LushOne Inca Synth Module
Build Instructions

Lushprojects.com

Getting started

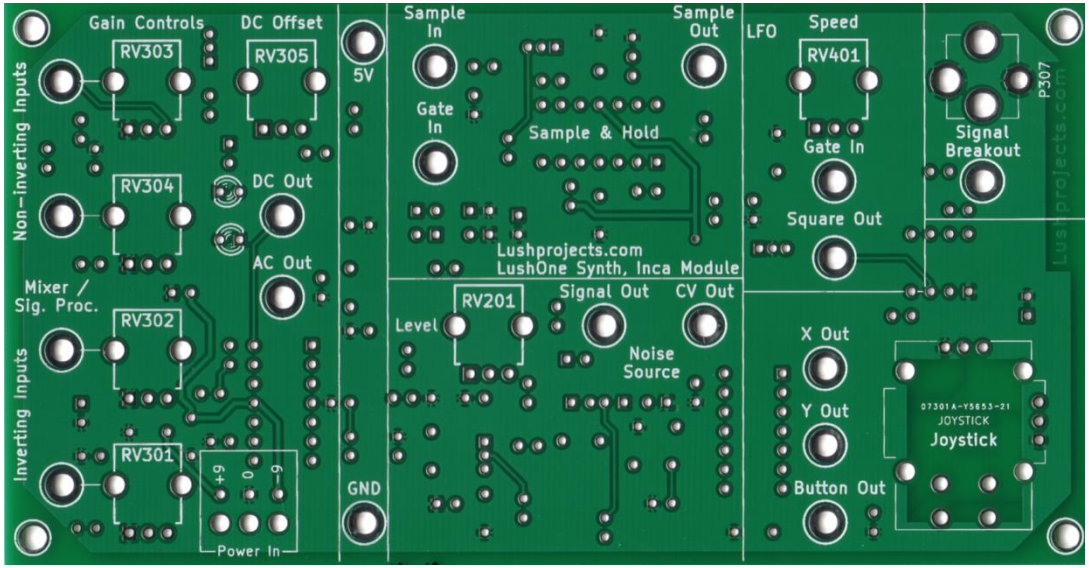
- If you can build the LushOne base module then then building the Inca should be easy
- Remember:
  - Accuracy and neatness is more important than speed
    - Get it working first time
  - These instructions will guide you but I assume you are familiar with basic techniques and equipment
- All components except the power-in are mounted on the circuit board – no slow, fiddly point to point wiring!

Build order

Build in any order you like, but I suggest:

- Patch sockets
- LEDs
- ICs
- Resistors, capacitors
- Transistor, diodes
- External connectors
- Power leads
- Variable resistors
- Joystick

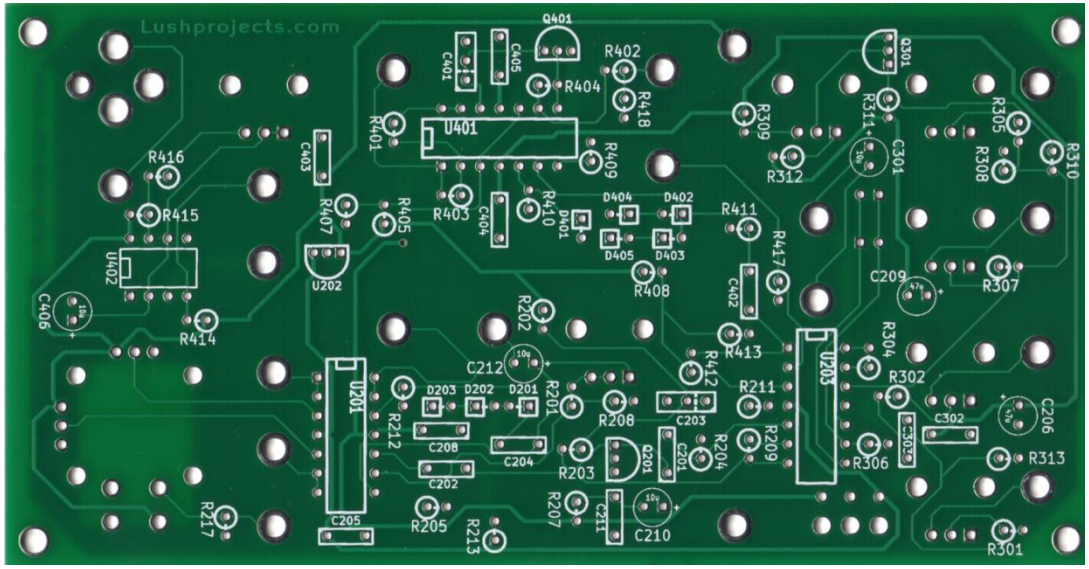
Front



The following components are mounted from the front:

- Patch sockets
- Variable resistors (but not trimmers)
- Breakout connector
- LEDs

Back



The following components are mounted from the back:

- Everything not on the front!

Patch sockets

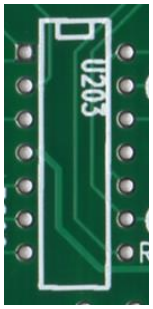
- 19 small silver patch sockets fit from front of board
- Fit in the large, labelled circles
  - Not the four mounting holes in the extreme corners
- Solder round rim on back
- Suggest you fit first so you can make them sit nicely flush with the board

LEDs

- Both LEDs are mounted from the front
- Short-lead goes towards the square pad
- Depending on your case design you might want to lift the LEDs up above the board

ICs

Designation	Type	Comment
U201,U203,U401	TL074	14 Pin
U402	7555 or equivalent	8 Pin
U202	78L05	3 Pin transistor-style case



- All ICs are mounted from the back
- ICs are provided unsocketed
  - You can add sockets if you like!
- Positions and orientations are marked on the silk-screen
  - Pin 1 also has a square pad
- The voltage regulator has the same case as the transistors – check the labels!
  - Orientation is shown on silk-screen

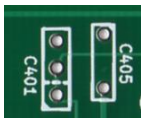
Resistors

Resistor	Value
R208	220R
R306	470R
R416,R415,R413,R217	1k
R201	2.2k
R411,R213	4.7k
R407	8.2k
R311,R408,R414,R211,R205,R207, R417	10k
R309	22k
R312,R401,R404	27k
R405	47k
R402,R403	68k
R307,R305,R302,R301,R310,R409, R410,R412,R209,R313,R418	100k
R304,R308	330k
R202,R203	470k
R212,R204	1M

- All resistors are mounted from the back
- Resistors are all mounted vertically
- Labels are not in a set position relative to the symbol – look for the closest label
- The round silk-screen symbol shown above shows the resistor locations

Value	Colours
220R	Red, Red, Brown, Gold
470R	Yellow, Purple, Brown, Gold
1k	Brown, Black, Red, Gold
2.2k	Red, Red, Red, Gold
4.7k	Yellow, Purple, Red, Gold
8.2k	Grey, Red, Red, Gold
10k	Brown, Black, Orange, Gold
22k	Red, Red, Orange, Gold
27k	Red, Purple, Orange, Gold
47k	Yellow, Purple, Orange, Gold
68k	Blue, Grey, Orange, Gold
100k	Brown, Black, Yellow, Gold
330k	Orange, Orange, Yellow, Gold
470k	Yellow, Purple, Yellow, Gold
1M	Brown, Black, Green, Gold

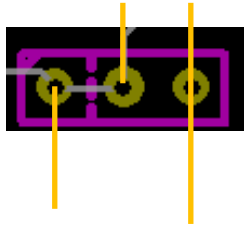
Capacitors



Designator	Value	Type
C402	10n	Ceramic
C401	10n	Polyester Box
C201, C202, C204, C205, C208, C211, C302, C303, C403, C404, C405	100n	Ceramic
C203	1u	Ceramic
C210,C212, C301,C406	10u	Electrolytic
C206,C209	47u	Electrolytic

- All capacitors are mounted from the back
- Capacitors are marked with one of the symbols shown above
- For electrolytic capacitors the “+” lead (longer lead) is labelled and indicated by the square pad.
- Some capacitors may come with either wide or narrow leg spacing. Connect as shown below.

Connect narrow legs to these pads

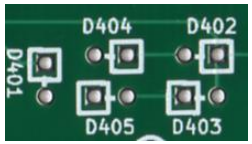


Connect wide legs to these pads

C401 – Polyester Box

Value	Marking
10n	103
100n	104
1u	105 or 1u

Transistors, diodes

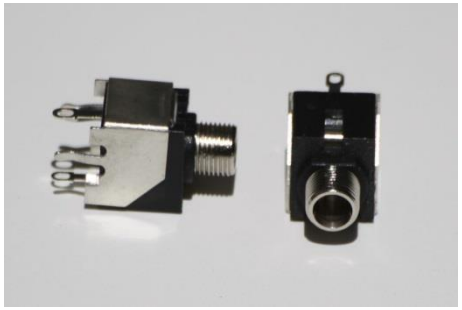


Q201, Q301	2N3904 NPN
Q401	J112, 2N5457 or similar N Channel FET

D201, D202, D203, D401, D402, D403, D404, D405	1N4148

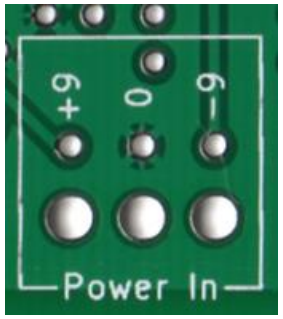
- All Transistors and diodes are mounted from the back.
- Transistors are marked showing the package orientation. Check you have the transistors and not the voltage regulator!
- There are both NPN and FET transistors – check you have the right one
- Q201 is a noise source and only two leads are connected (left and centre as shown in the photo above)
  - The third lead may be cut off near the body and not connected to avoid risk of picking up electrical interference
- Diodes are all vertically mounted and shown with the square symbol.
  - The diode's stripe should be towards the printed square / square pad
  - Small line coming out of square on silk screen shows direction of the lead.

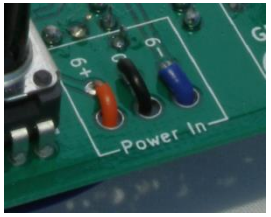
Connector



- A passive 3.5mm mono socket is provided for signal break-in/break-out
- Connect from the top of the board to footprint P307
- Smallest tag goes in the smallest hole for orientation

Power leads

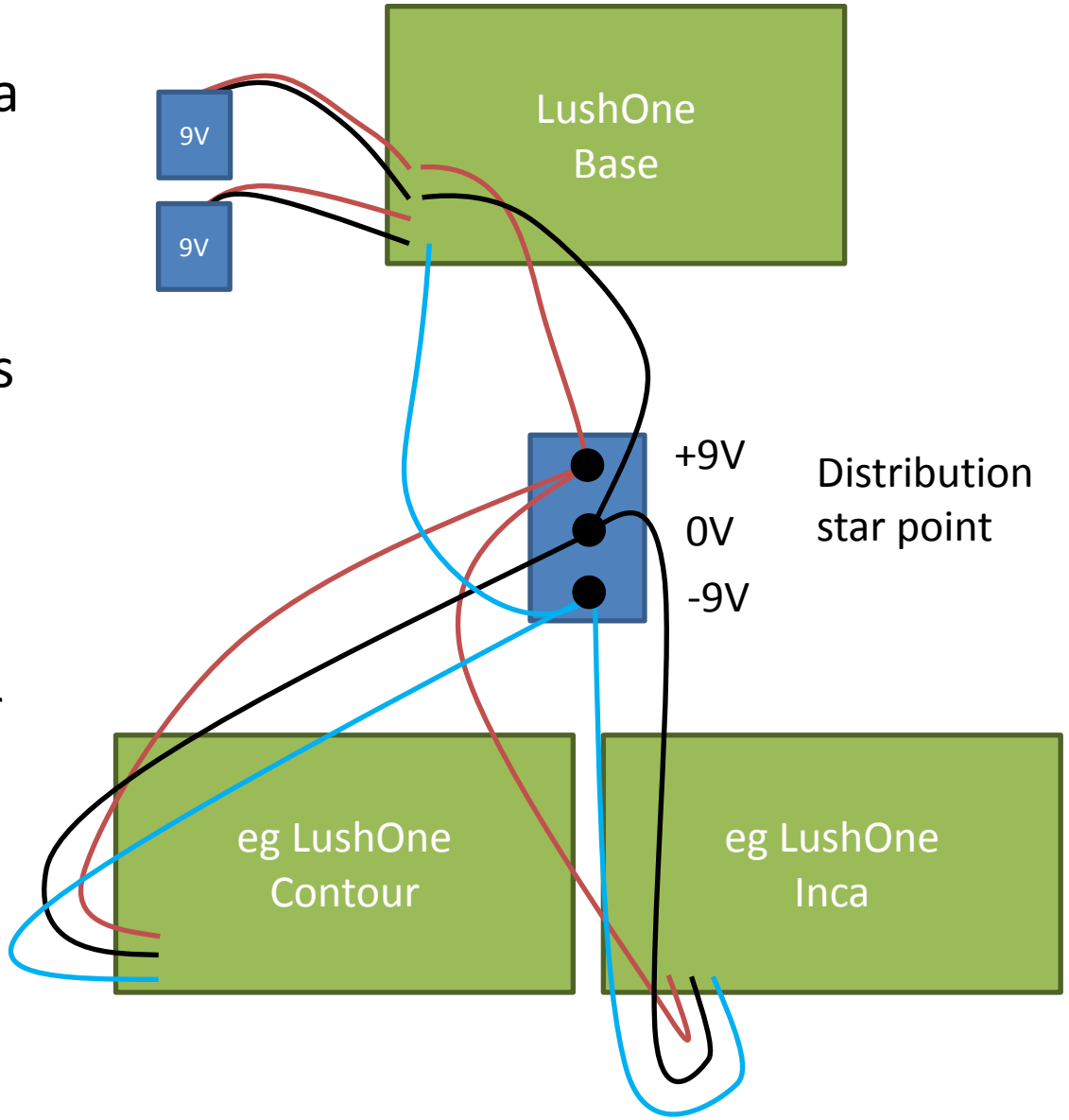




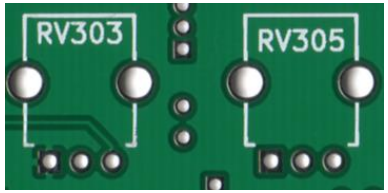
- The LushOne Inca can be connected to the LushOne base module for power
- Connect three leads to the LushOne “Power In” connectors
- Suggest:
  - Red = +9V
  - Black = 0V
  - Blue = -9V
- Connect other end of power leads to the spare terminals next to the Power In on the LushOne base
- If you have more than two modules in your system see next slide

Power with more than two LushOne modules

- To connect more than one LushOne module to a LushOne base it is desirable to use a “star” power connection point
- A simple terminal block is an easy choice
- Connect as shown in the diagram
  - Switched output of LushOne base goes to star point
  - Each additional module connects to the star point for its power



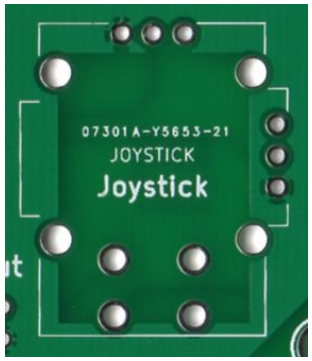
Variable resistors

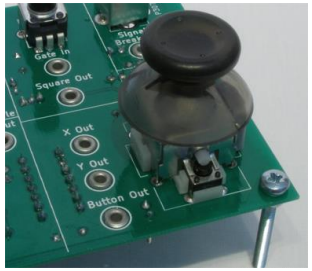


- Seven variable resistors are mounted where shown on front of board
- You may need to bend the pins slightly to make them sit properly

RV201 RV301, RV302, RV303, RV304, RV305, RV401	10k

Joystick





- Insert the joystick where indicated on the front
- The “hat” for the joystick is a push-fit

Checking time

- Congratulations – building should now be complete!
  - Take a break
- Time to check:
  - No parts left-over
  - All parts (particularly ICs) in the right way
  - No bad solder joints or unsoldered joints
  - Power connectors on correctly (very important!)
  - No solder bridges or other problems
- Good luck

Testing

Follow the quick reference guide or the tutorials to test the functions of the LushOne Inca

…now go play