

**HA-P90SD**



**Total compatibility with DSD128 (5.6MHz) native playback reveals music’s full emotional spectrum.**

**A portable amplifier/player equipped with the highest quality high-resolution sound circuitry.**

**Main Features**

● **5.6MHz DSD128 native playback from built-in microSD Card slot input.**

● **Circuitry designed for the highest in sound quality.**

- High-end Burr-Brown PCM1795 digital-to-analog converter (DAC).
- Dedicated dual 44.1kHz and 48kHz master clocks.
- Headphone amp utilizes discreet op-amp and push-pull circuitry.
- Burr-Brown OPA1602 SoundPLUS® operational amplifier.
- Ample 170mW + 170mW (at 32Ω load) high power output.

● **Portable amplifier with DAC offers easy connection to a wide range of devices.**

- Input terminal provides connection for digital coaxial, digital optical and analog line inputs.
- DSD native playback from Windows & Mac operating systems.
- DSD128 (5.6MHz) native playback from Apple iOS devices. (iOS 7 or later; Apple Camera Connection Kit not required.)
- DSD128 (5.6MHz) native playback from Android devices (using USB-OTG cable).

● **Easy-operation player specially designed for high-quality file playback.**

- Compatible with WAV, FLAC, MP3, AAC, DSF, and DFF (DIFF) audio files.
- Multifunction key pad ensures easy and reliable operation.
- Automatic sorting of various formats of music file tag information.

● **Robust, all-aluminum construction meets durability requirements of portable equipment while minimizing susceptibility to external noise.**

● **Free TEAC HR Audio Player application permits DSD native playback from a wide range of devices.**

● **Compatible with DSD64 (2.8MHz) DoP signal output from digital coaxial output jack (handled through firmware update).**

Brand	TEAC
Model	HA-P90SD
Color	Black / Red
UPC Code	BLACK: 043774 030910 RED 043774 031450
EAN Code	BLACK: 4907034 218868 RED: 4907034 219346
Overall Dimensions /NW W x H x D	67 x 22 x 123/280 (mm/g)
Package Dimensions /GW W x H x D	170x70x130/460(mm/g)
Qty. per Master Carton	10pcs

## Supplemental to New Product Information (SNPI)

### •High-resolution portable amplifier/player makes possible DSD128 (5.6MHz) native playback from an inserted microSD card

The HA-P90SD's digital music player enables convenient portable enjoyment of DSD128 (5.6MHz) sound sources, which most evocatively convey an artist's breath and passion, even while on the move.

Since first debuting the TASCAM DS-D98 DSD-compatible professional-use recorder in 2001, TEAC has focused on the possibilities inherent in the DSD format, which provides highly accurate sound recording quality, and released a string of DSD-compatible products worldwide. The DA-3000 Master Recorder released in 2013 supports the DSD128 (5.6MHz) file format, and has come to be used by studios around the world to create high-resolution recordings in DSD and other formats.

In the of consumer audio market, TEAC released the UD-501USB D/A Converter in 2012, which offers both DSD128 (5.6MHz) and PCM 384kHz native playback, providing ready access to the high threshold sound quality of DSD audio file playback.

The new HA-P90SD combines the dual functions of a high-quality portable amplifier and a DSD native-compatible player, and was developed through the integration of high-accuracy DSD file playback technologies that TEAC has amassed in its development of professional sound components, along with its clear, distortion-free headphone amp technologies.

### High-efficiency Analog Devices Blackfin® BF606 processor.

Integrating both Analog Devices' high-performance Blackfin® processor—which features low power consumption characteristics—and an embedded OS help realize extended playback times of approximately 6 hours, even when a high-resolution sound source requiring processing of large volumes of digital information is played back. This ensures the fullest enjoyment of high-resolution music files played back from a recorded microSD card.



### • Pursuing The Highest Sound Quality in Circuit Design.



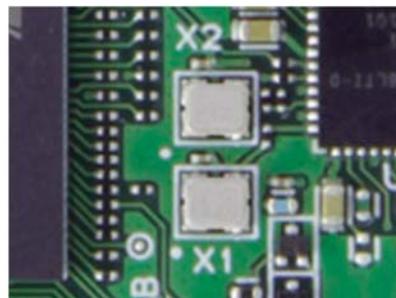
### Burr-Brown PCM1795 D/A Converter widely used in stationary D/A converters.

TEAC's UD-501 has consistently received high marks as a reference model for standalone D/A converters, and both it and the DSD128-compatible TASCAM DA-3000 Master Recorder employ the Burr-Brown PCM1795 DAC, which has been successfully employed by a wide variety of top-end equipment makers.

### Master clock equipped with two crystal oscillators (44.1kHz and 48kHz).

Two high-precision crystal oscillators are used in the master clock, which plays a critical role in digital audio processing. The use of dedicated clocks (22.5792MHz and 24.576MHz) for each of the system's 44.1kHz and 48kHz sampling frequencies, enables perfect synchronization with playback file sampling rates for high-accuracy D/A conversion.

The HA-P90SD is also asynchronous-compatible and does not rely on the PC clock during USB digital connection. This high-precision internal master clock makes possible clear playback sound quality together with excellent jitter noise suppression characteristics.

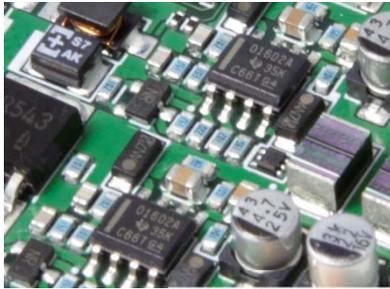


### Discrete headphone amp component design features op-amp with push-pull circuitry.

The HA-P90SD's AB-class headphone amp features a discrete component configuration that utilizes an

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operational amplifier and push-pull circuitry. Knowhow accumulated through the development of TEAC's HA-501 headphone amp was lavishly invested in this circuit design, which achieves a 10Hz – 80kHz frequency range and a S/N ratio exceeding 105dB, as well as 0.004% total harmonic distortion. Noise-suppression circuitry further ensures clear sound output, conveying the finest subtleties of the original, high-resolution sound source itself.

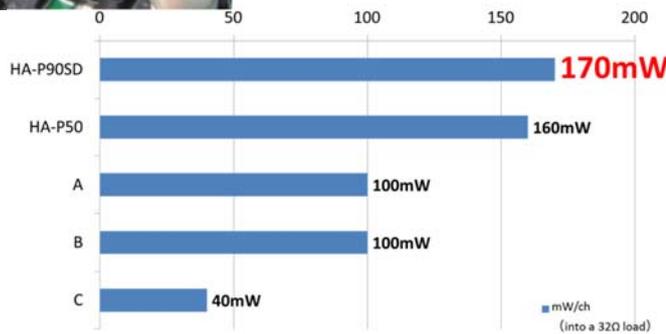


### Low-distortion, high-precision Burr-Brown OPA1602 audio op-amp.

The headphone amp section features a discrete design that employs a Burr-Brown OPA1602 SoundPLUS® operational amplifier developed exclusively for audio components. It realizes clear sound reproduction with greatly minimized distortion.

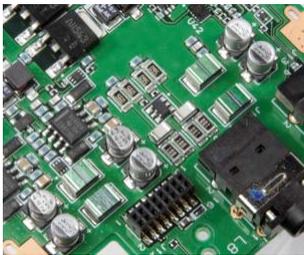
### Ample (at 32Ω)

The HA-P90SD realizes a (into a 32Ω significantly



### 170mW + 170mW power output

P90SD's high voltage power supply high output of 170mW + 170mW load). Its low-impedance design also enhances low-level sound reproduction.



### High-quality film chip audio capacitors used.

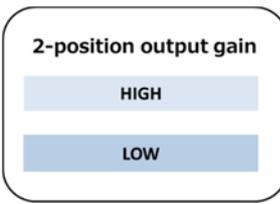
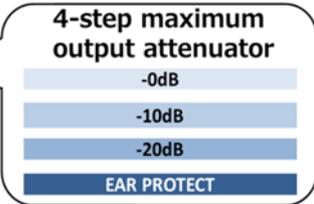
High-capacity film chip capacitors developed exclusively for audio reproduction are used to virtually eliminate unwanted noise and vibration from within the capacitors themselves, and more fully realize the delicate spatial expression of the DSD128 (5.6MHz) sound source.

### Circuit design suppresses noise interference

The HA-P90SD's circuit board layout vertically separates the analog and digital sections of the amplifier in order to eliminate the generation of unwanted noise due to inter-circuit interference. Noise-generated distortion is also greatly reduced.

### Compatibility with most earphones and headphones ensured by a broad 8 – 600Ω impedance range

A total of 8 output levels can be set by selecting from between 4 different maximum attenuator outputs and switching between LOW and HIGH gain settings. This capability ensures an optimum output signal for a wide range of headphone and earphone impedances and efficiencies.



• Portable amplifier with integrated DAC allows connection to a wide range of devices. Compatible with digital coaxial, digital optical and analog line inputs and digital coaxial.

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The HA-P90SD's coaxial and optical digital inputs, not to mention its analog line input, make it possible to input digital signals from other players, including portables, of up to PCM 192kHz/24-bit in resolution. High-precision D/A conversion and amplification circuitry enable enjoyment of fine and clear sound reproduction with headphones. Additionally, the Digital I/O jack also provides coaxial digital output of up to PCM 192kHz/24-bit. Used as a D/D converter, high-resolution sound sources input through the USB ports can also be output to other D/A converters. Capability for DSD64 (2.8MHz) by DoP signal output is also planned. (DoP output will be made possible through an upcoming firmware update.)

### **DSD native playback from Windows or Macintosh devices.**

As a USB DAC, the HA-P90S is compatible with native playback from Windows or Macintosh computers and other devices. Windows computers require installation of a dedicated ASIO 2.0 driver, while Macs use DoP for DSD native playback.

### **DSD128 native playback supported for iOS and Android devices.**

With the iPhone, iPad or iPod Touch, DSD128 (5.6MHz) native playback can be performed using the Lightning® or 30-pin connector cable supplied with the iOS device. Android devices can be connected using an OTG cable for DSD128 native playback. (Operation with all Android devices not guaranteed.)

### **• Simple player functions dedicated to high-quality sound file playback.**

### **Compatible with WAV, FLAC, MP3, AAC, DSF AND DFF (DIFF) files**

The HA-P90SD supports most major high-resolution music file formats. Files can be saved to a microSD card and played back as is, without concern about downloaded file formats.\*1

\*1 176.4k/192kHz 1FLAC files will be supported with a planned firmware update.

### **Automatic sorting and various play modes**

Tag information for music tracks recorded onto a microSD card can be read and sorted by track name, album, artist and genre, and easily viewed on the front panel display. Playlists created using the high-resolution TEAC HR Audio Player application can be edited and read on both PCs and Macs, and favorites lists can also be easily created using the HA-P90SD's front panel controls. Repeat or Shuffle playback can be quickly selected, and Gapless playback can be turned on or off through the user settings.

### **Manual controls offer smooth, reliable operation**

The multifunction see-saw switch pad located in the center of the front panel provides easy fingertip control of Play/Pause, Fast Forward, Rewind and Home functions. With single-hand operation, any desired music file can be quickly selected from a recorded microSD card inserted into its card receptacle, and instantly played.

### **Robust all-aluminum construction minimizes external noise**

The HA-P90SD's all-aluminum construction not only minimizes the influence of external noise on its internal circuitry, it also boasts exceptional durability in a slim design that measures only 21.5mm in thickness (excluding projections) — all essential features in a professional grade mobile component. The unit's side panels project outward at both ends to protect the volume knob and terminals if ever accidentally dropped. Rubber strips along the length of its front and rear panels absorb vibration and suppress noise even when laid on a table.

### **Built-in Li-Ion battery enables up to 7 hours continuous playback**

A built-in USB-rechargeable lithium-ion battery enables long hours of high-resolution listening enjoyment, even outdoors. Its large charging capacity ensures approximately 6 hours of continuous microSD card playback or 7 hours of digital input from an external iOS device (based on 1mW + 1mW output, with power mode set to "Low").

### **TEAC HR Audio Player enables DSD native playback from various devices**

The free TEAC HR Audio Player application provides access to high-resolution sound source playback, and is compatible with both iOS and Android smart phones systems, as well as Windows and Macintosh computer systems. The player enables complete enjoyment of the profound listening experience made possible by DSD128

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native playback, without being limited by the platform of the smart phone, tablet, PC or other device. (Only available with versions that support Android and iOS devices.)

### Features

#### Portable Headphone Amp

- Multi-function miniplug input jack compatible with analog line, and digital optical and coaxial inputs.
- Compatible digital input formats:
  - PCM44.1k/48k/88.2k/96k/176.4k/192kHz, 16/24-bit
  - DSD64 (2.8M)/DSD128 (5.6MHz),1-bit (USB A, USB MicroB ports only)
- DSD128 (5.6MHz) native playback via digital input from Windows, Macintosh, iOS & Android devices.
- Direct iOS Lightning® or 30-pin USB cable connection (Apple Camera Connection Kit not required).
- Free high-resolution TEAC HR Audio Player application compatible with Windows, Macintosh, iOS & Android devices.
- Asynchronous mode supported.
- Operating time: 7 hours continuous (when connected to iOS digital player).

#### Portable Player

- DSD128 (5.6MHz) or DSD64 (2.8MHz) native playback from inserted microSD card.
- Maximum microSD card capacity: 128GB
- Compatible sound file formats: WAV, MP3, AAC, WMA, FLAC, DSF, and DSDIFF (DFF)
- PCM bit rate: 16-bit/24-bit
- PCM sampling rate: 44.1k/48k/88.2k/96k/176.4k/192kHz (FLAC: 176.4 kHz and 192 kHz with planned firmware update)
- Operating time: 6 hours, continuous (DSD128, 5.6MHz; Power mode: Low; Gain: Low; Phones: 32Ω; Output: 1mW + 1mW)
- Automatic multi-format tag sorting (track name, album, artist, playlist, favorite)
- Repeat mode (Single repeat, specified range repeat)
- Shuffle mode (ON/OFF)
- Playback range designation: (Track name, album, artist, genre, playlist, favorite)
- Equalizer (4 presets)
- Gapless playback (ON/OFF)

#### Common Features

- Discreet headphone amplifier utilizes audio op-amp and push-pull circuitry.
- High power output (Impedance: 8 – 600Ω) of 170mW + 170mW (at 32Ω load).
- Analog Device Inc. BF606 Blackfin® processor.
- Burr-Brown PCM1795 D/A converter.
- Dedicated 44.1 kHz and 48 kHz high-precision crystal master clock generators.
- Burr-Brown OPA1602 SoundPLUS® audio op-amp.
- Separate digital and analog circuit layout.
- High/Low Gain switch and 4-step attenuator combine for 8 possible output settings.
- Digital coaxial output for microSD card data and digital USB input.
- Digital coaxial output of DSD64 (2.8MHz) via DoP (with planned firmware update).
- Slim 21.5mm-thick case.
- Robust all-aluminum construction minimizes susceptibility to external noise.
- Dimmer function.
- Display brightness adjustment.
- Automatic power-off function
- USB quick-charge using supplied USB-A DC charging cable (full charge: 4 hr).
- RoHS compliant.

## Specifications

Color	Black / Red	
Media	Compatible Media	microSD card (Max. 2GB), microSDHC card (max. 32GB), microSDXC card (max. 128GB)
Music Playback	Recordable Tracks	No. of files: TBA
		No. of folders: TBA
	Continuous Playback	Battery operating time: Approx. 7 hours (Apple iOS device, 32Ω load, 1mW + 1mW output, PWR Mode = LOW)
	File Format	WAV, MP3, AAC, WMA, FLAC, DSF, DSDIFF (DFF)
	Sampling	PCM: 44.1k/48k/88.2k/96k/176.4k/192kHz (FLAC: to 96kHz)
		DSD 2.8224MHz/5.6448MHz(Native Playback)
	quantization bit rate	16bit/24bit
	Bit Rate	MP3: 32/64/96/128/192/256/320kbps VBR/WMA: 48 – 384kbps CBR/VBR AAC: Max. 64 – 320kbps
	Folder Administration	Yes
	Tag Information	MP3 ID3 v1/v2, WMA Tag, AAC MP4, FLAC Tag, DSDIFF EmChunk, DSF ID3v2.3
	Database Administration	Track name, classification by album, artist, genre, playlist, favorites
	Resume Function	Yes
	Playlist Function	Yes
	Repeat Mode	Order of music to play, single music repeat, all music repeat
	Play Mode	AREA (range designation), REPEAT (repeat mode), RANDOM (random playback ON/OFF)
	Equalizer Function	yes
	Gapless Playback	ON/OFF
Audio	D/A Converter	BurrBrown PCM1795
	Inputs	USB A
		USB Micro-B port
		Digital optical (44.1k/48k/88.2k/96k/176.4k/192kHz) (3.5mm stereo mini jack: Common digital coaxial I/O and analog line input)
		Digital coaxial (44.1k/48k/88.2k/96k/176.4k/192kHz) (3.5mm stereo mini jack: Common digital optical and analog line input)
		Analog line (3.5mm stereo mini jack: Common digital coaxial I/O and digital optical input)
	Outputs	Analog (unbalanced) headphone output (3.5mm stereo mini jack)
		Coaxial digital (3.5mm stereo mini jack: 44.1kHz / 48kHz / 88.2kHz / 96kHz / 176.4kHz / 192kHz)
	USB DAC	44.1kHz~192kHz/16 • 24bit, DSD 2.8MHz • 5.6MHz
	Output Level	170mW+170mW (32Ω,1kHz,10%,JEITA)
		80mW+80mW (300Ω,1kHz,10%,JEITA)
		40mW+40mW (600Ω,1kHz,10%,JEITA)
	Impedance	8 – 600Ω
	Frequency Response	Line IN (20Ω drive): 10 – 80kHz (±3dB) WAV (fs: 192kHz): 10 – 80kHz (±3dB) DSD128 (5.6MHz): 10 – 80kHz (±3dB)
	S/N ratio	>105dB (Max. input, Low Gain, 100mW, 3.2Ω load)
THD+N	<0.004% (Max. input, Low Gain, 100mW, 3.2Ω load)	
Physical control	Volume control (also used as a power switch), Gain switch (Low/High), Digital IO/Line In selector switch, Multifunction keypad (Hold, Play/Pause, FF, REW, Home, Reset)	
Hold Function	Available	
Volume Adjustment	Analog control	
Display Languages	Basic alphanumeric display. Track names, artists and genres displayed in most western languages, as well as Japanese and Chinese ( both simplified and traditional characters).	

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Power Source	Battery	Rechargeable lithium-ion battery, 3,460mAh capacity
	Auto-Off Function	Auto power off (when not in operation)
	Charging Method	AC adapter (5V DC IN); VBUS feed from Micro USB B Connector
Screen	Display	OLED (organic EL)
	Resolution (W×H)	128 × 64 pixel
	Display Color	Monochrome (B&W)
LEDs	Power	Blue LED
	Charging	Red LED
Size	(W×H×D)	69.6 × 21.5 × 123mm (minus side projections)
Weight		280g
Operating Temperature		Operating ambient temperature: 0 – 35°C; Performance guarantee ambient temperature: 5 – 35°C
Accessories		USB cable (USB A to Micro USB B), DC plug cable (DC Plug to USB B), RCA conversion cable, rubber mounting belt for iPhone × 2, instruction manual, warranty card