

nonlinearcircuits

CHOMUL build & BOM

This module is inspired by an article from Harald Bode discussing ring modulators and multipliers (The Multiplier-Type Ring Modulator – H. Bode Jan 1967). Bode stated there are two types of multipliers, ones like the diode ring modulator which he states are suitable for use in modular synths and switching or chopper types which are only good for driving AC motors and *not* suitable for use in modular synths.

Ahem, so here is a switching or chopper type multiplier for use in a modular synth.

There are two multipliers on the PCB, with the inputs of the upper one swapped and fed to the switches of the inputs of the 2nd one. The outputs of both are fed to the switches of the inputs of the 'Passive aggressive XOR' (see 'This 2 will pass' and thanks Kris N for the name)

Usually with a switching multiplier, one input (marked SW on panel) will be a pulse signal but don't feel obliged, patch in whatever you like. These circuits work nicely with CV signals and are good at creating interesting envelopes. Looking on a scope, you will see gaps or steps where the diode and FET inherent V-on has an effect.

BOM – The Tayda & Mouser part numbers are given as examples

VALUE	QUANTITY	DETAILS
10uF	2	0805 25V or higher voltage rating Mouser:963-TMK212BBJ106MG-T or similar
1k	5	0805
4k7	2	0805 aka 4.7k
22k	1	0805
100k	10	0805
390k	2	0805
1M	4	0805
RL	2	0805 LED resistor, select to suit LED brightness. Not sure? Try 4k7 to start.
LED	2	3mm (use bi-polar if you like)
TL072 or TL082	1	Soic Tayda: A-1139
BC847	2	Soic Tayda A-1339
LL4148	4	sod-80 Tayda: A-1213
NFET J309	2	Mouser Part No 863-MMBFJ309LT1G
PFET J270	2	Mouser Part No 512-MMBFJ270 see notes
Eurorack 10 pin power connector	1	Tayda: A-198 cut to size
S1JL, Schottky, power rectifier or 10R	2	SMD SEE NOTES #1. dot on PCB indicates CATHODE (stripe on component).
3.5MM SOCKET	9	Tayda: A-2563

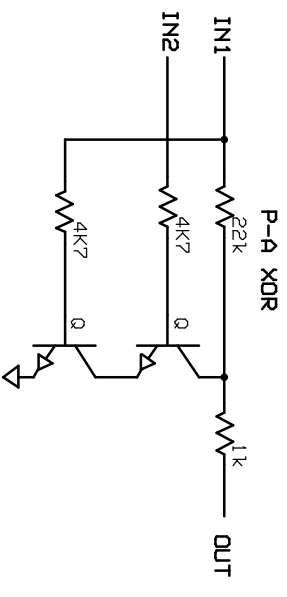
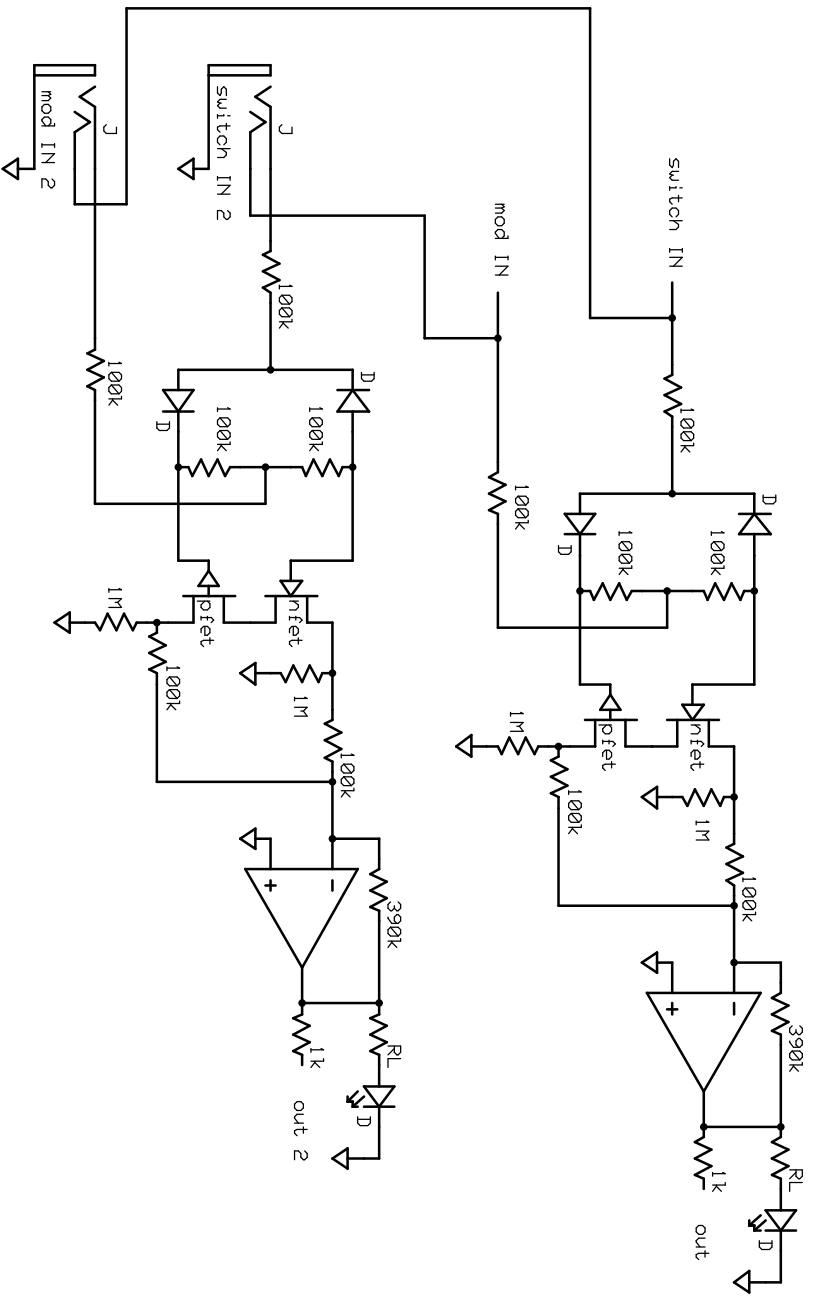
Additional notes:

1., Schottky (best option) or standard power rectifier diode 50-600V 1A or more, or use a resettable fuse or just a 10R (worst option). Examples: BAT54GWX, PMEG2005EGWX, AEC-Q101, 20V, SOD-123, PMEG2005EH DIODE, SCHOTTKY, 0.5A, 20V, 1N400x or S1JL or similar.

2. The chips, resistors, caps are cheapest from Tayda. Schottky diodes, CMOS & 1uF, 10uF 25V 0805 caps from Mouser/E14/Farnell/etc.

3. Join the Nonlinearcircuits Builders Guild on FB: <https://www.facebook.com/groups/174583056349286/> and ask questions there if you have any. If you prefer not to FB then email is fine.

4. I haven't tried but expect many P channel JFETs will work, as long as in the sot23-3 package and same pinout. I used J270 because the specs looked ok and it was the cheapest.



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The balanced FET modulator & XOR

andrewjf

Rev 1.0

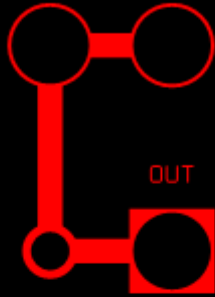
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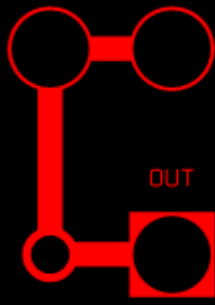


CHOMUL

SW 1 MOD



SW 2 MOD



IN IN



PASSIVE
AGGRESSIVE
XOR



NLC

