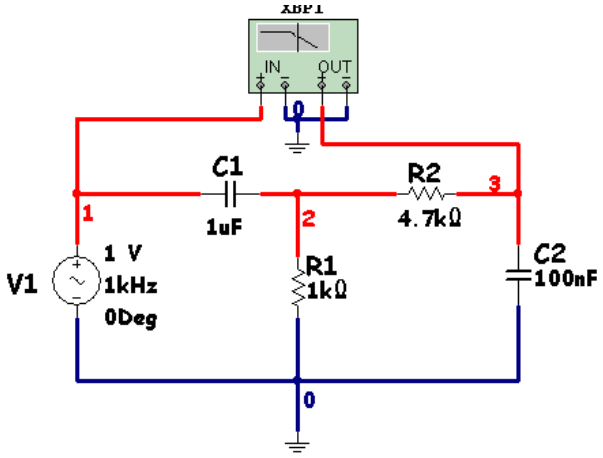
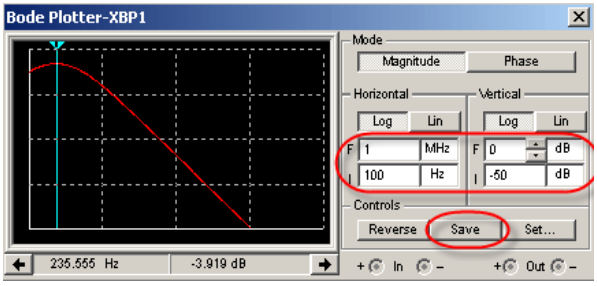
Using the Bode Plotter

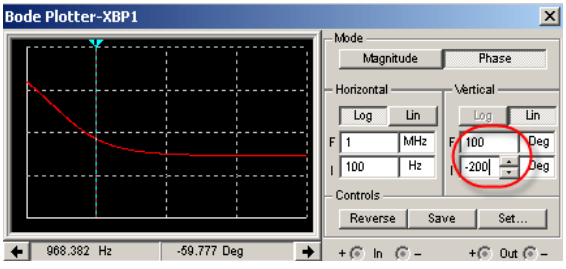


Connect the circuit to the left. Note that the circuit is using a 1 volt, 1 khz AC voltage source. While it might be tempting to replace this source with a Virtual Instrument Function Generator from EWB's virtual instrument set, in this case it will not be practical. As long as we are going to continue to use the Bode Plotter a function generator will work just fine. But as soon as you decide to perform an AC analysis on the circuit the function generator will no longer be possible. EWB requires that at least one AC voltage source be in the circuit when the AC analysis is being executed. Since this circuit soon be used for investigating the AC analysis (next tutorial) then we might as well keep the function generator out of the circuit.

EWB's Bode Plotter is a device which will provide a Magnitude and a Phase response curve for a circuit. Essentially this is a measure of V_{out} over V_{in}. The magnitude response can even be seen in a semi-log format. This device is excellent when a quick and dirty response is all that is necessary. Later on we will look at the AC analysis which will do an even better job of seeing the response of a circuit over varying frequency ranges.

Double click on the bode plotter and set the frequency range to run from 100 hz to 1 MHz, and 0 dB to -50 dB. Then run the simulation. Note that there is a cursor that can be used to find the amplitude (or phase) at a specific frequency.





You can observe the Phase response by selecting the phase button. In order to get this response shown to the left we had to change the vertical settings from the default of -720 degrees to 720 degrees to -200 degrees to 100 degrees.

	A	B	C	D	E
	Bode	data:	BOD		
	column	1	Frequency	(Hz)	
	column	2	Gain	(dB)	
	column	3	Gain	(Linear)	
	column	4	Phase	(Deg)	
	trace	name:	Bode	Result	
	Color:	255			
	Gain_Rang	3.16E-03			
	Gain_Rang	1.00E+00			
10	Phase_Ra	-2.00E+02			
11	Phase_Ra	1.00E+02			
12		Frequency	Gain (dB)	Gain	Phase
13					
14		1.00E+02	-6.18E+00	4.91E-01	3.95E+01
15		1.02E+02	-6.06E+00	4.98E-01	3.86E+01
16		1.05E+02	-5.94E+00	5.04E-01	3.76E+01
17		1.07E+02	-5.83E+00	5.11E-01	3.67E+01
18		1.10E+02	-5.72E+00	5.17E-01	3.57E+01
19		1.12E+02	-5.62E+00	5.24E-01	3.47E+01
20		1.15E+02	-5.52E+00	5.30E-01	3.37E+01
21		1.17E+02	-5.42E+00	5.36E-01	3.27E+01
22		1.20E+02	-5.32E+00	5.42E-01	3.17E+01
23		1.23E+02	-5.23E+00	5.48E-01	3.07E+01
24		1.26E+02	-5.13E+00	5.54E-01	2.96E+01
25		1.29E+02	-5.05E+00	5.59E-01	2.86E+01
26		1.32E+02	-4.96E+00	5.65E-01	2.75E+01
27		1.35E+02	-4.88E+00	5.70E-01	2.65E+01
28		1.38E+02	-4.80E+00	5.75E-01	2.54E+01

The response can be saved and then imported into Microsoft EXCEL or Quattro Pro if desired. The curves will of course also be visible for manipulation and formatting in EWB's Grapher as well.