

# *Unico nuovo*

Seven years have passed since the day **Unison Research** started a small revolution in the hi-fi world introducing to the market his masterpiece, the **Unico** integrated amplifier.

Opening a highway over new territories, previously only timidly approached, the Italian firm established new rules in the design of integrated amplifiers. Successfully mixing for the first time the sonic performances of single ended tube amplifiers and power capabilities of solid state designs it laid the foundations of the worldwide renowned and award winning **Unico Series**.

During these years **Unison Research** didn't sink into idleness but kept on having tests and experiments, with the spirit of a technician in love with music, aiming to find those hidden laws and secrets that makes an amplifier to become a magic box able to free the music, to give her vitality.

In the last year the **Unico Series** has been renewed, enriched, updated with new products and new release of previously produced units. Lots of new idea have been experimented so the secret formula for a good music amplifier have been refined.

Now **Unison Research** wants to accept the challenge of taking its best known and loved piece and renewing it, making it better.

The **UnicoNuovo** shares the only one triode stage per channel design as used in **UnicoP** and lately in **UnicoPrimo**, however it differs from the first since here a ECC83/12AX7 is used instead of a ECC82/12AU7, and differs from the last since a new biasing solution has been implemented and the single triode has been replaced by a parallel double triode design.

A single triode design allows only lower order harmonics to be generated (especially second order) with improved results in detail and clarity of the musical information while the higher gain tube, together with a fine tuned balance between the gain of tube and solid state stages, accentuate the valve

sound of the overall system. Doubling the number of triodes and having the working in a parallel configuration is further step toward a non-compromise solution bearing even more refined sonic performances.

**Unison Research** designers implemented a not so common solution for tube biasing, usually found in high quality phono stages, named "ionic bias" that takes advantages from particular characteristics of the tube and can reveal finer tonic nuances.

The triode stage is connected to a "level shifter and signal follower" stage which allows a direct coupling between tube and the second (solid state) stage which operates around zero volts.

A direct coupling with the power mosfet driver stage means that any dc voltage error on the follower will be amplified affecting the amplifier output. Moreover, it must be observed that what is to considered a small voltage variation for the tube amplifier (some volts) become a very high input signal for a solid state stage, thus calling for accurate bias of the tube. Of course, during the tube life, its bias point can change and a self adjusting bias control must be adopted in order to avoid any dc voltage which could appear on the amplifier output. **Unison Research** developed a power supply and bias system tailored to suite the required dc performance for the triode and the "level shifter and signal follower" stages avoiding manual tuning of the bias. A first servo loop controls the bias of these stages thus maintaining its output dc voltage close to zero within 1mV.

For the driver stages solutions long time tested in **Unico** amplifier has been implemented even with some little improvement suggested by the experience matured working on the following design. It is composed by a symmetrical current mirror stage, made with bipolar transistors, which drives the output devices.

The topology adopted is partially derived from that of very wide bandwidth video amplifiers, which also exhibit very small phase displacement. The signal is amplified as current signal instead as voltage signal. The more interesting

result in adopting the current mirror topology, is that a copy of the triode anode current is used to drive directly the output stage and converted to voltage directly on the amplifier output. Moreover a current signals, which is more natural for a transistor stage, results less sensitive to voltage variations (including power supply ripple), and allows lower impedances to be adopted in the interfaces, thus improving the amplifier bandwidth.

As regards the output devices, these are Power Mosfet arranged in a complementary-symmetry connection as in all **Unico Series** units but here the **Unison Research** technical staff has gone further toward an optimum solution.

In every power amplifier the power supply quality has great influence on the sonic performance of the unit. In an usual configuration (apart from dual-mono dual-power) both the channel shares the same power supply stage, here it's plain to see that the high current sunk by one channel may affect the supply voltage injecting spurious signal into the other channel output devices increasing cross-talk and intermodulation distortion.

The new idea implemented in the **UnicoNuovo** amplifier is that of adding a power stage dedicated to offer a good supply voltage to the output devices. At the cost of a doubled number of power mosfet, **Unison Research** designers developed a power stage fed by the single power supply capacitors bank and driven by a copy of the output signal. The output of this stage is the supply voltage of the output power devices. This way the mosfets driving the load have a constant voltage across them for most of the time.

The advantages of this choice are many:

- lower cross-talk with improved sound stage and detail;
- almost constant working point for the output devices with improved bandwidth and high frequency linearity;
- wasted power shared between a larger number of devices with improved reliability and increased expected life of the unit.

Stabilized power supplies have been adopted in every circuit part where more sophisticated structures than the simple filtering could have guaranteed an improvement in the performances, from 15V for the operational amplifiers to 100V required by the tube preamplifier stage.

Special attention has been dedicated to the output stage power supply circuit design. Once considered the large value and the highly impulsive behaviour of the currents it has to source, advanced solutions have been adopted to get the best performances from this important element of the amplification chain: a high value, high quality capacitors bank has been placed the closest as possible to the power mosfets in order to minimize the path for the impulsive currents adsorbed. Large space has been reserved to the power supply lines, and the ground paths have been designed with extreme care.

As usual for all the new project, the design includes a low impedance active stereo output dedicated to an active subwoofer or any other line-level input and the option to convert one of the line input to a phono input thanks to a easy to install RIAA preamplifier board.

The new aesthetical line featuring black hairlined aluminium chassis gives the **UnicoNuovo** a smart and sober looking, nice finishing of the surface and perfect proportions typical of an Italian style design.

The aluminium chassis ensures high rigidity too with improved sonic performances and spurious vibrations dumping thanks to the three point suspension.

With this new release of our best know product we want to keep the **Unico** running further on that highway opened many years ago, pointing to offer top class sounding amplifiers at affordable prices and enjoyable looking.

## Technical characteristics

Output power:	80W RMS on 8Ω
Frequency response:	-0.1dB @ 10Hz -0.5dB @ 100kHz
Input impedance:	50kΩ // 47pF
Input sensitivity:	260mV RMS
Input stage:	Pure A Class Parallel tube stage ECC83/12AX7
Output stage:	Dynamic A Class POWER MOSFET complementary pair
Inputs:	5 line unbalanced (1 phono optional)
Line Outputs:	1 tape, 1 sub (volume controlled)
Outputs connectors:	4 + 4 bi-wiring
Feedback factor:	10dB
THD:	0.15% @ 10W/1kHz
Power consumption:	400W max
Dimensions:	17.1in x 3.5in x 17in
Net weight:	31lbs