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NV73

ASSEMBLY GUIDE

REV: 1:01

QUICK ASSEMBLY GUIDE

7 STEPS TO MIC PRE HEAVEN!

1. **Solder parts on PCBs**
2. **Solder transformers**
3. **Insert transistors**
4. **Place PCBs in metal work**
5. **Initial test**
6. **Set bias**
7. **Attach face plate & knobs**

Record!

Frequently Asked Questions (FAQ)

Q. Is there a schematic that would be useful?

A. For reference you can download the Neve 1073 manual from AMS Neve website.
http://www.ams-neve.com/Sites/8/Files/Documents/Outboard/1073DPA_DPD_User_Manual.pdf
PCB designations reference this.

Q. What does the letter after a part number mean? e.g. C12A

A. The last letter of part numbers refers to which circuit/card it is part of.

e.g.	A = BA283AM	e.g. C12A is C12 on BA283AM circuit
	B = BA283NV	e.g. R3B is R3 on BA283NV circuit
	C = BA284	e.g. T1C is T1 on BA284 circuit

Q. Which lunchbox can I use this with? API 500 series? GDIY 51X series?

A. Both!
If you wish to use this with a GDIY lunchbox utilising the 24V rail. then follow the instructions in blue.

If you wish to use a normal API standard lunchbox, follow the instructions in red.

Q. Who can build this?

A. You!
As long as you have patience and are thorough in your work, anyone can build this mic pre. There's lots of support and information and it is tried and tested. There is very little off board wiring too.

1. Solder parts on PCBs

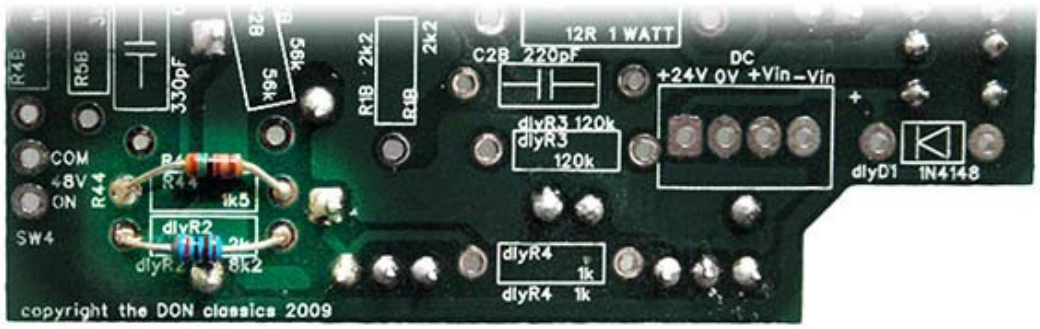
Insert all parts on to the PCB as marked on the silkscreen.
Silkscreens can be downloaded here:
http://www.thedonclassics.com/nv73-diy_manual.html

GENERAL TIPS:

- Start with smaller parts (resistors etc.) and work up to the larger parts (caps etc.)
- Solder sockets for transistors on all boards apart from the ***PS16Vto24V*** PCB and underside of ***MAIN*** PCB.
- Fit parts on the underside of PCBs first as there will be less room later.
- Take care when soldering polystyrene caps as they are particularly sensitive to heat. So try not to take too long when soldering them.
- Do not solder the main gain switch (Grayhill rotary switch) until after the PCB is in the metal work. Then you can line it up better before soldering through the bottom of the L-bracket.

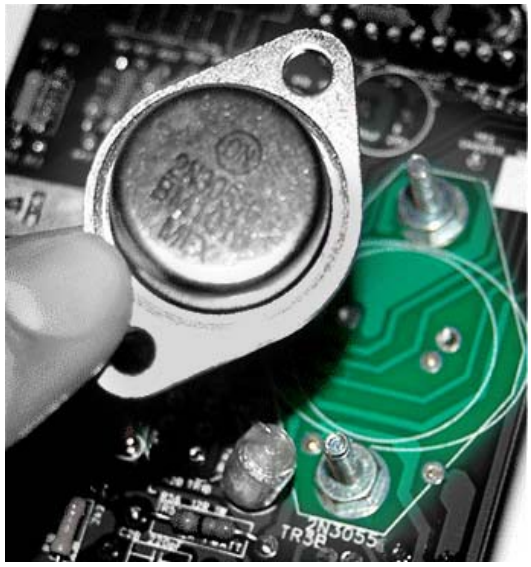
a) Solder *MAIN* PCB

- 220pF cap MUST be soldered on the bottom of the PCB (OR ***16Vto24V*** PCB won't fit in & you'll be slightly over 38.1mm in width)
- Keep all parts on underside of board less than 6.35mm in HEIGHT (or PCB won't screw down enough) Use a standoff as a guide.
- Cut legs of underside of DC-DC header (OR they'll short to metal work)
- Keep a space in between 8.2k and 1.5k resistors for small PCB to slot in (OR ***16Vto24V*** PCB won't fit in and you'll be slightly over 38.1mm in width)



- Keep legs cut short on topside of ***MAIN*** PCB,where the ***16Vto24V*** PCB will push up tight against main board (OR again you'll be over 38.1mm)

- Place screws for 2N3055 as shown before soldering.

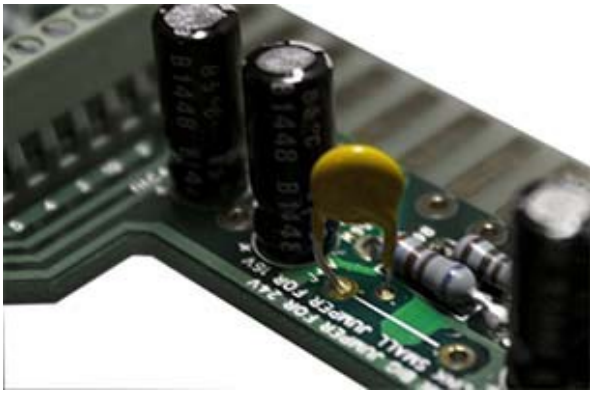


Place the following parts on the underside of the PCB to aid the build. (this will leave more space for things on the topside)

- 180pF cap
- 10R resistor
- 330pF cap
- 220pF cap

Setting for 500 series or 51X series

For the jumper position, use one of the PTC fuses. The position depends on whether you are building for 500 series (+-16V) or you are using a 51X lunchbox with 24V rail.

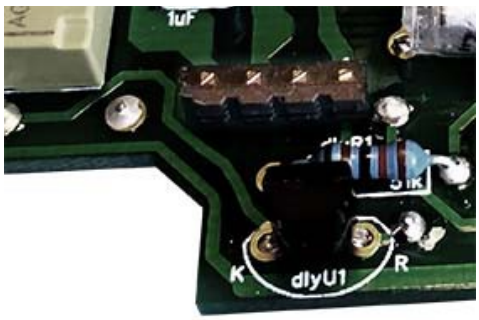


500 series position

51X series position

For the DC jumper setting:

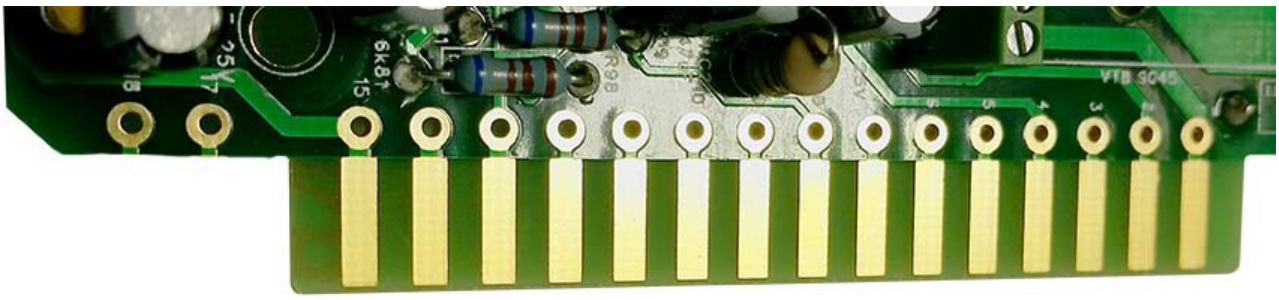
Use the gold header header for 500 series. Fit from bottom so the black plastic is on the underside, with the long gold prongs fitting through the PCB. Cut the legs on the underside to make sure no chance of shorting to metal.



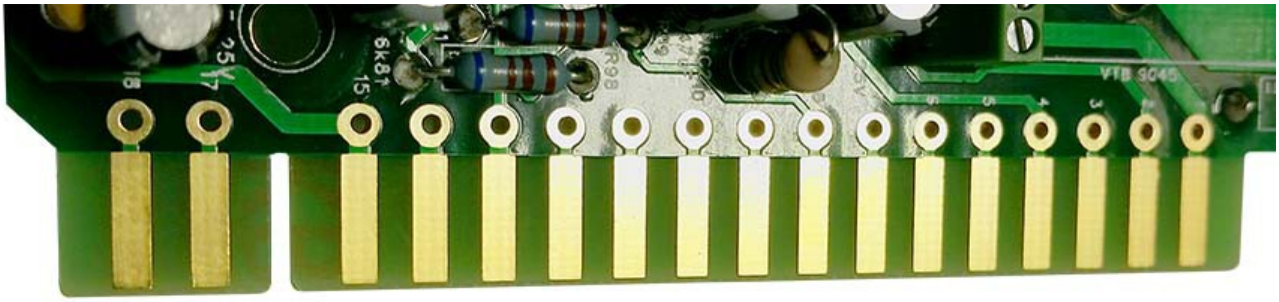
For 51X series, with a leftover resistor leg, join the hole marked **+24V** to the hole marked **+Vin**

Gold fingers:

For 500 series, you will also need to cut the extra 2 edge gold fingers to fit in a standard lunchbox. Use can use a small hacksaw or dremel.



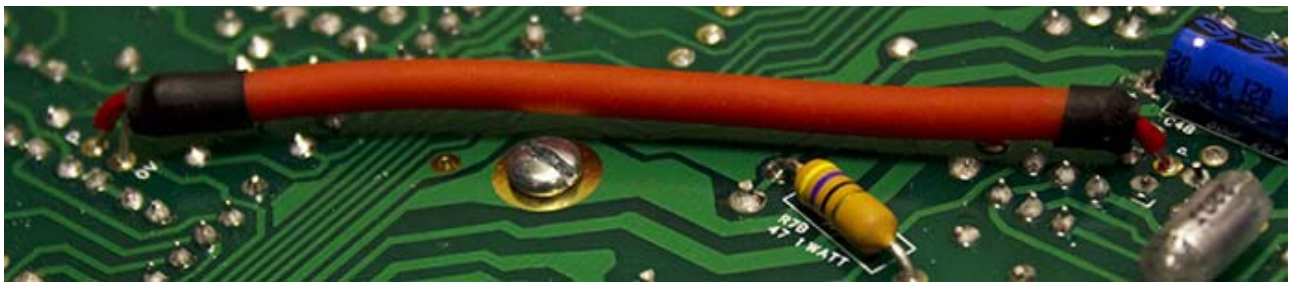
For 51X series, you will leave the 18 pins intact of course.



Wire the pot & switch

i) Wire P underneath the main PCB

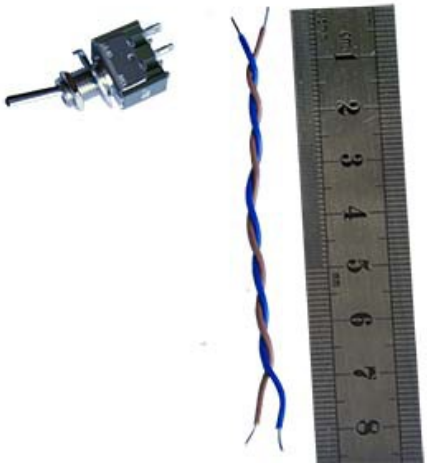
Use a shielded cable. Wire P to P.

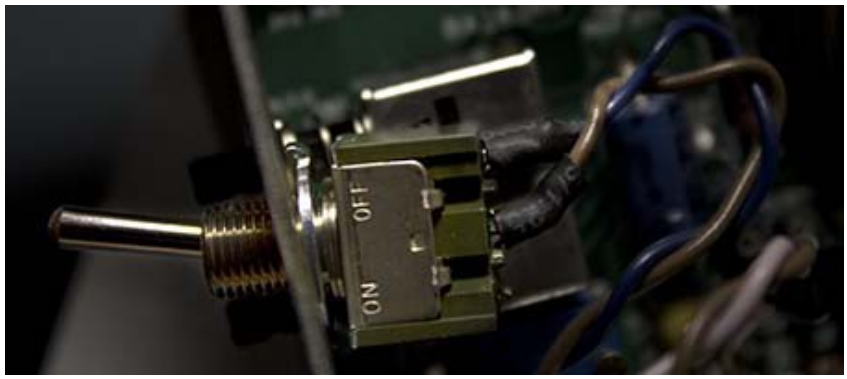


Connect the shield at one end marked 0V and cut off the shield at the other end.

TIP: To keep things tidy and to avoid any shorts, use a little heatshrink.

ii) Wire the 48V switch





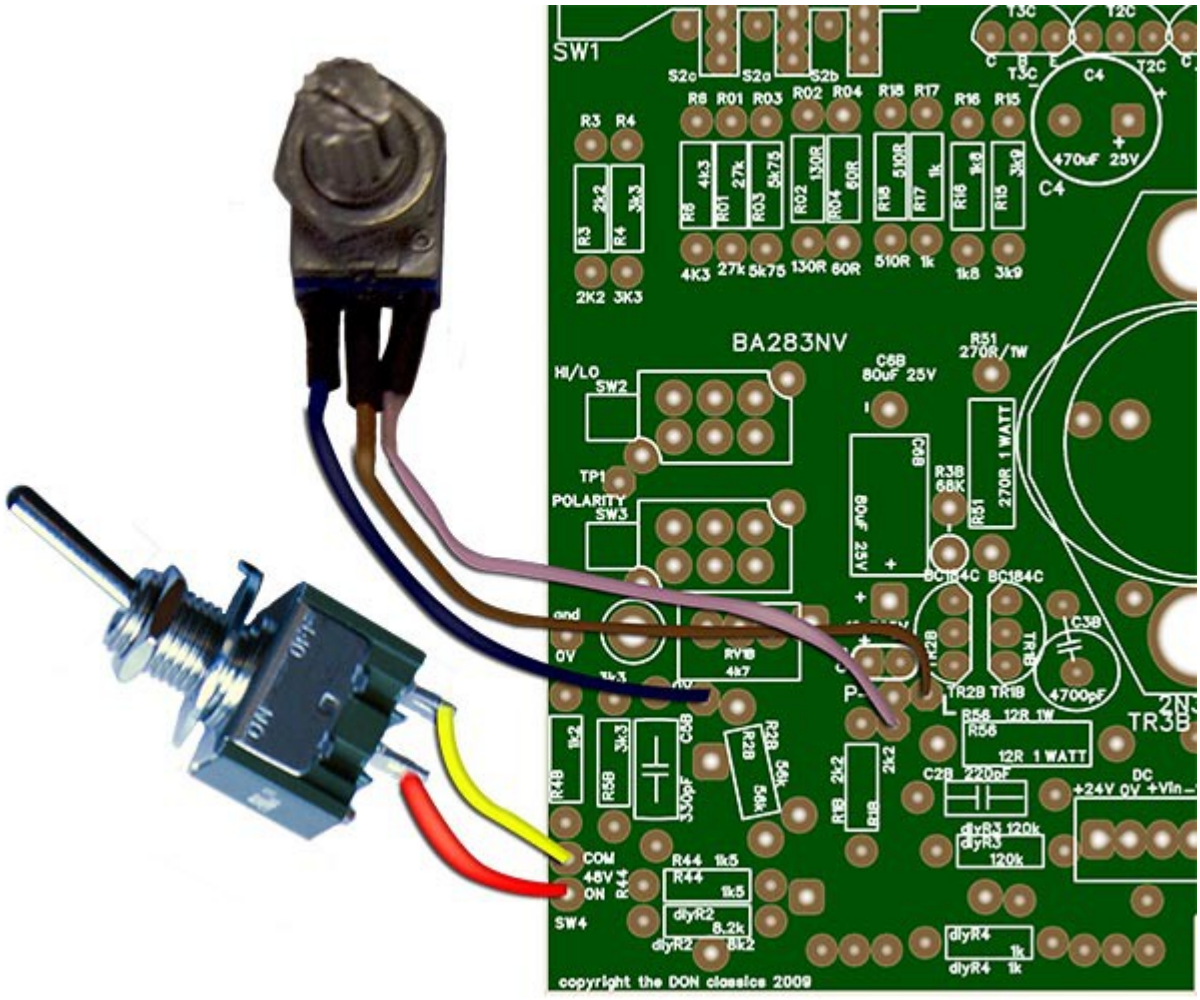
Use any equipment hook up wire..
Something around 22AWG to 24AWG.

TIP: To keep things tidy and to avoid any shorts, use a little heatshrink again.

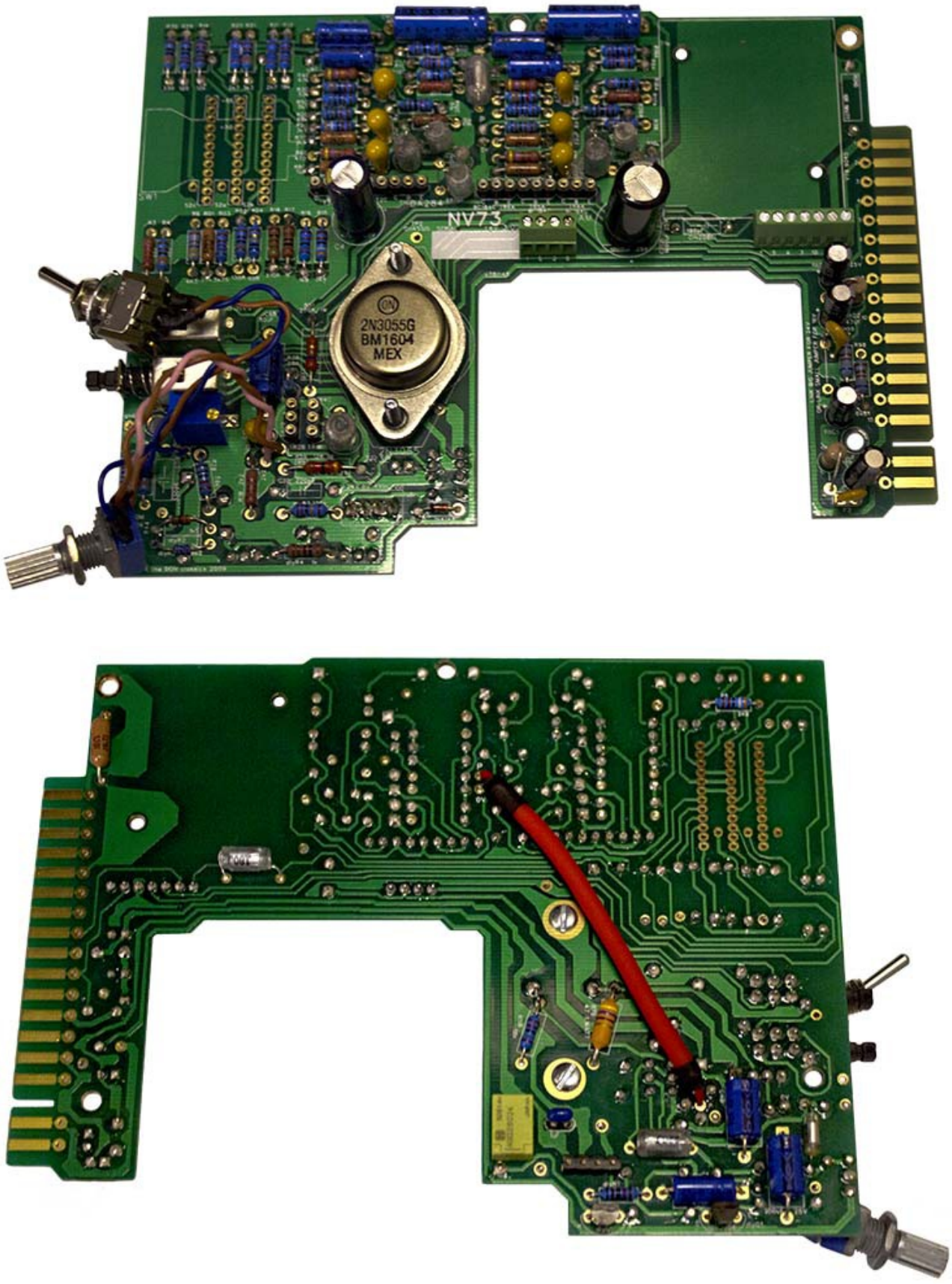
iii) Wire the output pot

Again, use any equipment hook up wire..
Something around 20AWG to 24AWG.

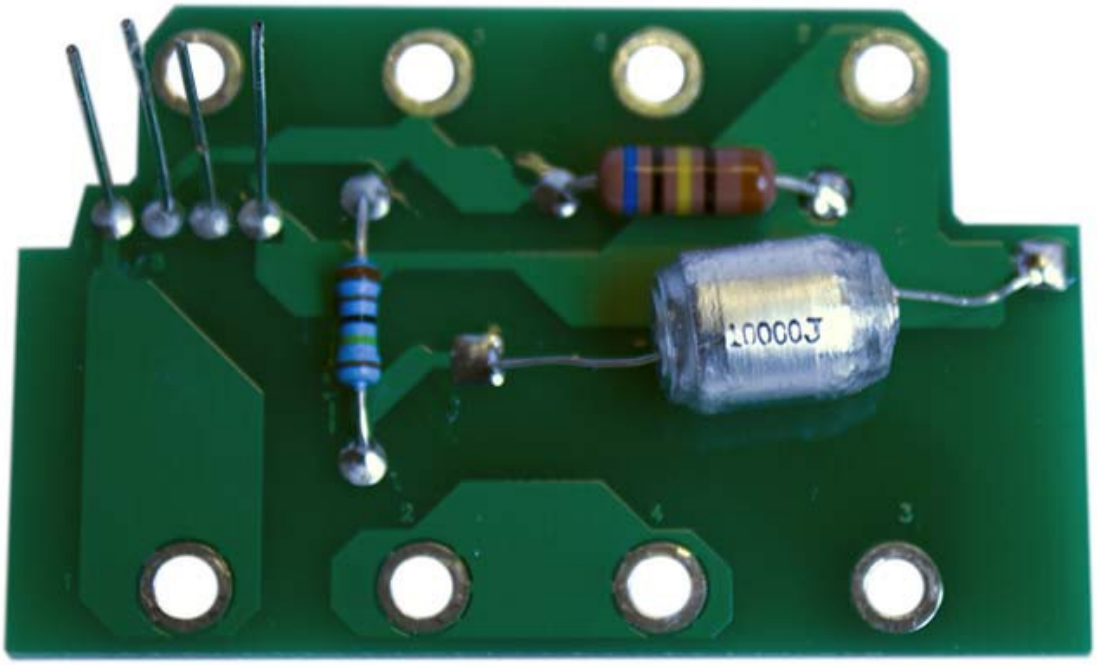
TIP: Again, to keep things tidy and to avoid any shorts, use a little heatshrink again.



The PCBs will end up looking like this:

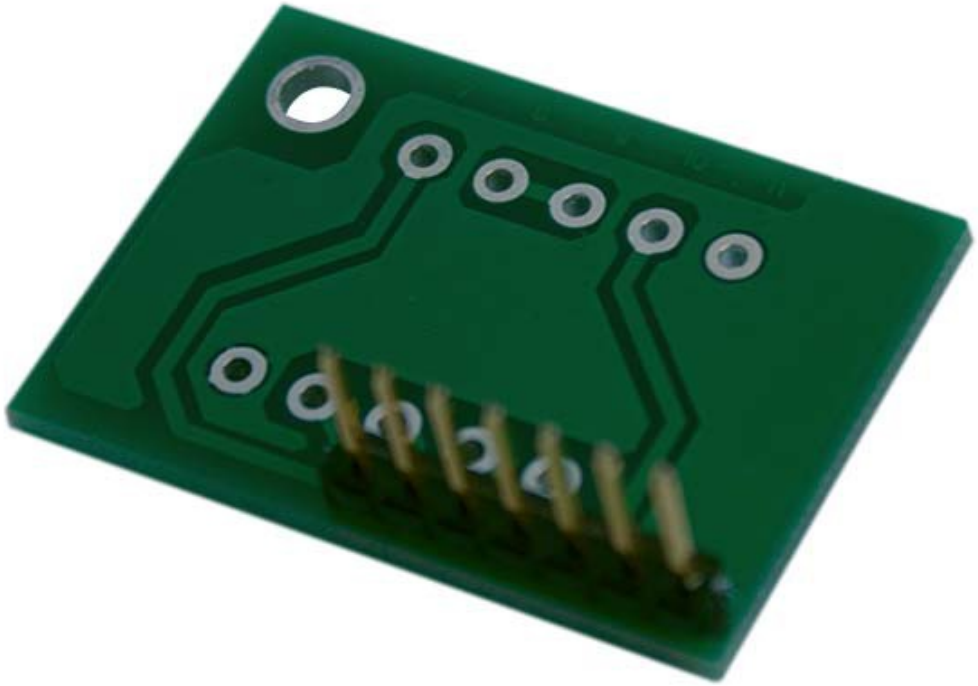


Output Transformer PCB



TIP: You can leave the resistor legs for connecting to the main PCB long as we'll cut them later once in the metal work, when we'll know the exact length we need.

Input Transformer PCB



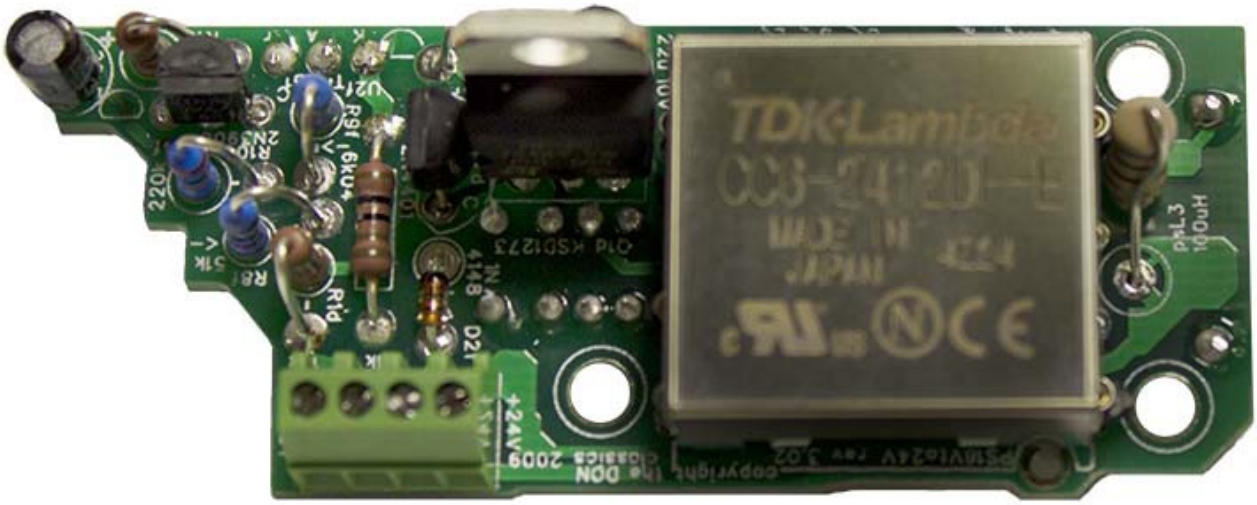
16Vto24V PCB (500 series only)

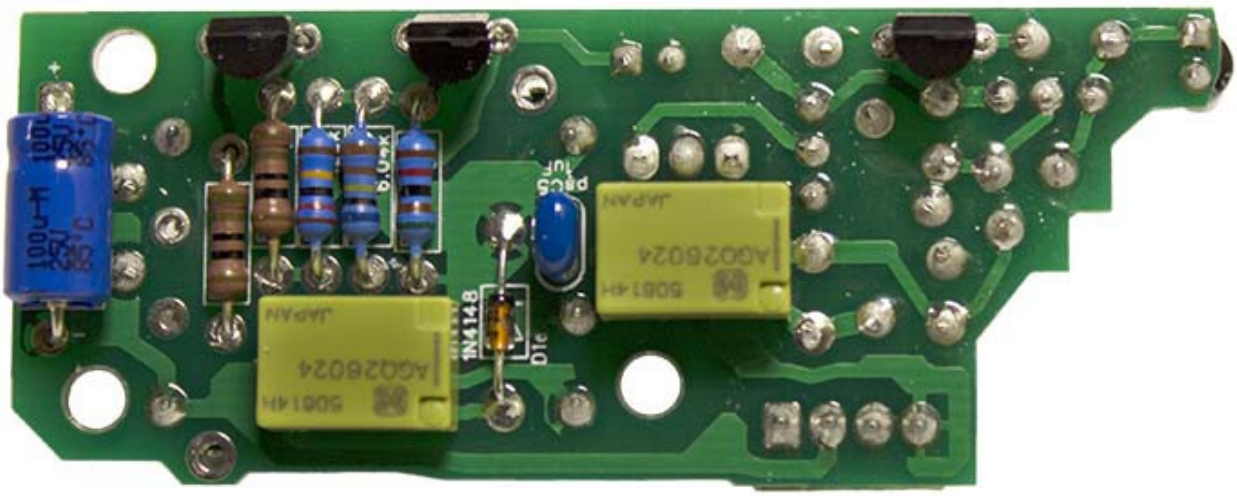
- Place transistor sockets on all DC/DC converter legs before soldering to PCB... (as shown in pic)

- Keep all parts on underside of board less than 6.35mm in HEIGHT (or PCB won't screw down enough) Use a standoff as a guide.

- Place inductor as shown below. this will ensure the pot fit better once assembled. (critical if using larger 1/4" shaft pot)

- Place the 3 transistors as shown below on the underside of the PCB. (not critical, but will fit better.)





2. Solder transformers to PCBs

a) Solder *Output Transformer*

TIP: You may need to desolder a little solder off the pins of the transformer to fit the PCB on. A simple solder sucker works fine for this.

Be sure to line up the PCB correctly so that the numbers of the PCB align correctly to the numbered pins of the transformer.

b) Solder *Input Transformer*

TIP: You can remove all four screws, as they'll not be needed.

Again be sure to line up the PCB correctly so that the numbers of the PCB align correctly to the numbered pins of the transformer.

3. Insert transistors

TIP: For positions T1C and TR4A, if you have a way of testing HFE, choose transistors with a HFE of higher than 600 for these two positions.
If you do not have a tester, then just place BC549C in these positions.

4 Place in metalwork

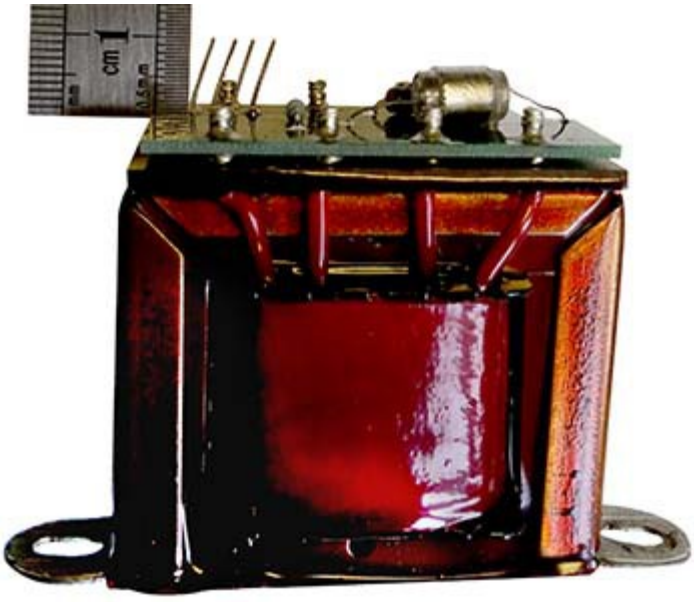
Place standoffs as shown. The metal standoff will be closest to pin 1 of the edge gold fingers.

Fit the grayhill switch pin in the 12 o'clock position as shown.
Then fit the silver foil over it to keep it in place.

Then place the Grayhill switch into the PCB and then place the PCB into the metal L-bracket.
Once there, secure the PCB with screws and secure the Grayhill switch with the nut and align correctly.
Once aligned, solder the grayhill switch through the bottom of the L-bracket.
Finally, remove the Grayhill nut and continue to assemble the NV73 together.

For the input transformer, you will need to trim the gold header a little. Place the transformer roughly in position to see where you will need to cut.

Do the same for the output transformer connectors (resistor leg off cuts).
These will have a slight angle to allow it to slot in easier.



A video has been prepared showing the assembly process:

https://www.youtube.com/watch?v=9FZNyv8M-I0

5. Initial test

BEFORE FIRST TURN ON:

1) Turn the blue trim pot (bias trim) completely anti clockwise. It's a 25 turn pot so you'll we need to rotate it completely several times.. you will hear it click on each rotation once you are at the extreme anti clockwise point.
2) Test that there is no short between any of the rails & ground. ie. Test with a multimeter that the resistance between edge fingers 12, 13, 14 & 15 **is not** below 100.
3) Test that there is no short between the 24V rail & ground. ie. Test with a multimeter that the resistance between pin 3 of the output transformer and pin 5 of the edge gold finger **is not** below 100.
4) Test that there is a strong connection between the case of the 2N3055 and the output transformer pin 1. ie. Test with a multimeter that the resistance **is** below 10.
5) Test that there **is** a connection between the three grounds of the lunchbox. Pins 1, 5 & 13. ie. Test with a multimeter that the resistance **is** below 10.

Once these tests are passed, you can turn on the unit. Have a multimeter ready to do test 6 as soon as you turn on the unit.

AFTER TURN ON:

6) With one multimeter probe on the metal work and the other on the case of the 2N3055; test the voltage.
   MAKE SURE YOU GET A VOLTAGE OF NO LESS THAN 21V. IF YOU DO... TURN OFF IMMEDIATELY AND CHECK THAT YOU HAVE TURNED THE TRIM POT COMPLETELY ANTICLOCKWISE. (YOU SHOULD HEAR A CLICK EACH TIME YOU TURN WHEN YOU ARE AT ANTI-CLOCKWISE)
7) While measuring the voltage of the case of the 2N3055, turn the bias trim pot clockwise until the voltage drops to 22V. It should take quite a few rotations of the trim pot. (multimeter should be on the case of the 2N3055 & ground probe on the L-bracket metal)

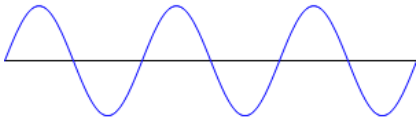
At this point, you are ready to put some audio through it to verify all is well!

6. Set bias

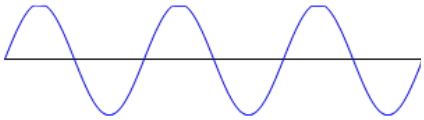
If you do not have access to an oscilloscope then it's not a huge deal, as setting the bias doesn't affect the sound in normal operation..

If you do have an oscilloscope then you will set the bias as follows:

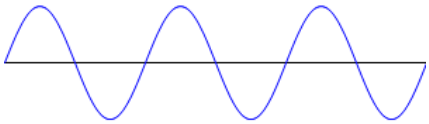
1) Set the NV73 at 60dB gain.
2) Set the output pot at around halfway.
3) Disconnect the output XLR of the lunchbox (if it's connected to something, this high level may clip the next piece of gear and skew the wave we're looking at.)
4) Connect the DAW to the input of the NV73 and set a 1kHz sine wave at around -70dBFS.
5) Connect the oscilloscope to the output of the NV73.
6) Turn up the DAW signal until you see the sine wave *just* start to distort.
7) At this point you will need to turn the bias trim pot to set it so that the sine wave squares off evenly on the top and the bottom **at the initial point of clipping**. You can use the output pot at this point to raise and lower the level to see where the sine wave flattens. Juggling back and forth with the output pot as you adjust the bias trim pot, you should be able to find the point where the sine wave flattens on the top and bottom evenly.
Remember to be careful with this as you are increasing current as you turn clockwise.. so if you are finding yourself turning clockwise a lot, double check that you're setting it correctly.



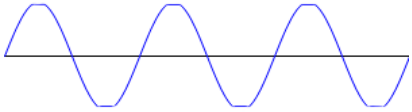
Initially you will see a sine wave like this.



As you increase level, one half will clip. Just as it starts clipping, adjust the bias trim pot.



It will probably then look normal again. At which point increase the level again. Repeat until it starts to clip equally on both sides.



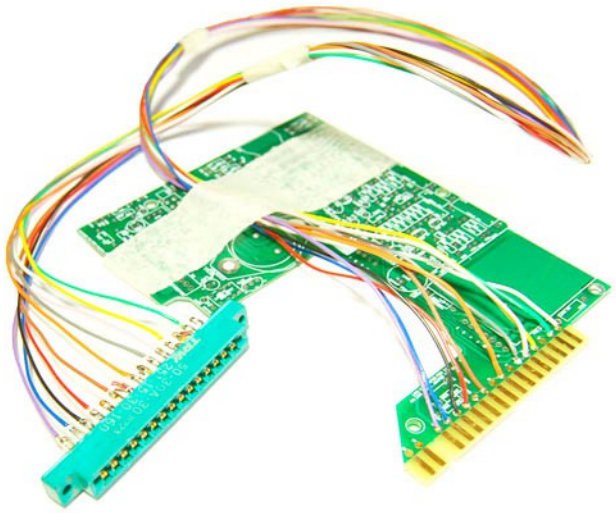
Adjusted correctly.

7. Attach front panel and knobs

TIP: If you use two screwdrivers when tightening the large red knob, it'll tighten to the shaft more evenly as you tighten both screws together.

Extra information

For tests, it may be worthwhile to build or buy a little jig to test units without having to root around in a lunchbox. eg. An EDAC attached to long wires attached to a PCB with the 15/18 gold fingers to insert to the lunchbox.
(One source of card edge connectors
and edge adapters is Jeff's excellent
store classicAPI)



Happy recording!