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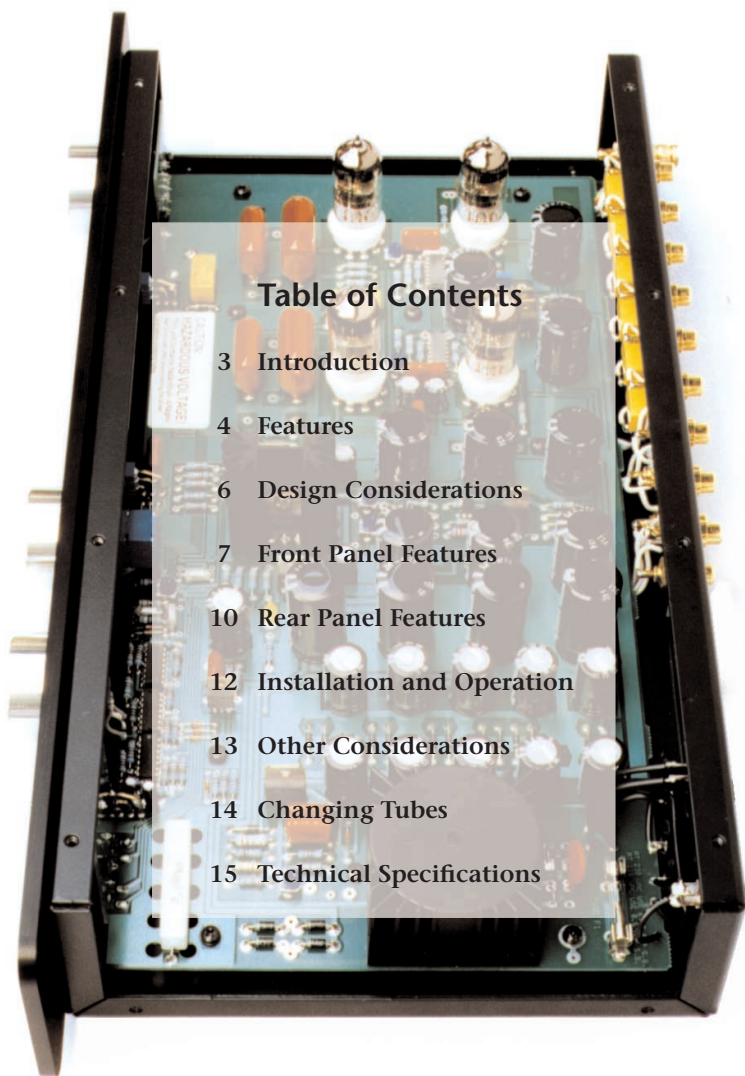
Owner's Manual



Herron Audio

VTSP-1A/166

*Vacuum Tube
Stereo Preamp*



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Welcome!

Thank you for your investment in the Herron Audio Vacuum Tube Stereo Preamplifier, a masterpiece of high-precision audio playback equipment. It is designed to be the finest product of its type available. The care in engineering and manufacturing of this product anticipates a lifetime of musical enjoyment.

The original Herron VTSP was created to provide a research platform for the development of other Herron Audio components. We recognized the need for a transparent line stage preamplifier that provided control of the signal source, level, and channel balance. Existing available equipment, regardless of price, failed to meet these needs due to distortion and coloration introduced into the signal and exhibited wide variations in unit-to-unit quality.

The VTSP-1A/166 employs a basic gain stage architecture similar to the highly praised VTPH-1 phono preamplifier. Years of research into circuit design and component performance were applied to the development of the

VTSP-1A/166, and new implementations of components led to a breakthrough in performance while maintaining conservative operation. The unconventional design of the VTSP-1A/166 has resulted in a level of performance unequaled in the audio industry. Not only did this preamplifier meet our design objectives for a research platform, it also provides the most musical and non-intrusive control of any unit of its type.

As with all Herron Audio products, the VTSP-1A/166 is engineered to be reliable and user friendly to overcome the fears many have expressed concerning vacuum tube components.

Manufacturing of the unit is performed under the tightest of quality controls.

Its limited production permits hand matching of components to the most exacting standards in the industry. Tubes are burned in, bench tested, and matched to extremely tight tolerances both as sets within a given unit and to the original design to ensure unprecedented performance and lack of unit-to-unit variation.

Please read the Owner's Manual completely BEFORE operating the unit.

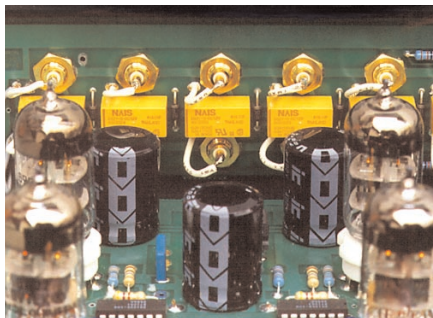
Features

Operating the Herron VTSP-1A/166 Preamplifier is easy and straightforward. The unit has been designed to be exquisitely simple and user friendly, with its operational readiness easily monitored.

A new and special feature of the VTSP-1A/166 is the *perfect tracking* volume control. This innovative use of servo control provides extremely accurate tracking between separate electronic stepped attenuators for each channel. This technology provides precise channel-to-channel balance across the full volume range while retaining the convenience of a conventional volume knob. This approach does not use a conventional potentiometer as a volume control thus eliminating a major source of signal distortion in many of the competing units. Our servo implementation also has the ability to handle a much higher signal level than many competing designs. Where some other units tend to limit the signal during dynamic peaks at the input, the VTSP-1A/166's *perfect tracking* system, with its substantial headroom, can easily handle large voltage

swings from even the most advanced phono reproduction equipment, high quality digital sources, and advanced signal processors in home theater systems.

Source input selection in the VTSP-1A/166 incorporates gold contact sealed relays located at the input connectors keeping the signal path length to an absolute minimum. This innovative configuration eliminates the distortion-generating wipers of conventional selectors and long runs of wire from the rear panel to the switch. An additional benefit is that in using sealed units, the contacts are not prone to corrosion, dirt, or the same kind of wear as conventional selector switches.



Relays located at inputs

The power supplies of all Herron Audio products reflect the engineering innovation that allows the Herron VTSP-1A/166 Preamplifier to provide the highest musical satisfaction without the artifacts produced by most other tube-based components. This power supply provides a rigid and unwavering voltage source to the tubes, producing remarkable resolution of musical events in time and sound stage.

The circuit board layout reflects consideration of all of its electrical properties in order to achieve outstanding audio performance with greater consistency than hand wiring. Compromise was not an option. The best possible perfor-

mance was the only consideration.

The unique design of the Herron VTSP-1A/166 Preamplifier, along with its conservative operating parameters, means that owners can expect the industry's highest level of performance to be maintained over the extended life of the unit.

All members of Herron Audio staff are audiophiles who regard the accurate reproduction of music as one of the highest applications of the engineering arts. We at Herron Audio believe in the pursuit of audio perfection. We hope you enjoy the fruits of our efforts. If you have any comments, suggestions, or questions, please contact us at 314-434-5416.

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Design Considerations

- *Perfect tracking* volume 166 step control system with unprecedented precision and dynamic range
- Infinite resolution indirect signal path balance control
- All-tube design operated conservatively for long life
- Relay input switching eliminates switching distortion
- Star grounding for low interference susceptibility and clean signal path
- Zero feedback—no feedback loops in the audio circuitry
- Super-low noise
- High input signal capacity without overload; see technical specifications
- Gold plated TIFF RCA and ground connectors
- Hand-picked components for accurate response and consistent unit-to-unit quality
- Automatic muting at startup and shutdown
- 72,000 μF of power supply energy storage capacitance
- 4 levels of high voltage regulation
- Regulated soft-start DC filament supply
- Regulated tube bias supply
- Toroidal power transformer
- Rugged 0.10" thick aluminum chassis with 0.25" thick heavily anodized faceplate
- Reversing power line (AC) polarity switch for minimizing line-to-chassis reactive currents and noise pickup
- Controlled warm-up of tube filaments and high voltage for extended tube life
- Low plate operating currents for extended tube life and cool operation
- Front panel indicators for power, filament voltage, and output/mute/monaural
- Each unit is given an extensive burn-in, including rigorous bench and listening tests

Front Panel Features



Automatic Mute and LED Indicators

The VTSP-1A/166 features a fully functional front panel capable of a wide range of signal control and easily-monitored operational readiness of the unit. When the VTSP-1A/166 is powered up, the automute feature is engaged until the unit is ready for operation. The first indicator on the panel is the POWER LED, which indicates the unit has been turned on. After a few moments, the FILAMENTS LED gradually brightens, as the voltage to the filaments slowly increases. When the unit is ready to operate, the OUTPUTS LED comes on and the automute is disengaged allowing signal to be passed to the main outputs. This process generally takes about a minute, but can take a little longer if the unit has not been operated for an extended period of time. This controlled start-up process helps maintain the high level of performance of the VTSP-1/166 and

greatly prolongs tube life while protecting sensitive connected components.

Selector Switch

The five-position Selector switch is used to choose the input signal, and remotely activates special sealed relays used to connect the input signal to the preamplifier's circuitry. The five positions in the Selector switch are:

- AUX 1
- AUX 2
- CD
- TUNER
- VIDEO

The selector switch positions correspond with the identically named inputs on the back panel.

If you have a phono preamplifier, such as the Herron Audio VTPH-1, we recommend that you connect it to the AUX 1 input, which is conveniently located next to the

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GROUND terminal on the back panel. The selector switch indicates the signal source that is used for the TAPE OUT on the back panel and also the MAIN 1 and MAIN 2 outputs (when the TAPE / SOURCE switch is in the source position).

TAPE / SOURCE Switch

The TAPE / SOURCE switch is located below and to the right of the selector switch. This switch controls the preamplifier main output source. When the switch is in the SOURCE position, the selector switch determines the signal used for both tape and main outputs. When the switch is in the TAPE position, the signal entering the inputs labeled TAPE on the back panel is used as a source for the Main Outputs.

The TAPE / SOURCE switch can also be used to support an external signal processor.

In normal operation, the TAPE / SOURCE switch is placed in the SOURCE position.

MONO / STEREO Switch

The MONO / STEREO switch is located in the middle of the front panel. When the switch is placed

in the STEREO position, the left and right channel signals remain separated. When the switch is placed in the MONO position, the left and right channels are combined into a single "summed" signal.

The OUTPUTS LED lights up in a combination of red and green with the MONO / STEREO switch in the MONO position.

In normal operation, the MONO / STEREO switch is placed in the STEREO position.

Balance Control

The VTSP-1A balance control provides a full range of adjustment for relative balance between the right and left channels. In the centered position, each channel is equal in signal sensitivity. Rotating the balance control in the clockwise direction (to the right) decreases the volume in the left channel (relative to the right channel). Rotating the balance control in a counter-clockwise direction (to the left) decreases the volume in the right channel (relative to the left). In the fully clockwise or counter-clockwise position, the left or right channel respectively will be muted. Normal operation is provided when

the balance control is in the centered position.

Volume Control

The volume control knob of the VTSP-1A/166 operates a servo that controls the positions of two (left and right) electronic stepped attenuators. This unique design provides the feel of a conventional volume control and the benefits of much lower distortion and better tracking from a unique state of the art electronic 166 step volume attenuator. Rotating the control clockwise increases the volume; rotating the control counter-clockwise decreases the volume. Its unique operation and integration into the VTSP-1A/166 contributes to this preamplifier's outstanding performance.

Occasionally, due to static discharge, the channel-to-channel tracking may require adjustment. An automatic servo reset is easily initiated by placing the Mute/Listen switch in the MUTE position, then returning it to the LISTEN position or by turning the volume control fully counter-clockwise (against the stop) and returning it to the desired level.

Step changes during adjustment of the volume control will be most audible for a short period of time just after the line stage or selected input equipment is powered on. Normally these step changes may be heard at roughly the 8:30 o'clock position and at high volume settings. Though not necessary, it is good operating practice to adjust the volume control to its lowest setting when switching inputs or when powering up or powering down the preamplifier.

MUTE / LISTEN Switch

The Mute/Listen switch is located below and to the left of the LEDs. This switch controls the muting of the main outputs (but does not mute the tape outputs). When in the LISTEN position, the signal is passed to the main outputs directly. When in the MUTE position, the signal is disconnected from the main outputs, and the volume is automatically turned down.

The OUTPUTS LED glows red when the switch is in the MUTE position.

In normal operation, the MUTE / LISTEN switch is placed in the LISTEN position.

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Rear Panel Features



The rear panel was designed for flexibility and ease of access to less-frequently used functions. The high precision RCA input jacks are heavily gold-plated to minimize signal-degrading corrosion. The special insulation material in the RCA connectors maintains purity of the signal from the input cable into the unit.

Power Connection

An IEC power cord connector is provided for attaching the Herron Audio-provided power cord or another chosen by the user.

POWER Switch

This is the unit's POWER switch. When placed in the on position, the unit is powered up. At power up, the unit is automatically muted until full operational capabilities are reached and the voltages are stable at the tubes.

When switch is moved to the off position, the unit is automatically muted and powered down.

POWER LINE POLARITY Switch

This switch selects the power line polarity.

AC line polarity may affect performance. The following is the recommended procedure for determining the best operation:

- Set the power line polarity switch to the "A" position.
- Set the volume control to the desired level and listen closely to the quality of the reproduction. This will be used as a baseline for determining AC polarity.
- Change the AC polarity of the preamplifier by switching the power line polarity switch to the

"B" position. Repeat the process, listening to the same source. Place the AC polarity switch in the position that sounds best.

Once set, it is not necessary to change the AC polarity unless your electrical service changes, or the unit is connected to a different electrical outlet. If the unit is used with the Herron Audio VTPH-1 phono preamplifier, we suggest that both the VTPH-1 and VTSP-1A/166 use the same AC polarity switch setting.

Inputs

The inputs are segregated by channel: the upper bank contains the left channel inputs, the lower contains the right channel inputs. Selector input pairs are arranged vertically.

The labeled input pairs, except for the pair labeled TAPE correspond to those available on the selector switch on the front panel. The input is selectable using the TAPE / SOURCE switch.

RCA input plugs should be inserted firmly into the input jacks

while the unit is powered down. Any individual ground bleed connections should be connected to the gold ground lug located near the end of the banks of input jacks.

It may be desirable to connect a source's right channel first, followed by the left.

Outputs

There are two types of outputs in the VTSP-1A/166. The main outputs are intended for connection to high quality power amplifiers or a multi-channel electronic crossover. Two pairs of main outputs are provided so that users may distribute the audio signal to multiple systems, or to simplify using multiple amplifiers in a complex or multi-way speaker system.

The tape outputs are provided to allow monitoring of the audio signal after the selector switch relays. The signal from the tape output corresponds to the input chosen by the selector switch.

The operation of the Herron VTSP-1A/166 Preamplifier is straight-

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Installation and Operation

forward. As with any fine audio component, careful set-up and integration into one's system is important for optimum performance, safety, and reliability.

Please read through the following set-up instructions completely prior to operating the unit.

Procedure

1. Position the unit in a well-ventilated area on a firm, stable surface, away from equipment that generates alternating magnetic fields such as motors, transformers, etc. Magnetic fields of this type can introduce hum into the signal path.
2. Connect the signal cables from the source components (CD, phono preamplifier, VCR, tuner, etc.) to the VTSP-1's rear panel jacks, left-to-left and right-to-right. Connect the ground bleed wires to the ground connector of the phono preamplifier.
3. Plug the amplifier and tape recorder input cables into the corresponding outputs, left-to-left and right-to-right.
4. Plug the power cord into the VTSP-1A preamplifier. Make sure it is firmly seated into the IEC socket prior to inserting the plug into an AC outlet.
5. Plug the power cord into a 115 volt (U.S. spec units) AC outlet.
6. Power up the unit by switching on the power switch.
7. Observe the LEDs for appropriate operation (see the Front Panel Features section). Listen carefully for the click of the automute engaging the outputs.
8. Power up the source component to be used and position the selector switch to choose that component.
9. Once the unit is powered up and operating, power up the down-stream amplifier(s) and crossover, if any, as recommended by their manufacturers.
10. With the Volume control in the lowest position, gradually increase the gain until the desired level is reached.
11. When the entertainment session is complete, it is suggested, but not required, that the VTSP-1 be powered down after the crossover, amplifiers, and tape recorder, and before the source components.

Other Considerations

With the higher definition and detail available through the VTSP-1A/166, careful attention to the set-up of other components will yield greater benefits. There may also be considerable gains from the upgrade of existing electronics.

Turntable mounting can improve performance by providing a more stable operating platform for the arm and platter. We have found that attention to turntable and platter leveling, fine balance of springs, dampening of vibrations, etc., can improve performance in many systems.

Tonearm balance, minor changes in antiskate, proper arm alignment, etc., all contribute to gaining the best performance. For certain arms, the use of a dampening wrap can improve performance dramatically.

We recommend the use of high-quality interconnecting cables between the source components and the VTSP-1A/166, and between the VTSP-1A/166 and components down-stream of it (the power amplifiers and speakers).

Due to the increased definition of detail, it may be necessary to make minor adjustments in speaker position or active crossover settings to optimize their performance. We have determined that minor time alignment changes in a setup can produce major advances in the overall quality of the reproduced signal bringing the listener closer to the original performance.

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Changing Tubes

We do not recommend changing tubes for the purposes of “improving sonic performance.” Tubes of even the same part number (6922 in the case of the VTSP-1A/166) from different manufacturers and different production lots generally vary considerably in many operating parameters. The Herron VTSP-1A/166 Preamplifier has been optimized for the tubes that were supplied by the factory. The original tubes should provide many years of good performance due to the conservative plate voltage and current operating requirements of the Herron Audio VTSP-1A/166 preamplifier.

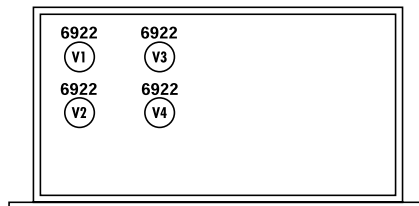
If replacement tubes are required, Herron Audio recommends the use of our factory matched sets of tubes. These tubes have been selected for their superior performance and have been matched much more closely than tubes—even from the

same manufacturer—from other suppliers.

All tubes in the Herron VTSP-1A/166 are of the type 6922.

If access to the interior of the preamplifier is necessary, be sure to install the grounding lug under the top screw at the rear of the chassis when reinstalling the cover.

When changing tubes, the VTSP-1A/166 should be unplugged and left off for a minimum of 30 minutes prior to opening the unit, to insure that hazardous voltages in the power supply have time to discharge before entering the unit.



VTSP-1A/166 Technical Specifications

- Tube complement:** 4 x 6922
- Frequency Response:** 1 Hz to beyond 100 kHz, 20 Hz to 20 kHz ±0.1 dB (volume control at 8 o'clock)
- Volume Control:** 166 position electronic stepped attenuator
- Volume Tracking:** Maximum differential: +/- 0.1 dB channel to channel
- Gain:** 14 dB
- Input Impedance:** 100,000 Ohms
- Output Impedance:** 100 Ohms nominal at 1 kHz
- Absolute Polarity:** Inverting
- Power Supply:** 72,000 µF of energy storage
4 levels of high voltage regulation
Regulated soft start DC filament supply
Regulated tube bias supply
Toroidal power transformer
- Power requirements:** U.S.: 120 VAC 60 Hz, 30 VA, Fuse 1/2 amp 250 volt slow blow
Export: 230 VAC 50/60 Hz, 30 VA, Fuse 1/4 amp 250 volt slow blow
- Input capacity:** 18 Volts RMS
- Dimensions:** 19" wide x 3.5" high x 10" deep
- Warranty:** 5 years, parts and labor; 90 days on tubes

CAUTION CAUTION CAUTION CAUTION CAUTION CAUTION

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Manufactured by *Herron Audio* Division of Herron Engineering, Inc.
St. Louis, Missouri

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