

Appendix A

Simple differential amplifiers for signals from pickup coils were fabricated. The circuit for one channel is shown in Fig. A.1. The main instrumentation amplifier is *INA128* (*Burr-Brown Corporation*). The gain is set by connecting a single external resistor, R_G :

$$G = 1 + \frac{50 \text{ [k}\Omega\text{]}}{R_G}. \quad (\text{A.1})$$

In the present study, a precision resistor of $50 \text{ }\Omega$ with an accuracy better than $\pm 0.1\%$ error is used, thus the gain of the amplifier was approximately 1000. The output signal passes through a low pass filter, whose cut-off frequency is about 16000 Hz.

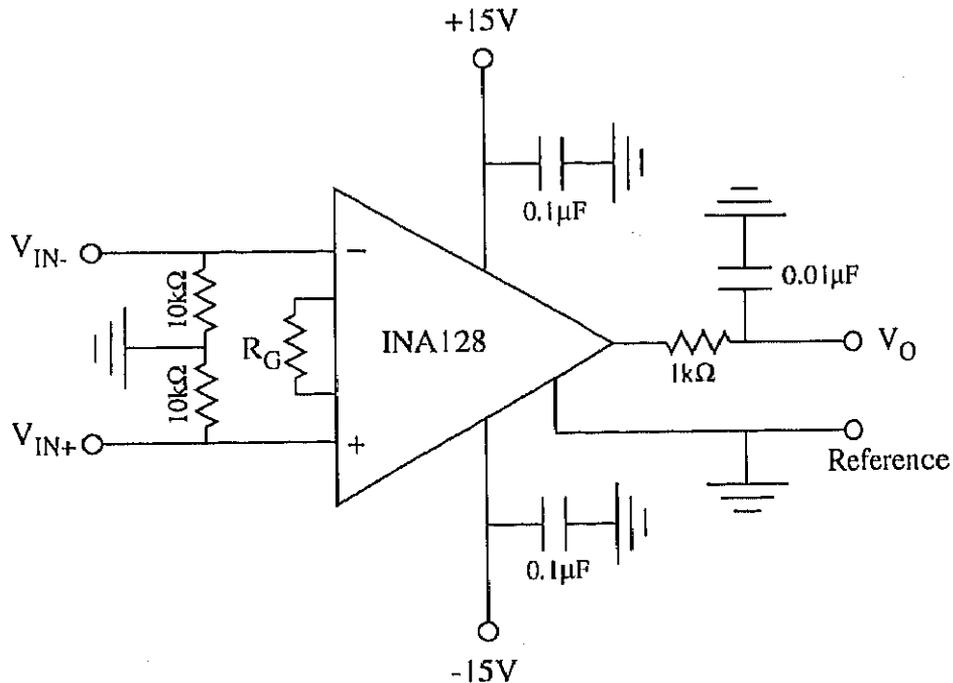


Fig. A.1: Circuit of a differential amplifier with a low pass filter.