

Multi-Criterial Quality of Vintage Audio Equipment in User's Assessment

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Abstract. The article presents key parameters for users of vintage audio electroacoustic equipment, which determine their quality. The research part presents the results relating to: knowledge of the concept of vintage audio, technical knowledge about electroacoustic equipment and the respondents' opinions on the quality of contemporary audio systems. The key features of your vintage audio equipment, important from the user's point of view, have also been distinguished. A diagnosis was made of whether the respondents attach importance to the price of the equipment and whether they would be willing to pay more for the quality of sound and workmanship. The article ends with a discussion of the research results and a summary.

Introduction

Sound has accompanied man since the beginning of his existence. These were the sounds of nature and the sounds of communication between tribesmen. The sound was used to warn, express emotions, feelings and later became one of the elements of art. Initially very primitive art, which over time turned into music. Primitive sound forms played accidentally on natural musical instruments can serve as an example. The development of human civilization has allowed the construction of many musical instruments, which have survived to modern times in an unchanged form. Vocal singing was also of great importance. Artists practicing this art enjoyed great respect and recognition in every epoch.

The nineteenth century AD brought the technical possibilities of recording sound on various carriers and reproducing it and duplicating it on constructed devices. Initially, these were very primitive devices, looking from today's perspective, but the very desire to record, duplicate and reproduce voice, singing or music at different times and places was important.

The invention of the vacuum tube and later the transistor gave the designers further opportunities to create more and more perfect devices for recording and reproducing sound. Other important inventions (it is impossible to list them all) that contributed to the development of audio systems include:

- invention of the radio;
- stereophonic (quadraphonic);
- computerization (sound processors);
- multi-channel systems.

The purpose of this study was to identify the key parameters of audio systems for users. It should be noted that the comparison and evaluation of the parameters was made without the use of specialized equipment (nor was it based on the results of studies using such equipment). It was purposeful and intentional. Quality in the assessment of a single user is subjective and only the results from the entire surveyed group of evaluators allowed for the formulation of objective (general) conclusions, which were included in the chapters on the discussion of the results and the summary.

The bibliography presented in the article is only intended to encourage the potential reader to explore the issues related to electroacoustics and, possibly, to arouse his interest in this direction.

According to the author of the article, each scientific study, paper or diploma thesis should contain definitions of the terms used and an explanation of their meaning. In a classic study, one should refer to the available bibliography, quote other authors and use the available literature. This article has omitted this form. This is due to the lack of space for such a presentation and also due to the very extensive range of information in this field. The presented list of literature sources is only a substitute of knowledge in the field of electroacoustics [1-4].

Quality Criteria for Audio Equipment

Each person hears subjectively and has their own tastes and unique experiences in this respect. This may be, for example, a preference towards emphasizing low tones or quite the opposite - towards high tones. Quite a large population of people prefer to boost the bass and treble while lowering the midrange. Some prefer to listen the music with low level volume, while others prefer the opposite - the more decibels the better. Some prefer to listen to music through headphones, which is unthinkable for fans of speaker systems.

An important element of the analysis of the quality of audio equipment, which many forget or omit completely, are the acoustic properties (parameters) of the room in which the listening session takes place. As an example, we should mention famous concert halls and world philharmonics. Even the best audio equipment will not sound good in a room that does not meet the basic acoustic parameters. At this point, the question should be asked, how to systematize the parameters of audio equipment so that it is possible to assess its quality? The answer seems very simple. You should compare the technical parameters and the equipment that has the best has the highest quality. Well, it turns out that's not the case at all. In the research part of the article, an attempt will be made to identify these key quality parameters (which may or may not result from technical parameters) that users are guided by when choosing music sets.

For the purposes of this study, the following technical quality criteria (measurable and expressed in appropriate units) were adopted: power, frequency response, total harmonic distortion, signal-to-noise ratio. Other criteria adopted (non-technical) are: musical experience, music scene, quality of workmanship, materials used, external appearance and price.

Research Methodology and Purpose

The respondents of the survey were users of vintage audio equipment from Poland. The condition for participation in the study was the possession and use of vintage audio equipment on a daily basis for at least five years, in order to be able to give authoritative answers. Participation in the study was voluntary and preceded by the verbal consent of the respondent. 30 questionnaires were carried out, of which, after checking the correctness of filling in, consistency and logic of the answers provided, all questionnaires were classified for further analysis. The survey contained 14 questions. All questions in the questionnaire were closed and single-choice questions.

The aim of the conducted research was:

- determining whether the respondents are familiar with the concept of vintage audio;
- obtaining knowledge whether the surveyed group has technical knowledge of audio equipment;
- isolation of the key features (assessment criteria) of the owned vintage audio equipment that are important from the user's point of view;
- diagnosing whether respondents attach importance to the price of equipment and whether they would be willing to pay more for the quality of sound and workmanship;
- getting to know the opinions of the respondents on the quality of currently produced audio systems.

The test results were presented graphically or summarized in tables and analyzed in the chapters below.

Presentation of Research Results

The first survey question from the record part concerned the separation of age groups of respondents. Age groups have been established for this particular study and are not related to commonly accepted age groups for sociological research. It was mainly about determining the generation that most often uses vintage audio equipment. The dominant group is the age range from 41 to 55 years, i.e. as much as 55%. The smallest age group is between 26 and 40 years old. The results for this part of the survey are summarized in Fig.1.

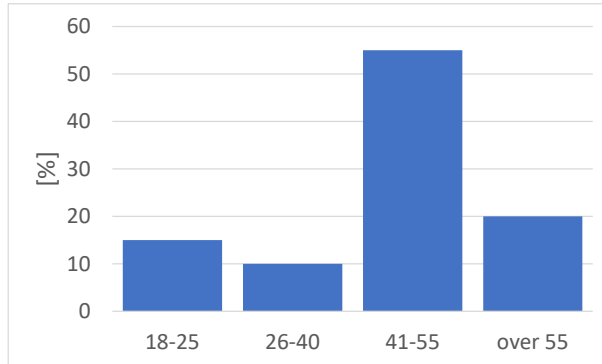


Fig.1. Age groups of respondents: 15%, 10%, 55% and 20%, respectively [own study].

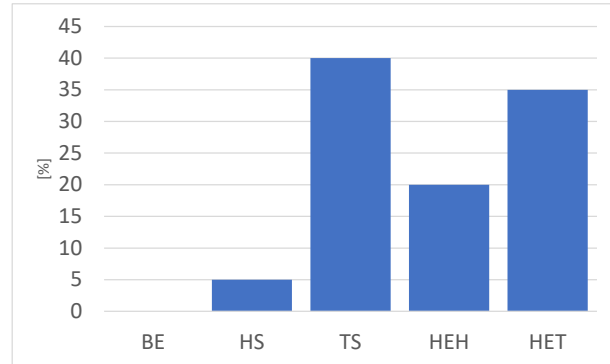


Fig.2. Education of the respondents: BE – basic education 0%; HS – humanities secondary 5%; TS – technical secondary 40%; HEH – higher education in humanities 20%; HET – higher technical education 35% [own study].

The second question from the record concerned the education of the participants in the study. The purpose of this question was to find out the type and level of education of the respondents participating in the study. Definitely, because as many as 75% of the respondents have technical education. None of the respondents completed primary education. One quarter of the respondents have secondary or higher education in the humanities. The results for this part of the survey are summarized in Fig.2.

The first survey question in the research part of the questionnaire was aimed at finding out the gradation of knowledge of the concept of audio vintage in the individual self-assessment of the respondents. The task of the respondents was to answer the question: how do you assess your knowledge of the concept of vintage audio? Half of the respondents assess their knowledge of the concept of vintage audio as good, and 30% as very good. Only one fifth considered their knowledge in this area to be at a sufficient level. The results for this survey question are summarized in Fig.3.

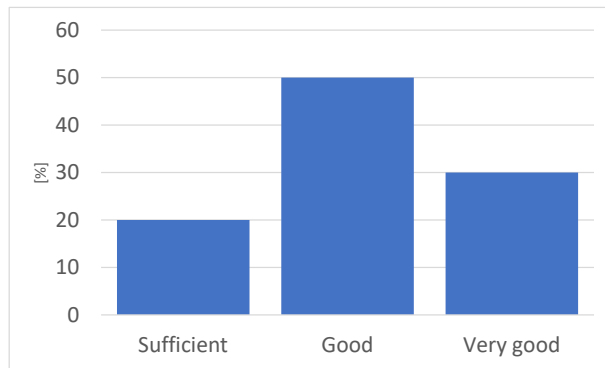


Fig.3. Knowledge of the concept of vintage audio in the self-assessment of the respondents: 20%, 50%, 30%, respectively [own study].

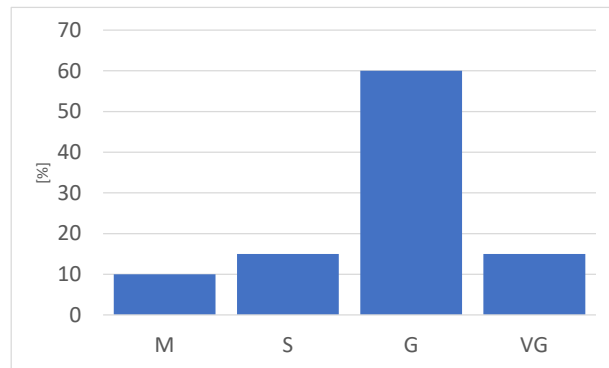


Fig.4. The level of individual technical knowledge in the field of electroacoustics in the self-assessment of the respondents: M – mediocre 10%; S – sufficient 15%; G – good 60%; VG – very good 15% [own study].

The second survey question related to the technical knowledge of the respondents. The respondents' task was to determine the level of their own technical knowledge in the field of electroacoustics, regardless of their education. The purpose of this question was to find out the respondents' opinions on their individual, strictly technical, knowledge of issues related to electroacoustics. Three quarters of the respondents describe their technical knowledge in the field of electroacoustics as good or very good. Only 10% of the respondents indicated a mediocre level, and 15% a sufficient one. The results for this survey question are summarized in Fig.4.

The next question concerned the respondents' knowledge of the technical parameters of the used vintage audio equipment. The respondents were asked to determine the level of knowledge about the typical technical parameters of their audio equipment. Specifically, it was about whether these parameters are known to them and can accurately indicate them by giving their values in generally used measurement units. More than half believe that they know the basic parameters of their vintage audio equipment. Five percent do not know this data and 30 know only some of it. Only ten percent declare knowledge of all the technical parameters of the audio equipment used. The results for this survey question are summarized in Fig.5.

The fourth survey question was aimed at finding out the respondents' opinions on the importance and meaning they attach to the catalog parameters of audio systems provided by manufacturers. Sixty-five percent of those surveyed say it matters little to them and twenty - very little. Only five percent of those surveyed believe that this is very important information for them. The results for this survey question are summarized in a Fig.6.

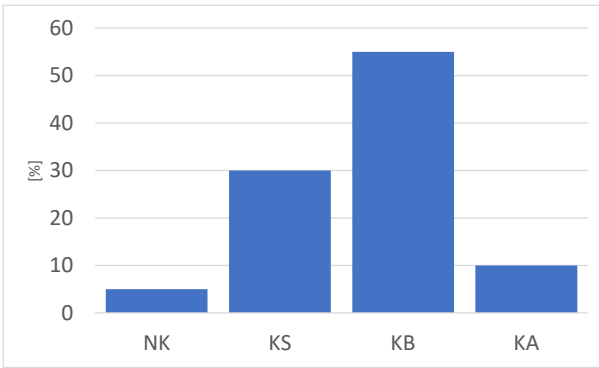


Fig.5. Knowledge of the technical parameters of your vintage audio equipment: NK – don't know 5%; KS – know some 30%; KB – know basics 55%; KA – know all 10% [own study]

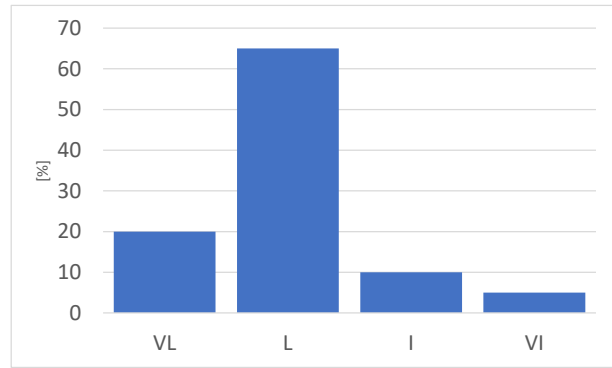


Fig.6. Importance of technical parameters of vintage audio equipment in the opinion of respondents: VL – very little 20%; L – little 65%; I – important 10%; VI – very important 5% [own study]

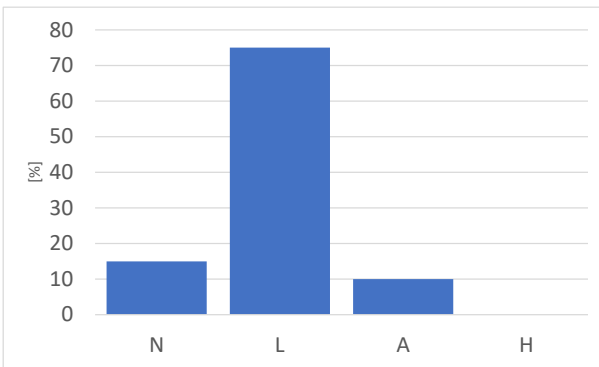


Fig.7. Failure rate of vintage audio equipment in the opinion of respondents: N – negligible 15%; L – low 75%; A – average 10%; H – high 0% [own study].

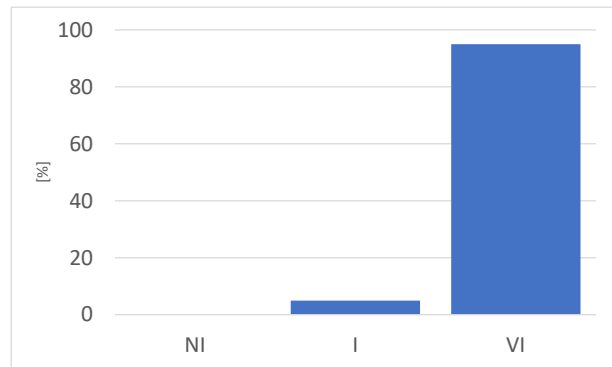


Fig.8. The importance of the sound quality of vintage audio equipment in the opinion of the respondents: NI – not important 0%; I – important 5%; VI – very important 95% [own study].

An important question in the survey was the question about the respondents' opinions on the failure rate of their vintage audio equipment. This indirectly gives us an answer about the quality of audio systems produced in the 1970s, 1980s and 1990s. Ninety percent of the respondents indicate a negligible and very low failure rate of their vintage audio equipment. None of the respondents marked the answer with a high failure rate. The results for this survey question are summarized in Fig.7.

The next survey question concerned the importance of the sound quality of vintage audio equipment owned by the respondents. Respondents were asked to indicate how important this parameter was for them. None of the respondents indicated that the sound of audio equipment is unimportant to them. Ninety-five percent of those surveyed answer this question with a "very important" answer. The results for this survey question are summarized in Fig.8.

The next survey question concerned the respondents' opinions regarding the quality of their vintage audio equipment. The quality of workmanship was understood in terms of the electronic components used and the finishing materials used. Three-quarters of respondents describe the quality of workmanship as very important for them from the point of use, and twenty percent as important. Only five percent of the respondents describe the quality of workmanship as unimportant. The results for this survey question are summarized in Fig.9.

The next survey question referred to the importance of aesthetic values that users attach to their equipment. One fourth of the respondents believe that aesthetic values are not important to them. Sixty percent indicate moderate to important. Only fifteen percent of the respondents indicated very important. The results for this survey question are summarized in Fig.10.

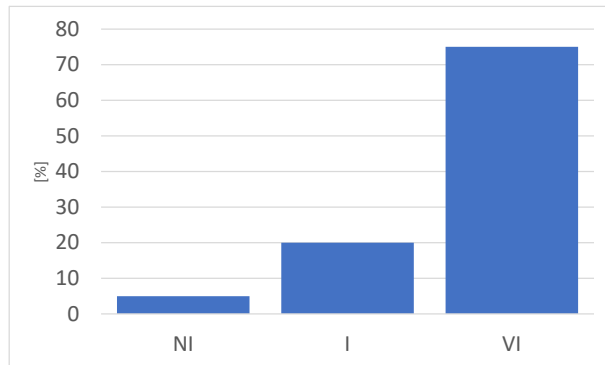


Fig.9. The importance of the quality of vintage audio equipment in the opinion of the respondents: NI – not important 5%; I – important 20%; VI – very important 75% [own study].

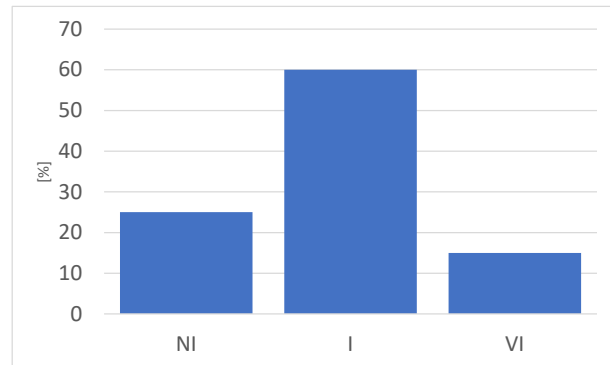


Fig.10. The importance of the aesthetic qualities of vintage audio equipment in the opinion of the respondents: NI – not important 25%; I – important 60%; VI – very important 15% [own study].

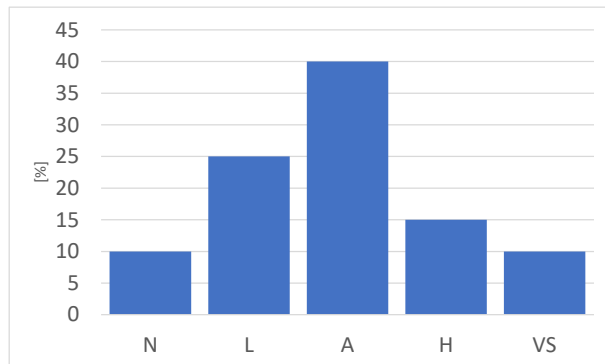


Fig.11. Significance of the price of vintage audio equipment in the opinion of the respondents: N – negligible 10%; L – low 25%; A – average 40%; H – high 15%; VS – very significant 10% [own study].

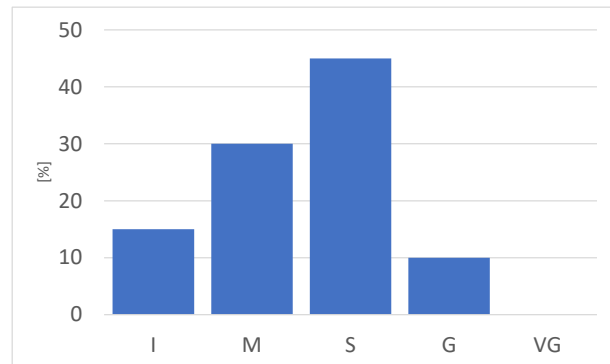


Fig.12. Quality of currently produced audio sets in the opinion of the respondents: I – insufficient 15%; M – mediocre 30%; S – sufficient 45%; G – good 10%; VG – very good 0% [own study].

Another survey question concerned the importance of price when buying vintage audio equipment. Of course, we are talking about the price on the secondary market for obvious reasons. The question also allowed us to determine whether buyers are willing to pay more knowing that they are paying for sound quality and build quality. For one tenth of the respondents, the importance of the purchase price is insignificant. The same number of respondents indicate this parameter as very significant. For sixty-five percent of the respondents, this parameter is of low or medium importance. The results for this survey question are summarized in Fig.11.

The next question from the questionnaire referred to the respondents' opinions on the quality of currently produced audio systems and sets. The approach to assessing quality in this case included subjective criteria such as sound quality, quality of materials used and perception of aesthetics. The results for this survey question are summarized in Figure 12.

Discussion of the Research Results

The largest age group were respondents over 41 (75%), and the least numerous (10%) aged 26 to 40. This is the result of changes that took place in the Polish economy after 1990. It can be said that then our country was flooded with a wave of dubious quality equipment imported from Western countries. Another factor that affects the small share of this age group is that they are professionally active people, bring up children and most likely lack the time (and probably also the financial resources) to pursue their own interests.

The education of the respondents has little influence on their interests towards electroacoustics. Nevertheless, the vast majority of respondents (75%) have technical education. The study did not specify the type of this technical education, and therefore it is difficult to say whether it is related to electroacoustics at least to a small extent.

The respondents know the concept of vintage audio very well. Eighty percent of the respondents assess their knowledge in this area as good or very good. Only twenty percent indicated sufficient. Certainly, this result is influenced by the popularity of the Internet, discussion clubs, forums, the availability of literature, online auctions and the very fact of owning and being interested in vintage audio equipment.

The level of individual technical knowledge in the field of electroacoustics in the self-assessment of the respondents is very good. Seventy-five percent of the respondents declare their level of knowledge in the survey as good or very good. Only twenty-five percent rate their knowledge as moderate or sufficient. The factors that affect this state are practically the same as for the knowledge of the concept of vintage audio.

Users' knowledge of the technical parameters of their vintage audio equipment is a very interesting phenomenon. Only ten percent declare that they know all the parameters of their equipment. The rest know only some or basic knowledge or do not know them at all (5%). Do users not attach so much importance to the parameters provided by manufacturers? Or maybe they just don't remember them or don't even try to remember them? These questions were answered in the survey in the next question. For eighty-five percent of the respondents, the importance of these parameters is low (65%) or very low (20%). It is hard to disagree with such an opinion. After all, we choose the equipment individually and our impressions are subjective and only the listening test is important.

In the opinion of the respondents, the failure rate of vintage audio equipment is very good. Fifteen percent of respondents assess it as negligible and seventy-five percent as small. This gives grounds to claim that vintage audio equipment is reliable. From the author's own experience, degradable elements (over time) may be a problem. Without going into details, this applies to belts and drive wheels (sprockets) made of plastic and the upper suspensions of the speakers (does not apply to suspensions made of canvas).

The sound quality of vintage audio equipment is very important to users. It is hard to be surprised and argue in this regard. After all, users strive for the best listening and the best possible acoustic experience. The same applies to the quality of the equipment, in particular the adjustment elements and the finishing materials used. This also affects the durability and reliability, which allows for long-term and trouble-free use of the equipment.

The aesthetic qualities of vintage audio equipment are of moderate importance in the opinion of the respondents. Of course, if we are dealing with nicely preserved specimens, the joy is double. It's getting harder and harder to find these on the secondary market.

The respondents also referred to the importance of the price of vintage audio equipment. It turns out that they are able to pay more for the quality of sound and workmanship as well as aesthetics than it would result from the economic calculation. This attitude results, among others, from the fact that the offer on the secondary market is limited.

The respondents assessed the quality of currently produced audio sets very critically. In their opinion, this assessment is as follows: unsatisfactory - 15%, mediocre - 30%, sufficient - 45%. No one indicated very good quality. Is it because of sentiment? To some extent, probably yes, but not entirely. This is evidenced by the research results presented earlier, relating to the expectations of users.

Summary

The issues that the author undertook to explore in the work are difficult. The first difficulty stems from the subjectivity of the criteria for evaluating audio sets and their differences from other consumer technical devices. Audio devices are perceived and perceived very individually (no two people hear and feel the same). Therefore, the subjectivity of the conducted research significantly limits their precision.

Conducting repeatable listening tests (especially in amateur conditions) is practically impossible. The perception of aesthetics, on the other hand, goes beyond the limits of quantification. Adoption of any scale in this respect will always result in a lack of appropriate accuracy.

Another difficulty that would seem to go unnoticed is the adoption of quantitative technical criteria. After all, you can compare selected catalog technical parameters and on this basis determine which audio set has better quality. It should only be noted that the differences between the parameters that actually determine the sound quality between individual devices are negligible. They are so small that the human ear cannot tell the difference. Therefore, such a comparison means nothing. A listening test is still necessary for verification, which invariably remains a subjective test.

It is worth emphasizing the fact that a small group of respondents took part in the study, among others because the population of users of vintage audio equipment is generally very small. So, are the test results representative? In that case, the fundamental question inevitably arises: what was the purpose of this article? According to the author, electroacoustics is a very developing and entertaining hobby. It provides entertainment and unforgettable experiences while listening to music. And what is very important, it shapes certain attitudes, teaches respect, patience, striving for perfection and deepens the broadly understood technical culture.

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