## ALL-JFET “SUPER BUFFER SB1”.
## EB-1102/404.

The ALL-JFET “SUPER BUFFER SB1” (1) is a very high quality low-noise, wide-band amplifier. The PCB is 80x145mm and contains two completely independent buffers. The buffers can be supplied from two independent power supplies. The schematic is shown in fig. 1. The SUPER BUFFER SB1 has been developed from the SUPER BUFFER and shares the topology with the professional microphone preamp EB-1102/212.

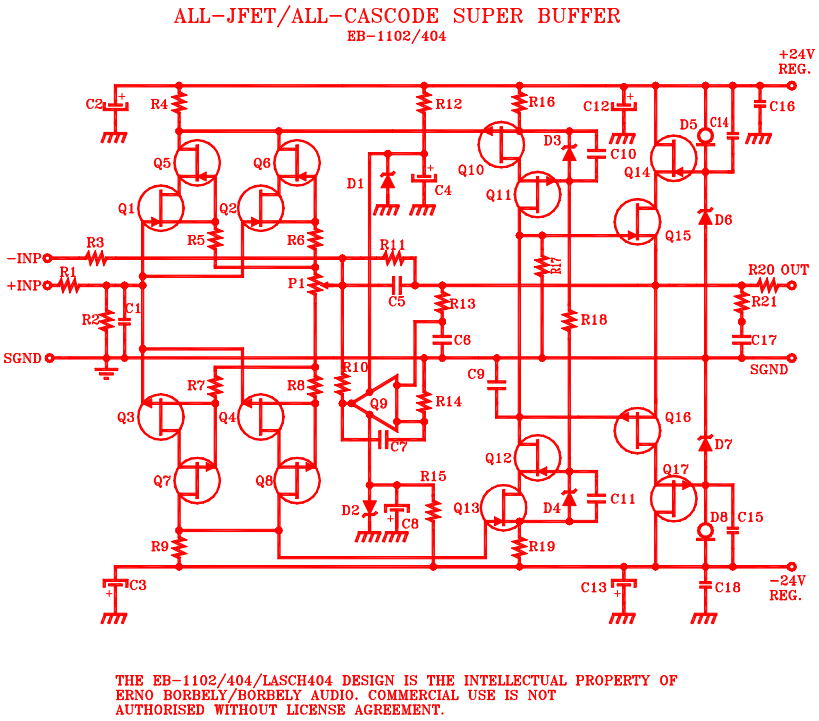


Fig. 1. The ALL-JFET “SUPER BUFFER SB1 ”.

The input stage is using selected and matched JFETs (Q1-Q4) for low-noise operation. They are cascoded by Q5-Q8 for linearity and for low input capacitance. The second stage is also using cascoded high-current JFETs for good linearity. The output stage is a matched complementary pair of JFETs, again cascoded for linearity and for low capacitance modulation. This topology ensures extremely low input noise and exceptional linearity, which allows operation over a wide gain rage without change in sonic character.

The amp is DC-coupled and the offset is controlled by Q9, which is powered by a pair of shunt regulators.

Typical specifications:
O.L.G: 66dB
O.L. Freq. Response: 20kHz
Unity gain freq. Response: >1MHz
Unity gain rise time: 100nsec.
Unity gain output impedance: <2 Ohm (without R20)
Equivalent input noise: 108nV, 20-30kHz
Input capacitance: approx. 2.6pF
Minimum load impedance: 1kOhm
Power consumption: approx. 35mA per channel at +/-24V.

| | Ch. 1 | | Ch2 | |
|---|---|---|---|---|
| Output | 1kHz | 10kHz | 1kHz | 10kHz |
| 1V | 0.0005 | 0.0013 | 0.0005 | 0.0013 |
| 3V | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| 5V | 0.0005 | 0.0011 | 0.0005 | 0.0011 |
| 8V | 0.0005 | 0.0012 | 0.0005 | 0.0011 |

Table 1: Typical THD readings for SUPER BUFFER SB1, with 6dB gain. (2)

**Set-up Procedure.**
If possible test each buffer module separately before installing it in the chassis. This simplifies measurements, adjustments, and if necessary, component changes. If you have access to a scope connect it to the output of the buffer and check whether radio frequency (RF) oscillations are present. If you have a complete audio instrumentation in your workshop perform the usual gain, frequency response, noise, Total Harmonic Distortion (THD) and Intermodulation Distortion (IM) measurements. +INP should be connected to SGND under DC measurements/adjustments.

Assemble the buffers except Q9. Set P1 to mid-position. Connect +INP to SGND at the input and SGND to PGND at the output. If the buffer is used in unity gain configuration –INP is left open. If it is used with 6dB or higher gain, then connect –INP to SGND. Connect +/-24V regulated supply to the board.

Connect a DVM across R16 (R19) and measure the voltage drop. It should be 3V ±5%. If the voltage-drop is more than 3.3V, increase the value of R5/R6 and R7/R8. Connect the DVM to the output of the buffer and adjust the DC offset to zero Volt with P1. Check the voltage across D1 and D2; it should be 10V. Install Q9, the offset should drop to less than a couple of mV after a minute.

If you have audio instrumentation connect an oscillator, set to 1kHz/1VRMS to the +INP and connect a mV meter/THD analyser to the output. The output should be 1VRMS in unity gain configuration and 2VRMS with 6dB gain (Use lower input level for higher gains). Check the THD, it should be less than 0.002%.

This completes the set-up procedure.

1. Erno Borbely: The All-FET Line Amp, AudioXpress 5/02. See also our homepage under “Articles”
2. Shinichi Komori, Japan: Private communication.