ELT-3050 Final Project

5/1/21

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**Preliminary Design Proposal**

**Overview:**

The purpose of this this project is to produce an arbitrary waveform generator (AWG). AWG’s can synthesize a general selection of waveforms usually ranging from sine, square, or triangle patterns.

They can also produce waveforms which are custom tailored to meet certain criteria an end user may require.

**Scope of project:**

An AWG will be created using the FRDM-KL25Z development board, with the accompanying VTC shield board. The AWG will have the ability to generate three pre-defined waveforms, as well as two user specified arbitrary waveforms. The AWG will have four selectable output frequencies, each having a maximum voltage output of 3.3 volts with the ability to be attenuated by a factor of 2. AWG functionality will be controlled via serial communication using predetermined commands.

**AWG Design:**

The initial design for the AWG consists of both hardware peripherals, and source code incorporated into a Free RTOS environment. The Open SDA serial port is used to acquire commands, as well as reading in ARB waveforms. Serial data will pass through a stream buffer to a task which will convert it into appropriate tokens. Command tokens will control the waveform output, whereas arb tokens will be loaded into the specified arb buffer.

**Project Timeline:**

This proposal will be presented for review on 05/01/2021. Upon approval, a functional prototype will be developed for a final review with an anticipated date of 05/12/2021. Any necessary revisions will be made at that time. The finished AWG, including documentation will be submitted 05/21/2021.