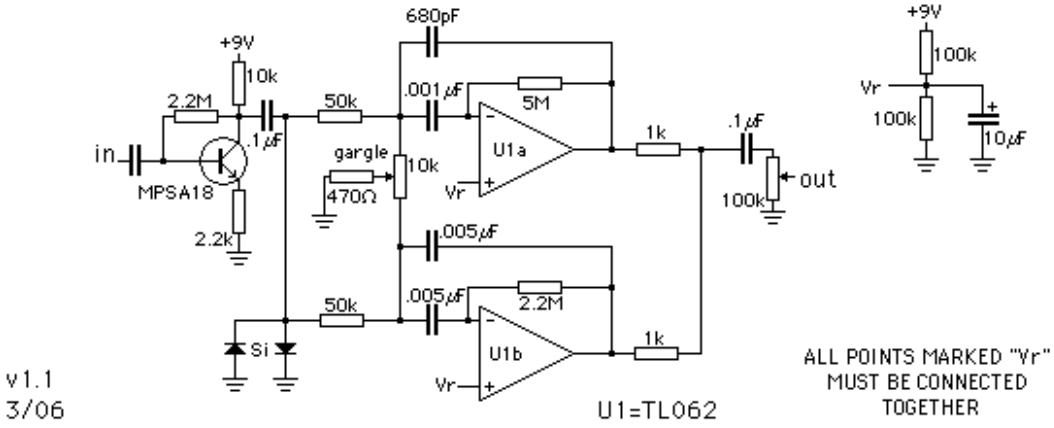
Circuit Snippets

All circuits are for non profit use. Contact me for all other uses.

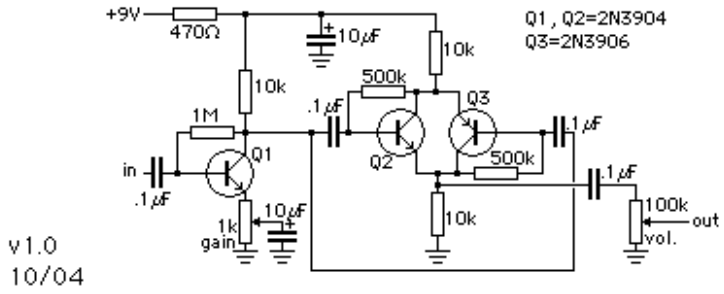
Gargletron



"Talking" type effect, two parallel MFB filters tuned by a single 10k pot. Similar to the EH Talking Pedal and Craig Anderton's Wah/AntiWah design. Gives good "vowel" sounds.

Listen to The Gargletron

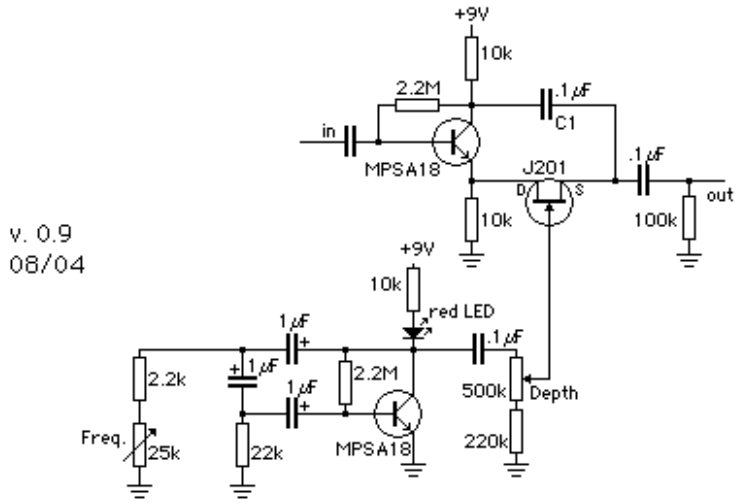
Pushme Pullyou



Decent octave up. Diodes, matched transistors need not apply. Gain stage drives a PNP/NPN pair for good fundamental cancellation. Transistors really aren't too critical. Q1 could be 2N3904 or higher gain transistor. Gain pot offers gains from about 10 to >100. At lower gains, the octave is fairly clean. Usual playing caveats apply for best octave.

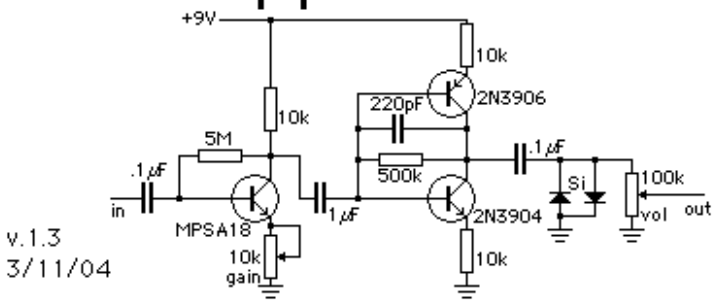
[Listen to The Pushme Pullyou]

Wobbletron



The Wobbletron is a simple vibrato circuit, using a pulsing LED phase shift oscillator by Darren Inwood and Rob Strand, and a single stage audio phase shift circuit. Very similar to the runoffgroove.com Phozer, this makes a tremolo-like true vibrato for wobbly sounds. Due to the nature of this circuit, the vibrato is most noticeable at higher speeds, and less dramatic at low speeds. It's possible to add more audio phase shift stages for more dramatic effect. However, there seems to be a cumulative effect in the distortion of the FET. C1 can be changed in value for a different vibrato "tone".

Tripple Fuzz



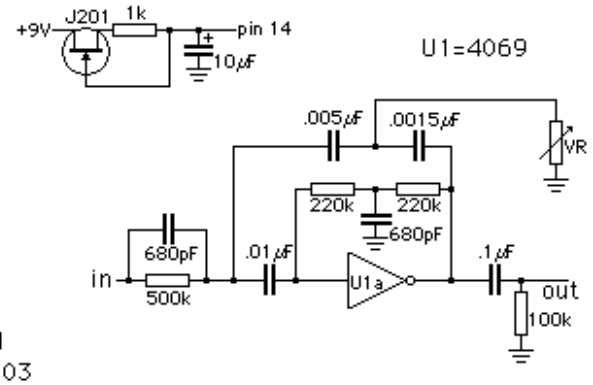
v.1.3
3/11/04

This is a fuzz using a "nonselective frequency tripler", originally designed by R. Lockhart Jr. At low gains the sound can be very sweet. As the gain rises, you get a odd splatty fizz going on. And at max gain, it's completely nasty. A nice, easy build.

Thanks to Ken Stone for the lead

Listen to The Tripple Fuzz

Ghost Dance



v1.1
10/03

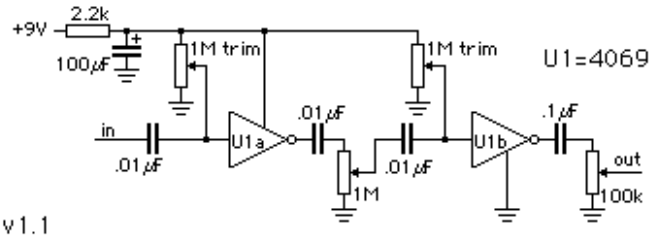
Good sounding modified Twin-T wah circuit using a single CMOS inverter for nice overdrive characteristics and simple construction. Nice amount of quack. The J201/1k resistor is a current regulator that keeps the inverter from sucking too much juice from the battery. VR can be any variable resistance to ground from around 1k-50k.

Tie all unused inverter inputs to ground.

IDEA!

Use a couple of those spare inverters as a HF RC oscillator with a fairly large conductive surface coupled to the RC network to drive a electronically variable resistor, such that the large conductive surface becomes a proximity control for the resistance.

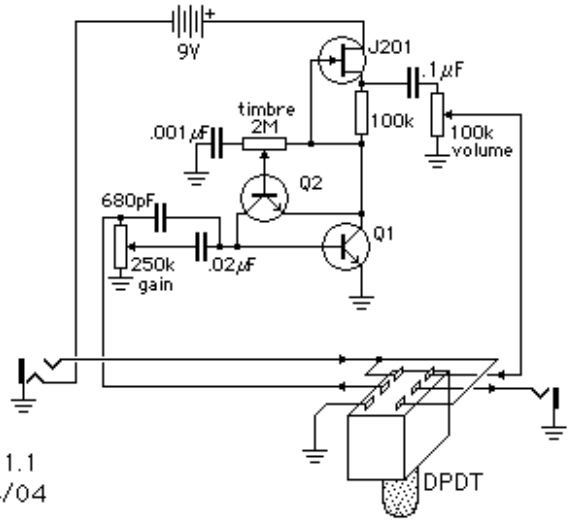
Calavera



v1.1
8/03

Nice variation on the CMOS "Tube Sound Fuzz" utilizing two stages and no negative feedback. Each inverter is biased into linear operation by a voltage divider on the input pin, in place of the usual negative feedback. The RC network on the power supply is necessary to keep oscillations down and power consumption reasonable. I used a 4069, but a 4049 may also work. YMMV.

Cinnabar

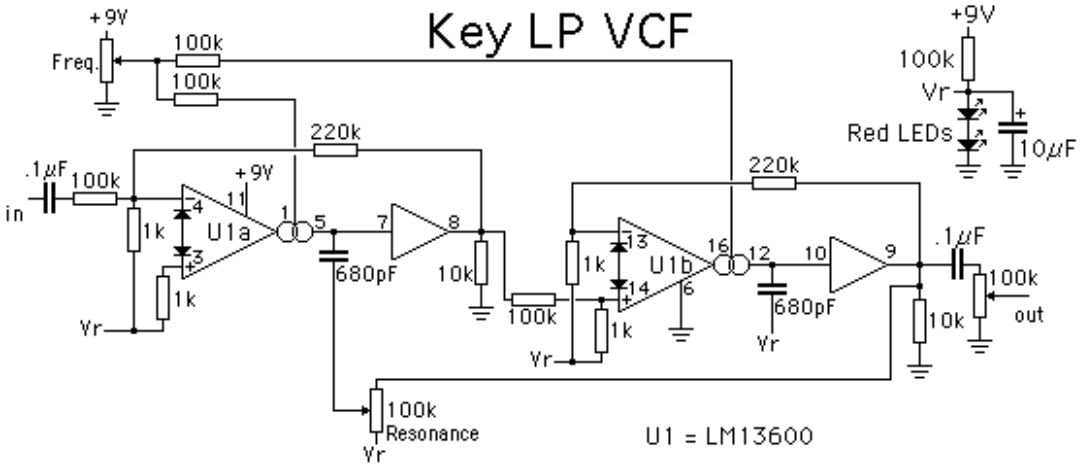


v1.1
4/04

Q1 and Q2 are high gain BJTs. The 2M Timbre pot changes the tone from smooth to spunky. Like the Tytewadd, current draw is less than 10µA.

Listen to the Cinnabar

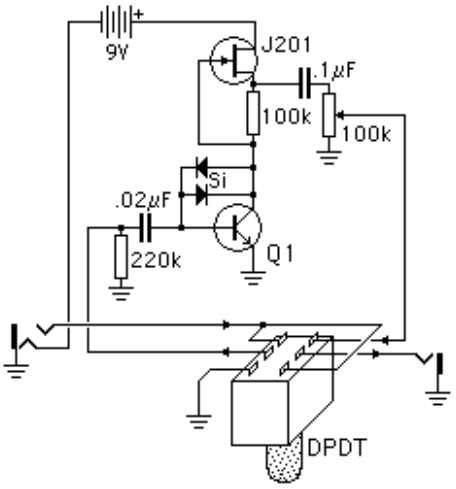
9V powered MS-20 Sallen-Key LP VCF



v0.8.1
6/03

Preliminary MS-20 filter running off single 9V battery, for stompbox use. Will oscillate when resonace is turned up, but distorts in a bit of a yukky way. Perhaps clippers there, like in other MS-20 clones, could tame that a bit.

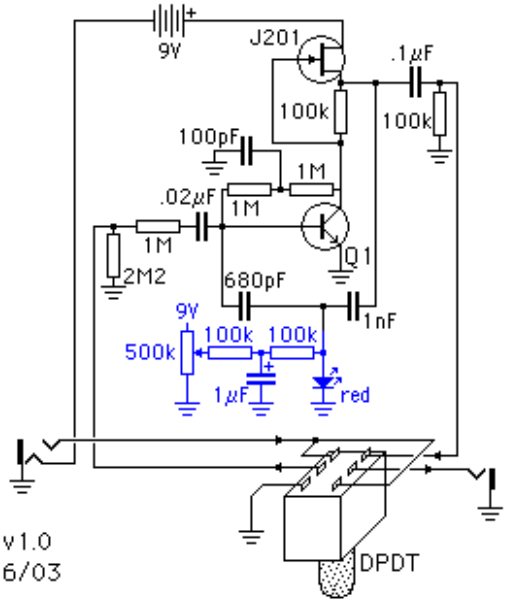
Tytewadd



v1.0
6/03

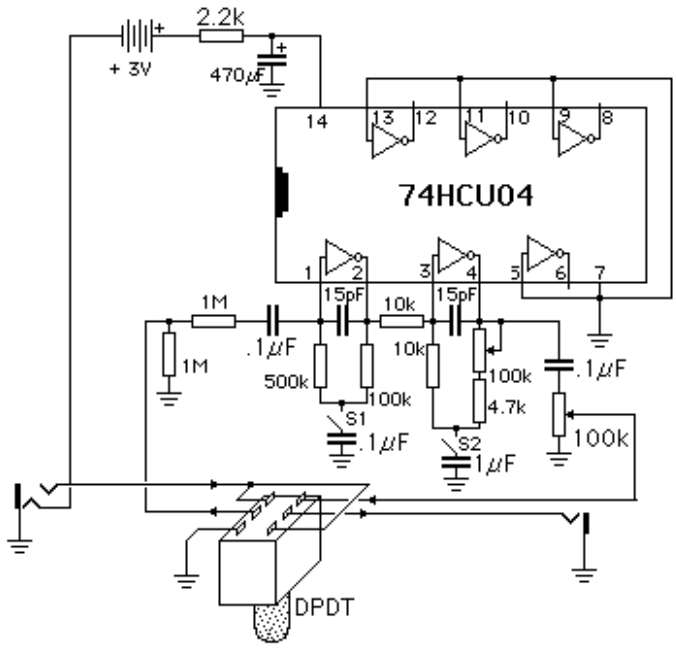
A miserly fuzzbox running on less than 10µA from a 9V battery, for the ultimate in battery life. Shown in simplest form, the 220k input resistor can be swapped with a pot for some gain control. Low input impedance, simple design, good sound. Q1 can be any med to high gain transistor.

KechiWah



Based on the same circuit as the Tytewadd, The KechiWah is also miserly with the power. As shown, it can use as much as 100µA, but if the parts in blue are replaced with a 50k - 100k pot to ground, power draw goes down to less than 10µA. Gain is controlled my the 1M resistor on the input, adjust higher or lower for best sound.

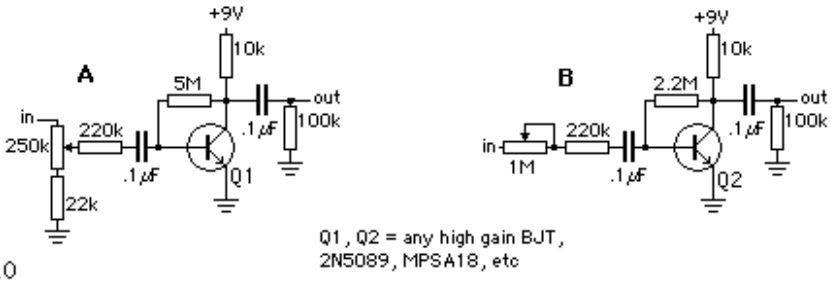
CMOS DRIVE



v1.0
01/03

3V powered OD/Distortion draws less than 1mA with good range of distortion tones. 74HCU04 is the chip to use, particularly designed CMOS chip for linear applications. Power supply filter cap must be large to avoid oscillations. Closing switches S1 and S2 suppresses negative AC feedback for stages 1 and 2 which has to raise gain. Depending on the setting of the 100k gain pot and the settings of S1 and S2, sounds from clean to heavy distortion can be dialed in. (Tested at supplies below 1.5V!... YMMV)

Boost-O-Rama

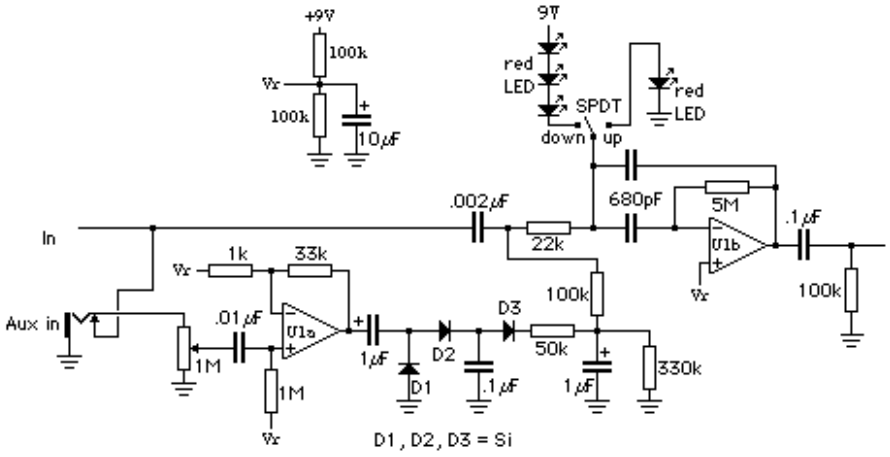


v1.0
5/03

Either of these simple clean boosts are capable of nice, jangle-y loud boost. Both are designed to give subtle, sweet overtones, yet still sound clear and loud. The main difference in the two is how the gain control is implemented. The "A" version uses a voltage divider volume control on the input, with a input impedance a little over 100k. Low enough to tame some of the high end, but not too low. The "B" version uses a series resistance on the input, with a variable input impedance depending on the gain setting... input Z falls as the gain is turned up. Either is a nice stand alone booster and a good alternative to the typical boosters out there.

Phuncgnosis

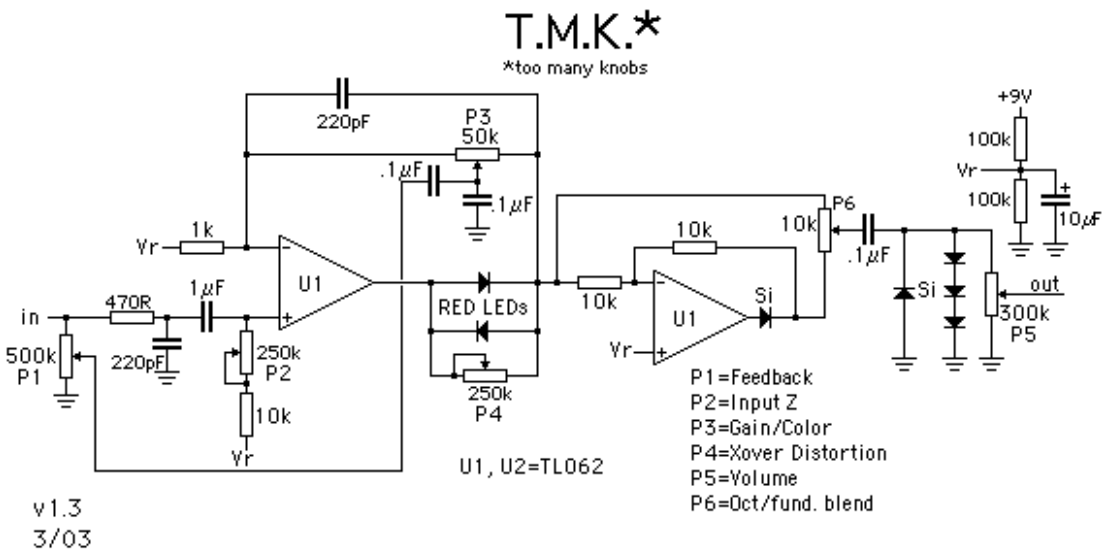
envelope filter



v1.1
5/03

Yet another envelope filter using some hacks to minimize ripple, flatten out response during the sweep, and provide for switchable up/down sweep. Any of the typical op amps should work OK. I used a TL062, but a TL072 and 4558 were tried with good results.

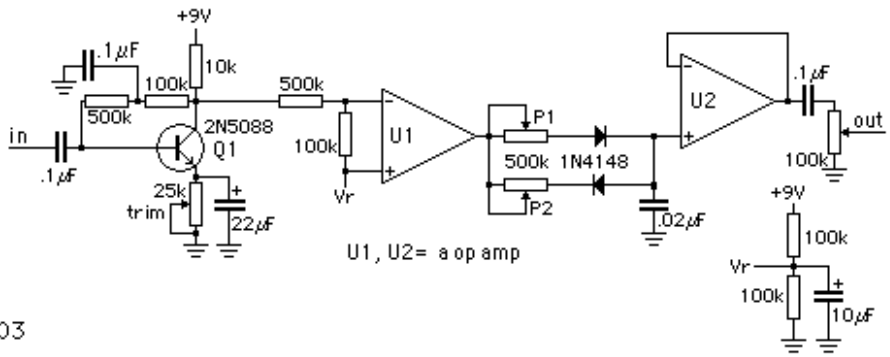
Listen to Phuncgnosis



This is a unruly fuzz, designed to be highly interactive with the guitar. Controls allow for positive feedback, variable input Z, variable crossover distortion, combo gain/ timbre control, and fundamental/octup blend. Fiddling with the knobs creates various amounts of gain, timbre changes, and oscillation.

Listen to sample of the T.M.K.

Simple Square wave Shaper made Simpler



v.9
3/03

This is a square wave shaper pretty much taken from a old article appearing in Polyphony Magazine back in the 80s by Bobby Beausoleil. The original circuit was called a Simple Square Wave Shaper and intended for analog synthesizer use. I adapted it for simple electric guitar use.

It works like this: the guitar signal is amplified by the transistor stage and squared off by U1. The square wave is sculpted by that weird RC network consisting of P1, P2, two diodes, and a .02µF cap. Setting P1 and P2 to minimum resistance yields a decent square wave output. As either P1 OR P2 resistance is turned up, either the leading or trailing edge of the square wave begins to slant until the output resembles a sawtooth-y wave. When BOTH P1 and P2 are set to max resistance, the output wave resembles a trapezoid like form. U2 buffers the wave shaper and sends the signal on it's merry way.

The part of the circuit that performs this magic is sometimes used as a slew rate limiter or a AR generator depending on the application. Here, it's used for audio frequencies. The square wave sound is pretty recognizable to most guitarists, the saw-like wave is a different distorted sound, almost brassy in character, and the trapezoid sounds kinda like a heavily filtered fuzz.

For best results, the 25k trimmer on the emitter of Q1 MUST be set properly, lest the "gating" action of U1 get too choppy. Simply adjust for best sensitivity.

This is what the Simple Square Wave Shaper sound looks like.

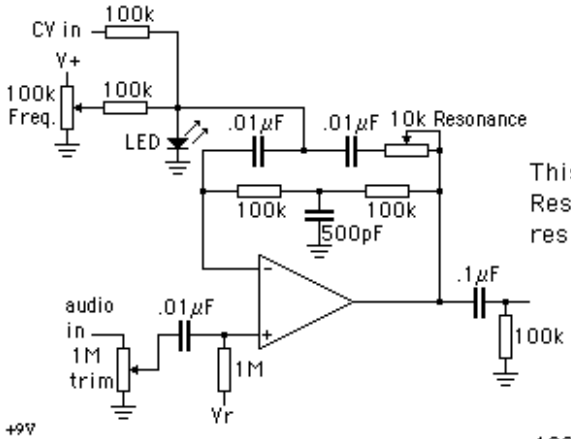
Listen to sample of the Simple Square Wave Shaper

Q&D VCF

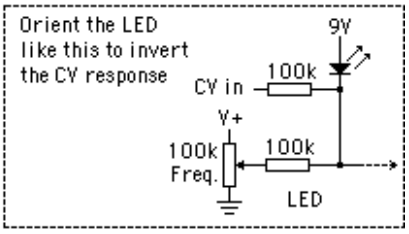
v 1.1
3/03

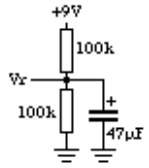
Served with and without oscillations!

These two designs are quasi synth VCFs, useful to get a decent fake lowpass response with a minimum of parts. Trim the input levels so that the output is unity gain with the Resonance set low and the cutoff frequency set all the way up. Two versions here, one will oscillate with the Resonance maxxed out, one won't. Get your guitar synth going with one of these filters!

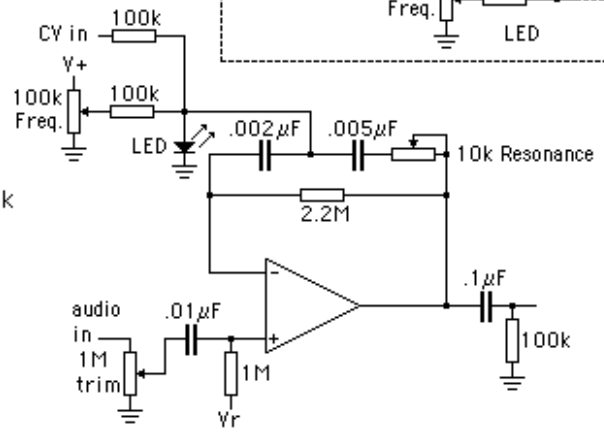


This version will oscillate when Resonance control is set to minimum resistance.

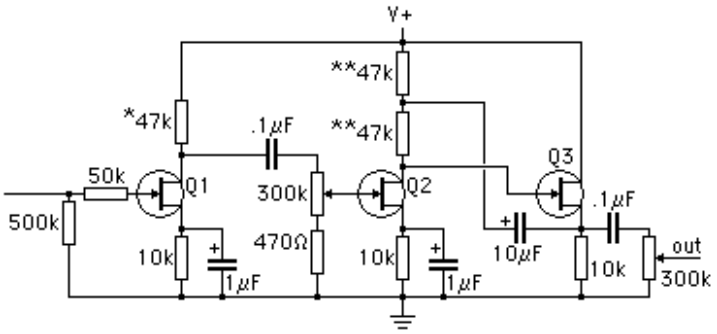




This version has a nicer resonant peak but will not oscillate even with Resonance cranked.



FET Driver

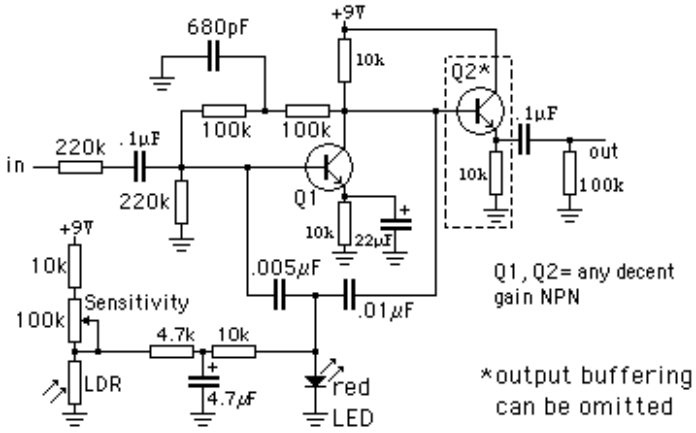


*adjusted so Q1 drain voltage is close to 1/2 V+
** adjusted so that Q2 drain voltage is close to 1/2 V+
Q1, Q2, Q3 = J201

V1.0
3/03

This is actually a good sounding OD/Dist circuit with good gain and noise characteristics. First stage (Q1) is pretty conventional, second stage (Q2, Q3) is bootstrapped for a gain boost and low output impedance. For best sound, drain resistors on Q1 and Q2 need to be tailored just right.

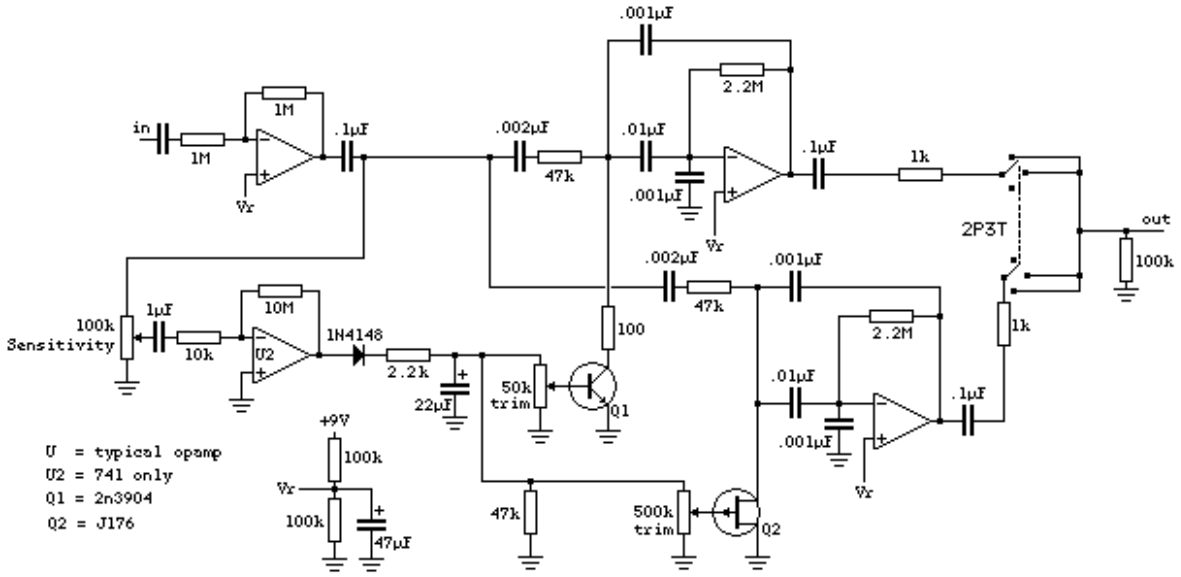
Photon Filter



v1.0
02/03

One implementation of the Idiot Wah, this version uses a LDR to control the wah. Makes a interesting pedal. Sensitivity pot allows useful control in dim or bright light. Variable resistance element is a LED to ground. The Q2 output buffer is nice to have, keeps the filter from getting loaded down at the output. But not absolutely necessary. The LDRs I have go down to about 1k in bright light, YMMV.

Gargler



V1.0
02/03

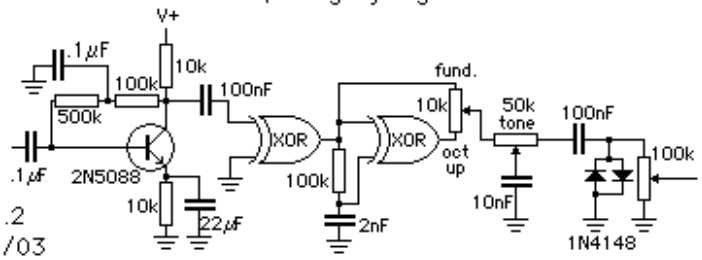
This was a envelope filter wah/antiwah/talking wah filter I built several years ago. It worked pretty well, but there are several things i would try differently now. Two separate MFB bandpass filters in parallel, switchable output from one or the other or both. One sweeps up, the other down. The ideas came from the DrQ/Talking Pedal/RG's site. Separately, the filters sound pretty typical env filter sounds. Together, they produce the "talking sound" as both filters are modulated. I was never quite satisfied with the circuit, several little things kept me changing parts around and I eventually abandoned the project. However, the basic idea is sound and it's a good starting point for anyone else wanting to make a "talking circuit".

Digital Octaver Fuzz

aka

Stupid CMOS Tricks

OR Why I should try things out
before opening my big mouth.

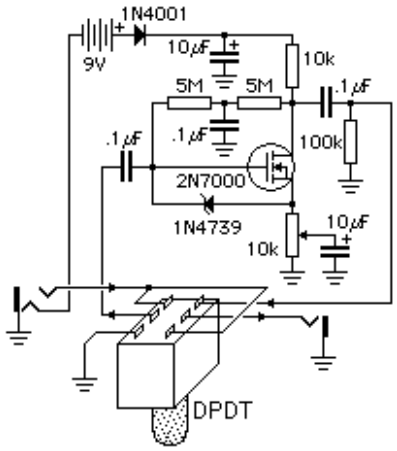


V1.2
01/03

This little octave up/fuzz is the result of a query on AMPAGE several months ago. Someone asked what a circuit like the second XOR stage would do. To which I replied something like "Probably nothing for guitar". Unfortunately, I should have tried it out before speaking. Because it functions perfectly well for guitar. As a octave doubler. Yes, a digital octave up. Both XOR gates are from a 4070 chip, first one squares up the edges, second has a RC network allowing the XOR to do its' thing. Variable by pot for a massive square wave fundamental fuzz or a mosquito-like octave up fuzz.

Let this be a lesson. Never listen to me. Just go ahead and try it out.

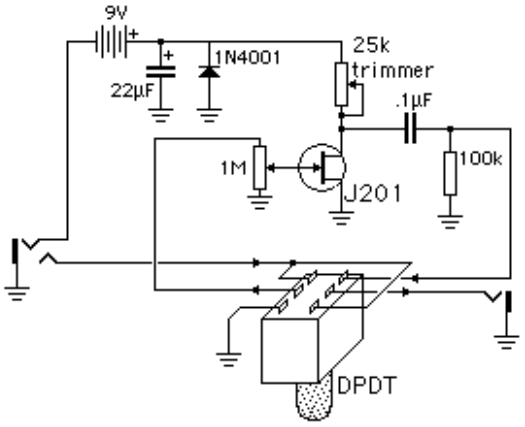
Duende



v1.1
12/02

MOSFET based booster with lots of fairly clean gain available. High input impedance throughout the gain range, modest power draw from a 9V battery.

Duende JFET

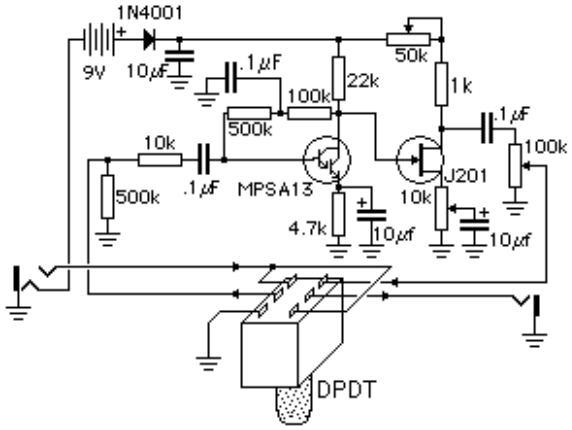


V.1.1

01/03

Good transparent booster with minimal parts. Less gain than a MOSFET, much nicer distortion characteristics than BJT. Works well with the J201s I have. YMMV.

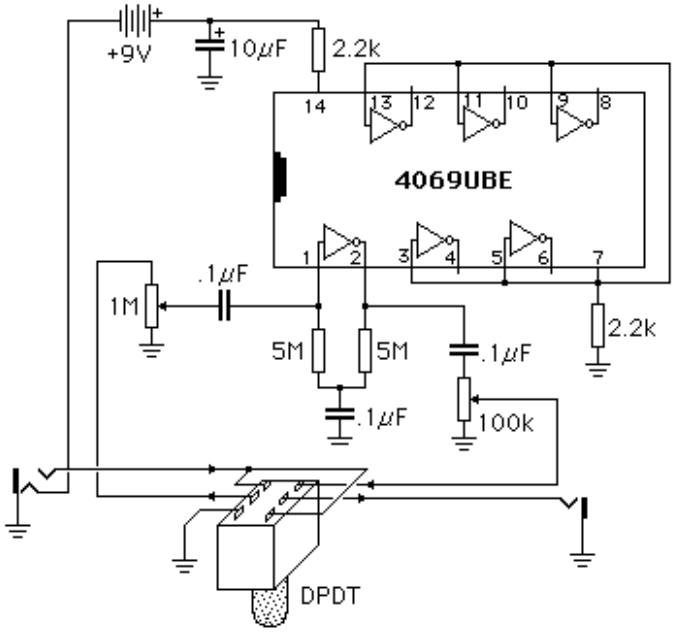
Jinx



v1.1
2/03

The evolution from a Fuzz Face style highly variable fuzz to a more easily reproduced highly variable fuzz. The 10k and 50k pots on the source and drain of the JFET are highly interactive, allowing everything from "soft attack" fuzz effects to octave up to regular fuzz tones.

CMOS Boost

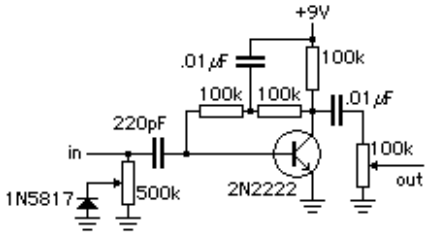


v1.0
11/02

A decent clean boost can be made using a few parts and a 4069UBE CMOS hex inverter chip. The inverter at pins 1 and 2 is biased into linear region by two 5M resistors, the .1µF cap between them helps keep the input from being loaded down and keeps gain up by reducing negative AC feedback. The inverter is run at full tilt, the amount of boost being regulated by the 1M pot at the input. The 2.2k resistors at pins 7 and 14 help keep power draw low and the output symmetrical. Unequal resistors results in less symmetrical clipping.

Despite the less-than-perfectly-linear performance as a audio amplifier, the CMOS inverter is quite at home with guitar signals. The inherent non-linearities suit electric guitar well, and even at maximum boost is not harsh and nicely musical in quality.

LofoMofo



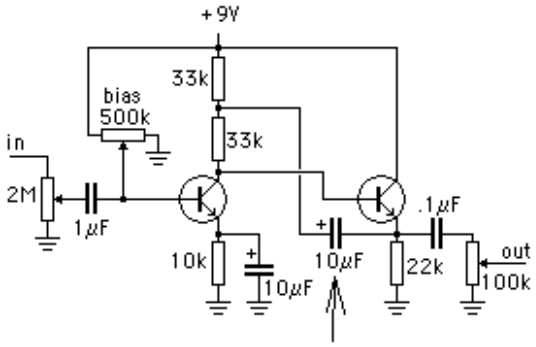
v.7
11/02

This is a lo-fi circuit, intended to turn audio signals into the kinds of sounds you'd get from a cheap pocket transistor radio. First and foremost, it cuts all the bass from the signal. The small input, output and AC shunting caps make sure of that. Second, the 500k pot/ Schottky diode on the input make a adjustable tinny distorting tiny speaker simulator. Third, and difficult to show on a schematic, is the specially selected "noise enhanced" transistor used specifically for its' noisy properties and accentuated background hiss. Just about any BJT could be used here, but I found old low hFE transistors to work best.

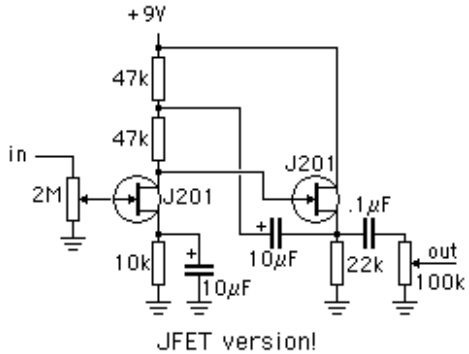
Bootstrapping for gain!

11/02
v1.0

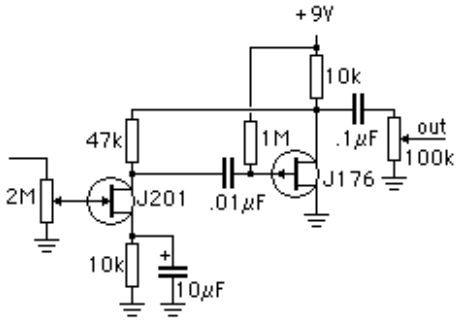
Good fuzz and OD tones from these!



Use some of the output signal via 10µF cap to get higher gains than normally possible.

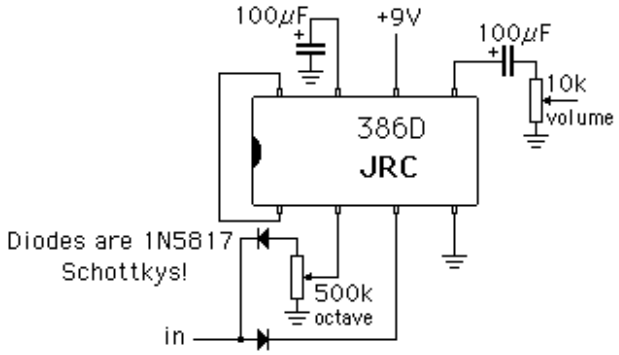


JFET version!



It's a JFET version of the Jordan bosstone! Just add diodes...

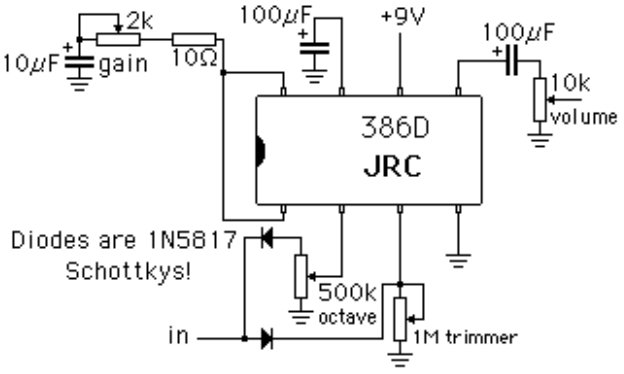
Rambler



11/02
v1.0

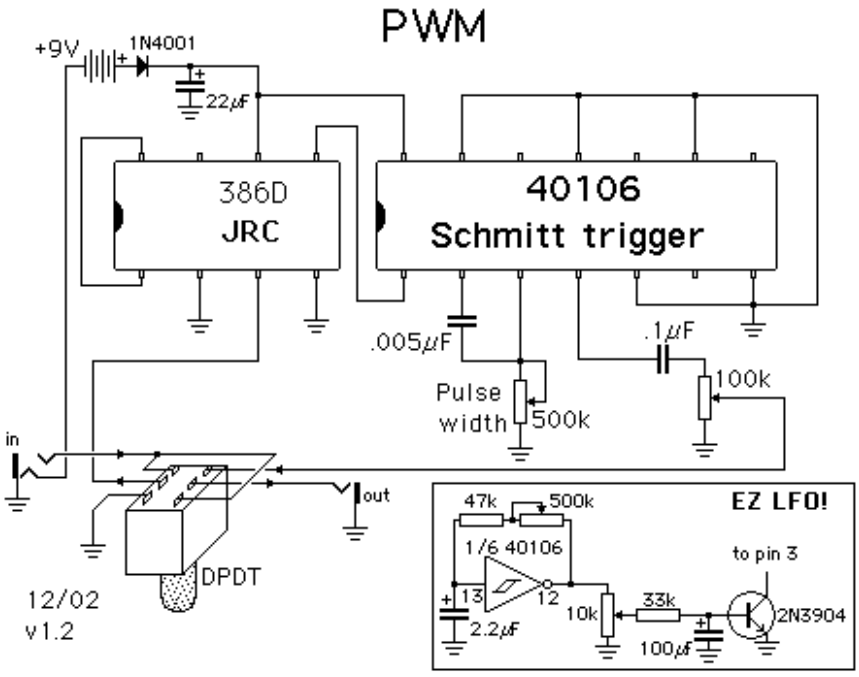
Simple octave/distortion with a twist of the knob. Very simple and can drive a speaker cabinet directly (use a JRC386D/NJM386D for best results) by cranking the volume all the way up and plugging into the cab. Octave knob goes from distortion to octave up tones. **1N5817 Schottkey diodes seem to work best here!**

Marginally better Rambler



11/02
v1.1
This setup allows better "nulling out" of the fundamental by tweaking the 1Meg trimmer and more useable gain with a twist of the 2k pot. Marginally better than the plain Rambler, for those who have to tweak the utmost performance out of the circuit.
To "tune in" the best octave up tone, crank the Gain and Octave pots up, and turn the 1Meg trimmer to the point where the octave note comes out best.

Listen to sample of the Rambler!

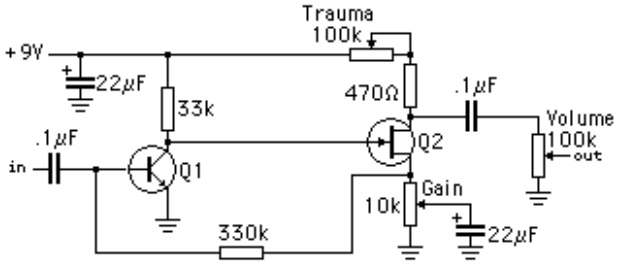


This circuit converts the guitar signal to a variable duty cycle pulse wave. The 500k pot controls the pulse width and can be put under control of a LFO, envelope follower, or external CV. Making for radical and animated waveform transformation, in the vein of analog synthesizers.

This is what the PWM sound looks like.

Listen to sample of the PWM!

Punch-In-The-Face



Q1= medium to hi gain BJT like NTE199, 2N5088, MPSA18

Q2= hand selected J201 for best octave up/"soft attack fuzz"

v. 1.0

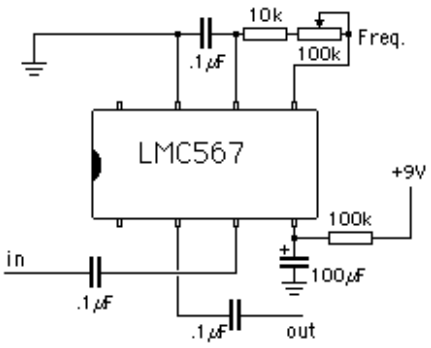
10/02

The latest Fuzz Face inspired offering. The big difference is the "Trauma" control, when used with the Gain control, will yield tones from hard fuzz to octave up to sputtery pulse to "soft attack" fuzz. Good clean up with the guitar volume knob. It may be good to choose Q2 from a lot of J201s to give the best "soft attack" fuzz and octave up effects.

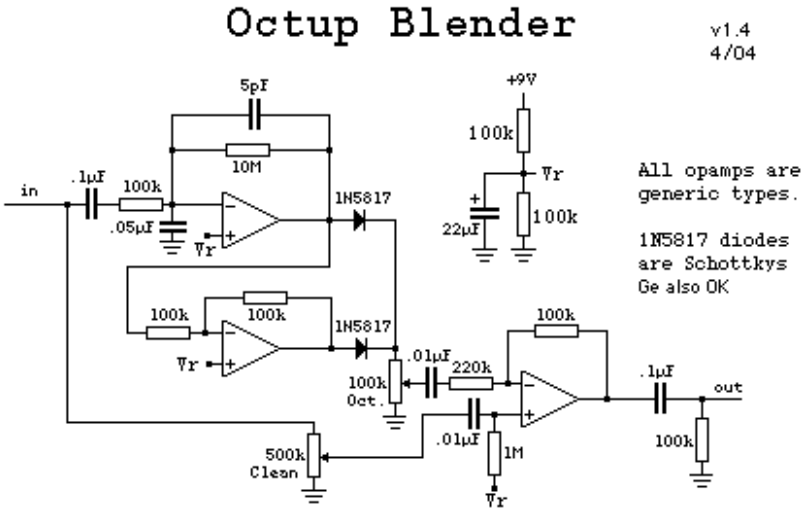
Thing Modulator

v 1.1

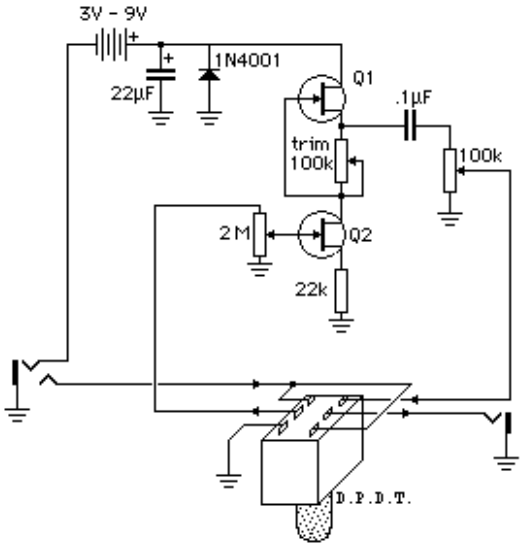
8/02



The Thing Modulator is inspired by the old Hemmo circuit. With the desire to make the thing shut up when I'm not playing, I found that using both a LMC567 (a CMOS 567) and a 100k/100µF RC network on the power pin go a long way to supressing the onboard oscillator, for a very simple, very low power (<100µA) pseudo ring modulator. Not perfect, but better. If you have access to a LMC567, it's worth a try.


Octup Blender
v1.4
4/04
5pF
10M
+9V
100k
Vr
22µF
100k
All opamps are
generic types.
1N5817 diodes
are Schottkys
Ge also OK
in
.1µF
100k
.05µF
Vr
1N5817
100k
100k
Vr
1N5817
100k
.01µF
220k
100k
Oct.
.1µF
out
.01µF
1M
100k
500k
Clean
Vr

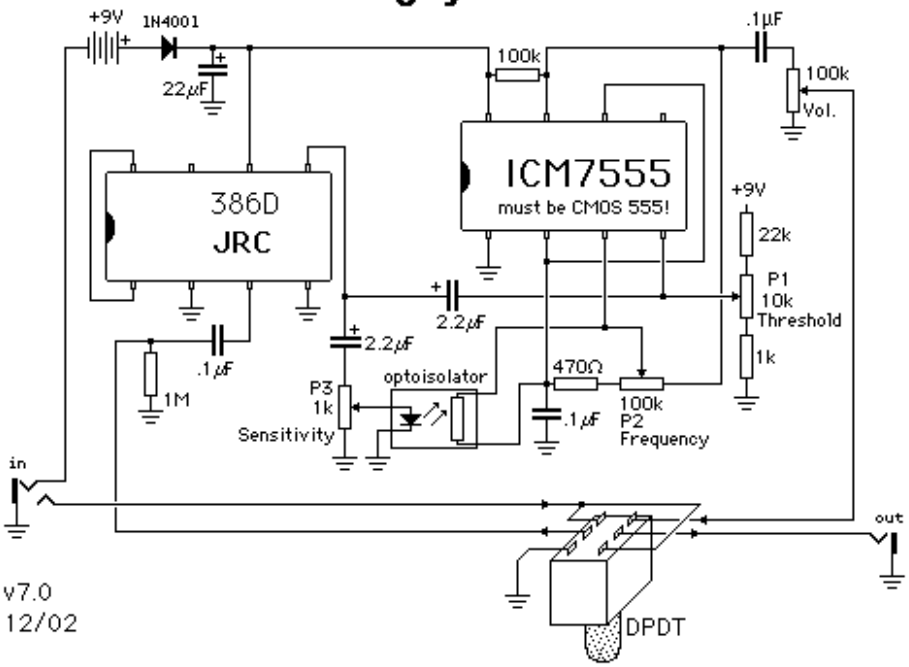
SyRuPP



v2.4 10/02

Here's my $.02 thrown into the Mini Booster pot. After eyeing the patent pointed out by Jack Orman, I decided to try a slightly different configuration to the now infamous Mini Booster (and all variations out there). The only unique things I've done are supplying +3V power, using two AA batteries, and using the 22k resistor. These two factors are what makes the SyRuPP stand out among guitar oriented µamps! The 22k resistor reduces current consumption to about 25 µA using Fairchild J201s! The two AA battery power supply will last a long time even if power is never turned off. I tried several different JFETs and they all worked when the 100k trimmer was set to the sweet spot. I use this as a overdrive. While it's fairly clean at minimum gain, it's never really pristine. And at maximum gain, the sound is pleasantly , well, syrup-y.

Uglyface



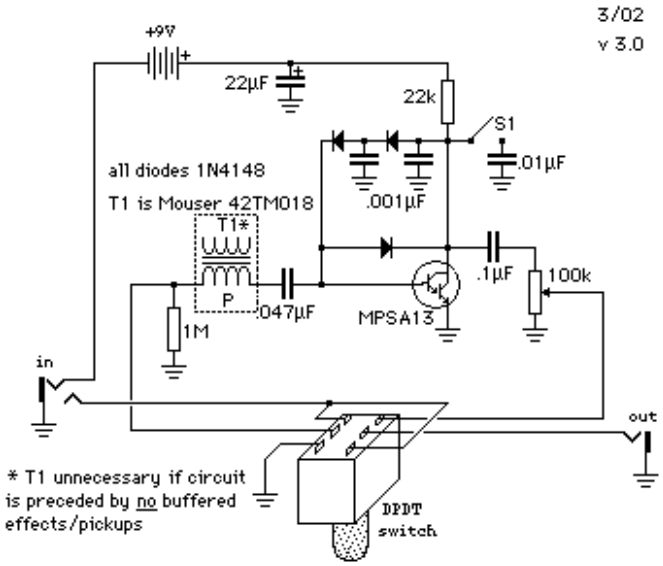
The Uglyface is a completely all-out fuzz unit for fat, noisy buzzsaw sounds. P1 sets the threshold for triggering the fuzz. This characteristic also means that notes can fade out abruptly when they decay below the set level. P2 is the frequency control. It functions as a unorthodox tone control, at one extreme producing synthesized octave down effects, at the other extreme, thin and nasal tones. When the threshold is set below the trigger point, the Uglyface becomes a free running oscillator, with P2 controlling the frequency. P3 is a Sensitivity control, regulating how much of the guitar signal will modulate the Frequency control.

Listen to sample of the Uglyface!

Now listen to sample of the Uglyface with envelope control!

This is what the Uglyface sound looks like.

The Bronx Cheer



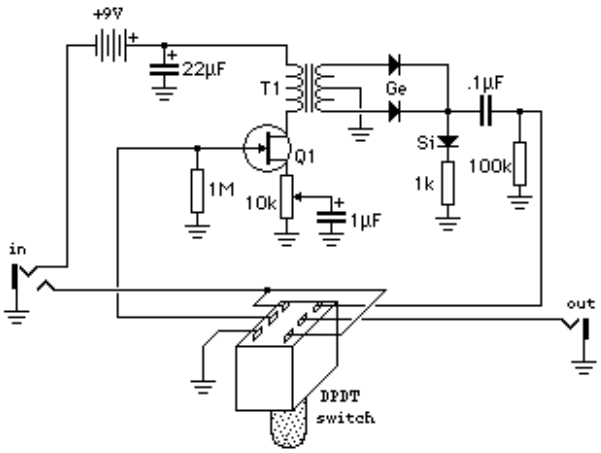
The Bronx Cheer is a envelope waveshaper filter. The resulting sound is unlike any effect ever heard before, short of a resonant VCF fuzz, or, well, raspberry. There are two simple controls. S1 is a hi-lo switch, changing the filtering frequency of the effect from high to low. And an output level control. That's it.

This effect is very responsive to playing dynamics and the timbre changes as notes fade away. Sounds can range from high resonance synth textures to wacky fuzz to bubbly raspberry, all depending on how hard the note is played, range of notes played, muting, etc. And it also does serious deconstruction to bass and keyboards, from cheesy Casio to high end modular. The greater the dynamic range, the more pronounced the effect.

Listen to sample of the Bronx Cheer!

This is what the Bronx Cheer sound looks like.

Jawari



v6.3
10/02

The Jawari is based on a pre-internet experiment I did. The word, "jawari" refers to the setup of the bridge on the Indian sitar, the characteristic which imparts a unique, buzzing quality.

This circuit, is similar in principle to octave-up effects, but the difference here is that gain is deliberately kept low. This difference is in dramatic contrast to the high gain used in most octave-up circuits, which helps increase sustain and bring out the upper harmonic.

Rather, this circuit exhibits a sustain reducing effect, in combination with a dramatic and dynamic timbre change, coaxing the tonalities of those stringed instruments from the East (like Neptune, NJ*) out of a normal electric guitar. It's especially suited to single note lines using the bridge pickup, or two out-of-phase pickups.

Q1 is a J201
T1 is a 10k:10k audio transformer Mouser 42TM018 or 42TL218
The Ge diodes are 1N34
The Si diode is 1N4148

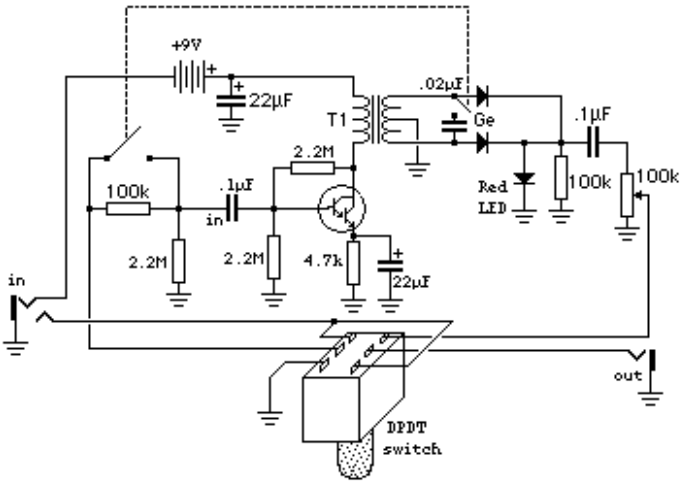
* Neptune, NJ was the home of the old Danelectro factory, original manufacturer of the Coral electric sitar, among other things.

Listen to sample of the Jawari!
Listen to another sample of the Jawari!
Proposed addition: DRONES!

Psychtar

v. 1.2

10/02



Q1 is a MPSA13
T1 is a 10k:10k audio transformer Mouser 42TM018
The Ge diodes are 1N34

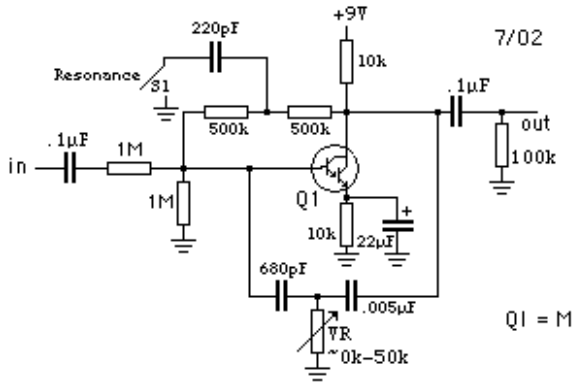
Goes from sitar to psycho!

Closing the DPST switch changes the effect from a Jawari-styled circuit to a nice octave up.

Idiot Wah

v. 1.3

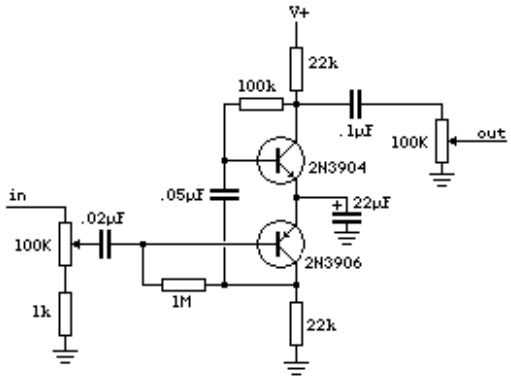
7/02



The Idiot Wah is a simple building block Bridged/Twin T filter giving a resonant lowpass response. It's specifically designed for electric guitar, for simplicity, and useability, making it a bit different different from similar designs. The input resistor helps the input from loading down and attenuates the input signal. The Darlington transistor has enough gain to keep the output at about unity. Biasing helps keep the distortion down. And most unusual, the unequal capacitors in the T network give a more useful, more musical range than the typical matched values.

VR can be a pot, a LDR, or any type of variable resistive element. Being a resistor to ground allows many different schemes to be used to control the cutoff frequency of the filter.

Harmonic Jerkulator



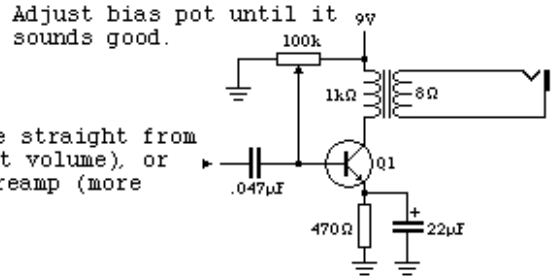
v. 1.1
1/24/02

My take on the odd and mysterious Interfax Harmonic Percolator. Basically, I changed all the parts so that I could substitute common parts (which I have) for the uncommon original parts (which I don't have). I also omitted the Ge clipping diodes on the output (contained in the original), to get a better listen to the bare circuit.

Which I'm pleased with. Very much a "transistor drive" sound, that cleans up as the guitar volume is backed off. Important to drive this circuit directly with passive guitar pickups for best sound (like other discrete transistor designs). Current consumption is very low, less than 200 µA.

Ultra Class A Superdrive Power Amp

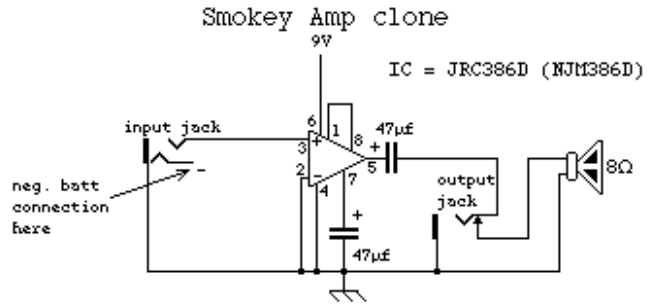
** Signature Series **



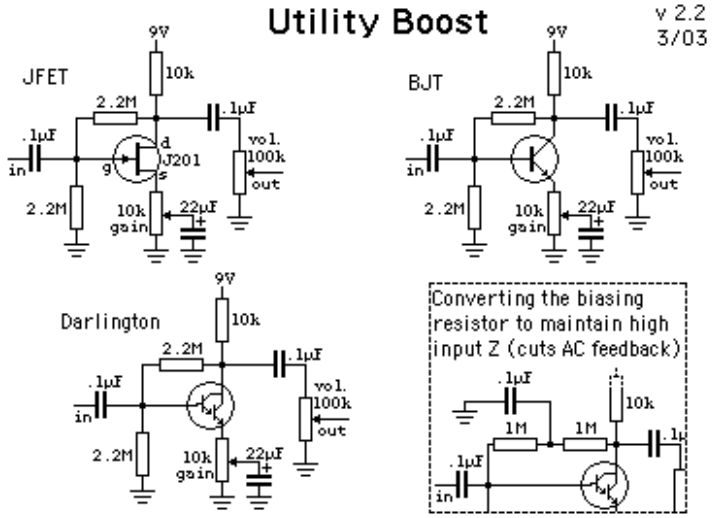
Q1 can be any of several silicon transistors. 2N3904, MPSA18, MPSA14, even 2N7000 all worked with a little tweaking of the bias pot.

Sound level isn't earth shattering by any means, but unique, especially when driven by a fuzz circuit. Current draw was around 4-6 mA. depending on Q1 and bias.

rev 1.0
12/3/01

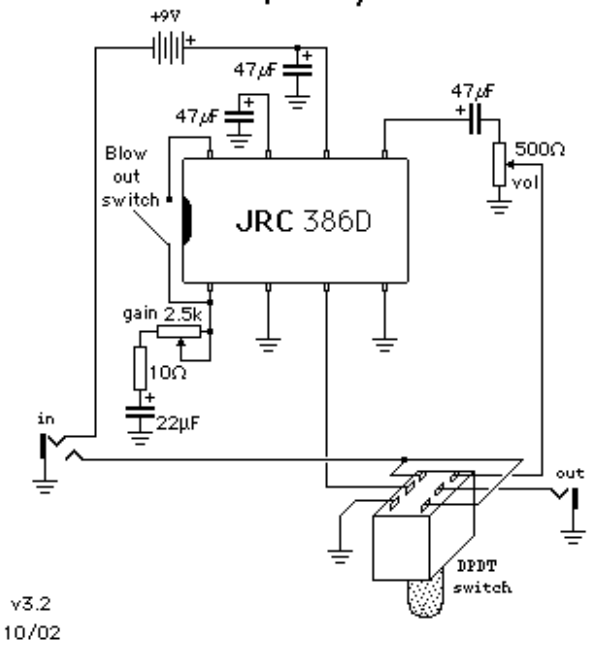


The JRC386D aka NJM386D (used in the Smokey) seems more stable and easier to tame than the National Semiconductor LM386. If yours is unstable, oscillates, or unusually yucky sounding, use the inverting input (pin 2) and ground the non-inverting input (pin 3). This may help. For less distortion, run at 12 Volts. for variable gain, put a switch between pins 1 and 8.



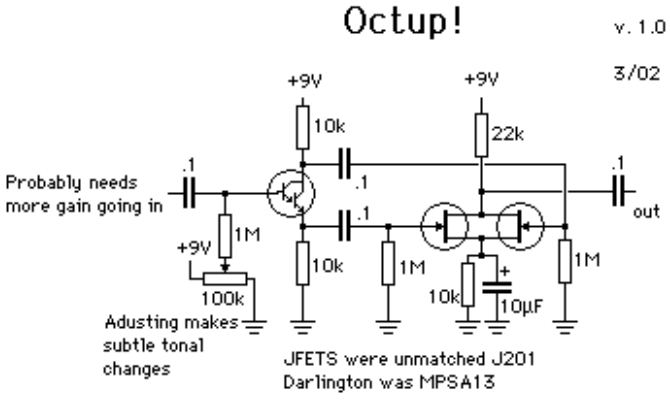
Simple booster/preamp for electric guitar or anything. J201 version is fairly clean even at max gain, high input Z, breaks up nicely. BJT version has lower input Z, more gain, breaks up more harshly (MPSA18, 2N3904, NTE103 tested). Darlington version is like BJT, high gain, breaks up harshly, but with higher input Z. Each circuit draws less than 500µA. Same circuit works with J201, MPSA18, 2N3904, NTE103, MPSA13, MPSA14.

Stupidity Box



The Stupidity Box has evolved from a plain distortion box into a plain distortion/power amp. Works like a normal dist box, plug it into a speaker cab, crank the volume, and it's a high gain 1/2W power amp. The JRC386D (NJM386D) is a must in this circuit.

Octup!



Promising, fairly clean octave up. Just breadboarded once. YMMV!

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Any questions? tpe123@yahoo.com