

Programming Arbitrary Waveforms Into the Agilent 33522A Function/Arbitrary Waveform Generator

Turn the function generator on. If Signal Express starts on the computer, close it. The waveform to be programmed into the function generator will be specified by the laboratory instructor.

Use Mathcad to create the data for the function generator. The below is a template for a specific function consisting of the sum of two sine waves. Save the data generated in a text file somewhere using Notepad.

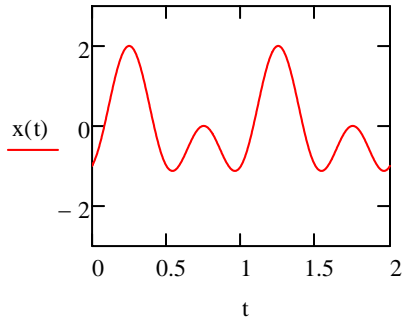
Download the LabVIEW program called Arbitrary Waveform Generator from the Software Applications section of the class web page. In the upper left hand corner of the LabVIEW front panel will be a control called VISA resource name. Click the selection arrow in this slot and click the address of the USB0 device. Set the Output Amplitude to the desired value on the front panel. Click the Run arrow at the top of the front panel. The program will then ask for the location of the data file. Enter it. The display on the function generator should now indicate a picture of the waveform entered.

Turn on the oscilloscope. Connect the output of the function generator to the oscilloscope. On the function generator press Local (Under System Button). Press Sample Rate and then enter 9 MS/s. Press Autoscale on the oscilloscope. Print the screen.

Program any additional waveforms specified by the laboratory instructor.

Programming HP33522A Arbitrary Function Gen for Two Tones

$$f_p := 1 \quad \omega_p := 2 \cdot \pi \cdot f_p \quad x(t) := \sin(\omega_p \cdot t) + \sin\left[2 \cdot \omega_p \cdot t - \frac{\pi}{2}\right]$$



Sample with 16,000 points for HP33522A Function Generator

$$N := 16000 \quad i := 0 .. N - 1$$

$$d_i := x\left(\frac{i}{N}\right) \quad \text{Max} := \max(d)$$

$$\text{Min} := \min(d)$$

$$\text{Max} = 2 \quad \text{Min} = -1.125$$

Normalize Points for Function Generator from -1 to + 1

$$d_i := \left(d_i - \frac{\text{Max} + \text{Min}}{2}\right) \cdot \frac{2}{\text{Max} - \text{Min}}$$

Put pointer in array.
Right Click. Select All.
Right Click. Copy Selection.
Open Notepad. Paste data into Notepad and Save File Somewhere.

	0
0	-0.92
1	-0.92
2	-0.919
3	-0.919
4	-0.919
5	-0.919
6	-0.918
7	-0.918
8	-0.918
9	-0.918
10	-0.917
11	-0.917
12	-0.917
13	-0.917
14	-0.916
15	...

Notes for Above. The symbol to the lower right of f "p" is a subscript for which the keyboard shortcut is the period on the keyboard. The symbol to the lower right of the d is an array index for which the keyboard shortcut is the left square bracket. The keyboard sequence for i is i colon, 0 semicolon, N-1.