

Application & Purpose:

Exceptionally high quality stereo valve pre-amp, featuring a dual gain stage with feedback and a current follower. Achieves very low levels of THD < 0.004% mostly lower 2nd order.

Features a switchable EQ filter and adjustable gain level.

Low output impedance to drive up to two power amps simultaneously.

WARNING: Very high DC voltage device. Care must be taken to avoid fatal electric shock.



Specification:

PCB Dimensions	139mm x 56mm x 1.6mm
Channels	Two (stereo)
Gain	Selectable - low(6dB), medium(9dB), high(12dB)
Input Impedance	determined by volume pot - recommend 150-200k Ω
Devices	2 x 12AX7 valves OR 2 x 12AY7 valves 1 x 12AU7 or 12AT7 valve
Frequency Response	Overall Range: 10Hz - 30kHz Flat EQ Setting: gentle roll-off between 20 and 30kHz Dynamic EQ Setting: Slight boost to bass and upper-mids
Output Impedance	< 500 Ω
Supply Voltage	285v and 265v DC (regulated power supply module available)
Idle Supply Current	25mA
Transformer	220v +/- AC 12-20VA
Earth Nets	Power and Audio (separated by loop breaker)
THD	Typically < 0.004% - mostly lower 2nd order

Details:

An exceptionally high-quality stereo audio pre-amplifier featuring a dual gain stage with feedback and a current follower. This amplifier can safely run two power amps with input impedances of 10k Ω each.

Low-distortion design (0.005%), features a switchable EQ filter for either a Flat or Dynamic EQ response. Dynamic EQ is similar to a Fletcher-Munsen loudness response, but less pronounced i.e. more subtle.

Jumper switches allow gain level to be selected; either low, med or high. Corresponding gain ratios are approximately 3, 4 and 5 respectively.

Setup and Usage:

The valves generate latent heat and require ventilation. This is achieved in the ZinAmp installation with holes in the top of the chassis through which the valves protrude.

Running this module in a sealed box with no ventilation will result in device failure and thermal damage to surrounding components. Do not attempt this.

- Valve 1: 12AX7 or 12AY7
- Valve 2: 12AX7 or 12AY7
- Valve 3: 12AU7 or 12AT7

Note: 12AY7 valves have a lower internal resistance and the amplifier exhibits slightly lower distortion than with 12AX7s fitted. This small discernable difference is a personal choice for the constructor.

Individual ground nets separate the audio and power grounds, eliminating hum. Power ground should make its own separate direct connection to the ground star or hub, definitely not to the Power Supply filter capacitors. Audio ground should be connected to the preamp or line-in audio ground.

Safety Note:

This module runs with DC voltages that are close to 300v. Unlike AC current, DC is more dangerous when touched as you will tend to stick to it rather than be repelled from it as with AC. Before handling this module, switch off, disconnect the AC power lead and discharge the High Voltage Power Supply by placing a screwdriver across its discharge terminals for 10 seconds. Check the voltage with a meter - if less than 2v, it is safe to handle.

EQ Switch

This module features a switchable EQ filter. Two settings are Flat and Dynamic.

- **Flat** - Flat F response with a slight roll off from 20kHz onwards
- **Dynamic** - Slight Boost to Bass and Slight cut to mid-range - like loudness, but more subtle

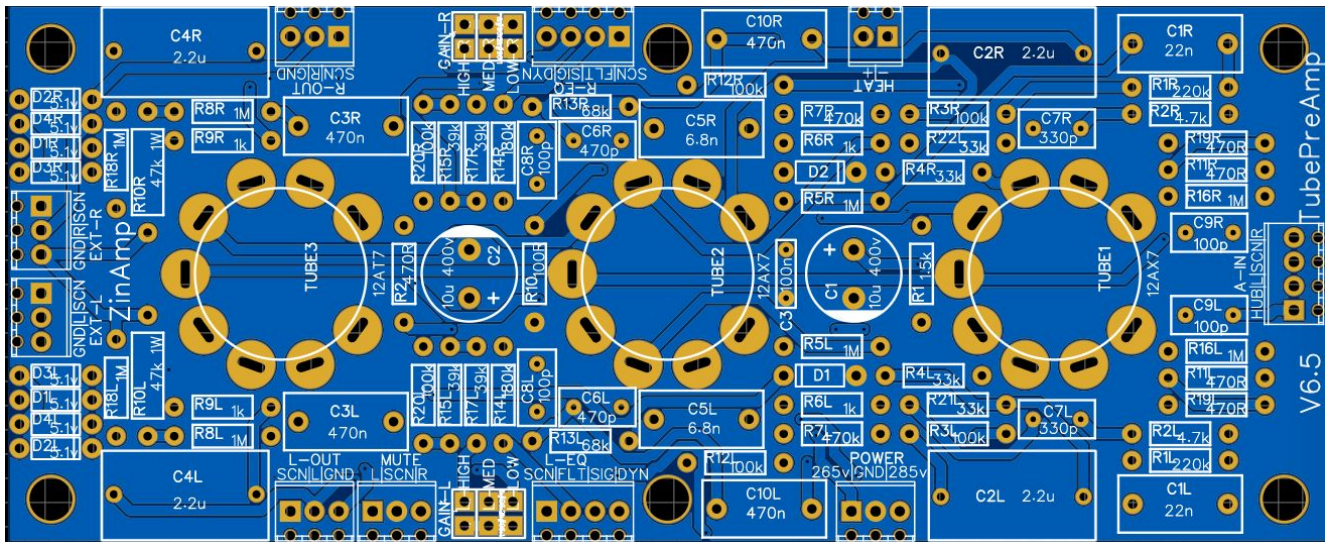
If you don't want to fit an EQ switch you will need to jumper the L-EQ and R-EQ terminals in either position.

- Flat - Jumper wire from Sig to Flt
- Dyn - Jumper wire from Sig to Dyn

OTHERWISE NO SIGNAL WILL APPEAR AT THE OUTPUT

A two position double pole switch can be used to select these settings. Use two lengths of 3 core screened cable between the switch and board - one length for each channel.

Bare PCB:



Connections:

Connector	Terminal	Destination	Notes
A-IN	Hub	Earth Hub or Star Ground Point	
	L	Volume Control	
	SCN	Cable Screen	Screen should be connected to Audio Ground (not power ground) at both ends
	R	Volume Control	
EXT-L/R	L/R	+ve terminal of external connector from amplifier	Provides signal to an external pre-amp (optional)
	SCN	Left Channel Phono Input of your installation -ve terminal	Connect cable screen at both ends (audio ground)
L-OUT/R-OUT	GND	Audio Ground of Power Amp	
	SCN	Power Ground from PreAmp	Cable screen is not connected at the power amp input.
	L/R	Audio Signal to Power Amp	
L/R-EQ	SIG SCN FLY DYN	Connects to L or R EQ Switch as Indicated	Can be jumpered if not using an EQ Switch. For Flat EQ solder SIG to FLT. For Dynamic EQ solder SIG to DYN.
HEAT	+/-	+12.6V and Ground on your low voltage Power Supply	Do not connect the -ve terminal to Audio Ground
Power	265v GND 285v	PreAmp Terminals on your HV Power Supply	Do not connect the GND terminal to Audio Ground

Parts List:

Recent Changes: Values of **C1L & C1R**, **C3L & C3R** and **C5L & C5R** have changed and may appear different on the PCB than in the parts list. The circuit has not changed. Please use the values in the parts list.

CONNECTORS: Both blank and ready-built PCB requires connectors be purchased and soldered on by the constructor. This is to give the constructor a choice of how they wire their own particular installation. Terminal block connectors are indicated in the list below in blue but can be swapped for equivalent 2.54mm pitch connectors e.g. Molex KK254 headers, which are provided to the constructor in self-wire kits.

Designator	Value/Spec	Qty	Manuf.	Manuf. Part	RS Part
A-IN,R-EQ,L-EQ	4 Pole Terminal (self-wire only)	1	RS-PRO	790-1102	790-1102
C1R,C1L	68n	2	Kemet	R46KF268040P0M	165-0030
C2,C1	10u 400v	2	RS-PRO	711-2034	711-2034
C3	100n	1	Epcos	B32529C1104K009	896-1341
C5L,C5R	6.8n	2	Epcos	B32621A0682J000	896-1568
C3L,C3R,C10L,C10R	470n	4	Panasonic	ECWFE2W474P1	105-1083
C4L,C4R,C2R,C2L	2.2u	2	Panasonic	ECWFE2W225JA	105-1076
C6L,C6R	470p	2	Wima	FKP2/470/100/5	484-2016
C7R,C7L	330p	2	Wima	FKP2/330/100/5	484-2000
C9R,C9L,C8L,C8R	100p	4	Wima	FKP2/100/100/5	484-1978
D1,D2	50v 1A	2	Vishay	1N4001-E3/54	628-8931
D4L,D2L,D3L,D1L,D4R,D2R,D3R,D1R	5.1v	8	Nexpera	BZX79-B5V1,113	508-359
HEAT,EXT-L,EXT-R	2 Pole Terminal (self-wire only)	3	RS-PRO	790-1098	790-1098
L-LOW,R-LOW,L-HIGH,R-HIGH,L-MED,R-MED	3 Row Jumper	2	Harwin	M20-9980346	745-7046
L,R	Shorting Link	2	RS-PRO	251-8575	251-8575
L,R	Shorting Link	2	RS-PRO	251-8575	251-8575
MUTE,POWER,R-OUT,L-OUT	3 Pole Terminal (self-wire only)	4	RS-PRO	790-1092	790-1092
OUT-L,OUT-R	2 Pole Terminal (self-wire only)	2	RS-PRO	790-1098	790-1098
R1	1.5k	1	Vishay	MRS25000C1501FCT01	683-3219
R10	100R	1	TE Connectivity	LR1F100R	125-1155
R10L,R10R	47k 1W	2	Vishay	ROX1SJ47K	214-1355
R13L,R13R	68k	2	Vishay	MRS25000C6802FCT00	683-3957
R14L,R14R	180k	2	Vishay	MRS25000C1803FCT00	683-4174
R15L,R15R,R17R,R17L	39k	4	TE Connectivity	LR1F39K	148-871
R1L,R1R	220k	2	TE Connectivity	LR1F220K	149-060
R2,R11R,R11L,R19R,R19L	470R	5	TE Connectivity	LR1F470R	125-1158

R20R,R20L,R12R,R12L,R3L, R3R	100k	6	TE Connectivity	LR1F100K	125-1168
R2R,R2L	4.7k	2	Vishay	MRS25000C4701FC T00	683-3799
R3R,R3L	100k	2	TE Connectivity	LR1F100K	125-1168
R4R,R4L,R21L,R21R	33k	2	Vishay	MRS25000C3302FC T00	683-3544
R6R,R6L,R9L,R9R	1k	2	Vishay	MRS25000C1001FC T00	683-3165
R8L,R8R,R5L,R5R,R16R,R1 6L,R18L,R18R	1M	8	Vishay	MRS25000C1004FC T00	683-4159
R7R,R7L	470k	2	TE Connectivity	LR1F470K	149-149
SOURCE,PREAMP	3 Pole Terminal (self-wire only)	2	RS-PRO	790-1092	790-1092
TUBE1,TUBE2	12AX7 or 12AY7	2	See Kit List	See Kit List	See Kit List
TUBE3	12AU7 or 12AT7	1	See Kit List	See Kit List	See Kit List

Parts available from [RS Online](#). Also try [Farnell](#), [Mouser](#) and other online suppliers.

Parts from different manufacturers can be substituted where spec is sufficient

Supplier trading names may differ by country.