

AN1282 APPLICATION NOTE

PREAMPLIFIER AND SPEAKER DRIVER USING TS925

The TS925 is an input/output rail to rail quad BiC-MOS operational amplifier. It is able to operate with low supply voltages (2.7V) and to drive low output loads such as 32Ω .

As an illustration of these features, the following technical note highlights many of the advantages of the device in a global audio application.

APPLICATION CIRCUIT

Figure 1 shows two operators (A1, A4) used in a preamplifier configuration, and the two others in a push-pull configuration driving a headset.

The phantom ground is used as a common reference level ($V_{CC/2}$).

The power supply is delivered from two LR6 batter-ies (2x1.5V nominal).

by F. MARICOURT

Preamplifier : the operators A1 and A4 are wired with a non inverting gain of respectively :

- □ A1# (R4/(R3+R17))
- A4# R6/R5

With the following values chosen :

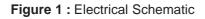
- R4=22kΩ R3=50Ω R17=1.2kΩ
- R6=47kΩ R5=1.2kΩ,

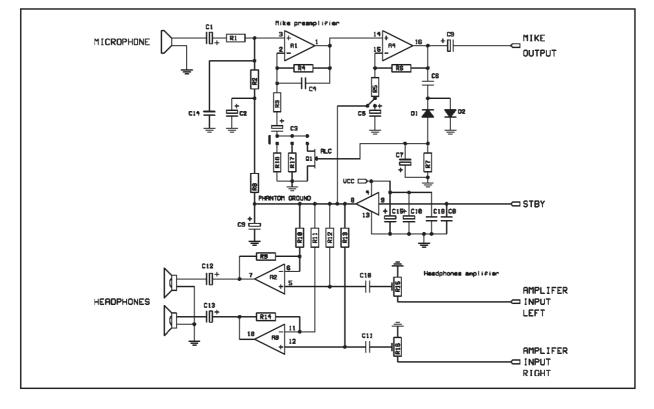
the gain of the preamplifier chain is thus 58dB.

Alternatively, the gain of A1 can be adjusted by choosing a JFET transistor Q1 instead of R17.

This JFET voltage controlled resistor arrangement forms an automatic level control (ALC) circuit, use-ful in many MIC preamplifier applications.

The mean rectified peak level of the output signal envelope is used to control the preamplifier gain.





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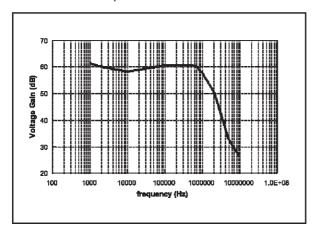
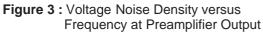
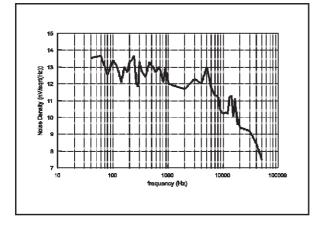


Figure 2 : Frequency Response of the Global Preamplifier Chain





Headphone amplifier : the operators A2 and A3 are organized in a push-pull configuration with a gain of 5. The stereo inputs can be connected to a CD-player and the TS925 drives directly the head-phone speakers. This configuration shows the abil-ity of the circuit to drive 32Ω load with a

maximum output swing and a high fidelity for reproducing sound and music.

Figure 4 shows the available signal swing at the headset outputs : two other rail to rail competitor parts are employed in the same circuit for compari-40 Sson (note the much reduced clipping level and crossover distortion)

Figure 4 : Maximum Voltage Swing at Headphone Outputs (R_L) 32 Ω)

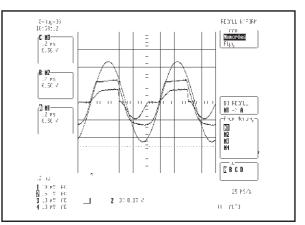
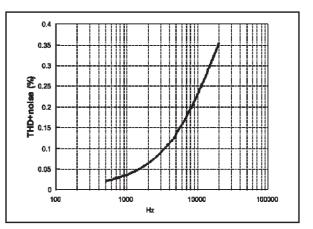


Figure 5 : THD+Noise versus Frequency (headphone outputs)



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