



PRE-AMPLIFIER A5

THIS MODULE IS USED TO AMPLIFY AND EQUALISE INPUTS FROM 2mV TO 1V TO GIVE A 1V OUTPUT SUITABLE FOR EACH POWER AMPLIFIER.

FEATURES

Due to the use of the latest **surface-mount** technology this module is not only much **smaller** than other available modules, but has a truly professional performance.

The entire hybrid circuit is fully **protected** against mechanical shocks and the ingress of dust and moisture by a protective coating of lacquer.

Because this **AMPLifier MOdule** uses a **seventh** of the material used by similar potted modules it is also more environmentally friendly.

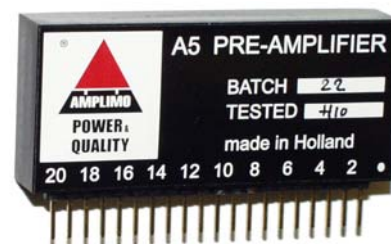
The two stage amplimo is a **complete** and **multi-purpose** module as it contains all of the most commonly used functions; the first stage of the preamplifier contains the amplification and equalisation circuits for phono and microphone inputs, the second stage amplifies the larger signals and contains the volume and active tone control circuits. The only additional components required for the A5 are the potentiometers for the volume and tone controls. **No** output capacitor or supply capacitors are required as the module contains its own voltage stabilisation circuits.

Years of experience and the use of the latest components have been applied to the design of this module, resulting in:

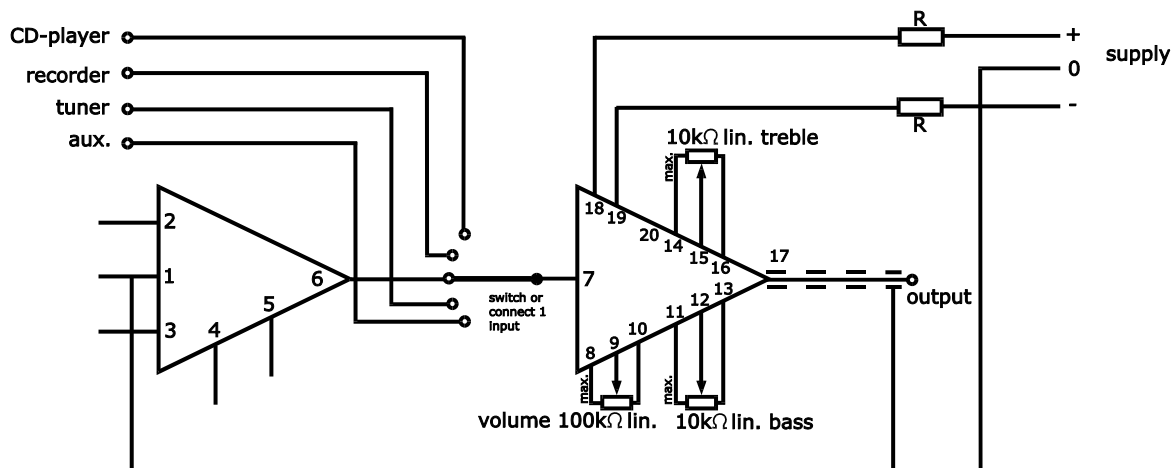
- **Extremely low noise** and outstandingly **high audio specifications** by the incorporation of high performance op-amps containing both JFET and BIPOLAR transistors; allowing a dynamic microphone to be amplified **without** the need for a microphone transformer.
- Universal preamplifier with large headroom, gain control and inputs for phono, CD, tape, tuner, auxiliary, etc.
- Symmetrical microphone input for maximum hum suppression.
- The possible use of a phantom supply.
- Immunity to high frequency interference.
- Phono input with RIAA equalisation **accurate to 0.2dB**, very **low noise** and with the possibility of a rumble filter.
- Active volume control making the A5 almost impossible to overdrive whilst also keeping the noise level very low. Even a +6dB CD input will not overdrive this amplimo module.
- Sophisticated **active** tone controls with optimum characteristics and large control ranges. Because of their low impedance, the tone controls are immune to hum and oscillations and therefore do not require the use of screened cables.
- Wide frequency range that is slightly limited in the first stage to ensure stability.
- Short-circuit proof output (pin 17)
- An A5 preamp is suitable for use with **all** AMPLIMO power supplies and power amplifiers. Suitable supply voltages are + and – 20V. (symmetrical voltages). The supply current is 15mA max.

The A5 can be quickly and securely mounted using the adhesive mounting support Z5, therefore **eliminating** the requirement for a printed circuit board or a drilled hole.

The goldplated terminal pins are easily accessible, and leads can be directly soldered on to them. A K5 connector can be supplied however, for fast replacement of the module if required. The 0.1" pitch of the terminals and the low profile conveniently allow the A5 to be mounted on a printed circuit board. As can be seen from its side view, the minimal space occupied by the A5 makes it very attractive to use. The A5 is extremely suitable for the rapid construction of an audio mixer with professional performance and versatility.



CONNECTIONS AND SPECIFICATIONS



TONE CONTROL STAGE

Input impedance	47 k Ω (pin 7)
Input voltage	0.1V nominal, 7V maximum
Gain factor	10 = 20dB
Output impedance	47 Ω
Output voltage	1V nominal, 6V maximum at load from 10 k Ω 5V maximum at load from 1 k Ω a headphone from 30 Ω can be connected.
Frequency range	4Hz – 60,000Hz at gain of 10 3Hz – 117,000Hz at gain of 1
Treble control	+ and – 15dB at 20kHz, active, constant centre frequency.
Bass control	+ and – 15dB at 20Hz, active, constant slope
Thd	0.009%

POWER SUPPLY REQUIREMENTS

The A5 can be connected to the power supply of the power-amplifier, as the supply voltages are internally stabilised in the A5 module.

The following dropper resistors are advised:

R=	wire link		when using power supply of + and –	20V till 23V
R=	390 ohm	0.25W	when using power supply of + and –	23V till 29V
R=	1000 ohm	0.25W	when using power supply of + and –	29V till 37V
R=	1800 ohm	0.50W	when using power supply of + and –	37V till 49V
R=	3300 ohm	1.00W	when using power supply of + and –	49V till 70V

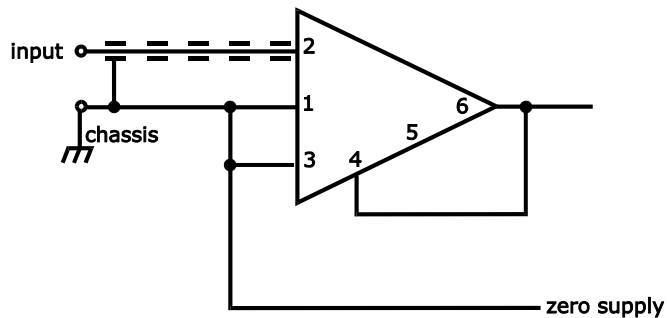
STEREO USE

Two A5 modules are required for stereo use, along with double gang potentiometers and double pole switches. The balance control consists of wiring each output (pin 17) , to the input of the relevant power amplifier via a 150Ω resistor. A 1kΩ linear pot is wired between the two power amplifier inputs with the slider connected to ground.

MOUNTING

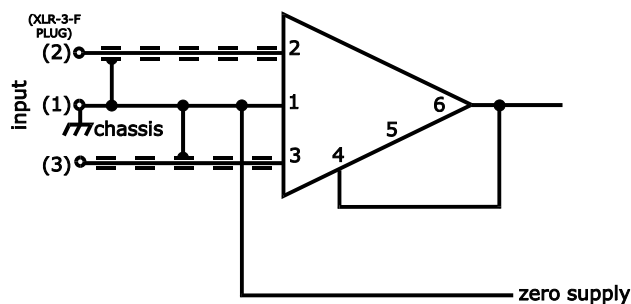
The module is quickly and simply mounted to a flat surface by using the adhesive mounting support Z5. The A5 is first slid horizontally into the support with its pins uppermost. Some thought should then be given before finally pressing home the module, as the support can not be repositioned once it is in place. It is very important that the mounting surface is clean, dry and free of grease. The A5 can also be mounted directly to a PCB by soldering, or using the K5 connector.

ASYMMETRICAL PREAMPLIFIER

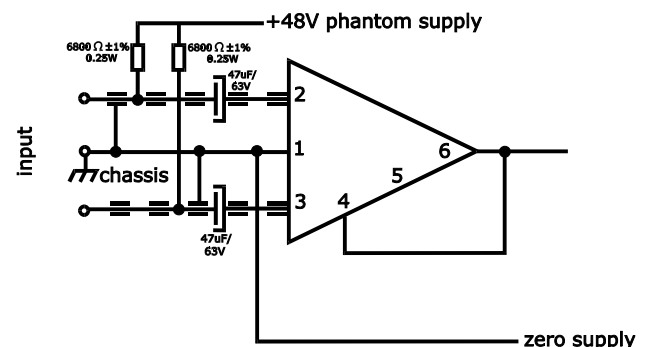


Input impedance	47 k Ω
Input voltage	2.2mV nominal, 160mV maximum
Gain factor	46 for e.g. microphone = 100mV nominal on pin 6 24 with a 1k Ω resistor in series with pin 3 10 with a 3.9k Ω resistor in series with pin 3 5 with a 10k Ω resistor in series with pin 3 1 with a 2.2M Ω resistor in series with pin 3
Output impedance	47 Ω
Frequency range	3Hz to 35,000Hz 20Hz to 35,000Hz with a 4.7 μ F capacitor in series with pin 2 and pin 3 100Hz to 35,000Hz with a 1 μ F capacitor in series with pin 2 and pin 3
Noise at input	-119dBV (Arms)

SYMMETRICAL MICROPHONE PREAMPLIFIER



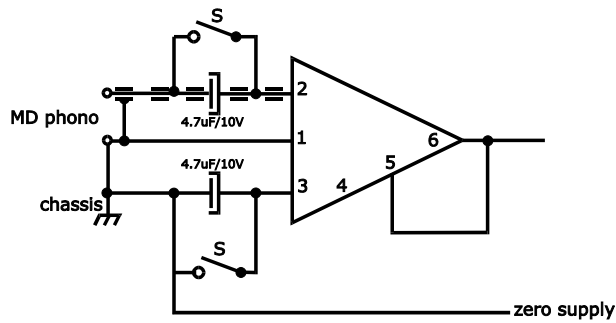
For a 200-600 ohm dynamic microphone



For a condenser microphone

Input impedance	2x 1000 Ω
Input voltage	2.2mV nominal, 160mV maximum
Gain factor	46 = 33dB
Frequency range	3Hz to 35,000Hz with no capacitors in series. 20Hz to 35,000Hz with a 4.7 μ F capacitor in series with pin 2 and pin 3 100Hz to 35,000Hz with a 1 μ F capacitor in series with pin 2 and pin 3
Noise at input	-119dBV (Arms)
CMRR	60dB

PHONO PREAMPLIFIER WITH RIAA EQUALISATION



Input impedance	47k Ω
Input voltage	2.5mV nominal, 177mV maximum
Gain factor	40 = 32dB at 1kHz
RIAA accuracy	+0.2dB between 20Hz and 20,000Hz
Rumble filter	with double pole switch S open
Noise at input	-124dBV (Arms)

LAYOUT

As the plugs for microphone, phono and the first stage of the A5 handle extremely low voltages, they are susceptible to hum and oscillations. Therefore all of the leads should be as short as possible, whilst keeping the A5, input sockets and potentiometers in close proximity to each other. The amplifier circuitry must be screened from other circuitry by a large piece of tin-plate connected to ground. The cabinet should not be too small.

WIRING

Ensure that the leads to and from the A5 do not run near to other leads or pass close to transformers. Pin 20 is used for mid-tone-control, see brochure MIX.

SCREENING

Only one end of the screen of screened leads must be connected to avoid earth loops. The entire circuit has to be screened by enclosing it in a metal case. It is important that each panel of the case is in good ohmic contact with all other panels of the case. Therefore all coated surfaces, (anodised, painted, etc.), should have the coating removed at the contact points to ensure good connection. An ohmic meter should be used to check continuity between all parts of the case and with the earth tags of the input and output sockets, especially those mounted on coated panels. The leads to the volume potentiometer should be twisted together, there is no need to screen these.

EARTHING

Pin 1 of the A5 is to be connected directly to the earth tag on the input socket. The earth tag on one of the inputs is to be connected directly to the chassis and the zero volt terminal on the power supply. The earth tags of all the input sockets are to be connected together.

INPUTS

If it is known or suspected that the input signal contains a DC component, then the input signal must be connected via a series 47 μ F capacitor. To eliminate large differences in volume when switching between different inputs, the highest volume signals should be attenuated by connecting them to the input via series resistors. If the first stage of the A5 is not used, then pins 1,2 and 3 should be earthed by connecting them to the chassis and the zero volt terminal of the power supply.

RECORDING

An output voltage for recording is available on pin 7, (this is before tone and volume controls), via a series 10k Ω resistor.

FINAL INSPECTION

It is important that all connections and all directions for use are checked before switching on, as otherwise dangerous oscillations may occur.
