

# ARCAM

## A19 Integrated Amplifier - Technical Notes



### Introduction

Unlike many amplifiers the A19 is designed to offer an accurate and uncoloured reflection of the real musical content without bringing a “Hi-Fi” sound to the music. This document sets out to explain, technical terms, how Arcam have used their considerable expertise to deliver stunning music from such an affordable amplifier.

### Design Overview

From input to output the A19 can be considered a “complete and honest exercise in engineering”. No technical tick box left has been left unchecked. The volume control knob is one of the very few component parts that remains from the FMJ A18 it replaces. It’s design is new but the design thinking is all Arcam.

### The Input stage (pre-amp)

The input stage of the A19 is based around a logic switching array that involves absolutely no moving parts. Not only does this give a simple, clean signal path but importantly it will not degrade over time. It induces a level of distortion so low that it’s on the threshold of measurability. After the input switch the audio signal is then correctly buffered and impedance matched by a line-driver stage using the best operational amplifiers that could be found for the job.

### The Phono Stage

The Phono Stage is a very good Moving Magnet (MM) design with a correctly implemented RIAA curve using “best for audio” WIMA capacitors in the filter stages. This was an import inclusion that the large number of customers now revisiting old or new vinyl discs will really appreciate and is far better than the phono stage found on typical amplifiers at the price.

The Phono Stage has a typical 5mV sensitivity and input impedance of 47k ohms / 100pF making it an easy match for a wide range of cartridges. If necessary, the Phono Stage can be switched off allowing a line level source to be connected to the Phono input instead (achieved using the user menus on the front panel).

### Volume Control

The Volume Control uses the same circuit found in Arcam’s top-of-the-range FMJ AV888 processor, namely the TI PGA2311 professional VCA. Using this part means the A19 pre-amp features the same topology as the “resistors around a multi pole switch” configuration found normally only in highly esoteric (and very expensive) dedicated pre-amps. In essence, the PGA2311 replicates this in a single silicon device using laser-etched high precision resistive ladders. The actual attenuation required is simply set by the resistor in circuit. The resulting device yields a bench mark 120dB S/N ratio and an incredibly low THD of just 0.0004%.

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### Power Amp

The power stage is a class AB design optimised for low noise and distortion with a very wide bandwidth. This means the A19 more than meets the potential demands of today's 24/96 and 24/192 digital audio sources. The amplifier's power output characteristics (2x 50w into an 8 ohm load or 2x 90w into a 4 ohm load) are bolstered by an extremely high performance custom toroidal transformer in the power supply. This is optimised to offer fantastic transient characteristics whilst maintaining output power, even when driving the most demanding of loudspeakers.

The power amp features a regular Zobel network plus a secondary network, placed at the loudspeaker outputs, that has been optimised to reduce the "antenna effect" of the loudspeaker cable. Speaker cables often pick up and then inject Radio Frequencies into the power amp stage with detrimental effects to music reproduction. This is an ever growing problem, especially with so many homes now using multiple radio frequency wireless systems such as WiFi, BlueTooth, DECT phones and the like.

### Headphones

The headphone stage has been carefully designed and is a far cry from the "after-thought" circuits typically found in many Hi-Fi amplifiers (basically just a dropper resistor from the loudspeaker outputs). The A19 features a carefully engineered discreetly optimised headphone driver with an output impedance of less than 1 ohm. It's recommended load range is between 16ohms and 4K ohms so all headphones are catered for including those with low efficiency. A stand-alone headphone stage of similar quality would cost hundreds!

### Auxiliary Power Supply

The A19 is the first Arcam integrated amplifier to offer an internal (independent) power supply able to supply the Arcam rSeries converters with a direct, isolated and highly regulated 6V power source. It's very important to note that this supply is in no way associated with or detrimental to any other internal supplies – it is an independent supply and designed for purpose and is an ideal match for the rSeries DACs and input converters.

### Design Summary

All building blocks of the A19 are designed and built with their own dedicated electrical environment, engineered with care and designed for performance:

- The high voltage, high current Power Amplifier
- The low voltage, ultra quiet Phono and Pre-amp stages
- The volume control with its own independent PSU
- The logic, control and display stages, again all independent

### Conclusion

The A19 uses solid, honest engineering, distilled from more than thirty years of audio experience, to deliver simply wonderful music. No more, no less.



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