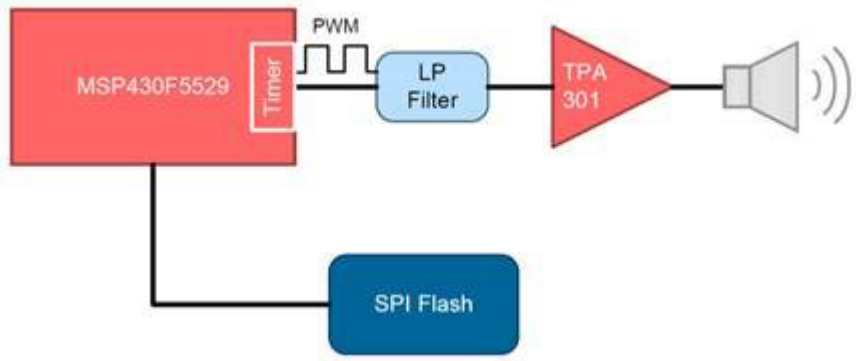
Technical Article

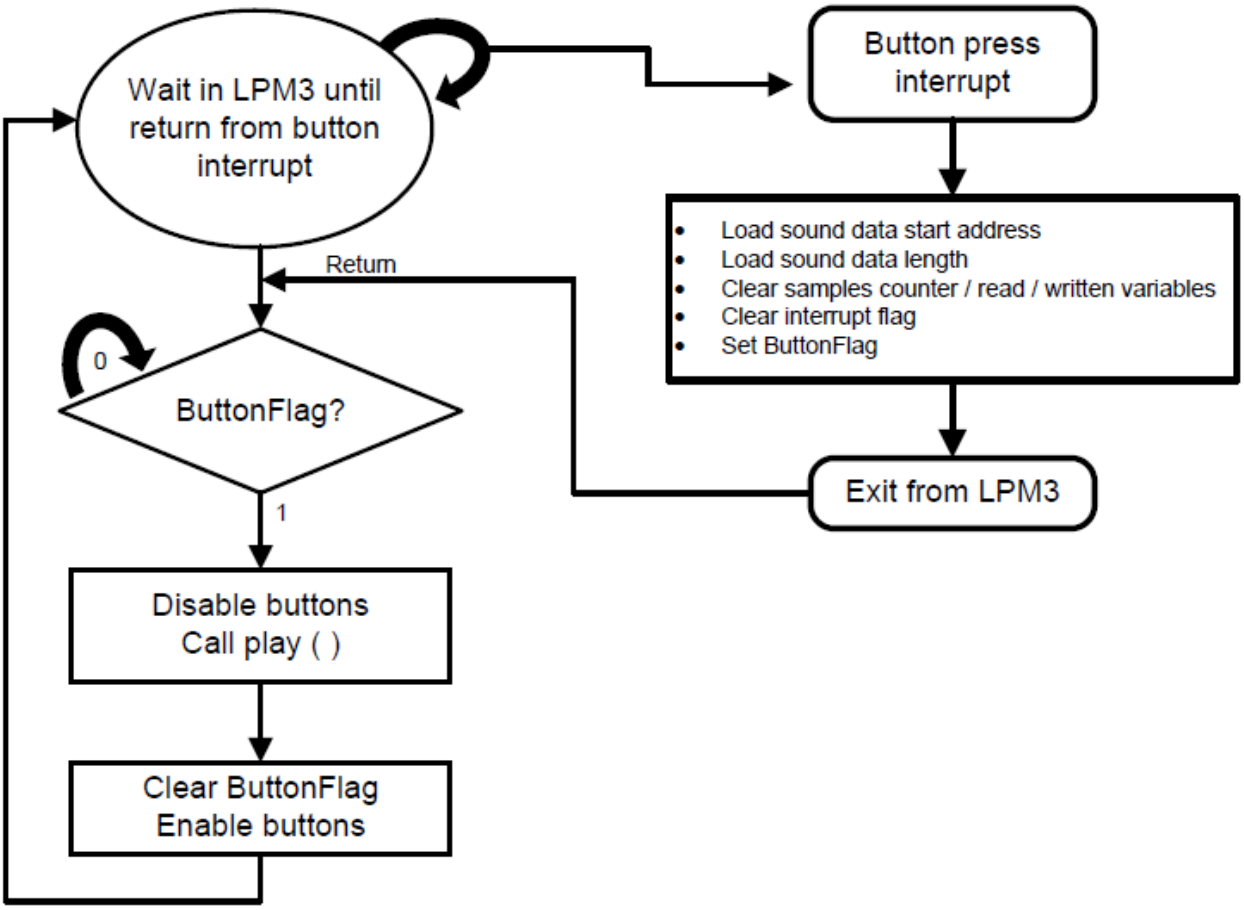
MSP430 MCUs: Testing...Testing...1...2...1...2

In today's world of high-definition video-on-demand, we seem to forget how good it is to talk. Well, now you can easily add an audio playback feature to almost any MSP430 MCU-based design using a new TI Design . From a talking heart rate monitor, weight scale or an emergency evacuation system, this design can be used for a wide range of voiceband audio playback applications.

This simple design uses a 16-bit timer to generate a PWM output which is filtered to create an analog signal and then amplified to appropriate levels for either headphone or speaker playback. The 8-bit .wav audio files are stored in a low-cost external SPI flash memory which can be easily programmed using the custom programming GUI.



The example code framework can be made to cycle through several stored audio samples when the appropriate LaunchPad button is pressed, this framework can be easily modified or alternatively the core functions may be incorporated into almost any MSP430 MCU application. By using simple "#define" statements, the user can select from several different MSP430 MCU LaunchPad kits and can also configure playback for various pre-defined frequencies.



The short video clip below demonstrates a couple of use cases for this new TI Design. In the first example the out-of-the-box demo simply scrolls through several pre-recorded 8-bit, 44.1Ksps audio samples, one for each button press. The second demo shows a TI application note called "EKG-based heart-rate monitor Implementation on the LaunchPad using MSP430G2xx" connected via UART to the voiceband audio demo, the EKG demo code already provides a heart rate signal to the UART so the voiceband demo simply decodes the serial data and uses a small menu program to select the correct phrases based on the reported heart rate.

In a real-world application, both the EKG measurement and voice playback code could be combined into a single MSP430 MCU to reduce cost and complexity.

MSP430 Voiceband Audio Playback

The application source files, schematic diagram, PCB layout, design guide and all necessary design documents can be found by clicking on the TI Design.

What would your MSP430 MCU say to you?

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