

tn0120

Playing Disk Files with SigGen/BioSig: Inverting phase; playing a series of files

1. SigGen and BioSig can present two types of disk files: 16-bit integer binary files and floating-point binary files. Disk files should be only a block of data and not have any header. Disk files are entered under Segment/Component/File16 or FileF. Data files must have a 3-digit numerical extension (i.e. .000, as explained below).
2. 16-bit Integer Binary File: 16-bit integer range will be interpreted into +/-10V in SigGen/BioSig, that is, 32767 is 10V, and -32768 is -10V.
Floating-point Binary Files: The actual value of the data will be considered as volt.
3. Data files can be played separately, or several binary files in sequence. To play several files in sequence: name the files all the same, but with extensions .000, .001, .002, and so forth. Create a variable that increments by integer amounts (eg. 0, 1, 2...). Use that variable under the file name when you create the segment component. As you can see, if this variable changes like 2, 3, 1, 0, etc., corresponding files with extensions .002, .003, .001, .000 will be presented in this order.
4. To play a signal that's been read off disk (File16 or FileF component type) 180 degrees out of phase with itself, you will need to multiply that signal by a segment that is DC -1V. To get a -1 "signal" in SigGen, create a tone of frequency 0, level 0 (or whatever corresponds to 1V) and phase -1.

Furthermore, in your application, you will have to the following:

PREPARING SPEECH FILES

Copy your speech files, in the order that you wish to use them, to "fname.000", "fname.001", "fname.002", "fname.003", where "fname" is an arbitrary file name which you will use in SigGen to identify the files. Make sure that SigGen uses the same sample rate at which they were recorded.

SIGNAL SETUP

Set the sample rate to the rate at which your speech files were recorded/sampled. Set the duration of the signal to at least the length of your longest speech file.

VARIABLES

You will need three variables for file number, intensity level, and phase. Set these variables up in SigGen as follows:

1. "File #": linear step; start 0; step 1; min 0; max 3; repeat factor 12; boundary control
2. "Level", dB: linear step; start 50; step 10; min 50; max 70; repeat factor 4; loop (you may have to set these differently depending on your calibration and how your speech files were recorded).
3. "Phase", deg: linear step; start 0; step 180; min 0; max 180; repeat factor 2; loop

SEGMENTS

You will set up two signal segments for this experiment. The first contains the pre-recorded speech segment. The second will be the alternating phase shift.

Segment 1: First component=File16. Enter the file name; SigGen automatically appends .000 to the file name; if the file is not in the directory in which SigGen is currently running, you will have to specify the full path of the file. (If you don't see any output in the SigGen signal window, make sure the file name is valid and the path is correct). In the variable box below, select the "File #" variable you defined previously. For the segment: press the "To Max" button under Duration; it probably makes sense to turn gating off, though it depends on your files.

Segment 2: First component=Tone, 0 dB, 0 Hz; set the phase to track on variable "Phase" which you defined previously. Set the App[lication] Meth[od] of the segment to Multiply. Gate type=none. Press the "To Max" button under Duration.

SUMMARY

This setup will allow you to play four sound files. Each one will be played at three intensities. For each intensity level, the file will be played twice normally and twice with the phase shifted 180 degrees. Thus, each file will be played twelve times for a total of 48 SGIs.

The "tricks" of this example that are not documented are (1) how to play a series of pre-recorded files and (2) how to phase-shift a pre-recorded file. All the rest of what I used here are documented in your SigGen manual.