



# TANDBERG® – a company with

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## The quest continues

Tandberg's quest for musical perfection is over half a century long.

Since 1933 when Vebjørn Tandberg founded the company his commitment to the outstanding reproduction of music has been lovingly pursued. It is this commitment that is foremost in the minds of all the engineers, technicians, and other employees who design and build Tandberg products.

The result of this ongoing quest is a reputation for quality and exceptional performance that has been consistently reinforced with each and every generation of Tandberg components.

Today Vebjørn Tandberg's commitment continues with the Tandberg Series 3000A . . . . a full line of high quality, high performance components designed to bring music reproduction that much closer to the reality of the original.

Shown on these pages are some of the people involved in the design and manufacturing of Tandberg products. Throughout the company there is a firm belief in the corporate goals, philosophy, and future.

Our engineers spend countless hours listening to design prototypes, and, in fact, it is not uncommon to find several versions of a specific unit on evaluation at one time. No design receives final approval until we are convinced it offers a more accurate musical reproduction than all alternatives.

Tandberg's Scandinavian heritage negates change for the sake of change. We change by evolutionary methods from an ongoing research and development program. Models evolve through logical and consistent design goals coupled with a basic understanding of environment considerations. Tandberg components offer superior sound and performance in conjunction with logical control and function selectors to enable simple and easy use. You certainly need not be an engineer to fully enjoy all the sophistication built into a Tandberg.

Just relax and enjoy the pleasure that over fifty years of research and development on our part can bring to your music.

## A technical overview

Tandberg's engineering philosophy is quite simple in theory . . . to design and manufacture products that offer superior sound reproduction, construction, control flexibility and style all at an affordable price. This philosophy requires truly unique engineering to attain our goals.

These goals have been achieved by eliminating superfluous or rarely used features. We put our technology inside where you can hear it. Tandberg's equipment does not wear an impressive facade of buttons, lights, knobs, and flashing displays to impress the eyes and deceive the ears.



# a purpose – our people believe

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Tandberg's audio design philosophy is based upon accepted and proven technologies. All audio circuits are comprised of discrete components. Integrated circuits are relegated to switching and functions only (except in TPT 3011A multiplex circuit and TCD 3014A Dolby NR\* circuits). Using discrete components allows Tandberg's designers to select every component for maximum performance.

Research indicates that electrolytic capacitors used by most manufactures have high di-electric absorption rates. These units tend to "memorize" a signal passing through and impress it on following signals. This characteristic memory produces audible distortion in the lower mid-range and bass frequencies.

Further research showed that polystyrene and polypropylene capacitors have minimal absorption rates and produce audibly improved sound. These more expensive capacitors are used in all audio circuits of the series 3000.

Also, ceramic capacitors widely used in today's audio circuits exhibit voltage-dependent capacitance value variations. This causes variable phase shift in the high frequencies leading directly to "hard and brittle" sound.

Again, polystyrene and polypropylene capacitors have no such voltage-sensitive properties in the high frequencies. They reproduce a much smoother and more natural high frequency sound quality.

Tandberg's newly patented Thermic Servo Loop eliminates DC voltage at the amplifier output through the use of temperature-sensing devices. This system eliminates the need for electrolytic capacitors used by other manufacturers to block DC output.

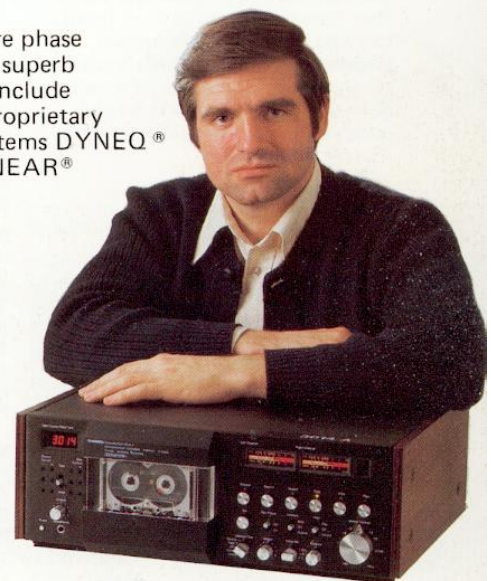
\* "Dolby" and the double-D-symbol are trademarks of Dolby Laboratories Licensing Corporation.  
Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

Tandberg's research and development team created an incredibly fast amplifier through the use of MOSFET transistors in the output stages. This means that transients are passed through the unit virtually unchanged resulting in amazingly life-like sound reproduction.

Tandberg's amplifiers utilize regulated toroidal power supplies and high current output stages. This insures stable, accurate, and powerful amplification into all loudspeaker loads. All feedback is applied in short loops to minimize its potential negative effects. In addition, the TPA 3006A and TPA 3009A have eliminated feedback in the output stages and have no overall feedback loop. This means superior sound reproduction, immeasurable TIM and THD along with high slew rate and rise times. MOSFET output amplifiers eliminate all sound degrading voltage and current limiting circuits.

Tuners incorporate electronic varactor diode tuning similar to those found in state of the art video systems. Tandberg has been designing and utilizing varactor tuning systems since 1962.

Tape decks are phase corrected for superb imaging and include Tandberg's proprietary recording systems DYNEO® and ACTILINEAR® for optimum recording quality and absolute minimum noise.





## TPT 3001A

### Programmable FM tuner

The TPT 3001A offers extremely low distortion, an unprecedented signal-to-noise ratio of 95 dB in mono and 92 dB in stereo, and overall performance specifications far above competing tuners.

The TPT 3001A has an electronic memory for 8 preset FM stations with 12 bit processor; IF bandwidth for wide, normal, and narrow; and a signal strength tuning meter with auto-ranging.

An 8 gang electronic front-end translates into incredible sensitivity. This combined with superb selectivity and capture ratio insure the finest FM performance available in the world today.

The TPT 3001A uses a discrete MPX decoder, not integrated circuits, to eliminate beat notes and increase audio quality. This multiplex decoder is more sophisticated than most complete tuners and alone achieves in excess of 80 dB separation at 1000 Hz.

The TPT 3001A Features Servo Lock Tuning, discrete components rather than integrated circuits in all signal carrying stages, variable muting, switchable FM de-emphasis.

With the TPT 3001A, FM finally comes of age as a viable high fidelity source.

#### Specifications:

50 dB quieting sensitivity:	
Mono	0.9 uV
	10.3 dBf
Stereo	11.0 uV
	32.1 dBf
With noise filter ANC:	
10 dB channel separation	5.0 uV
	25.2 dBf
Signal-to-noise ratio:	
Mono	95 dB
Stereo at 65 dBf (0.5 mV)	82 dB
Stereo at 85 dBf (5 mV)	92 dB
Selectivity $\pm$ 400 kHz:	90 dB
AM suppression ratio:	> 70 dB
Dimensions (cm):	Width 43.5
	Height 8.3
	Depth 35.0



## TPA 3006A

### Power amplifier

This unique amplifier offers a variety of innovative design concepts. TPA 3006A is the world's first zero feedback MOSFET amplifier. By utilizing the latest solid state MOSFET devices coupled with a proprietary Constant Source Impedance Driver Stage, Tandberg has achieved class A performance in a small, efficient A-B amplifier.

The elimination of feedback as well as all voltage and current limiting makes for readily discernable sonic superiority. The high current output stage (25 amps per channel) is kept linear with Tandberg exclusive Voltage Comparator Circuit. This ensures extremely low distortion without the sonic limitations of negative feedback.

TPA 3006A's high current output stages are backed up with a superb power supply offering tight regulation, high current, and speed of response. An extremely efficient toroidal transformer coupled with large storage capacitors allow such high power levels in a surprisingly compact size.

DC is eliminated from the output stages with our patented Thermic Servo Loop. This allows for absolute speaker protection without musical degradation. Other protection functions are achieved with a logic circuit which monitors all critical parameters. A unique load disconnect circuit is activated upon any sign of problems.

#### Specifications:

Continuous average power output (8 ohm, 20–20,000 Hz, THD < 0.02%):	2 x 150 W
SMPTE intermodulation distortion:	< 0.02%
IHF intermodulation distortion:	< 0.02%
Frequency response: 20–20,000 Hz	+0/–0.2 dB
Sensitivity:	1 V
A-weighted signal-to-noise ratio:	98 dB
Ref. 1 W/8 ohm	120 dB
Ref. 150 W/8 ohm	Width 43.5
Dimensions (cm):	Height 8.3
	Depth 35.0



## TCA 3008A

### Control amplifier

The TCA 3008A, the control module of the Series 3000A, provides immediate response and pin point control.

Tandberg's preamplifier incorporate state-of-the-art circuitry and utilizes 1% tolerance precision components for long life and channel to channel consistency.

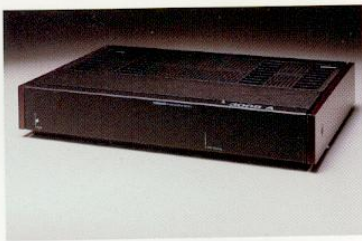
The TCA 3008A is comprehensively equipped with digital inputs allowing more than 20 volts of signal without input overload for use with the most demanding of tomorrow's source materials. TCA 3008A is also equipped with inputs for both moving magnet and moving coil cartridges. These have three main parts: a linear buffer stage, a passive equalization network for the high frequencies, and an amplifying stage with equalization for the lower frequencies. Maximum deviation from the RIAA-curve is within  $\pm$  0.2 dB.

The TCA 3008A includes inputs for two tape decks with provisions for dubbing, and for headphone output with independent volume control.

The new circuit designs of the TCA 3008A offers lower noise, better sonics, increased RF rejection and custom phono cartridge. Glass epoxy boards with dual copper foil for distributed ground, and minimum negative feedback loops for all amplifier stages requiring such feedback.

#### Specifications:

Frequency Response, 20–20,000 Hz:	
Phono	$\pm$ 0.2 dB
Tape 1, 2, Tuner, Digital	+0/–0.1 dB
Input Sensitivity – Ref. 0.5 V output:	
Phono MM	1 mV
Phono MC	80 uV
Tape 1, 2, Tuner, Digital	70 mV
A-weighted signal-to-noise ratio:	
Phono MM	80 dB
Phono MC	74 dB
Tape 1, 2, Tuner, Digital	97 dB
Input Impedance:	
Phono MM	33/47/100 kohm
Phono MC	150 ohm
Dimensions (cm):	Width 43.5
	Height 8.3
	Depth 35.0



## TPA 3009A

### Mono power amplifier

This newest addition to Tandberg's power amplifier family is truly a masterpiece of amplifier design. A High Current mono unit, TPA 3009A is based on the TPA 3006A design. Carried over are the outstanding sonic attributes and circuit highlights and components of TPA 3006A . . . polypropylene capacitors, 1% metal film resistors, ceramic base pots, 0 dB negative feedback and no voltage or current limiting.

TPA 3009A differs in an additional 4 MOSFET output devices for a total of 8, and double the power supply capacitance of the TPA 3006A. This enables the TPA 3009A to deliver 200 watts into 8 ohm, 330 watts into 4 ohm, 400 watts into 2 ohm, all at 0.02% IM and THD. Also, due to the substantial power supply and output stages, the TPA 3009A is capable of delivering 55 amps of constant current. At 1/2 ohm 1500 watts is available on a peak basis!

The TPA 3009A also incorporates Tandberg's patented Thermic Servo Loop to eliminate DC at the outputs with no degradation of the musical signal. Also eliminated are the commonly used output chokes which are found in almost all other solid state amplifiers. These coils are used to eliminate RF feedback but invariably cause sound deterioration.

#### Specifications:

Continuous average power output (8 ohm, 20 – 20,000 Hz, THD < 0.05%): 180 W  
 SMPTE intermodulation distortion: 0.05%  
 IHF intermodulation distortion: 0.05%  
 Frequency range: 20–20,000 Hz + 0/– 0.1 dB  
 Sensitivity: 80 mV  
 A-weighted signal-to-noise ratio: Ref. 1W/8 ohm 94 dB  
 Ref. 150 W/8 ohm 117 dB  
 Dimensions: Width 43.5  
 Height 8.3  
 Depth 35.0



## TPT 3011A

### Programmable FM tuner

Now, budget-conscious audiophiles can enjoy Tandberg quality with the TPT 3011A which benefits from the same sonic improvements made in the TPT 3001A.

The TPT 3011A has an electronic memory for 8 preset FM stations and a pre-tuning system with 12 bit processor.

It features a 5 gang electronic diode front-end that insures high sensitivity.

Like the TPT 3001A, it features Servo Lock Tuning, discrete components in all audio circuits, variable muting, switchable FM de-emphasis, and switchable voltage.

These features and more provide audibly improved sound performance at a most reasonable price.

And like the TPT 3001A, it's high quality, machined extruded aluminum construction offers a combination of strength and beauty. The TPT 3011A Tuner is a perfect match with the renowned TIA 3012A Integrated Amplifier. Together they make one of the world's finest receiver.

#### Specifications:

50 dB sensitivity: Mono 1.5 uV  
 14.8 dBf  
 Stereo 20.0 uV  
 37.3 dBf  
 Signal-to-noise ratio at 65 dBf: Mono 78 dB  
 Stereo 75 dB  
 Distortion at 50 dB quieting: Mono 0.3%  
 Stereo 0.3%  
 Alternate channel selectivity ± 400 kHz: > 100 dB  
 Spurious response ratio: > 70 dB  
 AM supression ratio: > 70 dB  
 Dimensions (cm): Width 43.5  
 Height 8.3  
 Depth 35.0



## TIA 3012A

### Intergrated amplifier

The Tandberg TIA 3012A Integrated Amplifier is tomorrow's hi-fidelity component ready for your enjoyment today.

The control amplifier stage of the TIA 3012A has digital inputs allowing more than 20 volts of signal without input overload for use with the most demanding of tomorrow's source material.

The TIA 3012A also features inputs for moving magnet and moving coil cartridges, two tape decks, and tuner plus independent record and listen select switches for total flexibility.

Tone control circuits are passive, consisting of 1% calibrated resistors with switchable turnovers and tone defeat.

DC output voltages are eliminated by Tandberg's patented "Thermic Servo Loop".

A combination of high current power supply design, distributed ground on all circuit boards, and MOSFET output devices produces an incredibly fast slow rate for virtually perfect transient response.

Once again, Tandberg sets the standard for quality conscious audiophiles.

#### Specifications:

Continuous average power output (8 ohm, 20–20,000 Hz, THD < 0.015%): 2 x 100 W  
 Sensitivity (Ref. 1 w/8 ohm): Phono MM 0.19 mV  
 Phono MC 15.0 uV  
 Phono digital disc, AUX 15.0 mV  
 Tape, Tuner 15.0 mV  
 A-weighted signal-to-noise ratio: Phono MM 78 dB  
 Phono MC 73 dB  
 Phono digital disc, AUX 84 dB  
 Tape, Tuner 84 dB  
 Dimensions (cm): Width 43.5  
 Height 8.3  
 Depth 35.0



**TCD 3014A**

**Cassette deck**

The electronics of the TCD 3014A are totally upgraded from the original highly regarded TCD 3014. All audio circuits have been redesigned to offer better sound with less noise. Circuits based on the incredible TCD 910 Professional Cassette Deck have been included to optimize tape handling, real time counter accuracy, phase response and imaging, as well as RF rejection.

Four servo controlled motors insure precise control and gentle tape handling. A 5 mm thick aluminum baseplate rolled under 40 tons of pressure eliminates stress and greatly increases strength. Azimuth alignment of the discrete, 3-head system means that the deck makes superior recordings on every tape.

DYNEQ and ACTILINEAR II, Tandberg's extraordinary contribution to quality cassette recording and reproduction, increase recording headroom by more than 20 dB while reducing noise and high frequency overload to a minimum.

The TCD 3014A includes one of the most technologically advanced control systems available today. Included is an 8 bit microprocessor and a 32 k EPROM programmed by Tandberg with its own custom software.

The combination of handling mechanisms, microprocessor controls, and the sonic improvements integrated into all Series 3000A components make the TCD 3014A the logical choice for exceptional music reproduction.

**Specifications:**

Frequency Response:  
 Metal IV 18 Hz — 23 kHz  
 (— 20 dB) ± 1.5 dB  
 With Dolby C NR ± 3.0 dB  
 Signal-to-noise ratio (Dolby C NR):  
 Metal IV > 74 dB  
 Erasure (1 kHz):  
 Metal IV > 80 dB  
 Wow and Flutter:  
 WRMS (PLAY) 0.06%  
 WRMS (REC—PLAY) 0.09%  
 DIN — IEC 0.12%  
 Dimensions: Width 43.5  
 Height 16.6  
 Depth 35.0



**TD 20A**

**Tape deck**

Much of Tandberg's reputation for quality is based on the unmatched performance of its tape decks. The TD 20A is a direct descendant of the products that made Tandberg a leader in the audio market.

The TD 20A features a four motor transport for superb tape handling, Programmed Read Only Memory operating system, four input mic./line mixing, and Track Sync for a very professional-type recording system.

The four, servo controlled motors in the transport system insure precise control and gentle tape handling. A 5 mm thick aluminum baseplate rolled under 40 tons of pressure in a unique "honeycomb" design eliminates stress and greatly increases strength.

The computerized operating system enables direct and responsive access to all transport operations including flying start record/editing, high speed cue and review, and eliminates the possibility of tape mishandling or damage at the same time.

Tandberg's patented ACTILINEAR recording system provides a tremendous breakthrough in tape recording capabilities by adding up to 20 dB of increased record amplifier headroom while reducing noise and high frequency overload to a minimum.

The TD 20A is the perfect choice for audiophiles who want the proven advantages of an open reel tape deck.

**Specifications:**

Frequency range ± 2 dB 20—30,000 Hz  
 THD distortion at 0 dB rec. level: < 2%  
 Tracks: 2  
 Tape speed: 15 — 7½ ips  
 Speed variations (wow and flutter):  
 WRMS R/P 15 ips 0.03%  
 7½ ips 0.05%  
 Speed tolerance: ± 0.5%  
 Signal-to-tape noise ratio:  
 IEC A-curve Max. 72 dB  
 IEC linear RMS 60 dB  
 Cross talk at 1000 Hz min.:  
 Mono 64 dB  
 Stereo 54 dB  
 Dimensions: Width 43.5  
 Height 45.0  
 Depth 19.5



**TD 20A SE**

**Tape deck**

A four motor transport system, micro-processor control operating system, Dyneq and Actilinear, Special Equalization, four input mic./line mixing, and Track Sync all combined to make the TD 20A SE the ultimate recording system for home or semi-professional use.

Tandberg's unique Special Equalization takes advantage of new, high output/low noise tapes by reducing the playback boost, thus diminishing tape hiss significantly and allowing up to 80 dB signal-to-noise without noise reduction circuits.

The DYNEQ headroom extension system automatically adjusts high frequency amplification of the musical signals to avoid overload of the tape. Possible distortion is prevented and signal strength may be increased dramatically without tape saturation, resulting in substantial increase in maximum record level.

Tandberg's patented ACTILINEAR recording system allows headroom extension for the record circuit electronics to provide up to 20 dB of increased record amplifier headroom.

The microprocessor enables direct, precise, and responsive access to all transport operations including flying start record/editing, high speed cue and review, and also eliminates the possibility of tape damage or mishandling.

**Specifications:**

Frequency range ± 2 dB 20—30,000 Hz  
 THD distortion at 0 dB rec. level: < 2%  
 Tracks: 2  
 Tape speed: 15 — 7½ ips  
 Speed variations (wow and flutter):  
 WRMS R/P 15 ips 0.03%  
 7½ ips 0.05%  
 Speed tolerance: ± 0.5%  
 Signal-to-tape noise ratio:  
 IEC A-curve Max. 80 dB  
 IEC linear RMS 70 dB  
 Cross talk at 1000 Hz min.:  
 Mono 64 dB  
 Stereo 54 dB  
 Dimensions: Width 43.5  
 Height 45.0  
 Depth 19.5

## THE VISIBLE DIFFERENCE

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Components with the outstanding performance of the Series 3000A usually involve compromises in styling, flexibility, or simplicity that limit their appeal to hi-fidelity buyers.

Not so with Tandberg. Each component of the Series 3000A offers a simplicity that means quick, logical response to user commands and provides unmatched ease of operation. Remote controls for the cassette and

tape decks offer even greater control simplicity for the user.

The design flexibility of the Series 3000A adapts to any lifestyle. Each unit related harmoniously to its environment and other components regardless of manufacturer.

Finally, the Series 3000A components offer strikingly beautiful, classic styling in quality machined extruded aluminum cabinets well-suited to the

elegance of any home decor. Attractive, optional rosewood side panels and a final touch of class.

With Tandberg's Series 3000A, compromise becomes a problem of the past.

Tandberg's Series 3000A offers an ideal balance of performance, simplicity, flexibility, and styling unavailable from any other manufacturer.



# TANDBERG'S YEARS OF EXCELLENCE

The Tandberg company was first established as "Tandbergs Radio-fabrikk A/S" in Oslo in 1933 by electronics engineer Vebjørn Tandberg.

Since 1933 the company has achieved many remarkable technical innovations and world "first", some principal milestones of which are as follows:

## 1933

The first products to be released were the battery-powered radio "Tommeliten" ("Tomthumb") and the mains-powered radio "Corona".

## 1934

"Huldra 1" radio was put into production, designed on a new principle with long and medium waves in one band.

## 1950

The company started its export activities.

## 1952

Tandberg's tape recorder, Model 1, was introduced. This was the world's first tape recorder with equalized peak-reading indicator ("magic eye").

## 1956

Tape recorder Model 5 was released. The first 1/4 track stereo recorder on the world market.

## 1961

The company produced and delivered its first language laboratory.

## 1964

The world's first tape recorder with "dual-gap" erase head was produced by Tandberg.

## 1966

Model TB 64X tape recorder with crossfield biasing system was introduced. The world's first tape recorder with frequency range to 15 kHz at the low speed of 9.5 cm/s.

## 1968

Tandberg's TP 41 portable radio was adjudged "best in the world" by leading trade magazines in the U.S.A.

## 1971

Tandberg's first digital tape transport was introduced.

## 1972

Tandberg absorbed "Radionette", a competing Norwegian consumer electronics company.

The same year TCD 300, the company's first cassette deck was introduced. This was the world's first 3 motor, dual capstan, closed loop, solenoid operated cassette deck and also first with complete servo control of wind and rewind.

## 1975

TCD 330 — the world's first 3 head, 3 motor cassette deck with full electronic logic control was introduced.

## 1976

Tandberg established a high technology research, development and sales company for data equipment in San Diego, U.S.A.

## 1978

TD 20A, reel-to-reel tape deck was introduced, which was the first to use the "Actilinear" recording system. TCD 340AM was the first cassette deck capable of recording and playing back metal tapes.

## 1979

TCD 440A was the first cassette deck to incorporate Tandberg's revolutionary dynamic record equalization system "Dyneq".

## 1980

Tandberg's Series 3000 was first launched. It was a new series of separate components, among which the tuner TPT 3001 was the world's first to have a signal-to-noise ratio better than 90 dB in stereo, and TCD 3004, a cassette deck with professional quality.

## 1982

TD 20A SE reel-to-reel tape deck with special equalization was introduced and was the world's first to reach 80 dB S/N on 1/4" tape without noise reduction systems.

The first product in the second generation of the Series 3000 — TIA 3012 Integrated Amplifier — was introduced.

## 1984

Tandberg introduces the TCD 900 series and breaks through the barrier of professional cassette use. The TCD 900 series has combined superior sound capability, mechanical and electronic quality, control flexibility and the experience of more than 50 years of electronic and tape recorder design/manufacturing.

## Addresses:

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