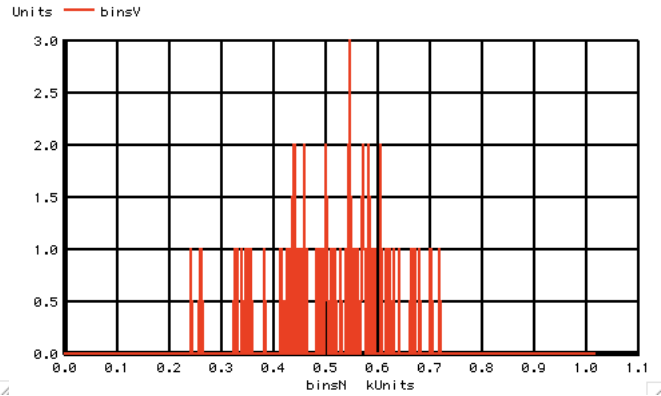
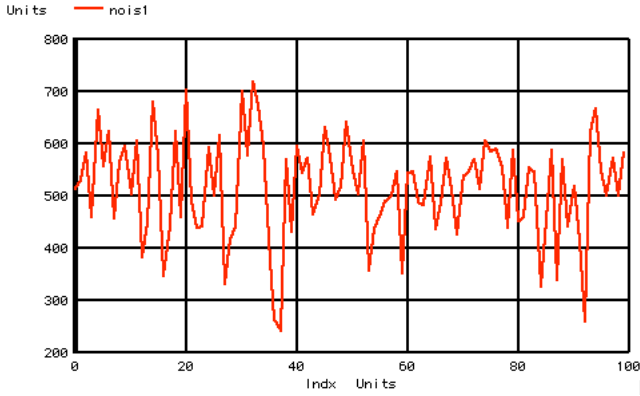


Histogram_8_RND(127)

HOW TO USE THE RND() FUNCTION TO GENERATE GAUSSIAN NOISE.



```

Circuit:      Histogram_8_RND(127)
=====Want_100_time_steps=====
random levels 0-> 127
Numb rnd waveforms 8
=====Build Arrays=====
Number Bins 0-> 1016
=====Build Noise Signal=====
plot          nois1 vs Indx
=====Histogram Data=====
plot          binsV vs binsN
=====Find Ave_Rms=====
Average level 515.5
RMS level     97.0253
Average expected 507.5
RMS expected  102.879
=====Done=====
  
```

Histogram_8_RND(127)

```

V1 1 0 0 dc
.control
set pensize      = 2
echo "=====Want_100_time_steps===== "
let n            = 100
let Nlev        = 127
let Nrnd        = 8
let Nbins       = Nlev*Nrnd
echo "random levels      0-> $&Nlev"
echo "Numb rnd waveforms $&Nrnd"
echo "=====Build Arrays===== "
unlet binsV
unlet binsN
unlet Indx
unlet nois1
unlet noisAC
let binsV       = vector($&Nbins)*0
let binsN       = vector($&Nbins)
let Indx        = vector(n)
let nois1       = vector(n)
echo "Number Bins      0-> $&Nbins"
echo "=====Build Noise Signal===== "
let index       = 0
repeat $&n
let nois1[index] = rnd($&Nlev)+rnd($&Nlev)+rnd($&Nlev)+rnd($&Nlev)+rnd($&Nlev)+rnd($&Nlev)+rnd($&Nlev)+rnd($&Nlev)
let index       = index + 1
end
plot           nois1 vs Indx
echo "plot           nois1 vs Indx"
echo "=====Histogram Data===== "
let index       = 0
let hist        = 0
repeat $&n
let indexb     = 0
repeat $&Nbins
let hist       = nois1[index]
if (hist < indexb +.1 & hist > indexb -.1)
let binsV[indexb] = binsV[indexb] + 1
endif
let indexb     = indexb + 1
end
let index       = index + 1
end
plot           binsV vs binsN
echo "plot           binsV vs binsN"
echo "=====Find Ave_Rms===== "
let mathAve     = (Nbins-1)/2
let mathRMS     = sqrt(Nrnd)*(Nlev-1)*.5/sqrt(3)
let averVal     = mean(nois1)
let noisAC      = nois1 - averVal
let RmsVal      = sqrt(mean(noisAC* noisAC))
echo "Average level      $&averVal"
echo "RMS level          $&RmsVal"
echo "Average expected   $&mathAve"
echo "RMS expected       $&mathRMS"
echo "=====Done===== "
.endc
  
```

.end