses; the more subtle tone functions of passive basses; the relative output of pickups; the speakers you use (size, cabinet design, etc.); the bass strings you use (roundwounds versus flatwounds, etc.); and so forth. Consider all of this as you work with these sample settings, which were developed using a Sadowsky Vintage 4-string in active mode, with Sadowsky Bright Nickel strings (45-65-85-105), and with the Input Switch set to -6 dB.

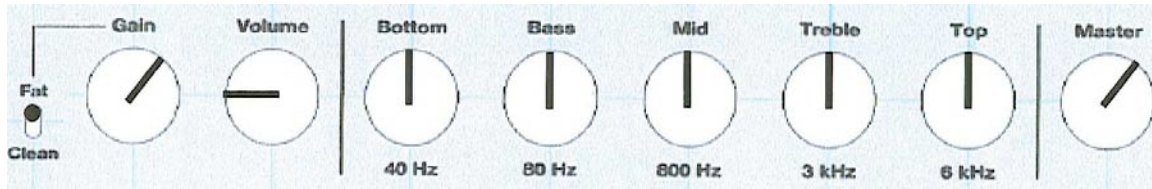
Note: The Master Volume control allows you to decrease or increase overall output without sacrificing the desired tone qualities of your settings.

Clean Starting Point



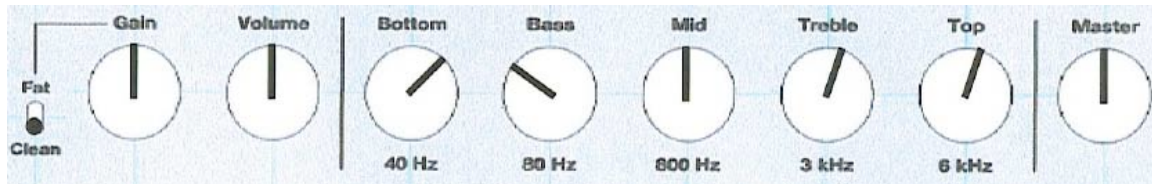
The preamp is in Clean mode, the Gain setting is less than the Volume setting, and the tone controls are at their theoretical flat positions. The result is a full, clean sound, using fingers, thumb, or pick.

Fat Starting Point



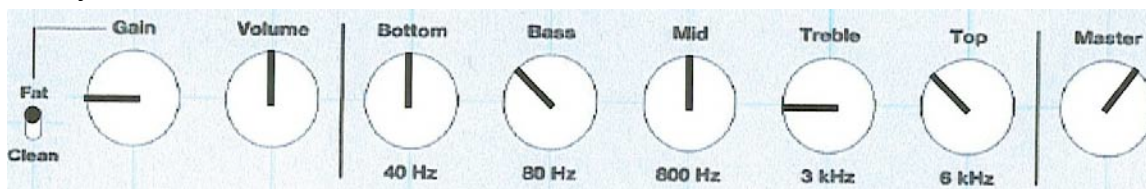
The preamp is in Fat mode, the Gain setting is greater than the Volume setting—so some harmonic distortion is being introduced—and the tone controls are at their theoretical flat position. The result is a full sound, but with a slight grind.

Finger Style



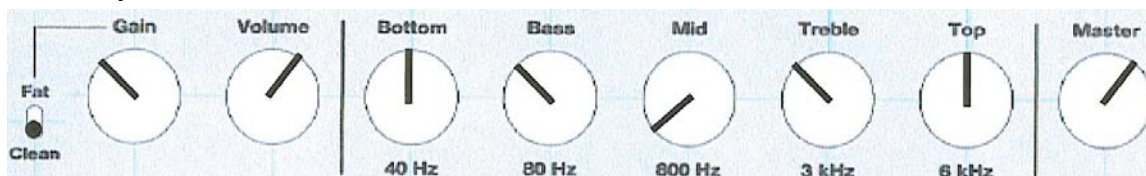
The preamp is in Clean mode, Gain and Volume are at noon, Bottom and Top are moderately emphasized, Bass is rolled off slightly, and Mid and Treble are very near their flat setting. The result is tight, punchy, powerful, quick, and detailed for finger-style playing.

Pick Style



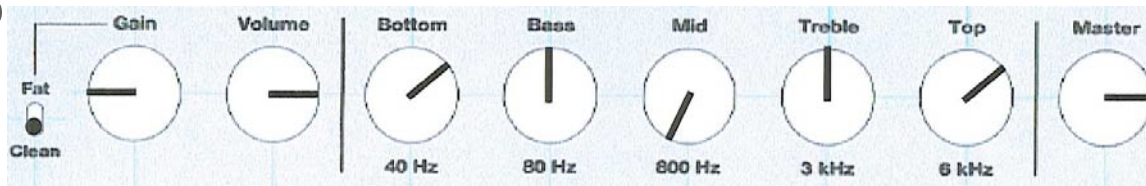
The preamp is in Fat mode, the Gain setting is less than the Volume setting, and the tone controls are set to provide a slightly bottom-heavy sound to compensate for the bright attack that is typical of pick-style playing. The small amount of harmonic distortion introduced by the Fat mode setting and the boosted Mid setting add a small amount of grind that further compensates for the edgy attack of a pick.

Thumb Style



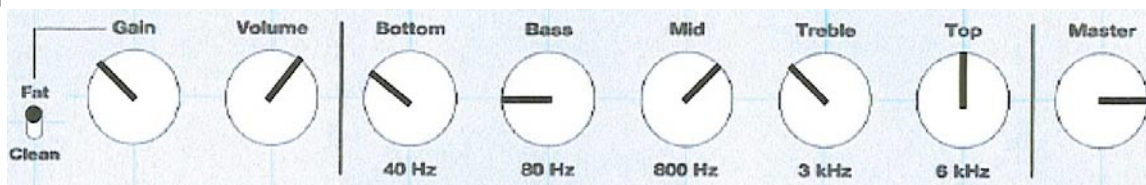
The preamp is in Clean mode, the Gain setting is less than the Volume setting, and the tone controls typify the somewhat scooped setting that is a favorite of thumb-style players. The result is clean and punchy, with smooth highs and an appropriately emphasized low-end left.

Slap-and-Pop Style



The preamp is in Clean mode, the Gain setting is substantially less than the Volume setting, the tone controls typify the dramatically scooped midrange that is popular with this playing style, and the boosted Bottom and Top settings, as well as the Master Volume setting, compensate for the lower output inherent with this style. The result is a smooth sound with enough high-end to cut through and enough low end to provide punch and balance.

Fretless



The preamp is in Fat mode, the Gain setting is less than the Volume setting, and the tone controls reflect a de-emphasis of low-end and an emphasis of upper-midrange. The result is a punchy, slightly mid-heavy grind with enough high-end emphasis to accentuate fretless “wolf tones.”

Specifications

Input	Impedance: 1 MOhm (unattenuated) Switch: 6dB of attenuation (active)
Tone Controls	Active: Bottom (40Hz) and Top (6kHz) Passive: Bass (80Hz), Mid (800Hz), and Treble (3kHz)
Output Power	210 Watts at 2, 4, or 8 Ohms
Tube Complement	Output Tubes: six EL34B-STR Preamp Tubes: one 6N1P and two 12AX7
Frequency Range	10Hz–40Khz (-3dB)
Lowest Frequency at Full Power	15Hz (-1dB)
Effects Loop	Signal Level: -4dBV Send Impedance: 1kOhms (buffered) Return Impedance: 20kOhms
Mains	Selectable Input Voltage: 100, 115, or 230VAC 50/60Hz Input Power: 400 Watts
Dimensions	16.93 inches (W) x 6.93 inches (H) x 9.84 inches (D) 430 mm (W) x 176 mm (H) x 250 mm (D) 4 rack units (RUs) high; 1 RU = 1.75 inches (~44 mm)
Weight	41.8 lbs 19 kg

Contact Information

- For updates to this users' guide and for information about SA200 spare parts and how to order them, refer to www.sadowsky.com.
- Phone: (718) 422-1123
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