Assembly Files

_ti_stm32f4_core.asm

Contains .include statements for all other _ti_stm32f4_*.asm files. Used to easily add new files into compilation without having to modify the make script.

_ti_stm32f4_gen_funcs.asm

Contains general purpose functions, such as a Binary-to-BCD function.

_ti_stm32f4_gen_macros.asm

Contains general purpose macros, such as MOV_imm32.

_ti_stm32f4_io_constants.asm

Contains .equ statements utilized by IO functions and macros. Constants primarily relate to GPIO usage.

_ti_stm32f4_io_funcs.asm

Contains functions for reading and writing data via the anode and cathode latches. Also contains initializing functions for the IO pins used by the anode, cathode and trigger-mode input. End of file contains code used for debouncing switch reads.

_ti_stm32f4_io_macros.asm

Contains macros utilized by IO functions, primarily for reading/writing to IO pins.

_ti_stm32f4_svccalls.asm

Contains functions to be used in C to make service calls using “svc” instruction.

_ti_stm32f4_svcpendsv_constants.asm

Contains .equ statements utilized by SVC/PendSV functions. Constants primarily used for initializing SVC and PendSV.

_ti_stm32f4_svcpendsv_funcs.asm

Contains functions initializing and using SVC and PendSV.

_ti_stm32f4_tim_constants.asm

Contains .equ statements utilized by TIM3/TIM4 functions. Note these are not the only .equ statements used by these Timer functions, but are the only ones that should not be modified.

_ti_stm32f4_tim_funcs.asm

Contains functions for using and initializing TIM3 & TIM4. Note that the .equ statements in this file contain "TIM3" in the name, but are also used in initializing TIM4. In the program, TIM3 is not actually used, but TIM4 is.

_ti_stm32f4_tim_macros.asm

Contains macros utilized by TIM3 & TIM4 functions.

_ti_stm32f4_usart_constants.asm

Contains .equ statements to be utilized by the USART functions. Constants primarily used for initializing USART2.

_ti_stm32f4_usart_funcs.asm

Contains functions for initializing and using USART2. The .equ statements within are used to configure USART2.

_ti_stm32f4_usart_macros.asm

Contains macro for enabling USART2.

_ti_stm32f4_waves.asm

Contains pre-generated waveforms for Sinusoid, Sawtooth and Square waves. Each waveform contains 256 samples of 12 bit numbers between 0x000 and 0xfff. These waveforms were generated by the ruby script “enee440_helper.rb”.

SimpleStartSTM32F4_03.asm

Contains interrupt vector table and reset handler. Slightly modified from provided version.

stm32f4xx_DACDMA_05_edit.asm

Contains necessary code for configuring, initializing and using the DAC-DMA-TIM6 combination. Slightly modified (especially in the DMA interrupt handler) from provided version.

H Files

_ti_stm32f4_core.h

Contains “#include” statements for all _ti_stm32f4_*.h files and “#include <stdint.h>”. This file is included within all _ti_stm32f4_*.h files for convenience.

_ti_stm32f4_IO.h

Contains “#define” statements for IO related constants, declarations of global IO related variables and definition for primary IO data structure, used for outputting data to the seven segment display and LEDs, and reading data from rotary encoder.

_ti_stm32f4_state.h

Contains several “typedef”s and data structures used to maintain the program’s state. Contains many “#define” statements used throughout the program, but primarily intended for program state related functions.

_ti_stm32f4_svccalls.h

Contains “#define”s and “extern” statements needed to use the service calling functions written in _ti_stm32f4_svccalls.asm. The contents of this file are primarily utilized by the SVC/PendSV functions in _ti_stm32f4_svcpendsv.c

_ti_stm32f4_svcpendsv.h

Contains “#define”s and data structures used to create the functionality of SVC/PendSV.

_ti_stm32f4_usart.h

Contains data structures and global variables used for USART functionality. The contents are primarily used for buffering input and output from the USART.

_ti_stm32f4_waves.h

Contains data structures and global variables used for keeping the DMA’s ping-pong buffers populated.

C Files

_ti_stm32f4_IO.c

Contains functions used for reading input from switches, updating the program state, and outputting the program state to the display and LEDs.

_ti_stm32f4_state.c

Contains functions used for maintaining program state. This includes the code for modifying the frequency of the waveforms being produced.

_ti_stm32f4_svcpendsv.c

Contains functions for registering and serving service calls, via SVC and PendSV. Portions of the SVC and PendSV interrupt handlers are contained here.

_ti_stm32f4_usart.c

Contains code for receiving and transmitting via USART2, including functions for maintaining the input and output buffers, and parsing the input characters. The USART2 interrupt handler is contained here.

_ti_stm32f4_waves.c

Contains code for populating the DMA ping-pong buffers, including code for handling the various output modes. Portion of the DMA interrupt handler is contained here.

main_new.c

Contains the main() function, which initializes the entire program, and functions for configuring the Systick. Also contains interrupt handlers for TIM4, TIM3 (unused), and Systick. Contains the body of a service call (Test_Service), used to demonstrate SVC/PendSV functionality.

Executable Files

Executables/Blinky.AXF

Executables/Blinky.elf

Executables/Blinky.hex

All three of the above files are pre-compiled forms of the program, included for convenience.

clean_Project.bat

Batch script used for cleaning the program directory after a build.

make_Project.bat

Batch script used for building the program.

Executables/enee440_helper.rb

Ruby script used to generate the waveforms (in _waves.asm). The script is configured by the first few lines within. To run (in command prompt): “ruby enee440_helper.rb”

Other Files

stm32f4xx_DMA_registers01.inc

Include file, included in stm32f4xx_DACDMA_05_edit.asm, containing .equ statements relating to configuring the DMA. Has not been modified from provided version.

stm32f4xx_TMR6&7_registers01.inc

Include file, included in stm32f4xx_DACDMA_05_edit.asm, containing .equ statements relating to configuring TIM6. Has not been modified from provided version.

linkBlinkySTM32F4_01.ld

Provided (unmodified) linker script used while building the program.

Blinky.uvproj

Primary Keil project file.

Blinky.plg

Blinky.uvgui_bill.bak

Blinky.uvgui_Tommy.bak

Blinky_uvopt.bak

Blinky_uvproj.bak

Blinky.uvgui.Tommy

Blinky.uvopt

The above seven files are used and maintained by Keil.