Sunn 200S Preamp

JFET-based adaptation of the legendary vintage bass head

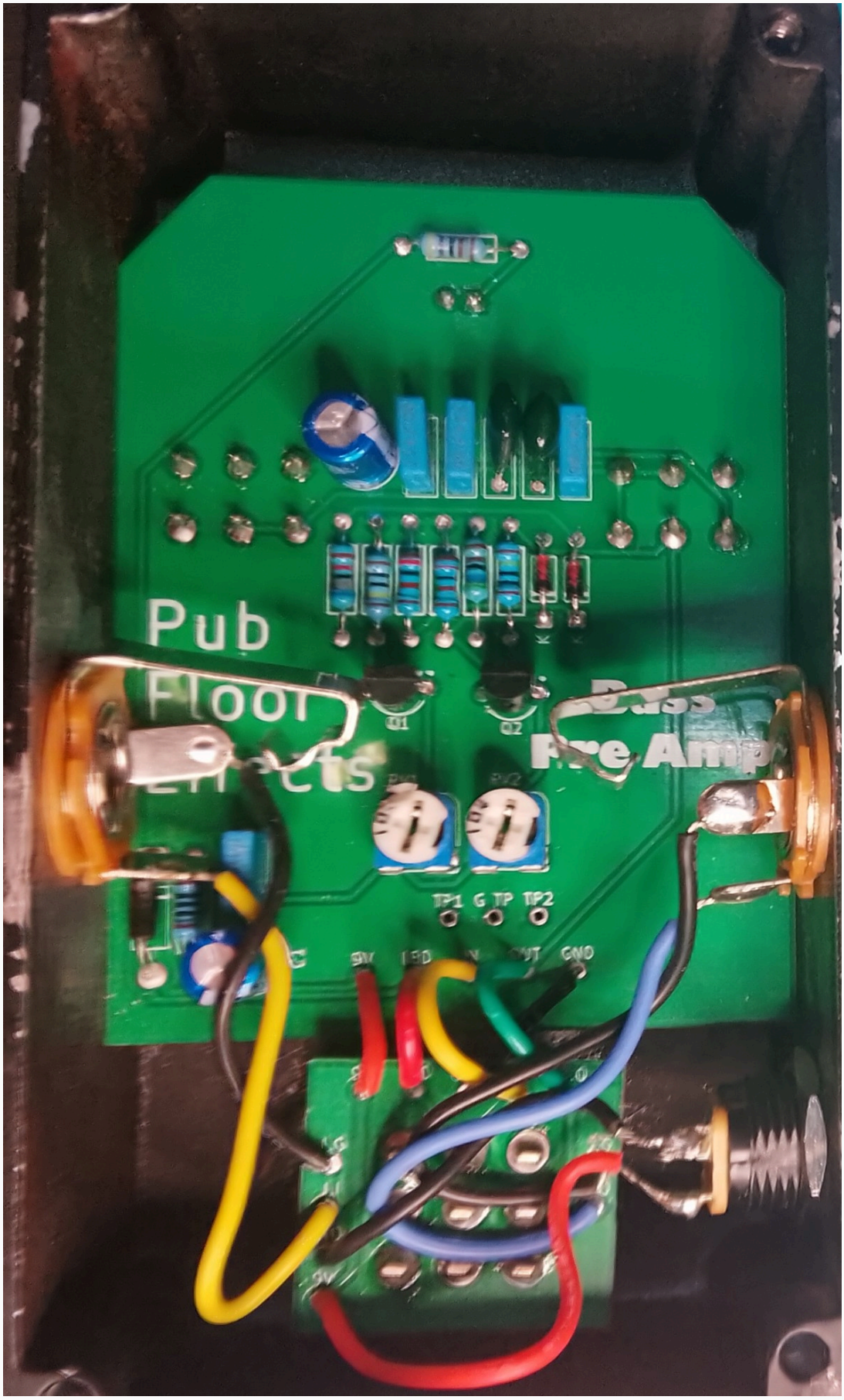

Pub
Floor
Effects
Bass
Pre Amp
Q1
Q2
TP1 G TP TP2
9V
LED
OUT
GND

Figure 1: *Completed Pedal Overview*

Overview

The Sunn 200S Preamp is a compact, JFET-based stompbox adaptation of the legendary late-1960s Sunn 200S tube bass amplifier. Engineered to translate the massive low-end headroom, punchy clarity, and warm harmonic grit of the vintage 6550/KT88-driven head onto a pedalboard, it substitutes the original amp's high-voltage tubes with a pair of biased JFETs.

- **Enclosure Size:** 125B
- **Power Supply:** 9V DC Center-Negative

Key Circuit & Tone Features

- Amp-in-a-Box Architecture: Similar in spirit to a Fender Bassman preamp, the 200S places its passive tone stack at the end of the circuit rather than in the middle. This layout preserves raw, uncompressed signal punch while letting you sculpt the final output.
- Expanded Tone Shaping: While the vintage 1967 Sunn 200S amp only featured Bass and Treble controls (alongside Hi/Lo boost switches), this DIY layout adds a dedicated Mid control. Combined with a Master Volume, it gives bassists and baritone/downtuned guitarists far greater control over how their signal cuts through a dense mix.
- Pedalboard-Friendly Footprint: Designed with a clean, low-parts-count circuit, the entire build fits comfortably inside a standard 125B enclosure.

Builder Notes

- JFET Biasing: Like most amp-emulation pedals, dialing in the trimmers to bias the JFET drains to roughly 4.5V–5V (on a standard 9V supply) is essential to unlock the right balance of clean headroom and tube-like breakup.There is 2 dedicated test points marked TP1 and TP2 and a dedicated ground marked G TP for biasing the Jfets. You will need a digital multimeter set to DCV with the black probe on the G TP and the red probe on TP1 or TP2.
- Versatile Placement: It works equally well as an always-on "foundation" tone-shaper at the end of a pedalboard, a dirt-friendly preamp running straight into a power amp or FX return, or an aggressive edge-of-breakup drive for stoner, doom, and vintage rock rigs.

Tools & Workshop Accessories

Building guitar pedals from component kits requires a dependable workbench setup. Having the right tools on hand prevents cold solder joints, damaged traces, and mechanical alignment errors.

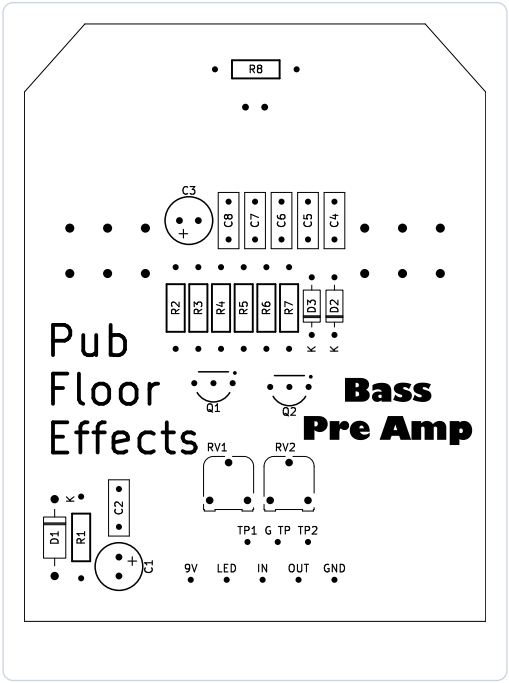
Essential Gear

Tool / Equipment	Specification & Purpose
Soldering Station	Temperature-controlled iron (set to 330°C–350°C) with a fine chisel or conical tip for clean PCB joints.
Solder Wire	60/40 or 63/37 Tin/Lead rosin-core solder (0.7mm–0.8mm diameter recommended for through-hole work).
Flush Wire Cutters	Precision diagonal cutters for trimming component leads flat against the PCB solder pads.

Needle-Nose Pliers	For bending component legs, holding parts securely, and tightening pot/jack mounting nuts.
Wire Strippers	For preparing 24 AWG or 22 AWG hook-up wire for off-board wiring (footswitch, jacks, pots).
Digital Multimeter	Essential for verifying resistor values, checking continuity, and adjusting JFET bias voltages.
Desoldering Pump / Wick	Solder sucker or copper braid for safely cleaning up mistakes or bridging errors.

PCB Outline Reference

The following diagrams illustrate the custom PCB and the precise location of all mounting holes and potentiometer pads. Use these references for drilling the enclosure and planning the off-board wiring layout.



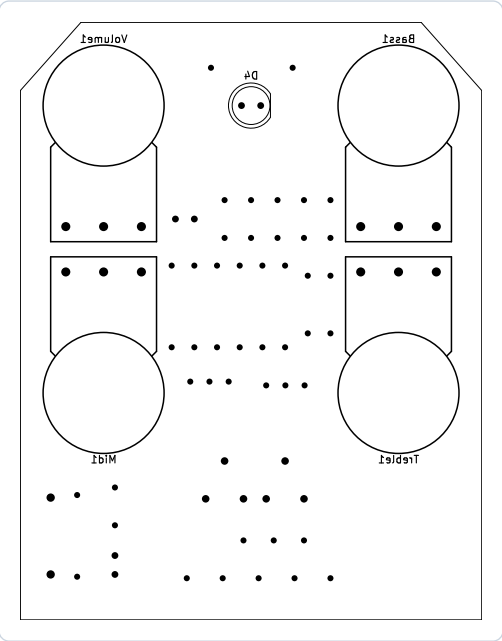


Figure 2: PCB Top and Bottom Silkscreen References

Bill of Materials (BOM)

Components

Ref	Qty	Value	Footprint / Notes
Bass1	1	100kB	16mm Right-Angle Pot
C1, C3	2	100u	Electrolytic 25V
C2, C4	2	100n	Film Box
C5	1	470p	Film Box
C6	1	2.7n	Film Box
C7, C8	2	220n	Film Box
D1	1	1N5817	
D2, D3	2	1N4148	
D4	1	Red LED	5mm THT LED
Mid1	1	5kA	16mm Right-Angle Pot
Q1, Q2	2	J201 or J113	TO-92 JFET
R1	1	100r	1/4W Resistor
R2	1	68k	1/4W Resistor
R3, R7	2	1Meg	1/4W Resistor
R4, R5	2	1.5k	1/4W Resistor
R6	1	5.6k	1/4W Resistor
R8	1	4.7K	1/4W Resistor
RV1, RV2	2	Trimmer	Bourns 3386F Vertical
Treble1	1	25kB	16mm Right-Angle Pot
Volume1	1	500kA	16mm Right-Angle Pot

Assembly Sequence

Assemble components in order of physical height to ensure easy soldering.

1. **Diodes:** Install D1 (1N5819) and D2 (LED). Pay attention to polarity! The band on the 1N5819 must face the stripe on the PCB silkscreen. The longer leg (+) of the LED goes into the square pad.
2. **Resistors & Capacitors (Non-Polarized):** Solder all resistors, ceramic capacitors, and film box capacitors (C2, C3). These parts are not polarized and can be installed in either orientation.
3. **IC Sockets & Transistors:** Install the 8-pin IC socket first (if your board uses one for the charge pump). Solder the JFETs (Q1, Q2) next, matching the flat side of the transistor body to the silkscreen outline. **Do not overheat the JFETs.**
4. **Electrolytic Capacitors:** Solder C4 and C1. These **are** polarized. Ensure the longer lead (positive, +) is placed in the square pad, and the stripe on the capacitor body faces the negative (-) marking on the silkscreen.
5. **Trimmer Potentiometers:** Install the trimmer pots (R-BIAS1, R-BIAS2).
6. **Off-Board Wiring Preparation:** Solder the lengths of hook-up wire (typically 24 AWG) into the designated PCB pads: IN, OUT, GND (two wires recommended), LED, and 9V.
7. **Mechanical Assembly:** a. Mount the 3PDT footswitch, 1/4″ input/output jacks, and the DC power jack directly to the enclosure. Tighten the nuts firmly. b. Solder the corresponding wires from the PCB to the jacks and footswitch according to the supplied schematic/wiring diagram (typically true-bypass). c. Fit the potentiometer (VOL) into the enclosure and ensure it is securely fastened before connecting the flying leads from the PCB.
8. **Final Check:** Before connecting power or inserting an IC (if applicable), perform a thorough visual inspection of the board for solder bridges, cold joints, or misaligned components.

Schematics & Diagrams

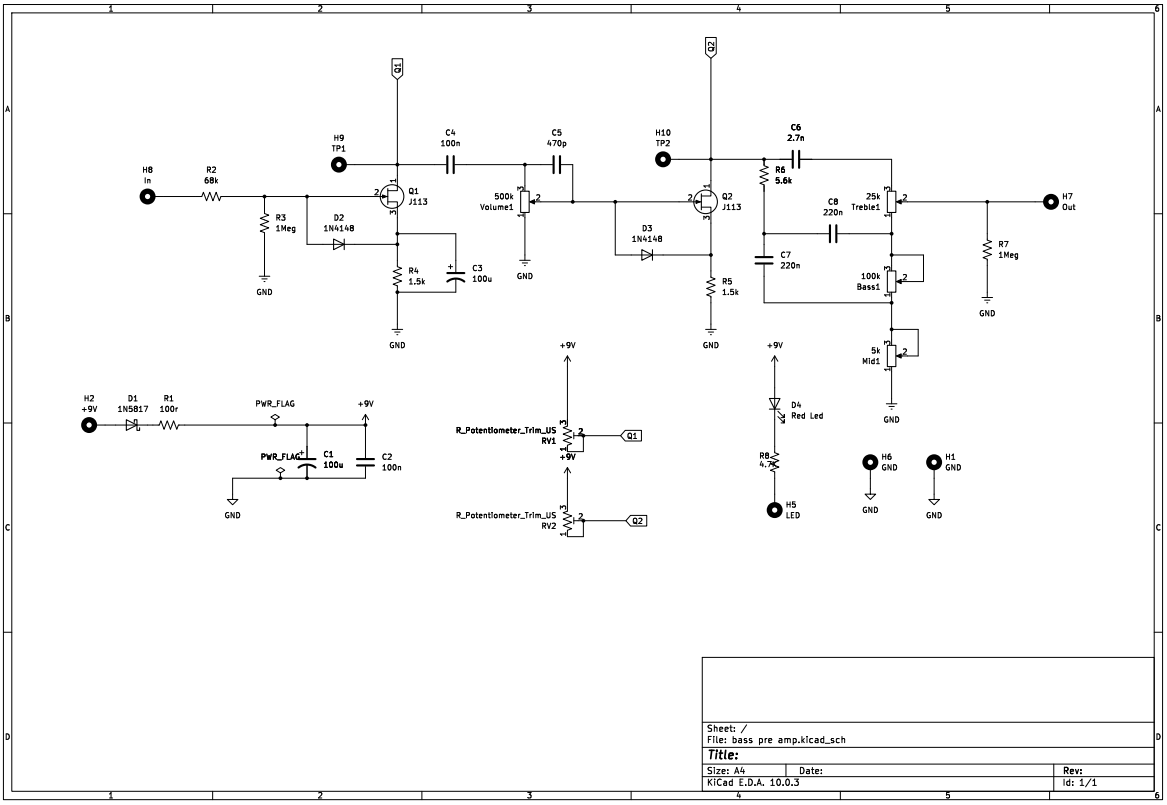


Figure 3: Circuit Schematic