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Macintosh: Serial Port Configurations for Nonstandard Baud Rates

Revised: 7/28/89
Security: Everyone

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This article last reviewed: 9 June 1989

Inside Macintosh, Volume II (pages 250-251) tells how to configure for eleven baud rates: 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 19200, and 57600.

Here's how to configure for other values.

For example, to obtain 38,400 baud rate on your serial port, the correct value to pass to SerReset is "1" for the baud rate constant.

Note that you can specify a given baud rate by making the serial driver control call with a control (csCode) of 13. The driver will return the closest baud rate that the serial driver will generate. This is documented in Inside Macintosh, Vol. II-254.

Some trivia:

The formula for figuring out the SerConfig baud rate constants is:

$$\text{Baud Rate Constant} = \frac{114709}{\text{Baud Rate}} - 2.0$$

For example, the baud rate constant for 9600 baud is:

$$\text{Baud Rate Constant} = \frac{114709}{9600} - 2.0 = 11.949 - 2.0 = 9.949 = 10$$

The 114709 figure comes from the SCC clock (3.670702 MHz) which comes from the system clock (15.6672 MHz), but doesn't divide down evenly because of the timing PALs (in fact 3.670702 = 15667200 /4 * 15/16, where the 15/16 is due to PAL timing). For the MacXL (Lisa), use 115200 instead of 114709.

Similarly, you can do a reverse calculation and find the baud rate, given a constant. Reversing the formula, you get:

$$\text{Baud Rate} = \frac{114709}{\text{Baud Rate Constant} + 2.0}$$

So, using the constant 10 (for 9600 baud), the formula gives

$$\text{Baud Rate} = \frac{114709}{10 + 2.0} = 9559.083$$

This isn't exactly 9600 baud. In fact the error percentage is:

$$1.0 - \frac{9559.083}{9600} = 1.0 - 0.996 = 0.426\%$$

If you try this with 38400, you get:

$$\text{Baud Rate Constant} = \frac{114709}{38400} - 2.0 = 2.987 - 2.0 = 0.987 = 1,$$

a baud rate of:

$$\text{Baud Rate} = \frac{114709}{\text{Baud Rate Constant} + 2.0} = 38236.333,$$

and an error percentage of:

$$1.0 - \frac{38236.333}{38400} = 1.0 - 0.996 = 0.426\%$$

Tech Info Library Article Number:3957