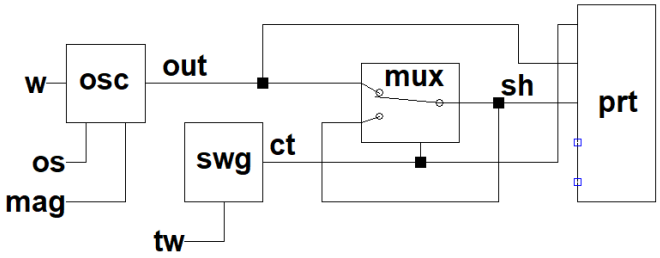
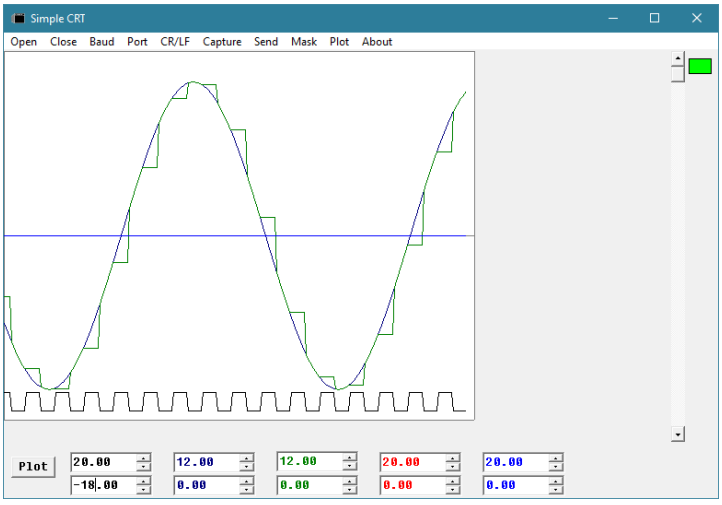
Multiplexer Examples

In addition to connecting an input to one of two sources, the multiplexer can also be used as a storage device. Attaching the second input to the output will cause the output to retain input one when input two is selected. An example of this is the sample and hold function.

The oscillator is set up to generate a sine wave and the square wave generator is used as the sample and hold control. Its frequency is about 21 times the sine wave frequency.



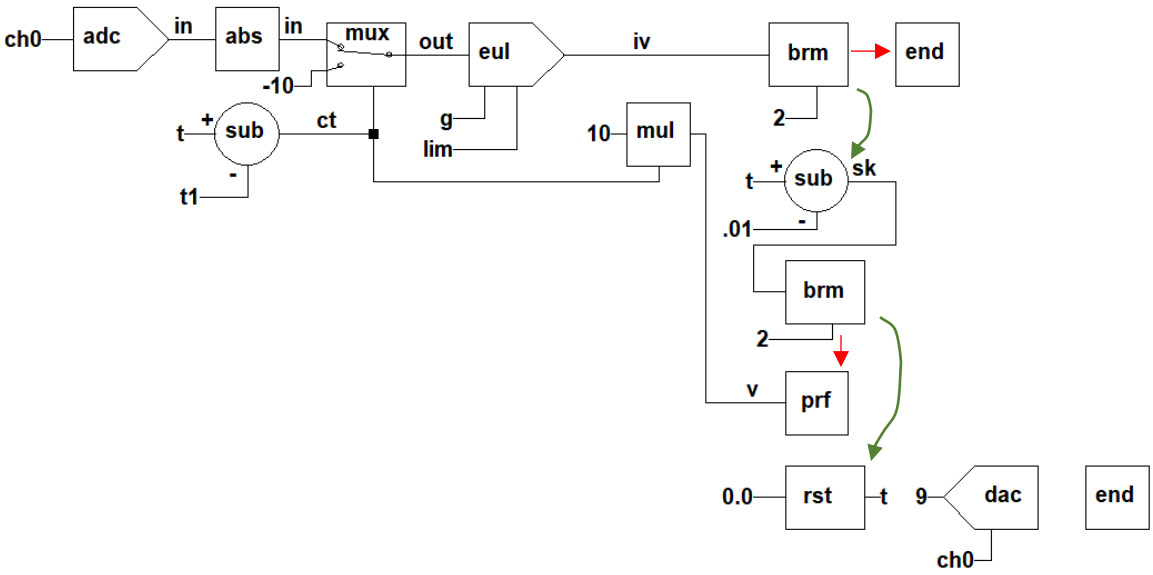

```
clr
osc w os mag out
swg tw ct
mux out sh ct sh
prt ct out sh
end
set dt .02
set max 1000
set w 2
set mag 10
set tw .15
set ct 1
```

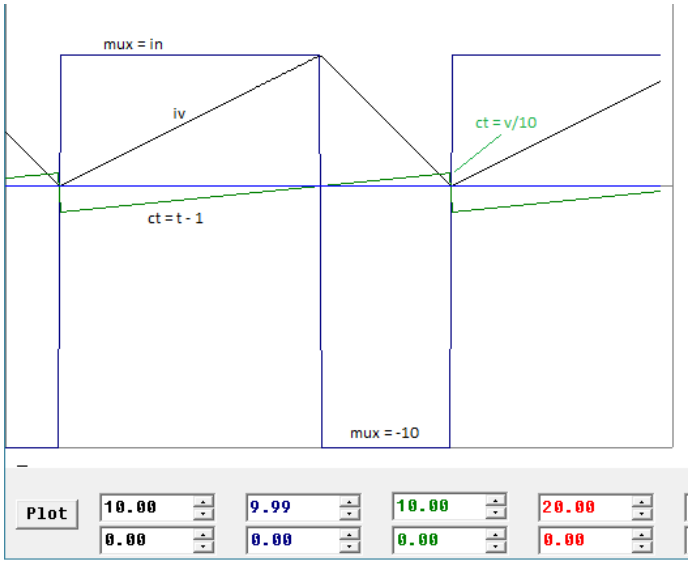


A simulation for a dual slope integrating ADC is contained in the Block Programming document. It uses conditional branches and counters to simulate the converter. The program required about 20 blocks. The simulation can be simplified using a multiplexer. Actual hardware for this type of converter also uses a multiplexer. It still takes about 14 blocks of code but the program is much simpler to follow.

ADC0 is used as the input. It feeds into an absolute value block keeping the input positive. The mux block switches the integrator input to the ADC for the positive ramp and to -10 for the negative ramp. The input ramp lasts for one second. The time to ramp back to zero is t-1. Time t-1 is also used as the mux control.

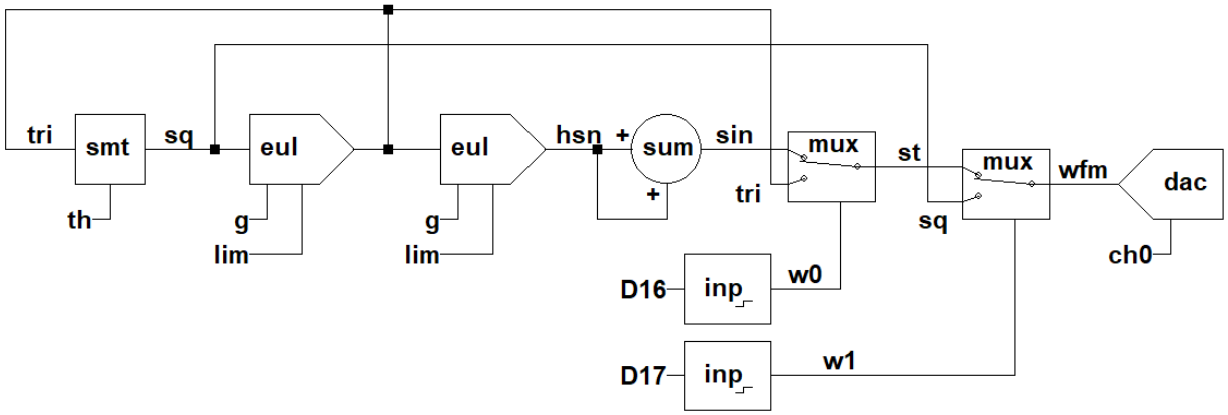
When the negative ramp goes below zero, the program breaks and prints t-1 times 10. This is the ramp down time times ten and it is the converted voltage. There is a second conditional that waits for the integrator to go positive for 10ms keeping extraneous printing from occurring.



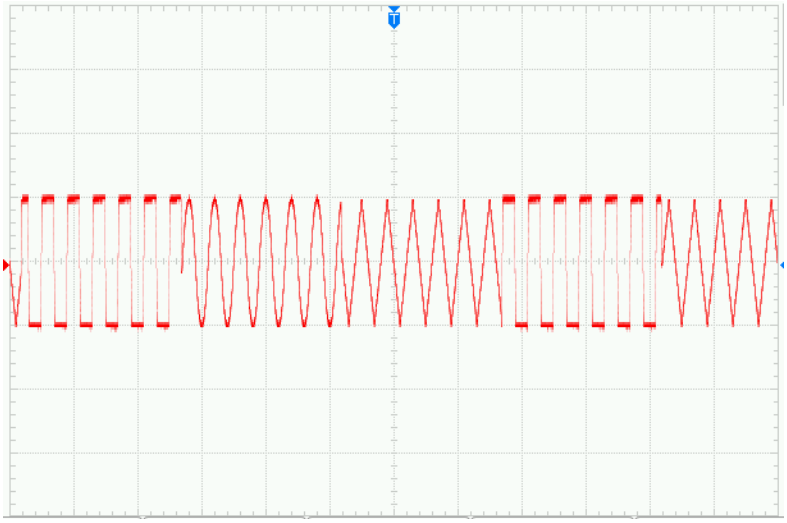


```
clr
adc ch0 in
abs in in
sub t t1 ct
mux in -10 ct out
eul out g lim iv
mul 10 ct v
brm iv 2
end
sub t .01 sk
brm sk 2
prf v
rst 0 t
dac 9 ch0
end
set max 100
set dt .0001
set in 2
set -10 -10
set g 1
set t1 1
set 2 2
set cm 1
set 10 10
set .01 .01
set lim 10
set fmt 3
set 9 9
```

In this last example, we will look at the most common application for a multiplexer, switching between signals. We will use a function generator as three input sources. It has a square wave, a triangle wave and pseudo sine wave output. Two multiplexers are used to direct each signal to DAC0. Digital inputs D16 and D17 are used for switching the multiplexers.




```
clr
smt tri th sq
eul sq g lim tri
eul tri g l2 hsn
sum hsn hsn sin
inp D16 w0
inp D17 w1
mux sin tri w0 st
mux st sq w1 wfm
dac wfm ch0
end
set dt .0001
set th 1
set g 500
set sq 1
set D16 16
set D17 17
set max 1000
set hsn -0.5
set lim 1.01
set l2 0.51
```



D17	D16	Wave form
0	0	sine
0	1	triangle
1	0	square
1	1	square