FSK Generation

Virtual Peripheral FSK Generation

Introduction

By combining several virtual peripherals, is possible to provide reception and transmission of asynchronous 1200 bps data using Frequency Shift Keying (FSK) signaling. The resulting software will have uses in a wide range of telephone based information systems.

FSK_TX Source Code

This application combines PWM, 16-bit timer, and UART virtual peripherals and with a sine lookup table to generate 1200 bps FSK transmission. The UART is used to interface to a PC terminal session at 19.2 Kbps. Any data received by the UART software is sent to the FSK_send routine for transmission. FSK_send first enables the PWM output and external DAA output circuitry and begins to send a 1200 Hz start bit for a duration of 1.5 bits (1250uS). For data transmission a frequency of 1200 Hz represents the mark and 2200 Hz represents a space. This is immediately followed by the data byte and a stop bit at 2200 Hz. All frequency shifts are phase coherent.

This virtual peripheral relies on an external RC filter to generate the FSK frequencies. A low pass filter is required on the PWM output to create the analog signal as shown in the circuit in figure 1.
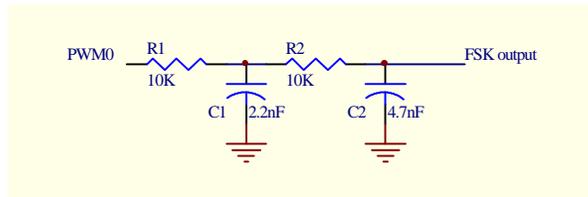
Figure 1 – FSK Output Filter

The transmission method used is not compliant to any specification. Future revisions will be available to provide compliance to the Bell 202 specification and also to provide FSK demodulation.

Additionally, before this circuit can be connected to any telephone system an appropriate DAA circuit is also required. As seen in the source code, bit three of port A is used to enable the DAA output.