Technical Paper

Amplifiers TPA 3016 A - TCA 3018 A

TANDBERG

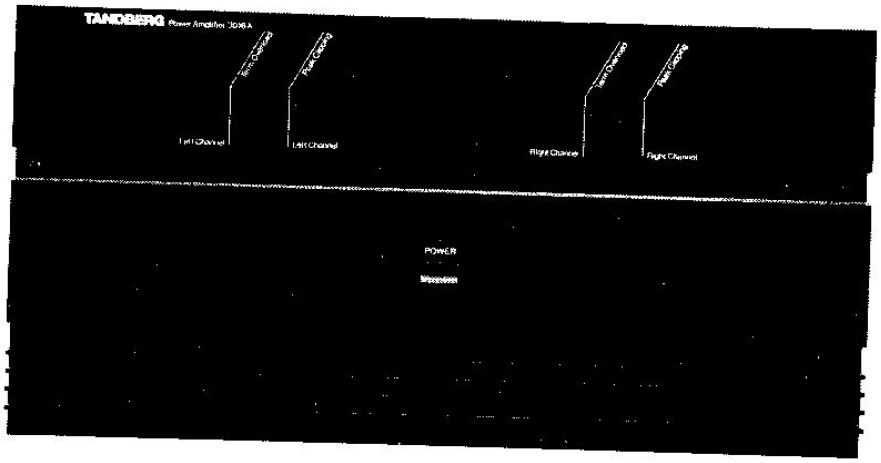
3016
3018

AMPLIFIERS

Tandberg's amplifier designs represent the latest advancement in state of the art. Packaged in a handsome black anodised solid aluminum case, it provides the user with well thought controls for optimum enjoyment of the listening material as well as flexibility of interconnections to additional audio components.

The amplifiers share a common heritage of musical accuracy resulting not only from innovative circuit design, but also from meticuolous attention to the engineering details, as listed below —

TPA 3016 A POWER AMPLIFIER



TCA 3018 A CONTROL AMPLIFIER

Component selection

All audio stages are comprised exclusively of polypropylene capacitors and metal film resistors, selected for the optimum audio performance.

These selected polypropylene capacitors eliminate dielectric losses and dynamic capacitance changes in conventional components, with their subtle sonic blurring of details, loss of perspective and focus, and a harsh metallic sound.

All metal film resistors used provide high accuracy and long term stability.

The audio section employs only discrete selected active elements.

To ensure long trouble free interconnections all input and output sockets are gold plated.

Zero Negative Feedback

Tandberg's preamplifiers and power amplifiers contain zero negative feedback. The result of this is remarkable sound reproduction. Purity, transients, openness, resolution and imaging are unparalleled – an distinct improvement over widely employed by the industry negative feedback design.

By using very special circuit topology elements with high quality and tolerances unheard of in regular mass production, together with an ingenious layout of the circuit boards and component selection, it has been possible to build a zero feedbak amplifier.

In addition, distortion has been kept at the same or lower levels than traditional designs.

The linearity of the amplifiers are maintained at all levels and with all loads.

No negative feedback also means no need for stability compensation, no stability problems, no internal circuit overload or conditional stability. How this affect sound reproduction is remarkable! Transients, openess, perspective, focus, resolution . . . everything is enhanced with this technology. The best proof is to compare the performance of the Tandberg sets with any other "high end" product.

TCA 3018 A

High level inputs

All high level inputs on TCA 3018A offer an overload rating in excess of 20 Volts!

No matter how dynamic the source is, it will not overload the input.

RIAA

Passive Phono EQ. Both phono sections, MC/MM, use passive H.F. and L.F. sections.

Therefore the phono stages have zero feedback resulting in no sonic degradation.

Separate power supplies

Through a common transformer the TCA 3018A has separate windings and, therefore, separate power supplies for left and right channels. This means that the channels are completely separated without interference between left and right. The two power supplies, which incorporate high speed regulated voltages and stiffness, result in better sound.

TPA 3016 A

Two mono amplifiers, AC electronic governed fan

TPA 3016A consists of two separate power stages with only mains switch and fan in common. The fan is electronically controlled by the temperature of each separate heatsink. Only under very demanding situations will the fan be activated, and only as much as needed to keep the transistors at an optimum working temperature.

The fan automatically starts at 60°C and accelerates its speed to ensure that the amplifiers temperature does not exceed 70°C.

The heatsinks are also very effective without the fan since the transistors are mounted on the outside of the amplifier improving the cooling through natural convection.

"Rock solid" power supplies

A power amplifier's ability to maintain control with all loads, is very dependent on the stability of the power supply where it is bound to get the current whenever it needs.

Even small voltage modulations of power are audible (unstable perspective and not fully controlled bass). Therefore the power supplies have two rugged mains transformers and 120.000 microfarads of storage capacity to ensure rigidity. This makes the power amplifier able to drive loads even below 2 ohm.

Superior current capability

16 MOSFET power transistors, 8 MOSFETS per channel, each MOSFET rated to 8 Ampere continuous current. Combined with a large, efficient power supply this make the amplifier able to deliver superior current capability, approaching the 100 Ampere barrier.

The output devices require no protection and are therefore able to draw all current required from the rigid power supply.

These advanced features also make the TPA 3016A an ideal choice for professional applications.

Feedforward driver stages, MOSFET output stages

This takes full advantage of the MOSFET speed and inherent current sharing. The feedforward circuit eliminates the ON-resistance in the MOSFET's completely. This results in very low output impedance at even several hundred kHz assuring full control over all elements in the speakers.

This results in highly detailed and accurate midrange and high-end unmatched by any other design.

Thermic Servo Loop

No negative feedback would have caused DC stability problems without special servo systems. Usually this is done electronically with a lowpass filter and negative feedback, which affects the sound. Controlling by means of circuit elements temperature coefficients have no negative effects and solves the problem perfectly.

Technical Data

Tandberg Power Amplifier 3016A

Power requirements:		115 V ± 10%, 60 Hz or 230 V ± 10%, 50 Hz
Power consumption:		210 – 2500 W
Dimensions:		Width: 17 1/8" (43.5 cm) Depth: 13 3/4" (35.0 cm) Height: 8 11/16" (22.1 cm) Weight: 62 lbs (28 kg)

Technical Data according to IHF-A-202, 1978

Continuous Average Power Output:	(8 ohm, 20 – 20.000 Hz, THD < 0.05%)	220 W
Frequency range:		+ 0/– 0.1 dB, 20 – 20.000 Hz
A-weighted Signal-to-Noise ratio:	(Ref. 1 W/8 ohm)	92 dB

Secondary Disclosures

Output Impedance (20 – 20.000 Hz):		typical 0.02 ohm
Wideband Damping Factor:		typical 400
SMPTE Intermodulation Distortion:		typical 0.05%
IHF Intermodulation Distortion:		typical 0.05%
Channel Separation:		> 90 dB
Transient Overload Recovery Time:		Immeasurable

Other Technical Data

Continuous Average Power Output in 4 ohm:		400 W
Continuous Average Power Output in 2 ohm:		600 W
Frequency range:		+ 0/– 0.2 dB, 0.07 – 1.5 MHz
Sensitivity (1 W/8 ohm/1 kHz):		100 mV
A-weighted Signal-to-Noise ratio:	(Ref. 220 W/8 ohm)	117 dB
Pulse power:		2500 W in 0.5 ohm

Specifications are subject to change for further improvement without notice.

Optional Extras

– Rosewood side walls for freestanding units.

– Rack mounting kit.

YOUR AUTHORIZED TANDBERG REPRESENTATIVE:

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Technical Data

Tandberg Control Amplifier 3018A

Power requirements:	115/230 V ± 10%, 50/60 Hz
Power consumption:	55 W max.
Ac.-outlets:	Switched 1
Dimensions:	Width 17 1/8" (43.5 cm)
	Depth 13 ¾" (35.0 cm)
	Height 3 ½" (8.9 cm)
	Weight 12.5 lbs (5.7 kg)

Technical Data according to IHF-A-202, 1978

Frequency range:		
Phono MM:	20 – 20,000 Hz	± 0.2 dB
Phono MC:	20 – 20,000 Hz	± 0.2 dB
Tape 1, Tape 2:	20 – 20,000 Hz	+ 0/– 0.1 dB
Tuner, Digital Disc, AUX:	20 – 20,000 Hz	+ 0/– 0.1 dB
Maximum Voltage Output:		
Variable output:		5 V at THD = 0.006%
Variable output:		10 V at clipping level
Tape 1, Tape 2:		7.5 V
Headphone output:		20 V unloaded
Total Harmonic Distortion (20 Hz – 20,000 Hz):		
Phono MM:		< 0.009%
Phono MC:		< 0.009%
Tape 1, Tape 2:		< 0.005%
Tuner, Digital Disc, AUX:		< 0.005%
Input Sensitivity – Ref. 0.5 V output voltage:		
Phono MM:		1 mV
Phono MC:		60 µV
Tape 1, Tape 2:		80 mV
Tuner, DD, AUX:		80 mV
A-weighted Signal-to-Noise ratio:		
Phono MM:		78 dB
Phono MC:		74 dB
Tape 1, Tape 2:		90 dB
Tuner, DD, AUX:		90 dB
Maximum Input Voltage (1 kHz):		
Phono MM:		290 mV
Phono MC:		14 mV
Tape 1, Tape 2:		20 V
Tuner, DD, AUX:		20 V
Input impedance:		
Phono MM:		47 kohm
Phono MC:		150 ohm
Tape 1, Tape 2:		10 kohm
Tuner DD, AUX:		10 kohm

Secondary Disclosures

Output impedance:	
Variable:	47 ohm + 10 uF in series
Headphones:	150 ohm
Headphones (min. load):	4 ohm
Filter:	
Sub Sonic:	– 12 dB/oct., – 3 dB at 15 Hz
Crosstalk (100 Hz – 10 kHz):	
Phono MM:	To any of the other sources > 70 dB
Phono MC:	To any of the other sources > 70 dB
Tape 1, Tape 2:	To any of the other sources > 70 dB
Tuner, Digital Disc, AUX:	To any of the other sources > 70 dB
Separation (100 Hz – 10 kHz):	
Phono MM:	> 53 dB
Phono MC:	> 53 dB
Tape 1, Tape 2:	> 58 dB
Tuner, Digital Disc:	> 58 dB
Transient intermodulation:	
All inputs:	Immeasurable

Other Technical Data

Frequency range:	
Tape 1, Tape 2:	1.6 – 1,500,000 Hz + 0/– 3 dB
Tuner, Digital Disc:	1.6 – 1,500,000 Hz + 0/– 3 dB
Phase shift (20 Hz – 20,000 Hz):	
Tape 1, Tape 2:	$+0.5^{\circ}/-0.5^{\circ}$
Tuner, Digital Disc, AUX:	$+0.5^{\circ}/-0.5^{\circ}$

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Optional Extras

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– Rack mounting kit.