

**AUDIOVideo**

REVIEW: I32 INTEGRATED AMPLIFIER AND CD32 CD PLAYER  
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# Primare CD32 and I32

The Swedish hi-fi company Primare was formed in 1985. Its radical first products introduced the concept of 'lifestyle' design to the hi-fi market, and can still be seen in the Copenhagen Museum of Industrial Art. From the start Primare products have belonged to the high-end hi-fi category, and although the company's range also includes home theatre components, the brand has principally succeeded in the field of hi-fi.

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Both devices, the I32 amplifier and CD32 player, are equipped with a solid steel chassis, which guarantees perfect freedom from the effect of external electromagnetic fields. The massive nature of the chassis and the tightly screwed-on top (2 mm steel sheet), ensure considerable protection from external shock and structural feedback. The front panels are of black anodized aluminum (silver is also available). The "Nordic" design is original, yet restrained and both devices have a "timeless" design quality.

CD player CD32 uses an ASA-TECH drive mounted on its own sub-chassis. The power source is strictly analogue, with a bulky "R" core transformer, adequate capacity reservoir capacitors (6 x 4700 $\mu$ F) and four circuit stabilisers. The electronics are divided into two independent and separated parts, the control part and the signal part. The control electronics are based on Toshiba circuits, which together with the five-second buffer FIFO and a sampling frequency generator ensure minimum jitter. The signal electronics are in the main equipped with Burr-Brown circuits: a two-channel asynchronous generator and SRC43291 sampling frequency converter, a digital filter with an eightfold over-sampling DF1706, and two D/A converters PCM 1704 (sampling frequency up to 96 kHz and 24 bit resolution).



The D/A converter output analogue amplifiers are equipped with MOSFET transistors and are connected in an unbalanced (single-ended) manner when operating in Class A. Because DC servos are used in the output, there are no signal coupling capacitors. Analogue outputs are both balanced (XLR) and unbalanced (RCA). In addition digital outputs Toslink, SPDIF and AES / EBU are also available on the rear panel. The player can reproduce MP3/WMA files from a USB flash memory but the location of the USB connector on the rear panel is not operationally ideal. An RS-232 jack is used for connection to home control systems.

Present on the front of the player are an OLED display and only three buttons (including a power button). Two buttons are more than adequate for the majority of the required functions, but it is necessary to learn the correct sequence and duration of key strokes. Because an SRC circuit (Sample Rate Converter) is used as a sampling frequency generator, the player allows up-sampling on sampling frequencies 48 and 96 kHz. A favorable feature is the fact that switching the sampling frequency with a minimum time lag is possible during reproduction, affording the possibility of direct comparison of differentials.

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The integrated amplifier I32 is of a design similar to that of a CD player, the only difference being the connection points and controls on the front panel. When comparing the respective weights of the player and the amplifier, it is clear that the I32 is not based on classical analogue technology. As the instruction manual points out, the amplifier functions as a class D power device. The progressive power supply operates in pulse mode and offers the advantage of being a function of PFC (Power Factor Control). In practice this means that due to the power network, the amplifier behaves as a real load. In addition to its low power consumption, the amplifier does not affect the power network in return.



The input circuits are classically analogue and there are 12 compact miniature relays located in the immediate vicinity of the input sockets, responsible for switching the two balanced (XLR) and the three unbalanced inputs (RCA). Signal amplification is effected by operational amplifiers Burr-Brown OPA2134 and volume and balance control is provided with precision damping LM1972 cells.

**Power amplifiers operating in Class D are often referred to as digital, but this is not completely true with reference to the nature of the analogue processed signal.** Nevertheless, signal processing is in switching mode, i.e. pulse with a single voltage corresponding to a power level. The pulse width is proportional to instant voltage of the analogue signal. Following the "integration" of the output signal with the filter, which removes the frequency spectrum of switching and higher frequencies, the power-amplified analogue signal is recovered.

The major problem in traditional Class D designs is the said output filter, which changes its output according to load. Primare is using power modules marked UFPD (Ultra Fast Power Device). This technology monitors the output of the filter and adjusts the amount of feedback required to achieve a constant loop gain which is consistent at every frequency regardless of load. The result is a full range amplifier with low distortion and a relatively low output impedance (damping factor of 4 CI is greater than 100).

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The amplifier can be upgraded with a digital media module, which plugs into the rails behind the rear panel. In addition to the SPDIF inputs and outputs, the module is expected to offer an interface for the iPod, a DAB and FM receiver and a web receiver, including LAN and Wi-Fi. Unfortunately, this interesting module has not yet been introduced. The amplifier is controlled by the processor, making it possible to reprogram the names of inputs, the basic setting of volume and the balance of each input. It all looks impressive on the high resolution OLED display.

The CD player is controlled equally elegantly. Both devices are controlled together using a single remote control without a sync cord connection. The CD player can be programmed by remote control to change the order of songs and the countdown time on display. All functions are provided with full display graphics. Playback from an external USB source is simple and thanks to the OLED display, easy to use. It clearly reproduces only MP3 and WMA formats.

**The sound reproduction through this system is spectrally balanced with a deep velvety bass and a non-distorted treble. Spatial localisation is stable and clear. Playback of CDs with a sampling frequency of 44.1 kHz is concrete and "tight", and sounds quieter and more 'open' with increasing sampling frequency reproduction. I would prefer to select up-sampling by mood and by record. The properties of the amplifier will force even an average loudspeaker into "brisker motion". The bass has adequate power with an unlimited dynamic range and solid contours for high-volume listening. Both Primare devices also afford excellent quality of reproduction.**



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**CD32 CD PLAYER SPECIFICATIONS:**

<b>FREQUENCY RANGE</b>	20 Hz - 20 kHz (-0.5 dB)
<b>SUPPORTS</b>	CD, MP3, WMA
<b>CONVERTERS</b>	PCM 1704
	1 x Stereo Balanced XLR
	1 x Stereo Unbalanced RCA
<b>OUTPUT</b>	1 x Optical Digital Toslink
	1 x Digital Coaxial SPDIF
	1 x Digital Balanced AES/EBU
<b>INPUT</b>	USB
<b>DIMENSIONS</b>	430 x 110 x 385 mm
<b>WEIGHT</b>	9 kg

**I32 SPECIFICATIONS:**

<b>OUTPUT POWER</b>	2 x 120 W / 8 ohms, 2 x 230 W / 4 ohms
<b>FREQUENCY RANGE</b>	10 Hz-20 kHz (-0.5 dB)
<b>INPUT</b>	2 x Balanced XLR, 3 x Unbalanced RCA
<b>OUTPUT</b>	1 x Preamp, 1 x Record
<b>DIMENSIONS</b>	430 x 100 x 385 mm
<b>WEIGHT</b>	11 kg

**AUDIOVideo Verdict:**

<b>PLUS</b>	The reproduction quality, fully functional input for USB players, even for iPod.
<b>MINUS</b>	USB port on the rear panel.
<b>SOUND</b>	100%
<b>BALANCING</b>	95%
<b>DIMENSIONAL</b>	95%
<b>EQUIPMENT</b>	100%
<b>CONTROLS</b>	95%
<b>OVERALL</b>	95%