

TANDBERG®



The Challenge:

To create a cassette deck that makes today's source material technology available to the most demanding music lover in an easy to operate, yet sophisticated format.

Today's source materials, including digital, represent significant advantages in sound reproduction. Frequency response, dynamic range, signal-to-noise ratio have all been improved to such a degree that yesterday's acceptable cassette deck is at best mediocre today.

The Solution:

The TCD 3014, an entirely new generation of cassette deck.

In designing and manufacturing the TCD 3014, Tandberg's engineers combined significant advantages in performance with computer technology in an easy to use system.

The result is a deck with the most sophisticated microprocessor control system available today for true simplicity of operation.

Consider now the individual, but not less overwhelming component challenges that faced our engineers and how the extraordinary solutions they devised are combined to create the outstanding TCD 3014.

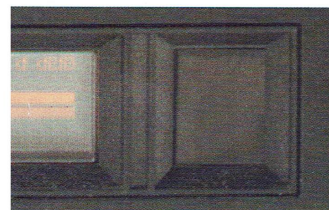
The Challenge:

Technology at Home

Integrate a high technology product with the widest variety of at-home situations.

The Solution:

- A wireless infrared remote control allowing most functions (including flying start/record) with the built-in receiver section (optional).



- Optional side panels in rosewood to unify the TCD 3014 with the rest of the Series 3000A line.
- Machined extruded aluminum professional rack mounts are also available.

The Challenge:

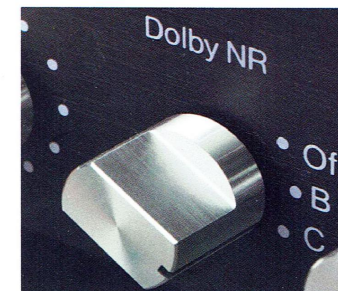
Noise Reduction

To reduce both the background hiss inherent in the slow-speed, narrow-track cassette format and residual tape noise without degrading high frequency response or musical accuracy.

The Solution:

The TCD 3014 features both Dolby B and Dolby C (Trademark Dolby Labs., Inc.) for excellence in noise reduction.

Dolby B insures compatibility with previously recorded tapes.



Dolby C includes improved circuitry which offers substantial improvement in signal-to-noise plus better high frequency overload capabilities. Dolby C in conjunction with Actilinear II and Dyneq achieves an outstanding musical signal free of annoying background hiss.

The Challenge:

Electronics

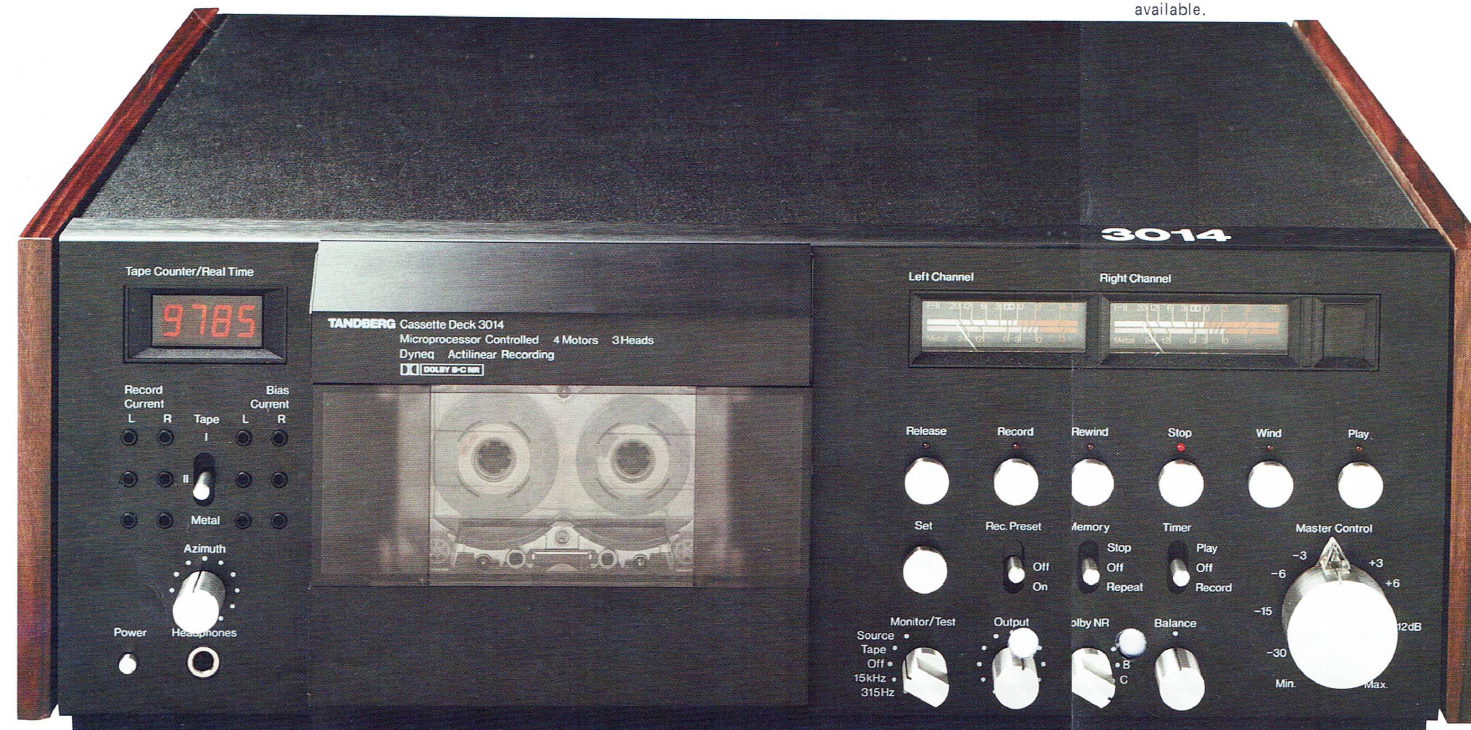
To create electronics with linear frequency response, wide bandwidth, extended dynamic range, superb signal-to-noise ratio, phase coherence, electronic stability, plus freedom from self-generated hum and noise.

The Solution:

To use the same advanced design philosophies learned at the leading frontiers of sound with other components in Tandberg's acclaimed Series 3000A.

- The TCD 3014 uses no integrated circuits in the signal path except new, re-designed Dolby B and C processors. Instead, individual components are selected for ultimate parameters of noise, sound quality, low distortion, gain and stability.
- Polystyrene or polypropylene capacitors rather than electrolytic or ceramic types are used in all critical circuits that carry musical information to insure optimum sound quality.
- The TCD 3014 refuses to compromise musical accuracy and uses phase compensating circuitry and ultra-wideband design to pass a signal with no audible degradation in sound or imaging.
- Dyneq, Tandberg's patented headroom extension system for tape recording, helps overcome the severe high-frequency limitations inherent in the cassette recording process. This is accomplished by a DYNAMIC record EQualizer which controls high frequency boost during record to enable more signal on the tape without loss of highs.
- Actilinear II is as great a breakthrough in eliminating "the cassette sound" as was Tandberg's proprietary Actilinear. Actilinear II offers a totally re-designed transconductance amplifier which takes the music and bias signals as pure voltage and converts them to a pure current. Actilinear II is a research-grade amplifier with a bandwidth so wide that it can actually pass square wave bias frequencies.

It is totally symmetrical in operation. Its practical benefits include in excess of 20 dB audio headroom increase in the record amplification stages. It also eliminates interaction between record head impedance and the musical signal passing through it.



The Challenge:

Metering Circuits

Meters must indicate accurately the strength of signal applied to the tape, be easy to read and interpret.

The Solution:

The TCD 3014 utilizes peak-reading meters which show high velocity peaks in all their subtlety (unlike bar graphs which generally leave large gaps between segments). Yet these meters have slow decay to give good averaging results as well as easy visibility. These meters will respond to a 2 milli-second peak within 1 dB and are full wave peak detectors regardless of phase.

Since all tapes are less sensitive to high frequencies than to bass and mid frequencies, tape decks use a high-frequency boost known as record equalization to achieve flat frequency response.



Meters on the Tandberg TCD 3014 indicate the signal after this record equalization has been applied. Therefore, they monitor the signal being recorded on the tape, not the signal coming into the record amplifier as most other recorders do. As all Tandberg cassette meters in the past, these are set to the now industry standard of 0 dB = 250 nWb/meter.

While the TCD 3014 is recording, the source/tape switch controls only the output of the deck; the meters show input levels to the tape at all times. This feature makes possible audible tape monitoring and simultaneous visual monitoring of input levels to the tape.

Tandberg meters utilize one scale for Types I and II tapes and a second scale for Type IV tapes. The second scale allows recording of the higher signal levels permitted by the Metal Type IV tapes.

The Challenge:

Control Flexibility

To create a recorder that is simple to use but sophisticated enough to satisfy the most advanced audiophile.

The Solution:

The TCD 3014 offers the ideal balance of simplicity and sophistication.

- All microprocessor functions are controlled by the same touch sensors that govern normal tape functions.
- Auxiliary functions include cue and review at one-third speed, individual program search in either search-to-stop or search-to-play modes, automatic rewind and replay from memory, and the choice of a real-time counter calibrated to each tape for accuracy in wind as well as play mode.



- The electronic counter can be used to measure either revolutions of the tape or elapsed time in both wind modes and play/record. Instant switching with memory between revolution and real-time counting is possible.
- Timer play/timer record is available with an external clock. A built-in 6-second turn-on delay is programmed for all electronic circuits to stabilize before the transport can be engaged.
- Both fixed and variable outputs are included on the back panel. Input sensitivity controls and a switchable multiplex filter are included. A back panel switch permits the use of non-standardized, older, chromium dioxide cassettes with auto-selection of all other tapes.

The Challenge:

The Transport

To design a tape drive system that offers stable, consistent, gentle tape handling and a high-speed, responsive, easy to operate control mechanism.

The Solution:

The TCD 3014 features four servo-controlled motors in the tape transport system linked to sensors which monitor the speed and direction of the tape. The sensors then apply the proper voltage to insure accurate handling.

In fast-forward or rewind, the supply-side motor "tells" the take-up motor the speed at which it is turning. This means that a constant speed is maintained at all times in both wind and rewind functions.

In wind or rewind, one second equals one minute of play or record time. The TCD 3014 also has one-third speed for cue, review, or search.

The transport mechanism offers superb construction. It is built on a 5 mm thick aluminum baseplate rolled under 40 tons of pressure to eliminate stress and greatly increase strength. It also features an 8.2 and an 8.4 cm diameter flywheel, a dual-capstan, closed-loop drive system, and a cassette locking mechanism that guarantees accurate positioning of the tape every time.

The TCD 3014 transport also features:

- Tandberg built, discrete three-head system.
- Azimuth alignment for all tapes utilizing a built-in test system.
- Linear motor drive to position the head bridge and pinch rollers to tape accurately.

Resonances are eliminated by the use of predominantly aluminum casting and the use of mass differentiated dynamically balanced flywheels, pinch rollers, and a closed-loop capstan drive.



There are more demands on cassette technology today than ever before.

Because cassettes are a more important part of the listening experience than ever before.

Because tapes, systems, music, and source material are better than ever before.

Cassettes now make stunning reproduction of music from all generations.

But even the best of previous generation equipment entails compromised reproduction.

That's why Tandberg engineers created the new TCD 3014 cassette deck — to help you enjoy the best music from every generation through the most advanced modern technology.

Tandberg's engineers called upon 50 years of experience in high technology to create an entirely new unit, one specifically designed to meet the stringent music reproduction requirements imposed today by advances in both source material and reproduction equipment.

For over half a century, the Tandberg reputation for quality, outstanding performance, and long-term owner loyalty has been based on our commitment to total excellence in product — from sub-chassis to external appearance.

Our success is largely due to the decision-making process our engineers apply to meeting the challenges in sound reproduction technology.

Tandberg's problem-solving approach means we closely study every area of concern. We then conduct an exhaustive evaluation of potential solutions. Finally, we choose the best solutions for overall consistency and integrity.

You face the same decision-making process when selecting a piece of high technology audio equipment.

This brochure details the decision-making process we used to design the revolutionary Tandberg TCD 3014. We believe that once you understand the process and the TCD 3014, you will find your decision-making much simpler.

Tandberg's Series 3000A high fidelity components offers a superb, well balanced, thoughtful combination of performance, simplicity, and quality in both design and construction.

Like other Series 3000A components, the TCD 3014 features control flexibility, operational simplicity, high sonic and musical accuracy.

Tandberg Series 3000A components also exhibit subtlety of design. All units are stackable and like-sized with identical knobs and colours for a harmonious appearance. Primary knob placement and primary control functions are uniform to insure both ease of operation and adaptability.

Tandberg's component design is not revolutionary. Rather, it is evolutionary, designed for ultimate integration of music into the environment of your home.

The Tandberg TCD 3014: the new generation of cassette deck for every generation of music.

Specifications:

Supply Voltage:	230 V $\pm$ 10%, 50 Hz 115 V $\pm$ 10%, 60 Hz	Erasure (1 kHz): Metal IV	> 80 dB
Power Consumption:	50 watts	Crosstalk:	
Tape Speed:	1 7/8 ips.	Side A – B (1 kHz)	< 60 dB
Speed Tolerance*:	$\pm$ 0.5%	Track 1 – 2 (1 kHz)	< 40 dB
Wow and Flutter:		Inputs:	
WRMS (Play)	0.06%	Input impedance	150 kohms
WRMS (Rec. – Play)	0.09%	Sensitivity:	
DIN – IEC	0.12%	Low	100 mV
		High	10 mV
Frequency Range:		Outputs:	
Metal IV	18 Hz – 23 kHz	Minimum load impedance/ max. voltage	
(– 20 dB)	$\pm$ 1.5 dB	at unloaded output:	
With Dolby C	$\pm$ 3.0 dB	Play 700 mV(Fixed line output)	100 ohms/700 mV
Tape II	18 Hz – 20 kHz	Play Variable (Variable line output)	100 ohms/0 – 4 V
(– 20 dB)	$\pm$ 1.5 dB	Headphones:	8 ohms/3.5 V
Tape I	18 Hz – 20 kHz	Dimensions:	
(– 30 dB)	$\pm$ 1.5 dB	Width	43.5 cm (17 1/8")
Harmonic Distortion – 250 nW/m, Dolby B:		Height	16.6 cm (6 9/16")
Metal IV	< 1%	Depth:	35.0 cm (13 3/4")
Tape II	< 2%	Weight:	9.8 kg (21.6 lbs)
Tape I	< 1.5%		
Signal-to-Noise Ratio, A-curve weighted (Dolby C):			
Metal IV	> 74 dB		

* At nominal mains voltage and normal operating temperature.

Specifications are subject to change for further improvement without notice.

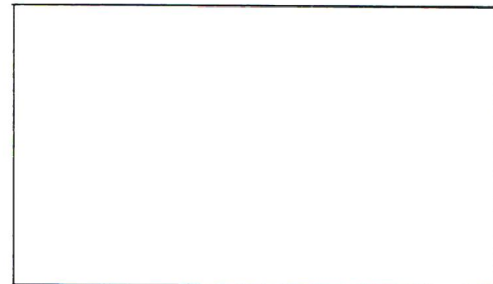
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