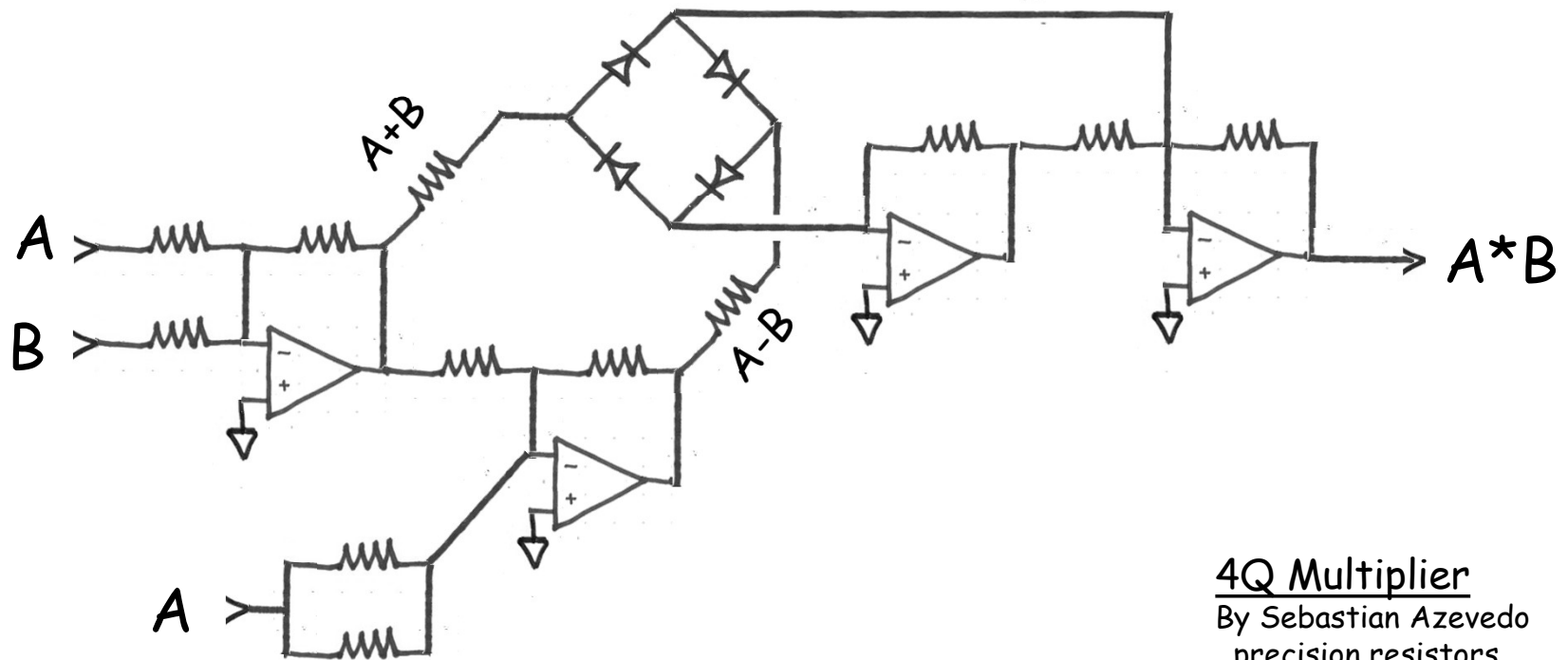


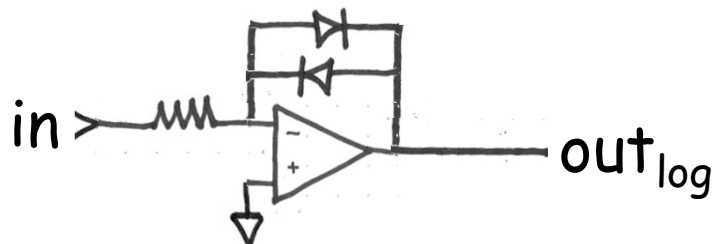
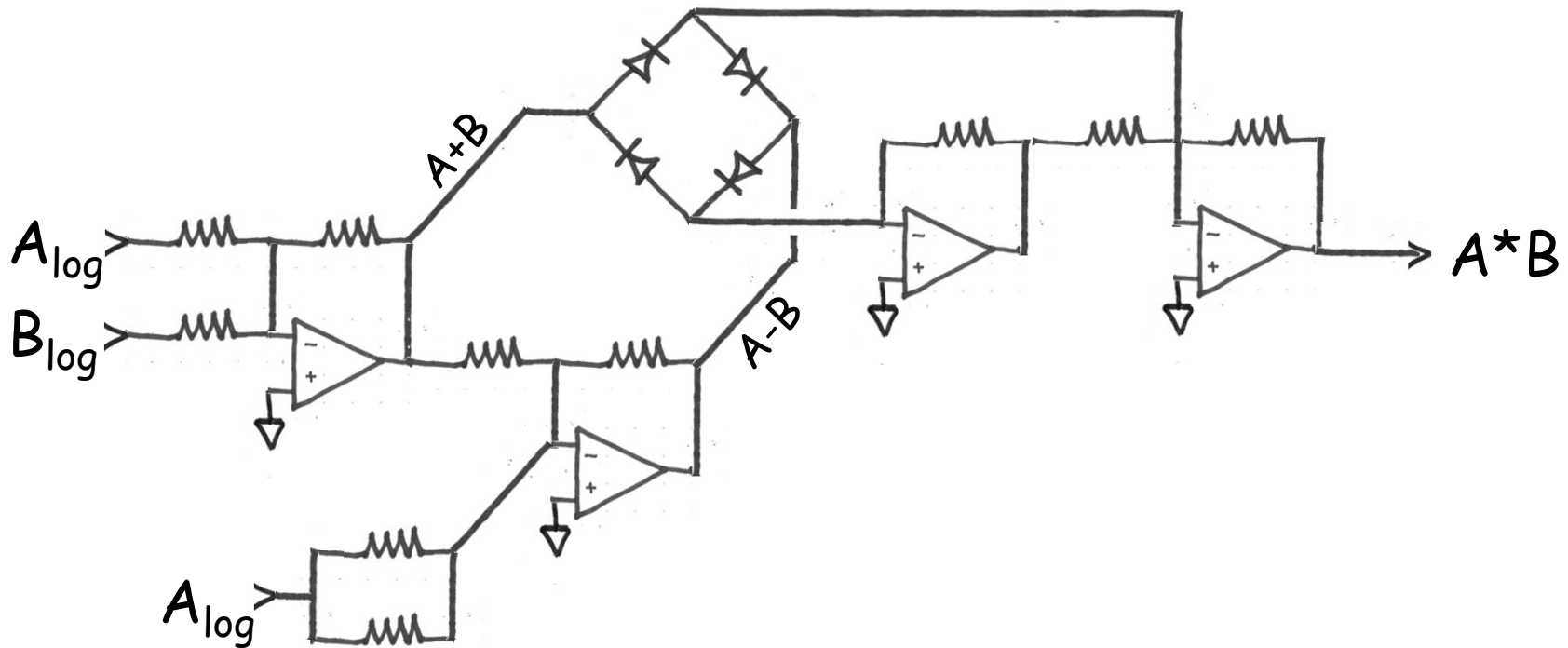


4Q Multiplier

By Sebastian Azevedo
precision resistors,
matched diodes,
low-offset opamps

Notes (william jehle):
As **designed**
All $R=10k$

<https://www.youtube.com/@MadScientistGuitarLab>



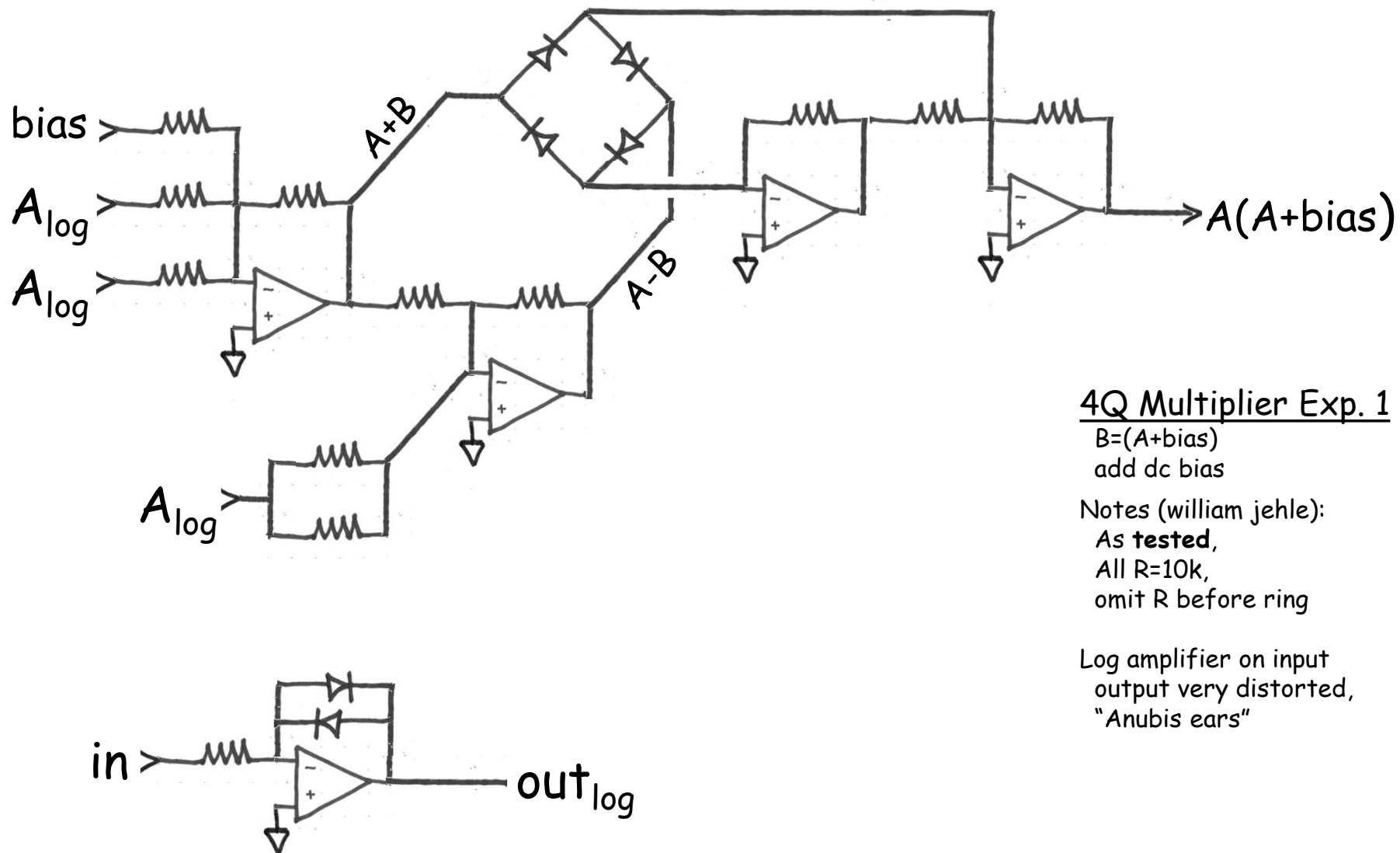
<https://www.youtube.com/@MadScientistGuitarLab>

4Q Multiplier (rev 1)

By Sebastian Azevedo
precision resistors,
matched diodes,
low-offset opamps

Notes (william jehle):

As **built**,
All $R=10k$,
omit R before ring,
 A 1 to 20dB gain applied,
Log amplifier on inputs



4Q Multiplier Exp. 1

$B=(A+bias)$

add dc bias

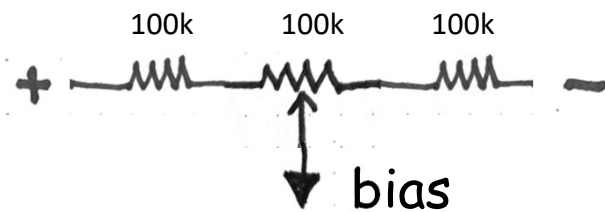
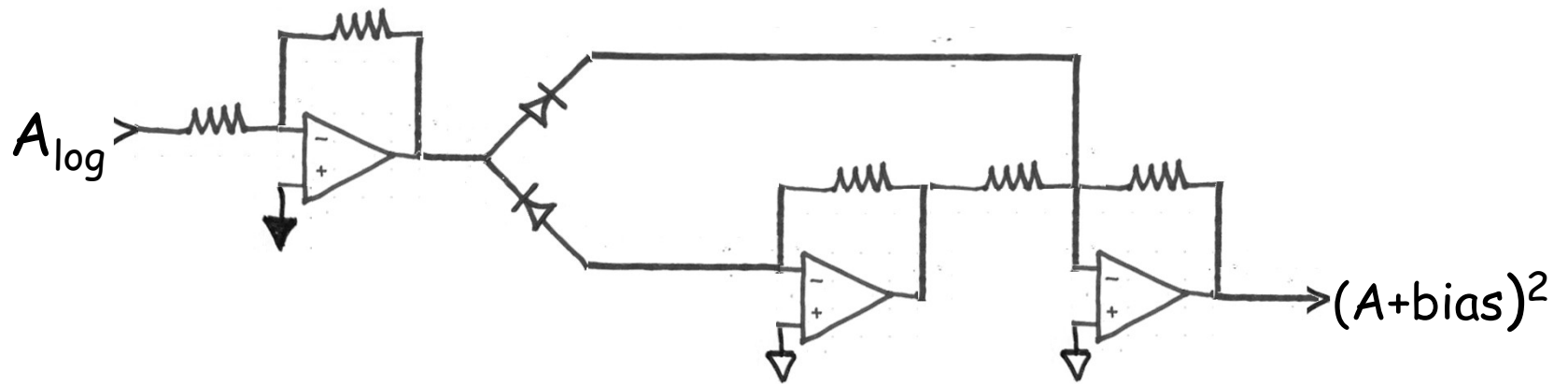
Notes (william jehle):

As **tested**,

All $R=10k$,

omit R before ring

Log amplifier on input
output very distorted,
"Anubis ears"



4Q Multiplier Exp. 2

(A-B) branch removed
add dc bias +ve input

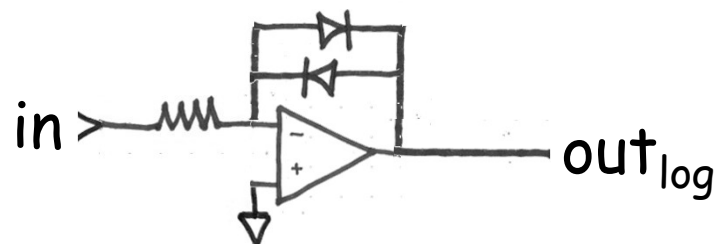
Notes (william jehle):

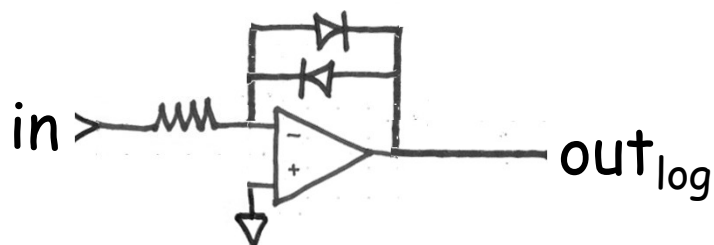
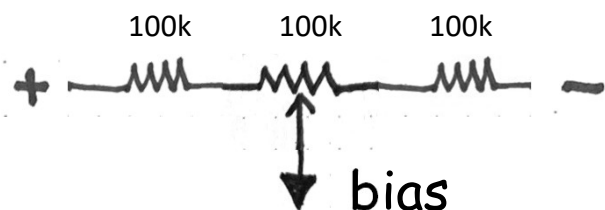
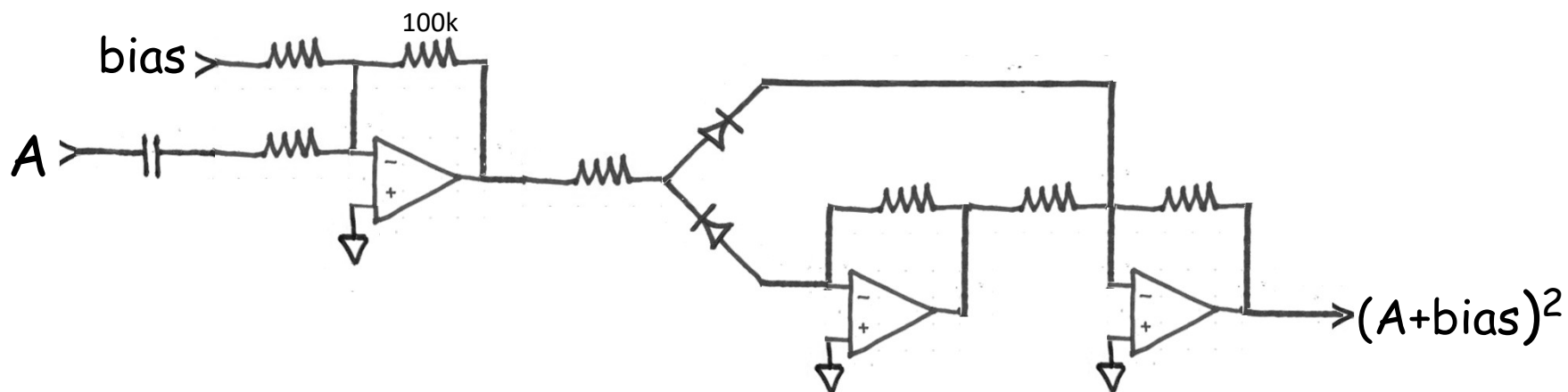
As tested,

All R=10k or as marked,
omit R before ring

w/o Log amp on input
Output very distorted

Log amplifier on input
octave "shark tooth"
full-wave rectifier





Multiplier Exp. 3

(A-B) branch removed
add dc bias -ve input

Notes (william jehle):

As **tested**,

All R=10k or as noted,

Added R before ring

Log amplifier on **output**
"correct" output on
test signal, but octave
up.

Output is octave fuzz.
Bias tends to favor
in-phase (+ve bias)
out-of-phase (-ve bias)