# arbWaveCom

Generated by Doxygen 1.8.9.1

Thu Jul 16 2015 11:13:43

# Contents

# Chapter 1

# Module Index

## 1.1 Modules

Here is a list of all modules:

# Chapter 2

# Data Structure Index

## 2.1 Data Structures

Here are the data structures with brief descriptions:

# Chapter 3

# File Index

## 3.1 File List

Here is a list of all documented files with brief descriptions:

# Chapter 4

# Module Documentation

## 4.1 Option subsystem return codes

Return codes used internally to indicate how to respond to parsing options.

### Macros

- #define OPT_RET_OK 0

  *Indicates successful option parsing. Continue program operation.*
- #define OPT_RET_ERR -1

  *Indicates an error occurred while parseing options. Exit with non-zero code.*
- #define OPT_RET_EXIT -2

  *Indicates program should exit normally without further activity.*

### 4.1.1 Detailed Description

Return codes used internally to indicate how to respond to parsing options.

## 4.2 Option encoding bitmasks

Bit masks for encoding the flags for the various options that can be set on the command line.

### Macros

- #define OPT_TEMPLATE_MASK (1u << 0)

  *Flag for requested template file output. 0 is unset, 1 is set.*
- #define OPT_RANDAMP_MASK (1u << 1)

  *Flag for using random amplitudes for output. 0 is unset, 1 is set.*
- #define OPT_HELPREQ_MASK (1u << 2)

  *Flag for user-requested help. 0 is unset, 1 is set.*
- #define OPT_FROMCMD_MASK (1u << 15)

  *Flag indicating user input frequency specification via command-line options. 0 is unset, 1 is set.*
- #define OPT_STARTSET_MASK (1u << 8)

  *Flag indicating user specified a start frequency, found in progOptions::start_f. 0 is unset, 1 is set.*
- #define OPT_STOPSET_MASK (1u << 9)

  *Flag indicating user specified a stop frequency, found in progOptions::stop_f. 0 is unset, 1 is set.*
- #define OPT_AMPSET_MASK (1u << 10)

  *Flag indicating user specified an amplitude. If OPT_RANDAMP_MASK is not also set, found in progOptions::amplitude. 0 is unset, 1 is set.*
- #define OPT_PERIODSET_MASK (1u << 11)

  *Flag indicating pulse duration is set, found in progOptions::tooth_period. 0 is unset, 1 is set.*
- #define OPT_NUMSET_MASK (1u << 12)

  *Flag indicating the number of teeth is set, found in progOptions::num_f. 0 is unset, 1 is set.*
- #define OPT_ALLSET_MASK ( OPT_STARTSET_MASK | OPT_STOPSET_MASK | OPT_AMPSET_MASK | OPT_PERIODSET_MASK | OPT_NUMSET_MASK )

  *Pre-combined set of flags for checking if all needed command line options are set.*

### 4.2.1 Detailed Description

Bit masks for encoding the flags for the various options that can be set on the command line.

Options these flags refer to are stored in progOptions::flags

## 4.3 Expected filenames for I/O

File names are hard-coded here for use throughout the program.

### Macros

- #define TEMPLATE_FILENAME "template.txt"

  *File to output the frequency specification template to.*
- #define INPUT_FILENAME "freqSpec.txt"

  *File to read for frequency specification input.*
- #define OUTPUT_ROOT "awgOutput"

  *File name stem used.*

### 4.3.1 Detailed Description

File names are hard-coded here for use throughout the program.

# Chapter 5

# Data Structure Documentation

## 5.1 freqList Struct Reference

### Data Fields

- unsigned int **freqCount**
- unsigned int **actualSize**
- double * **freqList**
- double * **ampList**
- double * **durList**

The documentation for this struct was generated from the following file:

- genBinary/genBinary.h

## 5.2 progOptions Struct Reference

Structure to hold values for command-line options.

`#include <defOptions.h>`

### Data Fields

- uint32_t flags

  *Bit flags used to indicate on-off states for various options. See Option encoding bitmasks.*
- double amplitude

  *Amplitude chosen for combs with constant output-amplitude. In range [0, 1] (fraction of max).*
- double start_f

  *Start frequency, sets the lowest frequency to be output in the series of pulses. In MHz.*
- double stop_f

  *Stop frequency, sets the highest frequency to be output in the series of pulses. In MHz.*
- unsigned int num_f

  *The number of individual pulse to generate.*
- double clock_freq

*The sample output frequency. In MHz.*

- double tooth_period

  *The length of each pulse. In ns.*

- char * inputPath

  *C-string for a command-line specified frequency specification file path.*

### 5.2.1 Detailed Description

Structure to hold values for command-line options.

Expected initialization found in OPT_INIT_VAL

**See also**

helpText TODO

The documentation for this struct was generated from the following file:

- defOptions/defOptions.h

# Chapter 6

# File Documentation

## 6.1 defOptions/defOptions.h File Reference

Functions and parameters for dealing with command-line options.

```
#include <inttypes.h>
```

### Data Structures

- struct progOptions

  *Structure to hold values for command-line options.*

### Macros

- #define OPT_RET_OK 0

  *Indicates successful option parsing. Continue program operation.*
- #define OPT_RET_ERR -1

  *Indicates an error occurred while parseing options. Exit with non-zero code.*
- #define OPT_RET_EXIT -2

  *Indicates program should exit normally without further activity.*
- #define OPT_TEMPLATE_MASK (1u << 0)

  *Flag for requested template file output. 0 is unset, 1 is set.*
- #define OPT_RANDAMP_MASK (1u << 1)

  *Flag for using random amplitudes for output. 0 is unset, 1 is set.*
- #define OPT_HELPREQ_MASK (1u << 2)

  *Flag for user-requested help. 0 is unset, 1 is set.*
- #define OPT_FROMCMD_MASK (1u << 15)

  *Flag indicating user input frequency specification via command-line options. 0 is unset, 1 is set.*
- #define OPT_STARTSET_MASK (1u << 8)

  *Flag indicating user specified a start frequency, found in progOptions::start_f. 0 is unset, 1 is set.*
- #define OPT_STOPSET_MASK (1u << 9)

  *Flag indicating user specified a stop frequency, found in progOptions::stop_f. 0 is unset, 1 is set.*
- #define OPT_AMPSET_MASK (1u << 10)

*Flag indicating user specified an amplitude. If OPT_RANDAMP_MASK is not also set, found in progOptions::amplitude. 0 is unset, 1 is set.*

- #define OPT_PERIODSET_MASK (1u << 11)

  *Flag indicating pulse duration is set, found in progOptions::tooth_period. 0 is unset, 1 is set.*

- #define OPT_NUMSET_MASK (1u << 12)

  *Flag indicating the number of teeth is set, found in progOptions::num_f. 0 is unset, 1 is set.*

- #define OPT_ALLSET_MASK ( OPT_STARTSET_MASK | OPT_STOPSET_MASK | OPT_AMPSET_MASK | OPT_PERIODSET_MASK | OPT_NUMSET_MASK )

  *Pre-combined set of flags for checking if all needed command line options are set.*

- #define TEMPLATE_FILENAME "template.txt"

  *File to output the frequency specification template to.*

- #define INPUT_FILENAME "freqSpec.txt"

  *File to read for frequency specification input.*

- #define OUTPUT_ROOT "awgOutput"

  *File name stem used.*

- #define OPT_INIT_VAL {0, 0.0, 0.0, 0.0, 0, 1024.0, 0.0, NULL}

  *Initialization data for a progOptions instantiation.*

### Typedefs

- typedef struct progOptions progOptions_type

  *Structure to hold values for command-line options.*

### Functions

- int **parseOptions** (int argc, char *argv[ ], progOptions_type *options)
- void **printOptions** (const progOptions_type *toPrint, const char *idStr)
- void **printBitSetting** (uint32_t flags, unsigned int mask, const char *title)

### Variables

- int g_opt_debug

  *Whether -d/–debug has been set. 0 is unset, 1 is set.*

- int g_opt_quiet

  *Whether -q/–quiet has been set. 0 is unset, 1 is set.*

#### 6.1.1 Detailed Description

Functions and parameters for dealing with command-line options.

Contains the functions used to handle parsing of input flags, printing out debug information about set options, and masks used to decode flags.

### 6.1.2 Typedef Documentation

#### 6.1.2.1 typedef struct progOptions progOptions_type

Structure to hold values for command-line options.

Expected initialization found in OPT_INIT_VAL

**See also**

helpText TODO

## 6.2 defOptions/defOptions_int.h File Reference

Sets up global flags for debug and quiet options.

### Variables

- int g_opt_debug = 0
  *Whether -d/–debug has been set. 0 is unset, 1 is set.*
- int g_opt_quiet = 0
  *Whether -q/–quiet has been set. 0 is unset, 1 is set.*

### 6.2.1 Detailed Description

Sets up global flags for debug and quiet options.

## 6.3 defOptions/templateContents.h File Reference

Content of the template file printed with the -t or –template flags.

### Variables

- const char templateStr [ ]
  *The full template file contents.*

### 6.3.1 Detailed Description

Content of the template file printed with the -t or –template flags.

Contained here in its entirety to allow easy editing in the future.

### 6.3.2 Variable Documentation

#### 6.3.2.1 const char templateStr[ ]

**Initial value:**

```
="# Lines starting with '#' are comments\n\
# All other lines should be in the following format\n\
# freq [MHz], duration [ns], amplitude [relative, [0,1] ]\n\
# durations are a goal, not a guarantee, will be rounded to nearest 1/2 cycle of freq (including 0!)\n\
# amplitudes relative scales, where 1 is full-scale.\n\
# Output is only 8-bit, so effective amplitude resolution is 1/127 ~ 0.008\n\
#\n\
# Example line of 111 MHz for 30ns, with 3/4 full scale amplitude\n\
# 100, 30, 0.75\n\
"
```

The full template file contents.

The template file will be written to disk when the full program is called with the -t or –template flags. This gives an example of how to specify the output pulses, as well as a description of how it will actually work internally.

# Index