

T+A

HVEQ

Software for room calibration

User Manual

Version 1.1

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General Information

Function

The **HVEQ** software has been specially developed for the purpose of room calibration with the **T+A** HV series (**P 3000 HV / PA 3000 HV***). The software can be used to ascertain the acoustics of the listening room quickly and easily.

The equalizer, tone and volume settings can be controlled conveniently from your PC by means of a network connection to your device.

The software includes a function which automatically calculates the ideal values, thereby setting up the three equalizers in the optimum way.

* The tone control and room calibration functions are a retro-fit option for the PA 3000 HV.

Hardware and software

Minimum system requirements:

Pentium 4 @ 2 GHz or similar

512 MB RAM

Windows XP SP3 or higher

Sound card (optional)

Network connection

Essential accessories

- **T+A** Audio Signals CD
- Calibration microphone
(e.g. Dayton UMM-6
USB calibration microphone)
- Network cable (optional)

Installation

Installation

The software can be obtained from our website:
www.ta-hifi.com/hveq.

Unpack the ZIP file into a folder on your computer.
There is no need to install the software: to start the program simply double-click on the file "hveq.exe".

Settings

In Windows Mixer select the microphone connected to the system as the standard recording device, and set sensitivity to high.



If you select too low a setting for input sensitivity, you will have to set an excessively high level for the calibration process, and this runs the risk of damaging the loudspeakers.

Connecting the device to the PC

The **HVEQ** software includes the facility to enter all the requisite settings conveniently via a network connection.

The connection between the **P 3000 HV / PA 3000 HV** and the PC should be direct, i.e. without looping through a router or similar device. This is accomplished by connecting a network lead to the LAN socket on the back panel of the **P 3000 HV / PA 3000 HV** and to the network socket of your PC.

The IP address of the **P 3000 HV / PA 3000 HV** is pre-set in the software (192.168.178.253). It may be necessary to adjust your computer's IP range, depending on its configuration.

Switch the **P 3000 HV / PA 3000 HV** on, then click on the **Connect** button. As soon as the device is connected to the PC, the button's inscription switches to **Disconnect**.

Screen layout

① Channel

The channel to be adjusted is set at this point.

② Tone and equalizer settings

These Select fields are used for adjusting the tone and equalizer settings.

③ Calibration functions

At this point a new calibration process can be started, and recorded curves can be suppressed or erased.

④ Connection to the device

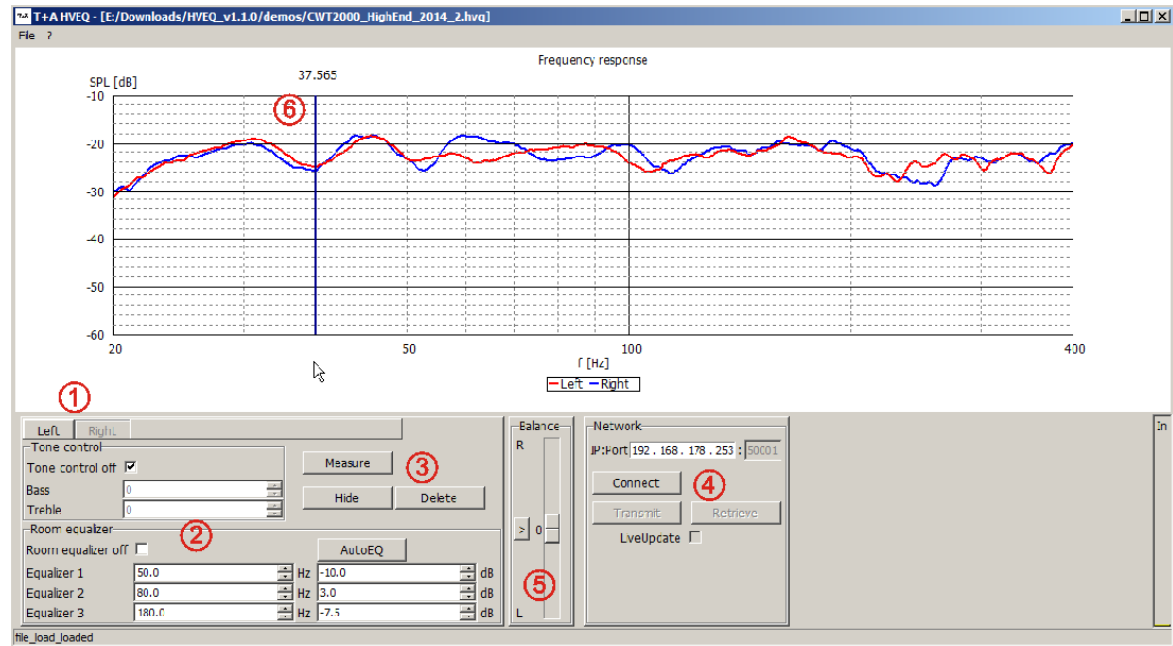
A connection to the device can be made in this area, and settings called up and / or transferred.

⑤ Balance setting

This slider is used to alter the balance setting.

⑥ Cursor

The cursor line displays the frequency at the selected point, and can be shifted using the mouse pointer..



Operating the software

Channel selection

The settings for the two channels can be adjusted separately; use the "**Left**" or "**Right**" buttons to select the channel which is to be calibrated or adjusted. The on-screen button for the currently selected channel is emphasised.

Room calibration

The room calibration function of the **P 3000 HV / PA 3000 HV** consists of three equalizers per channel.

The program calculates the effect of the equalizer setting beforehand, so that you can directly see any change to the settings. Before adjusting the equalizer (see next section), you should therefore either carry out the loudspeaker calibration process, or load an existing frequency response curve.

The individual equalizers can be adjusted once the curve has been loaded or recorded: The first step should be to determine the points at which marked peaks or troughs are located, although priority should be given to filtering out the peaks. In the example diagrams on the next page, there are two peaks at 45 Hz and 170 Hz and a trough at 38 Hz. The exact frequency can be found by moving the cursor line to the appropriate point using the mouse; the frequency is shown above the line.

If you wish to alter the equalizer settings, you must first remove the tick at "**Room calibration off**". The values for frequency (**Hz**) and level (**dB**) can be increased or reduced by means of the arrow buttons in the appropriate window or by scrolling with the scroll wheel of the mouse.

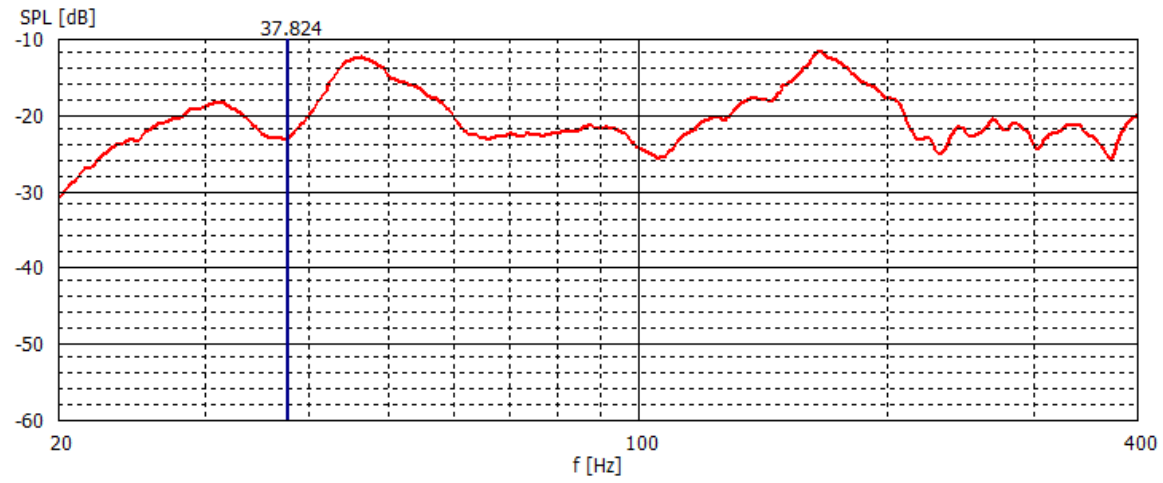
Adjust the three equalizers in such a way that the frequency response is as smooth as possible. When you have optimised the frequency response, you can transfer the equalizer settings to the **P 3000 HV / PA 3000 HV**. If the device is connected using a network cable, the values can be transferred by clicking on the "**Transmit**" button. If there is no network connection, the values must be entered manually on the device.

The software includes an automatic adjustment facility in addition to manual equalizer adjustment. Click on the "**AutoEQ**" button to initiate automatic calibration; a progress bar indicates the progress of the process.

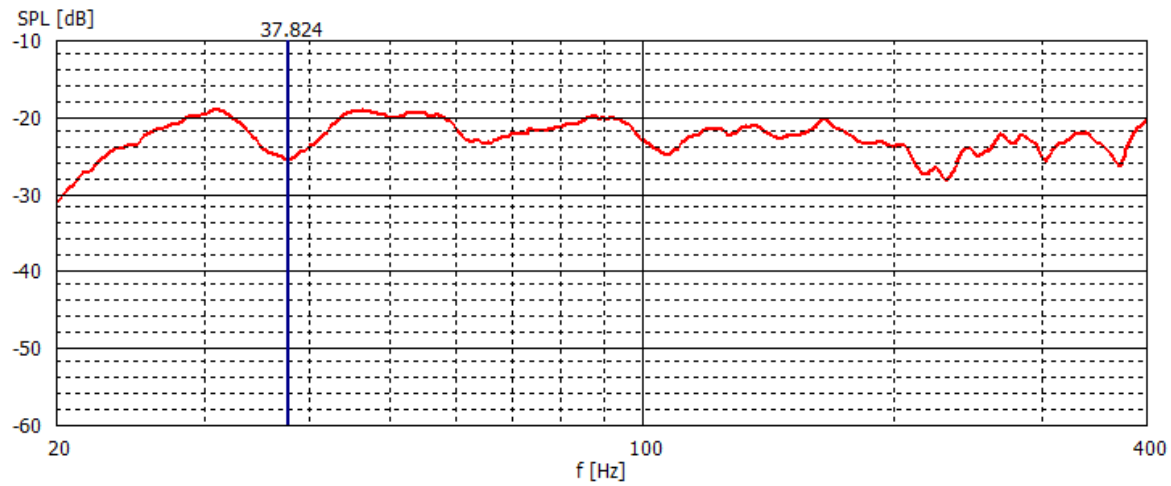


The maximum amplification of the **P 3000 HV / PA 3000 HV** equalizers is 6 dB, which corresponds to four times the power at the specific frequency. Such extreme values could overload the loudspeakers mechanically and electrically, so please be very cautious when using the equalizers' amplification function!

Frequency response before correction





Frequency response after correction




Tone controls

If you wish to alter the tone settings, you must first remove the "**Tone controls off**" tick. The set values for **Bass** and **Treble** can be increased or reduced using the arrow buttons in the appropriate window. The new values can then be transferred to the **P 3000 HV / PA 3000 HV** by clicking on the "**Transmit**" button or being updated automatically if the option "**Live update**" is set. Changes to the tone controls can be done to both channels separately or together. The preferred method of changing the values can be set in the upper menu line under the item "**Configuration**".

-  The tone control settings are transferred to the device via the network cable (LAN). If you are using the software without a network connection, you must enter the tone control settings directly on the device.
-  The independent tone control is available since firmware version V 1.10 (device firmware).

Balance

The balance of the **P 3000 HV / PA 3000 HV** can be adjusted using the "**Balance**" slider. To adjust the balance setting, click on the slider and move it to the desired value by dragging with the mouse (button held pressed in). For resetting the balance to zero, click on the > - button.

-  This function is only available if a network connection is present.

Network


If you wish to make full use of the software's range of functions, the device to be adjusted should be connected to the computer using a network cable.

The factory default IP address of the **P 3000 HV / PA 3000 HV** is pre-set in the "**IP:Port**" field.

The connection between the device and the PC is made using the "**Connect**" button. As soon as the connection is present, the button's inscription changes to "**Disconnect**". If necessary, the connection can be broken again here.

Once the device is connected to the computer, the equalizer and tone control settings can be called up or transferred. To interrogate the settings, click on the "**Call up**" button; click on "**Transmit**" to transfer the settings.

If the "Live Update" option is selected, every change is being transmitted directly to the connected device.

-  For more information on the network connection please refer to the chapter entitled "Installation – connecting the device to the PC"

Calibration

Calibrating the frequency response

This is the procedure for calibrating the frequency response:

- Insert the **T+A** Audio Signals CD in the CD player.
- Switch the **P 3000 HV / PA 3000 HV** on, and select the CD player as source.
- If the device is connected to the computer using a network cable, please click on "**connect**" to establish the connection.
- If the device is not connected using a network cable, enter the tone control, Loudness and room calibration settings directly on the device itself.
- Select the channel to be calibrated using the "**Left**" or "**Right**" button.
- Set up the calibration microphone at your normal listening position.
- Click on the "**Calibrate**" button to start the calibration process.
- Start the indicated track on the CD.
- Increase the volume until the modulation indicator on the right changes from yellow to green. (If you calibrate the second channel, do not change the volume!)
- The calibration process starts automatically when the Status line at the bottom lights up green.

If the volume needs to be increased to a very marked extent, the calibration can be started

manually at any time using the space bar or the "**Start**" button. To abort the process click on "**Cancel**"

- When the calibration process is complete, the recorded curve is displayed on the screen.

Calibrating the microphone

To ensure that measurements are carried out with maximum accuracy, the HVEQ program offers the facility to read in the calibration data for the connected measurement microphone.

The calibration data must be present in the form of a file with the ".txt" suffix. The content of the file must look like this:

1. Column: **Frequency**
2. Column: **Amplitude**
3. Column: **Phase** (may also be missing or zeros)

Lines that do not begin with a number are ignored by the program and treated as a comment

```
"Sens Factor =-17.823dB, SERNO: 1380988"  
4.6758 -4.4208 10.22  
5.099 -4.4168 11.74  
5.5605 -4.3875 13.55  
6.0638 -4.2955 15.55  
6.6126 -4.0683 18.15  
7.2111 -3.6758 20.28  
7.8637 -3.1788 21.05  
8.5755 -2.6872 21.49  
9.3516 -2.2685 21.2  
10.198 -1.9147 20.2  
11.121 -1.606 19.23  
12.1275 -1.3408 18.1  
13.2252 -1.1221 16.82  
14.4221 -0.9528 15.53  
15.7274 -0.8317 14.3  
17.1509 -0.7497 13.24  
18.7032 -0.6915 12.43  
20.396 -0.6269 11.87  
22.242 -0.5346 11.41  
24.255 -0.4298 10.82  
26.4503 -0.3345 10.13  
28.8443 -0.2585 9.41  
31.4549 -0.1996 8.74  
34.3018 -0.1483 8.14  
37.4064 -0.1007 7.61  
40.7919 -0.0503 7.12  
44.4839 0.0074 6.62  
48.5101 0.0619 6.05  
52.9006 0.1021 5.44
```

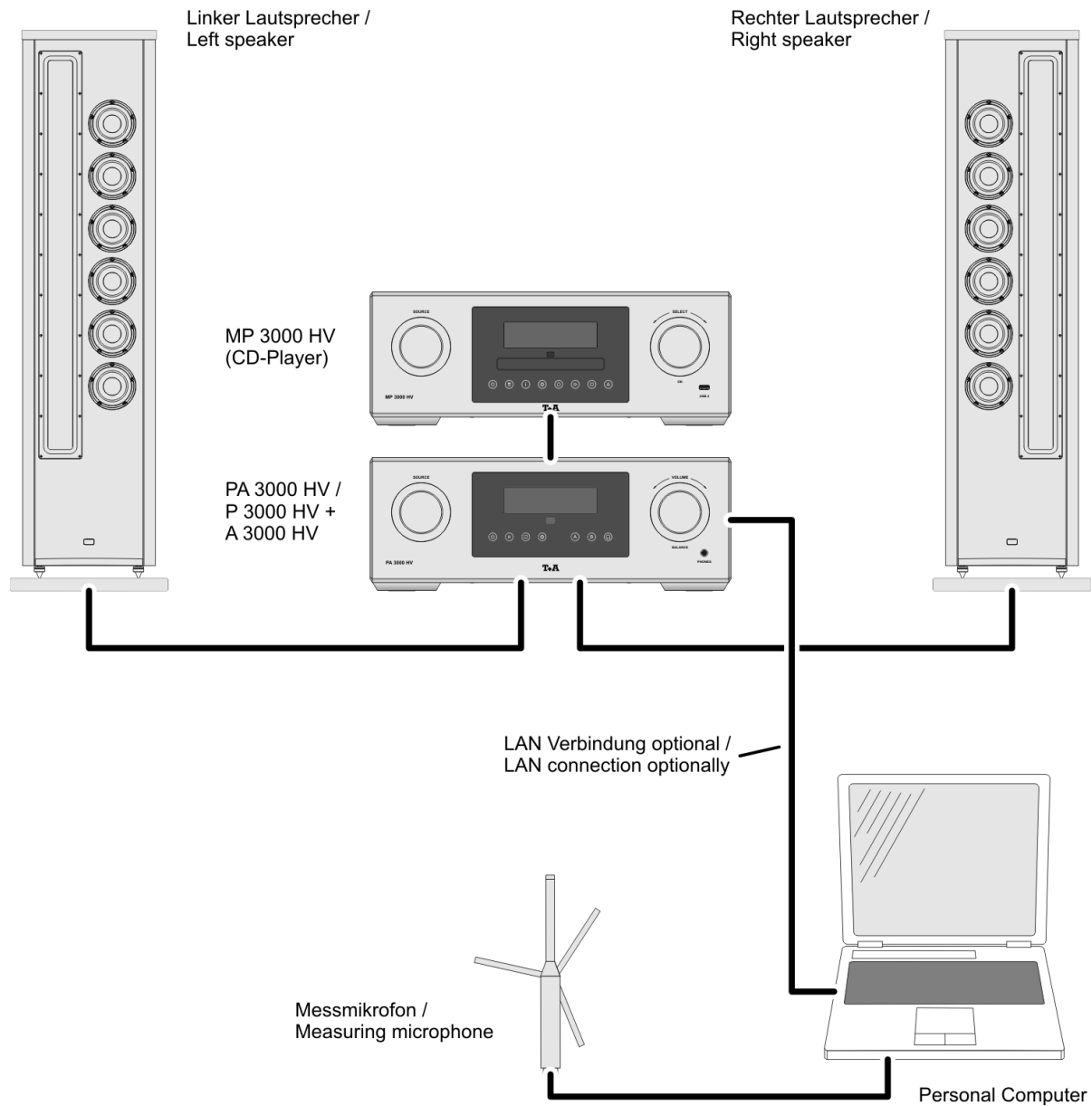
The file must be renamed "**mic.txt**", otherwise the HVEQ program will be unable to read in the data.

Copy the renamed file into the HVEQ folder.

When started, the program checks for the presence of calibration data. If it finds the file "**mic.txt**", it automatically loads it. No further adjustments are required.

If you wish to carry out measurements using a different microphone, you must load a new file corresponding to the new microphone; the program must then be re-started.

Wiring diagram



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