



# dvd player DVD32R

...the first European DVD Player certified for PAL and NTSC by THX™

The DVD32R is a DVD player of outstanding video and audio quality, is easy to setup and use, and exceeds the high THX™ Ultra standard. On top of that, it proves that a DVD player can achieve reference standard replay of CD, to finally lay to rest the idea that DVD players need to offer anything less than the best CD reproduction.

### No short-cut to quality and performance

There are many DVD kits available, pre-packaged solutions around which manufacturers simply add their own casework and logo. A quick and easy route to adding a DVD player to a product range, but fundamentally products with inevitable performance compromises. Very few high-end audio manufacturers are prepared to devote the time and resources necessary to produce a player from the ground up, but for TAG McLaren this was the only way to achieve the performance which is possible with the DVD format.

### Sleek lines with a racing engine under the bonnet

The following pages describe how the DVD32R achieved its excellent performance without compromising its ease of use. The topology and devices used to achieve the excellent sound and picture quality were selected after constructing and evaluating many prototypes. Each prototype underwent extensive laboratory, listening and viewing tests to fine tune and compare the options. The result is the reference standard DVD player DVD32R.

www.tagmclaren.com

TAG McLaren

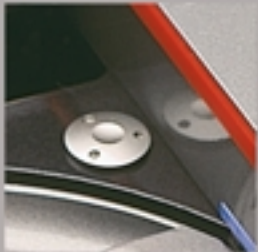


# Sophistication

## ...in every detail



Heavy sub-chassis for jitter reduction at source



Solid mount to the 3 mm top-plate



BNC and RCA for best component video



Hollow, polished lightweight metal puck for low inertia

### High-mass transport for low jitter

The DVD32R is one of the very few DVD players in the world to use a top loading transport. This approach has been associated for many years with the very best CD players. It allows a more stable platform for the laser assembly which eases the demands on the servo control electronics and their power supplies which in turn improves data integrity and reduces jitter. These lessons learnt apply even more to the higher density, very fast spinning DVD!

The DVD32R's drive motor and servo electronics are mounted to a purpose built aluminium sub-chassis, which has been mass loaded by carefully placed lead. The resulting sub-chassis weighs almost 1 kg, and is supported on carefully selected damping isolation bushes for further mechanical decoupling. The entire drive assembly is then placed into a sub-enclosure for electrical screening which in turn is rigidly fixed to a solid 3 mm aluminium plate. The servo control and data recovery printed circuit board (which receives its clock from the main pcb via a dedicated coaxial link) is attached to the sub-enclosure as close as possible to the dual wavelength laser assembly, screened by a further metal plate. The data is serialised and sent from this board to the MPEG decoder on the main pcb.

### Automatic, adaptive drawer mechanism

Many hi-end top-loading constructions have manual open/close operation which seems incompatible and inconvenient with a high cost product. The DVD32R aluminium diecast drawer door runs on a polished steel bar and a Teflon glider, driven by an electric motor via a steel wire. The torque of the motor is progressively adapted by the control software to achieve perfect and consistent performance over temperature and age.

### Convenient disc changing in the dark

When the drawer opens it activates an array of blue LEDs inside the drawer to assist placing a disc which is beneficial in a home cinema environment. The light is switched off during play to prevent potential interference.

### Precise clock for best sound and video quality

Accurate extraction of the disc's audio and video data demands precise clocks. The low phase noise single frequency master oscillator in the DVD32R ensures that all video and audio clocks are synchronous to avoid the undesired effects of 'beating'. All required clock frequencies are derived from this master clock using a phase locked loop and two voltage controlled oscillators. The clock signals are transferred across the PCB using independently buffered and precisely terminated clock traces to each of the circuits. This prevents decision threshold uncertainty which would introduce jitter. The result is purer sound and a more precise picture.

### MPEG decoder from the experts

MPEG decoding is at the core of a DVD player. TAG McLaren Audio worked closely with National Semiconductor's field-leading subsidiary Mediamatics, in finding the best MPEG decoder solution. After long evaluation Pantera-DVD™, the first IC to integrate all back-end functions of a DVD player onto a single chip, was selected. This unrivalled level of integration, which includes host processing, a 32-bit RISC processor, MPEG specific hardware, 10-bit video DACs and the NTSC and PAL encoders, provides the DVD32R with a no-compromise MPEG decoder solution.

### Uncompromised video quality

The video circuitry within the DVD32R uses broadcast quality components along its entire signal paths. The video outputs are individually buffered by high speed current-feedback op-amps. Besides two Composite and two S-Video outputs, two sets of Component video outputs are provided, one using RCA Phono, the other broadcast quality BNC connectors. For best Component video quality S-Video and Composite are switched off, except when an on-screen graphic is presented by the software.



### On-screen display (OSD)

The video processing elements include vertical filtering and an anti-flicker filter to also deliver high quality graphics display. The full-resolution on-screen display is produced by an integrated digital domain OSD generator, avoiding any superfluous circuitry in the analog video paths. The result is uncompromised picture quality.

# A safe investment

## ...growing with your needs

### Advanced Digital Waveform Control

One would expect that a perfect digital signal is a so called square wave with very fast rise and fall times at the zero crossing points, but this would require digital interconnects with an infinite bandwidth and would make it impossible to prevent signal reflections and interference, degrading the quality of the digital signal and hence the sound. It is important to keep the signal bandwidth to a minimum, whilst maintaining accurate transitions of the data edges through the zero crossing point. The DVD32R incorporates our advanced Digital Waveform Control circuitry which reduces rise and fall times whilst preventing waveform discontinuities. The result is a reduced bandwidth and less demand on the digital interconnects, hence less cable induced jitter.

### Discrete, independent digital audio drivers for precision

The DVD32R uses, for added perfection, two separate, discrete drivers, tightly controlled in their output impedance to 75 ohms, for each of its two coaxial digital audio data outputs. This not only ensures complete isolation between the outputs but also that any reflections occurring at the receiving end, due to an impedance mismatch, are not re-reflected back from the DVD32R.

### TAGtronic Synchronisation Link T<sup>2</sup>L for reduced jitter

When the DVD32R and AV32R are used together, the TAGtronic Synchronisation Link T<sup>2</sup>L produces a tighter, cleaner and more controlled sound. T<sup>2</sup>L allows the AV32R to fix its clock to provide a low noise, ultra low jitter reference right next to its audio DACs, where it needs to be for optimum sound quality. Locking the AV32R's clock requires the DVD32R to synchronise its clocks to the AV32R, which is done through the TAGtronic Synchronisation Link. The DVD32R provides both a T<sup>2</sup>L input and output connection to permit easy daisy-chaining of further digital sources with T<sup>2</sup>L capability, such as the TAG McLaren CD transport CDT20R-T<sup>2</sup>L.

### Massive power reserves

Despite its low power consumption the DVD32R uses a large toroidal transformer as this has the benefit of a very low stray magnetic field, reducing the possibility of interference with the audio data and video signals. The transformer is also very quiet, reducing hum to an inaudible level.

### Best decoupling

To reduce interference between the processing, digital data and analog video sections they have separate power supplies, 12 in total, right down to having eight separate secondary windings on the transformer.

### Low stand-by power

The DVD32R includes a second, smaller transformer to power the remote control and microcontroller circuitry. This results in very low electrical consumption (<3 W) when the DVD32R is switched to standby whilst allowing full remote control.

### Multi-layer printed circuit boards

The DVD32R's multi-layer printed circuit boards control the complex pattern of return currents, provide controlled impedances and minimise coupling better than a conventional circuit board could ever do. The result is better signal to noise, reflected in crisper pictures and sound.

### Mixed technology construction

Performance is optimised using surface mount components for fast digital transfer and leaded components for perfect analog signals whilst perfect manufacturing quality is achieved using a combination of inert-gas reflow and wave soldering techniques.

### TAGtronic Communication Bus for system integration

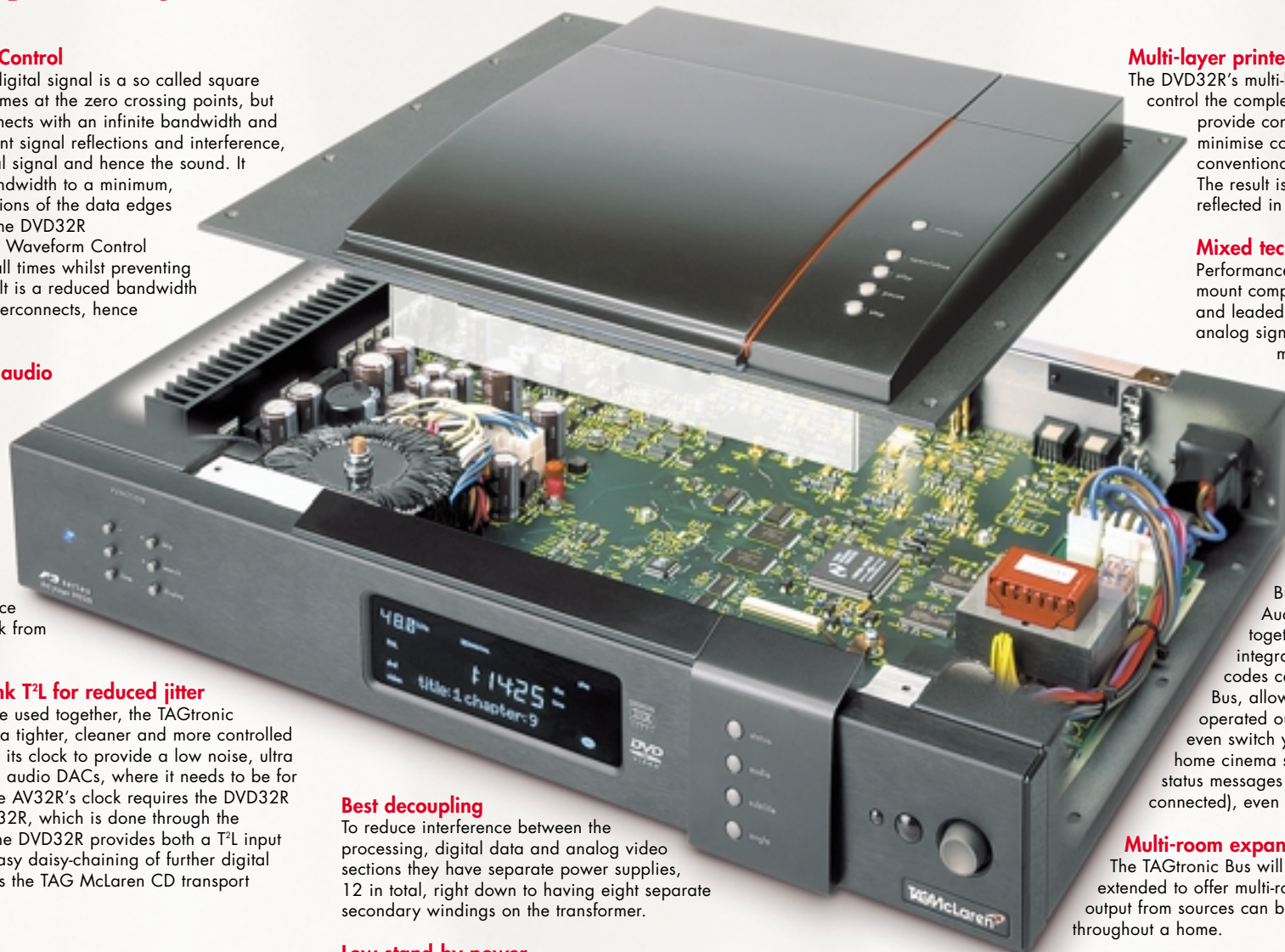
The DVD32R features the TAGtronic Communication Bus. This allows TAG McLaren Audio units to work seamlessly together to form an effective, integrated system. Remote control codes can be transferred over the Bus, allowing system components to be operated out of sight. The DVD32R can even switch your complete TAG McLaren home cinema system into standby or display status messages from the AV32R (if connected), even in component video mode.

### Multi-room expansion

The TAGtronic Bus will allow the system to be extended to offer multi-room capability in which the output from sources can be controlled and redirected throughout a home.

### Test-Pattern generator

The picture from the DVD32R can only be as good as your display device allows. The DVD32R is the first DVD player to include software-driven test-patterns and hardware test circuitry to assist in calibrating your display device for best brightness, contrast, colour, tint, sharpness, convergence and geometry setting.



# Fit for the Future

TAG McLaren has successfully demonstrated that upgradability is a reality. Visit [www.tagmclaren.com](http://www.tagmclaren.com) and confirm it for yourself. The DVD32R follows this tradition.



**When the total is more than the sum of its parts**

Connect our home cinema components

via the TAGtronic Communication Bus and they

form a perfect system. Playing a CD will switch the five channel amplifier into stereo mode. Switch the DVD32R into standby and all other units will follow.

Request status messages from the AV32R and the DVD32R will insert them into the picture, even in component video. The possibilities are endless...

## Software upgrades

All of the DVD32R software is kept in re-programmable, FLASH memory. This is a significant advantage over players which, for cost reasons, cannot offer field re-programmability. Software upgrades allow the DVD32R to support new features and formats, all that is required is to download upgrades from the TAG McLaren Audio website, using a PC and a TAGtronic Programming cable.

## DVD-Audio upgrade

TAG McLaren is continuously observing the market to look for abilities to improve their products. One of the most promising new formats is DVD-Audio. TAG McLaren is already working, in close relationship with Mediamatics, on the hardware and software implementation of this fascinating new format. However, at the time of writing, there are still details of DVD-Audio undefined. The DVD32R is upgradable to DVD-Audio should this new format take off. The DVD32R has been given the ability to output DVD-Audio through an IEEE1394 Fire Wire interface, an enhanced S/PDIF or even a DSub connection.

## Progressive scan video upgrade

The DVD32R hardware can be upgraded to progressive scan for NTSC and PAL.

## Digital video output upgrade

Pending copy protection issues, the DVD32R is hardware upgradable to a digital video output. You will need a TV/projector which accepts this digital signal to benefit from this new format.

## Technical Data:

- Europe's first THX™ Ultra approved DVD player for both NTSC and PAL
- Compatible with DVD-Video and CD Music (8 and 12cm)
- PCM, Dolby Digital, MPEG, DTS digital output at 44.1, 48 and 96 kHz with 16, 20 or 24 bits
- Native support of NTSC-M, PAL-B/D/G/H/I and PAL M
- Composite, S-Video and Component outputs
- Very low jitter clock re-times the SPDIF audio data
- TAGtronic Synchronisation Link T<sup>PL</sup> allows master clock in the AV32R

## Key Building Blocks

- High mass sub-chassis
- Dual wavelength Laser
- Mediamatics Pantera-DVD™ 32bit RISC processor for best audio and video quality
- Siemens 16-bit microcontroller for most comprehensive user interface
- Stable multi-frequency internal clocks
- Massive round-core transformer
- Twelve independent stable power supplies
- Premium-grade analog components
- Broadcast-quality video components

## In and Outputs

- Two Composite outputs @ 1.0 Vp-p (75 Ohm, neg.sync.)
- Two S-Video outputs
  - Y-signal: 1.0 Vp-p (75 Ohm, neg. sync.)
  - C-signal: NTSC: 286 mVp-p (75 Ohm)  
PAL: 300 mVp-p (75 Ohm)
- Two Component video outputs, one with RCA, the other with BNC connectors
  - Y: 1.0 V p-p (75 Ohm load, 300 mV sync.)
  - CB(B-Y): 700 mVp-p (75 Ohm load)
  - CR(R-Y): 700 mVp-p (75 Ohm load)
- Three digital audio outputs (two coaxial SPDIF and one optical)
  - IEC958 output level: 0.5V p-p
  - TOSLINK output level: -18dBm (wavelength 660 nm)
- Enhanced TAGtronic Bus support
- TAGtronic Synchronisation Link T<sup>PL</sup>
- Prepared for IEEE1394 Fire Wire, enhanced S/PDIF and D-Type upgrades

## Test-Pattern Generator

- Software and hardware generated test-patterns to assist in optimising picture quality

For further information e-mail our helpdesk on:

[helpdesk@tagmclaren.com](mailto:helpdesk@tagmclaren.com)

or visit our website at:

[www.tagmclaren.com](http://www.tagmclaren.com)

## Ease of Use

- Unique Setup Wizard lets you forget printed user manuals
- Fully remote controlled
- Delivered with a backlit, learning remote for home cinema use
- User configurable auto-standby function
- TAGtronic Bus for inter-product communication and firmware upgrades

## System Integration

- Sharing of remote commands over the TAGtronic Bus allows hidden installation of AV processor and amplifiers
- Display of AV32R status via TAGtronic Bus received on-screen graphics, even on Component video

## Upgrade Paths

- Firmware upgrades via the TAG McLaren Audio website
- Hardware upgrades scheduled for DVD-Audio, Progressive Scan for NTSC and PAL and Digital Video Interface (pending copy protection approval)
- Chassis prepared for upgrade to IEEE1394 (Fire Wire), D-Type and RCA connection

## Construction

- Suspended sub-chassis houses high mass top loader mechanism
- Mixed technology construction
- Multi-layer printed circuit board for best signal to noise ratio
- High-quality control knobs, surfaces and fascia for life-long perfection
- Extensive vibration damping of chassis panels
- Sorbothane™ mounting feet for best vibration isolation

## General

- Power requirements: 100/115/230 V AC 50/60 Hz depending on country
- Power consumption: operating: 32 W, standby: <3 W
- Dimensions 445 (L) x 320 (W) x 100 (H) mm
- Weight 9.6 kg (approx.)
- Operating temperature: 5° C to 35° C

We reserve the right to alter design and specification without notice. Specification may vary for different countries

'Dolby', 'Pro Logic', 'AC-3' and the double-D symbol are trademarks of Dolby Laboratories. The THX name and logo are © Lucasfilm Ltd and are trademarked. All rights reserved.

© Lucasfilm Ltd. & TM. All rights reserved.

'DTS' is a trademark of Digital Theater Systems, Inc.

Pantera-DVD is a trademark of Mediamatics.



Pure blue power light and tactile switches



Solid 8 mm aluminium front, rigidly fixed to a 3 mm top plate



Custom-made isolation feet for vibration de-coupling

## TAG McLaren Audio Ltd.

The Summit, Latham Road, Huntingdon, Cambs., PE29 6ZU United Kingdom

tel: +44 (0)1480 415600

fax: +44 (0)1480 52159

freephone: 0800 783 8007

## TAG McLaren Audio Inc.

1506 Providence Highway, Unit 25, Norwood, MA 02062 United States of America

tel: (781) 769-6611

fax: (781) 769-6615

toll free: (888) 293-9929