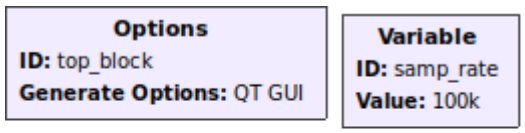
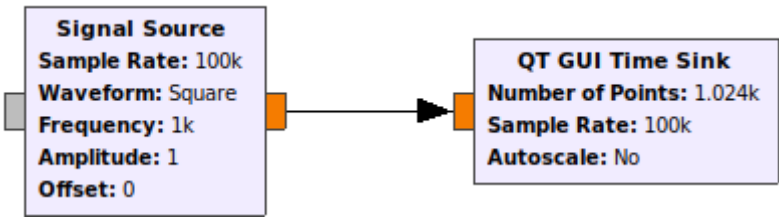
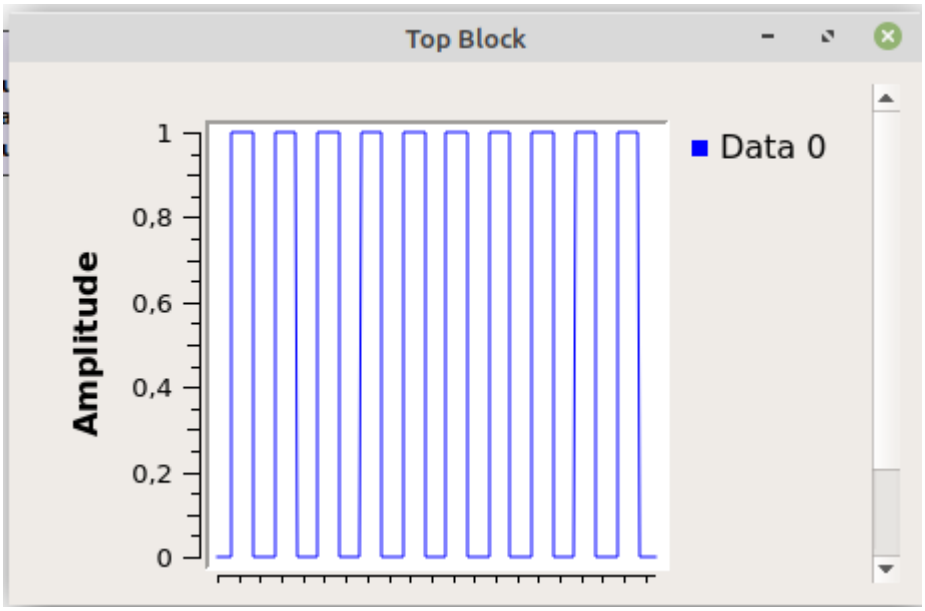
1- Étude de la transmission d'un signal rectangulaire

1)



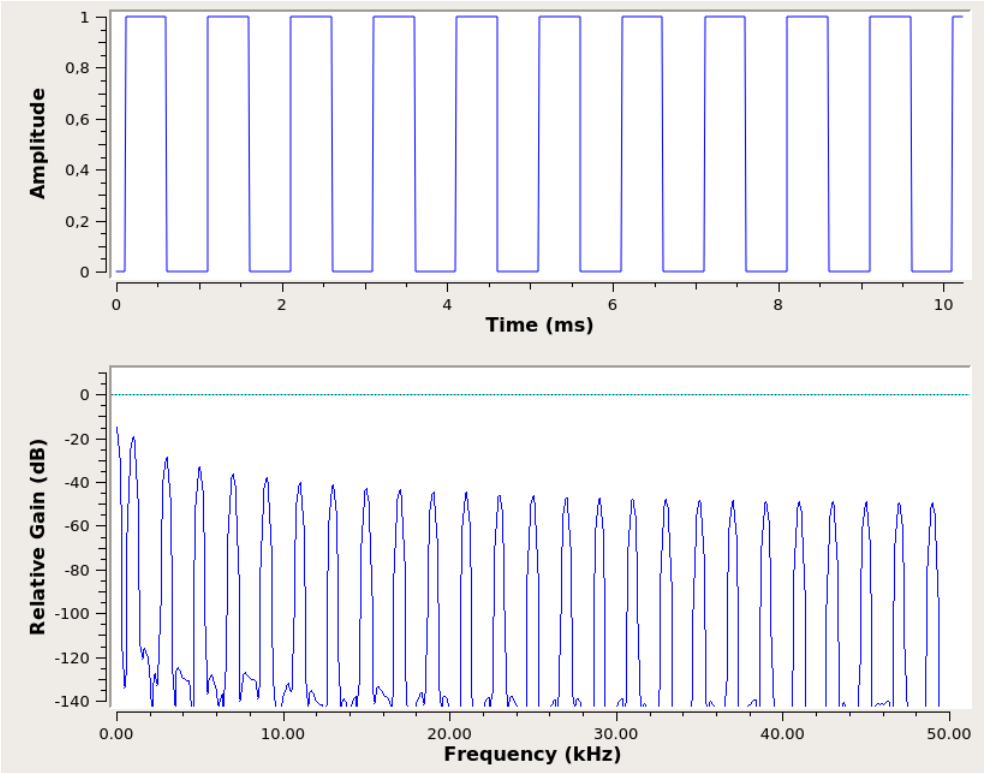


2)



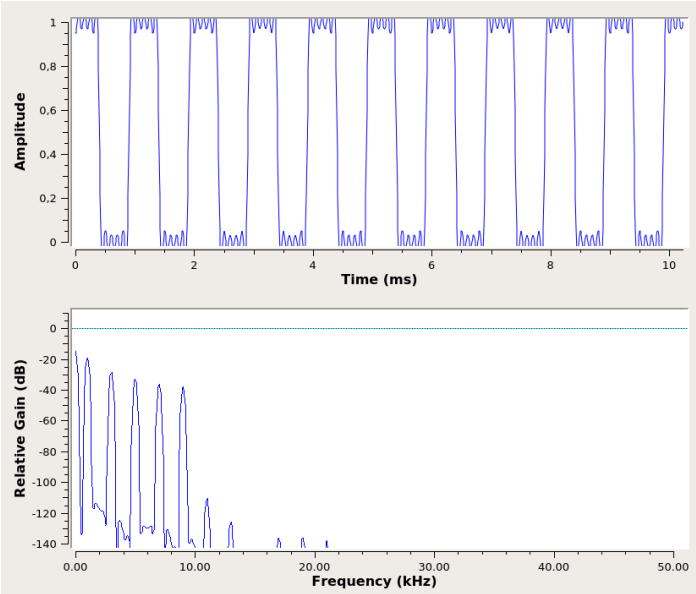
3) Le bloc Throttle sert à exécuter le diagramme de flux à la vitesse indiqué dans le bloc variable.

4)

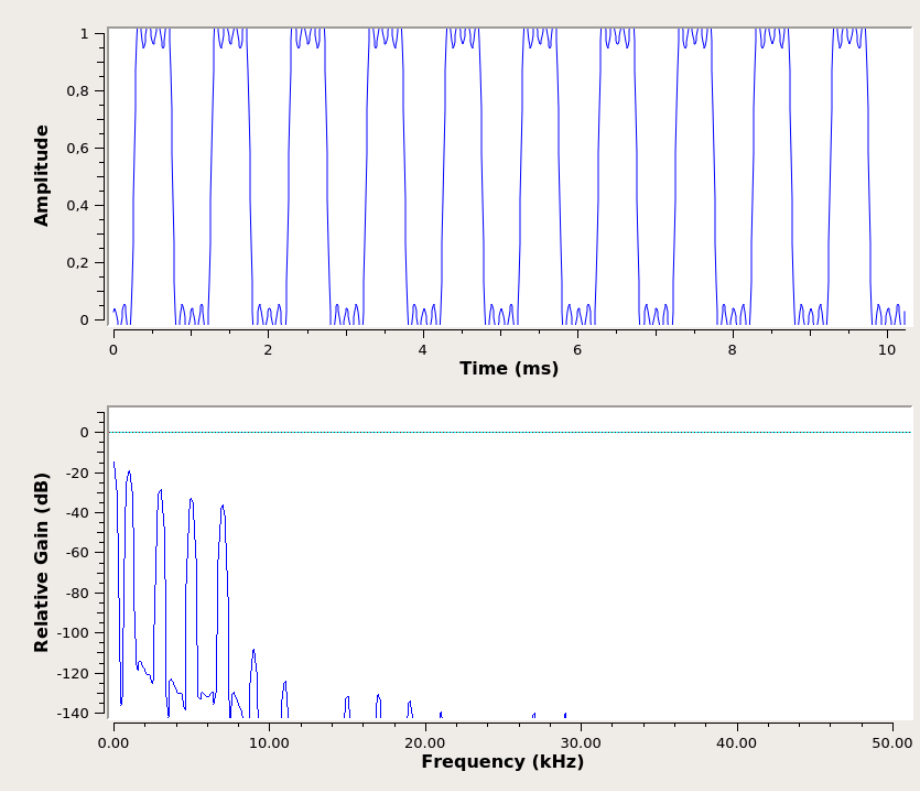


5) Il y a 3 pics de fréquence entre deux amplitudes.

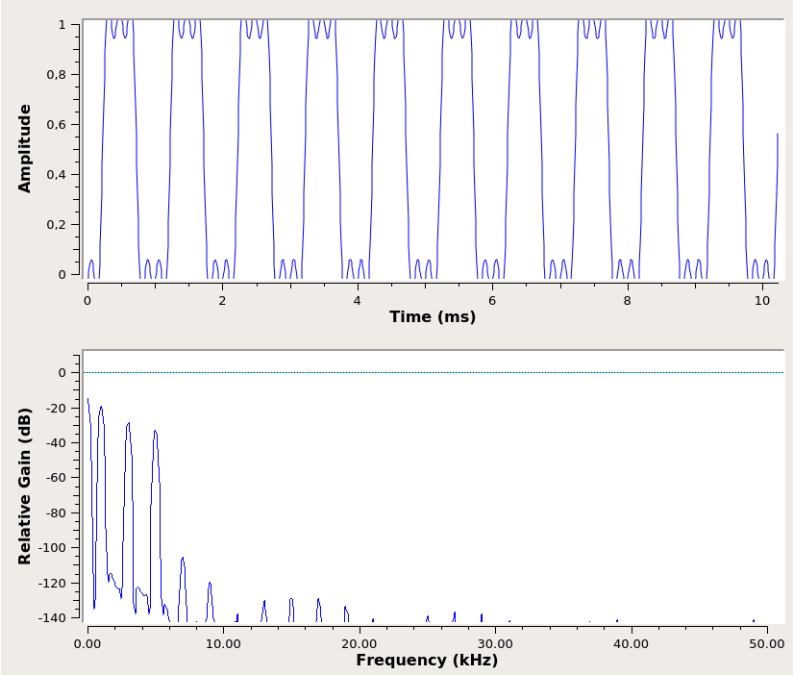
6) Le signal est bien coupé à 10kHz, car le filtre laisse pas passer au-delà de 10 kHz



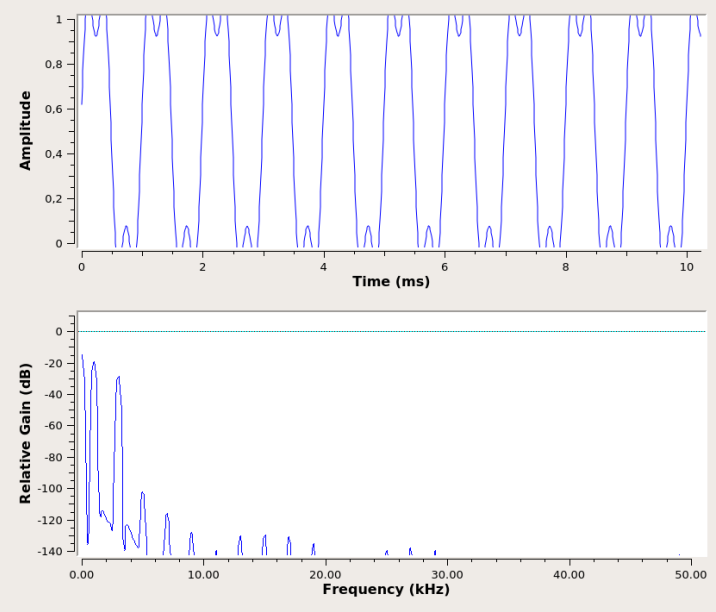
7) Pour 8 kHz :



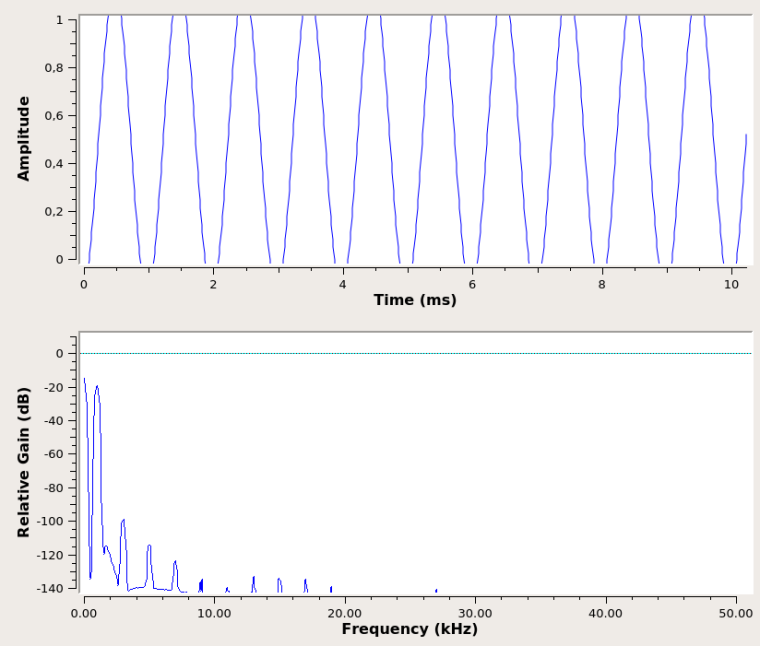
Pour 6 kHz :



Pour 4 kHz :



Pour 2 kHz :

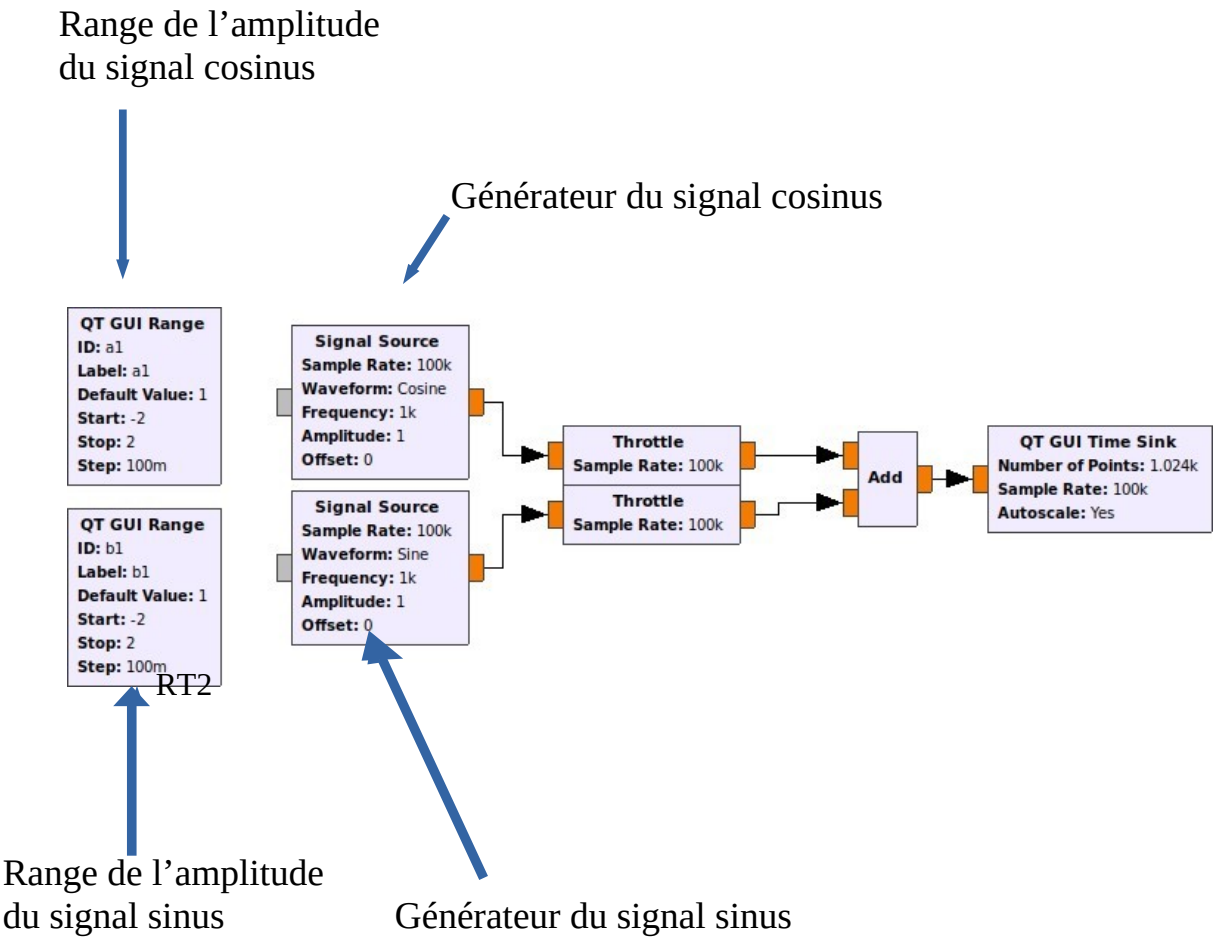


8) On peut voir que plus la bande passante est faible plus la fidélité du signal est faible. Par exemple, pour une bande passante de 2 kHz le signal ressemble plus à un carré mais à une sinusoïdal.

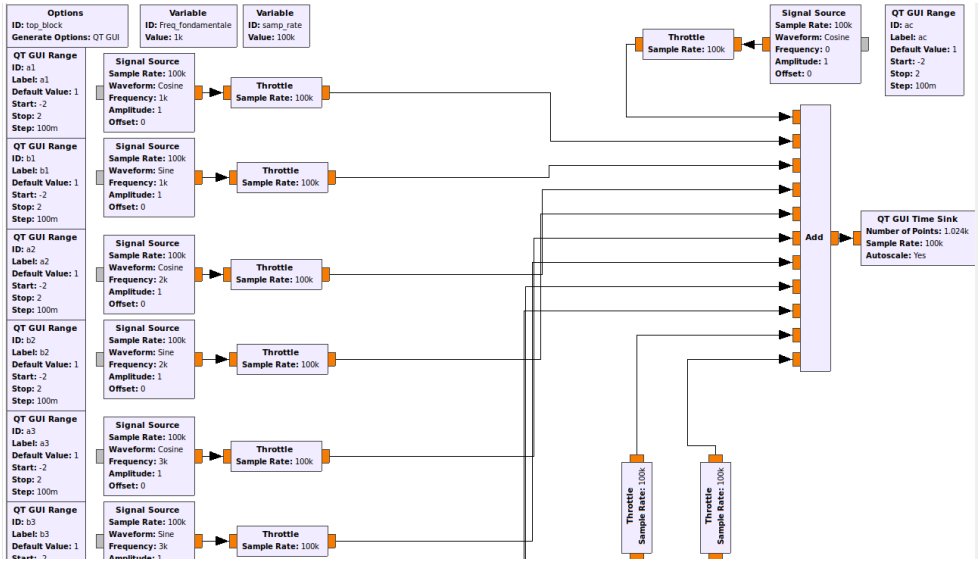
2- Réalisation d’un synthétiseur universel de signaux

1) Ce diagramme de flux réalise un addition d’un signal sinus et un signal cosinus.

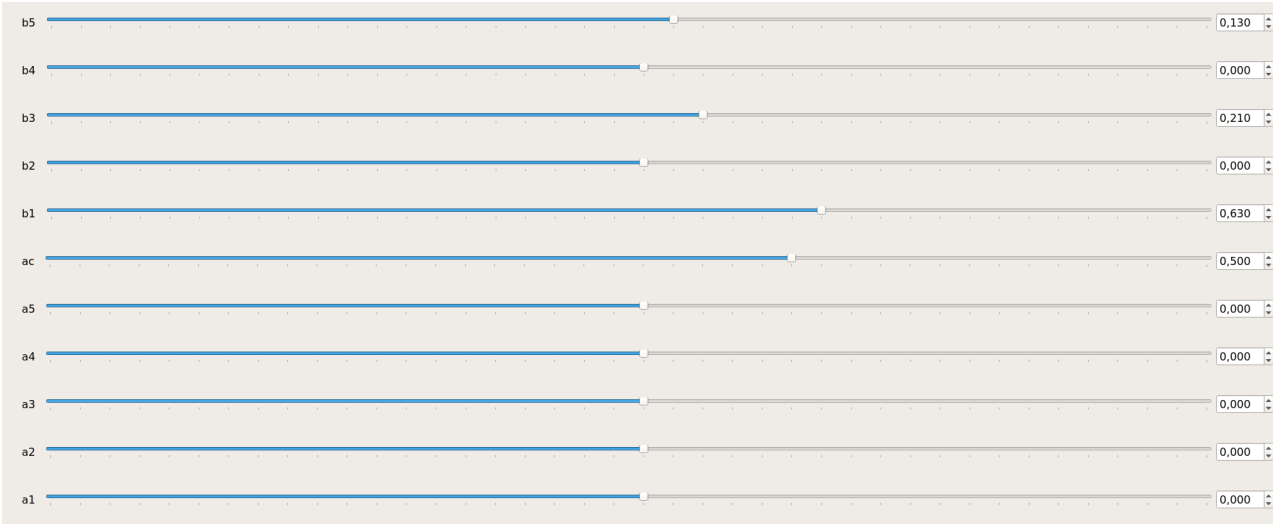
2)

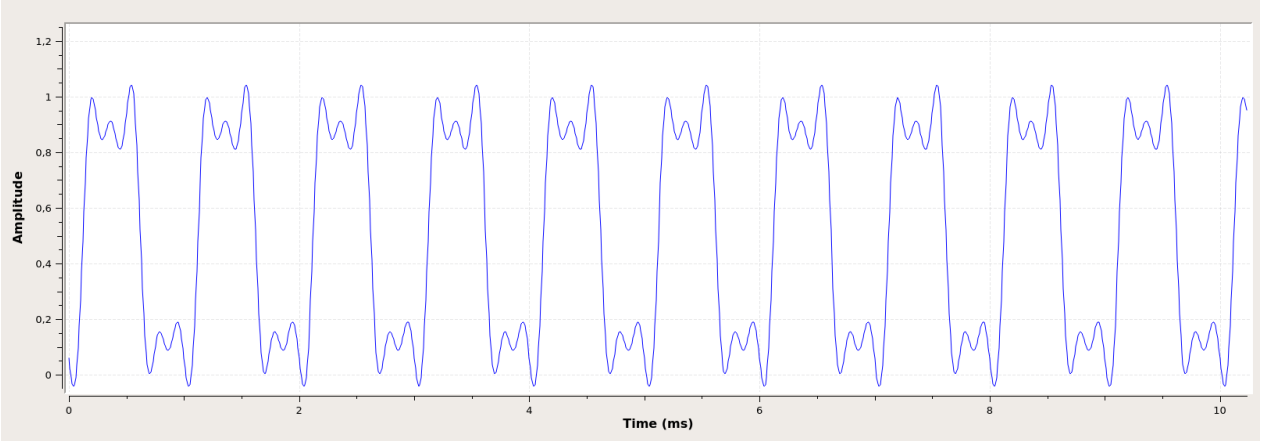


3)

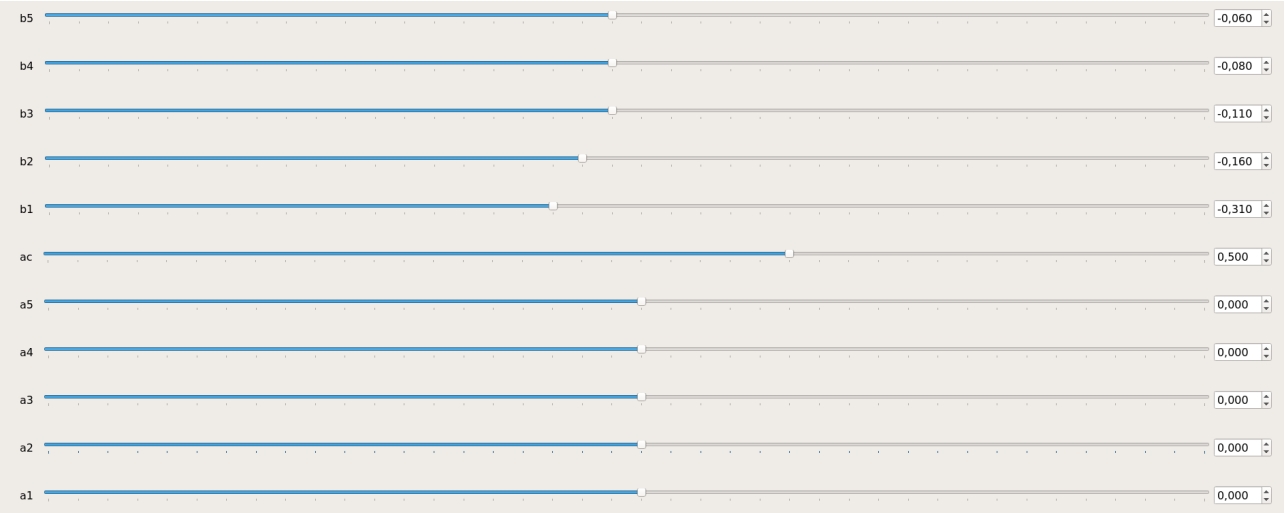

Options
ID: top_block
Generate Options: QT GUI
Variable
ID: Freq_fondamentale
Value: 1k
Variable
ID: samp_rate
Value: 100k
QT GUI Range
ID: a1
Label: a1
Default Value: 1
Start: -2
Stop: 2
Step: 100m
Signal Source
Sample Rate: 100k
Waveform: Cosine
Frequency: 1k
Amplitude: 1
Offset: 0
Throttle
Sample Rate: 100k
QT GUI Range
ID: b1
Label: b1
Default Value: 1
Start: -2
Stop: 2
Step: 100m
Signal Source
Sample Rate: 100k
Waveform: Sine
Frequency: 1k
Amplitude: 1
Offset: 0
Throttle
Sample Rate: 100k
QT GUI Range
ID: a2
Label: a2
Default Value: 1
Start: -2
Stop: 2
Step: 100m
Signal Source
Sample Rate: 100k
Waveform: Cosine
Frequency: 2k
Amplitude: 1
Offset: 0
Throttle
Sample Rate: 100k
QT GUI Range
ID: b2
Label: b2
Default Value: 1
Start: -2
Stop: 2
Step: 100m
Signal Source
Sample Rate: 100k
Waveform: Sine
Frequency: 2k
Amplitude: 1
Offset: 0
Throttle
Sample Rate: 100k
QT GUI Range
ID: a3
Label: a3
Default Value: 1
Start: -2
Stop: 2
Step: 100m
Signal Source
Sample Rate: 100k
Waveform: Cosine
Frequency: 3k
Amplitude: 1
Offset: 0
Throttle
Sample Rate: 100k
QT GUI Range
ID: b3
Label: b3
Default Value: 1
Signal Source
Sample Rate: 100k
Waveform: Sine
Frequency: 3k
Throttle
Sample Rate: 100k
Signal Source
Sample Rate: 100k
Waveform: Cosine
Frequency: 0
Amplitude: 1
Offset: 0
Throttle
Sample Rate: 100k
QT GUI Range
ID: ac
Label: ac
Default Value: 1
Start: -2
Stop: 2
Step: 100m
Add
QT GUI Time Sink
Number of Points: 1.024k
Sample Rate: 100k
Autoscale: Yes
Throttle
Sample Rate: 100k
Throttle
Sample Rate: 100k

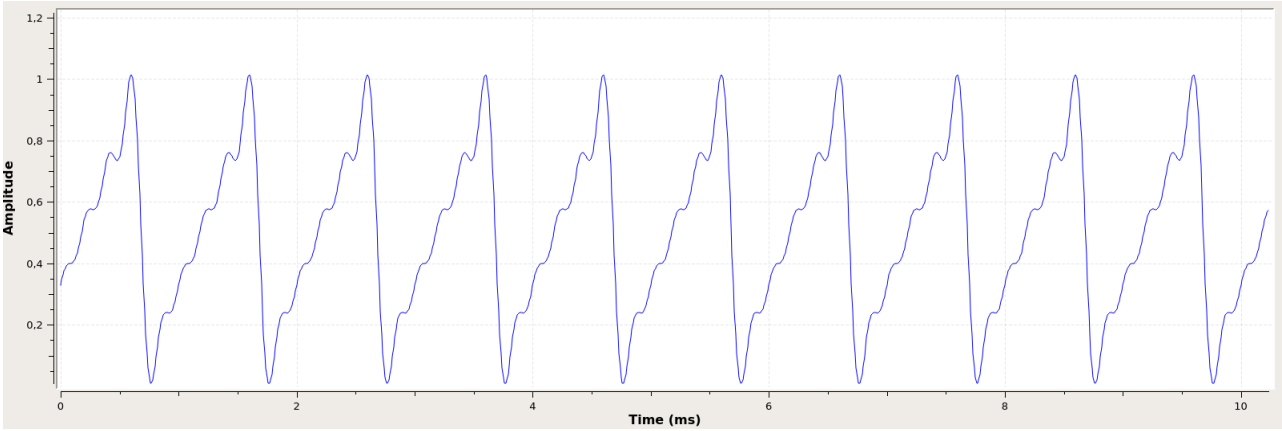
4)


b5
0,130
b4
0,000
b3
0,210
b2
0,000
b1
0,630
ac
0,500
a5
0,000
a4
0,000
a3
0,000
a2
0,000
a1
0,000

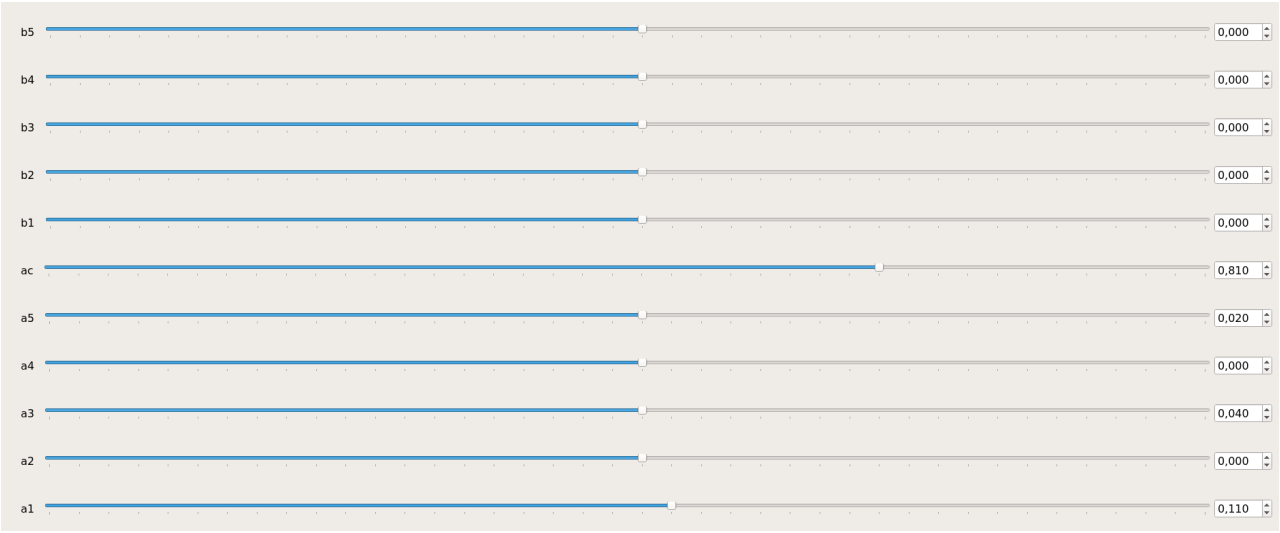

Amplitude
1,2
1
0,8
0,6
0,4
0,2
0
0
2
4
6
8
10
Time (ms)

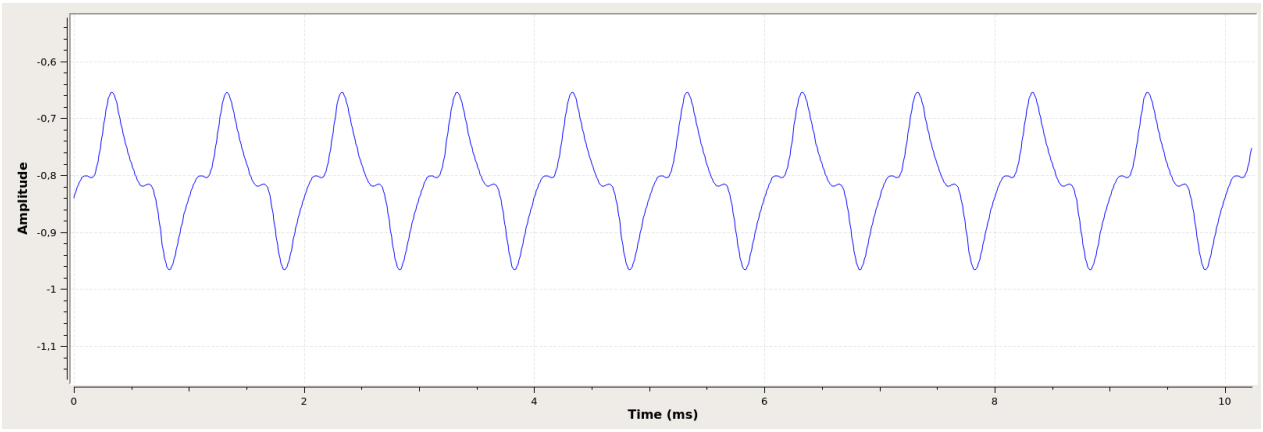
5)


b5 -0,060
b4 -0,080
b3 -0,110
b2 -0,160
b1 -0,310
ac 0,500
a5 0,000
a4 0,000
a3 0,000
a2 0,000
a1 0,000


Amplitude
1,2
1
0,8
0,6
0,4
0,2
0
2
4
6
8
10
Time (ms)

6) Signal triangle





3- Étude de la transmission d’un signal rectangulaire