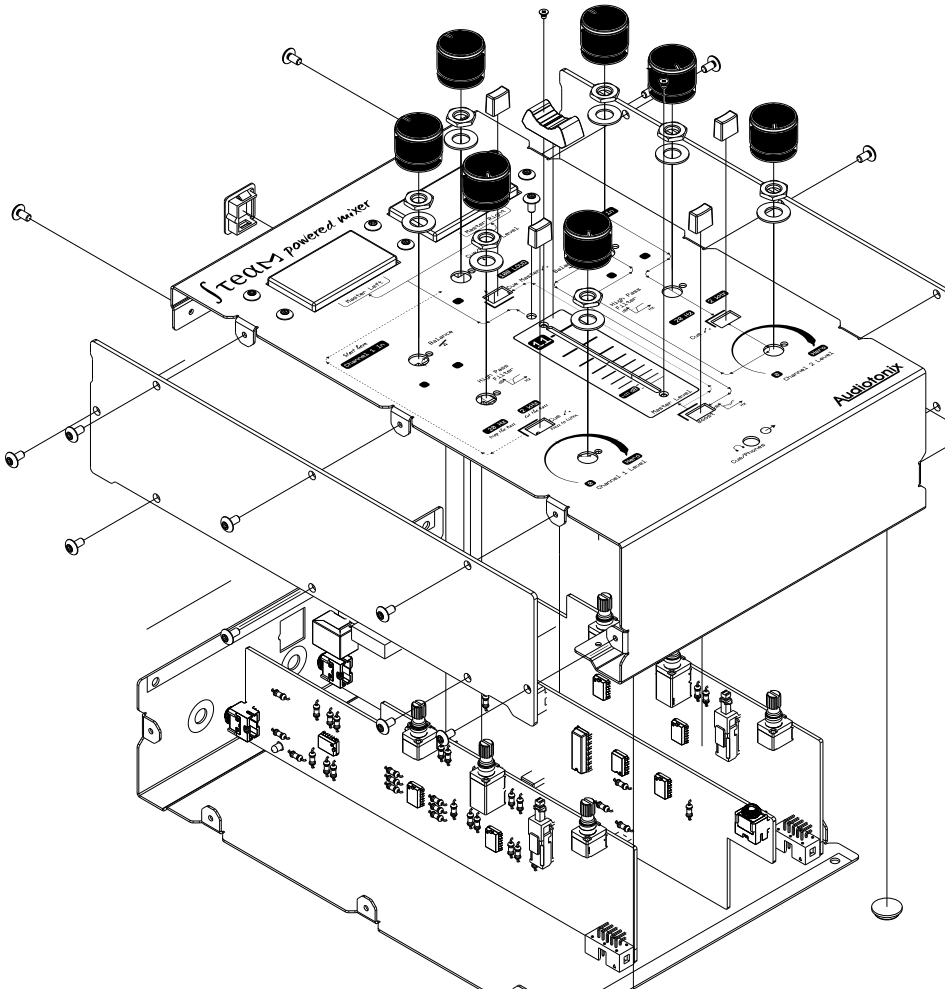
Audiotonix

∫team
powered mixer

Assembly Instructions

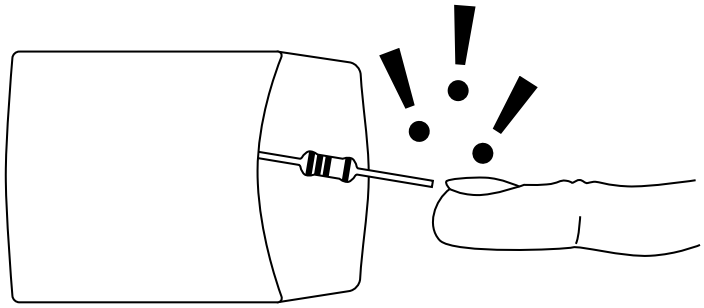


Contents

Introduction

Important Safety Warnings

- **Warning**: Read and follow all warnings and instructions to avoid risk of serious injury or death.
- **Warning**: Do not allow children under the age of 12 to play with, use, or attempt to assemble this product. Children over the age of 12 should be supervised by a responsible adult during the assembly of this product.
- **Warning**: Check to make sure the product is correctly assembled before use. An incorrectly assembled product may pose the risk of electric shock, fire, overheating, or explosion.
- **Warning**: Ensure you have consulted relevant training information for how to assemble kit electronics. This guide should only by used to supplement formal educational material. If you are unsure of any element or step, seek the help of an individual who is qualified as an instructor or a trained service technician.
- **Warning**: Do not put your fingers in the component envelopes! The component legs have sharp points and can get caught between your finger and your nail!



- **Warning**: Eyes protection must be used when soldering due to fumes and risk of solder splatter.
- **Warning**: Ensure all soldering assembly is done in a well ventilated area.
- **Warning**: Soldering irons get very hot. **Do not touch the metal part**. Handle with care. Follow original manufacturers instructions closely and use appropriate protective equipment.
- **Warning**: Some metal components may have sharp edges. Handle with care.

- **Warning**: Handle mechanical tools with caution. Ensure that all screw drivers are the correct sizes for the screws. Slipping with a spanner, screwdriver or any other tool, can cause severe injury and damage to components or circuits.
- **Warning**: Incorrect assembly of some components might cause them to explode or fail.
- **Warning**: Electrical shorts might cause components to malfunction and break or overheat. Check all joints for shorts and confirm component orientations are correct before attempting to power the unit.
- **Warning**: Turning on or attempting to power the unit during the assembly process can lead to damage to component as well as physicial harm to the user.
- **Caution**: This kit contains delicate electronic circuits and components which can be broken easily. Please handle with care and take appropriate steps to avoid damage.

Advice for Teachers

Before proceeding with this project in an educational setting there is a video which should be watched before the first session. This video gives some examples of the equipment required, as well as some general advice on how to proceed safely and efficiently through the assembly process.

Instructions for teachers

Soldering Tips

Soldering Step-by-Step

These are some steps which act as a rough guide to solder the components.

1. Check to see if there is a required orienatation for the component
2. Load the component into the holes
3. Make sure the component is sitting flat
4. Clean and tin the tip of the soldering iron
5. Position the flat edge of the tip of the soldering iron against the board and component leg for 3 - 5 seconds
6. Hold a length of solder and manoeuvre it so that the end taps the point where the component and the solder pad meet. Be careful not to use too much solder
7. Inspect the joint to make sure there is a good connection and the correct amount of solder has been used

All components should be soldered on the same side of the board, with the exception of one LED which will be soldered on the opposite side of one board only. The silk-screening (white printed ink) on the PCB is used to identify the location of each component - if there is no silk-screening then this means that the board is upside down.

Soldering Tutorial Videos

There is a QR code for each step which links to a video showing how the component is soldered. These videos are identified by the icons below - this QR code links to a video on how to solder.

How to solder

Additional Soldering Advice

For a more in depth introduction to soldering, this YouTube video provides a detailed guide to soldering

How to Solder (Beginner's Guide)
https://www.youtube.com/watch?v=3jAw41LRBxU)

Soldering General Advice and Precautions

These are some things to watch out for.

- Soldering should be done on a solid, level surface and the soldering iron should never be put into contact with flammable materials.

- Solder components in a well-ventilated area and avoid inhalation of soldering smoke/fumes.

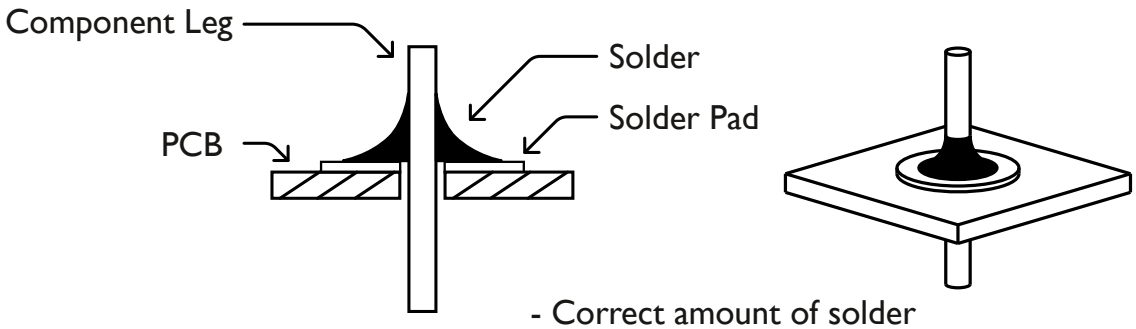
- Ground planes take longer to heat up - these are identifiable by the fact they are surrounded by copper (other pads often have a single track leading up to them). These might take 5 seconds or so to heat up.

- Some components have orientations - **soldering these in the wrong way round could cause the component to break or explode**!

- Some components are sensitive to too much heat. This is true for the ICs (Integrated Circuits - black rectangles with lots of legs). These styles of component should not normally take more than 5 seconds for the solder to join to both the component and the pad. Allow time for component to cool down between legs.

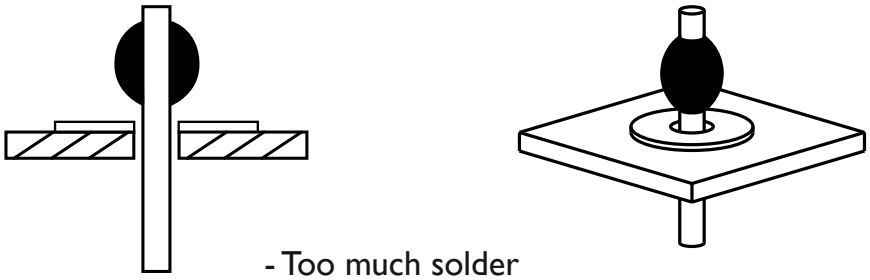
Good vs. Bad Solder Joints

Good Joint Example



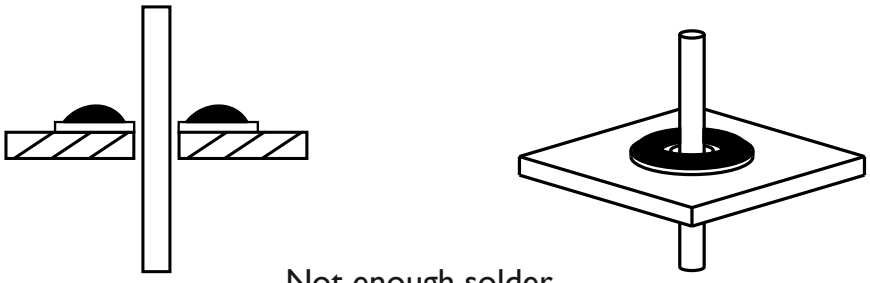
- Correct amount of solder
- Good connection

Bad Joint Example 1



- Too much solder
- No connection

Bad Joint Example 2



- Not enough solder
- No connection

Before you begin

Tools Required

Electronic Assembly:

- Eye protection
- Appropriate clothing - e.g. lab coats
- Soldering iron
- Solder - **Lead free solder must be used**
- Flux
- Wire Cutters

Mechanical Assembly:

- # 0 PoziDriv® Screw Driver
- # 1 PoziDriv® Screw Driver
- 10 mm Spanner

Power and Cables Required for Operation of Finished Unit

• 3.5 mm to 3.5 mm Auxillary Cable	x 2
• USB A - USB B Cable	x 1
• Recommended PSU USB 2.0, 5V 0.5A max	x 1

What's in the box?

Mechanical Components:

• Chassis Top	x 1
• Chassis Bottom	x 1
• VU Bracket	x 1
• Clear Acrylic Sides	x 2
• Fader Cap	x 1
• Rotary Knobs	x 7
• Rubber O-Ring	x 7
• Rectangular Push-Switch Caps	x 4
• M2 Countersink Screws	x 2
• M3 Button Head Screws	x 27
• Adhesive Foot	x 4
• Plastic Grommet	x 1

Wiring Looms:

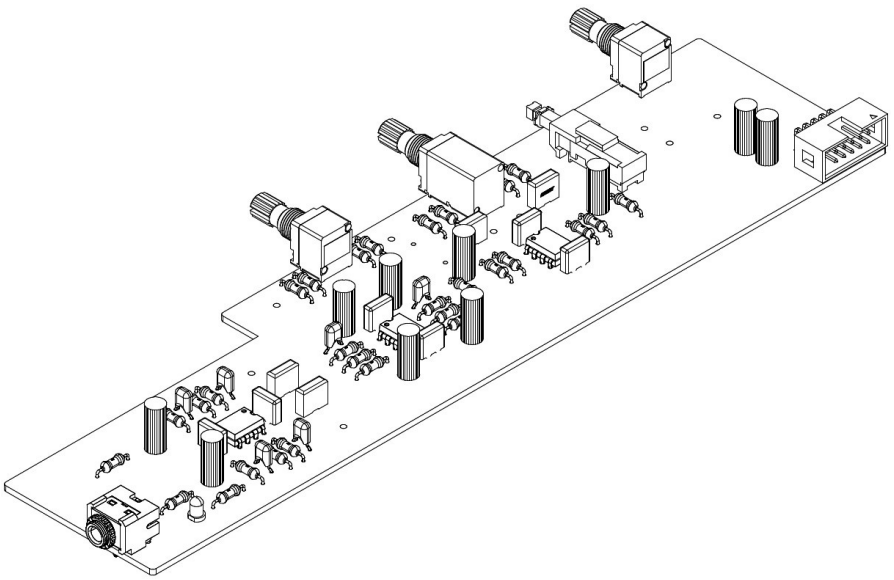
• VU Meter Loom	x 2
• Fader Loom	x 1
• Ribbon Cable Loom	x 1

Electronic Components:

• Line In PCB	x 2
• Master Out PCB	x 1
• Line In Components Box	x 2
• Master Out Components Box	x 1

Line In PCB

Solder Assembly Guide



Line In PCB Components

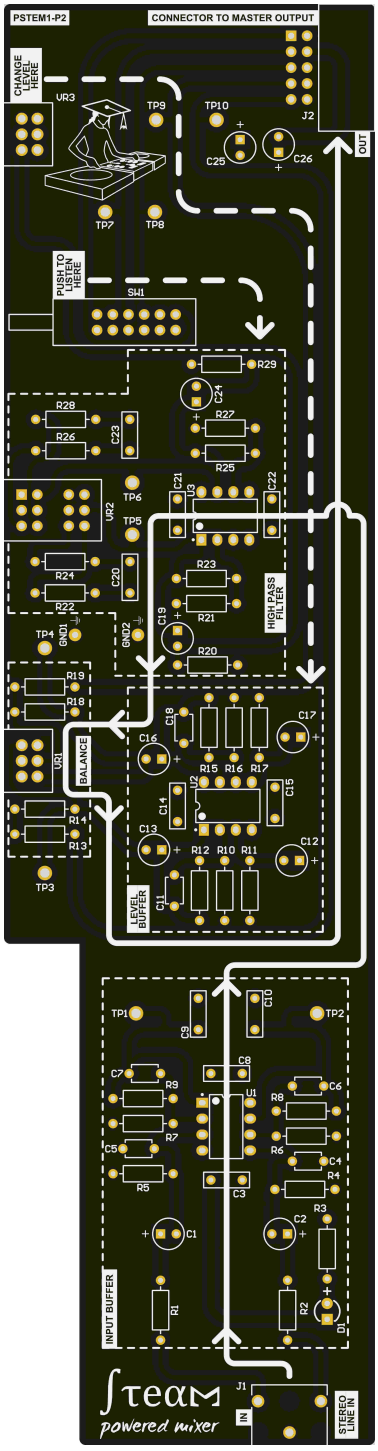
	Issue A Bare PCB
1	Resistor 330R 1/4W
2	Resistor 1K 1/4W
3	Resistor 1K2 1/4W
4	Resistor 3K6 1/4W
5	Resistor 4K7 1/4W
6	Resistor 10K 1/4W
7	Resistor 15K 1/4W
8	Resistor 22K 1/4W
9	Resistor 47K 1/4W
10	Op-Amp
11	Capacitor Ceramic 47pF 100V 5%
12	Capacitor Polyester 47nF 100V
13	Capacitor Polyester 100nF 63V
14	3.5mm Stereo Audio Jack Connector
15	10 Way Right-Angle IDC Header
16	Switch Horizontal Push Latched 4-Pole
17	Pot. Rotary 10K Lin +/-20%
18	Pot. Rotary 10K Log +/-20%
19	Pot. Rotary 100K Lin +/-20%
20	Capacitor Electrolytic 22uF 20% 50V
21	Green LED

Line In PCB Bare Board

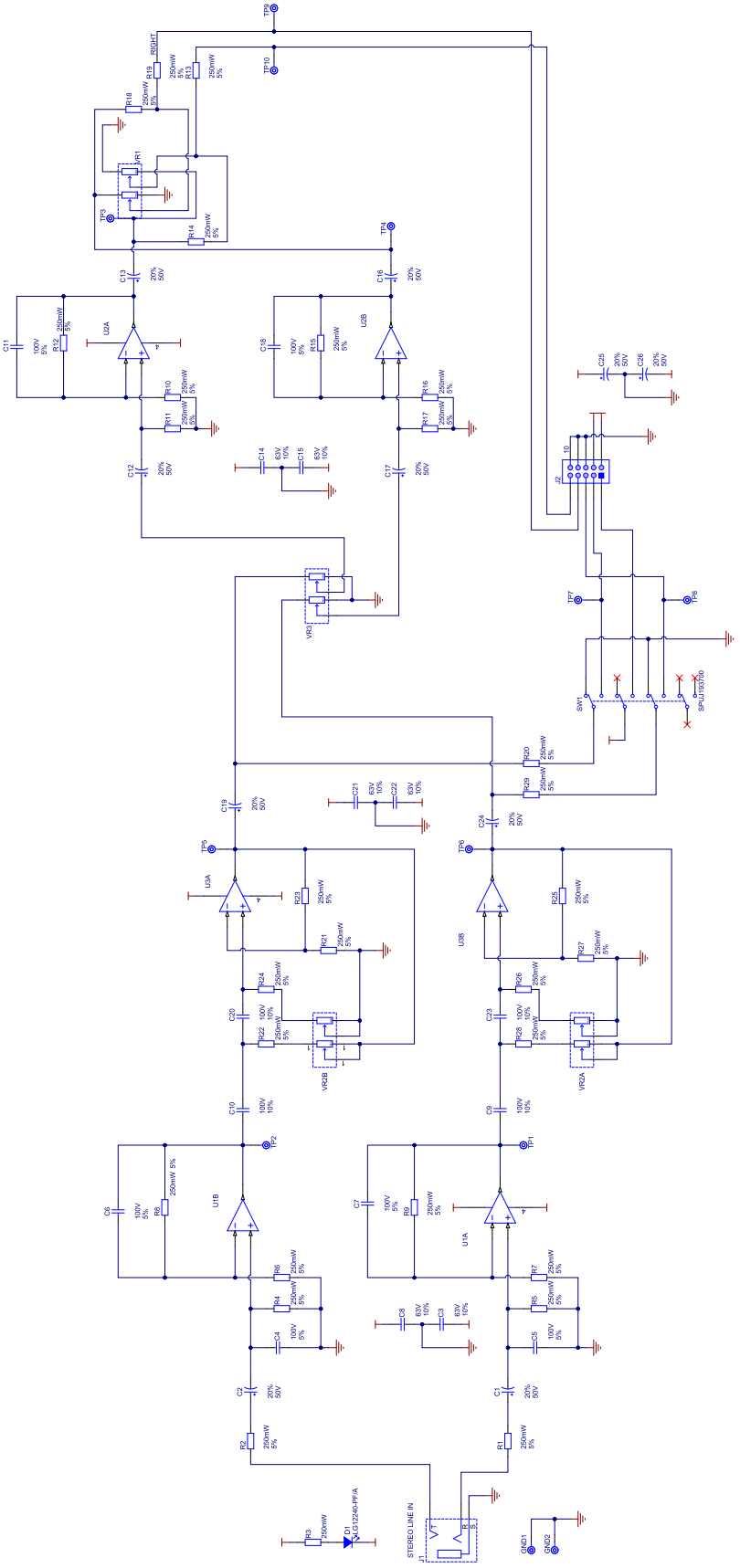
- Thick white lines shows the channel signal

- Dotted white lines show control signals

- Dotted boxes identify different processing sections.



Line In PCB Circuit Diagram



Line In PCB Solder Assembly

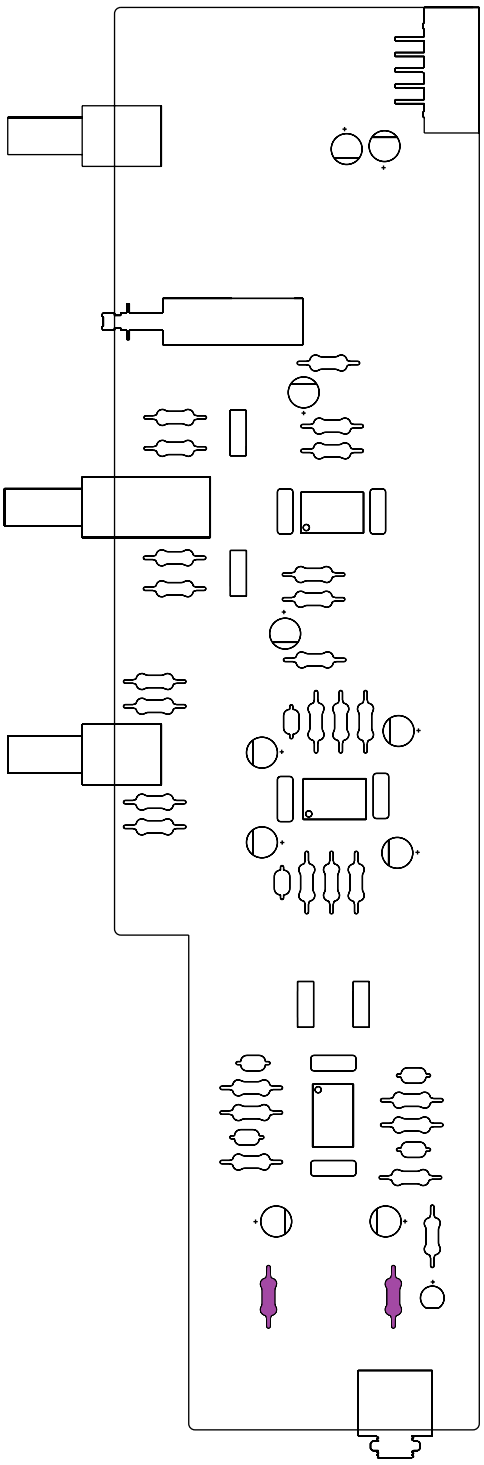
1 Resistor 330R 1/4W

R1, R2

1 ∫team
Line In
330R x2

Orientation Not Critical

How to solder a resistor



Soldering Tips:

1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

Line In PCB Solder Assembly

2 Resistor 1K 1/4W

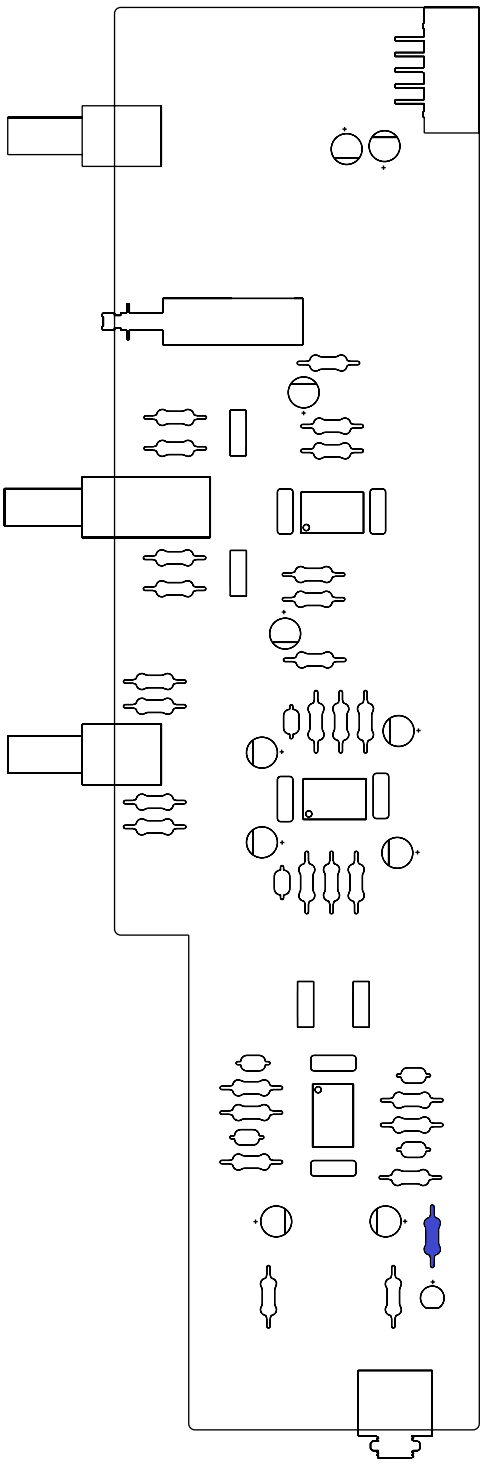
R3

2 ∫τεαм

Line In
1K x1

Orientation Not Critical

How to solder a resistor



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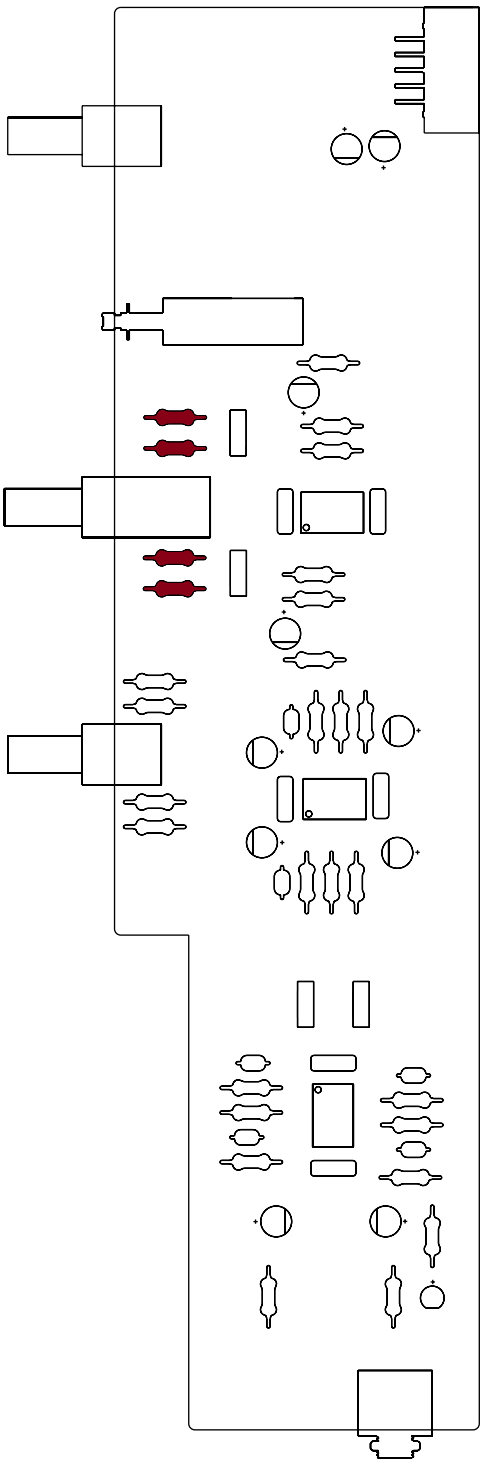
Line In PCB Solder Assembly

3 Resistor 1K2 1/4W

R22, R24, R26, R28



3 ∫team
Line In
1K2 x4

Orientation Not Critical

How to solder a resistor

Soldering Tips:

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Line In PCB Solder Assembly

4 Resistor 3K6 1/4W

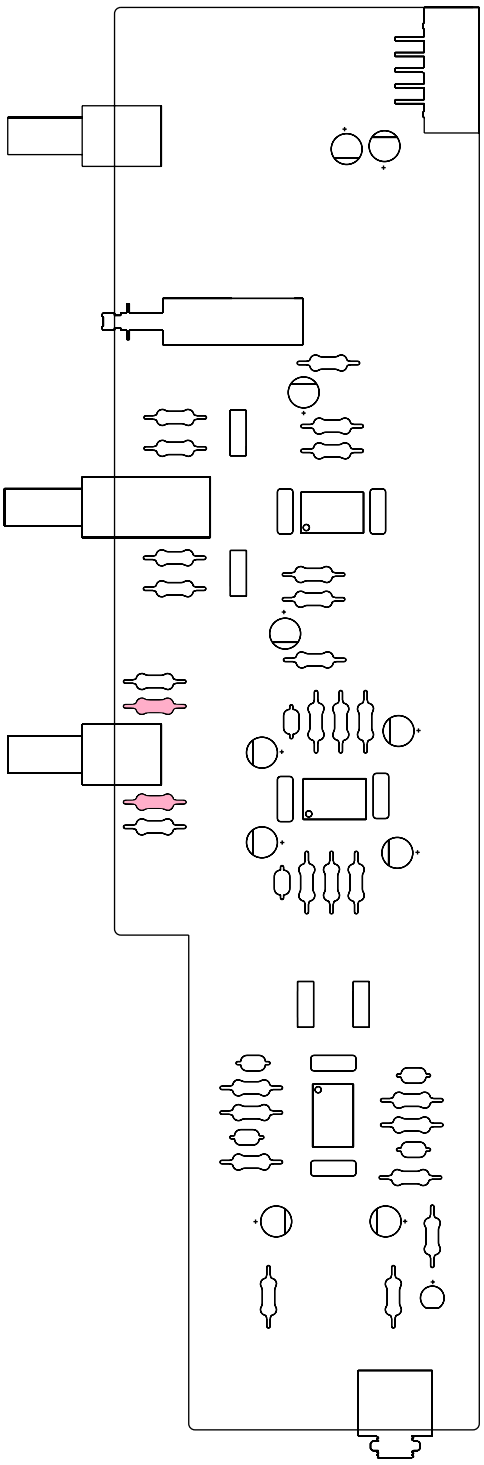
R14, R18

4 ∫τεαм

Line In
3K6 x2

Orientation Not Critical

How to solder a resistor



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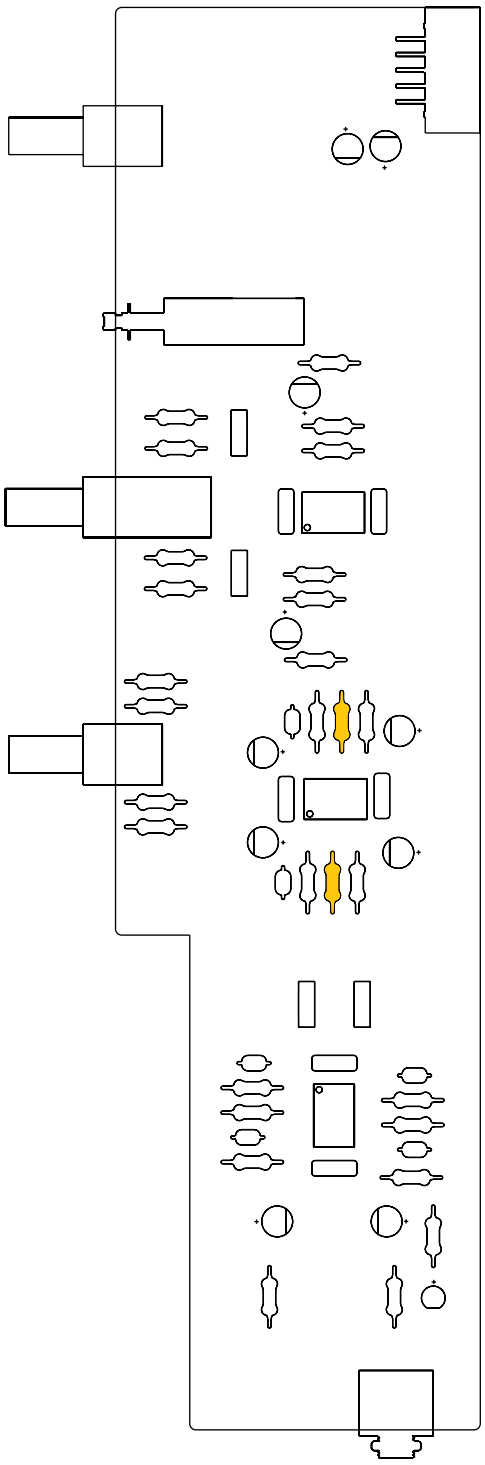
Line In PCB Solder Assembly

5 Resistor 4K7 1/4W

R10, R16

5 ∫team
Line In
4K7 x2



Orientation Not Critical

How to solder a resistor

Soldering Tips:

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Line In PCB Solder Assembly

6 Resistor 10K 1/4W

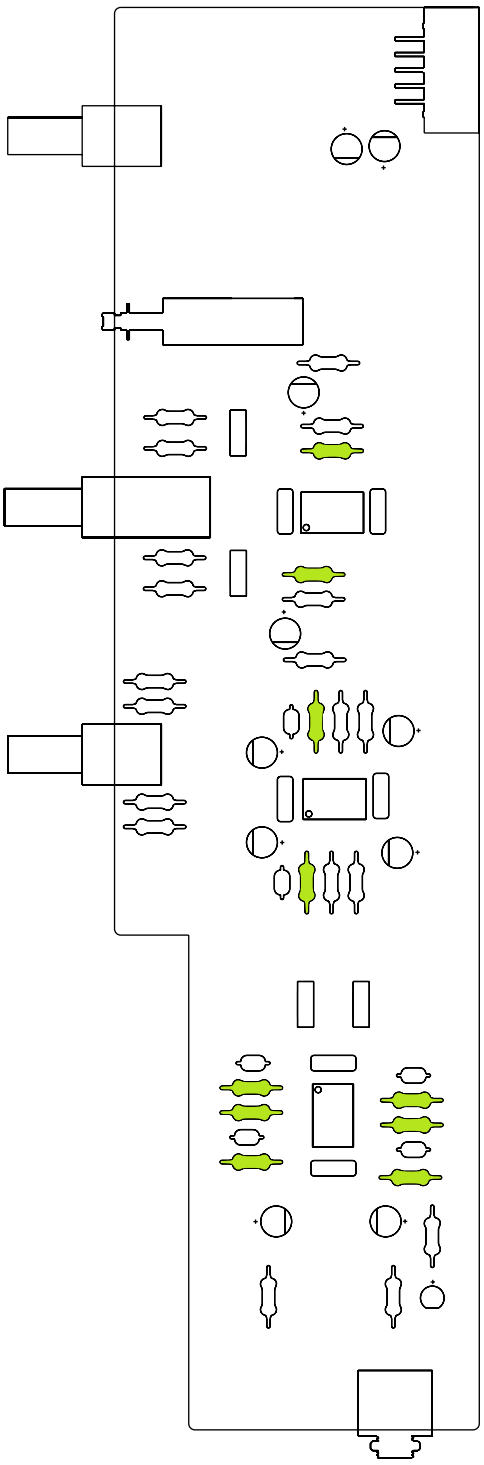
R4, R5, R6, R7, R8, R9, R12, R15, R23, R25

6 ∫τεαм

Line In
10K x10

Orientation Not Critical

How to solder a resistor



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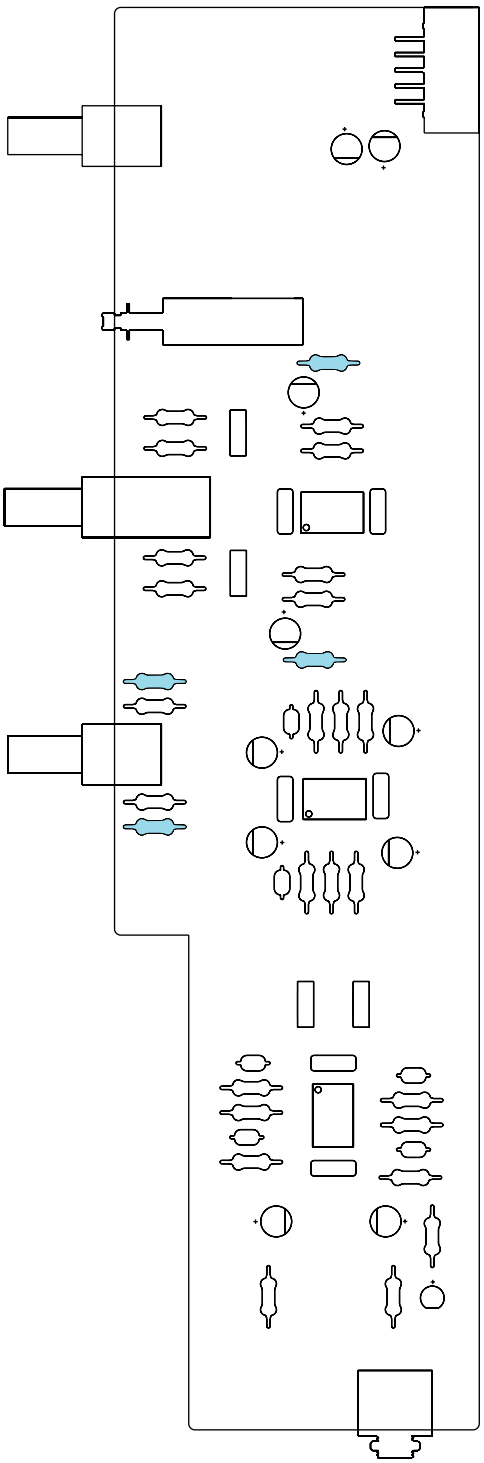
Line In PCB Solder Assembly

7 Resistor 15K 1/4W

R13, R19, R20, R29



7 ∫team
Line In
15K x4

Orientation Not Critical

How to solder a resistor

Soldering Tips:

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Line In PCB Solder Assembly

8 Resistor 22K 1/4W

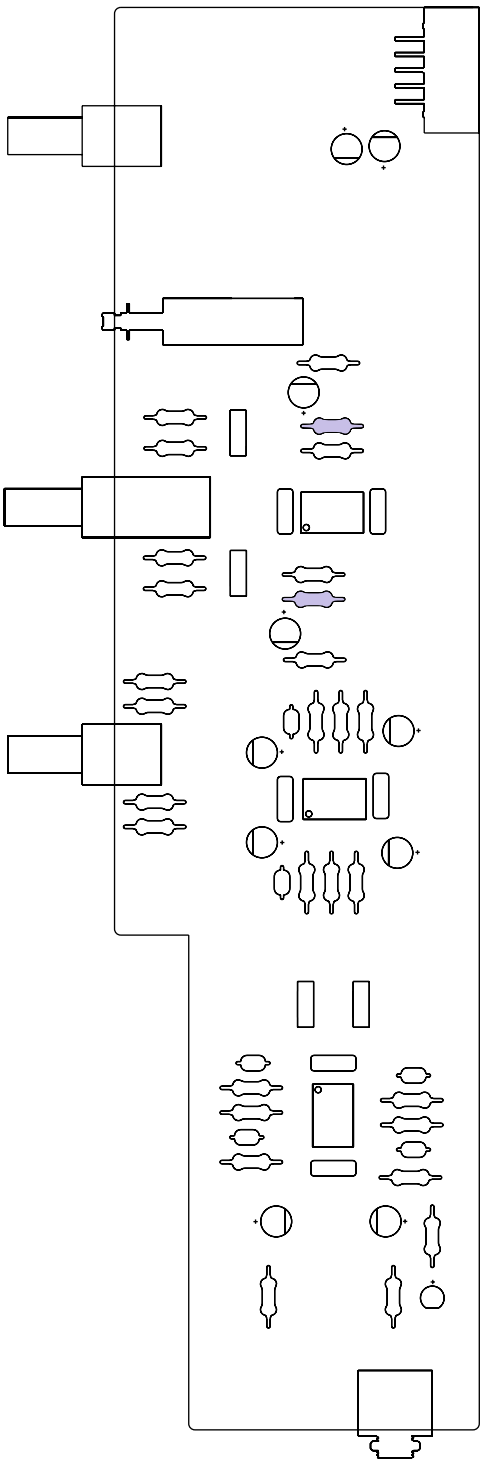
R21, R27

8 ∫τεαм

Line In
22K x2

Orientation Not Critical

How to solder a resistor



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Line In PCB Solder Assembly

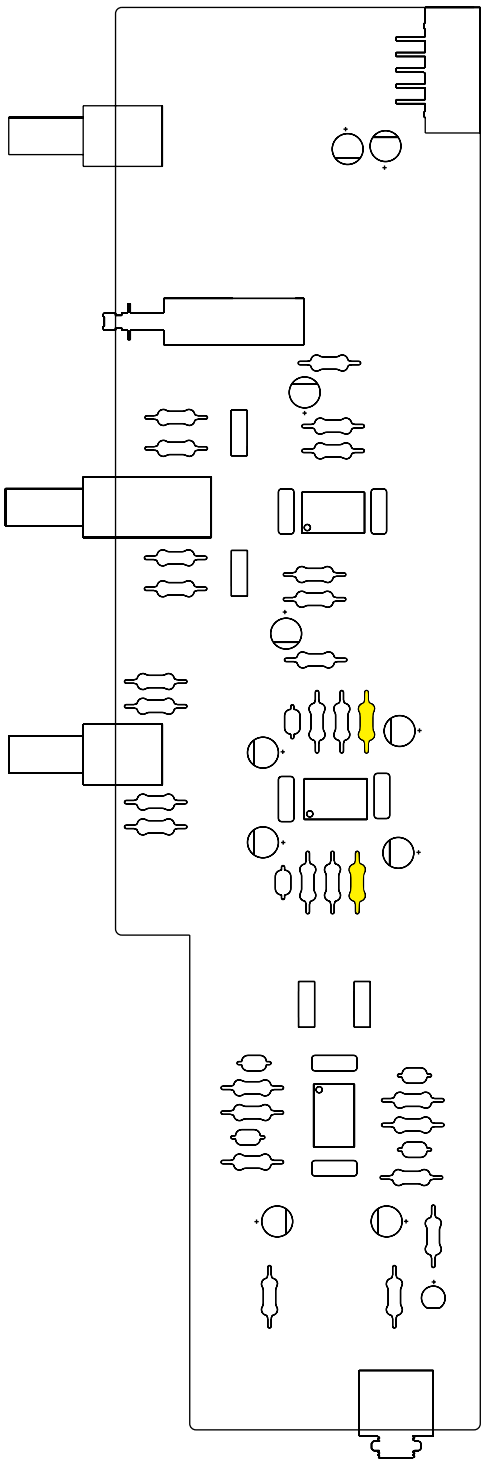
9 Resistor 47K 1/4W

R11, R17

9 ∫team
Line In
47K x2

Orientation Not Critical

How to solder a resistor



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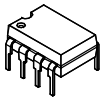
Line In PCB Solder Assembly

10 Op-Amp (Operational Amplifier)

U1, U2, U3

10 ∫team

Line In
Op-Amp x3



Check Part Orientation!

How to solder
an Op-Amp

Soldering Tips:

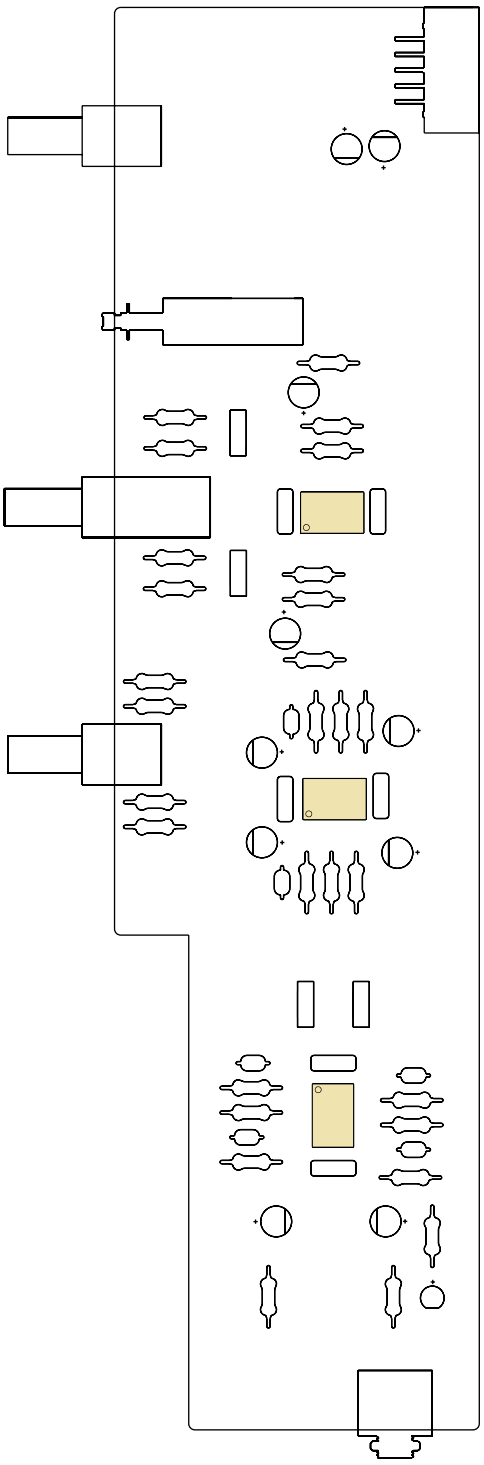
1. Place component so that it is flat against board. **Check part orientation is correct!**
2. Solder one of the corner legs
3. Check that component is still flat then solder the leg diagonally opposite
4. Again check the component is flat. If not, press the iron against the end of the problematic leg until the solder melts and using a finger, push the component flat from the other side of the board
5. Solder the remaining legs

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! If these are fitted the wrong way round, they might explode when the unit is powered.

Warning! These components can get hot very quickly which can cause a risk of burning.

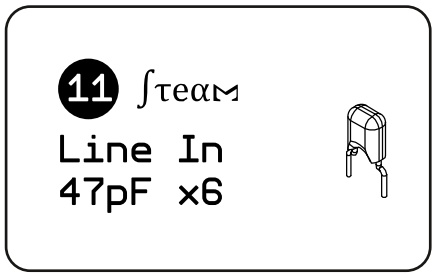
Caution! Do not apply heat from the iron for more than 5 seconds at a time, as this might damage the component.



Line In PCB Solder Assembly

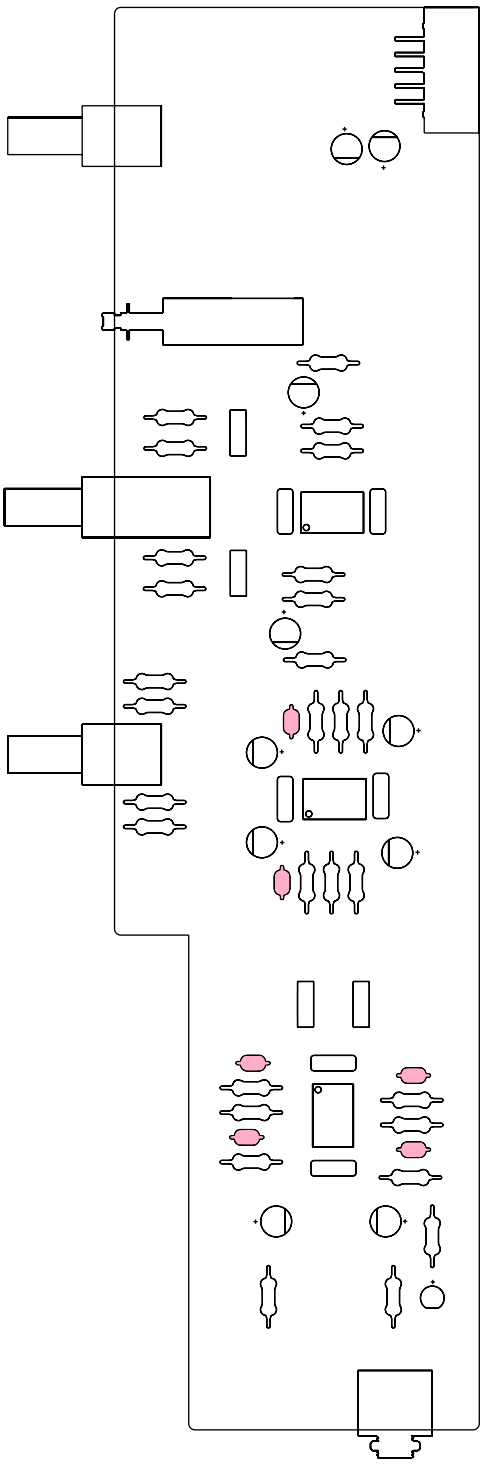
11 Capacitor Ceramic 47pF

C4, C5 ,C6 ,C7, C11, C18



Orientation Not Critical

How to solder a ceramic capacitor



Soldering Tips:

1. Pull component through the board as far as it can go
2. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
3. Solder the component
4. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts - but it is for some capacitors!

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

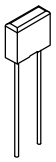
Line In PCB Solder Assembly

12 Capacitor Polyester 47nF

C9, C10, C20, C23

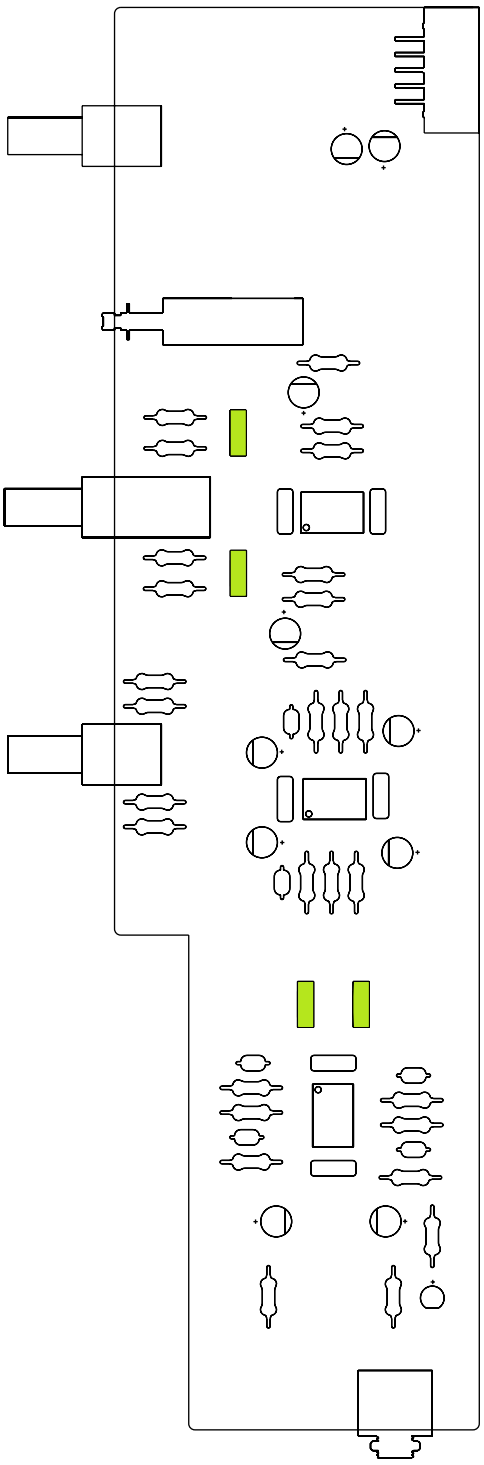
12 ∫τεαм

Line In
47nF x4



Orientation Not Critical

How to solder a polyester capacitor



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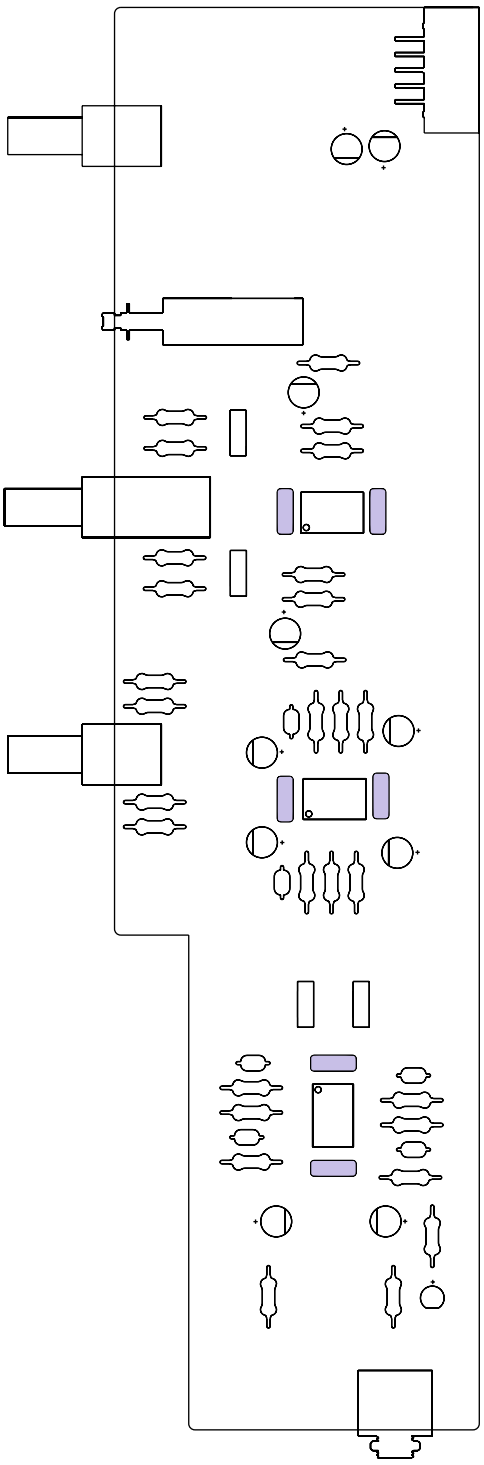
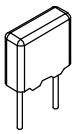
Line In PCB Solder Assembly

13 Capacitor Polyester 100nF

C3, C8, C14, C15, C21, C22



13 ∫team
Line In
100nF x6



Orientation Not Critical

How to solder a polyester capacitor

Soldering Tips:

1. Pull component through the board as far as it can go
2. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
3. Solder the component
4. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts - but it is for some capacitors!

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

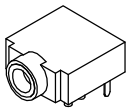
Line In PCB Solder Assembly

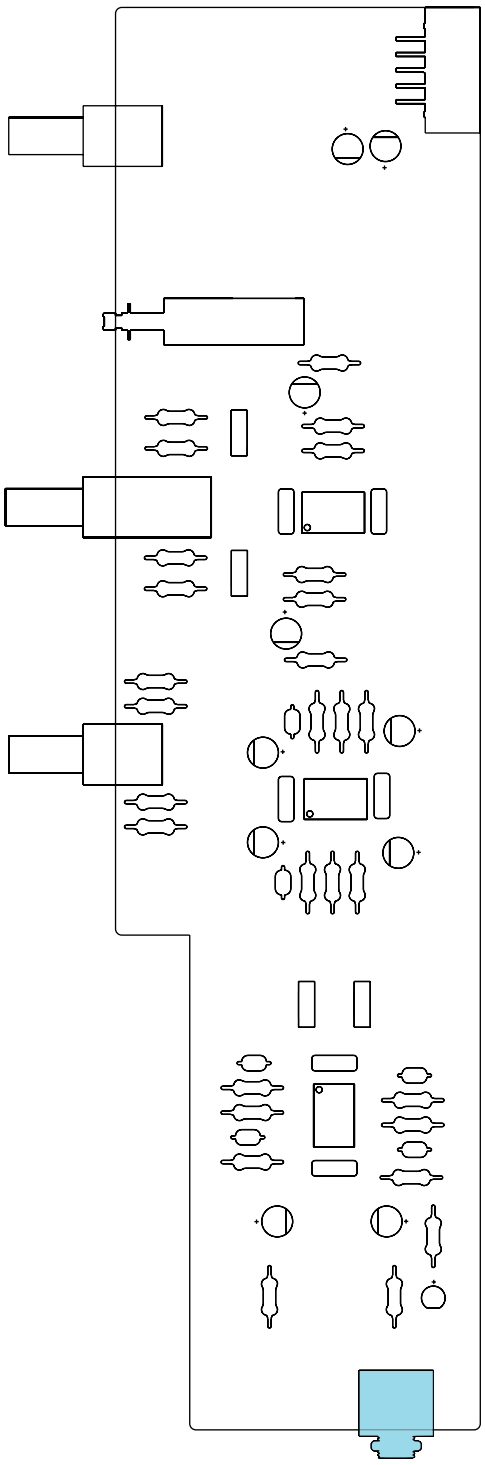
14 3.5mm Stereo Audio Jack Connector

J1

14 Steam

Line In
J1 x1





How to solder a 3.5 mm Audio Jack Connector

Soldering Tips:

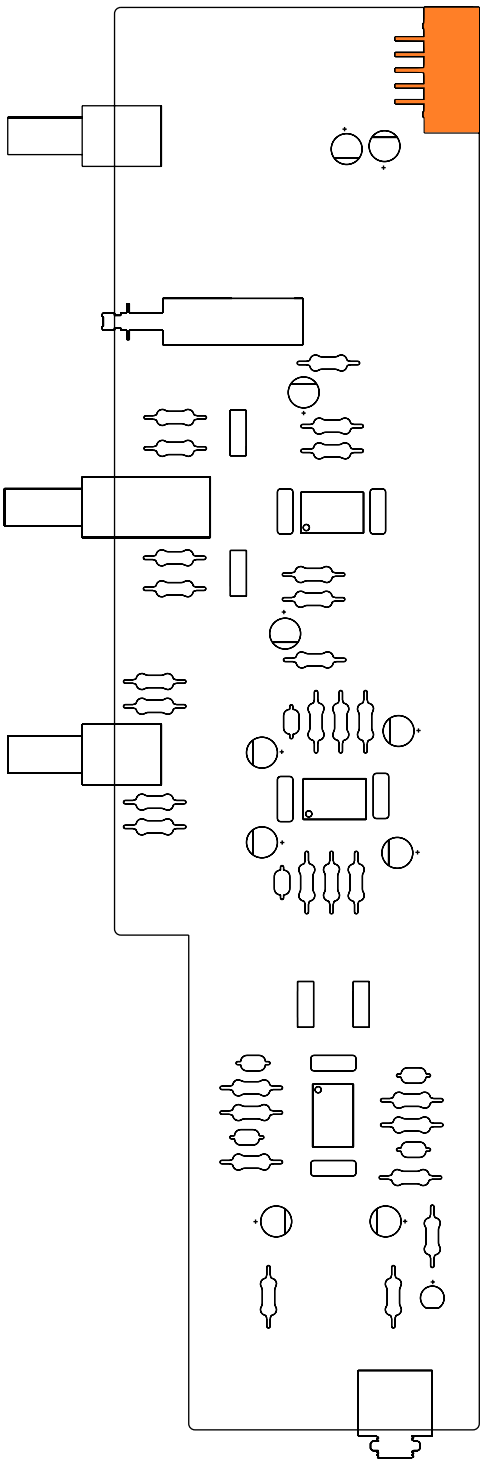
Make sure component is flat before soldering first pin, if this is soldered badly, it won't align with the metalwork.
Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

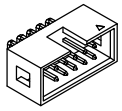
Line In PCB Solder Assembly

15 10 Way Right-Angle IDC Header

J2



15 ∫team
Line In
J2 x1



Check Part Orientation!

How to solder a 10 Way IDC Header

Soldering Tips:

Make sure component is flat before soldering. This part easily rocks out of position.
It might help to try resting this component on top of something to make sure it stays in position when soldering.
Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

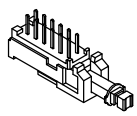
Line In PCB Solder Assembly

16 Switch Horizontal Push Latched 4 Pole

SW1

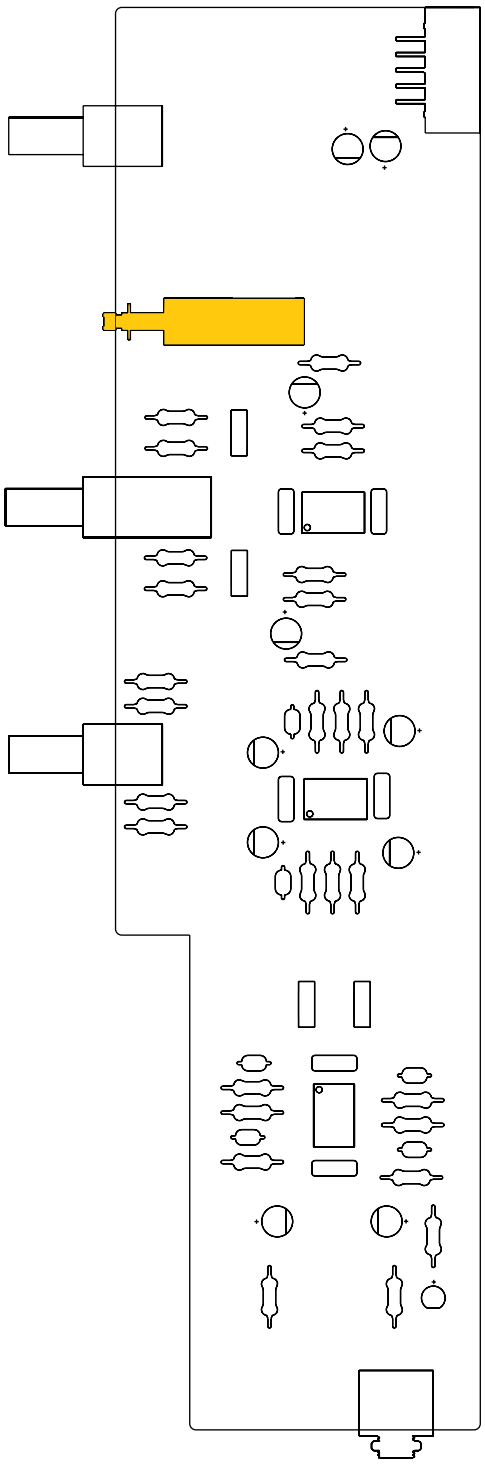
16 ∫τεαм

Line In
SW1 x1



Check Part Orientation!

How to solder a horizontal push switch



Soldering Tips:

Make sure component is flat before soldering first pin, if this is soldered badly, it won't align with the metalwork.

Solder one pin and then solder the opposite corner. Make sure component is still flat. If not, reheat the pin and push the component flat.

Note: It is difficult to remove this component once more than one pin has been soldered so it is worth checking to make sure it is still flat after soldering the first two pins.

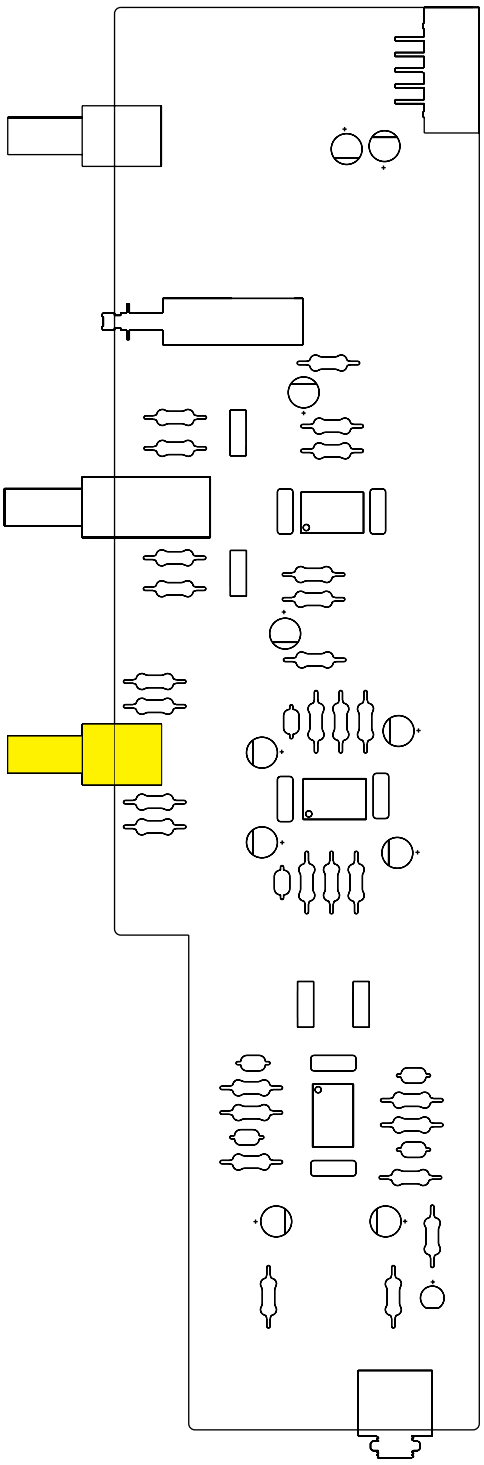
Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Line In PCB Solder Assembly

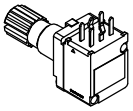
17 Pot. Rotary 10K Lin +/-20% - B103

VR1



17 ∫team

Line In
VR1 x1



Check Part Orientation!

How to solder a rotary potentiometer

Soldering Tips:

Make sure component is flat before soldering first pin, if this is soldered badly, it won't align with the metalwork.

Solder one pin and then solder the opposite corner. Make sure component is still flat. If not, reheat the pin and push the compoent flat.

Note: It is difficult to remove this component once more than one pin has been soldered so it is worth checking to make sure it is still flat after soldering the first two pins.

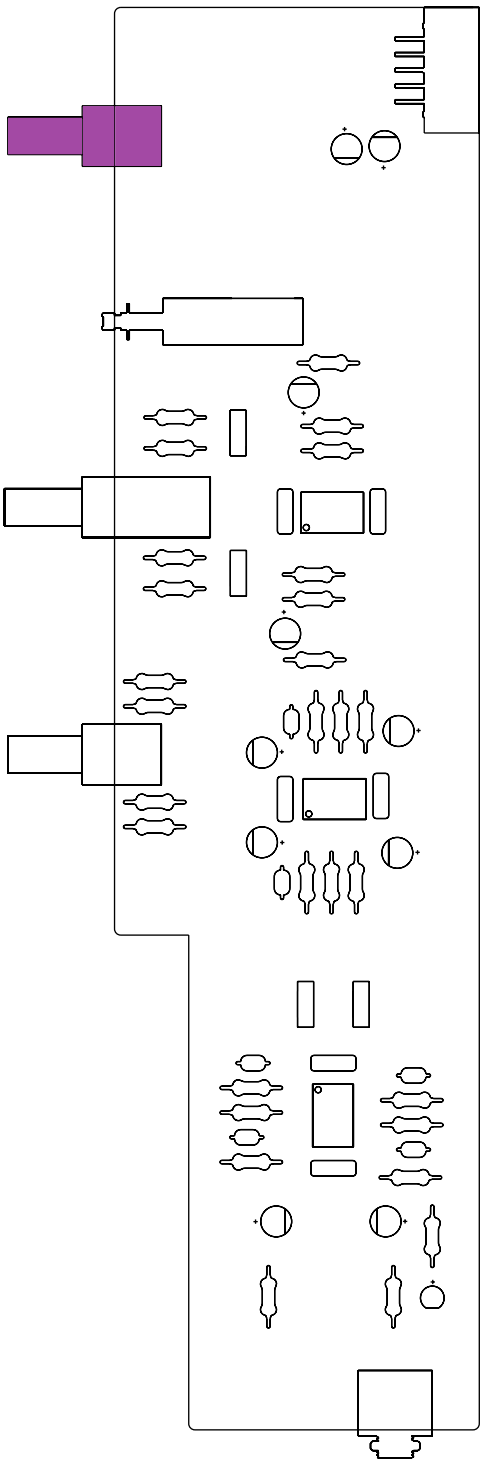
Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Line In PCB Solder Assembly

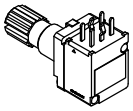
18 Pot. Rotary 10K Log +/-20% - A103

VR3



18 ∫team

Line In
VR3 x1



Check Part Orientation!

How to solder a rotary potentiometer

Soldering Tips:

Make sure component is flat before soldering first pin, if this is soldered badly, it won't align with the metalwork.

Solder one pin and then solder the opposite corner. Make sure component is still flat. If not, reheat the pin and push the compoent flat.

Note: It is difficult to remove this component once more than one pin has been soldered so it is worth checking to make sure it is still flat after soldering the first two pins.

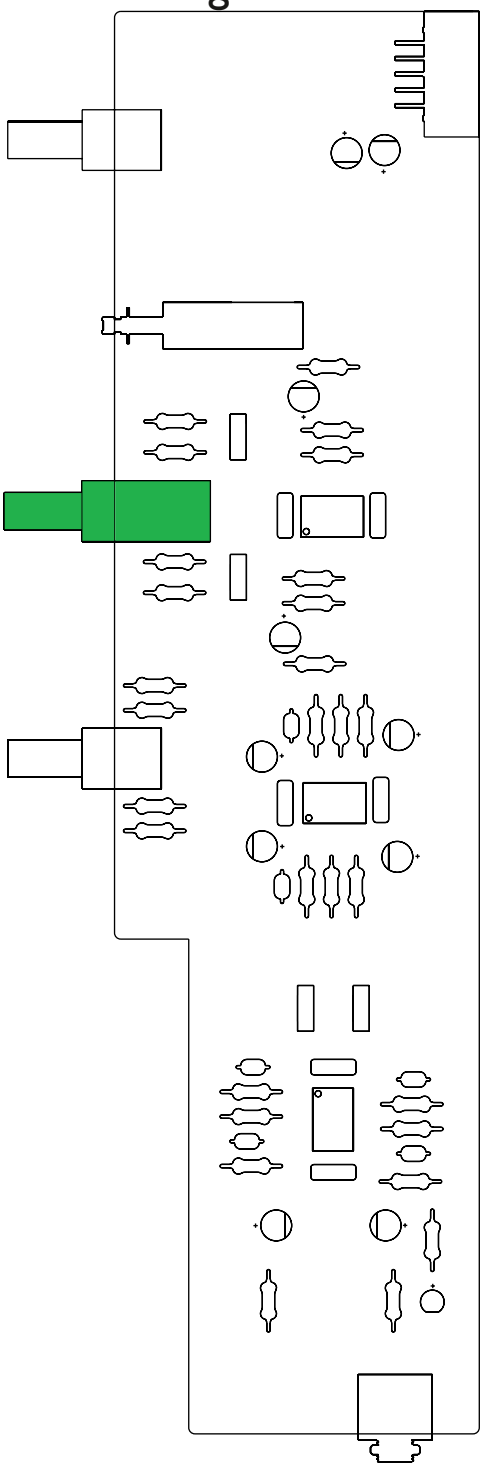
Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Line In PCB Solder Assembly

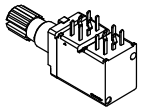
19 Pot. Rotary 100K Lin +/-20% - C104 Dual Gang

VR2



19 ∫team

Line In
VR2 x1



Check Part Orientation!

How to solder a rotary potentiometer

Soldering Tips:

Make sure component is flat before soldering first pin, if this is soldered badly, it won't align with the metalwork.

Solder one pin and then solder the opposite corner. Make sure component is still flat. If not, reheat the pin and push the compoent flat.

Note: It is difficult to remove this component once more than one pin has been soldered so it is worth checking to make sure it is still flat after soldering the first two pins.

Warning! These components can get hot very quickly which can cause a risk of burning.

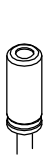
Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Line In PCB Solder Assembly

20 Capacitor Electrolytic 22uF 20% 50V

C1, C2, C12, C13, C16, C17, C19,
C24, C25, C26

20 ʃteaм
Line In
22uF x10



Check Part Orientation!

How to solder an electrolytic capacitor

Soldering Tips:

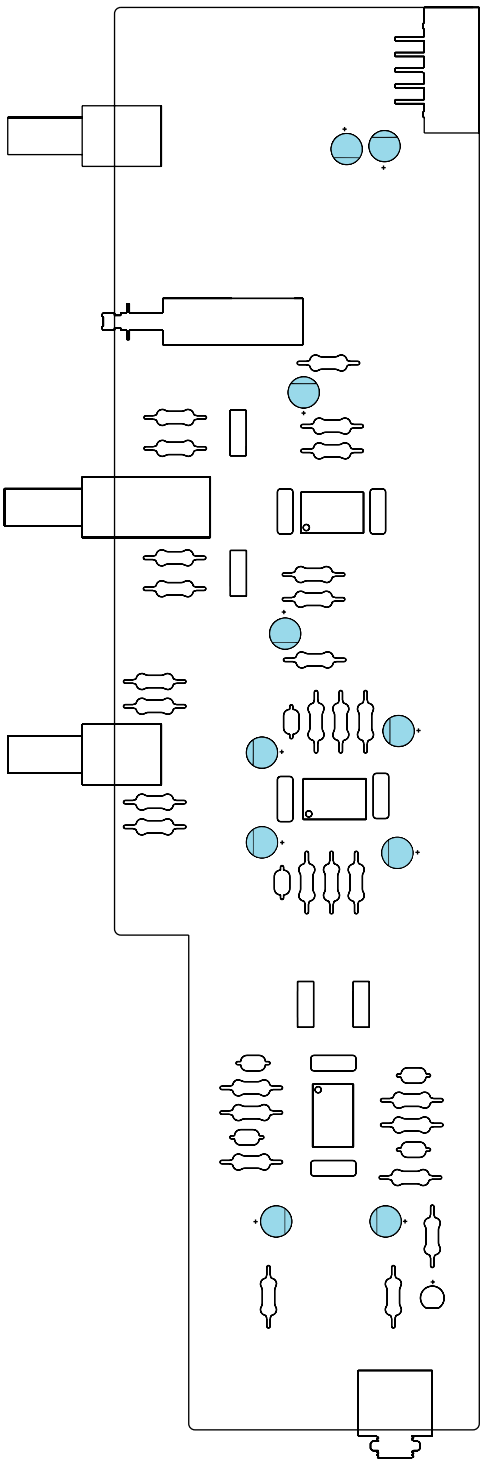
1. Pull component through the board as far as it can go. **Check the part orientation!** The pale line printed on the capacitor identifies the **negative** pin.
2. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
3. Solder the component
4. Using wire cutters, trim the leg to roughly 1 mm long

Warning! If these are fitted the wrong way round, they could explode when the unit is powered.

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

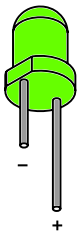


Line In PCB Solder Assembly

21 Green LED

D1

21 ∫team
Line In
LED x1



Check Part Orientation!

How to solder an LED

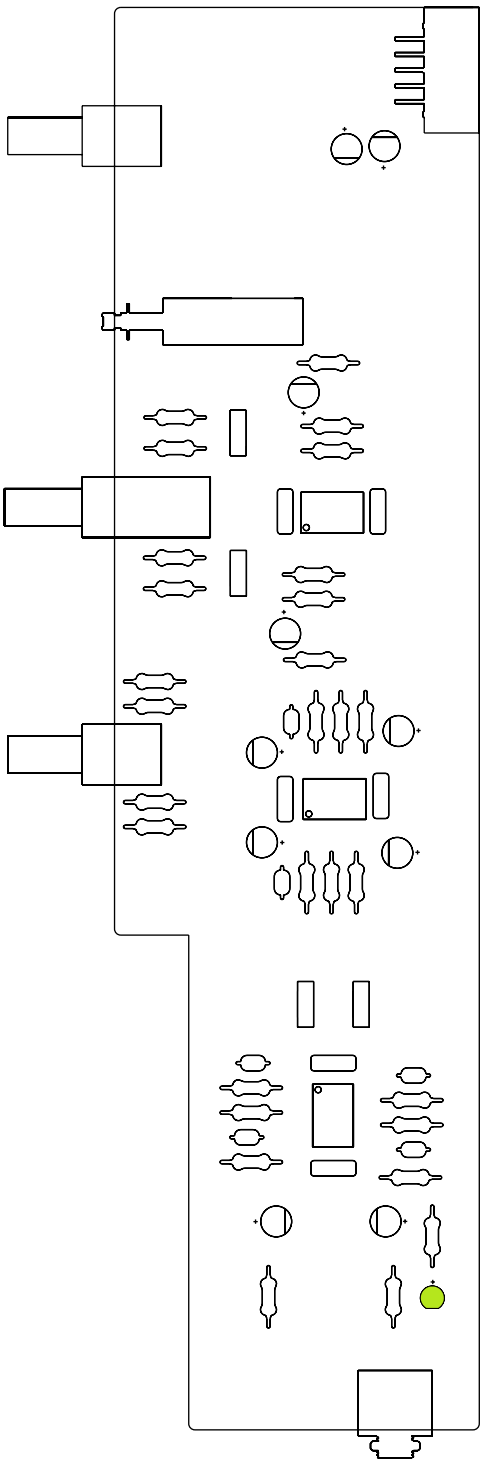
Soldering Tips:

1. Decide which side of the board this part needs to go on (there are two Line In PCBs, one has the LED fitted on one side, and the other one has it fitted on the opposite side). **Check which side this one needs to be fitted.**
2. Pull component through the board as far as it can go. **Check the part orientation!** If this is incorrect, the LED will not light up.
2. Put a 45 degree bend in each leg to hold the component in position, check the component is still flat.
3. Solder the component.
4. Using wire cutters, trim the leg to roughly 1 mm long.

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

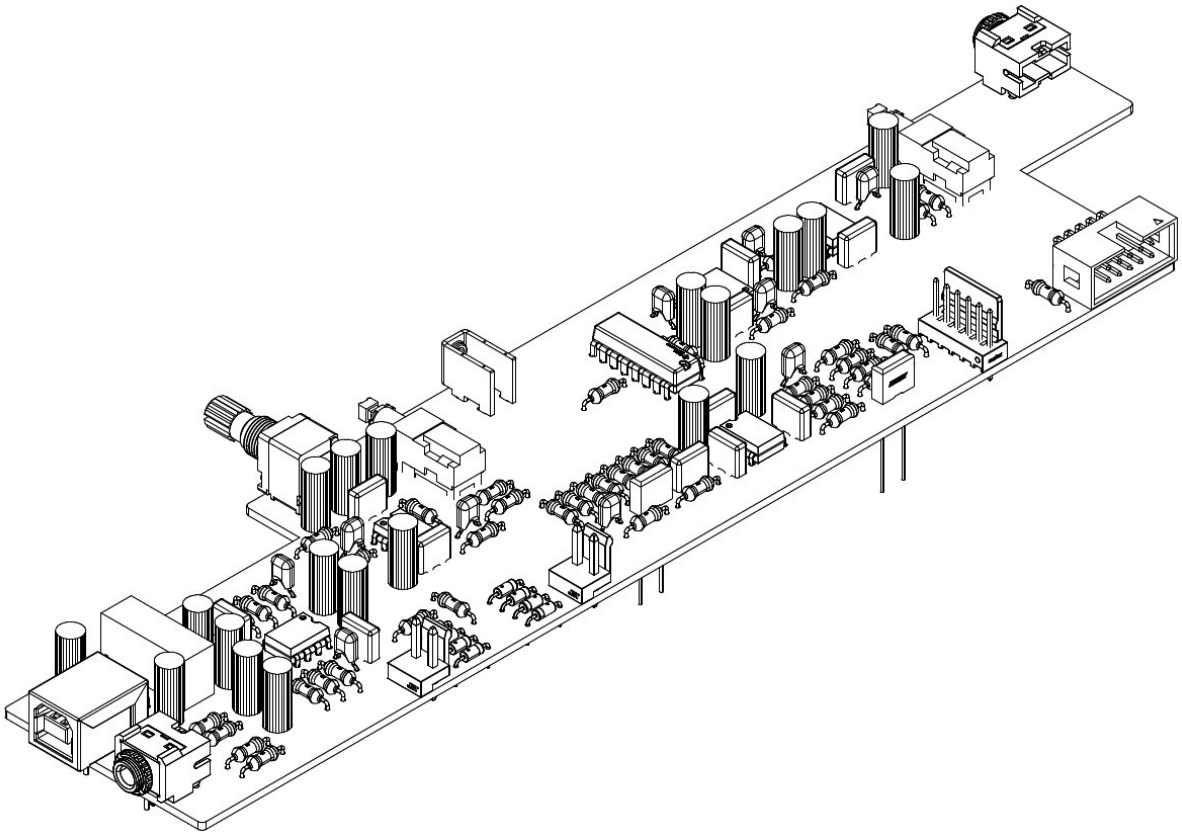


Line In PCB Solder Assembly

Board Complete

Master Out PCB

Solder Assembly



Master Out PCB Components

	Issue A Bare PCB
1	Resistor 47R 1/4W
2	Resistor 2K4 1/4W
3	Resistor 3K6 1/4W
4	Resistor 4K7 1/4W
5	Resistor 5K6 1/4W
6	Resistor 6K8 1/4W
7	Resistor 7K5 1/4W
8	Resistor 10K 1/4W
9	Resistor 15K 1/4W
10	Resistor 47K 1/4W
11	Capacitor Ceramic 47pF 100V 5%
12	Capacitor Electrolytic 22uF 20% 50V
13	Capacitor Polyester 100nF 63V
14	Capacitor Polyester 2700pF 100V
15	Capacitor Electrolytic 4.7uF 16V
16	Axial Inductor 6.8uH
17	Diode 1N5711 70V 15mA
18	Op-Amp
19	IC Switch SPDT
20	Isolated Module DC-DC Converter
21	3.5mm Stereo Audio Jack Connector
22	10 Way Right-Angle IDC Header
23	Connector 4 Way USB 2.0 type B R/A
24	Header SIL 2 Way Friction Lock 0.156"
25	Header SIL 6 Way Friction Lock 0.1"

continued overleaf

Master Out PCB components continued

(26)	Pot. Rotary 10K Lin +/-20%
(27)	Switch Horizontal Push Latched 2Pole
(28)	Metal Joint Block M9000
(29)	Capacitor Ceramic Disc 470 pF 3 kV
(30)	Axial Fuse 125V 1A

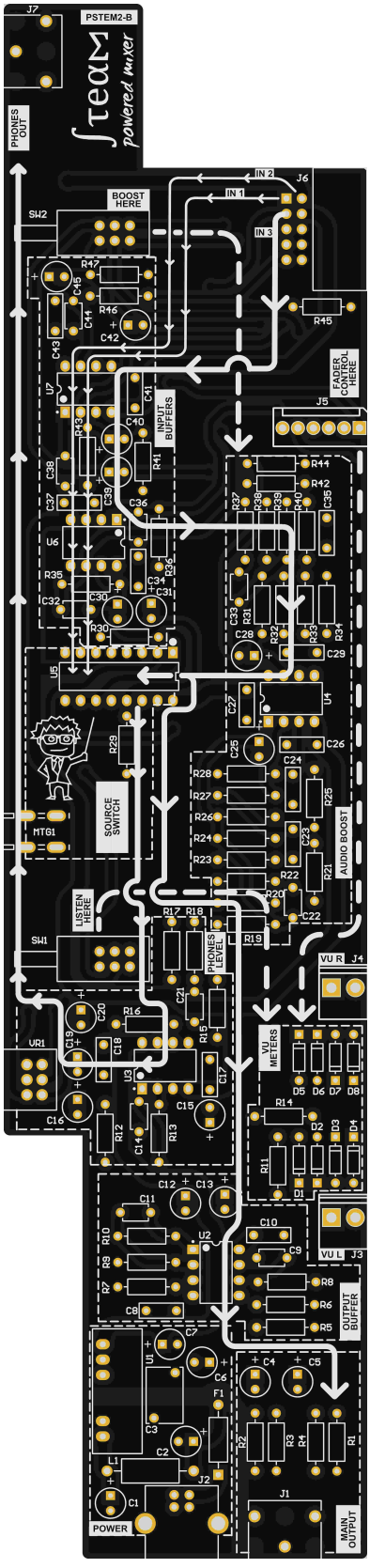
Master Out PCB Bare Board

- Thin white lines show input channel signals

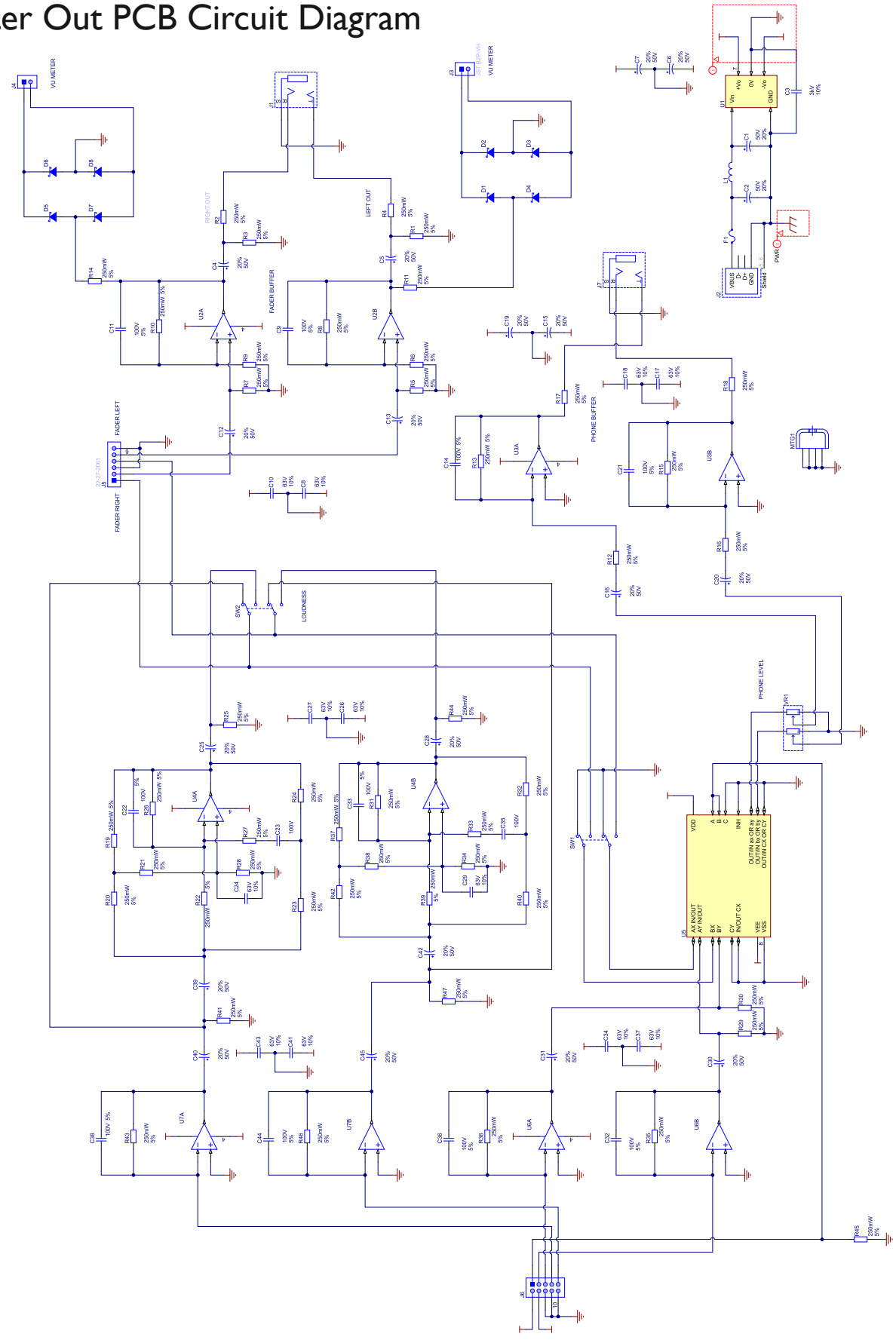
- Thick white lines shows the master channel signal

- Dotted white lines show control signals

- Dotted boxes identify different processing sections.



Master Out PCB Circuit Diagram



Master Out PCB Solder Assembly

1 Resistor 47R 1/4W

R2, R4, R17, R18

1 Steam
Master
47R x4

Orientation Not Critical

How to solder a resistor

Soldering Tips:

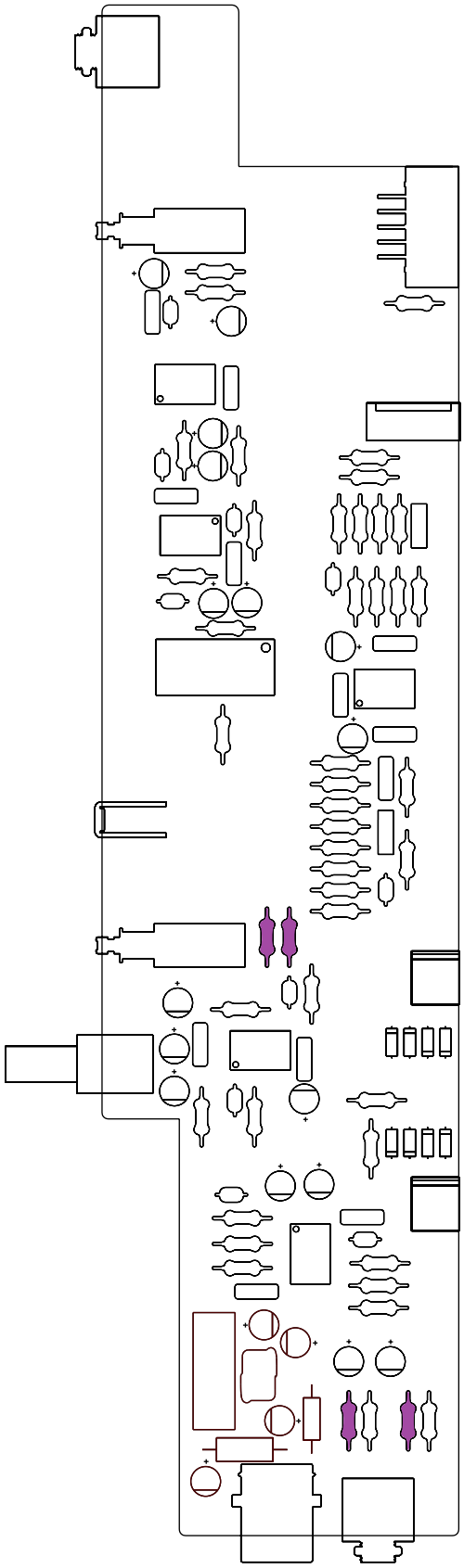
1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

2

Resistor 2K4 1/4W

R19, R23, R37, R40

2 ∫team
Master
2K4 x4

Orientation Not Critical

How to solder a resistor

Soldering Tips:

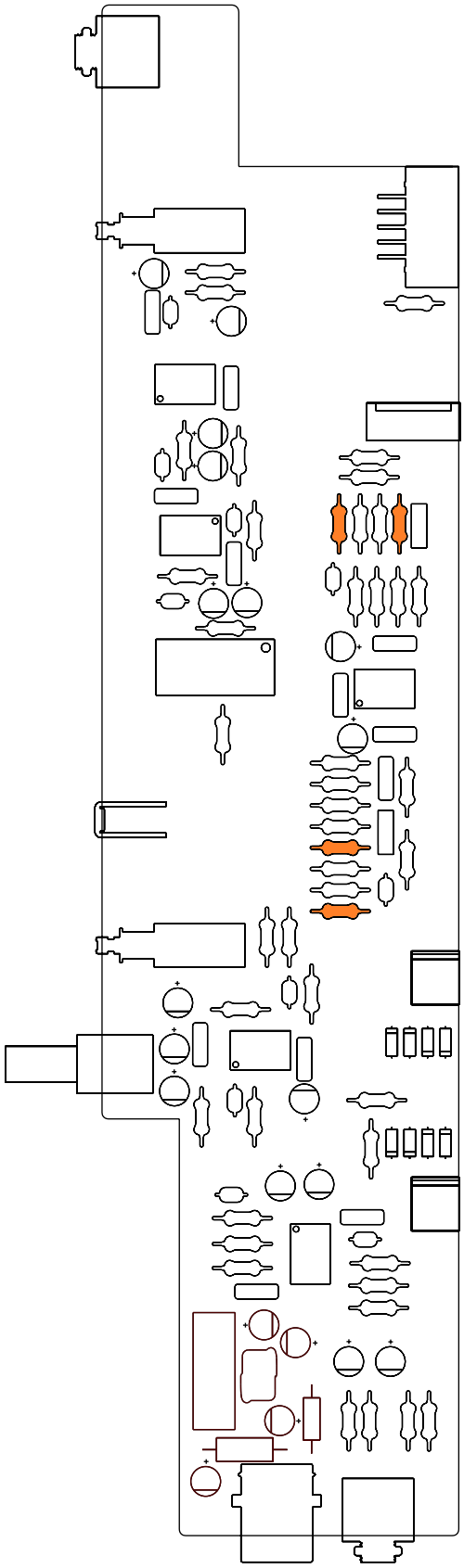
1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

3

Resistor 3K6 1/4W

R11, R14

3 ∫τεαм

Master
3K6 x2

Orientation Not Critical

How to solder a resistor

Soldering Tips:

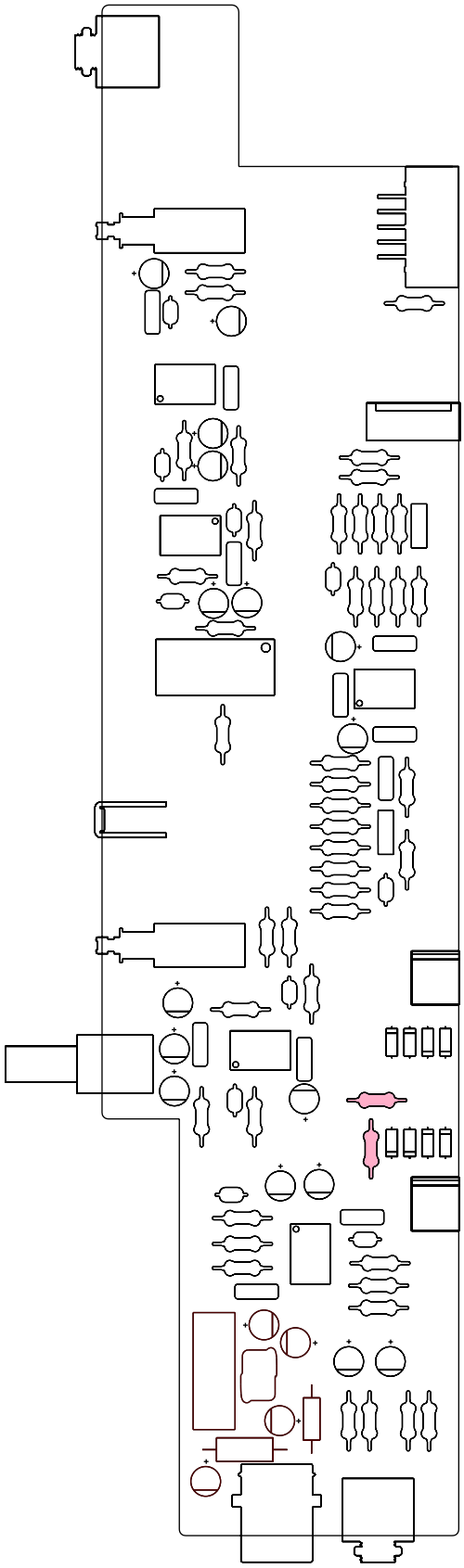
1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

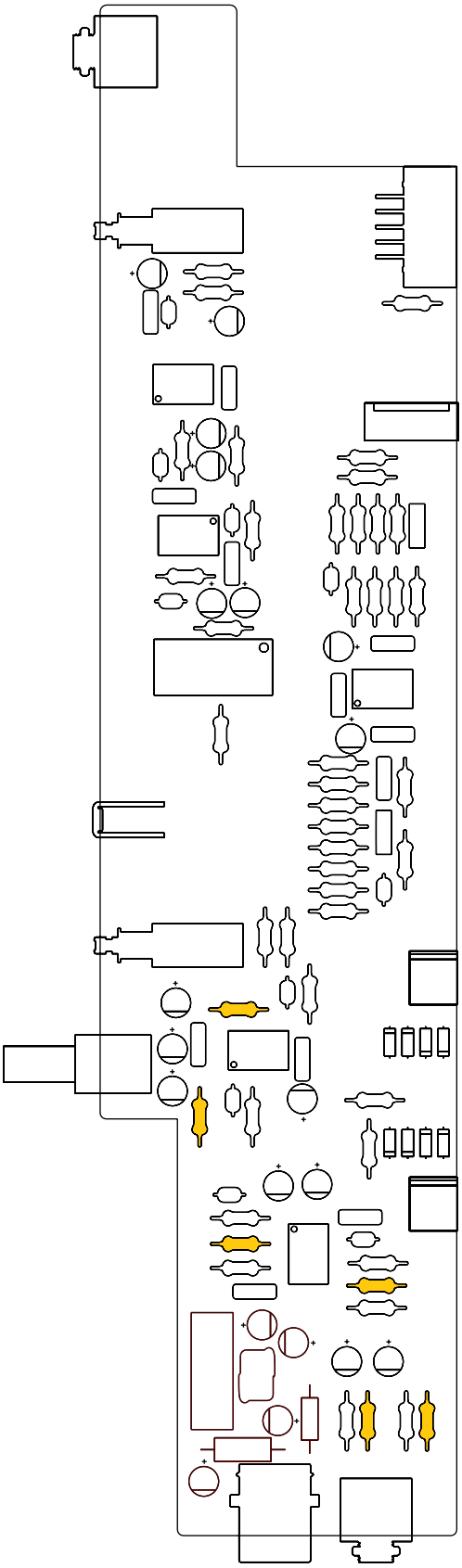
4 Resistor 4K7 1/4W

R1, R3, R6, R9, R12, R16

4 ∫team
Master
4K7 x6

Orientation Not Critical

How to solder a resistor



Soldering Tips:

1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

Master Out PCB Solder Assembly

5

Resistor 5K6 1/4W

R28, R34

5 Steam
Master
5K6 x2

Orientation Not Critical

How to solder a resistor

Soldering Tips:

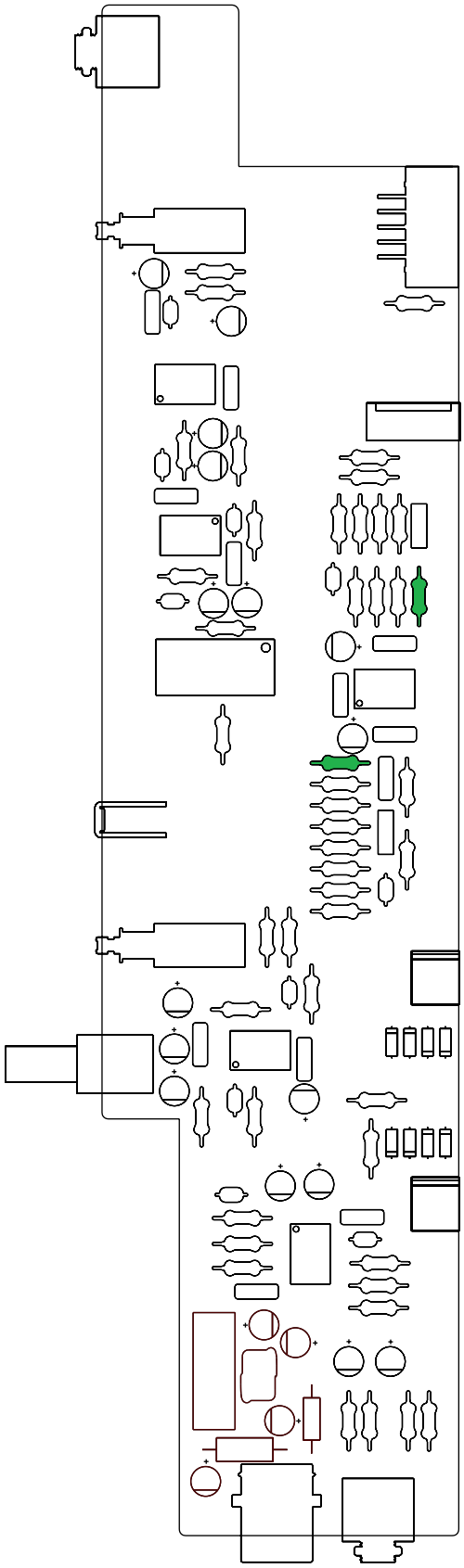
1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

6

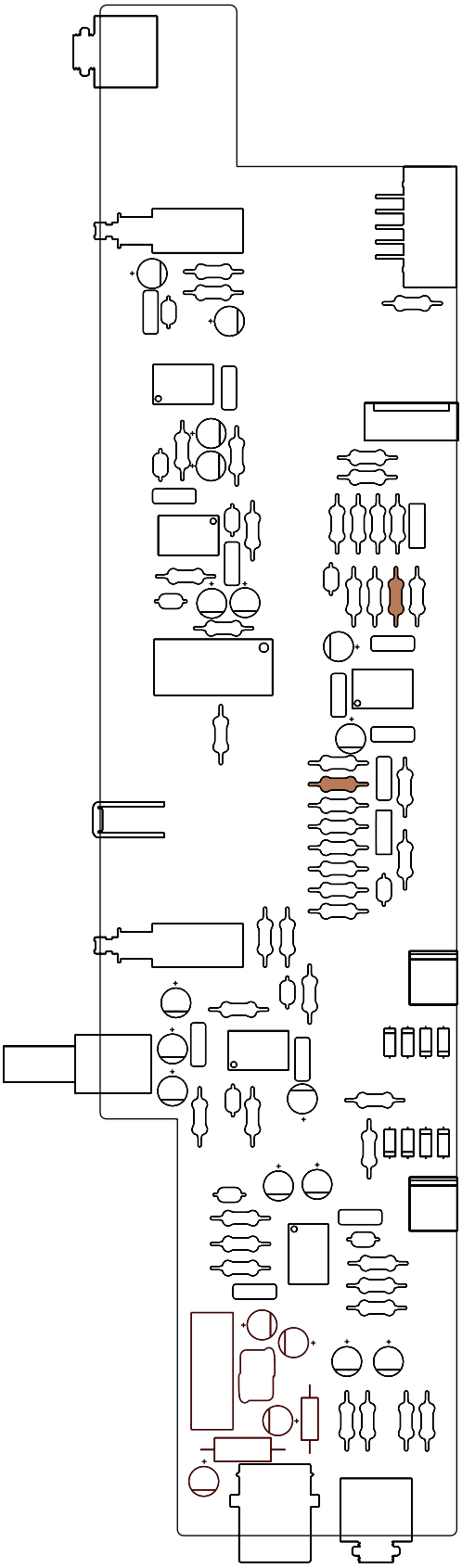
Resistor 6K8 1/4W

R27, R33

6 ∫team
Master
6K8 x2

Orientation Not Critical

How to solder a resistor



Soldering Tips:

1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

Master Out PCB Solder Assembly

7

Resistor 7K5 1/4W

R20, R21, R24, R32, R38, R42

7 Steam
Master
7K5 x6

Orientation Not Critical

How to solder a resistor

Soldering Tips:

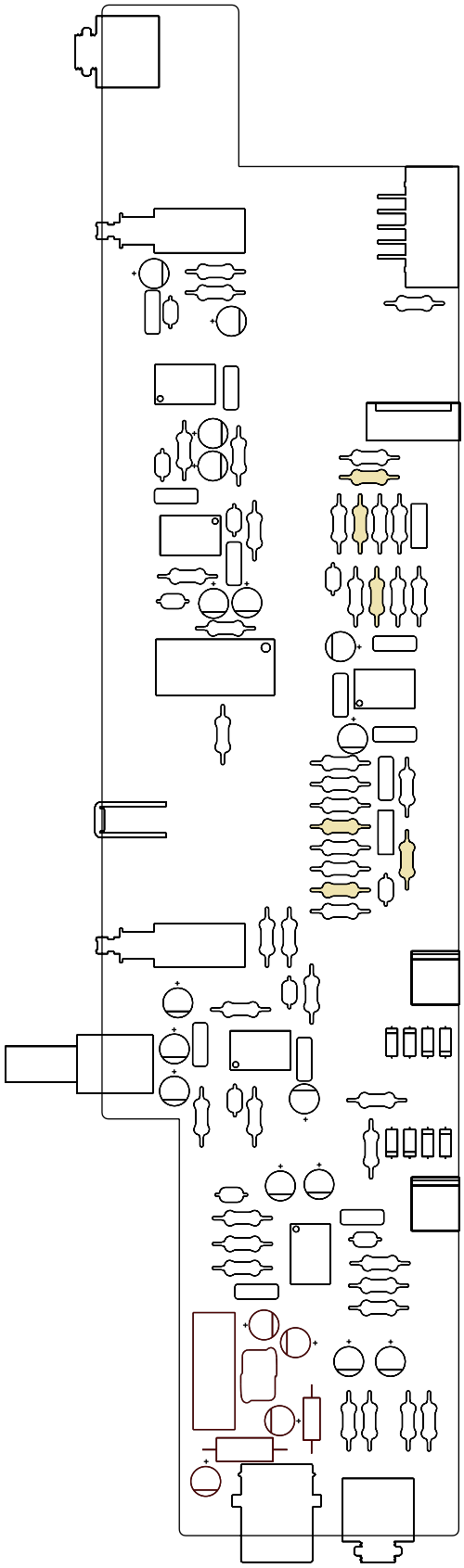
1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

8

Resistor 10K 1/4W

R8, R10

8 ∫team
Master
10K x2

Orientation Not Critical

How to solder a resistor

Soldering Tips:

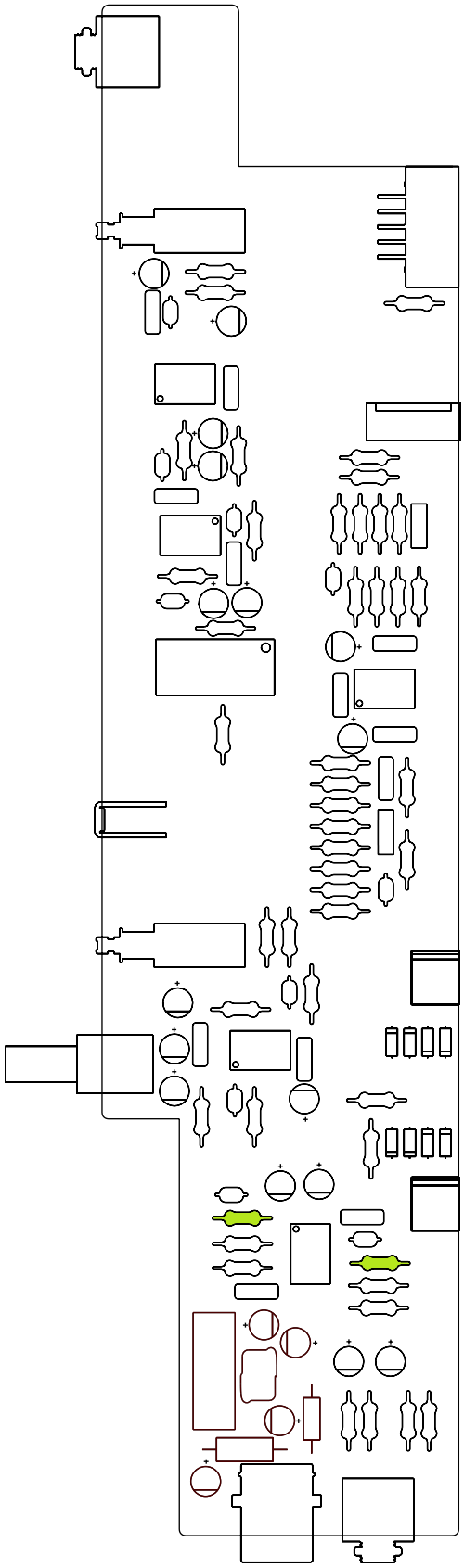
1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

9

Resistor 15K 1/4W

R13, R15, R35, R36, R43, R46

9 ∫τεαм

Master
15K x6

Orientation Not Critical

How to solder a resistor

Soldering Tips:

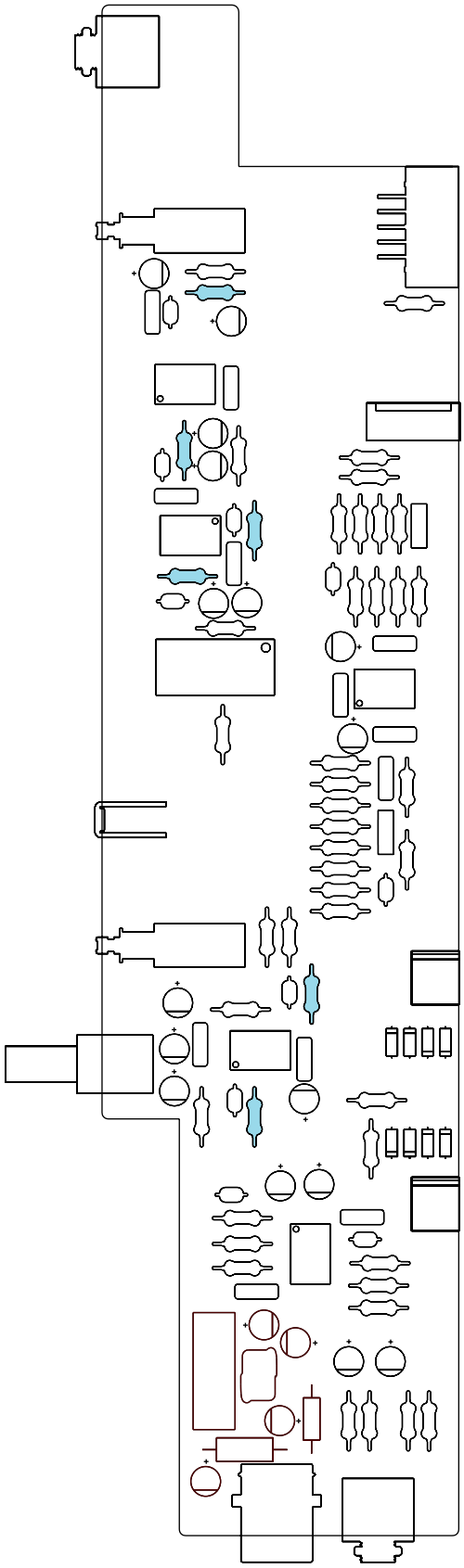
1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

10

Resistor 47K 1/4W

R5, R7, R22, R25, R26, R29, R30, R31, R39, R41, R44, R45, R47

10 ∫team
Master
47K x13

Orientation Not Critical

How to solder a resistor

Soldering Tips:

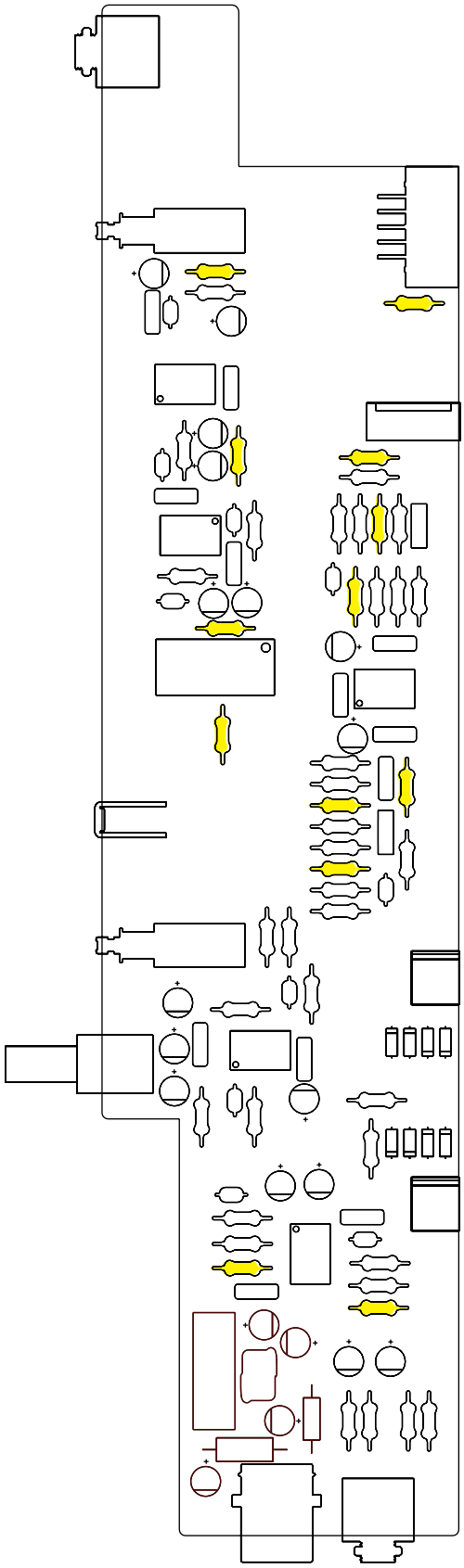
1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

11

Capacitor Ceramic 47pF 100V 5%

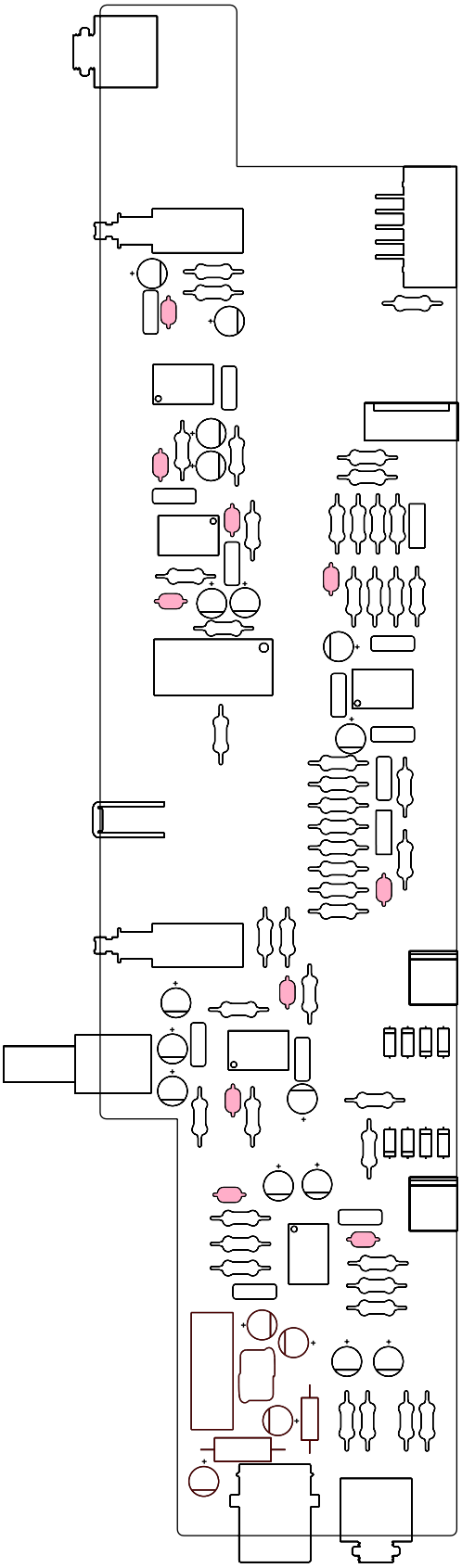
C9, C11, C14, C21, C22, C32, C33, C36, C38, C44

11 ∫τεαм

Master
47pF x10

Orientation Not Critical

How to solder a ceramic capacitor



Soldering Tips:

1. Pull component through the board as far as it can go
2. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
3. Solder the component
4. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts - but it is for some capacitors!

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

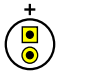
Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

Master Out PCB Solder Assembly

12 Capacitor Electrolytic 22uF 20% 50V

C4, C5, C12, C13, C15, C16, C19, C20, C25, C28, C30, C31, C39, C40, C42, C45

12 ∫team
Master
22uF x16



Check Part Orientation!

How to solder an electrolytic capacitor

Soldering Tips:

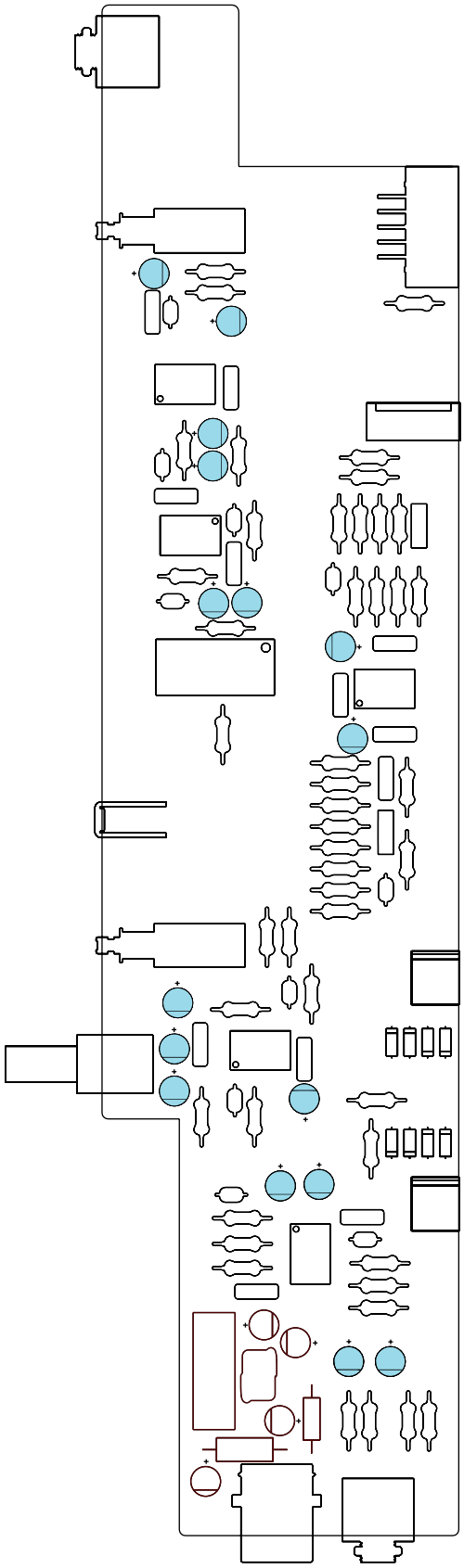
1. Pull component through the board as far as it can go. **Check the part orientation!** The pale line printed on the capacitor identifies the **negative** pin.
2. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
3. Solder the component
4. Using wire cutters, trim the leg to roughly 1 mm long

Warning! If these are fitted the wrong way round, they could explode when the unit is powered.

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

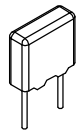


Master Out PCB Solder Assembly

13 Capacitor Polyester 100nF 63V

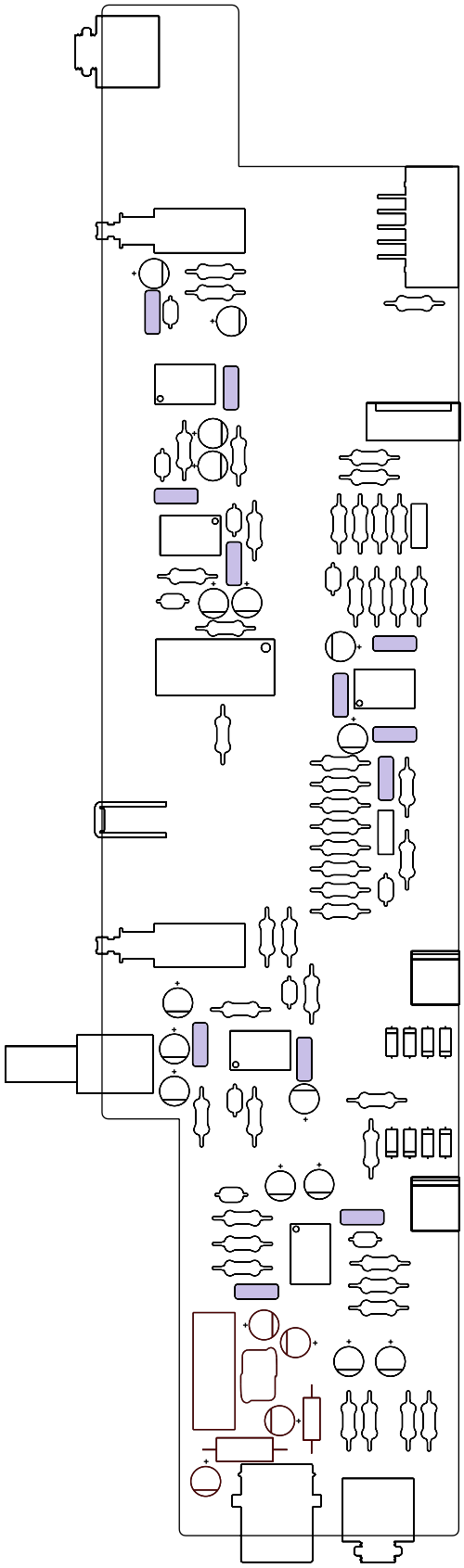
C8, C10, C17, C18, C24, C26, C27, C29, C34, C37, C41, C43

13 ∫τεαм
Master
100nF x12



Orientation Not Critical

How to solder a polyester capacitor



Soldering Tips:

1. Pull component through the board as far as it can go
2. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
3. Solder the component
4. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts - but it is for some capacitors!

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

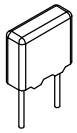
Master Out PCB Solder Assembly

14

Capacitor Polyester 2.7nF 100V

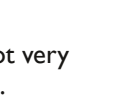
C23, C35

14 ∫team
Master
2.7nF x2



Orientation Not Critical

How to solder a polyester capacitor



Soldering Tips:

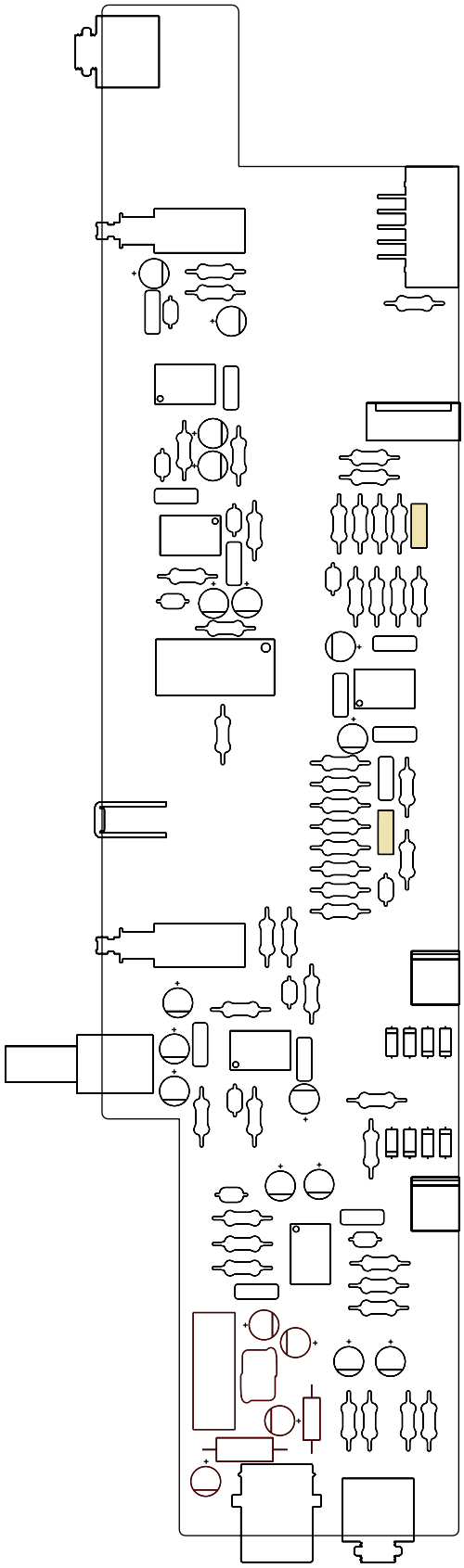
1. Pull component through the board as far as it can go
2. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
3. Solder the component
4. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts - but it is for some capacitors!

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

15 Capacitor Electrolytic 4.7uF 16V

C1, C2, C6, C7

15 ∫τεαм
Master
4.7uF x4

Check Part Orientation!

How to solder an electrolytic capacitor

Soldering Tips:

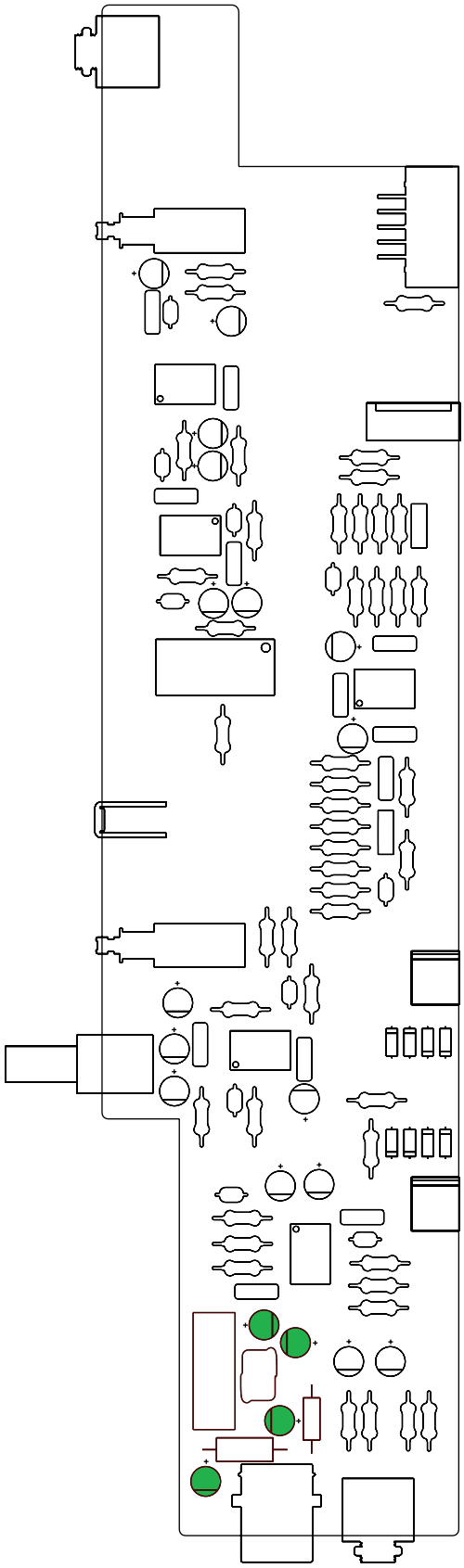
1. Pull component through the board as far as it can go. **Check the part orientation!** The pale line printed on the capacitor identifies the **negative** pin.
2. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
3. Solder the component
4. Using wire cutters, trim the leg to roughly 1 mm long

Warning! If these are fitted the wrong way round, they could explode when the unit is powered.

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

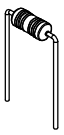


Master Out PCB Solder Assembly

16 Axial Inductor 6.8uH

L1

16 ∫team
Master
6.8uH x1



Orientation Not Critical

How to solder an axial inductor

Soldering Tips:

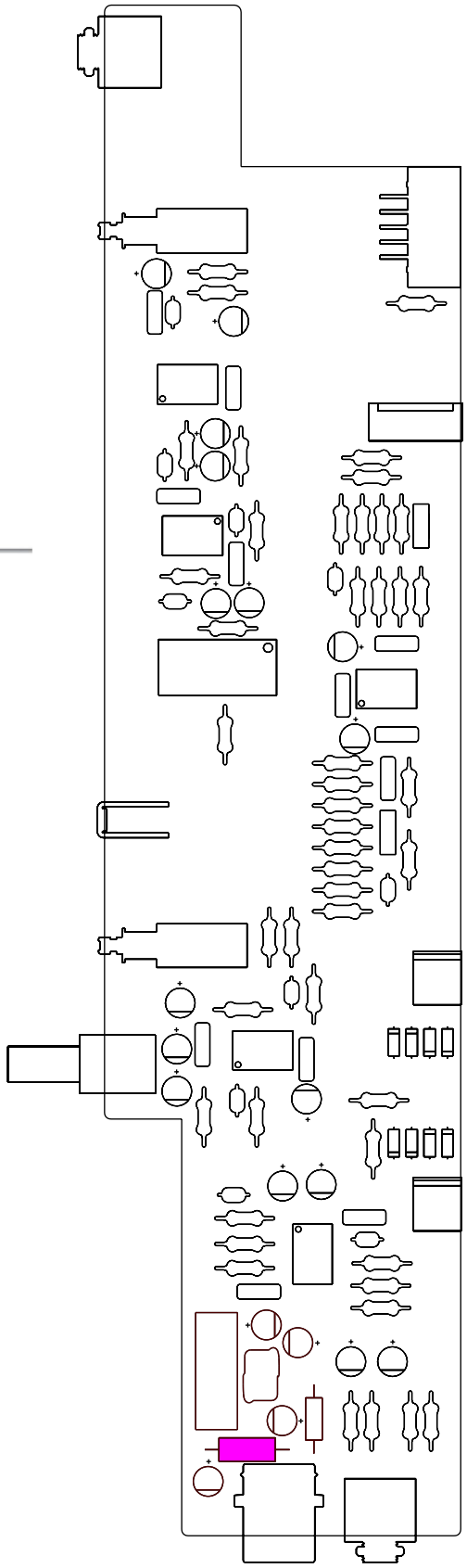
1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

17 Diode 70V 15mA

D1, D2, D3, D4, D5, D6, D7, D8

17 ∫τεαм

Master
DIODE x8

Check Part Orientation!

How to solder a diode

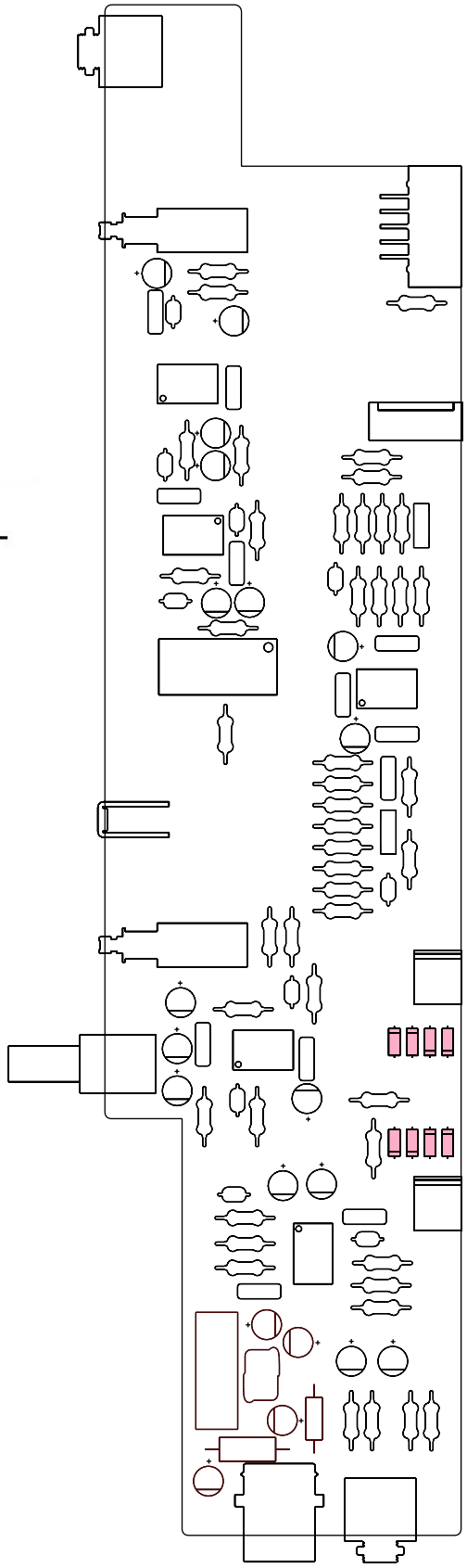
Soldering Tips:

1. Pull component through the board as far as it can go. **Check the part orientation!** If this is incorrect, the VU Meters will not work as intended
2. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
3. Solder the component
4. Using wire cutters, trim the leg to roughly 1 mm long

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

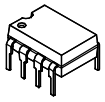


Master Out PCB Solder Assembly

18 Op-Amp (Operational Amplifier)

U2, U3, U4, U6, U7

18 ∫team
Master
Op-Amp ×5



Check Part Orientation!

How to solder
an Op-Amp

Soldering Tips:

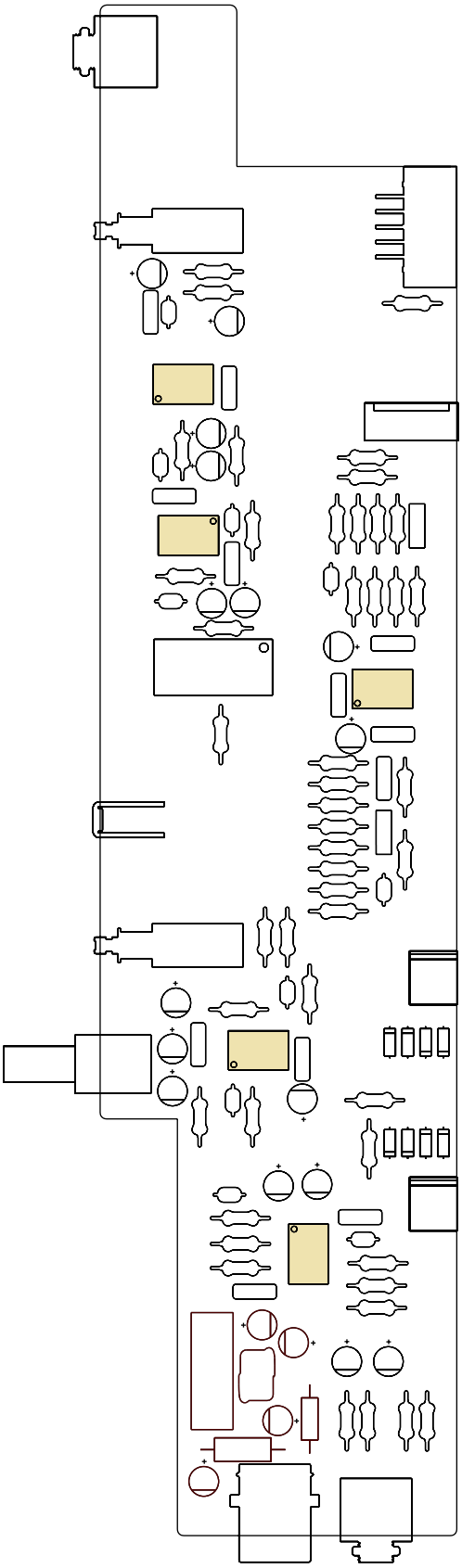
1. Place component so that it is flat against board. **Check part orientation is correct!**
2. Solder one of the corner legs
3. Check that component is still flat then solder the leg diagonally opposite
4. Again check the component is flat. If not, press the iron against the end of the problematic leg until the solder melts and using a finger, push the component flat from the other side of the board
5. Solder the remaining legs

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! If these are fitted the wrong way round, they could explode when the unit is powered.

Warning! These components can get hot very quickly which can cause a risk of burning.

Caution! Do not apply heat from the iron for more than 5 seconds at a time, as this might damage the component.



Master Out PCB Solder Assembly

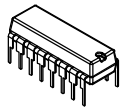
19 IC Switch SPDT 240R

U5

19 ∫TEAM

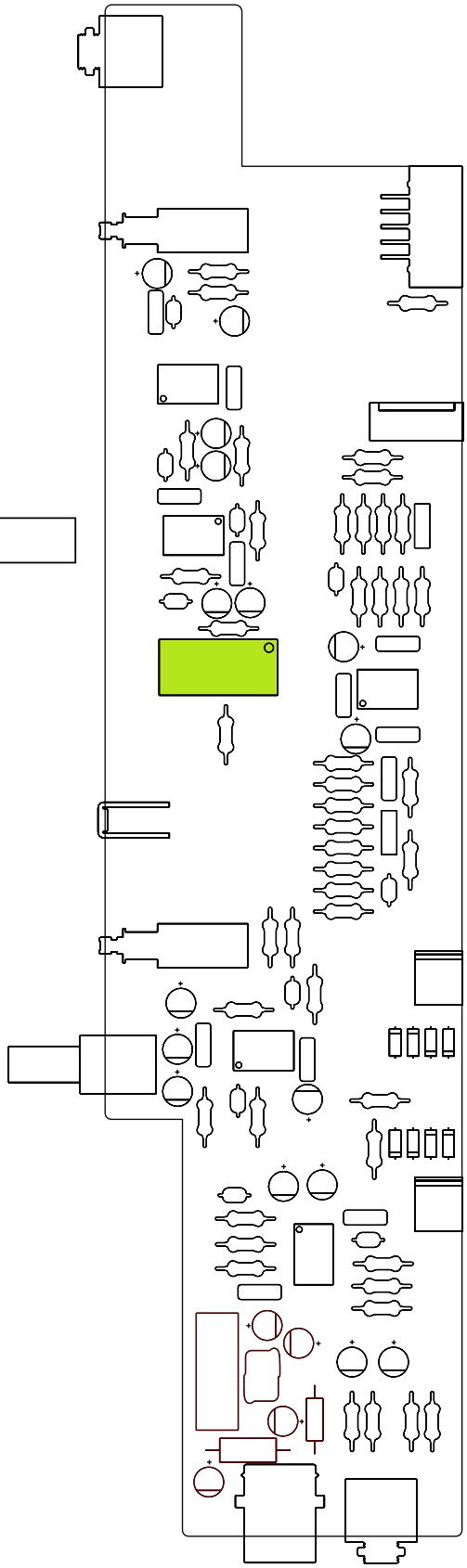
Master

U5 x1



Check Part Orientation!

How to solder an IC switch



Soldering Tips:

1. Place component so that it is flat against board. **Check part orientation is correct!** It is very easy to accidentally solder this part the wrong way around - there are notches at either end. **The deep, semi-circular recess identifies the correct orientation**. Not the shallow circular recess at the opposite end
2. Solder one of the corner legs
3. Check that component is still flat then solder the leg diagonally opposite
4. Again check the component is flat. If not, press the iron against the end of the problematic leg until the solder melts and using a finger, push the component flat from the other side of the board
5. Solder the remaining legs

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! If these are fitted the wrong way round, they could explode when the unit is powered.

Warning! These components can get hot very quickly which can cause a risk of burning.

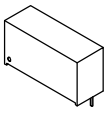
Caution! Do not apply heat from the iron for more than 5 seconds at a time, as this might damage the component.

Master Out PCB Solder Assembly

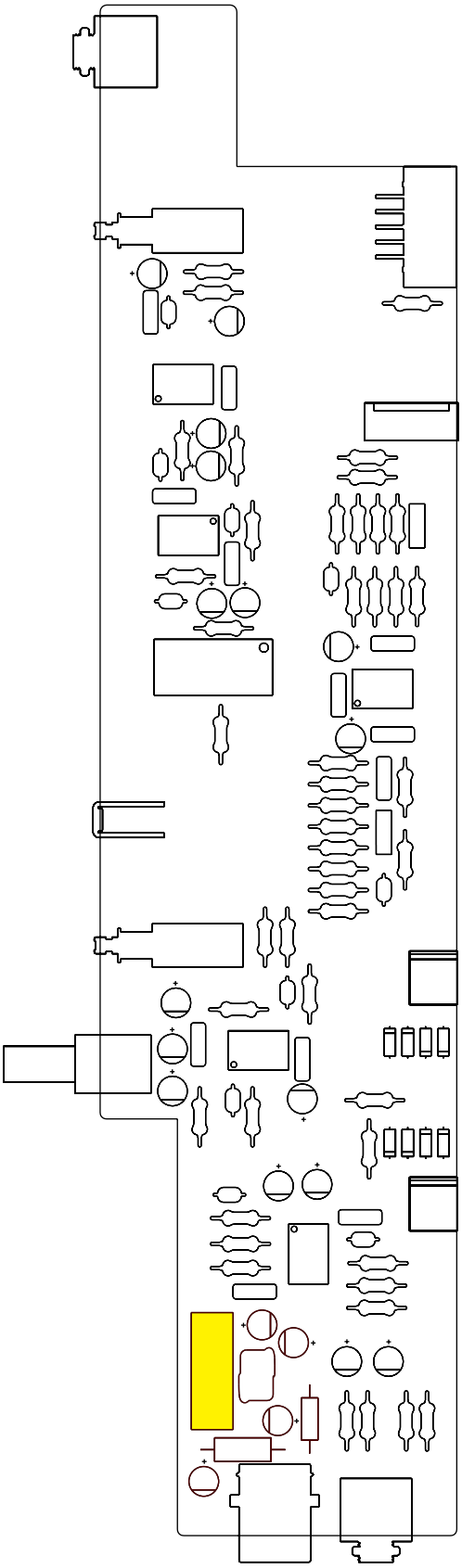
20 Isolated Module DC-DC Converter

U1

20 ∫team
Master
U1 x1



How to solder a DC-DC converter



Soldering Tips:

Make sure component is flat before soldering first pin, if this is soldered badly, it won't align with the metalwork

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

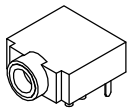
Master Out PCB Solder Assembly

21 3.5mm Stereo Audio Jack Connector

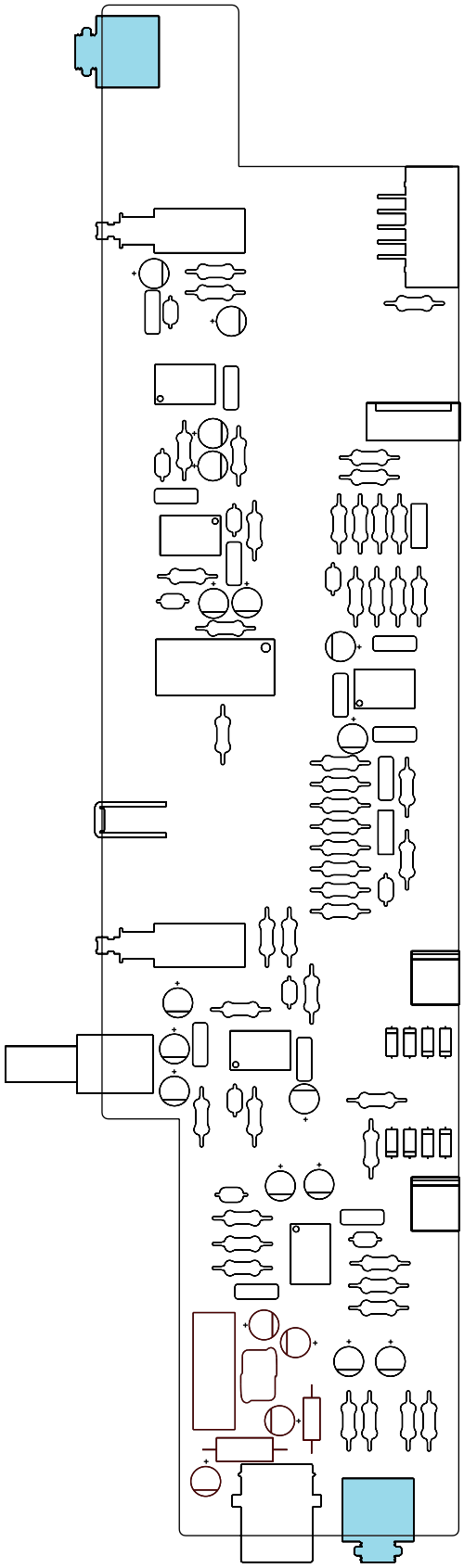
J1, J7

21 ∫τεαм

Master
J1/J7 x2



How to solder a 3.5 mm Audio Jack Connector



Soldering Tips:

Make sure component is flat before soldering first pin, if this is soldered badly, it won't align with the metalwork

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

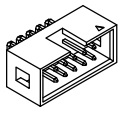
Master Out PCB Solder Assembly

22

10 Way Right-Angle IDC Header

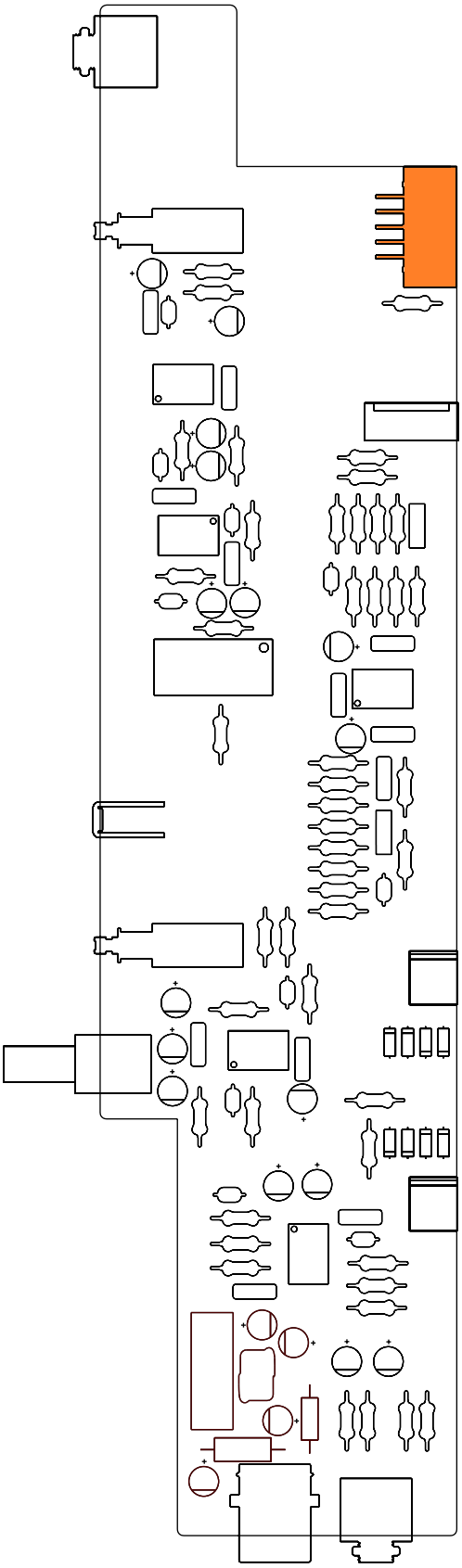
J6

22 ∫team
Master
J6 x1



Check Part Orientation!

How to solder a 10 Way IDC Header



Soldering Tips:

Make sure component is flat before soldering. This part easily rocks out of position.
It might help to try resting this component on top of something to make sure it stays in position when soldering

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

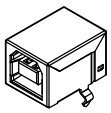
Master Out PCB Solder Assembly

23 Connector 4 Way USB 2.0 type B R/A

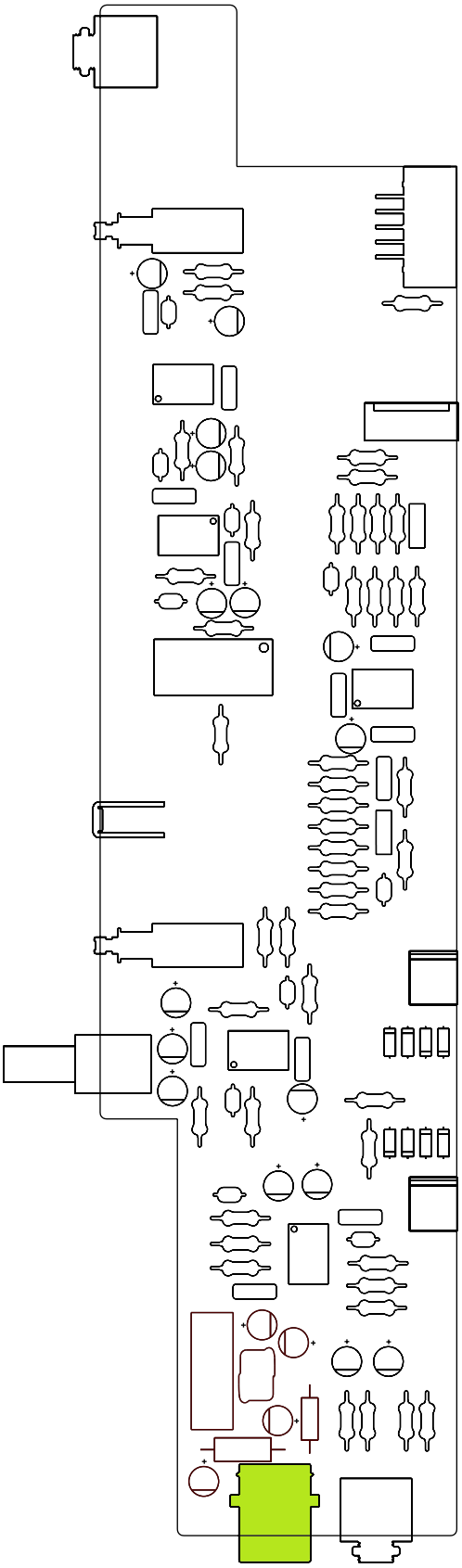
J2

23 ∫τεαм

Master
J2 x1



How to solder a USB connector



Soldering Tips:

Make sure component is flat before soldering first pin, if this is soldered badly, it won't align with the metalwork
More heat (time) and slightly more solder is required for the outside two legs of this component.

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

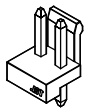
Master Out PCB Solder Assembly

24

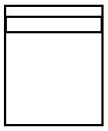
Header SIL 2 Way Friction Lock 0.156"

J3, J4

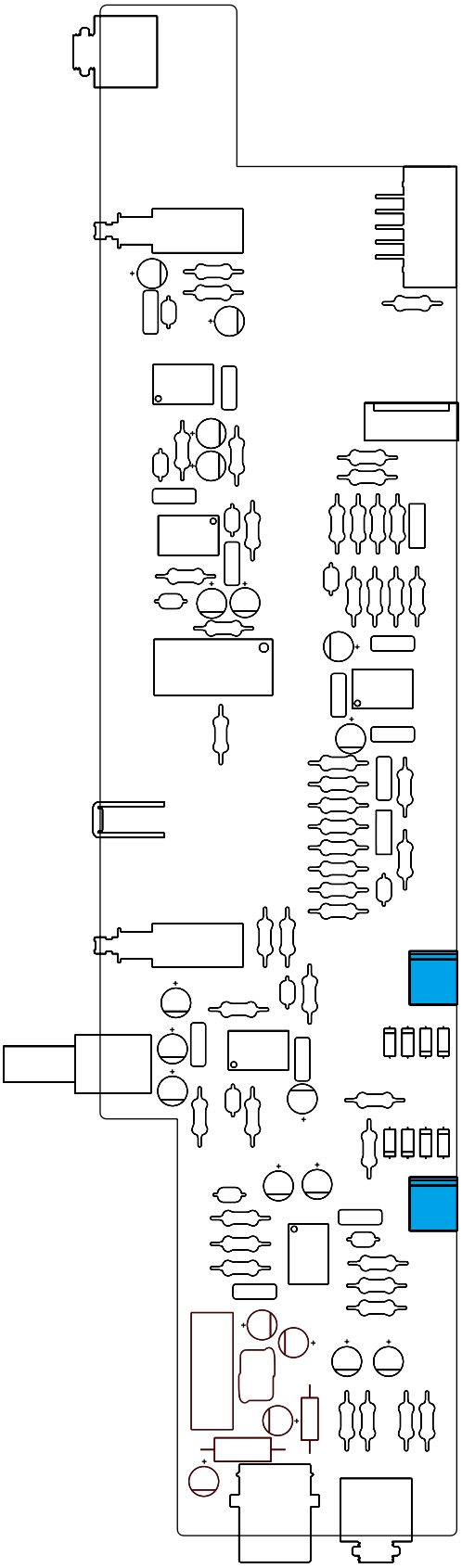
24 ∫team
Master
J3/J4 x2



Check Part Orientation!



How to solder a 2 way header



Soldering Tips:

1. Pull component through the board as far as it can go. **Check the part orientation!** If this is incorrect, the product will not work and multiple components will fail
2. Solder the component.

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Master Out PCB Solder Assembly

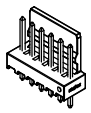
25

Header SIL 6 Way Friction Lock 0.1"

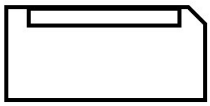
J5

25 ∫τεαм

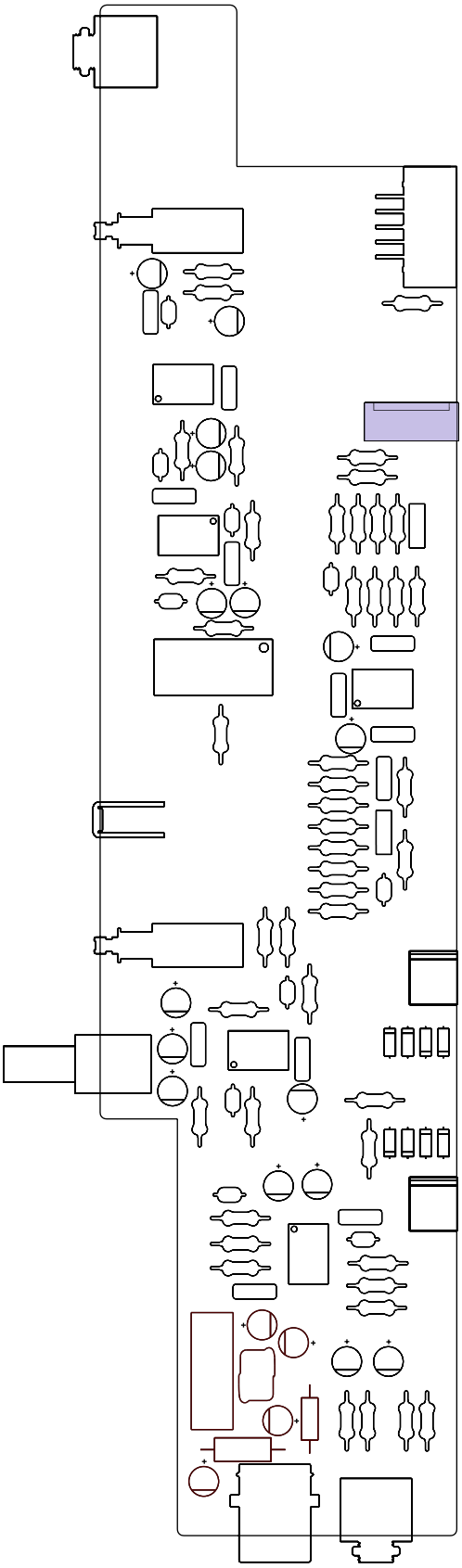
Master
J5 x1



Check Part Orientation!



How to solder a 6 way header



Soldering Tips:

1. Pull component through the board as far as it can go. **Check the part orientation!** If this is incorrect, the product will not work and multiple components will fail
2. Solder the component.

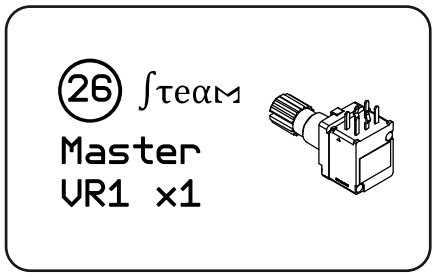
Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Master Out PCB Solder Assembly

26 Pot. Rotary 10K Log +/-20%

VR1



Check Part Orientation!

How to solder a rotary potentiometer

Soldering Tips:

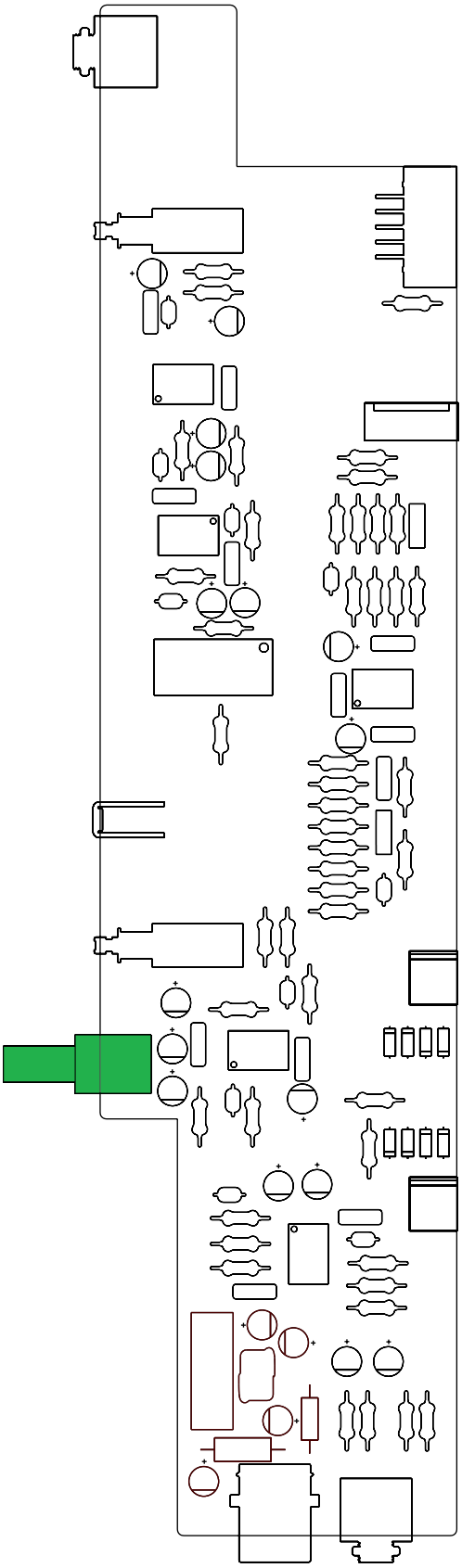
Make sure component is flat before soldering first pin, if this is soldered badly, it won't align with the metalwork.

Solder one pin and then solder the opposite corner. Make sure component is still flat. If not, reheat the pin and push the compoent flat.

Note: It is difficult to remove this component once more than one pin has been soldered so it is worth checking to make sure it is still flat after soldering the first two pins.

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

27

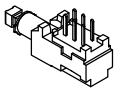
Switch Horizontal Push Latched 2-Pole

SW1, SW2

27 ∫TEAM

Master

SW1/2 x2



Check Part Orientation!

How to solder a horizontal push switch

Soldering Tips:

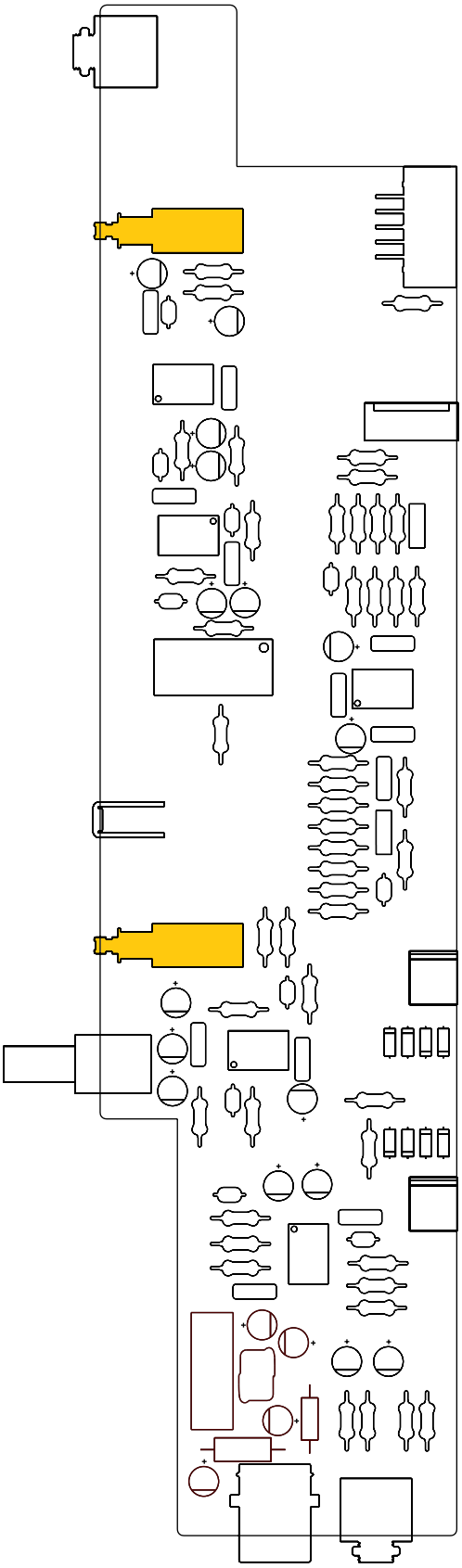
Make sure component is flat before soldering first pin, if this is soldered badly, it won't align with the metalwork.

Solder one pin and then solder the opposite corner. Make sure component is still flat. If not, reheat the pin and push the component flat.

Note: It is difficult to remove this component once more than one pin has been soldered so it is worth checking to make sure it is still flat after soldering the first two pins.

Warning! These components can get hot very quickly which can cause a risk of burning.

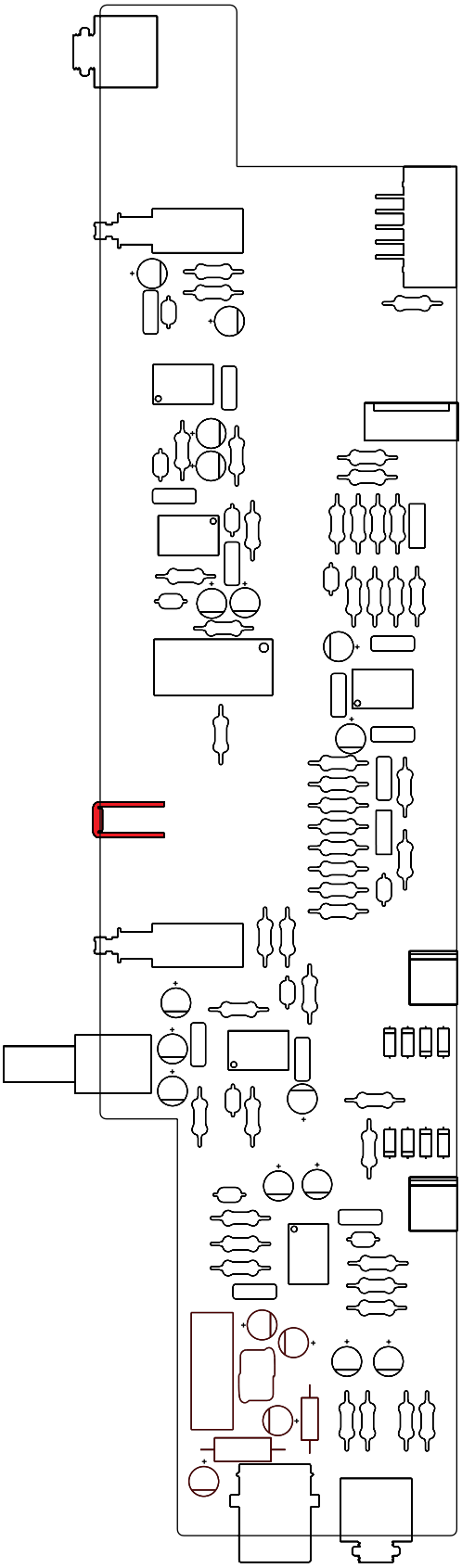
Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**



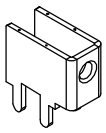
Master Out PCB Solder Assembly

28 Metal Joint Block

MTG1



28 ∫team
Master
MTG x1



Check Part Orientation!

How to solder a metal joint block

Soldering Tips:

Make sure component is flat before soldering first pin, if this is soldered badly, it won't align with the metalwork
More heat (time) and slightly more solder is required for this component - **this means it gets hotter than other components**.

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

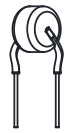
Master Out PCB Solder Assembly

29

Capacitor Ceramic Disc 470 pF 3 kV

C3

29 ∫τεαм
Master
470pF x1



Orientation Not Critical

How to solder a high voltage capacitor

Soldering Tips:

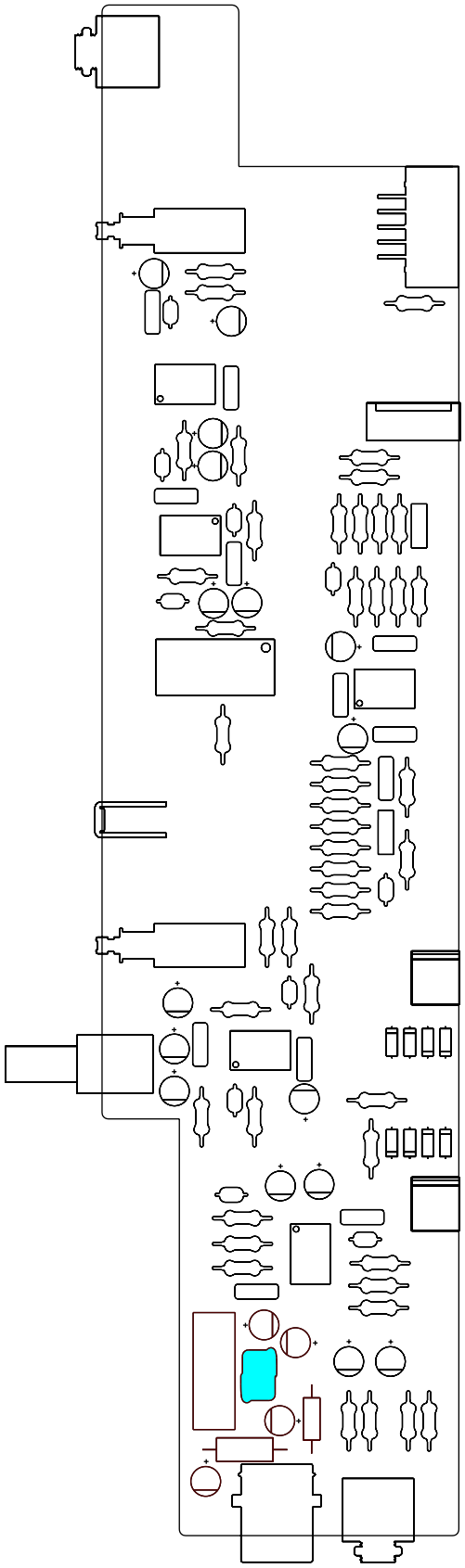
1. Pull component through the board as far as it can go
2. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
3. Solder the component
4. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts - but it is for some capacitors!

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**



Master Out PCB Solder Assembly

30 Axial Fuse 125V 1A
F1

30 ∫team
Master
FUSE x1

Orientation Not Critical

How to solder an axial fuse

Soldering Tips:

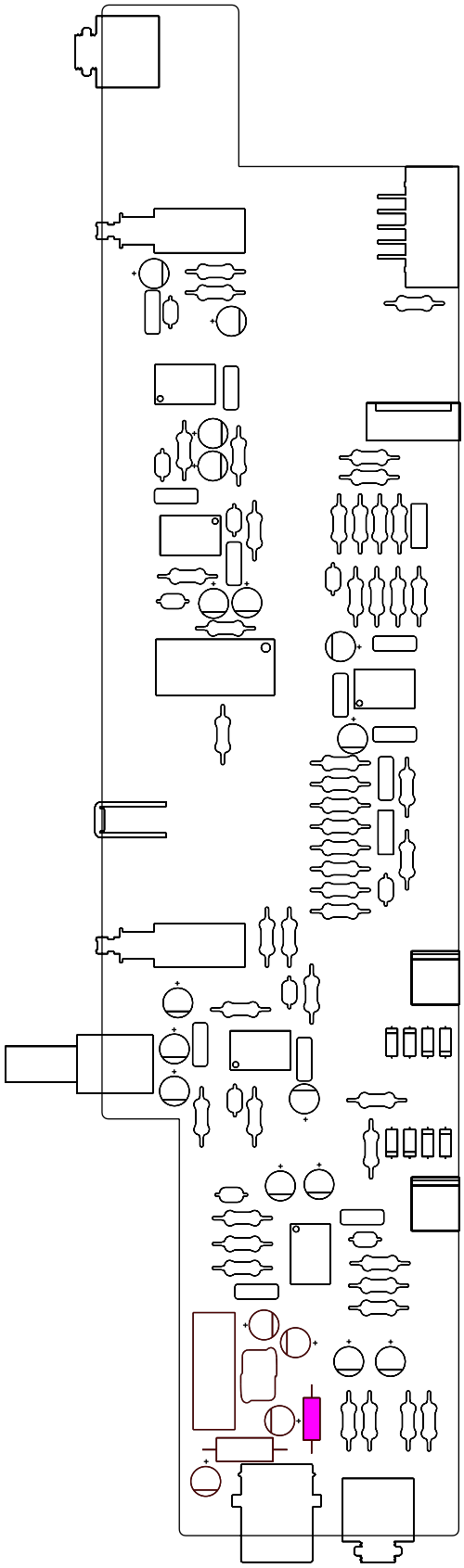
1. Pull component through the board
2. Using pliers if necessary, pull the component flat against the board
3. Put a 45 degree bend in each leg to hold the component in position while making sure that the component is still flat
4. Solder the component
5. Using wire cutters, trim the leg to roughly 1 mm long

Note: Orientation is not important for these parts, although for some people, convention is that the gold band is on the right or top

Warning! These components can get hot very quickly which can cause a risk of burning.

Warning! While soldering, there is a risk of solder splatter. **Make sure you are wearing eye protection.**

Warning! When trimming the component legs with cutters, shards of metal and wire can fire off in unpredictable directions. **Make sure you are wearing eye protection.**

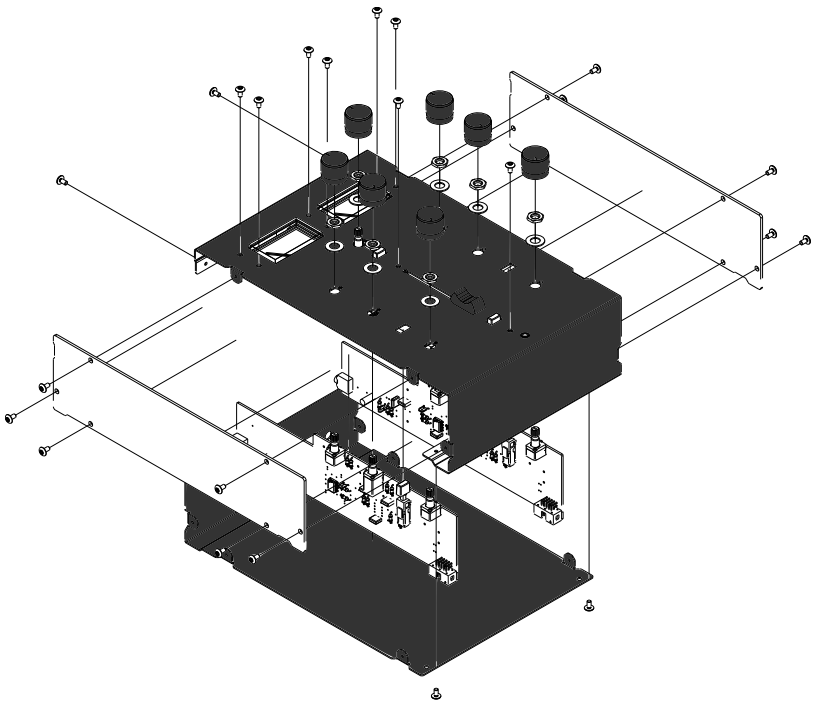


Master Out PCB Solder Assembly

Board Complete

Mechanical Assembly

Metalwork Assembly



Mechanical Assembly Components

Mechanical Components:

• Chassis Top	x 1
• Chassis Bottom	x 1
• VU Bracket	x 1
• Clear Acrylic Sides	x 2
• Fader Cap	x 1
• Rotary Knobs	x 7
• Rubber O-Ring	x 7
• Rectangular Push-Switch Caps	x 4
• M2 Countersink Screws	x 2
• M3 Button Head Screws	x 27
• Adhesive Foot	x 4
• Plastic Grommet	x 1

Wiring Looms:

• VU Meter Loom	x 2
• Fader Loom	x 1
• Ribbon Cable Loom	x 1

Mechanical Assembly

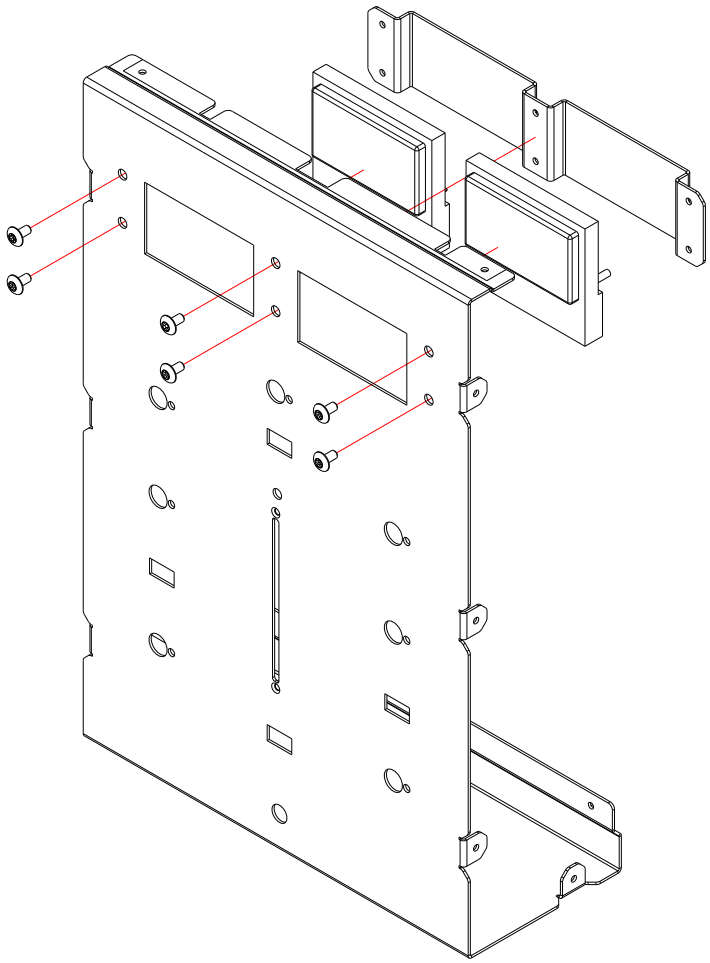
1 VU Meters

Components Required:

- Chassis Top x 1
- VU Bracket x 1
- M3 Button Head Screws x 6
- VU Meter Loom x 2

Tools Required :

- # 1 PoziDriv® Screw Driver



Mechanical Assembly

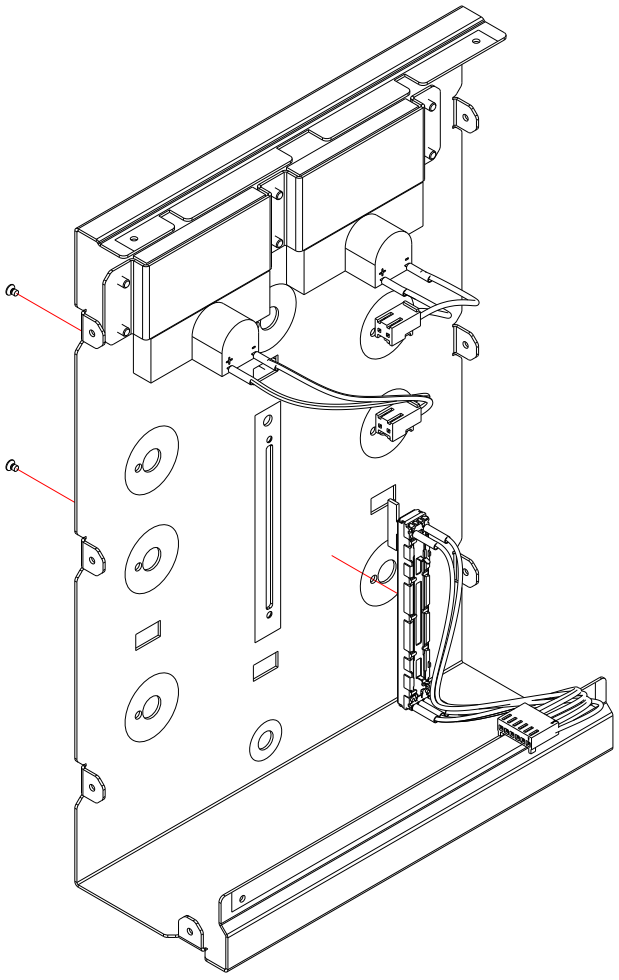
2 Fader Loom

Components Required:

- Fader Loom x 1
- M2 Countersink Screws x 2

Tools Required :

- # 0 PoziDriv® Screw Driver



Mechanical Assembly

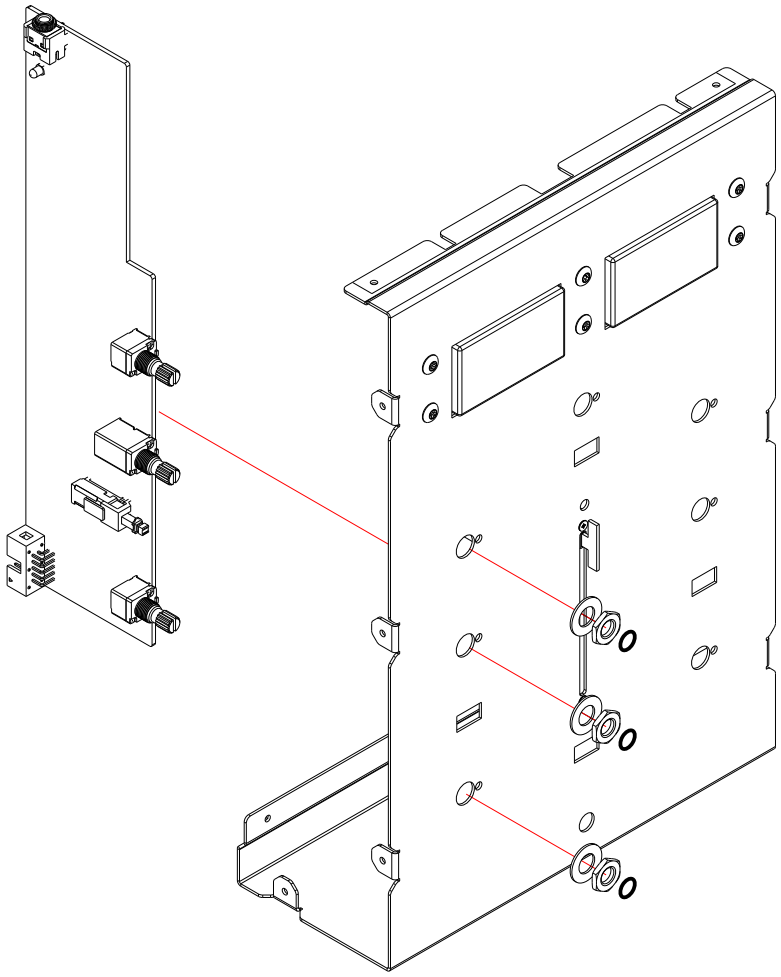
3 Line In PCB

Components Required:

- Potentiometer Nut x 7
- Potentiometer Washer x 7
- Rubber O-Ring x 7

Tools Required :

- 10 mm Spanner



Assembly Notes:

- Fit the Washer, Nut and then Rubber O-ring. Make sure the O-Ring is sitting in the middle of the smooth section of the potentiometer shaft.

Mechanical Assembly

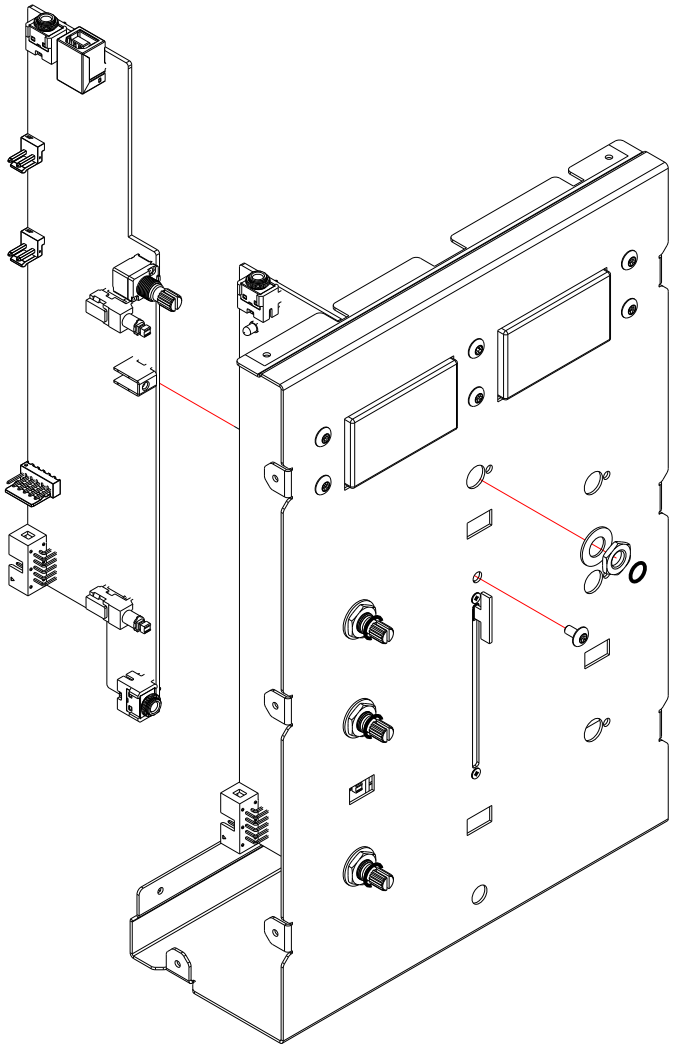
4 Master Out PCB

Components Required:

- Potentiometer Nut x 1
- Potentiometer Washer x 1
- Rubber O-Ring x 1
- M3 Button Head Screws x 1

Tools Required :

- 10 mm Spanner
- # 1 PoziDriv® Screw Driver



Assembly Notes:

- Remove the knurled nut from the 3.5 mm jack located at the Cue/Phones position and re-fit and hand-tighten once the other fixings are fitted
- Fit the Washer, Nut and then Rubber O-ring. Make sure the O-Ring is sitting on the smooth section of the potentiometer shaft.

Mechanical Assembly

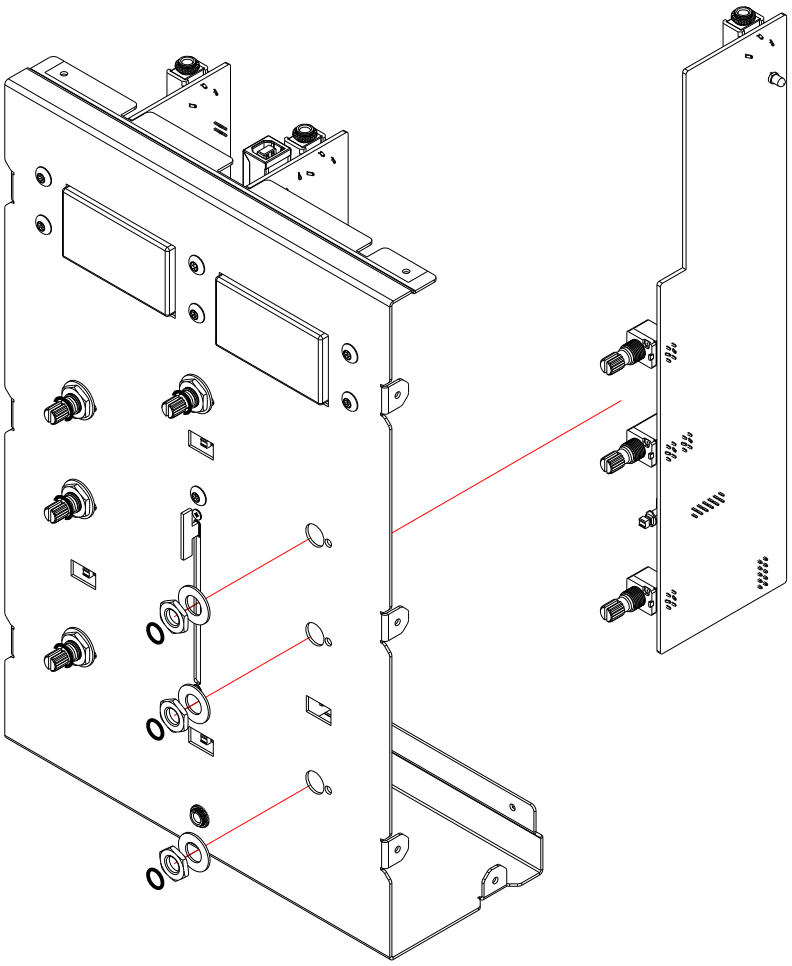
5 Second Line In PCB

Components Required:

- Potentiometer Nut x 7
- Potentiometer Washer x 7
- Rubber O-Ring x 7

Tools Required :

- 10 mm Spanner



Assembly Notes:

- Fit the Washer, Nut and then Rubber O-ring. Make sure the O-Ring is sitting in the middle of the smooth section of the potentiometer shaft.

Mechanical Assembly

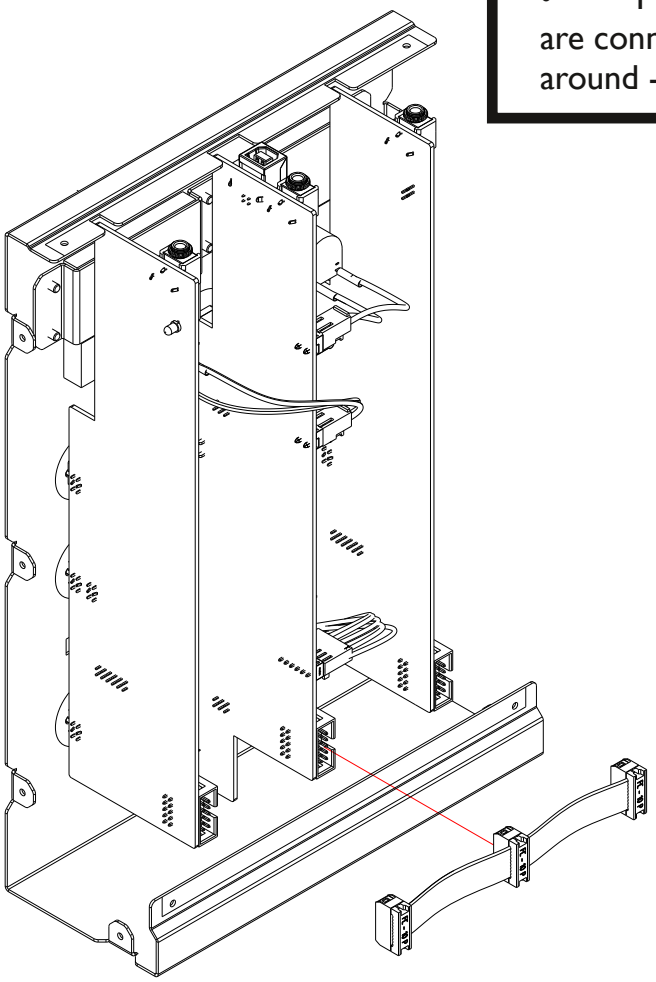
6 Loom Assembly

Components Required:

- Ribbon Cable Loom x 1

Assembly Notes:

- Connect all looms (VU Meters x2, Fader Loom, and Ribbon Cable)
- Make sure that the VU Meters are connected the correct way around - this is labelled on the PCB!



Mechanical Assembly

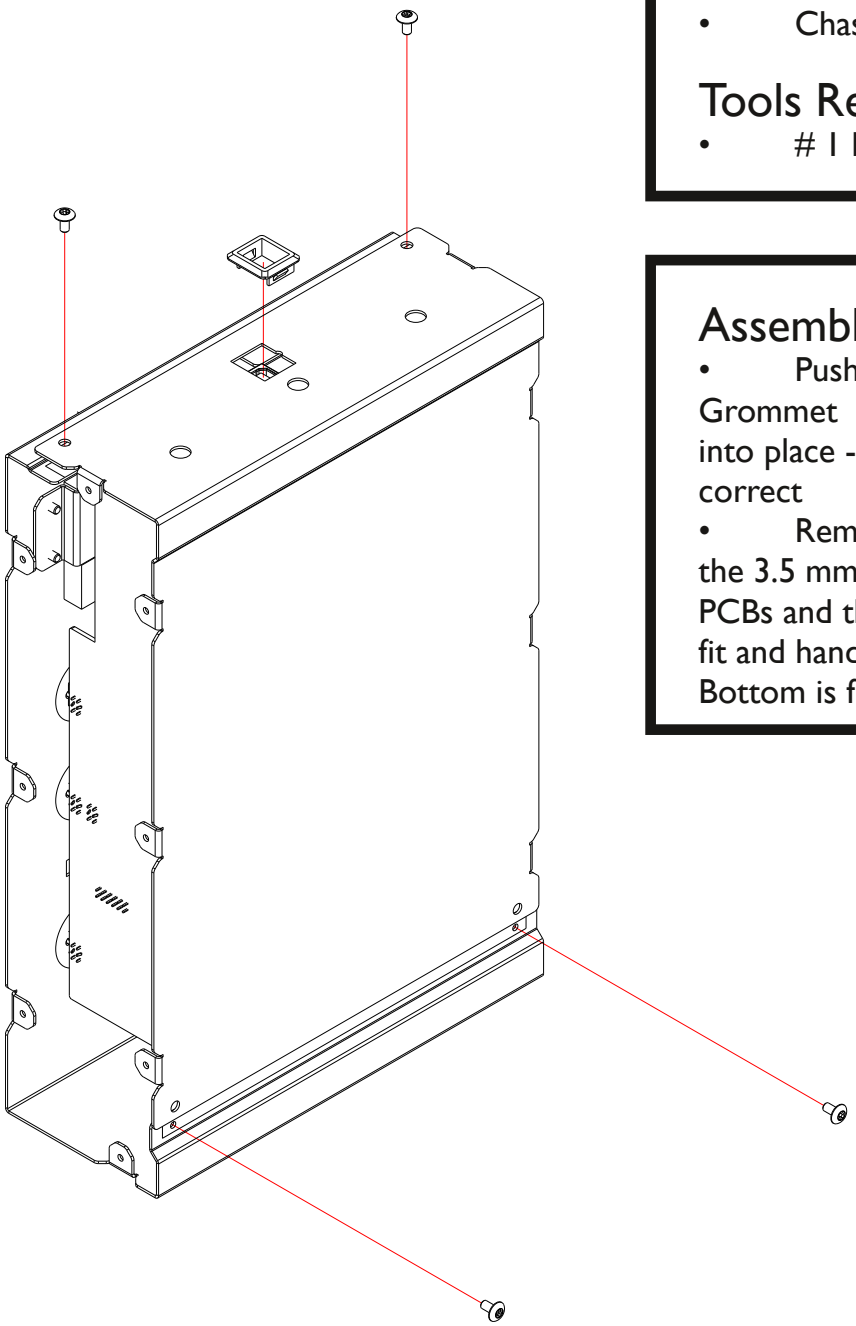
7 Chassis Base

Components Required:

- M3 Button Head Screws x 4
- Plastic Grommet x 1
- Chassis Bottom x 1

Tools Required :

- # 1 PoziDriv® Screw Driver



Assembly Notes:

- Push-fit Plastic Grommet so that it snaps into place - check the orientation is correct
- Remove the knurled nut from the 3.5 mm jacks on both line in PCBs and the master ut PCBs and re-fit and hand-tighten once the Chassis Bottom is fitted

Mechanical Assembly

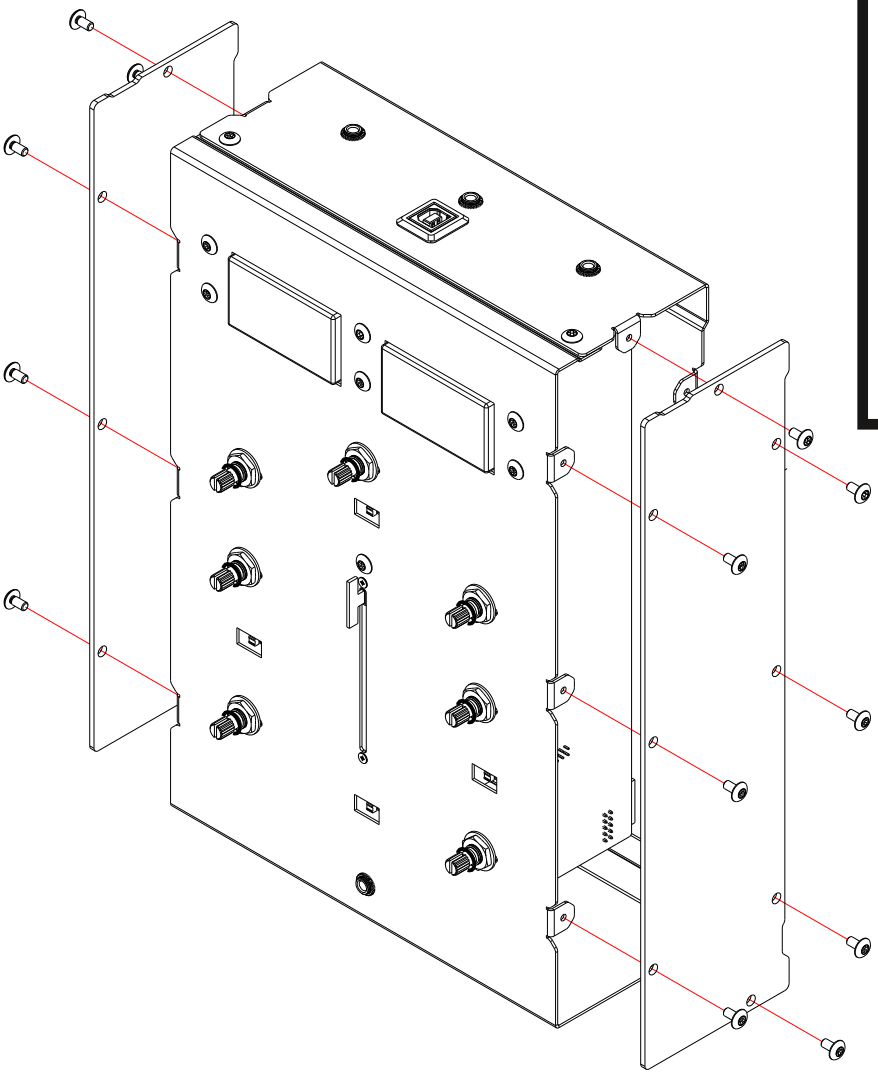
8 Clear Sides

Components Required:

- Clear Acrylic Sides x 2
- M3 Button Head Screws x 16

Tools Required :

- # 1 PoziDriv® Screw Driver



Assembly Notes:

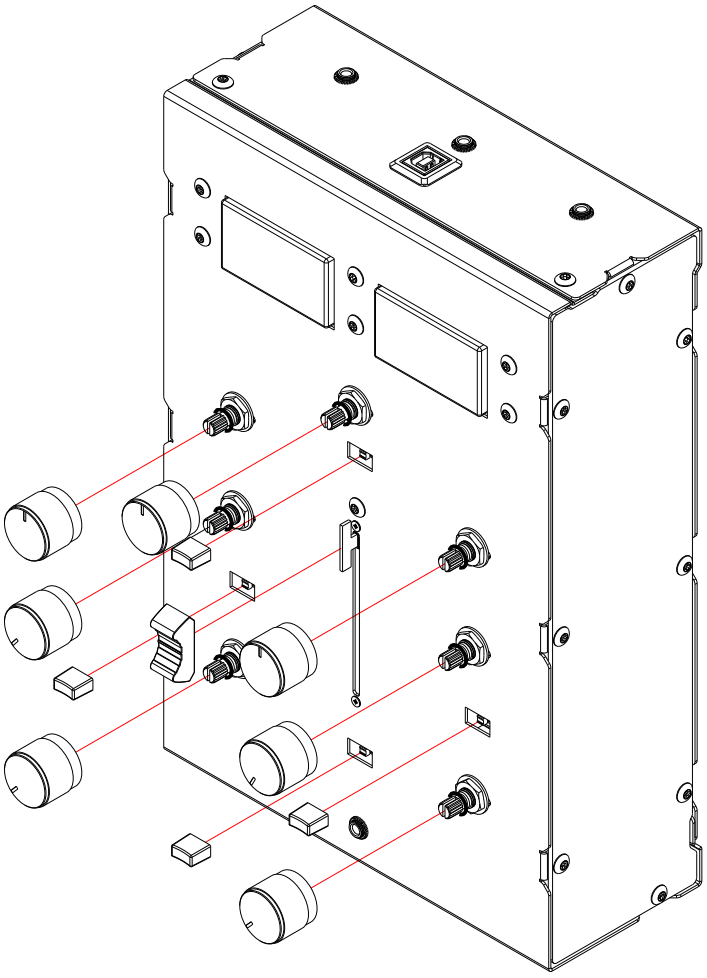
- Ensure the orientation of the Clear Acrylic Sides is correct. There is a notch in one corner which clears the step in the metalwork

Mechanical Assembly

9 Knobs and Switch Caps

Components Required:

- Fader Cap x 1
- Rotary Knobs x 7
- Rectangular Push-Switch Caps x 4



Assembly Notes:

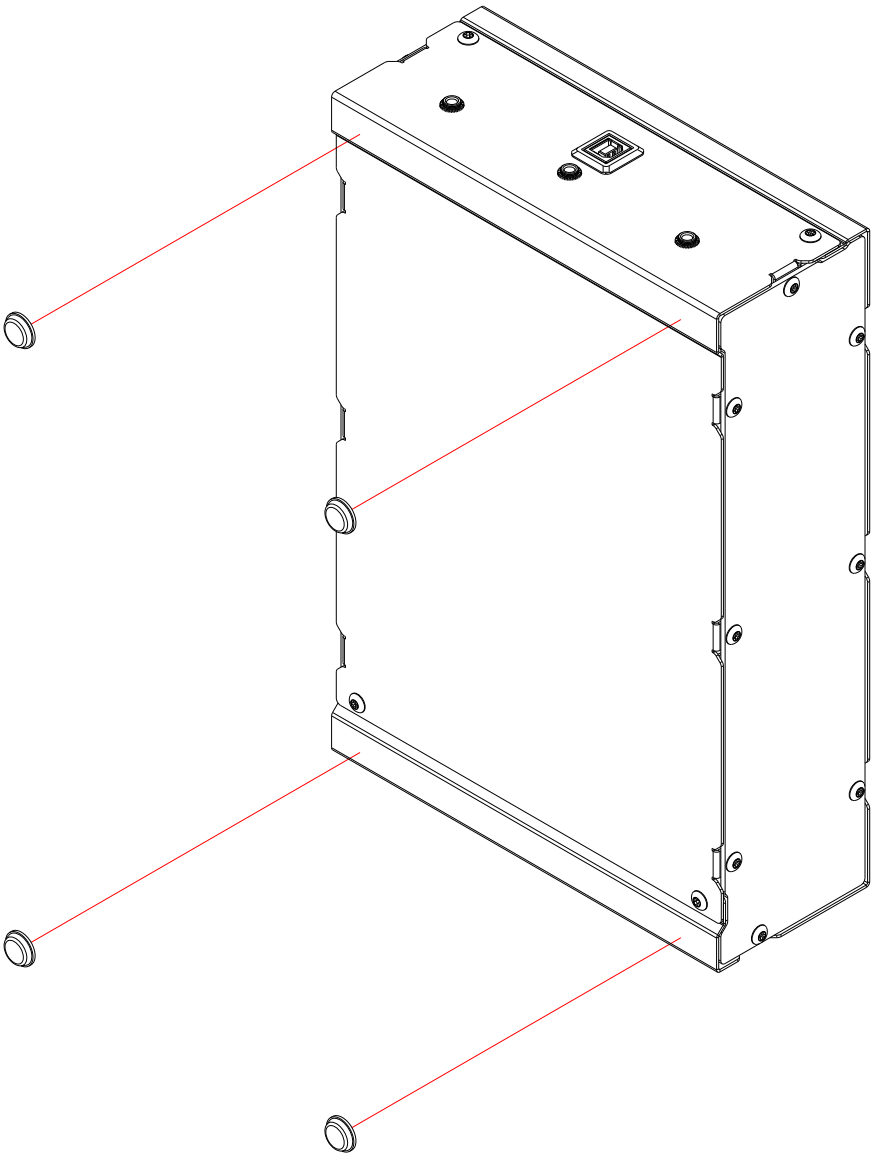
- Make sure all pots are rotated to the left, so alignment of line on the rotary knob can be aligned correctly

Mechanical Assembly

10 Adhesive Feet

Components Required:

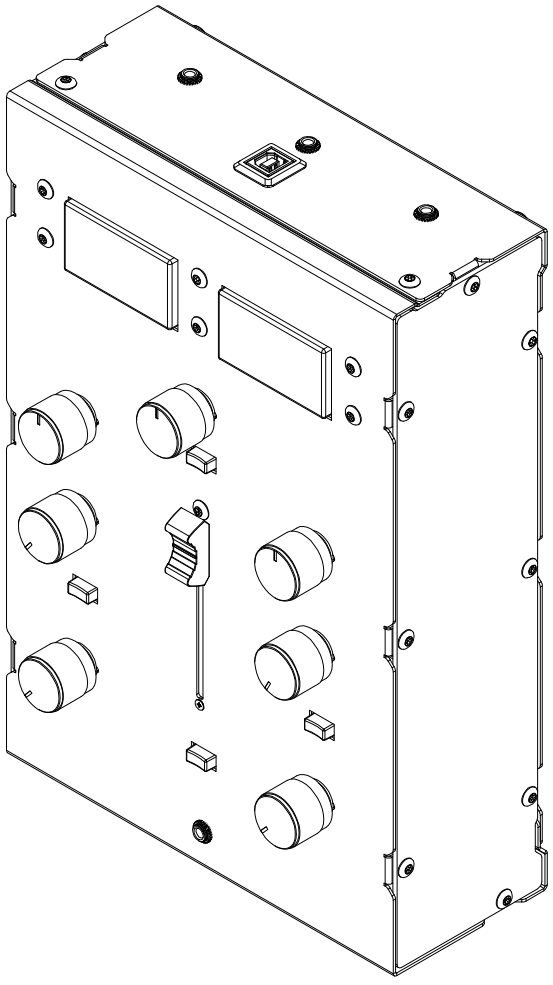
- Adhesive Foot x 4



Assembly Notes:

- Use a ruler to position feet roughly 10 mm from the outside of the assembled unit to the edge of the foot

Mechanical Assembly Complete

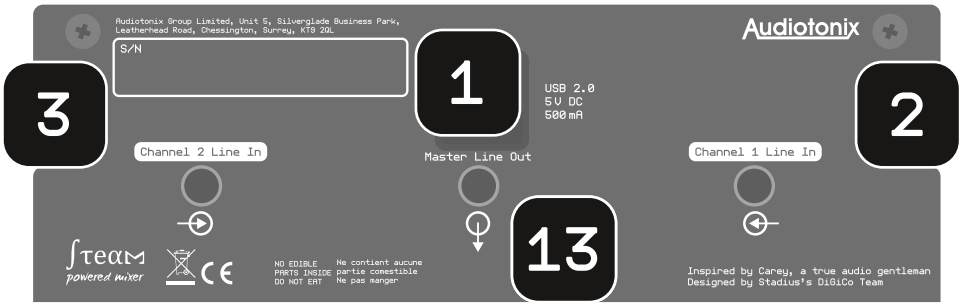


Operation of Unit

How to Use Your Finished Mixer

- **Warning!** Check to make sure the product is correctly assembled before use. An incorrectly assembled product may pose the risk of electric shock, fire, overheating or explosion.

Rear Panel Diagram and Explanation



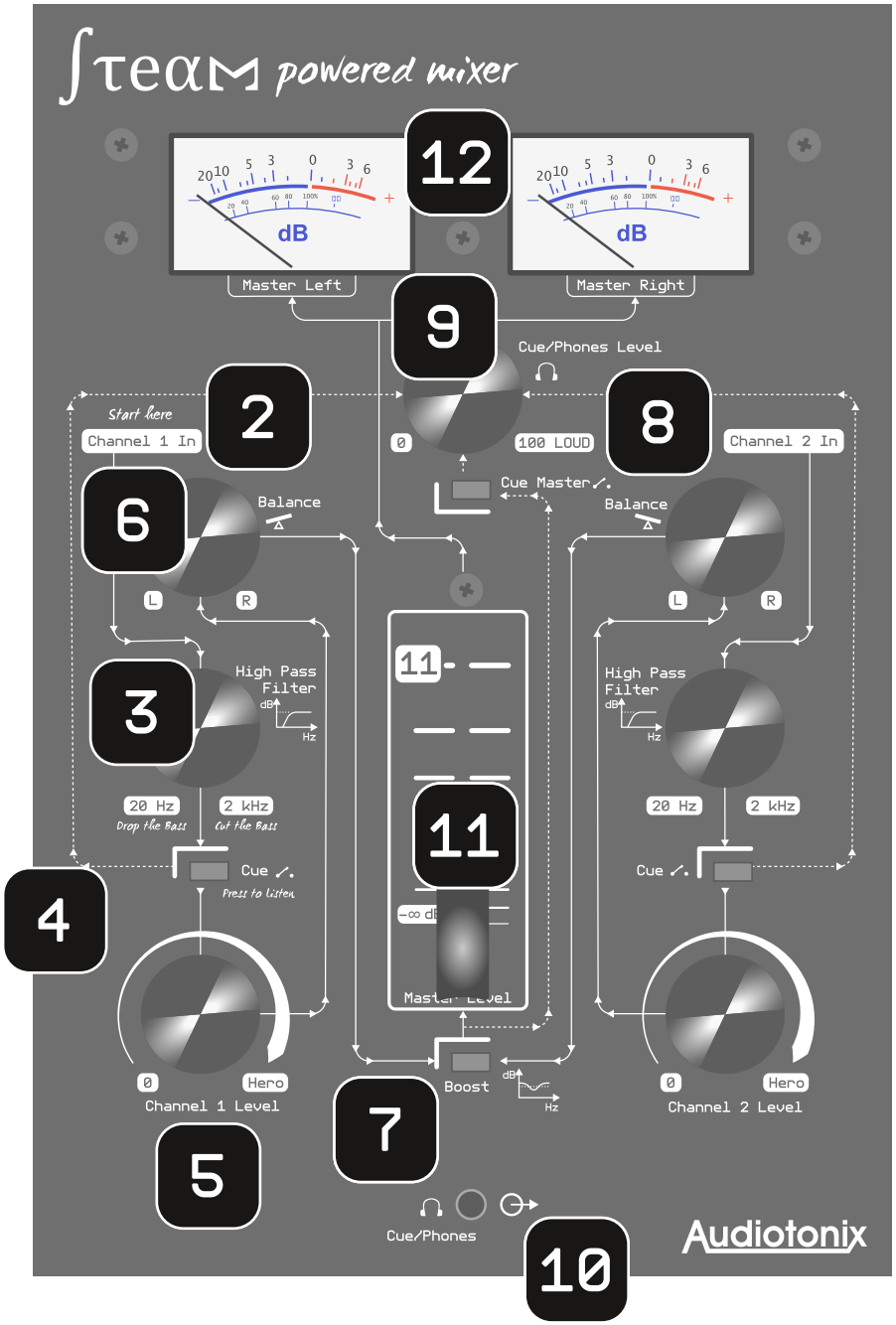
1 USB B Power input. 5V 500 mA. **Warning:** This must be provided from a rated and certified supply. Using an unrated supply could result in fire, risk of serious injury or death.

2 Channel 1 Line Input. The unit is designed for consumer rated electronic outputs, for example laptops, audio players, mobile phones. (Rated to –10 dBV). Connector socket is a 3.5 mm jack.

3 Channel 2 Line Input. The unit is designed for consumer rated electronic outputs, for example laptops, audio players, mobile phones. (Rated to –10 dBV). Connector socket is a 3.5 mm jack.

13 Master Line Output. The output is designed for powered/active speakers.. Connector socket is a 3.5 mm jack.

Front Panel Diagram



Front Panel Diagram Explaination

2 Graphical representation of Channel 1 Line Input. This indicates the beginning of the signal path within the mixer

3 High Pass Filter. This knob attenuatates (removes) lower frequencies. It is used as an effect to create a sense of drama and to ensure that the bass frequencies of both tracks are not clashing (clashing bass frequencies are very noticable, whereas higher frequencies tend to blend together more nicely)

4 Headphone Cue Switch. Press this switch to listen to this channel in your headphones. **Warning:** If the Cue/Phones level is too loud, pressing this switch could damage your hearing! Check that the Cue/Phones is at a reasonable level for your headphones. **Note**: If the cue button does not appear to be working on the channels, it could be that the master switch is activated (see item 8)

5 Channel 1 Output Level. Use this knob to control the output level of Channel 1. This will control how much signal is sent to the master bus (bus is a word used in audio which normally refers to a channel which sums its inputs and routes them to a mono or stereo output)

6 Left/Right Balance. Use this knob to direct how much signal is sent to the left and right master stereo outputs. This is also known as panning

7 Boost Button. This button takes advantage of a psycho-acoustic effect to make the sound of the track sound bigger/fatter. It boosts the low and high frequencies while lowering the mids. Use with caution - if your channel level is already high, the signal will clip

8 Cue Master Button. This button is useful as it allows you to hear your master mix without having speakers plugged in. **Note**: This switch will bypass Cue for Channel 1 and Channel 2, if it is pressed, it will always solo/cue the master channel, **regardless of whether or not the other two switches are pressed.**

Operation of Unit

9 Cue/Phones Level and Output. This knob controls the output level for the headphones **Warning:** If the Cue/Phones level is too loud this **will** damage your hearing! Check that the Cue/Phones is at a reasonable level for your headphones. Take a break after listening for an extending period of time. Ears are very sensistive to sound. If you want a long career in audio then you need to look after your hearing (it's also a good idea wearing ear plugs at gigs and clubs too)

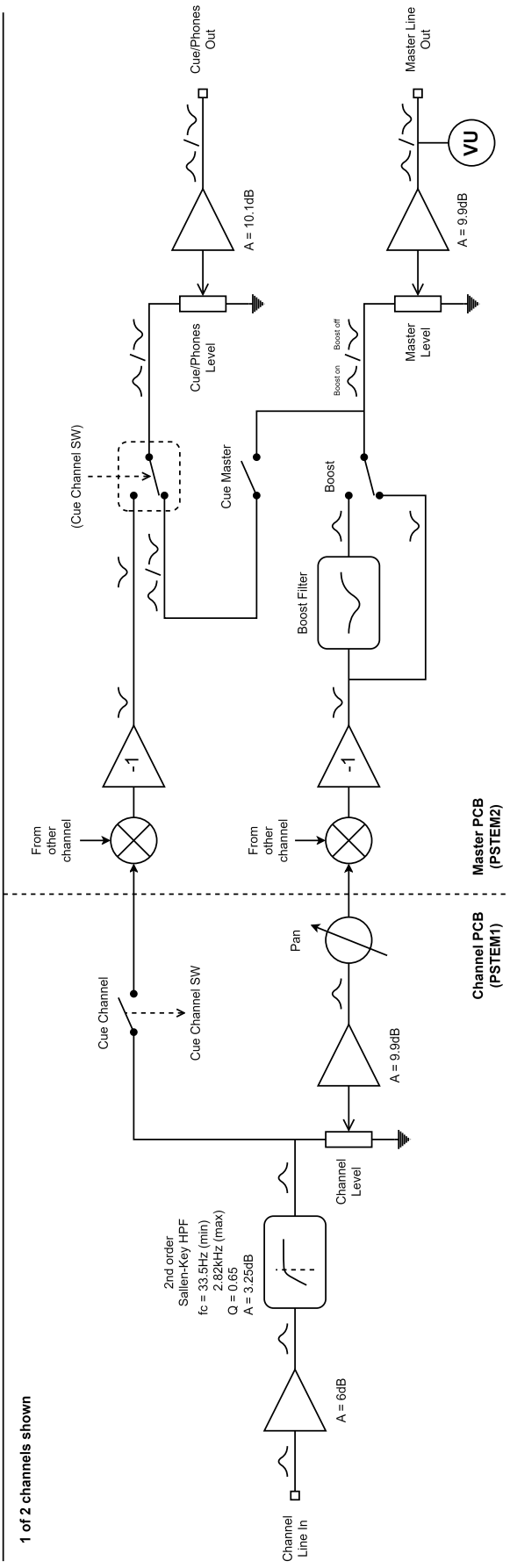
10 Headphone Output. This output provides an amplified headphone output capable of driving a variety of headphone types

11 Master Level. Use this fader to turn the mix all the way up to 11. Turn it back down a bit if it starts clipping (once it starts clipping, it won't get any louder, it will just sound more distorted)

12 VU Meters. VU stands for Voltage Unit. VU meters give a Root-Mean Square average of a signal (This turns the negative parts of the signal to positive, and then takes an average of the whole signal). VU meters have a relatively slow response time, which means they provide a good indicator of the average signal over a few hundred milliseconds. If the signal is going past 0 dB then this is clipping

How to use your mixer

System Block Diagram



Further Research

Links to Engineering Channels

Moritz Klein - DIY Modular Synthesis

This YouTube channel has a lot of great explantions on basic principles of electronics, as well as how different modules are made for audio synthesisers and their functions.

The analog oscillator core anyone can build
https://www.youtube.com/watch?v=QBatvo8bCa4

3Blue1Brown - Mathematical Principles

This channel is great for learning more generally about mathematics - it covers advanced topics but in a very approachable way

The essence of calculus
https://www.youtube.com/watch?v=WUvTyaaNkzM

Coding Train - Software Development

This channel is mostly unrelated audio technology, it refers to a different type of engineering - software engineering. Software is a vital component in all modern digital mixing desks. This channel is a fun way to learn the basics

Coding Challenge #3: The Snake Game
https://www.youtube.com/watch?v=AaGK-fj-BAM

Khan Academy - Engineering Courses

If you want to learn more about the practice of electrical engineering (which will also provide a good foundation for analogue and digital electronics), then this is a course which goes over the fundamentals of electrical engineering

https://www.khanacademy.org/science/electrical-engineering