

Example 4: Transient response graph

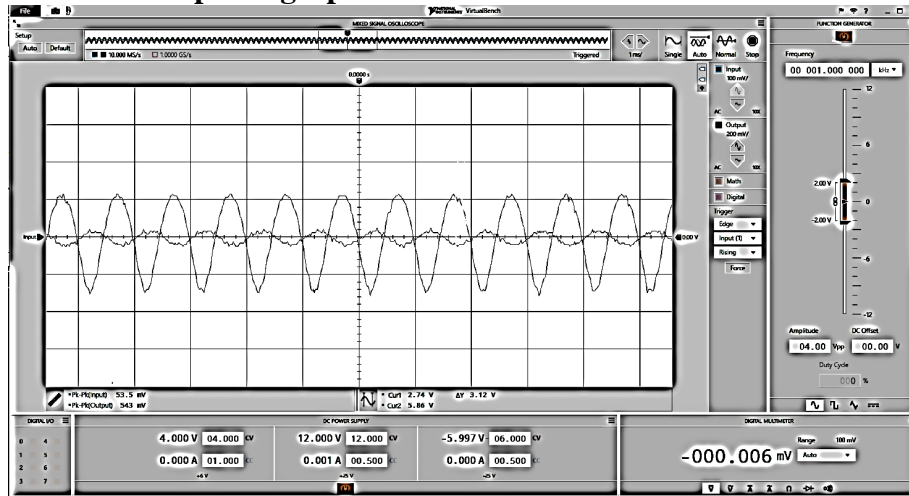


Figure 8: Virtual Bench input and output voltages

In the figure above, rather than prepare a proper graph, the student simply included a screen shot of the (virtual) instrument, as if that was an adequate substitute. It is not. A proper graph figure has axis labels, units, numbers, and a legend to identify the different curves. This image has none of those things. The student preparing this perhaps thought, “The reader can look at the oscilloscope settings and figure all of that out.” But, the oscilloscope settings are too small and blurred to be read. Moreover, it is the report writer’s responsibility to interpret raw results to show and point out what is meaningful. This figure essentially says, “You figure it all out; I don’t have time.” Or, “This isn’t important enough to do properly.” Neither conveys a favorable impression of the writer.

The number of cycles shown should be reduced so that the features can be enlarged. Seeing 11 identical cycles doesn’t add to what showing three cycles would have conveyed to the reader. In this case, the original figure submitted by the student in his lab report did not have enough resolution to “fix it up”. No “fixed up” version of this one can be shown, but it would have looked much like the earlier two. At least in this case the axes are square (and there is no keystone) because it was done via screen capture rather than a camera.

Example 5: Simulation Transient Response graph:

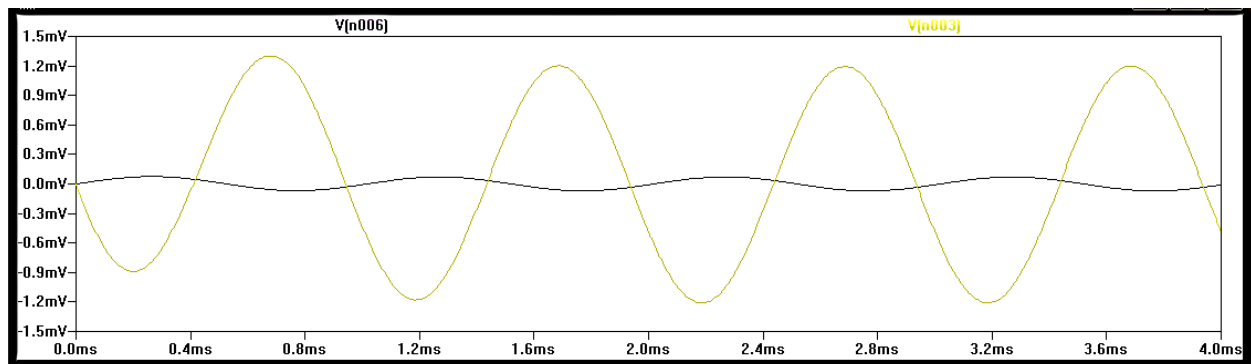


Figure 4: Transient Display for the Common Emitter Amplifier

This is from a circuit simulator. The numbers are way too small to read, there are no grid lines, and there is a thick black border artifact that should be removed. In a report, usually figures should not have borders. There are no labels for either axis, and nothing identifies which curve is which (there is no legend). In reworking this figure, the left half is expanded to show fewer cycles with the lettering larger and more readable. (It has also been changed to greyscale to save image storage space.) Gridlines and annotations were added.

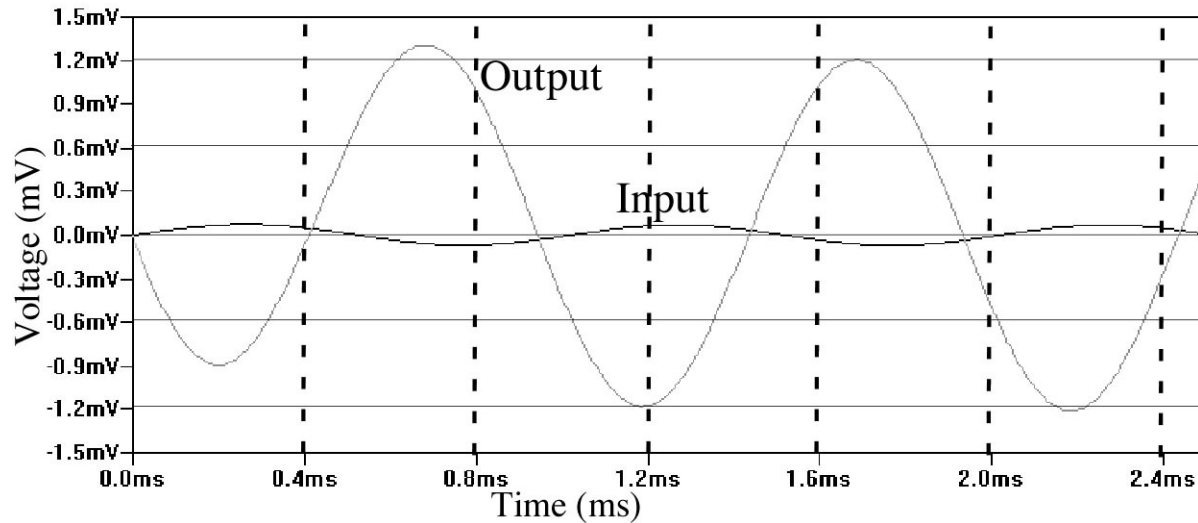


Figure 4: Transient Display for the Common Emitter Amplifier

Example 6: Magnitude response plot for an amplifier, from lab data

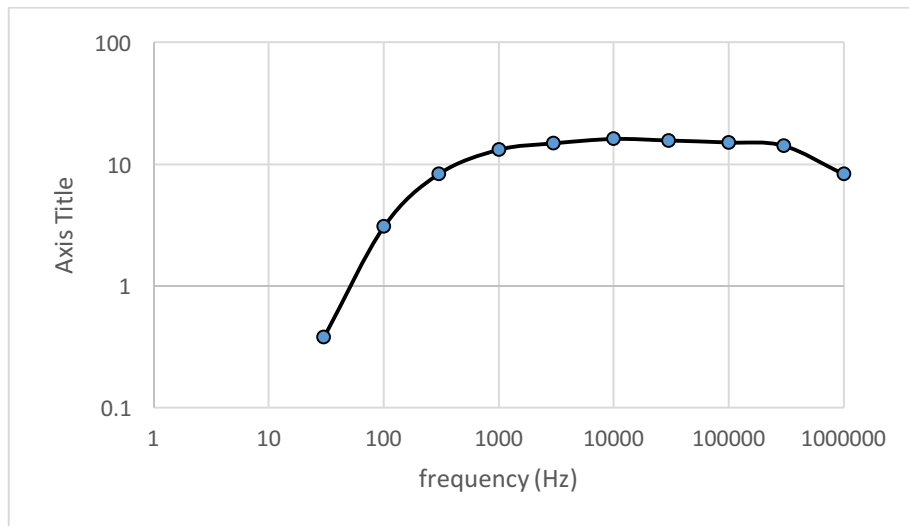


Figure 7: Bode Plot

This is typical of a figure prepared from a table of data taken during a lab exercise, with Excel used to produce the figure. It is titled a “Bode Plot”. A Bode plot actually includes two graphs, one for Magnitude (as here) and one for Phase (not shown). So this should properly be titled “Magnitude Bode Plot for the Amplifier.” The figure and title should be centered.

Apparently the student was in such a hurry that he didn't bother to put in a vertical axis title. "Axis title" as a title is not useful, and does not give units. For a Bode Plot, the vertical axis should be in dB (deciBels). The logarithmic vertical scale is equivalent to that, but not quite the same.

The horizontal scale, in Hz, is a bit problematic because of the large range. By the right side of the figure, seven digits are needed. It would be better to shift to 1K for 1000 and 1M for 1000000. If one needed a frequency scale over many orders of magnitude, this is preferable for a clearly readable graph. That modification probably cannot be easily done in Excel; you may have to do it with image postprocessing before pasting your figure into Word. Note that the leftmost frequency should have been 10 Hz, not 1 Hz, since there is no data between those frequencies. Also, Frequency should be capitalized since it is a title, if only for an axis.

Some additional details: There should be no border. The labels, numbers, and axes should be black, not grey. (Grey is OK for grid lines perhaps, but when copied on a typical copier, grey lines may become black or disappear.)