

With four power-amps in one box giving two independent stereo amplifiers, ZinAmp Bi Amp is surprisingly straightforward to assemble. Two power supplies, four amplifier modules and independent gain dials for high and low frequency paths.

This amplifier is for use with an active speaker crossover fed from a power amp. The Bi Amp contains no crossover circuitry of it's own. It contains two pairs of power amps; one for low frequency and one for high frequency signals.

Note: This kit features Simultaneous Class A (SCA) on the lower frequency pair of power amps only. This is because the back-EMF effect that SCA addresses is not really an issue on the high frequency path.

The table below shows the parts that are included, depending which kit you have purchased. Information of how to source everything you may need is in this Kit List.

**Appendix 1** at the end of this Kit List shows the typical purchase cost of items where they are not included in your particular kit:

	Push-fit wiring w. assembled PCBs	Self-wire w. assembled PCBs	Push-fit wiring w. blank PCBs	Self-wire w. blank PCBs
	🔧💰💰💰💰	🔧🔧💰💰💰	🔧🔧🔧💰💰	🔧🔧🔧🔧💰
Enclosure	✓	✓	✓	✓
Transformers	✓	✓	✗	✗
Internal Wiring	✓	✗	✓	✗
Transistors & Valves	✓	✓	✗	✗
Switches, Pots & Dials	✓	✓	✓	✓
Rear Sockets & Connectors	✓	✓	✓	✓
Components	✓	✓	✗	✗

If you have difficulty finding any of these items online, email [parts@zinamp.co.uk](mailto:parts@zinamp.co.uk) and we will help you to find what you need.

## Enclosure:



Black Anodise Finish



Silver Anodise Finish

## The Bi Amp Power Amplifier enclosure comprises of:

- 1 x aluminium chassis - pre-drilled, tapped and marked
- 1 x front panel (black or silver)
- 1 x lid (black or silver)
- 1 x adhesive rear decal
- 4 x rubber feet
- 2 x heatsink - pre-drilled and tapped
- 1 bag of M3 x 12mm countersunk slot-head machine screws
- 1 bag M3 plain metal washers
- 1 bag M3 nuts
- 1 bag of M4 19mm nylon stand-offs
- 1 bag of M4 x 10mm nylon cheese-head screws
- 8 x M5 x 20 mm countersunk screws (black or silver)
- 8 x M3 x 5 mm countersunk screws (black or silver)
- 1 x LED Holder
- 1 LED

## Transformers:

All Modules are powered by a Single 300VA Transformer

Toroidal 300VA 2x115v to 2x40v with electrostatic screen and EMI/RFI shield.

Recommend Airlink [CM0300240](#) from [Airlink Transformers](#)



# Internal Wiring:

## Push Fit wiring:

Based on Molex KK 254 fittings and comprises of:

2 x Power Amp Set - [download spec](#)

1 x Power Amp Input Set - [download spec](#)

Note: Replacement wires damaged during construction require purchase of the corresponding kit. Individual wires are not stocked.

Push-fit wiring requires Molex KK 254 PCB headers to be soldered onto your PCBs -these are supplied with each PushFit wiring set.

NOTE: If you are assembling your own PCBs but are using Push Fit wiring, you don't need to purchase any of the parts listed as 2, 3 or 4 Pole Terminal - these [appear in blue](#) in the Parts List further down.



HOWEVER: You WILL need 2 Pole Terminal Block (4 pieces) for the Speaker Switch Module. This can be purchased from RS: [790-1098](#)

## Self-wiring:

We recommend screw-type terminal block (see module datasheets). You will need to purchase these.



Alternatively, you may choose to assemble your own Molex KK 254 socket-blocks and solder Molex PCB headers to your boards. You will require a Molex crimping tool to make the connections that insert into the socket-blocks.

## Cables and Wire:

If you are self-wiring, you will find the wiring specs above a useful reference for planning your cable cuts. Cable types and lengths can be found in these specs, but broadly, you will need the following types of cable:

- Single Core Screened - 24AWG (optional)
- 2 Core Screened - 24AWG
- 3 Core Screened - 24AWG
- 2 Core Unscreened (black/red) - 24AWG
- 3 Core Screened (black/green/red) - 22AWG
- Single Core (green) w. silicone flex - 22AWG
- Single Core (red) w. silicon flex - 22AWG
- Loudspeaker Cable (any colour) - 18AWG

To reduce the amount of cable you need to purchase, you can substitute the Single Core Screened Cable for 2 Core Screened and just use one core. Avoid using both screens for RCA audio inputs as you may introduce cross-talk between left & right channels.

# Transistors:

Two types of MOSFET power transistor are used in the SCA Power Amp:

1. Class A/B Output Devices - LateralFETs - 1 pair per channel
  - Medium Power (80W) use Exicon [ECX10N20](#) & [ECX10P20](#) from [Profusion](#) or
  - Full Power (100W) use Exicon [ECW20N20](#) & [ECW20P20](#) from [Profusion](#)
2. Class A Output Devices (optional) - HexFETs 1 pair per channel
  - [IRFP140NPBF](#) and [IRFP9140NPBF](#) HexFets from [RS Online](#) or [Farnell](#)



This amplifier contains 4 separate power amps, two of which - the low frequency pair - are SCA. Therefore the output devices required are:

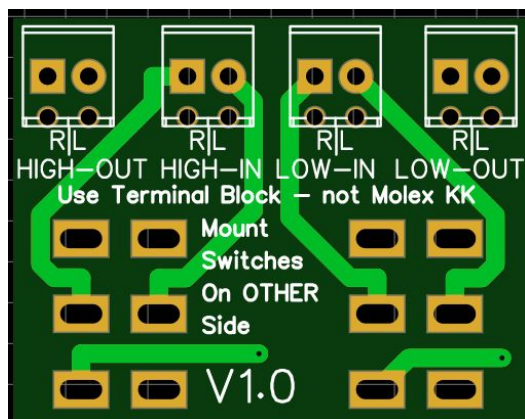
Low F Pair L & R: 2 x [ECW20N20](#) | 2 x [ECW20P20](#) | 2 x [IRFP140NPBF](#) 2 x [IRFP9140NPBF](#)

High F Pair L & R: 2 x [ECX10N20](#) | 2 x [ECX10P20](#)

## Switches, Pots & Dials:

Switches, Pots and Dials are included in all kits. Also included are the PCBs required to mount each switch and connect it up. None of these switches come pre-mounted on the PCB because the cost of mounting one switch and a row of connectors onto a PCB in a factory is too high to justify passing on to the constructor. The soldering for these items is simple, clearly labelled and is fairly quick for the constructor to do during kit assembly. The PCBs for these switches are shown below:

Speaker Switch (Low and High Paths)



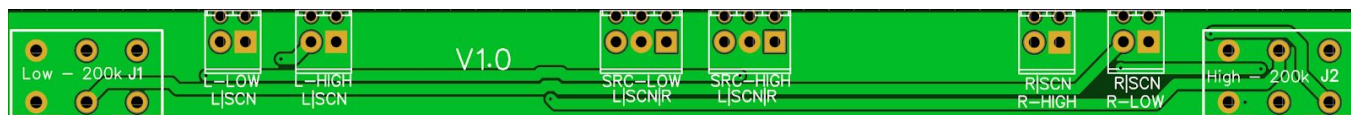
2 Pos



2 Pos

**Gain Control** - comprises two potentiometers. Both are linear, not logarithmic. This is acceptable because the dials on the front of a ZinAmp BiAmp are Gain controls, not Volume Controls. The idea is to set and leave them, using a pre-amp for volume control.

Gain Pots



200k  
or 250k



200k  
or 250k

Note: In black kits, the pots have splined shafts and in silver kits they have round shafts. This is because of the difference in the way the black and silver dials fit to the shaft.

## Rear Sockets & Connectors

The rear panel of the BiAmp comprises the following connectors which are included in all kits.

If you have selected a Push Fit wiring kit, the RCA connections will be ready-soldered to the input cabling. The assembly guide explains how to fit these through the holes in the enclosure.



Self Wiring kits include RCA connectors that can be soldered by the constructor. The assembly guide explains how to do this.

### Also included:

5 Fuse Holders

1 IEC Mains AC Connector

4 pairs of Speaker Binding Posts



## Component List:

In kits where blank PCBs are specified, the following components are required. We have tried to consolidate the number of components used across different modules where possible. The list below is sorted by Supplier Part Number and many of these parts are used across more than one PCB module.

If the part number you are searching for is out of stock or unavailable at RS, you can substitute components of similar spec and size. Lead pitch (distance between pins) is the most important consideration for capacitors.

If you need to substitute a component and you are not sure, email: [parts@zinamp.co.uk](mailto:parts@zinamp.co.uk)

In most cases, Supplier Part refers to [RS](#)

Value/Spec	Manufacturer	Manufacturer Part	Supplier Part	Part Count
1 Row Jumper	RS-PRO	251-8086	251-8086	2
1.8k	Vishay	MRS25000C1801FCT00	683-3231	16
1000u 63v	Rubycon	63ZL1000MEFC16X35.5	703-7377	4
100k	Bournes	PV36W104C01B00	<a href="#">769-2160</a>	8
100k	TE Connectivity	LR1F100K	125-1168	4
100n	Kemet	R46KF310040P1M	126-2250	2
100n	Kemet	R82DC3100Z350K	126-2266	18

100p	Wima	FKP2/100/100/5	484-1978	16
100R	TE Connectivity	LR1F100R	<a href="#">125-1155</a>	24
100R 1W	TE Connectivity	ROX1SJ100R	125-1174	2
100R 3W	TE Connectivity	ROX3SJ100R	214-2623	3
100u 35v	Vishay	MAL203850101E3	684-1973	12
10k	TE Connectivity	LR1F10K	125-1164	6
10p	Vishay	561R10TCCQ10BA	831-2871	4
10R	TE Connectivity	LR1F10R	125-1154	4
10R 1W	TE Connectivity	ROX1SJ10R	<a href="#">214-0879</a>	4
10u 50v	Nichicon	UST1H100MDD	501-9267	4
10v	Nexperia	BZX79-C10,113	544-4461	8
150R	Vishay	MRS25000C1500FCT00	<a href="#">683-3058</a>	4
15k	Vishay	MRS25000C1502FCT00	683-3055	2
18v	Nexperia	BZX79-C18,113	544-4499	4
1k	Vishay	MRS25000C1001FCT00	<a href="#">683-3165</a>	20
1R	TE Connectivity	LR1F1R0	<a href="#">150-565</a>	8
1u 100v	Kemet	R82EC4100Z370K	126-2282	12
2 Pole Terminal - Mains	RS-PRO	146-8345	146-8345	6
<a href="#">2 Pole Terminal (self-wire only)</a>	<a href="#">RS-PRO</a>	<a href="#">790-1098</a>	<a href="#">790-1098</a>	<a href="#">22</a>
2.2k	Vishay	MRS25000C2201FCT00	<a href="#">683-3449</a>	8
200m 3W	Vishay	RWM0410R200JR15E1	485-1408	4
2200u 100v	Epcos	B41231B9228M000	171-3279	4
220n	Panasonic	ECWFE2W224J	<a href="#">105-1073</a>	1
220u 63v	Rubycon	63PX220MEFC10X16	766-0117	8
22k	TE Connectivity	LR1F22K	<a href="#">125-1167</a>	8
<a href="#">3 Pole Terminal (self-wire only)</a>	<a href="#">RS-PRO</a>	<a href="#">790-1092</a>	<a href="#">790-1092</a>	<a href="#">30</a>
3.3k 1W	TE Connectivity	ROX1SJ3K3	214-1210	4
330R	Vishay	MRS25000C3300FCT00	<a href="#">683-3540</a>	8
33k	Vishay	MRS25000C3302FCT00	683-3544	4
390R	Vishay	MRS25000C3900FCT00	683-359	8
<a href="#">4 Pole Terminal - Mains</a>	<a href="#">RS-PRO</a>	<a href="#">146-8347</a>	<a href="#">146-8347</a>	<a href="#">1</a>
470n	Panasonic	ECWFE2W474P1	105-1083	4
470u 63v	RS-PRO	711-1615	711-1615	4
50v 1A	Vishay	1N4001-E3/54	<a href="#">628-8931</a>	24
50v 2A	Vishay	SBYV27-50-E3/54	629-6746	8
560R	TE Connectivity	LR1F560R	148-449	8
8.2k	TE Connectivity	LR1F8K2	148-714	4
82R	Vishay	MBB02070C8209FCT00	506-4784	12
BC327	On Semi	BC32716BU	<a href="#">761-9819</a>	4
BC337	On Semi	BC33740BU	<a href="#">761-3943</a>	8
BD679	ST Micro	BD679A	486-0014	4
ECW20N20	Exicon	ECW20N20	ECW20N20	4
ECW20P20	Exicon	ECW20P20	ECW20P20	4
GBPC3504W T0	HY	GBPC2510W	917-8815	1
IRFP140NPBF	Infineon	IRFP9140NPBF	542-9816	4
IRFP9140NPBF	Infineon	IRFP9140NPBF	541-1269	4
KBP310	HY	GBU2510	923-5472	2

KSP42TA	On Semi	KSP42TA	<a href="#">739-0505</a>	4
KSP92TA	On Semi	KSP92TA	<a href="#">806-4627</a>	12
MJE340	On Semi	MJE340G	464-205	8
MJE350	On Semi	MJE350G	<a href="#">463-218</a>	8
MJH11022G - NPN	On Semi	MJH11022G	790-5397	2
MJH11022G - PNP	On Semi	MJH11021G	790-5393	2
SWITCH-DPDTEs	RS-PRO	401-680	401-680	2

## Appendix 1 - Parts Purchase Cost Estimator

These are the items that need to be purchased with each type of kit. These costs are estimates based on Feb 2020 prices in the UK and should be within +/-5%.

	Push-fit wiring w. assembled PCBs	Self-wire w. assembled PCBs	Push-fit wiring w. blank PCBs	Self-wire w. blank PCBs
Transformers		£55	£55	£55
Wiring		£30		£30
Transistors			£85	£85
Components			£180	£180
<b>TOTAL</b>	<b>£0</b>	<b>£85</b>	<b>£220</b>	<b>£250</b>

Add the respective total to the cost of your selected kit to give a total build cost - within +/-5%

We cannot guarantee any of these prices, but do email [parts@zinamp.co.uk](mailto:parts@zinamp.co.uk) if you believe these are outside of 5%. We will always try and help you source parts as cheaply as possible.