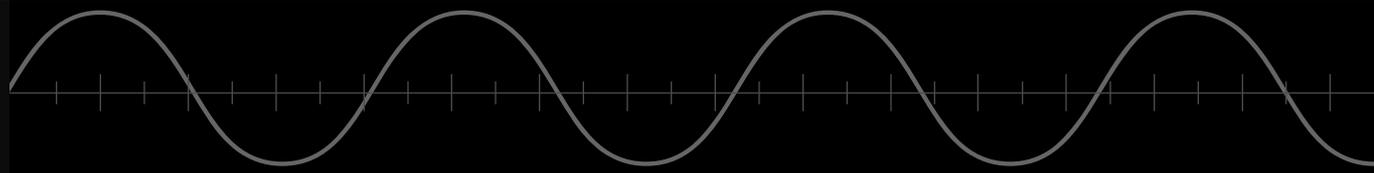
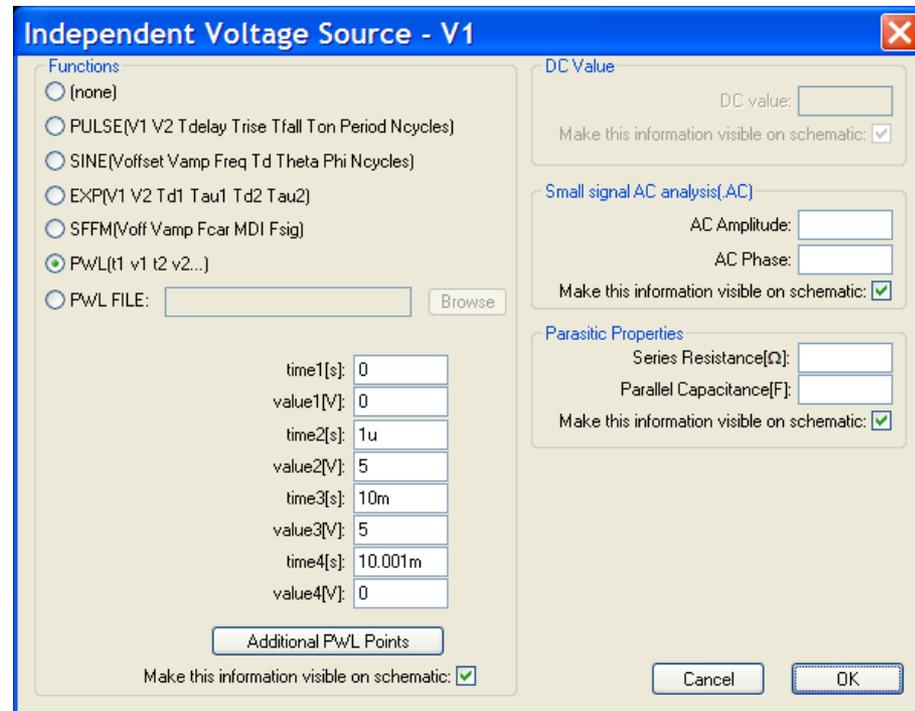
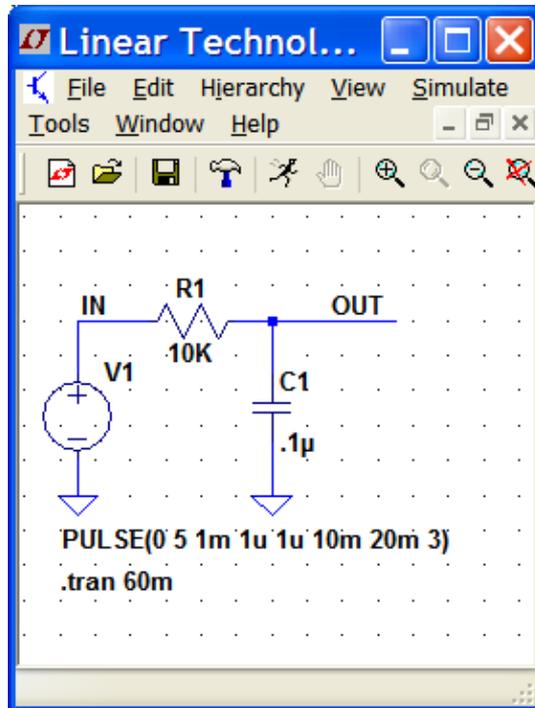


Piece-Wise Linear (PWL) Voltage Sources



Creating a PWL Voltage Source

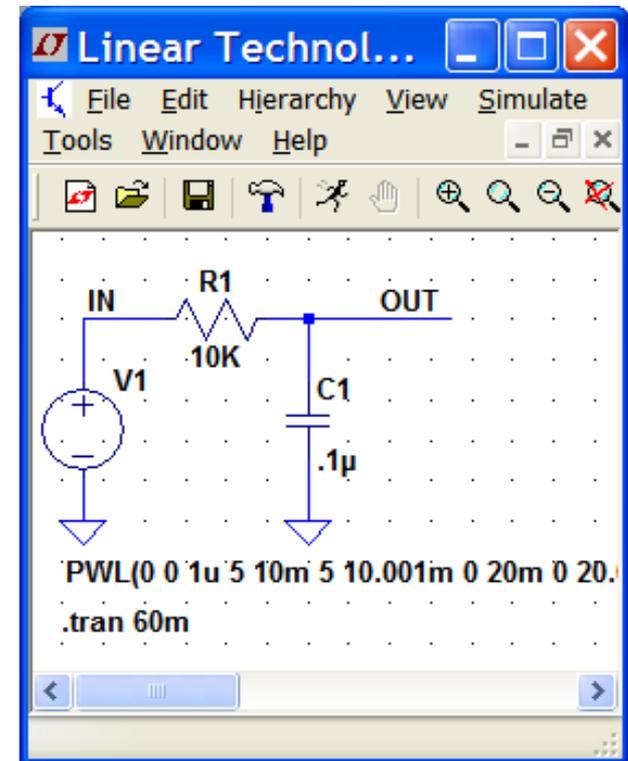
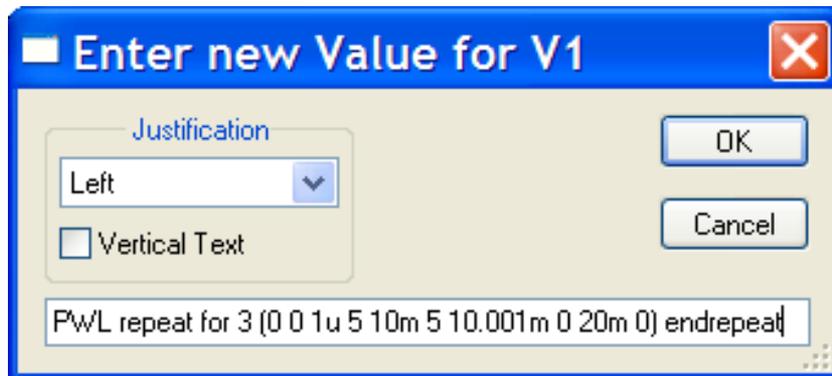
- ❖ Open up the simulation file titled “RCFilterTimeDomain.asc”
- ❖ Run the simulation and probe the IN and OUT nodes
- ❖ Right-Click on the voltage source and select the PWL function
- ❖ Configure the PWL source to manually recreate the pulse waveform as shown in the voltage source window on the right
- ❖ Rerun the simulation. Notice a single pulse is now present.



RCFilterTimeDomain.asc

Repeating PWL Source

- ❖ Open up the simulation file titled “RCFilterTimeDomainRepeat.asc”
- ❖ Run the simulation and probe the IN and OUT nodes
- ❖ Right-Click on the PWL text string and use the repeat command to create three cycles of the input square wave.



RCFilterTimeDomainRepeat.asc

Importing Externally Generated PWL Sources

- ❖ To import a PWL waveform from a file, Right-Click on a voltage source, select “Advanced”, and select “PWL File”
- ❖ The file format must contain pairs of numbers separated by white space (carriage return, spaces, tabs). The first number is time (in seconds) and the second number is voltage.
- ❖ Like the standard PWL, you can also repeat, as shown in these examples

- ❖ Example 1 (datapoints in a line):

PWLExamplesLine.asc



❖ 0 0 0.1 1 0.2 0.5 0.5 0 0.7 0.3 1 0

- ❖ Example 2 (datapoints in columns):

PWLExamplesColumn.asc



❖ 0 0

❖ 0.1 1

❖ 0.2 0.5

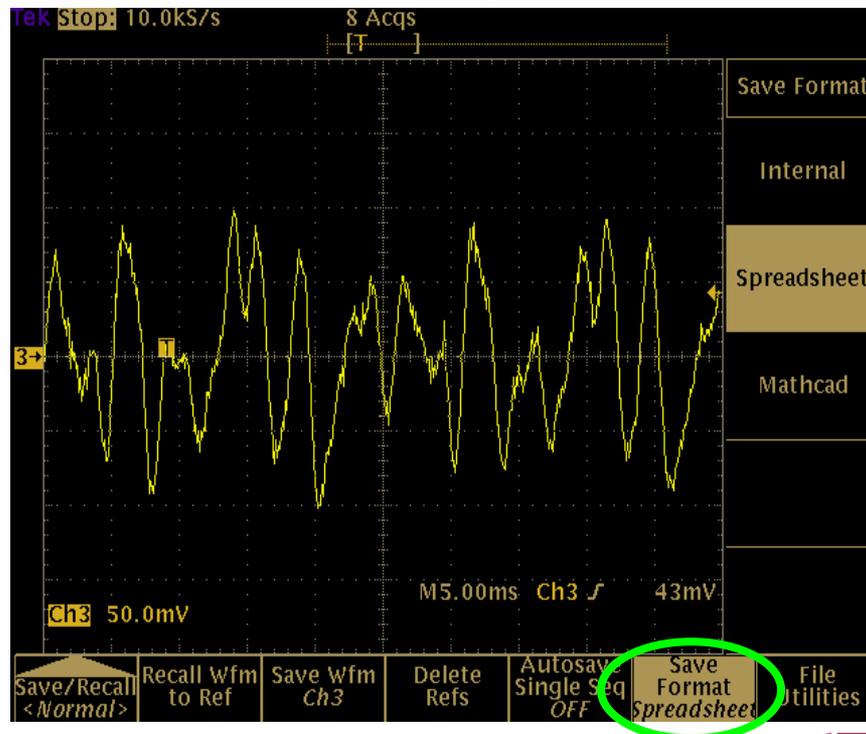
❖ 0.5 0

❖ 0.7 0.3

❖ 1 0

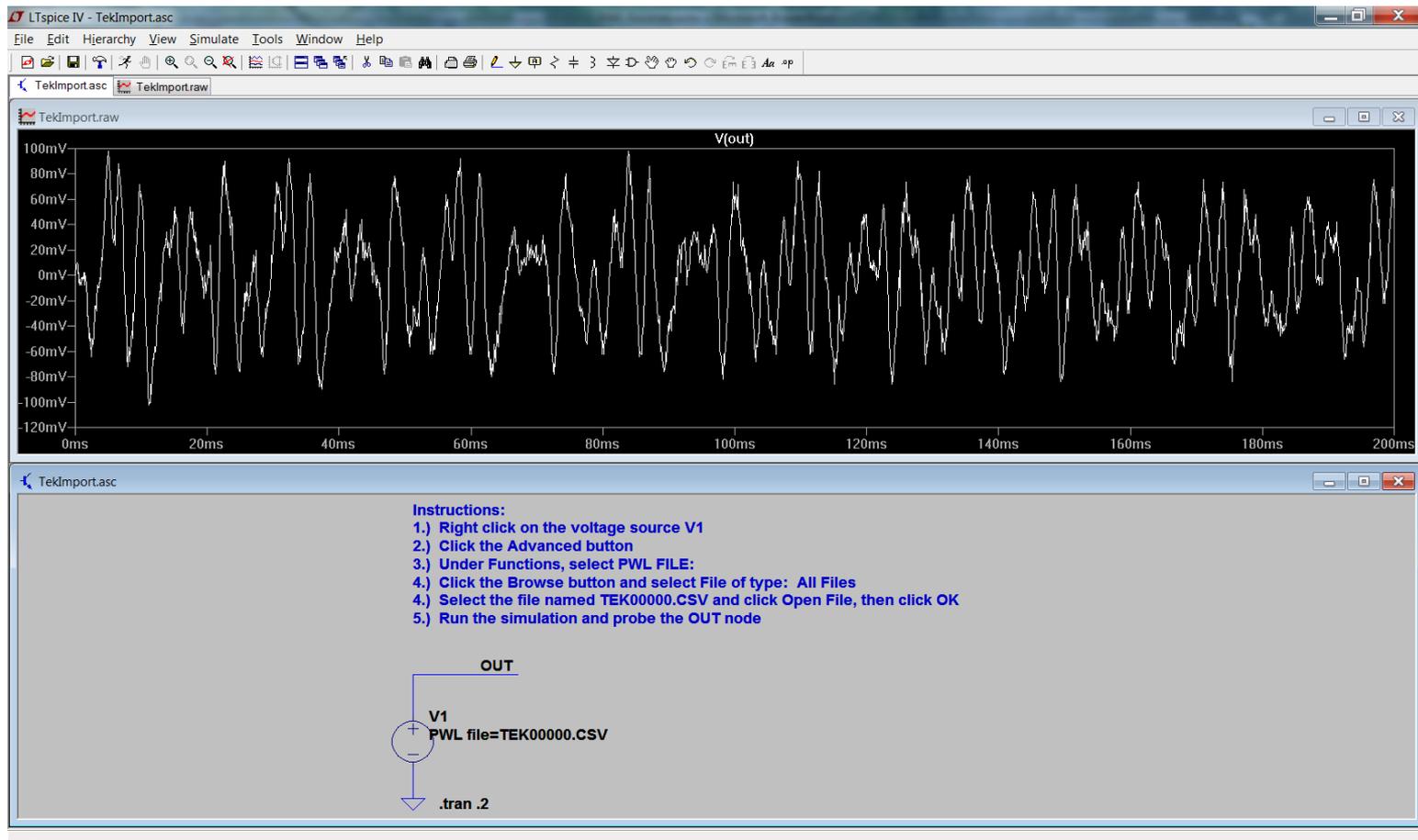
Importing a PWL Waveform From an Oscilloscope

- ❖ PWL waveform data can be imported into LTspice from an oscilloscope waveform capture
- ❖ Data can be comma separated or space separated data pairs (Time Value). Ex. .csv file.
- ❖ Many Oscilloscopes will export in this format (ex. Save Format *Spreadsheet* option shown below)



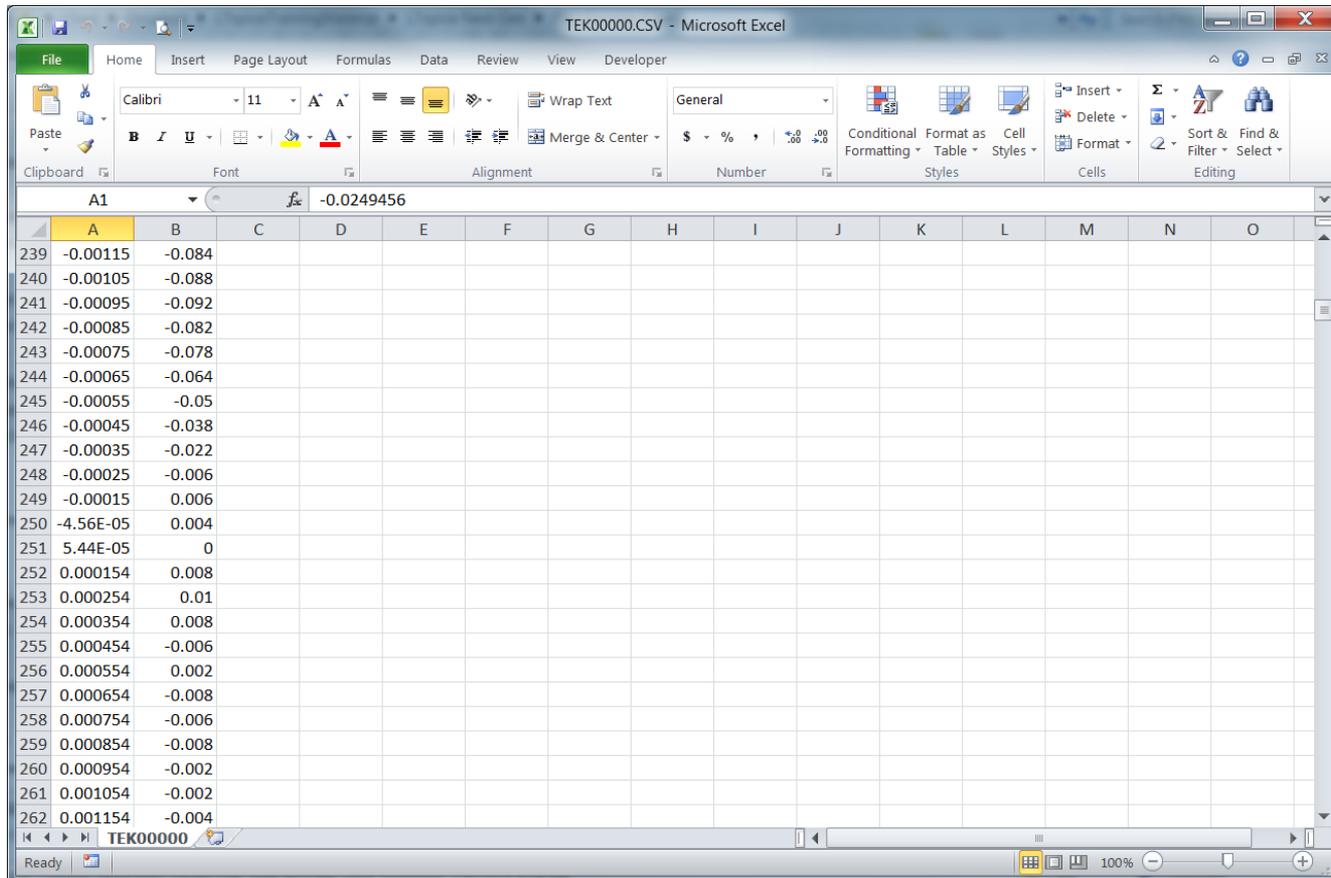
Importing a PWL Waveform From a File

- ❖ Open up the simulation file titled “TekImport.asc” and follow the instructions in the simulation file.



Importing a PWL Waveform From a File

- ❖ One thing to notice is that data with a negative time is ignored. Your scope may consider the trigger time to be $t=0$ in the output file. If you want to use this data, edit the time column in the spreadsheet as needed.

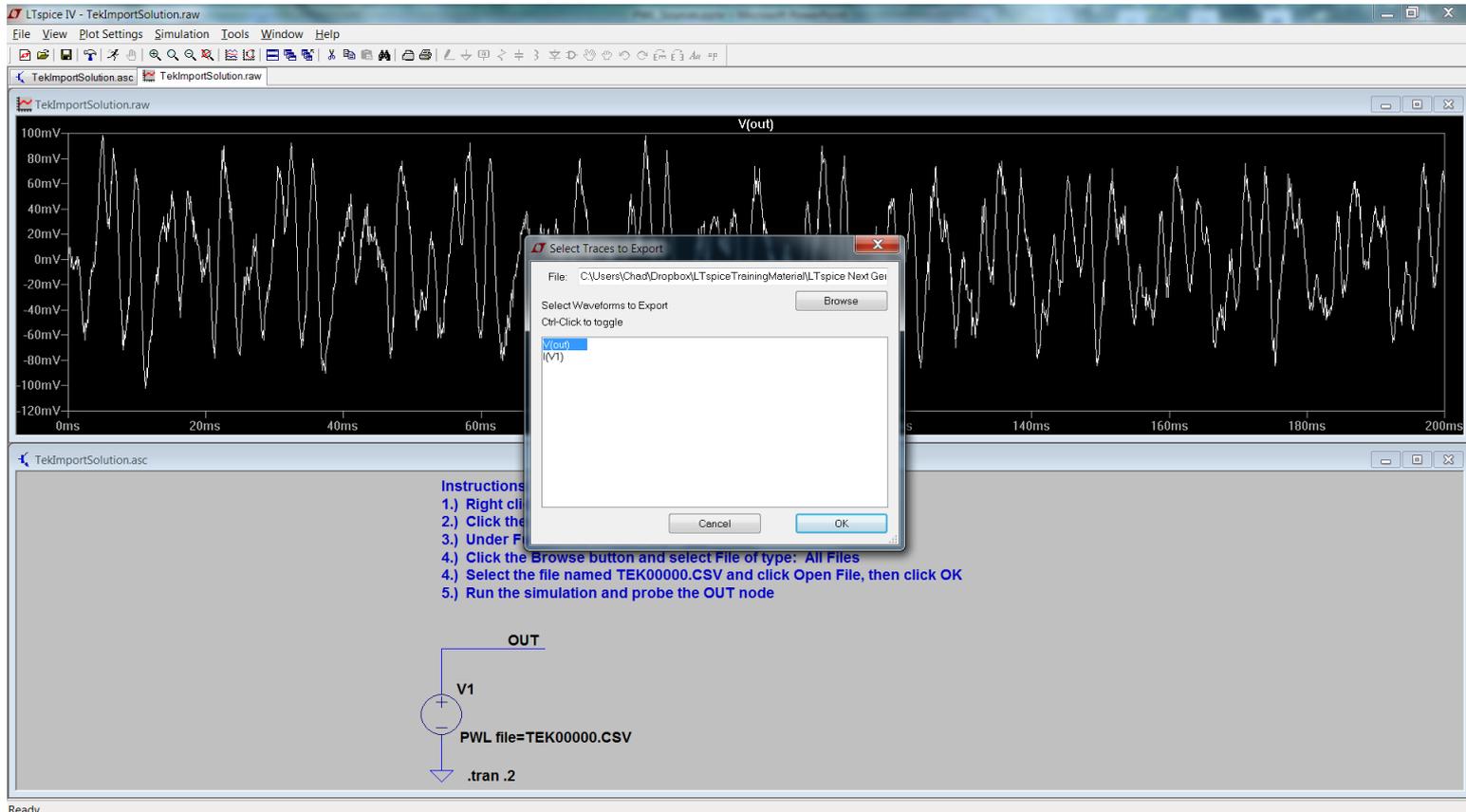


TEK00000.CSV - Microsoft Excel

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
239	-0.00115	-0.084													
240	-0.00105	-0.088													
241	-0.00095	-0.092													
242	-0.00085	-0.082													
243	-0.00075	-0.078													
244	-0.00065	-0.064													
245	-0.00055	-0.05													
246	-0.00045	-0.038													
247	-0.00035	-0.022													
248	-0.00025	-0.006													
249	-0.00015	0.006													
250	-4.56E-05	0.004													
251	5.44E-05	0													
252	0.000154	0.008													
253	0.000254	0.01													
254	0.000354	0.008													
255	0.000454	-0.006													
256	0.000554	0.002													
257	0.000654	-0.008													
258	0.000754	-0.006													
259	0.000854	-0.008													
260	0.000954	-0.002													
261	0.001054	-0.002													
262	0.001154	-0.004													

Exporting Waveforms to ASCII

- ❖ With a waveform window active, go to File -> Export.
- ❖ Select the node voltage or current to export and click OK.
- ❖ The file location is shown at the top of the dialog box.



TekImport.asc