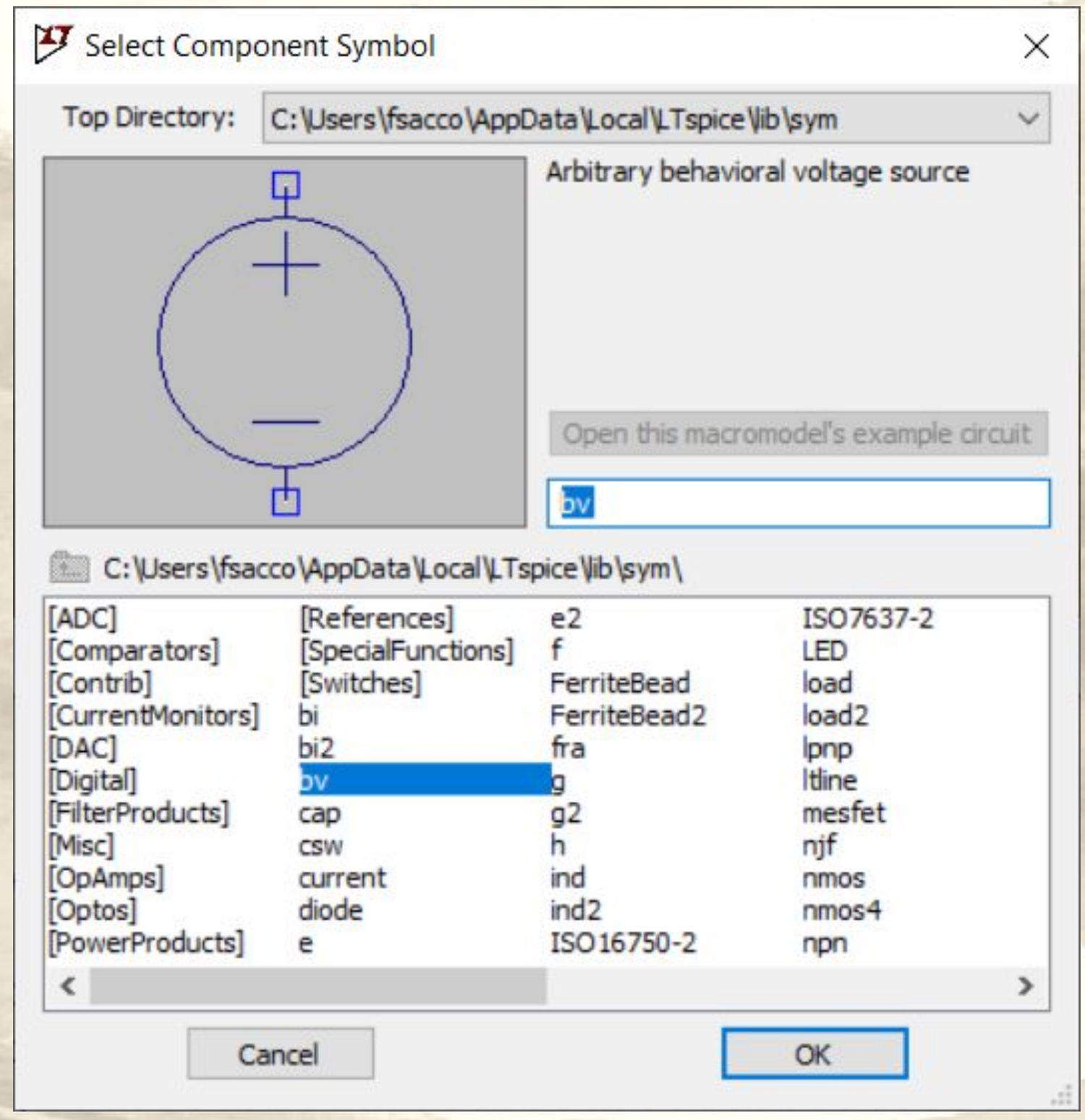
Drops of LTSpice

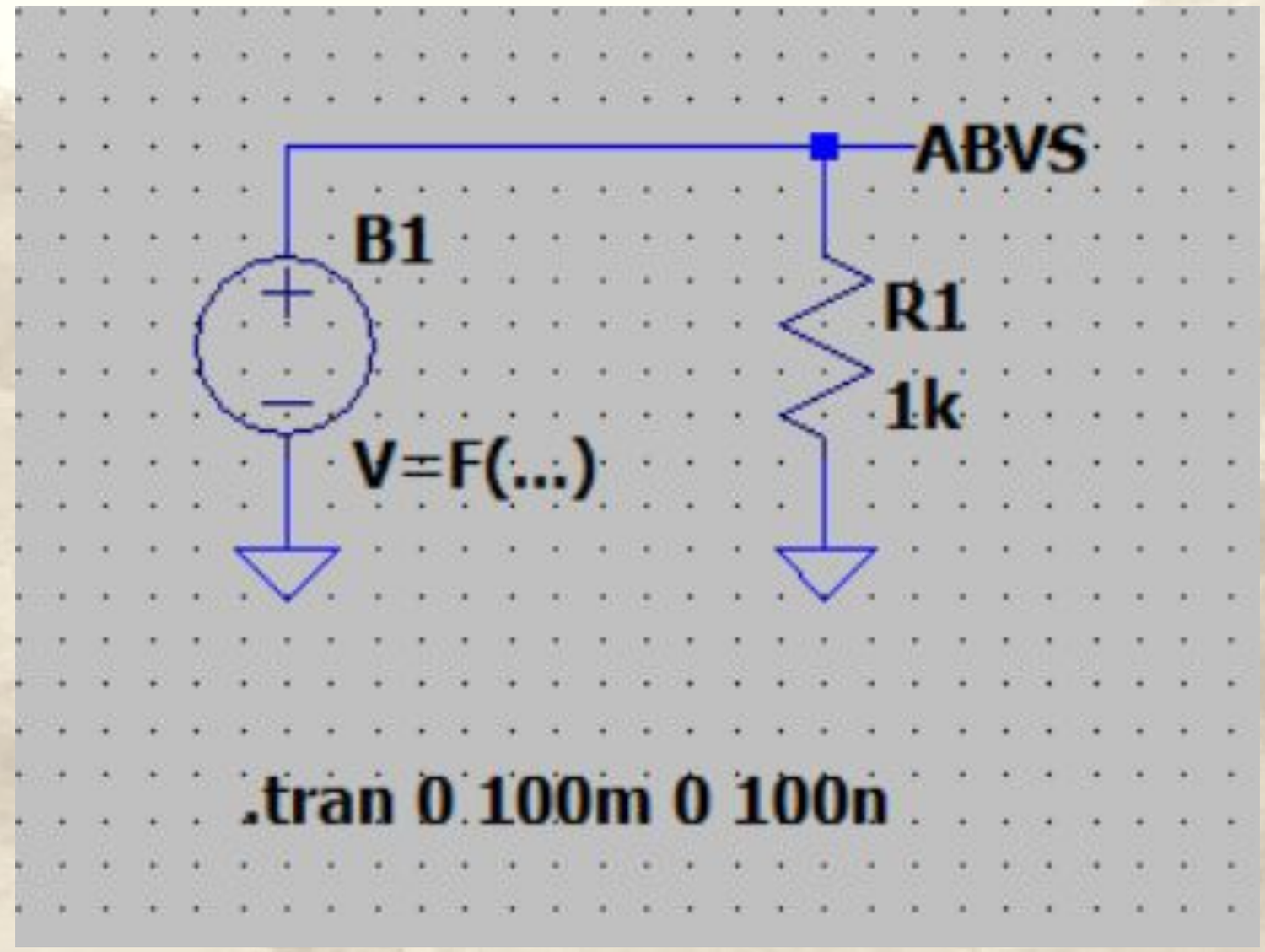
How to use the Arbitrary Voltage Source

LTSpice contains a very interesting component...



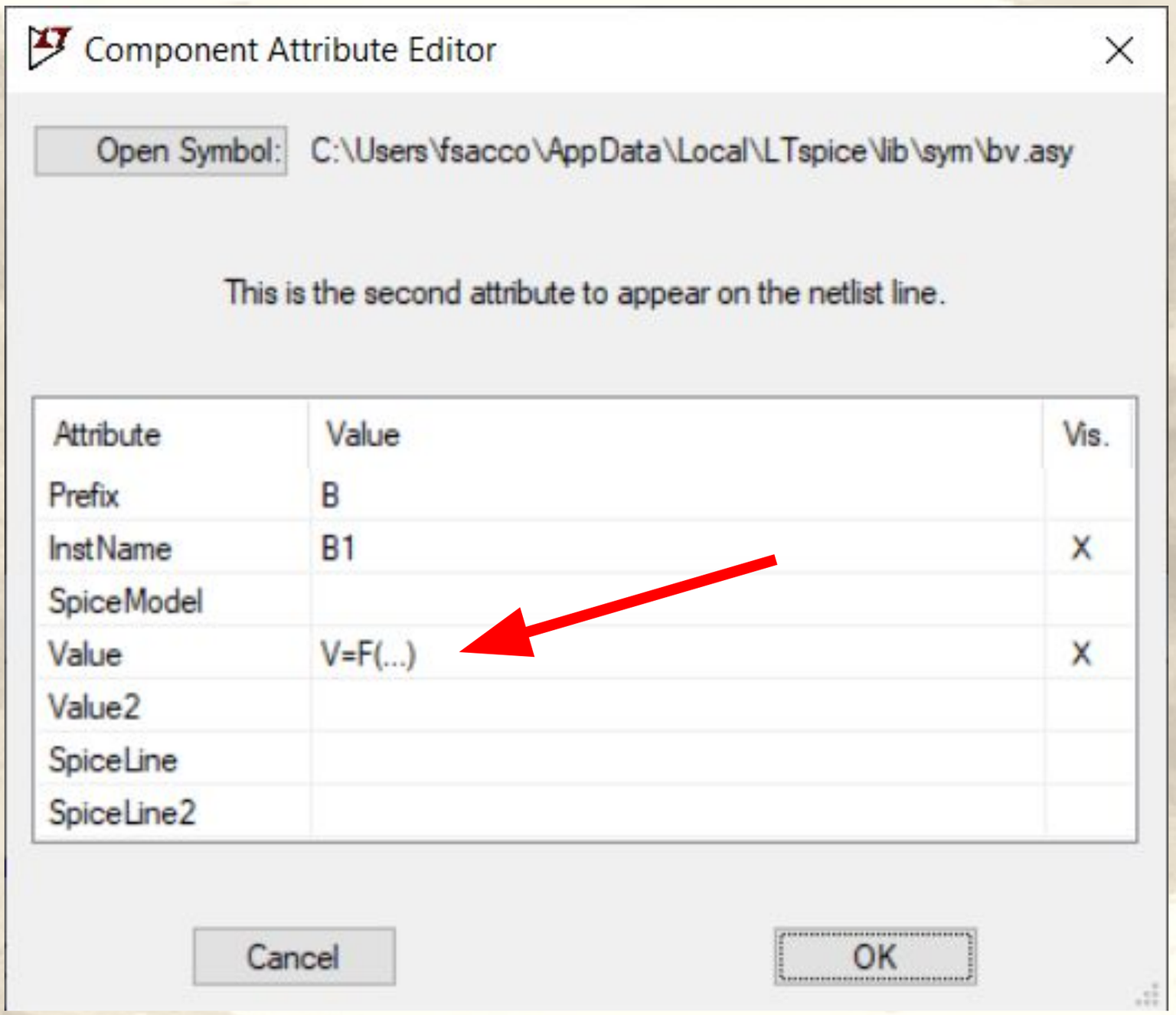
The Arbitrary Behavioral Voltage Source

It looks like a standard voltage source.



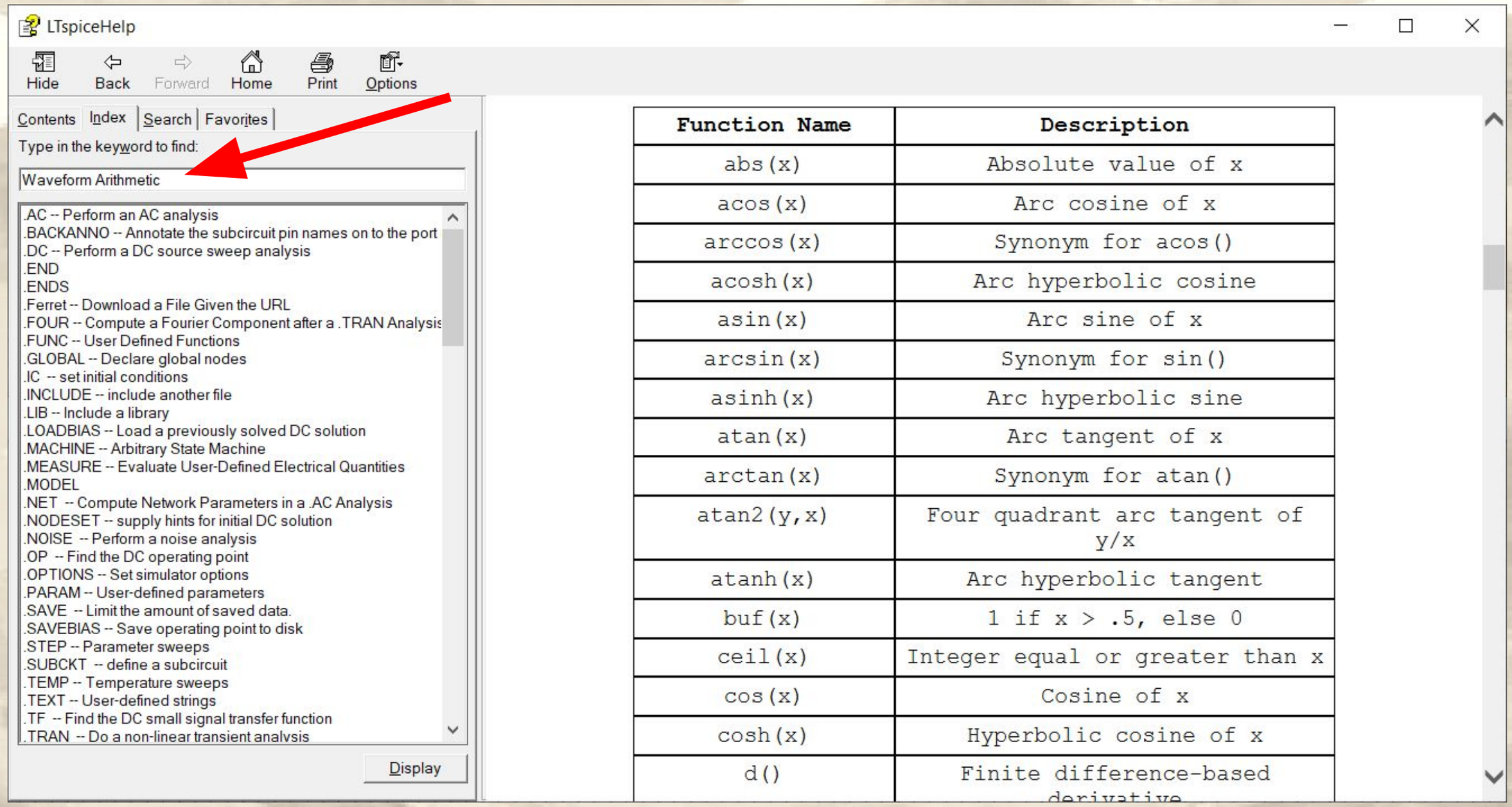
But notice the V=F(...)

By editing the component, it is possible to add a mathematical function



This function will define the voltage behavior.

In the software's help window you can get details of all the functions that can be used, searching for Waveform Arithmetic



Function Name	Description
abs(x)	Absolute value of x
acos(x)	Arc cosine of x
arccos(x)	Synonym for acos()
acosh(x)	Arc hyperbolic cosine
asin(x)	Arc sine of x
arcsin(x)	Synonym for sin()
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
atanh(x)	Arc hyperbolic tangent
buf(x)	1 if x > .5, else 0
ceil(x)	Integer equal or greater than x
cos(x)	Cosine of x
cosh(x)	Hyperbolic cosine of x
d()	Finite difference-based derivative

But I will demonstrate some of them.

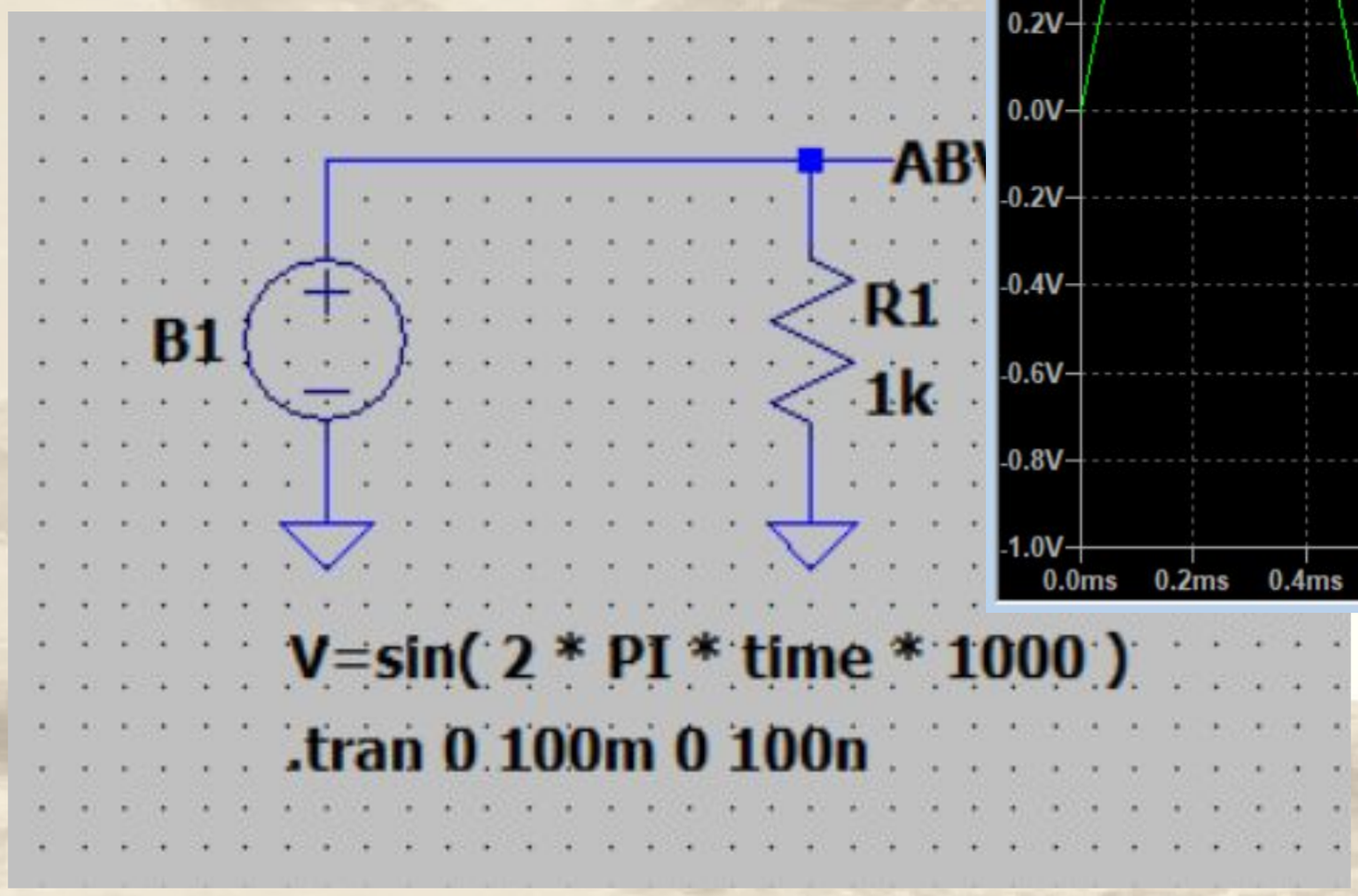
There are some constants that you can use. The pi, for example.

Name	Value
E	2.718281828459045235
pi	3.141592653589793846
K	1.3806503e-23
Q	1.602176462e-19

time is another important keyword!

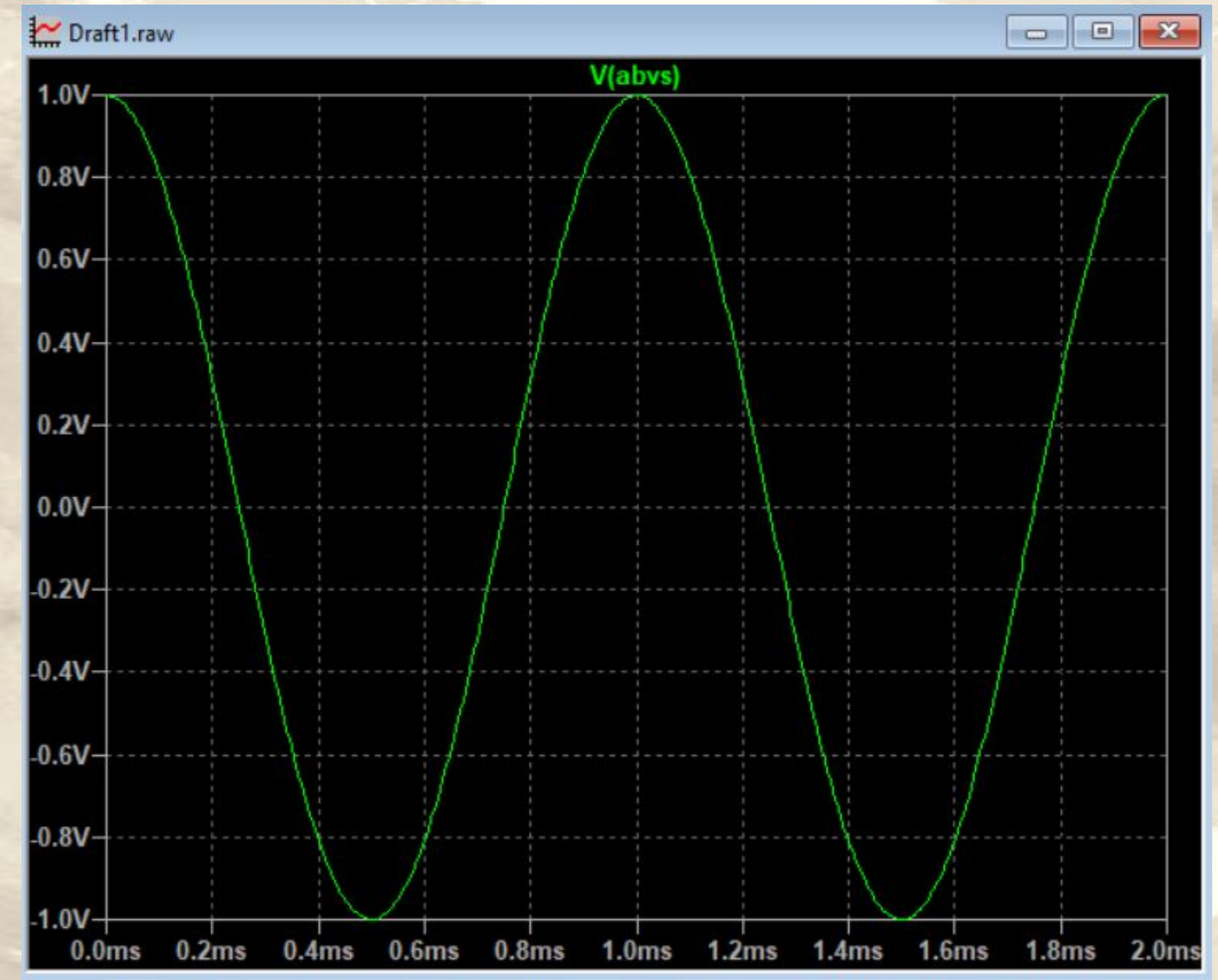
To have a 1kHz sinusoidal signal, the function is

$$V=\sin(2 * Pl * time * 1000)$$



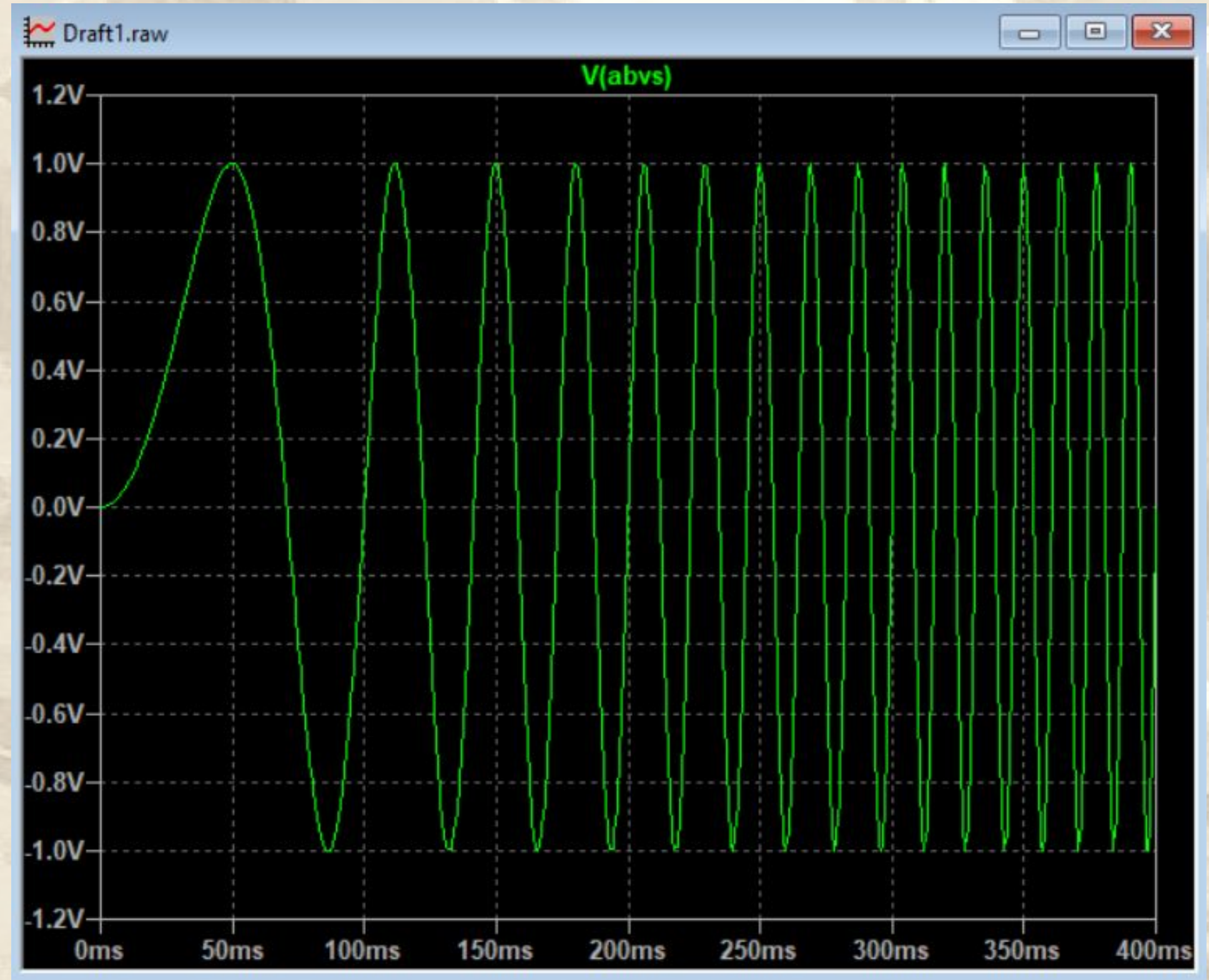
And to have a cosine...

V=cos(2 * PI * time * 1000)

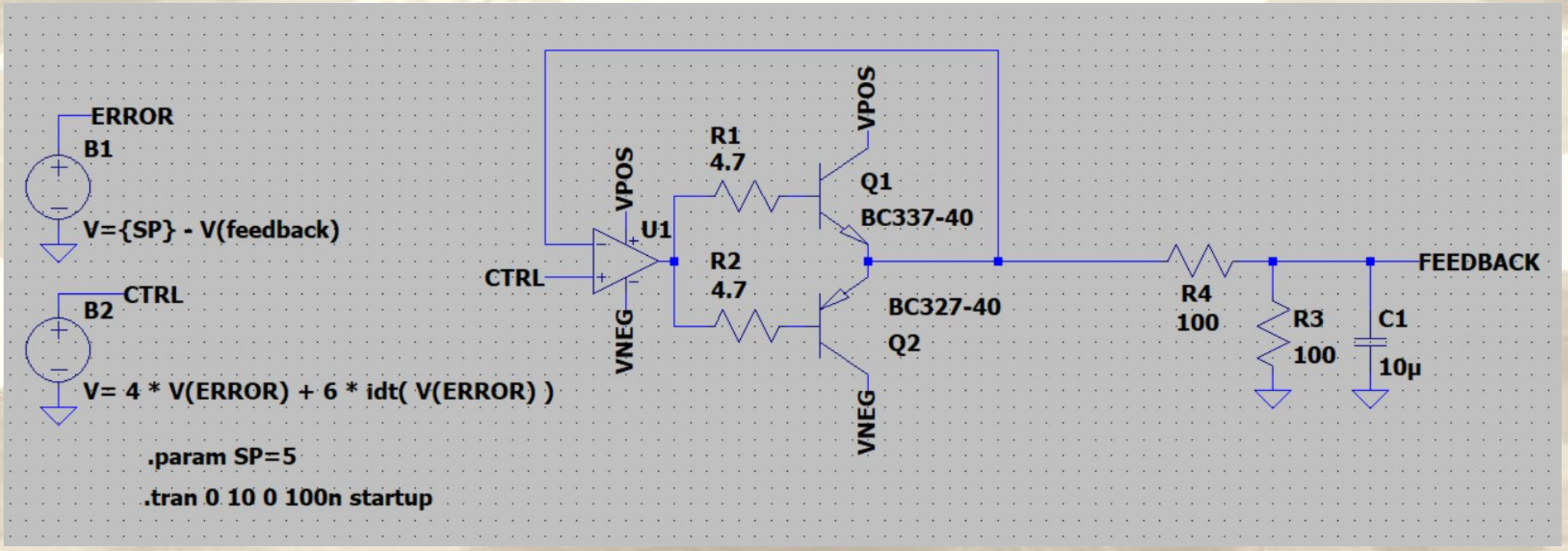


LTSpice allows advanced functions

V=sin(2 * PI * 100 * time ** 2)



Very advanced functions.



Here we use an arbitrary source to calculate the error, and the result is fed to another to perform a PI.

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