

ComplementaryBufferWithDeadtime

The fix to to “PulseModulations.lib” for the ComplementaryBufferWithDeadtime giving the error “questionable use of curly braces” is to recognize that the original version used voltage sources and the revision by @Bordodynov used current sources is to rewrite the sub-circuit as detailed below:

Original

```
.subckt ComplementaryBufferWithDeadtime I P N
B1 P 0 V=idt(1,0,inv(V(I)))>Tdead tripdt={tripdt}
B2 N 0 V=idt(1,0,buf(V(I)))>Tdead tripdt={tripdt}
.param Tdead=1u tripdt=1*Tdead
.ends ComplementaryBufferWithDeadtime
```

@Bordodynov revision

```
.subckt ComplementaryBufferWithDeadtime I P N Va=5V Tdead=1u
B1 0 P i=(idt(1,0,inv(V(I))) ≥ Tdead)*Va tripdt={tripdt} Rpar=1 Cpar=10n
B2 0 N i=(idt(1,0,buf(V(I))) ≥ Tdead)*Va tripdt={tripdt} Rpar=1 Cpar=10n
.param tripdt=1*Tdead
.ends ComplementaryBufferWithDeadtime
```

Current Library Version

```
.subckt ComplementaryBufferWithDeadtime I P N Va=1V Tdead=1u
B1 0 P i={Va}*(idt(1,0,inv(V(I))) ≥ {Tdead}) tripdt={tripdt} Rpar=1 Cpar=10n
B2 0 N i={Va}*(idt(1,0,buf(V(I))) ≥ {Tdead}) tripdt={tripdt} Rpar=1 Cpar=10n
.param tripdt={Tdead}
.ends ComplementaryBufferWithDeadtime
```

The functions used in the .subckt have the following definitions:

buf(x)	1. if $x > .5$, else 0.
inv(x)	0. if $x > .5$, else 1.
idt(x[,ic[,a]])	Integrate x, optional initial condition ic, reset if a is true.

For all conditions of the input, $V(I)$, either current source B1 or current source B2, but not both, will be integrating a constant 1, with an initial condition of 0, producing a linear ramp converting time in seconds to a current in amperes. The other current source will be held in RESET, that is the value of the current source that not producing a linear ramp will be identically zero. When the value of the integral exceeds the value $\{Tdead\}$, the value of the relational expression will flip from zero to one. The value of $\{Va\}$ will scale the output and the Rpar of 1Ω will convert the current to a voltage.