Drops of LTSpice

How to create functions

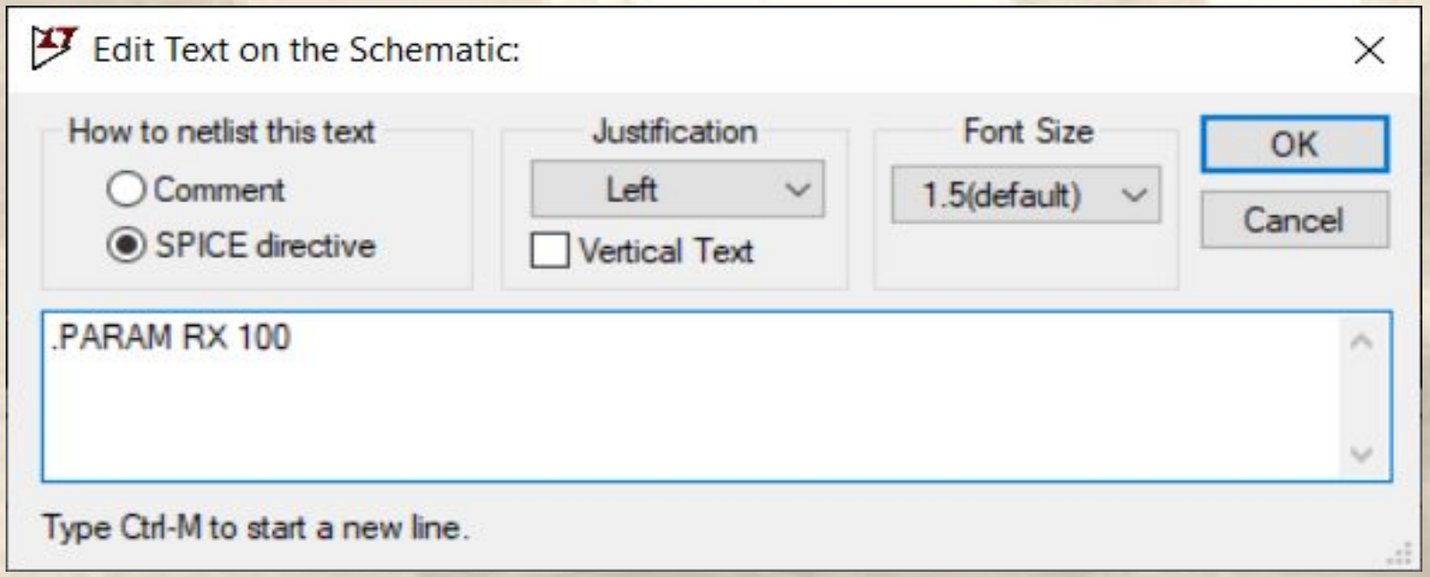
You already know that LTSpice has a set of really cool math functions.

Function Name	Description
abs(x)	Absolute value of x
absdelay(x,t[,tmax])	x delayed by t. Optional max delay notification tmax.
acos(x)	Real part of the arc cosine of x, e.g., acos(-5) returns 3.14159, not 3.14159+2.29243i
arccos(x)	Synonym for acos()
acosh(x)	Real part of the arc hyperbolic cosine of x, e.g., acosh(.5) returns 0, not 1.0472i
asin(x)	Real part of the arc sine of x, asin(-5) is -1.57080, not -1.57080+2.29243i
arcsin(x)	Synonym for asin()
asinh(x)	Arc hyperbolic sine
atan(x)	Arc tangent of x
arctan(x)	Synonym for atan()
atan2(y,x)	Four quadrant arc tangent of y/x

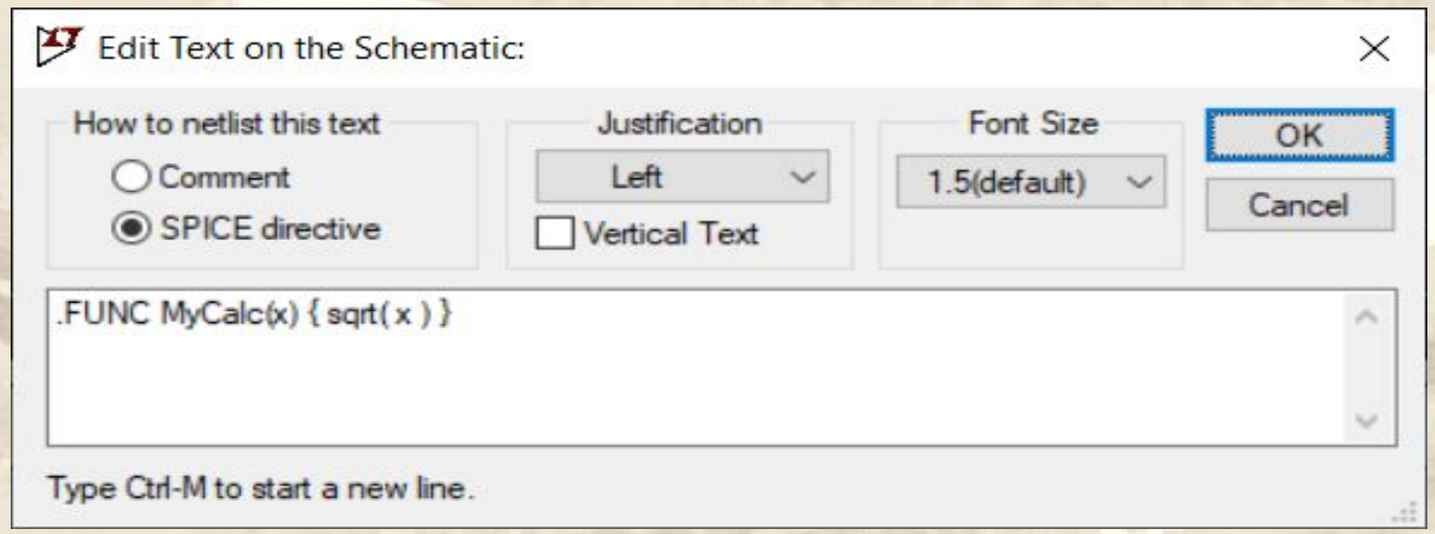
But can we create our own functions?

Yes, we can. And there are two ways.

For constant values, we can use the .param directive.

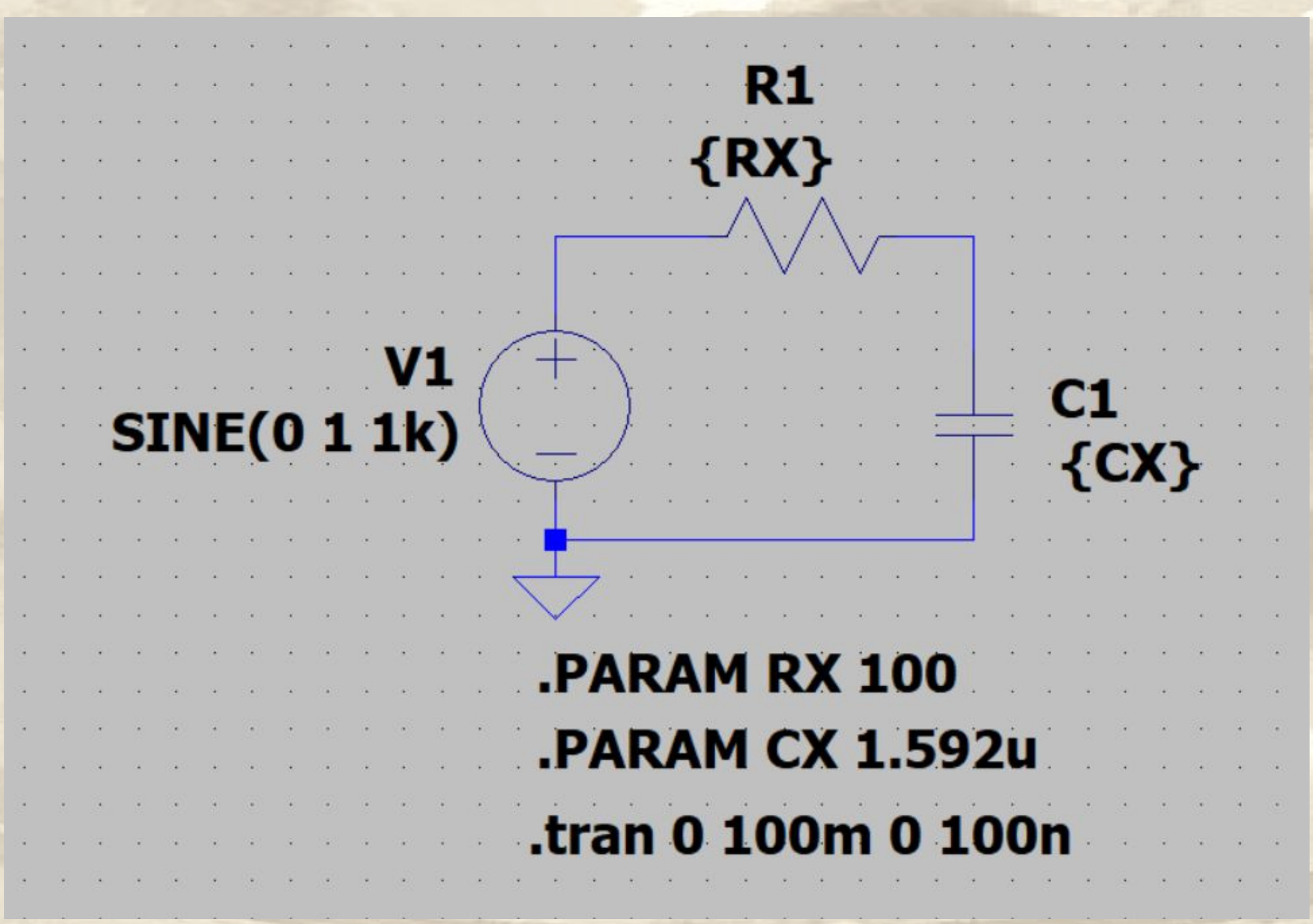


For variables such as time and voltage, we use the .func directive.



For example...

Let's imagine a circuit with a capacitor and resistor.



Let's imagine that we want the impedance of the capacitor to be the same as that of the resistor.

$$X_C = \frac{1}{2\pi f C}$$

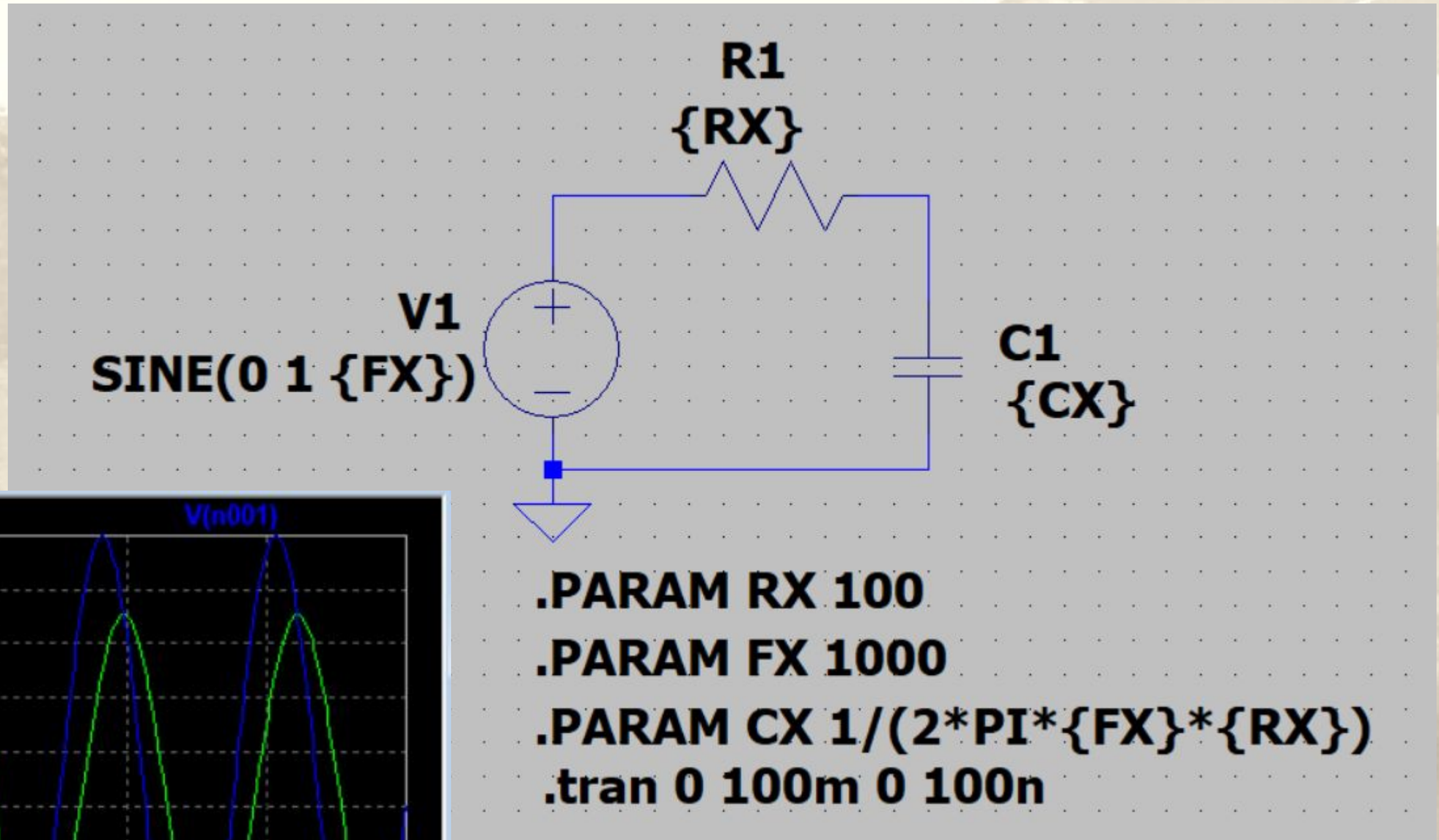
Once...

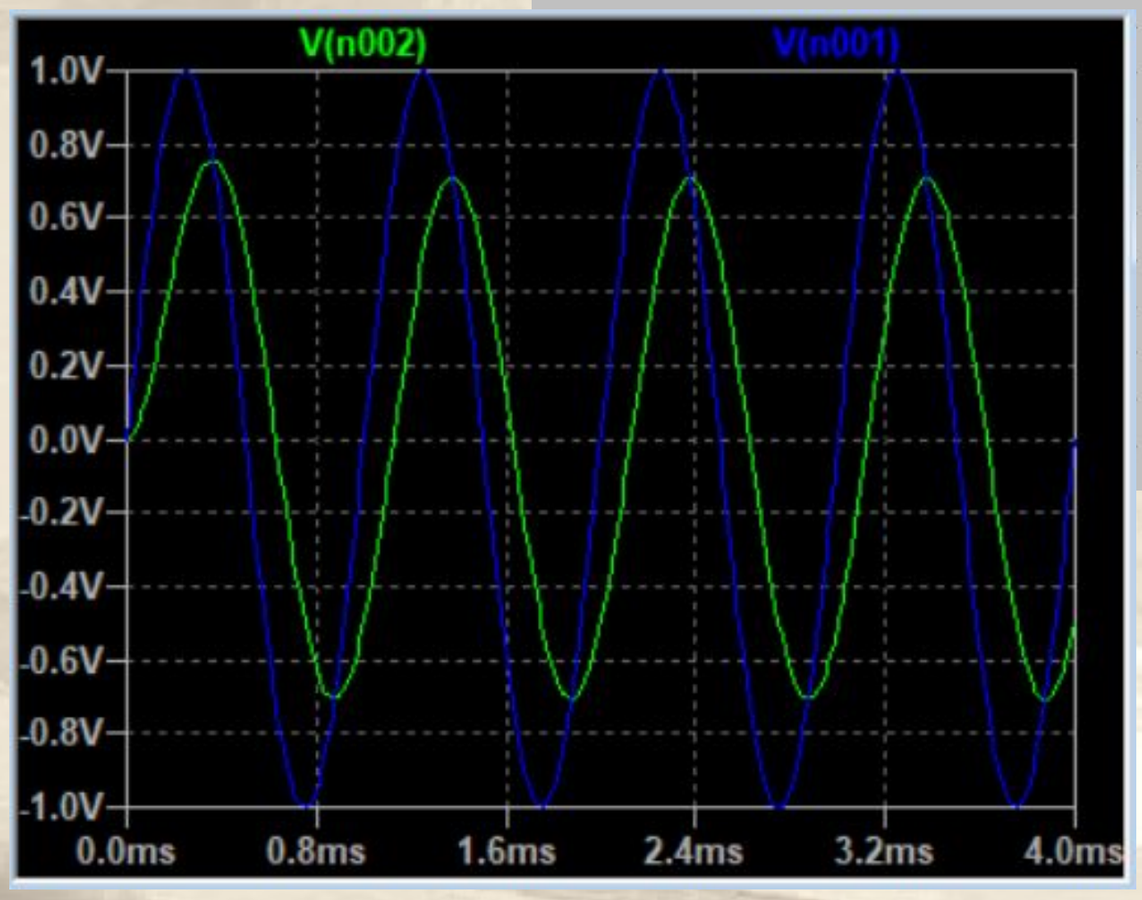
f=1kHz and R=100Ω

Xc=1.592μF

But it's more fun to have LTSpice calculate it for us.

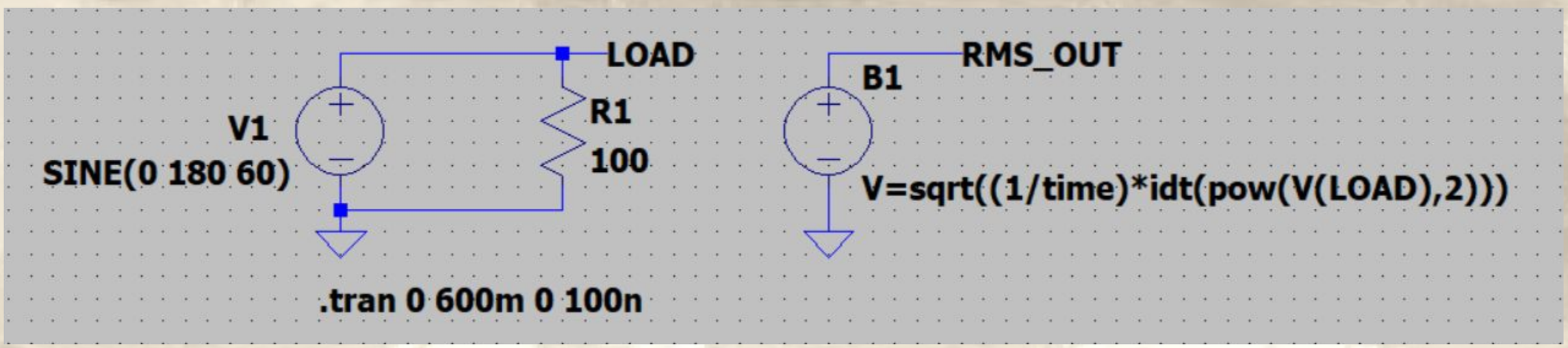
And we can use .param to do this for us.





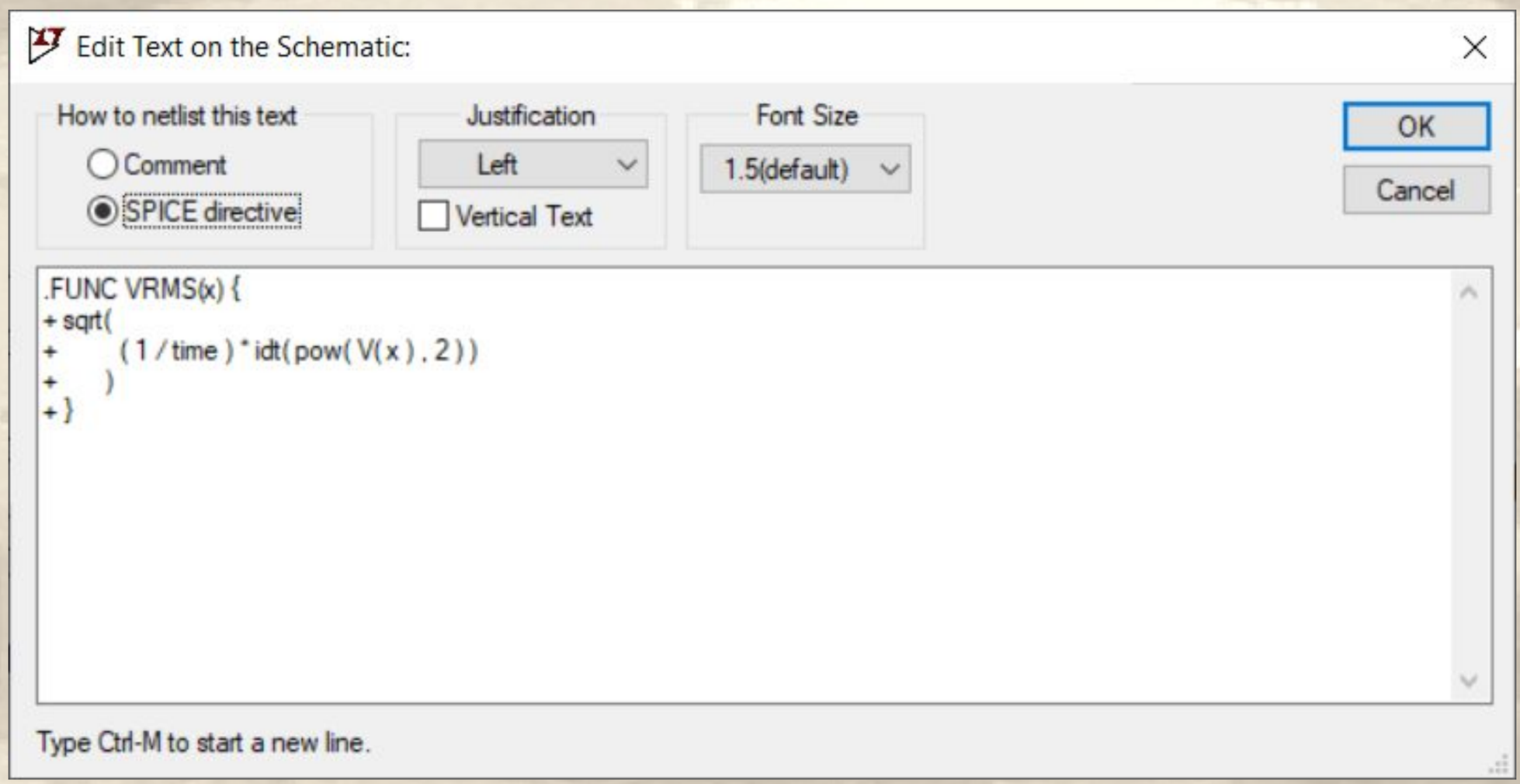
Now... let's now imagine a calculation using the voltage values generated in the simulation.

We can use an arbitrary voltage source to give us the resulting RMS voltage.

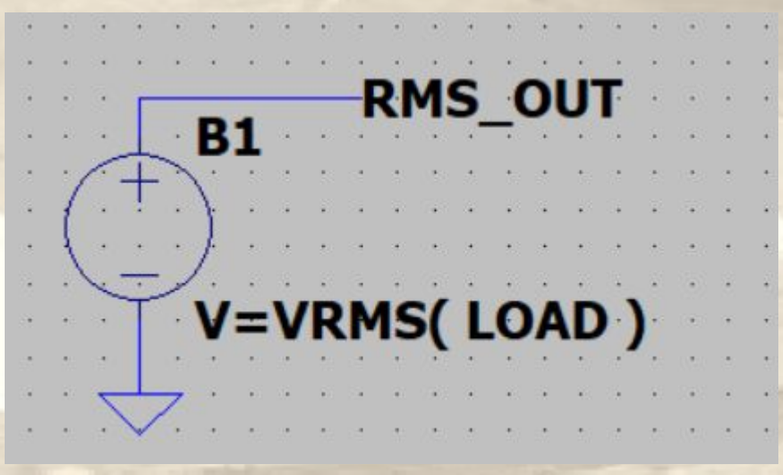


But it's a mess.

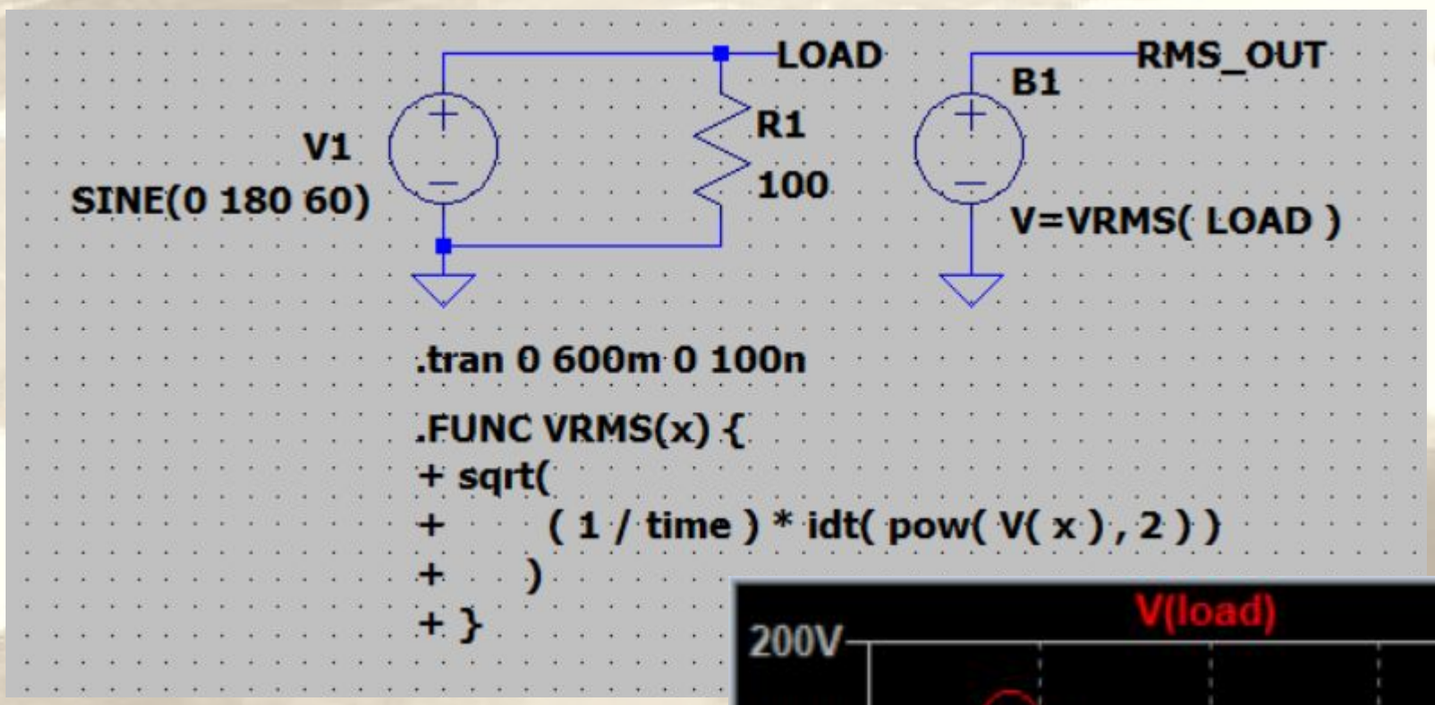
Editing a function is simpler.

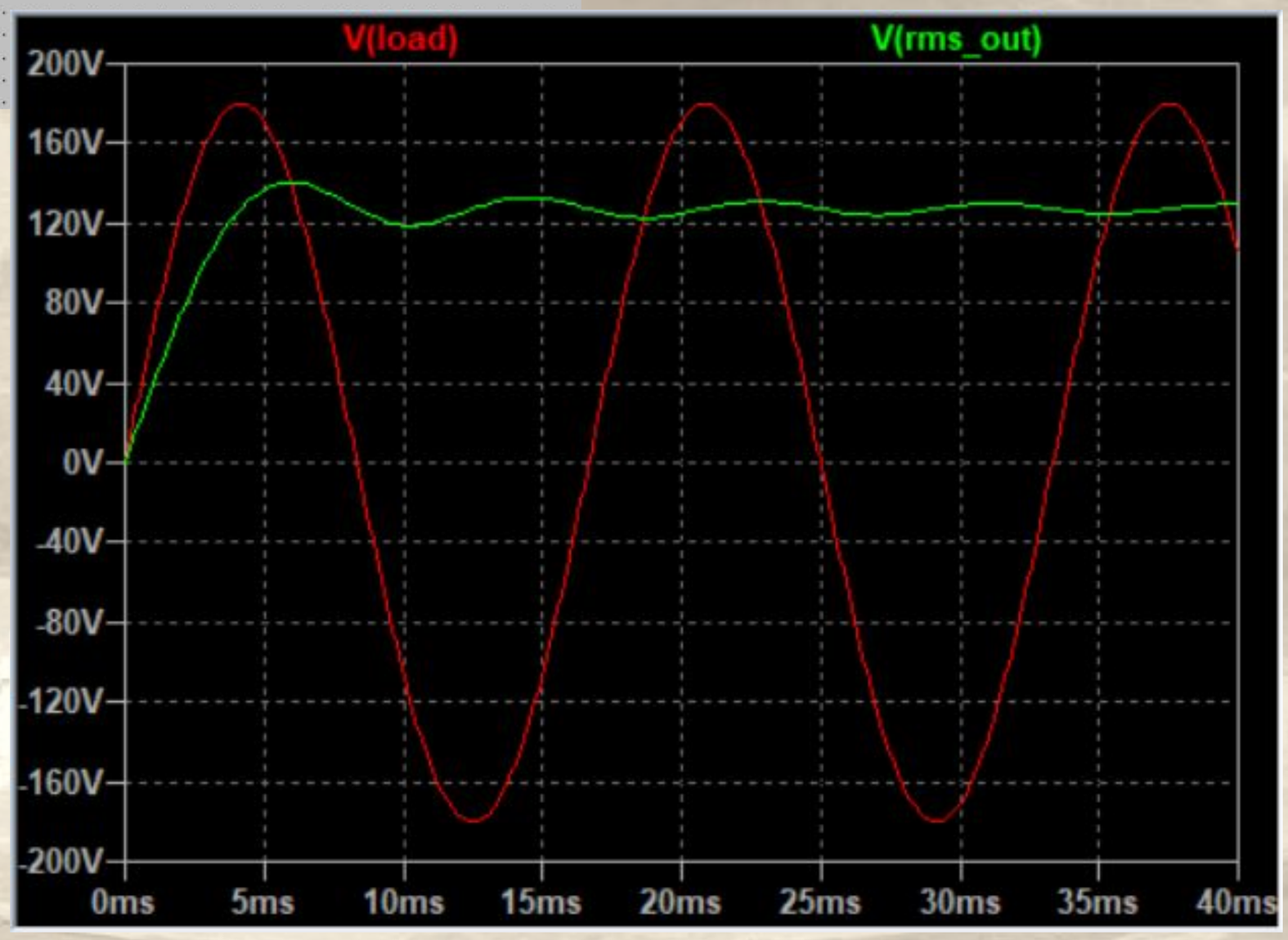


And the result is cleaner.



And the result is professional!





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