

### MN3005 version

Part	Value	Part	Value
R1	1M	C1	470p
R2	10k	C2	47n
R3	475k	C3	10uF
R4	10k	C4	6n8
R5	10k	C5	100p
R6	47k5	C6	10uF
R7	47k5	C7	220n
R8	10k	C8	10uf
R9	10k	C9	10uF
R10	10k	C10	100n
R11	10k	C11	100p
R12	10k	C12	6n8
R13	10k	C13	100n
R14	10k	C14	330p
R15	100k	C15	10uF
R16	4k7	C16	1uf
R17	10k	C17	100uF
R18	10k	C18	100uF
R19	22R	C19	100uF
R20	22k	C20	100n
R21	10k	C21	100p
R22	18k	C22	1uF
R23	100k	C23	2n2
R24	100k	C24	33n
R25	10k	C25	1n
R26	10k	C26	39n
R27	10k	C27	330p
R28	10k	C28	10uF
R29	10k	C29	220n
R30	10k	C30	10uF
R31	22k	C31	100p
R32	10k	C32	220n
R33	47k5	C33	10uF
R34	47k5	C34	6n8
R35	10k	C35	100p
R36	47k5	C36	10uF
R37	150R	C37	100n
R38	100k	C38	100n

Q1 - Q4 MPSA18

D1 1N4001  
D2 1N4148

IC1 LF353N  
IC2 NE570  
IC3 MN3005  
IC4 MN3101

BIAS 22k  
CANCEL 10k  
CLOCK 1M  
DELAY 1MB  
FEEDBACK 50k  
MIX 50k

### v3205 version

Part	Value	Part	Value
R1	1M	C1	470p
R2	10k	C2	47n
R3	475k	C3	10uF
R4	10k	C4	6n8
R5	10k	C5	100p
R6	47k5	C6	10uF
R7	47k5	C7	220n
R8	10k	C8	10uf
R9	10k	C9	10uF
R10	10k	C10	100n
R11	10k	C11	100p
R12	10k	C12	6n8
R13	10k	C13	100n
R14	10k	C14	330p
R15	100k	C15	10uF
R16	4k7	C16	1uf
R17	10k	C17	100uF
R18	10k	C18	100uF
R19	1k5	C19	100uF
R20	22k	C20	100n
R21	10k	C21	100p
R22	18k	C22	1uF
R23	100k	C23	2n2
R24	100k	C24	33n
R25	10k	C25	1n
R26	10k	C26	39n
R27	10k	C27	330p
R28	10k	C28	10uF
R29	10k	C29	220n
R30	10k	C30	10uF
R31	22k	C31	100p
R32	10k	C32	220n
R33	47k5	C33	10uF
R34	47k5	C34	6n8
R35	10k	C35	100p
R36	47k5	C36	10uF
R37	150R	C37	100n
R38	100k	C38	100n

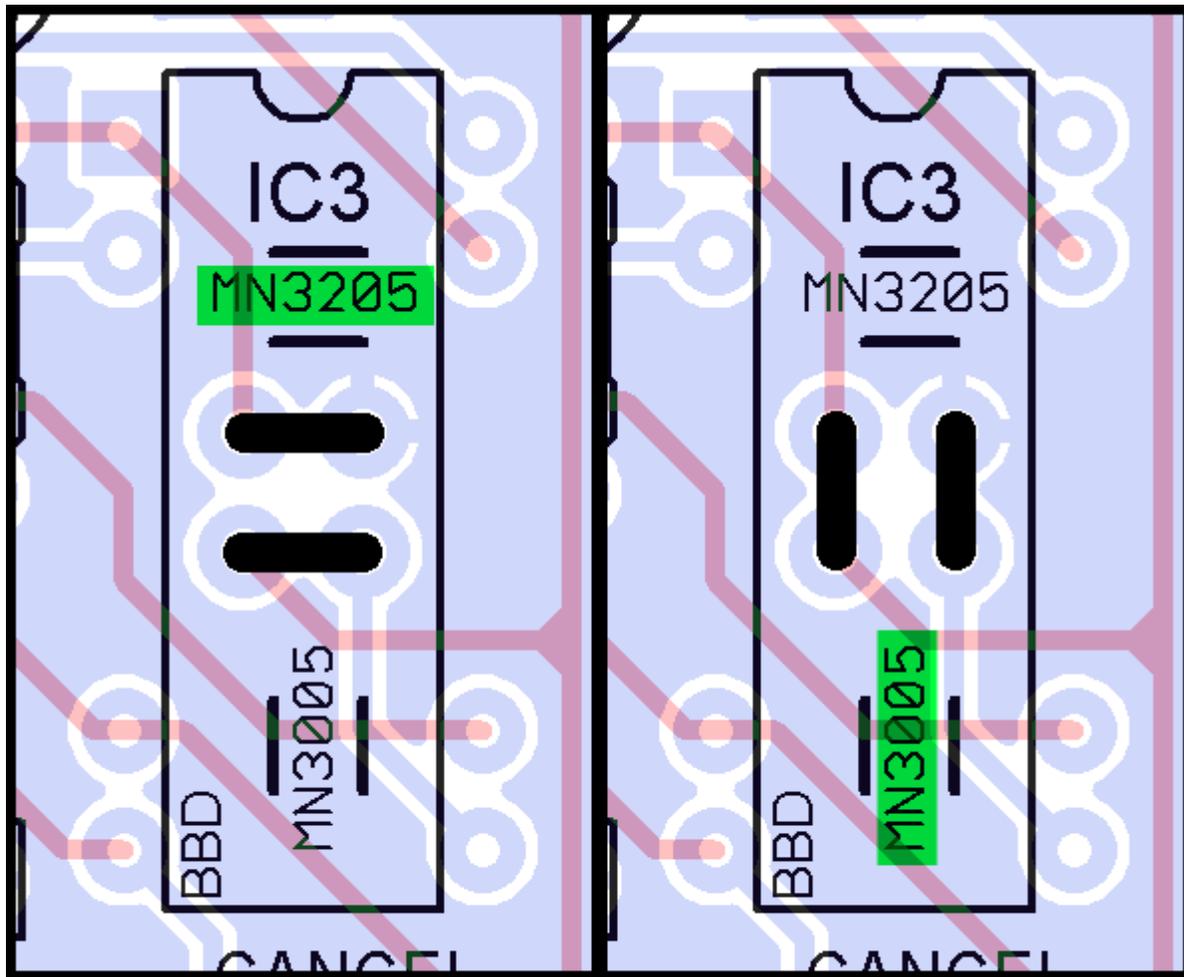
Q1 - Q4 MPSA18

D1 1N4001  
D2 1N4148

IC1 LF353N  
IC2 v571  
IC3 v3205  
IC4 v3102

BIAS 22k  
CANCEL 10k  
CLOCK 1M  
DELAY 1MB  
FEEDBACK 50k  
MIX 50k

**(i) How to hook up the MN3005 or MN3205/CoolAudio v3205**



**v3205 CONFIGURATION  
MN3205 CONFIGURATION**

**MN3005 CONFIGURATION**

BBD	Clock	Compander
MN3005	MN3101	SA571N
MN3205	MN3101	SA571N
V3205	V3102D	V571D

You can use the LF353 op-amp for any version, or sub another quality dual op amp in its place.

The MN3005 and v3205 have been confirmed builds. The MN3205 configuration is untested, as of yet, but should work just as well.

Both the v3205 and MN3005 should give you between 300-350ms of delay signal.

**IT IS NOT RECOMMENDED THAT YOU SWITCH BETWEEN THE MN3005 AND MN3205/v3205 ON THE SAME BOARD.** We found this caused problems and resulted in dead boards and/or components. If you want to avoid this, you should decide before soldering in your jumpers which version it will be.

## (ii) Trimpots

For the trim pots, the standard one from **smallbear** will be a little too big (although you may be able to squeeze them in or put them on the bottom of the board).

I used the following trimpots:

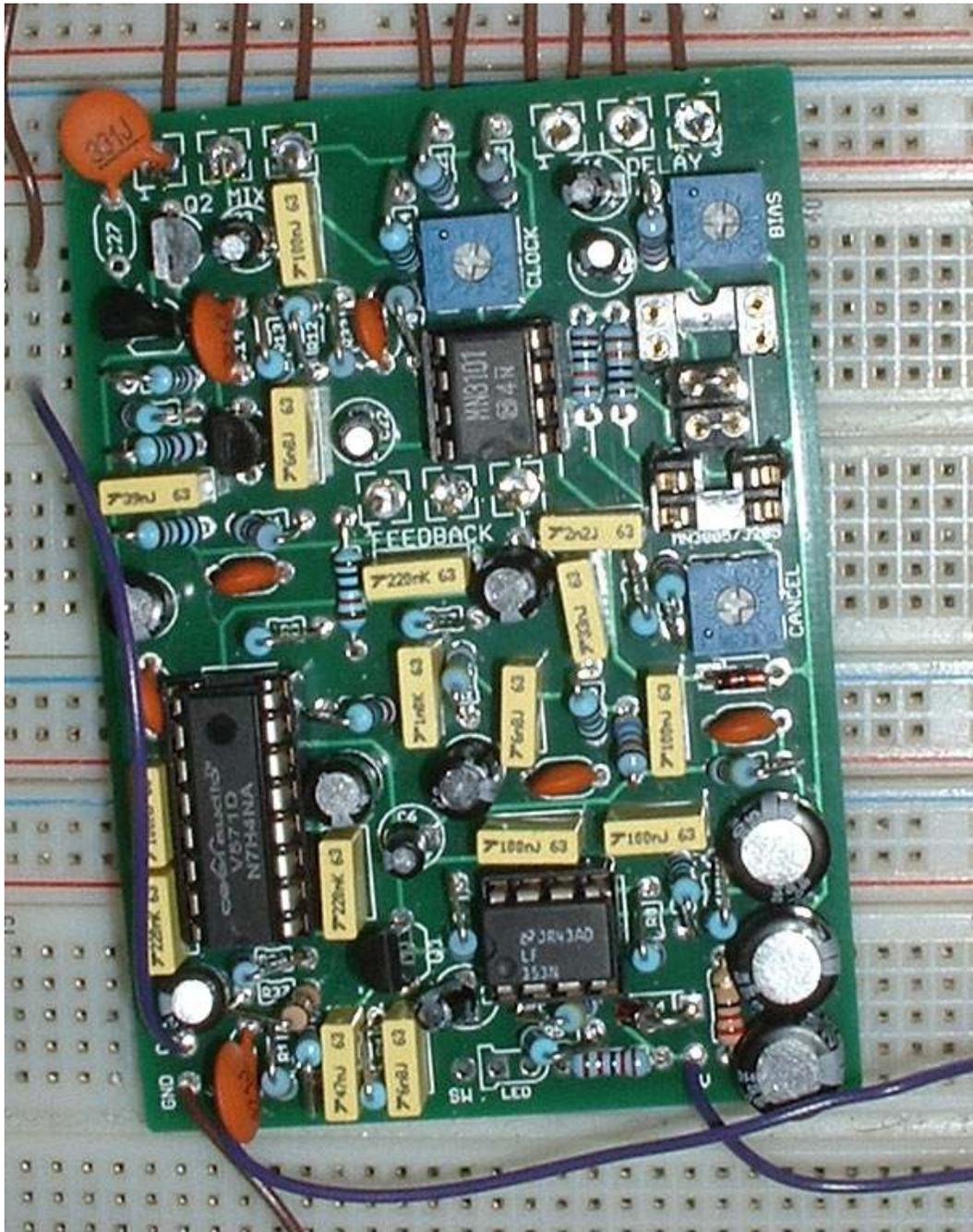
<http://www.mouser.com/Search/ProductDetail.aspx?R=3362P-1-105LFvirtualkey65210000virtualkey652-3362P-1-105LF>

<http://www.mouser.com/Search/ProductDetail.aspx?R=3362P-1-103LFvirtualkey65210000virtualkey652-3362P-1-103LF>

<http://www.mouser.com/Search/ProductDetail.aspx?R=3362P-1-223LFvirtualkey65210000virtualkey652-3362P-1-223LF>

You may use other trimmers, of course, but make sure the dimensions are similar to the above.

### A completed prototype



## (iv) Modulation and double delay time add-ons

Abfackeln (Marcus) has been working on creating some add-ons for the board for modulation and double delay time. You can get more information about these addons here:

<http://www.freestompboxes.org/viewtopic.php?f=7&t=8376>

The **M1**, **M2**, and **M3** pads on the board are for wiring the modulation features.

## (v) Delay calibration

If you do not have access to an oscilloscope, you can calibrate the delay pretty closely by ear. Here are some basic instructions:

Set all the trimmers to their middle position. Set the Delay and Feedback pots to their middle positions and the Mix pot all the way up. Fire up the delay. Start by adjusting the Bias trimmer until you hear the delay signal pass. As you turn the Bias trimmer back and forth you will hear a little bit of a scratchy sound, most likely. Now adjust the clock trimmer to the right. You will hear the delayed repeats increase in time. As you adjust it, you will probably hear a little clock noise introduced. Listen closely for a high pitch whine, or a high pitch beep at the very end of a delayed repeat. Leave this trimmer adjusted for the best balance of delay time with minimum noise. You can adjust the Cancel trim to see if it cleans up the signal any.

If you are using a scope, there is already a very good set of instructions on General Guitar Gadgets here:

[http://www.generalguitargadgets.com/index.php?option=com\\_content&task=view&id=48&Itemid=26](http://www.generalguitargadgets.com/index.php?option=com_content&task=view&id=48&Itemid=26)

## (vi) Mods

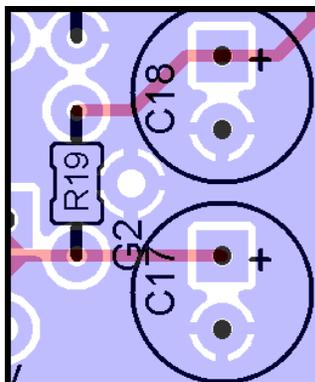
You can put two back to back diodes between lugs 2 and 1 of the Feedback pot to clamp the maximum amount of oscillation. This will keep the volume level of the feedback from getting out of control. Use an SPST if you want to make it switchable. Try two 1n914's.

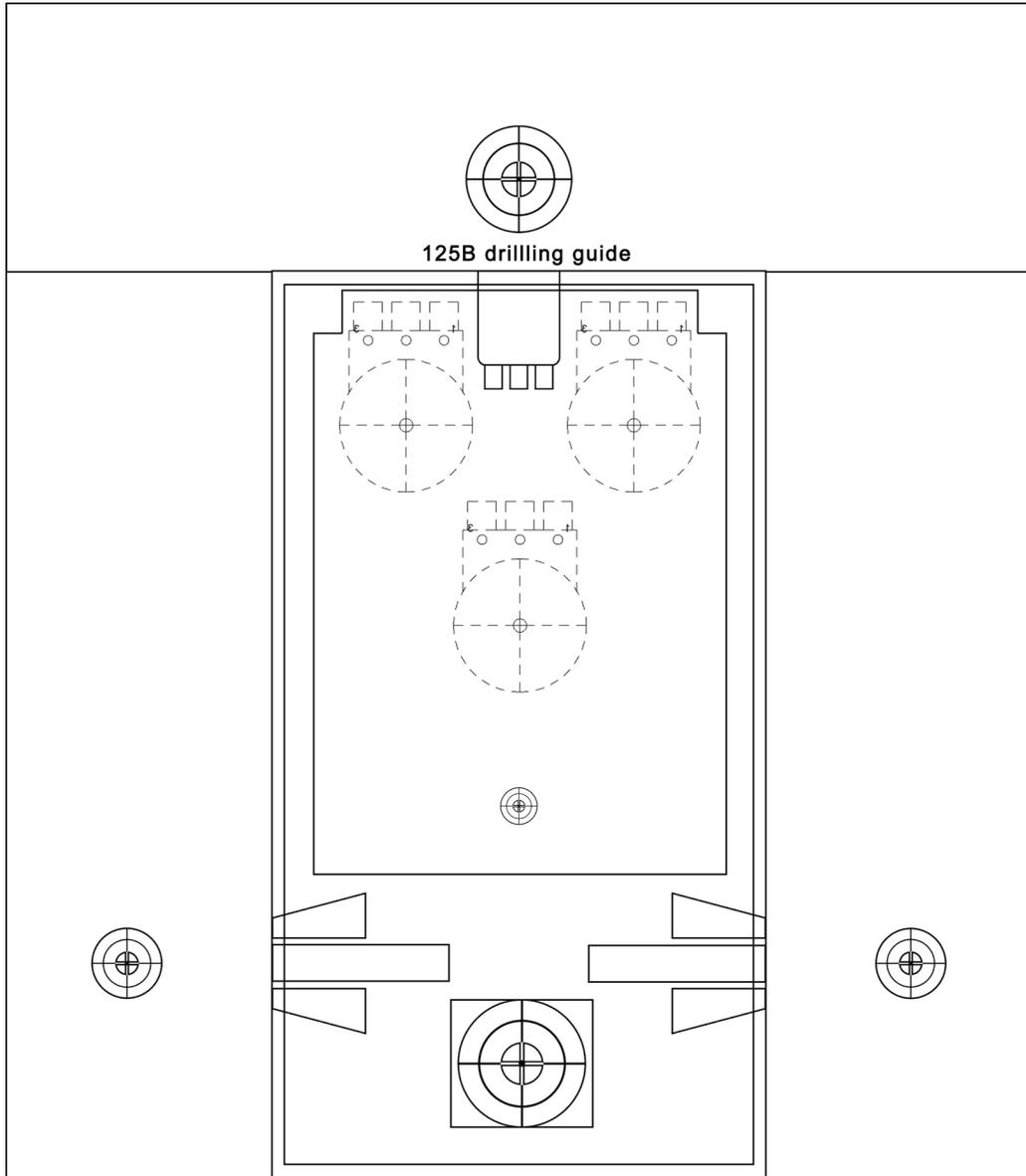
Changing the value of R31 will control how soon the feedback control goes into oscillation. Try socketing this resistor and play around with the value if you find the control isn't working as well as you'd like. Lowering the value will make it oscillate sooner and raising it will make it oscillate later.

## (vii) Revision Notes

After checking the v3205 datasheet, I found that the operational voltage for the BBD is listed as 4-8v. This means that **R19** as used in the MN3005 version is likely too low to knock the voltage down for maximum performance. Through experimentation, I found that a 1k5 worked really well and resulted in around 7.5v. So, if you are planning on building the v3205, you will likely want to socket **R19** to find the best value. If your repeats are very quiet then try bumping the value up a little more (make sure to use your DMM to check your voltages, too).

I also placed an extra ground pad **G2** next to **R19** in case you want to use an 8v regulator (I have not tested this).





*Special thanks to Abfackeln and the other prototypers that made this project possible!*