SAUCE OF UNCE

BUILD INFO

nonlinearcircuits

This circuit is based on the Buchla 265 Source of Uncertainty. Functionally it is very similar to the original circuit; the difference is sections of the circuit have been redesigned to use common components. The original 265 SOU used a number of rare components and required 24V to power one section.

This module works fine at +/-12V and at +/-15V and does not require any unobtanium.

These build notes assume you are a reasonably experienced builder, this module is **not** suitable as a 1st, 2nd or even 3rd project.

Please follow the build notes carefully **before starting** as there are a few places where you need to select resistors to obtain outputs that operate in the voltage ranges you require.

BOM

BC547 (marked “n” on PCB)	2	npn
BC557 (marked “p” on PCB)	1	pnp
J108 (marked “gsd” on PCB)	2	FET J112 works too
TL074	4	**SMT SOIC** - 0.050 pitch - 14 pin
dual Vactrol	1	VTL 5C2/2, 5C3/2 maybe the slower 2/2 is best. I used some NOS Silonex which are very slow.
single Vactrol	1	Silonex NSL32 or Macron or Vactrol
10 pin euro power connector	1	
100k pots	2	see notes
Kobiconn sockets	7	see notes
LEDs	2	Select RL resistors to suit LED brightness
10uF electro caps	4	2mm lead spacing
decoupling caps 47nF-100nF	7	value not marked on PCB, 2.5mm lead spacing
10uF BP electro	1	non-polarised, 2.5mm lead spacing
4.7uF electro	1	2.5mm lead spacing
1nF (102)	4	4.5mm lead spacing
10nF (103)	2	4.5mm lead spacing
100nF (104)	2	4.5mm lead spacing
150nF (154)	1	poly….use a good one,
1uF (105)	3	4.5mm lead spacing
22nF (223)	1	4.5mm lead spacing

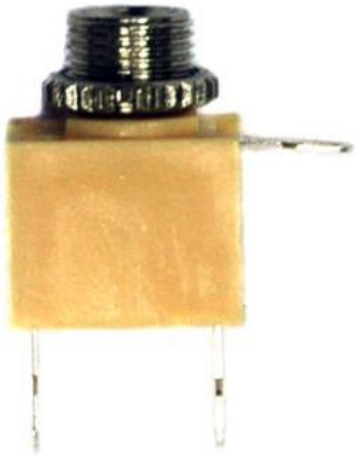
10R	2	thru-hole
220R	3	thru-hole
1k5	1	thru-hole
2k2	3	thru-hole
5k6	1	thru-hole
6k8	2	thru-hole, see notes
8k2	1	thru-hole, see notes
10k	4	thru-hole, see notes
12k	1	thru-hole
15k	4	thru-hole
27k	1	thru-hole
33k	2	thru-hole, see notes
39k	1	thru-hole
47k	1	thru-hole
51k	2	thru-hole
68k	4	thru-hole
82k	1	thru-hole
100k	1	thru-hole
150k	1	thru-hole
220k	1	thru-hole
330k	1	thru-hole
470k	2	thru-hole
1M	4	thru-hole
10M	5	thru-hole
RL resistors	2	select to suit LED brightness, thru-hole
1k (marked “1”)	4	1206 or 0805
10k (marked “d”)	10	1206 or 0805
100k (marked “c”)	7	1206 or 0805
3V9 zener diode	1	thru-hole

notes:

sockets

The PCB takes Kobiconn sockets, other types will not fit. I buy Kobiconn clones from this ebay seller. They are fine and he has been reliable – wonderco_buy

search his store for: Earphone Phone Jack 3.5mm SCJ-310 3P Mono + On/Off



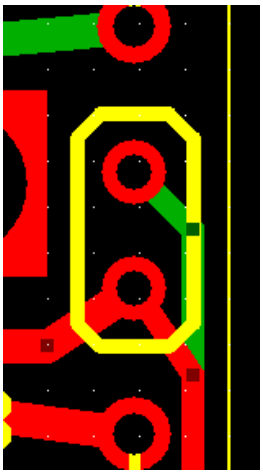
pots

These are a common footprint, if you have built any of my boards before you know what to get. I use 100k pots from Song Huei - R0903N-B100k, L-25KC (the 25 is the length L).

These ones from Tayda are cheap and good - http://www.taydaelectronics.com/potentiometer-variable-resistors/rotary-potentiometer/linear/100k-ohm-linear-taper-potentiometer-round-shaft-pcb-9mm.html

decoupling caps

There are unmarked decoupling caps on the PCB, these have a 2.5mm lead spacing, install 47nF – 100nF caps, ceramics will do. The decoupling caps look like this on the PCB:



BUILDING

1. Install the four TL074 ICs first, otherwise it will be VERY difficult to install them after all the other components are on the board.
2. Install the rest of the smd components next. There are only three vaues, the pads are for 1206 but you can easily it 0805 on there as well. These smd parts go on both sides of the PCB.

c = 100k

d= 10k

1 = 1k

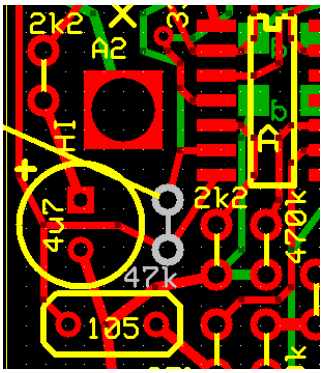
3. Install the rest of the components in the usual order: resistors, transistors, caps. **BUT FIRST**

there are three sections to consider:

1. Procedure to set noise levels

The resistor marked '47k' next to the 4u7 electro capacitor sets the level of the noise outputs and determines the behaviour of the entire circuit. Normally when a transistor based noise circuit is built, the builder has to select the transistor to get the desirable noise levels. In this circuit you use any BC547 transistor and select the resistor to set the noise level. My first and second proto-types used 47k to get 5-6V noise levels; the third one I built used a 12k resistor, obviously a very noisy transistor.

So, **leave out** the 47k resistor mentioned above and shown below, until everything else has been built –



When the circuit is built, turn it on and measure the voltage of the signal at **pin 1** of the TL074 (A) next to the 47k resistor. Ideally use an oscilloscope and look at the lovely noise, possibly a multimeter will work as the noise is quite solid and may look like DC. You can expect get a voltage of 0.2 to 1.2V. Whatever you get, assuming you want noise levels of 5-6V, use this equation to determine the resistor:

$$\frac{11000}{your\ voltage\ at\ pin\ 1} = resistor\ \Omega$$

Just choose a resistor the next standard value up from your answer.

So, for example, if you measure 0.25V at pin 1 of TL074 (A), you would calculate 11000/0.25 = 44000, so use a 47k resistor

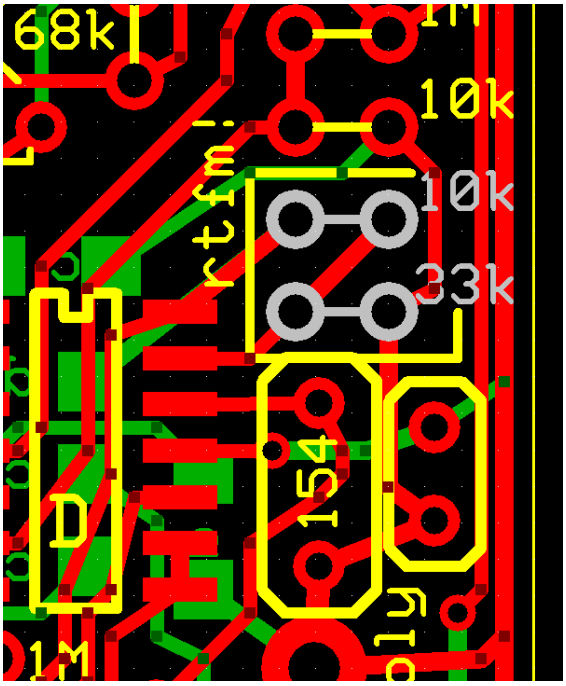
If you measure 1V at pin 1, you would calculate 11000/1 = 11000, so use a 12k resistor.

If you do not get this, email me or pm on Muffs or ask in the thread on Muffs.

2. Set output level of stored random section

If building for Euro**, leave out the 10k and 33k resistors** shown below, in the box marked “rtfm”. **Install a link in the 10k position, leave the 33k empty**. This will give outputs ranging from 0 to 5-6V.

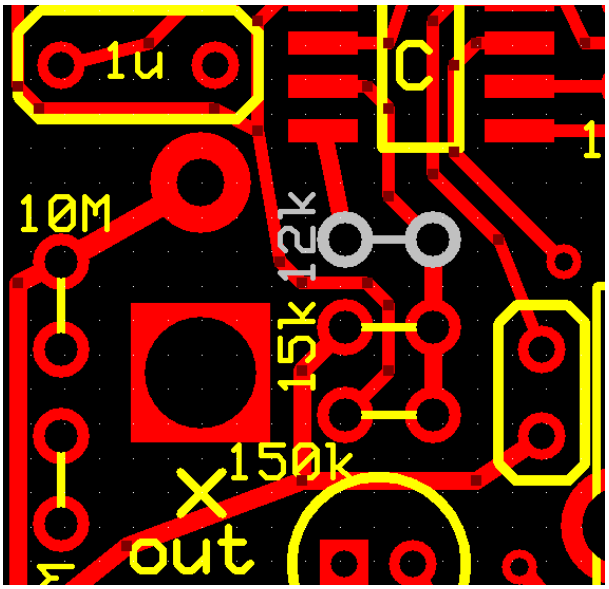
For Buchla systems, install the 10k and 33k resistors to increase the voltage swing.



3. Set output level for the Random out

For **Eurorack systems do not install the 12k** as shown below. **Instead install 6k8 or 8k2** to get the random (smooth) voltages going up to 5-6V.

For Buchla systems, install the 12k.



Wiring

no wiring ☺

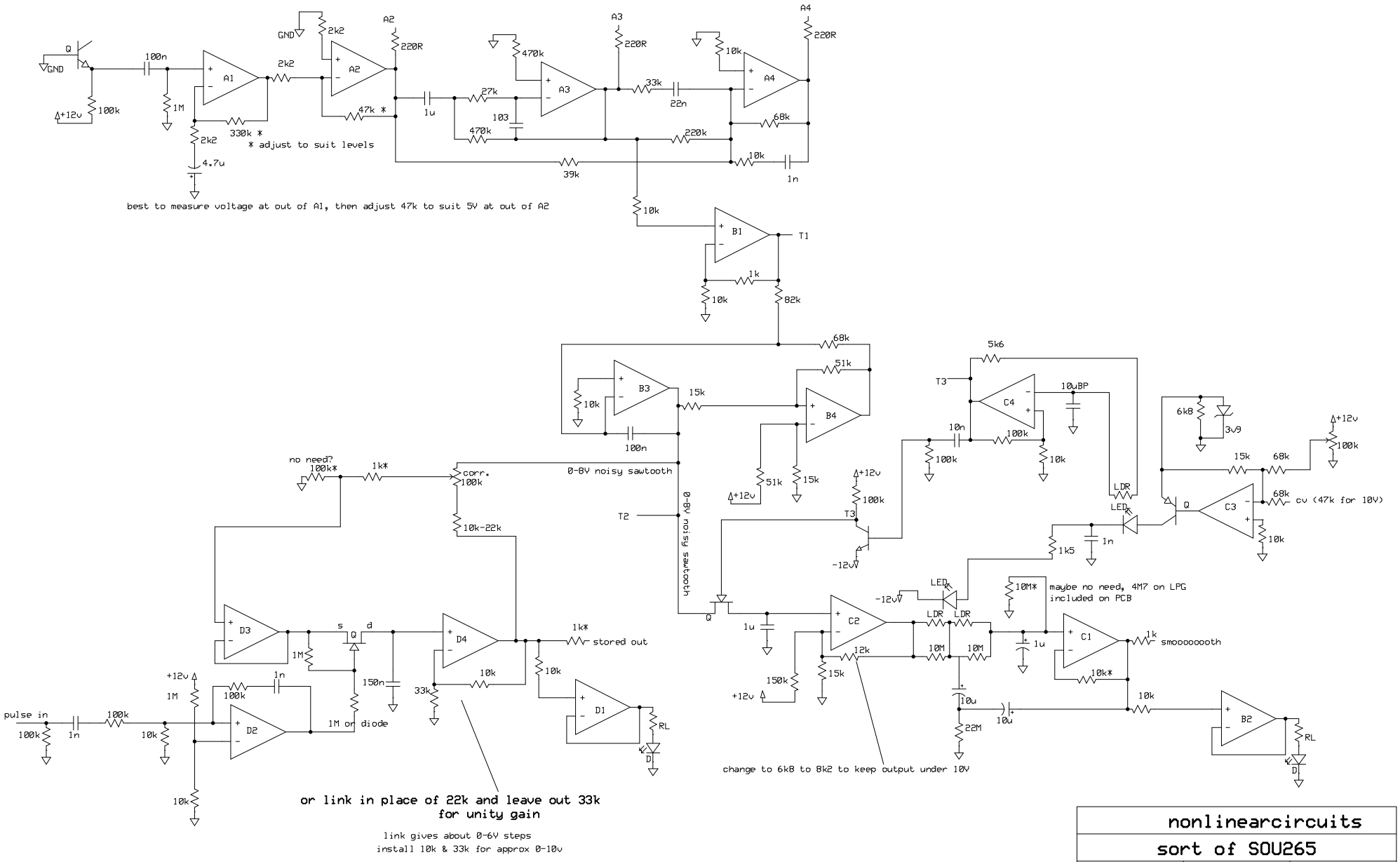
Testing

There are three test points, useful for troubleshooting, marked T1, T2, T3. You need an oscilloscope to test them.

T1 should be a random noise signal, approx 5V amplitude. A bit bigger or smaller is okay.

T2 should be a 'noisy' or jittery sawtooth, about 8V amplitude, around 100Hz. It does not have to be exactly these values, near enough is fine.

T3 is the output of the VCO, should be a square-wave bouncing from +10V to -10V and changing frequency as you tweak the Random pot. The frequency should go from very slow (say every 20 seconds) to 30Hz. Again these values do not need to be exact, the frequency range will depend a lot on your single vactrol.



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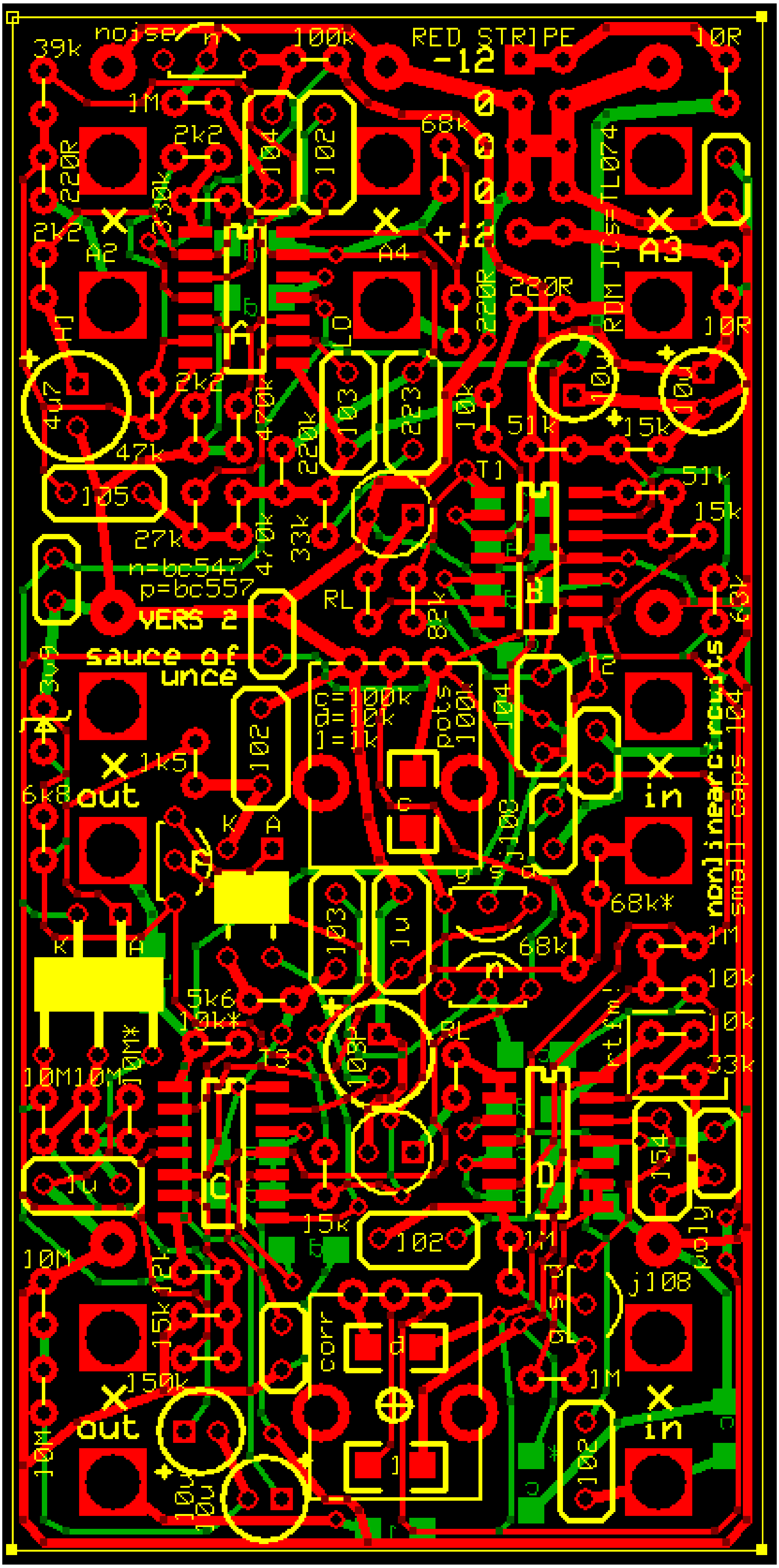

noise
RED STRIPE
-12
0
+12
A2
A4
A3
HI
LO
RDM ICs=TL074
n=bc547
p=bc557
VERS 2
sauce of
unce
c=100k
a=10k
l=1k
pots
100k
out
in
out
in
nonlinearcircuits
small caps 104
63v
corr
poly
j108