

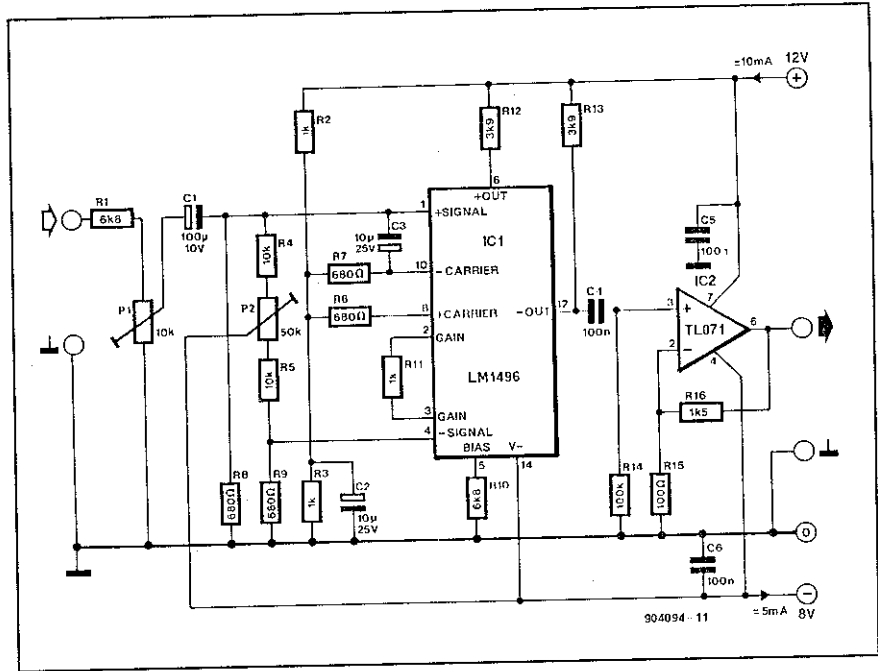
an input of 12 V the amplification is unity; when the input drops to 0.1 V, the amplification is only just 0.1

The value of the input resistors has been fixed at 680 Ω: this value gives a reasonable compromise between the requirements for a high input impedance and a low noise level

To ensure good suppression of the input signal at the output it is essential that the voltages at pin 1 and pin 4 of IC1 are made absolutely identical with P4. It is possible, with the aid of a spectrum analyser, to suppress the fundamental (input) frequency by 60–70 dB

The output signal at pin 12 is distorted easily since the IC is not really designed for this kind of operation. The distortion depends on the level of the input signal. At a frequency of 1 kHz and an input level of 100 mV, the distortion is about 0.6%; when the input level is raised to 500 mV, the distortion increases to 2.3%, and when the input level is 1 V, the distortion is 6%. The signal-to-noise ratio under these conditions varies between 60 dB and 80 dB

The circuit draws a current of 10 mA from the positive supply line and 5 mA from the negative rail



from the negative rail

The phase shift between the input and output signals is about 45° (output lags)

Finally, although the normal output is

taken from pin 12, there is a similar output, but shifted by 180° (with respect to that at pin 12) available at pin 6

(T. Giffard)

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SYMMETRICAL LOW-NOISE PREAMPLIFIER

The SSM-2016 differential audio preamplifier from PMI is primarily intended for amplifying signals from low-impedance sources (<1 kΩ) such as a 150-ohm microphone. If higher impedances are used, the SSM-2015 is a better choice

The circuit diagram of the preamplifier is shown in Fig 1 while the internal circuitry of the SSM-2016 is given in Fig 2

The amplification, α, of the preamplifier is determined solely by resistor R5 and is calculated from:

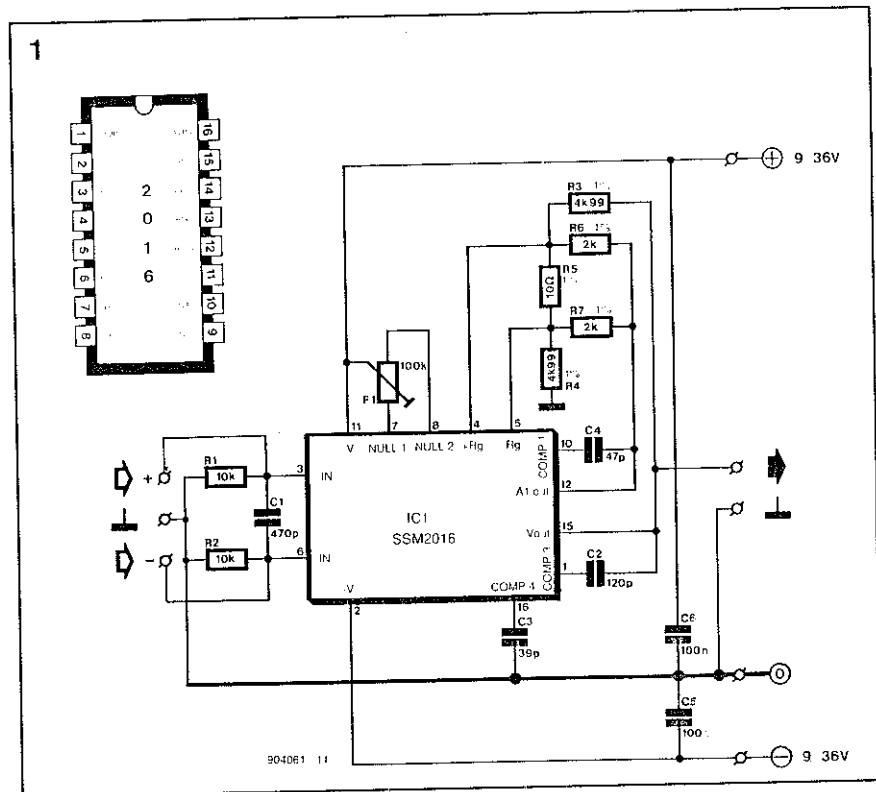
$$\alpha = (R3+R4)/R5 + (R3+R4)/(R6+R7)$$

With values as shown, this may be simplified to:

$$\alpha = 10^3/R5 + 3.5$$

With R5 = 10 Ω, the amplification is thus 1000 (60 dB). Although the specification of the preamplifier is hardly dependent on the chosen amplification, it should be noted that the distortion is slightly lower at smaller amplification factors

The external resistors have a large bear-



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