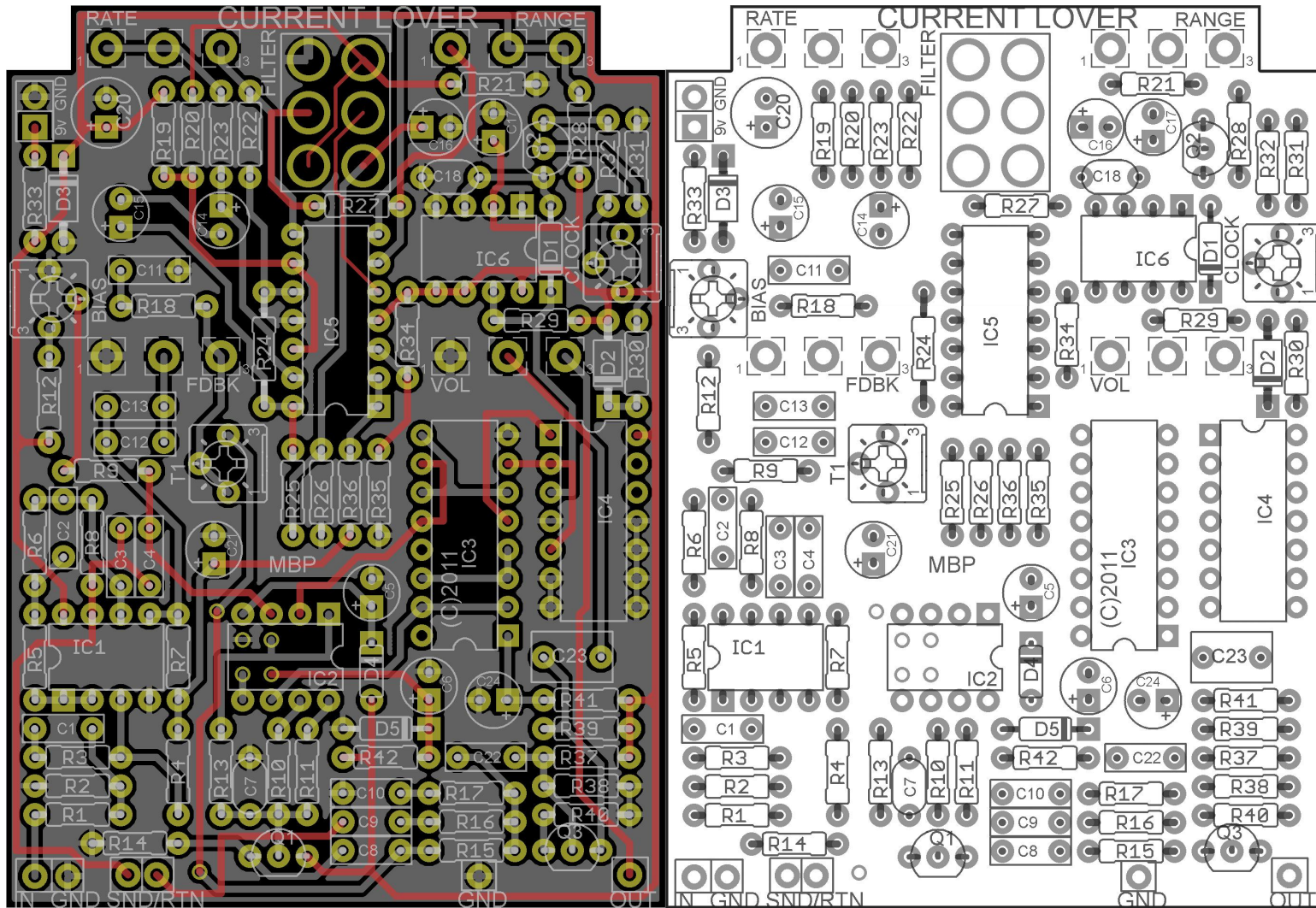


CURRENT LOVER

11.2011 madbeanpedals

PCB Dimensions: 2.3"W x 3.15"H



Resistors		Resistors		Caps		Diodes	
R1	5k6	R24	10k	C1	39n	D1	1n914
R2	1M	R25	47k	C2	47n	D2	1N4007
R3	5k6	R26	27k	C3	1n	D3	1N4001
R4	1M	R27	15k	C4	100n	D4	1n914
R5	470R	R28	33k	C5	10uF	D5	8.2v Zener
R6	4k7	R29	10k	C6	10uF	Transistors	
R7	100k	R30	62k	C7	680pF	Q1	2N3904
R8	5k6	R31	1M2	C8	68n	Q2	2N5087
R9	100k	R32	3k9	C9	220n	Q3	2N5088
R10	4k7	R33	10R	C10	47n	ICs	
R11	4k7	R34	200k	C11	47n	IC1	JRC4558
R12	82k	R35	200k	C12	3n3	IC2	***
R13	47k	R36	1k	C13	2n2	IC3	CD4049UBE
R14	10k	R37	470k	C14	33uF	IC4	CD4013BCN
R15	8k2	R38	100k	C15	33uF	IC5	LM324N
R16	13k	R39	10k	C16	1uF	IC6	LM311
R17	470R	R40	3k	C17	1uF	Switch	
R18	470R	R41	10R	C18	22pF	FILTER	DPDT
R19	39k	R42	100R	C20	100uF	Trimmers	
R20	24k			C21	10uF	CLOCK	100k
R21	8k2			C22	100n	BIAS	100k
R22	30k			C23	100n	T1	10k
R23	3k9			C24	47uF	Pots	
*** IC2 can be MN3207 or MN3007						FDBK	10kB
						RANGE	100kB
						RATE	1MC
						VOL	100kA

What Is It?

The **Current Lover** is an adaptation of the Electro-Harmonix Electric Mistress™ flanger for 9v operation and a variety of BBD chips. It offers very warm and rich flanging while maintaining low noise operation and flexibility in its controls. Additions to the vintage Mistress design are included. These are a buffered clock signal to the BBD, an FX loop for through-zero flanging and an output gain stage to match or exceed the bypass volume.

Much of the development of the **Current Lover** was based on the work by presented by Thomeeque on DIYstompboxes and therefore much gratitude is owed to him for making it available. Thank you! While there is no single sided artwork available for the **Current Lover**, if you wish to etch your own Electric Mistress board, please check out his threads on DIYSB.

Controls

Rate – Controls the speed of the LFO which drives the flanger effect.

Range – Controls the overall depth of the flanging effect.

Feedback – This is the amount delay line signal sent back to the input of the BBD. Higher levels of feedback increase the complexity of the flanged signal and can yield some intense, airplane flanging.

Volume – This is the output volume of the added gain stage at the end of the effect. It allows you to match or exceed the bypass signal.

Filter - This DPDT switch disconnects the LFO for a mild to moderate ring-modulator effect. This effect can be influenced with the **Range** and **Feedback** controls.

Notes

There are three possible BBD choices in building the **Current Lover**. These are the MN3007, the MN3207 and the v3207. The MN3007 is still available although it is fairly expensive (\$8 – \$12 for a single chip). For this reason, the **Current Lover** was designed for alternative BBDs which are more readily available and less expensive. The MN3207 is similar to the MN3007 but has lower current consumption and different supply voltage requirements. The v3207 is a pin-for-pin clone of the MN3207 and is manufactured by Coolaudio. Prototypes were built using the MN3007 and MN3207. While the v3207 was not tested it should work following the same building procedure outlined below for the MN3207. The video demo linked below was built using the MN3207 from smallbear, which was about \$5.

Be wary of purchasing MN3007 chips online. There are some oversea sellers on eBay offering fake or counterfeit chips. It is best to purchase the MN3007 or MN3207 from a reliable source like smallbear, or other DIY'ers, if possible.

The **Current Lover** allows you to use PCB mounted 16mm pots and DPDT switch for an easier build. The pads for the DPDT are sized for lugs instead of pins since they are very common.

There are several labeled ground connections ("GND") on the board. You do not need to use all of them: they are there for convenience.

Two SND/RTN pads are included if you wish to experiment with a through-zero type flanging effect. If you do not wish to use this feature, you will need to jumper the two pads together for correct operation. Note that this document does not include any information on generating through-zero effects as that was not part of the development process. It is offered for those who wish to experiment. You can find some info about TZ with the Electric Mistress™ on DIYSB.

This is a complicated and challenging build. Take your time!

Links

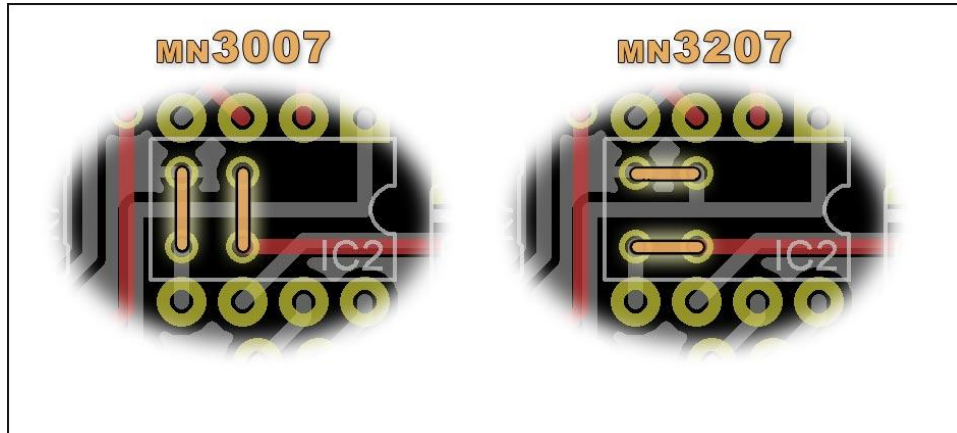
Video demo of the madbeanpedals **Current Lover** build: http://www.youtube.com/watch?v=_CLKc7_c5eE

MN3007 vs. MN3207 (v3207)

Jumpers

There are a few steps to take depending on whether you are building the MN3007 or MN3207 version (assume that the v3207 is the same as MN3207). The power and ground pins on these two chips are the opposite of one another, which also influences how some additional components connect to the BBDs. To allow for the different chips, two jumpers are located on the PCB to set which pins get the power and which pins get ground.

Connect the highlighted jumpers as shown below for your BBD version.

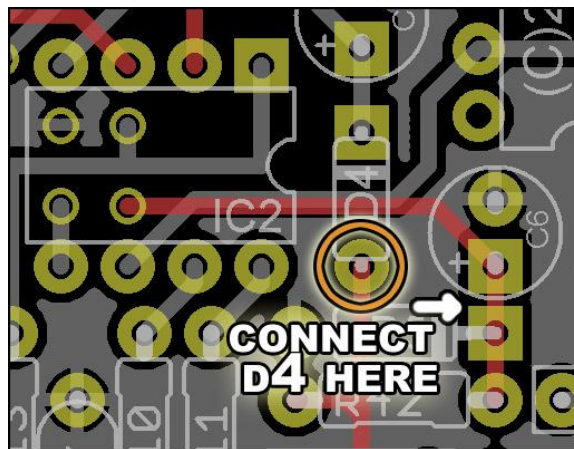


Power

The MN3007 and MN3207 have slightly different power requirements. The MN3007 can operate for up to 15vDC. The MN3207 supply voltage needs to be clamped at around 8v.

MN3007 – Omit **D4**, **D5** and **C5**. Connect the square and round pins of **C5** together via a jumper. This does two things: connects pin1 of the MN3007 to VC via a 100R series resistor for (nearly) full voltage operation and connects the VGG pin of the chip to ground. Note that while the **Current Lover** is intended for 9v operation, you can safely operate it up to 15vDC provided it is well regulated. If you change to a larger supply after biasing it for 9v, you will most likely have to re-bias the effect for the larger supply voltage.

MN3207 – Connect **D5**, and **C5** as per the layout diagram. This limits the supply voltage to 8.2v. **D4** should limit the 8.2v BBD supply to about 14/15 for connecting to the VGG pin. However, there is a small error here in that **D4** is actually connecting from VC on the board and not the 8.2v (VDD) supply. However this is a very easy fix. Simply connect the bottom lead (anode) of **D4** to the **C6/D5** junction. This can be done on the bottom side of the board to keep things looking clean. This is the solution I recommend. Once the board is powered, you should have between 7.6 and 7.7vDC on pin4 of IC2.



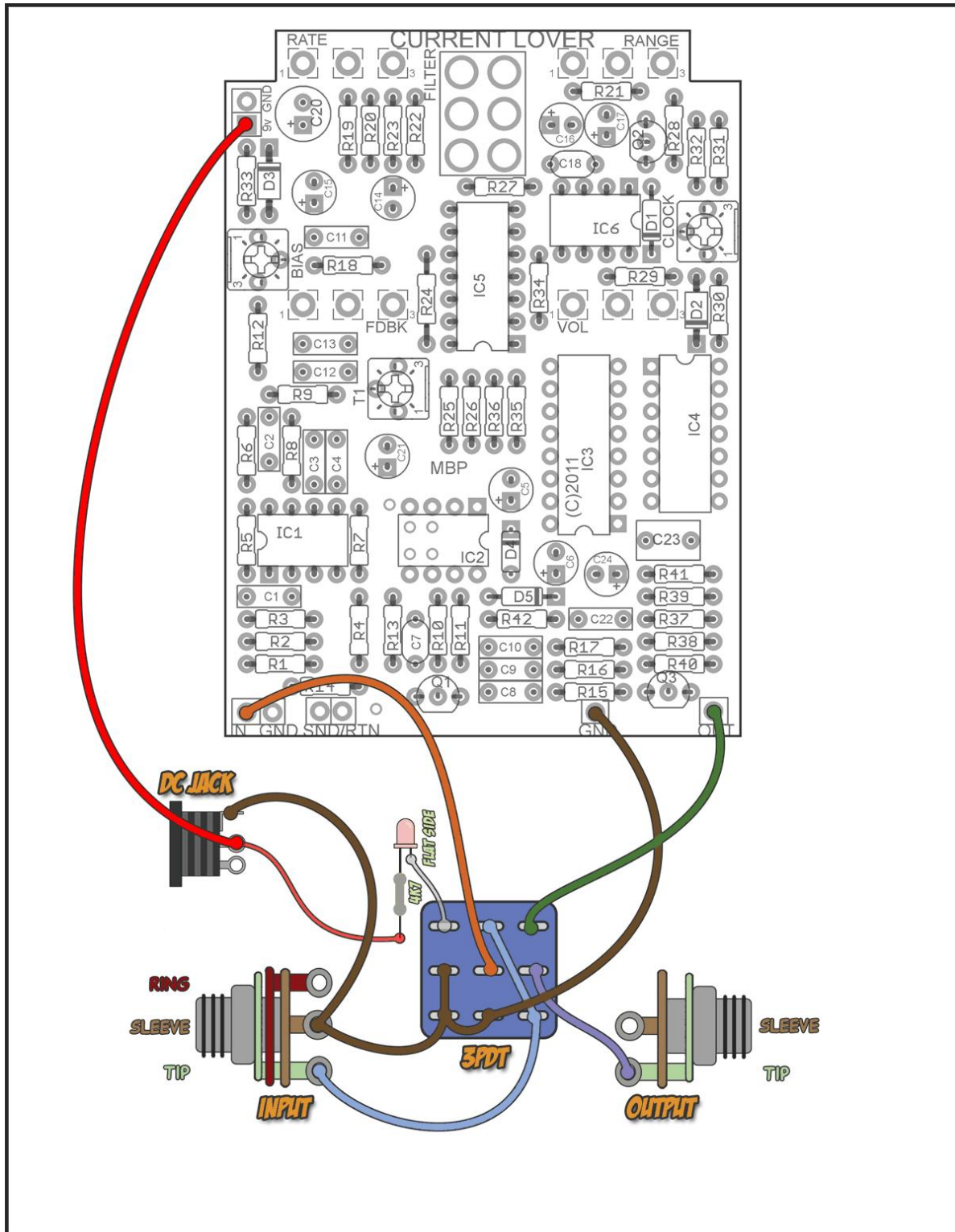
Biasing

The final step after soldering all the components and jumpers is to properly bias the operation of the clock and BBD. This is actually very easy and can be done by ear.

Before powering up the board and connecting your guitar and amp, set the **Clock** and **Bias** trimmers to their middle position. Set the **T1** trimmer and **Rate** pot fully counter-clockwise. Finally, set the **Range**, **Volume** and **Feedback** pots to approximately their middle positions and the **Filter** switch to the up position. Now connect the board between your guitar and amp and power it up. You should get signal through the effect, although you may not hear any flanging yet. If you do not have any signal, double check your connections and ensure that there are no bugs in your build.

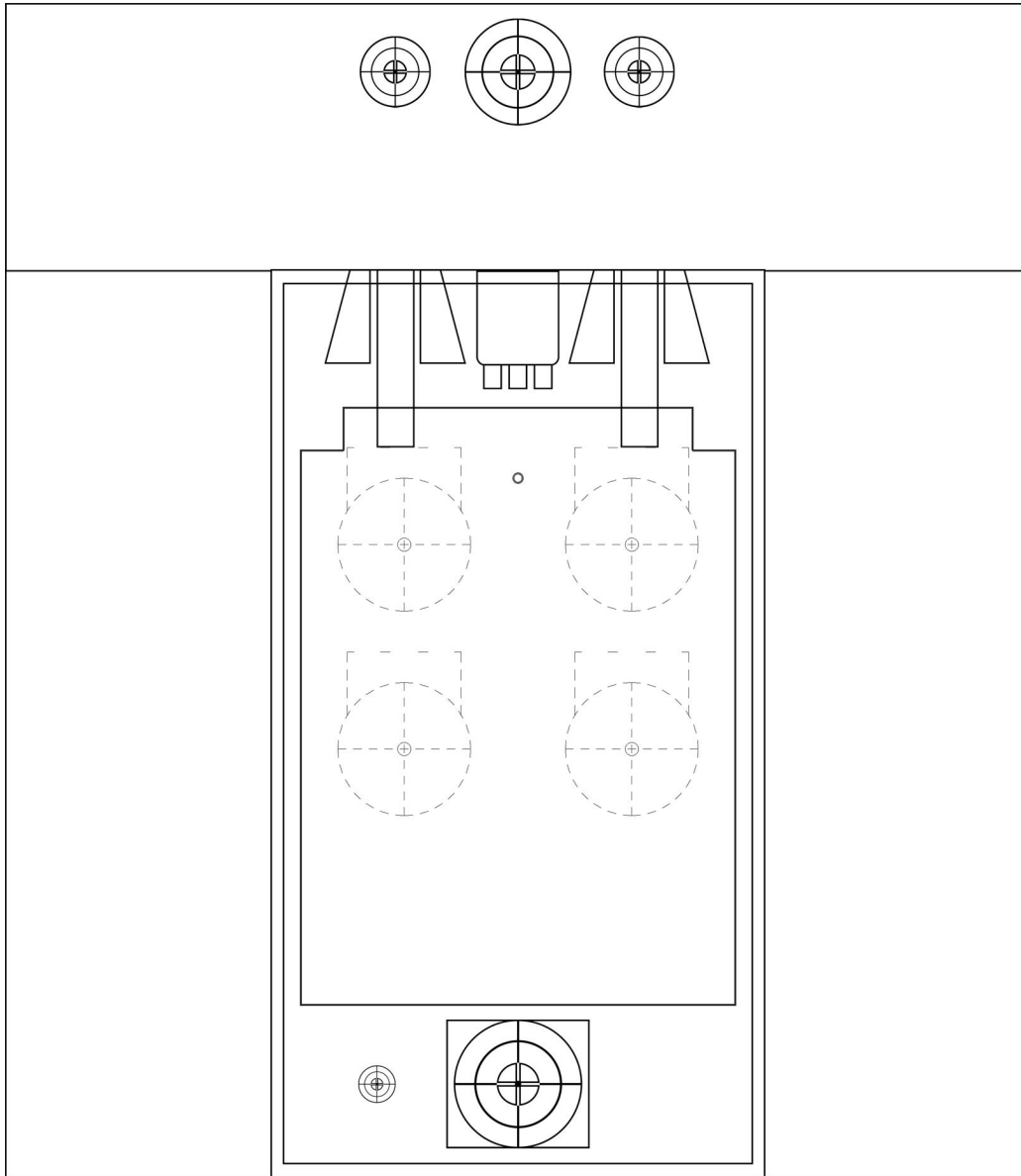
First adjust the **Bias** trimpot until you get some flanging. You don't have to be precise, just get the BBD working. Next adjust the **Clock** trimpot to the point where you achieve a wide sweep with minimum noise. If the flange starts to oscillate at the bottom of its sweep you will need to do a little more adjustment. Go back and tweak the **Bias** trimpot further clockwise until you get smooth up and down flange without any excessive feedback or oscillation at the peaks of the sweep. Set the Feedback control fully clockwise and gently adjust **T1** clockwise until you get the maximum feedback desired (**T1** acts as a limit to the maximum allowed feedback). Continue making minor adjustments to the trimmers while testing the limits of the Rate, Range and Feedback controls. Describing this process makes it seem more complicated than it actually is: your ear will be the guide in achieving the best sound across the widest range of control settings.

Wiring



Drill Template 125B

5.4"W x 6.18"H @ borders



This template is approximate. Check measurement and placement carefully before committing to drill.

There is no single sided artwork for etching a Current Lover PCB

Licensing

*The user may utilize a purchased **Current Lover** PCB from madbeanpedals for DIY/non-commercial purposes. You may not use the artwork to sell your own version of the PCB design or as part of a “kit” or similar commercial product.*