

# M 40 HV

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Vierzig Jahre T+A



**T+A**

# M 40 HV

## Anniversary Edition

In 2018 T+A celebrates its 40th birthday. Ample justification for us to develop a very special product which reflects all our experience; a device which will only be built in our anniversary year.

We decided that this product should be a large mono power amplifier, since this is the final link in the electronic chain, and therefore determines in the final analysis the quality of the music signals, which originate at the source devices and are passed on to the speakers. The M 40 HV provides our HV-series High-Res players and pre-amplifiers with an extremely unique, uncompromising power amplifier which satisfies the most extreme audiophile demands under a vast range of operating conditions. Of course, it can also be used to form the perfect power amplifier for any other High-End set of equipment. One thing we have learned in our forty-year history is that the world of electro-acoustics does not permit a single perfect solution to all requirements; instead every overall design philosophy offers its own strengths and weaknesses. And that is why we have consistently developed optimum solutions for each requirement, whether it is based on valve technology or the very latest form of digital signal processing. The M 40 HV combines our experience in the various areas of High-End audio technology: audiophile valve construction for the input stages, High Voltage technology for the transistor stages, intelligent thermal processor control for the output stages together with our usual uncompromising case design and construction.

Our aim in developing the M 40 HV was not simply to build yet another “giant power amplifier” capable of generating as much power as possible. Of course, power is important, and the M 40 HV can supply it in abundance, but we believe that musicality, naturalness and uncoloured reproduction have top priority. The sophisticated design of our M 40 HV enables demanding music lovers to select any of various modes of operation according to personal taste, the loudspeakers in use and the power required, and in every case to achieve a magnificent result in terms of sound quality.



# M 40 HV

## Mono Power Amplifier

### Nominal power

into 4 Ohms	1,000 Watts
into 8 Ohms	550 Watts

### High Current Mode

up to 60 Watts pure Class A,  
up to 250 Watts Class AB

### Frequency response +0 - -3db

1 Hz – 150 kHz

### S / N Ratio

> 114 dB

### Damping factor

> 115

### Mains power requirement

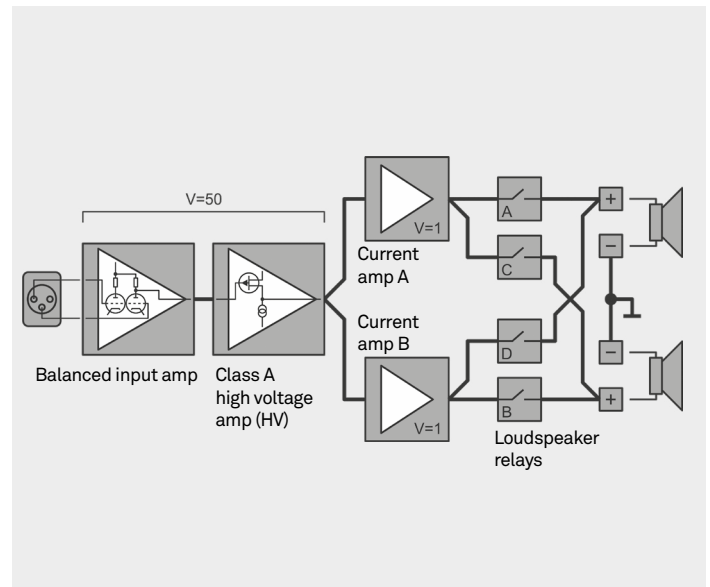
2,500 W

To achieve all this we have equipped our finest power amplifier with a circuit design which is unique in the world, combining classic analogue techniques, valve technology, High Voltage amplifier design and intelligent parameter control. The entire input amplification section is based on carefully selected High-End valves of the 6SN7 type, operating in Class-A mode. This results in a very harmonious sonic image, and instils the musical and tonal advantages of valve technology in the sound character of the M 40 HV. The input stage is designed as a symmetrical differential amplifier exploiting an all-valve cascode circuit. The subsequent voltage amplifier stage is a High Voltage (HV) J-FET amplifier circuit with triode performance characteristics, which also operates in pure Class-A mode. The result is excellent bandwidth and an agile performance which defines the sound qualities of the amplifier as a whole. At the input side the current amplifier stages are based on MOSFET driver transistors whose performance curve harmonises superbly with the HV voltage amplifier stage. At the output side the current amplifiers are equipped with no fewer than twenty extremely high-performance ring emitter bi-polar transistors. These components satisfy the most extreme demands in terms of current supply capacity and bandwidth. The M 40 HV can be switched off completely (OFF) or switched on permanently (ON), whereas the AUTO position enables the amplifier to switch itself on via the automatic power-on circuit when a music signal or control voltage is present, or via the H-Link data bus. The small push-button switches the loudspeaker terminals on and off, while a long button-press cycles the VU meter between peak display, average display and OFF modes.





The symmetrical input amplifier is a valve amplifier in a cascode circuit, controlling the High Voltage (HV) Class A J-FET voltage amplifier stage; the amplification factor is 50. This is followed by two separate current amplifiers with an amplification factor of 1 exploiting MOSFET transistors on the input side, and high-performance bi-polar ring emitter transistors on the output side.



All the amplifier stages of the M 40 HV are designed in such a way that they are totally linear and undistorted in operation. Achieving this performance requires the use of nothing but the best possible components; these parts are carefully matched to each other and calibrated in-house for each machine using sophisticated selection processes.

The level of linearity and bandwidth achieved with the M 40 HV is so high that it has been possible to completely avoid the use of overall negative feedback.

Another special and unique feature of the M 40 HV is the duplication of

the output current amplifier (power amplifier). Each of these output amplifiers is capable of up to 1,000 Watts, and each is connected to a pair of loudspeaker terminals. The two output amplifiers can either be wired in parallel - in order to increase current delivery capability - or in bi-amping mode; in this case a separate signal is fed to the bass and mid-range / high-frequency circuits of suitable loudspeakers, i.e. types equipped with bi-amping terminals. Even if the loudspeaker connected to the amplifier is not fitted with bi-wiring / bi-amping terminals, the two loudspeaker outputs can still

be connected to the loudspeaker terminals using separate cables. In this configuration all the internal and external speaker leads are wired in parallel, and all four loudspeaker relays present in the M 40 HV also operate in parallel, resulting in extremely low dynamic internal resistance, and optimum damping for the loudspeaker. The outcome is excellent control of speaker cone travel, maximum possible control in the bass range, and superb detail resolution in music reproduction.





### Back panel connections

Pre-amplifiers can be connected using Cinch, XLR 3-pin or XLR 4-pin plugs.

The M 40 HV features two identical output stages, each of which is connected to a pair of our High-End loudspeaker terminals made of Rhodium plated pure brass. This makes it possible to connect suitably equipped loudspeakers in bi-amping / bi-wiring mode. In this configuration one output stage handles the bass range and the other the treble / mid-range (bi-amping ON). In the bi-amping OFF position the output stages are wired in parallel, but bi-wiring is still possible in this mode.

Moving the left slide-switch to HighCurrent doubles the idle current. In this mode an output of up to sixty Watts is possible in pure Class A mode. In the High Power position the full operating voltage is used.



The M 40 HV features a total of three independent mains power supply units with three high-quality toroidal transformers with low electromagnetic stray fields. A high-voltage mains section with extremely sophisticated regulation powers the valve circuits of the voltage amplifier section. The constancy of the valve supply voltages is better than 10 ppm.

The two power amplifiers are fed by a pair of high-performance transformers, each rated at 1,000 Watts, and with a total reservoir capacity of more than 180,000  $\mu$ F. This guarantees more than adequate power reserves at any time, capable of coping with any imaginable load situation. Another truly unique feature is the facility to switch the operating vol-

tage of the M 40 HV output stages between the values  $\pm 50$  V (High Current mode) and  $\pm 100$  V (High Power mode). Selecting the lower operating voltage more than doubles the idle current in the output stages, with the result that the current amplifiers of the M 40 HV generate up to about 60 Watts in pure Class A mode. We particularly recommend this HighCurrent mode of operation if your system features high-efficiency loudspeakers, and for general listening at normal volume levels. The HighPower mode enables the amplifier to generate a maximum output of well over 1,500 Watts (into 2 Ohms). This mode of operation is especially recommended for use with high-impedance loudspeakers (impedance higher than 6 Ohms),

and for general use when high power is required.

The M 40 HV cannot simply be switched on; it has to "ramp up" slowly, otherwise the mains would collapse. For this reason a cleverly programmed micro-processor is responsible for all power-on and control processes. It also controls the protection circuit, and monitors the mains voltage, the internal supply voltages and the operating temperature of the M 40 HV. The system also monitors the loudspeaker outputs for D.C. voltage errors, short-circuits and overload, thereby protecting the loudspeakers connected to the unit. The problem is displayed on the M 40 HV's integral screen.

The whole HV-series has set new standards all over the world in respect of materials used, mechanical refinement and workmanship. For the M 40 HV our developers insisted on using only the finest components. We work "from the solid": the heat-sinks are extruded in a single process using extremely powerful tools, while the shielding enclosures are machined from solid blocks. The waste heat generated is considerable,

but the substantial material mass reliably and constantly dissipates the energy, with the result that the M 40 HV does not require a cooling fan in spite of its huge power. All the materials used in the amplifier section are nonmagnetic, and the mains power supply transformers are housed inside a steel shielding chamber. The overall mass of 52 kg guarantees that it is completely de-coupled from the outside world.

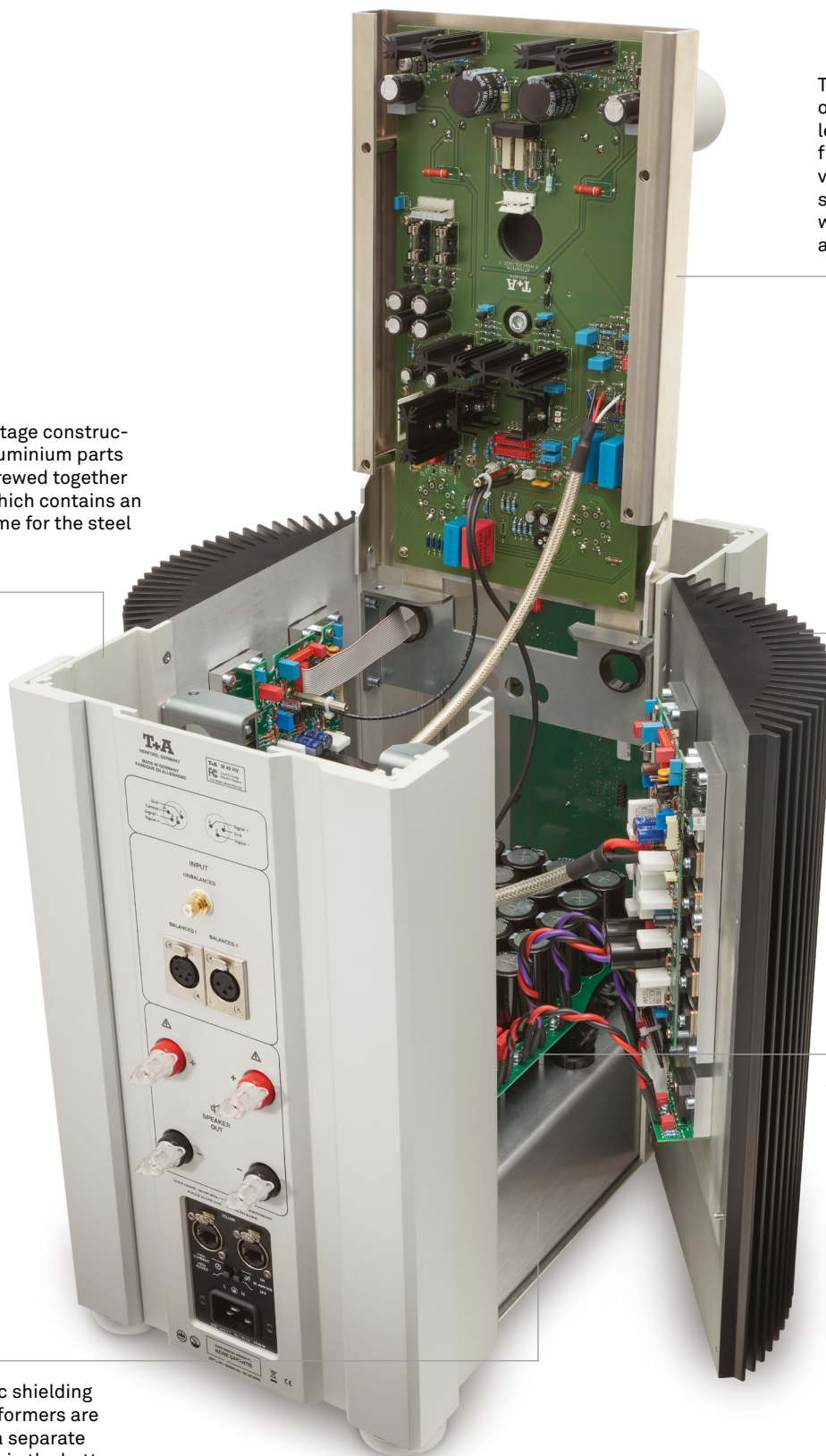
The case is of two-stage construction: the external aluminium parts are permanently screwed together to form a housing which contains an integral chassis frame for the steel sub-assemblies.

The valve input stage is mounted on a nonmagnetic chassis cradle, which is completely isolated from the power section. The valves are electromagnetically shielded by grounded cylinders which are milled from massive aluminium.

The two power amplifiers are located to left and right on solid aluminium heat-sinks, whose substantial mass disperses the waste heat, and effortlessly dissipates it.

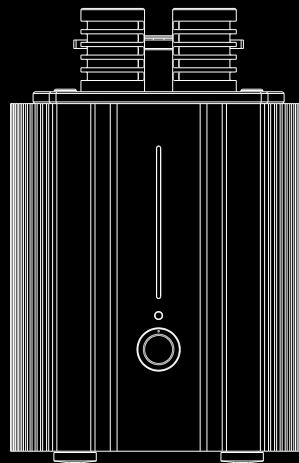
The mains section circuit board is located in the bottom part of the housing, and provides a gigantic reservoir of energy.

For electromagnetic shielding purposes the transformers are accommodated in a separate shielding enclosure in the bottom.



# M 40 HV

## Mono Power Amplifier



<b>High Power Mode</b>	
Nominal Power 8 Ohms / 4 Ohms	550 Watts / 1,000 Watts
Peak Power 8 Ohms / 4 Ohms	570 Watts / 1,070 Watts
<b>High Current Mode</b>	
Power	up to 60 Watts pure Class A, up to 250 Watts Class AB
Frequency response +0 / -3 dB	1 Hz – 150 kHz
Slew Rate	65 V/μs
Damping factor 4 Ohms	> 115
S / N ratio	> 114 dB
Distortion (5 W, 4 Ohms, 1kHz)	< 0,009 %
Inputs	unbalanced (RCA), balanced XLR 3 pin and XLR 4 pin
PWR Supply capacity	180,000 μF
PWR requirement 110 V - 115 V/60 Hz or 220 - 230 V/50 Hz	2,500 Watts
Standby	< 0,5 Watts
Features	Trigger input +5 ... 20 V
Dimensions (H x W x D), Weight	56 x 36 x 47 cm (21.5 x 14 x 19"), 52 kg (114 lb)
Accessories	Power Cord C19, H Link-Cable
Available finishes	Case: silver laquer 47 or titanium laquer 64, HV-individual heat sink black 42



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