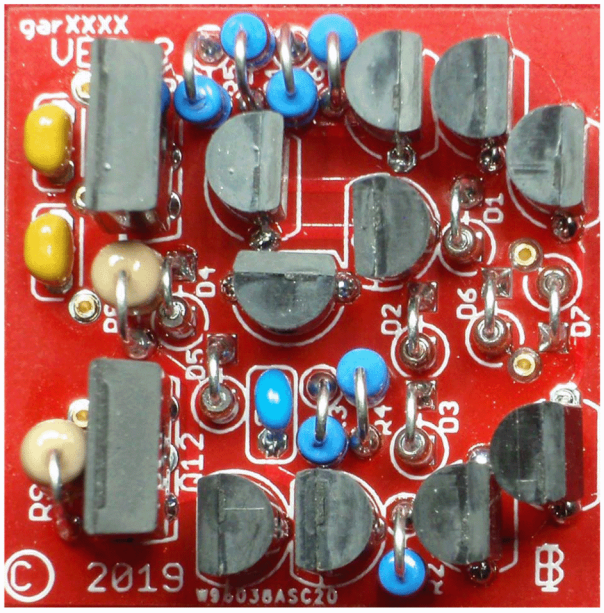
garXXXX ASSEMBLY MANUAL

(BASED ON OA10)



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Recommended Tools for Assembly:

Small conical tip iron… the smaller the better.
Recommended… Hakko FX 888-D
https://www.hakko.com/english/products/hakko_fx888d.html

For best results use Kester 44   63/37 .031 or small solder.

A Panavise or small bench vice for holding the PCB while soldering.

A magnifying light.

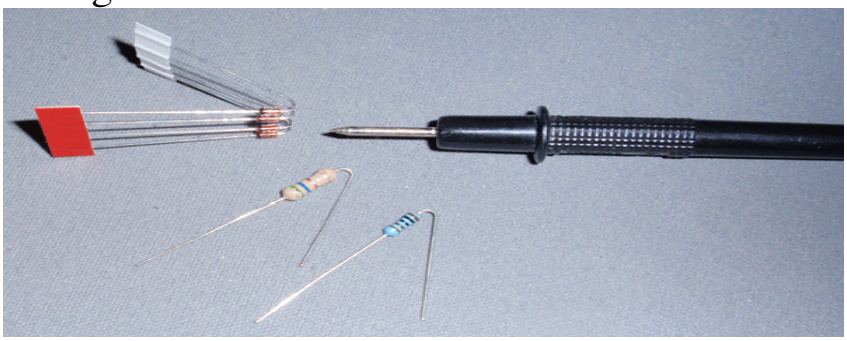
A sharp pair of small dykes.
Recommended….CHP170
http://www.all-spec.com/products/CHP-170.html

WARNING: WEAR EYE PROTECTION WHEN CLIPING WIRE ENDS !!

Solder wick or Soldapullt or
Recommended.. The Hakko 808 or FR300 Desoldering Station
Once you try one you will never go back to wick etc.

VOM Meter for checking Resistor values

A small screwdiver shaft or meter probe
For bending Resistor and Diode leads



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ASSEMBLY TIPS

FOR ALL "gar" KITS

Note that the OUTPUT transistors are **NOT** the same. One is a NPN and the other is a PNP. Make sure that they are in the correct positions and facing the correct direction

Note the BLUE Murata caps are all different values. Make sure you got the correct cap in the correct positions.

Note that the DIODES are polarized. Make sure that the black band on the diode is in the hole with the circle. Note the diode pads on the PCB are square shaped. They are the ONLY square pads on the PCB.

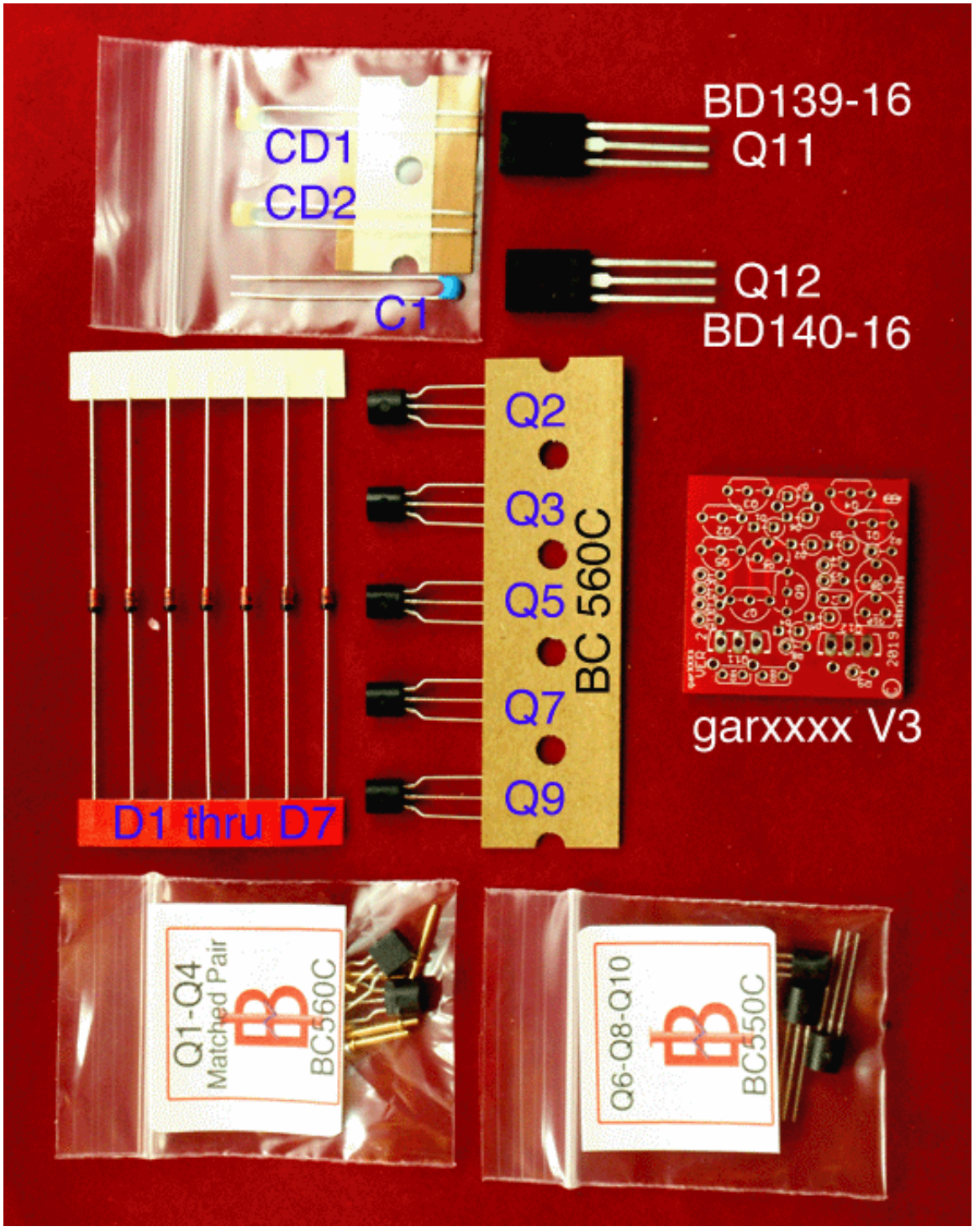
All BC560C transistors are on tape. (Except for the Matched pairs in the gar918 and garxxxx(OA10) kits. These are in little bags with the milmax pins.) The pads on the PCB are in a straight line for the BC560Cs and only these so that they will not be confused with the BC550C pads. Make sure they are facing the correct way as shown on the silkscreen.

All BC550Cs transistors are in little bags. One of the bags is for the MATCHED input pair (gar2520, gar1731 garAM10 kits) and this bag will also include the Millmax pins. Do not remove the transistors from this bag until installing them so they do not get mixed up with the other BC550C transistors in the kit. All BC550C pads on the pcb are in a triangle formation so as not to be confused with the straight line BC560C pads. Make sure they are facing the correct way as shown on the silkscreen.

Measure all RESISTOR values at instillation and install according to this manual. In general, be careful when measuring values above 100k so you will not be including your skin resistance in the measurement.

Note on part substitutions in kits.....
Occasionally the parts listed in the BOM of each kit maybe temporarily unavailable from my parts supplier. A substitution part will be included in the kit. These parts will be of the same value, tolerance and quality of the part listed in the BOM.

For you folks sourcing your own parts For your builds....,
All the ¼ watt resistors use any major brand 1% metal film.
The ½ watt resistors can be any major brand carbon film or metal film 5% or better.
The Murata caps can be 50v or 100v 5%. Any major brand npo/cog 5% with the lead spacing of .1" or 2.5mm can be used if necessary..
Output transistors can be ON semi, Fairchild or ST micro transistors.
Note that the ST micro transistors have a slightly different
Package but will drop right in the PCB just fine.



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STUFFING ORDER

Cs

Ds

550

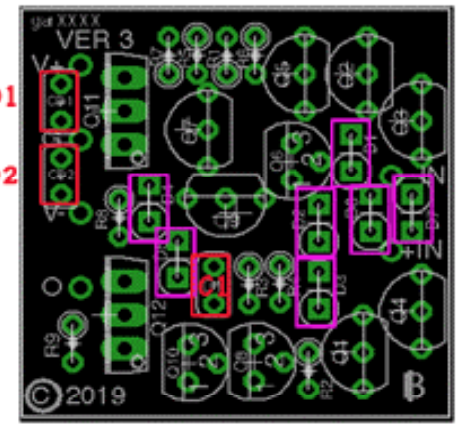
560

560Match

Rs

Q11,Q12

Pins

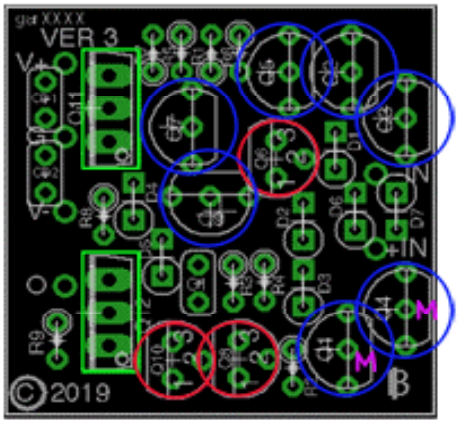


1N4148 diodes or 1N914

CD1 CD2 .1uf

C1 47pf

Q11, Q12 face this way>>>>>>



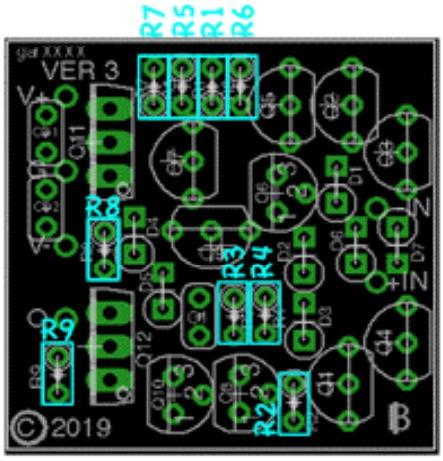
BC550CBU Q6, Q8, Q10

550 Triangle footprint

BC560CTA Q2, Q3, Q5, Q7, Q9

560 inline footprint

M BC560CTA MATCH hFe Q1, Q4



R1, R4 1.2k

R2, R5 2.7k

R3 120R

R6 4.7Meg

R7 330R

R8 10R 1/2W

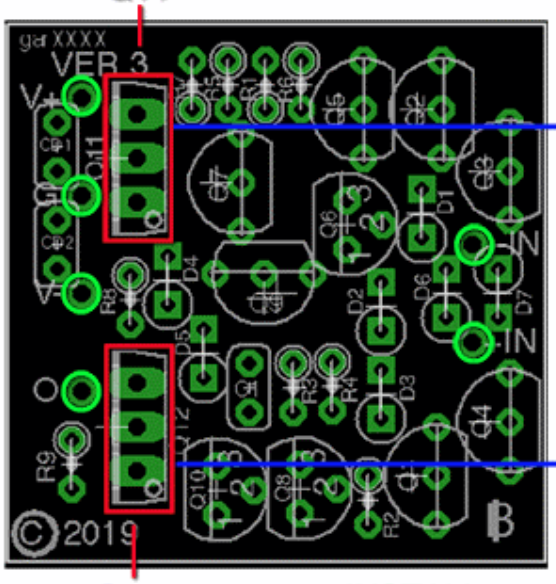
R9 3.3R 1/2W

OUTPUTS & PINS

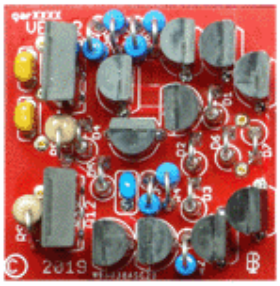
INSTALL ORDER

Q11) BD139-16

Q12) BD140-16

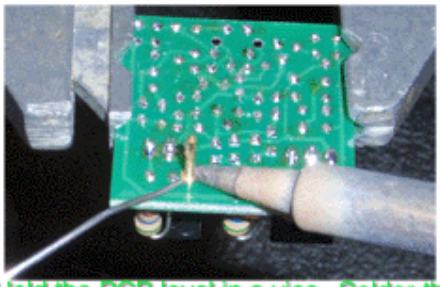


MAKE SURE PRINTING ON TRANSISTORS FACE THIS DIRECTION



MILLMAX PINS

INSTALL 6 MILLMAX PINS ON THE BOTTOM OF THE PCB



Hold the PCB level in a vice. Solder the pins at the Base of the Pin. Don't let the Solder get on the pin more than an 1/8" above the PCB.

garXXXX BOM

Part#	VALUE	Mouser#	Notes
R1	1.2k	271-1.2k-RC	
R2	2.7k	271-2.7-RC	
R3	120 ohm	271-120-RC	
R4	1.2k	271-1.2k-RC	
R5	2.7k	271-2.7-RC	
R6	4.7 Meg	603-MFR-25FBF52-4M7	
R7	330 ohm	271-330-RC	
R8	10 ohm	293-10-RC	1/2Watt
R9	3.3 ohm	291-3.3-RC	1/2Watt
CD1	.1uf	594-K104K15XR7RF5TL2	
CD2	.1uf	594-K104K15XR7RF5TL2	
C1	47pf	RCE5C1H470J0A2H03B	
D1-7	1N4148	512-1N4148TR	1N914
Q1	BC560C	512-BC560CTA	MATCH
Q4	BC560C	512-BC560CTA	MATCH
Q2	BC560C	512-BC560CTA	On TAPE
Q3	BC560C	512-BC560CTA	On TAPE
Q5	BC560C	512-BC560CTA	On TAPE
Q7	BC560C	512-BC560CTA	On TAPE
Q9	BC560C	512-BC560CTA	On TAPE
Q6	BC550C	512-BC550CBU	Bulk
Q8	BC550C	512-BC550CBU	Bulk
Q10	BC550C		
Q11	BD139-16	512-BD13916S	BULK
			or
Q12	BD140-16	512-BD14016S	RAIL
Pins	MILLMAX	575-310320	

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Disclaimer time....

USE COMMON SENSE WHEN USING TOOLS !

If you burn yourself, burn down your house when soldering or put your eye out clipping wire ends... DON'T COME TO US !!

YOU HAVE BEEN DULY WARNED !!