

The Digitization of Nikola Badev's Collection

1. Introduction

Limited lifetime (existing time) of the analogue sound carrier; their instability; obsolete systems for their reproduction; these are some of the reasons why digitizing has been introduced as significantly important process for preserving the audio heritage.

In the last few years, digital audio has reached a development extent that enables efficient usage in preserving audio collections of any size. The audio integration in information systems, the development of appropriate standards, and the wide acceptance of systems for digital audio usage, have replaced all other media for sound preserving in that extent, that practically there is no other option (www.iasa-web.org). Digital technology enables cloning of audio stored data without any losses. Distribution of data in such way keeps the art live and available.

Nevertheless, digital carriers, in long terms, could also be endangered. So, the way to eternity gets new dimension. Stored data constantly migrate from one type of carriers to another. The world has reached consensus that there is no other option than to accept data migration as the only strategy.

Currently in Macedonia, there is large quantity of material existing in analogue format. If this material is not digitized in near future, it will be fully gone. This would mean losing part of our cultural heritage forever.

By digitizing the collections of Firfov, Vidoevski, Hadjimanov, the Institute of Research and Music Archiving (IRAM) has become a leader in this field. Currently it is the only institution that is working towards protecting the audio cultural heritage and its safeguarding.

The wish to protect the cultural heritage, and in this case family heritage, has brought to cooperation between IRAM and family Badevi. Knowing the wish, the level of equipment and previous experience in the field of digitizing, Roska Badeva, the daughter of Nikola Badev, in March 2005, approached the Institute. She stated

that in her home collection she had possessed certain number of sound carriers which she would like to be digitized. The next action was getting the materials and samples and digitizing.

After we had got the materials, we saw that there were:

- 4 magnetic tapes
- 7 DAT
- 87 audio cassettes - all kept in board boxes.

Apparently, most of them are audio cassettes, which are most endangered sound carriers along with the stereo tapes.

The sound carriers were from different background:

- Magnetic tapes - BASF
- DAT - 4 **BASF**, 2 **TDK**, 1 **Maxell**
- Audio cassettes - 34 **TDK**, 14 **SONY**, 11 **Philips**, 9 **Maxell**, 4 **BASF**, 2 **IPLAS**, 1 **JVC**, 1 **SoundWave**, 1 **MARK II**, 1 **RTL**, 1 **Vox Tape**, 1 **Star Rex**, 1 **Merco** and 6 original editions.

On most of the carriers, the content was recorded on the carrier itself. Apart from the songs, that are dominant, we also noticed 13 audio tapes with radio programs dedicated to Nikola Badev.

1. Biography of Nikola Badev

Having in mind that Nikola Badev's life and musical activities are presented in monograph "Nikola Badev", in this short presentation of his biography we used information from this monograph.

Nikola Badev is one of the numerous performers who worked in the period after Second World War. He was born in 1918 in the village of Glishik, Kavadarci. On the age of 10 he starts to learn to play the violine. He was a member of the folklore ensemble in Kavadarci, the city choir of Vasil Hadjimanov, and later he becomes famous as a footballer in the football club "Jugoslavia". He meets Vasil Hadjimanov after the war, and it was this event that was crucial in determining of Badev's future career as a singer. In 1948 Badev makes his debut on the Radio Skopje programme. His shining career began. He became one of the legends who interpreted and affirmed Macedonian folklore.

"Do tri mi pushki puknale", "Mama Tode ucheshe", "Zalajala crna kuchka", "Petlite pejat den mi se deni", "Neli go vidovte Asaneja" were his first songs that he recorded on 5 August 1955 for Music Production of Radio Skopje. His first duet was with Mirvet Belkovska on 5 September 1955. For the Music Production of Radio Skopje he recorded over 200 songs, solo and duet. The motives of these songs are lyrical, love motives, humorous motives, revolutionary motives, motives from the life of Macedonians who go to work abroad. Badev has recorded over 100 records for music production companies in former Yugoslavia. The first record was made in 1952 for "Jugoton" with titled song "Teshka beshe nashata razdelba". In 1964 he won the golden record on the "Ilidja" festival for folklore music, and in 1967 on the contest "Septembar u Ivanjici", together with his daughter, Badev won the first prize. He often was a guest of "Tanec" ensemble, folklore groups from Skopje and the country. He also took part in concerts of folklore ensembles from Belgrade, Sarajevo, Zagreb, etc.

Many have said that Nikola Badev is an exceptionally talented singer, always vividly performing, with melodies richly ornamented. Nikola Badev is one of the few performers who have made the macedonian song famous all over the world. With his interpretation, Nikola Badev has left indelible marks in our folklore.

2. Digitization

The process by which an analogue signal is being replaced with a digital signal is called digitizing. For this process there are standards already applied by **IASA** (International Association of Sound and Audiovisual Archives) and **AES** (Audio Engineering Society). According to these standards the characteristics of the audio materials should retain, and no compression or any other processing (such as noise reducing) is allowed. Audio materials should be created in decompressed format such as AIFF (Audio Interchange File Format) or SD II (Sound Designer II). Currently, the most available standard in the commercial technology is the format of 44.1 KHz and 16 bits. Yet, IASA recommends the process to be done with sampling rate of minimum 48 KHz, and processing depth of 24 bits (The Safeguarding of the Audio Heritage: Ethics, Principles and Preservation Strategy Version 2, IASA TC 03 2001).

We have started with digitizing the magnetic tapes, and then DAT audio cassetts.

3.1 Digitizing the magnetic tapes

As it was already mentioned, we have received 4 magnetic tapes. For their digitizing we used:

- **Revox B77 Stereo tape recorder**
- **Motu Patchbay**
- **Yamaha O2R Sound Mixer**
- **Macintosh Computer**
- **Logic Audio 4.0 Softwer**

We first listened to the tapes in order to get to know their condition and the recorded material. On the tapes there were songs which had been rerecorded from a record.

The speed of magnetic tapes was 19 cm and 38 cm per second. The signal from the stereo tape recorder was transmitted to the patchbay. From the patchbay the signal was transmitted to the sound mixer by optical cable , and then to the computer where it was recorded in Logic Audio. Two of the magnetic tapes were recorded in Logic Audio without stopping, and the recording of the other two (19cm/s) was interrupted,

due to the length of the material, over 1 hour, and the software limited ability for recording up to 1 hour. The interruption was done prior to the limitation, in order to avoid a situation where a certain song would be cut.

2.2 Digitizing DAT (Digital Audio Tape)

In order to digitize these carriers we used:

- **TASCAM DA-20 MK II**
- **ProTools** Interface
- **Macintosh** Computer
- **ProTools 5.0.1** software

The sound from DAT was taken to the ProTools interface where an analogue signal is converted into a digital signal. Then the signal got to the computer where it was recorded in the ProTools Application and then saved on one of the hard discs.

Final documents were saved in **Sound Designer II (SD II) format, 44.1 KHz** and resolution of **16 bits**.

Same as the magnetic tapes, these carriers were recorded at different speed. Five out of seven DAT reproduced a material with 48 KHz, and the other two with 32 KHz (Long Play).

In order to save more material on a proper carrier we needed Long Play at DAT and lower speed at magnetic tapes.

The number of songs on these carriers caused some problems in digitizing. The most common problem that we faced with was the closeness of two songs in a row. With the end of the first song started the second song, so there was no possibility for the first song to be heard to the end. The reverberation of the end of the song was cut.

Some songs that were digitized from magnetic tapes were repeated in DAT records, but with better quality. These songs were also digitized in order to provide better sample of a certain song. The difference in the quality appeared because of the fact that the songs on stereo tapes were rerecorded from records, and the songs on DAT were rerecorded from magnetic tapes.

3.3 Digitizing audio cassettes

From the materials that were given to us the most numerous were audio cassettes. For the process of digitizing we used:

- **Marantz - stereo cassette deck**
- ProTools Interface
- **Macintosh** Computer
- **ProTools** Software

The way of digitizing the audio cassettes was similar to the one of DAT. This time the sound from the audio cassette was taken from the deck to the interface, and then recorded in ProTools application and saved on a hard disc.

The big number of audio cassettes emphasised the amount of material for digitizing. However, knowing the overall number of songs that Nikola Badev had recorded, over 200, and the fact that by then we had digitized 216 songs, we assumed that the audio cassettes contained already digitized songs. Eventhough the content of the cassettes was written on papers, we listened to all 87 cassettes in order to:

- Define the quality of the record
- Determine if we had already digitized some songs
- Determine if a same song is performed with different orchestra

The results showed that we had already digitized songs from DAT that were also recorded in the cassettes.

During the process there were some songs with certain noise, but we agreed, according to the IASA recommendations, not to make any changes.

3. Making a catalogue

After we had completed the process of digitizing we started with creating a secondary data base. Secondary data are also very important because without them it is impossible to easily identify and find certain audio samples.

For creating the data base we used sample from IRAM which has been used for digitizing other collections.

In the data base we defined:

- | | |
|------------------|--------------|
| - Duration | - Author |
| - Title | - Arranger |
| - Starting words | - Performer |
| - Language | - Digitizing |

- Tone centres
- Variants
- Comment

4. Catalogue results distribution

This material is carried through 375 units. 80 out of these 375 units are digitized from magnetic tapes, 135 units from DAT and 159 units are digitized from audio cassettes.

The digitized material from this collection is 15,8 GB (16, 967, 689, 454 bytes).

5.1 Duration

Total duration of all 375 units is 26 hours, 40 minutes, and 6 seconds.

Besides the songs, in the collection there are radio programs. Therefore we defined the total duration of the musical samples and the radio programs:

- Radio programs - 7 hours and 44 minutes
- Songs (and one dance) - 18 hours, 56 minutes, and 6 seconds.

The shortest musical sample lasts 1 minute and 23 seconds (song: “Teknuva li ti ludo”), and the longest sample lasts 6 minutes and 57 seconds (song: “Ajde slushaj, slushaj, kalesh bre Angjo”).

The average duration of a song is 3 minutes and 9 seconds.

5.2 Titles

In this section, we entered the titles in the column for author’s/performer’s title. We used the monograph “Nikola Badev” from Roska Badeva to determine the correct titles. In the “title” section we entered 359 titles of songs and 1 title of a dance. The titles of the radio shows were entered in the “comment” section.

From the entered titles there are:

- 54 cases where one title of a song appears twice
- 23 cases where one title appears three times
- 13 cases where one title appears four times
- 2 cases where one title appears five times
- 1 case where one title appears six times.

The other titles appear only once.

There were some cases where songs with same melody have one different word in the titles. For example: “Bolna e legnala” and “Bolna e padnala”; or “Bolna e legnala mladata madjirka” and “Bolna e padnala belata madjirka”. Regardless their melodies, we considered these titles different.

5.3 Lyrics incipit

Same as the previous column, in this section we entered 359 starting words of songs. There is no starting words in the cells for the radio shows and the instrumental “Veleshko oro”.

In 91 cases there is reappearing of the starting words.

5.4 Language

Viewing the information given in this section, we came to these numbers:

Language	Number of songs
Macedonian	351
Serbian	8

This section gives the language on which the songs from the collection is performed. If we add the 15 songs from the radio programs, we come to a number of 366 units in Macedonian language.

There are also songs in Serbian language because apart from MRTV, Badev had recorded songs for productions in other Yugoslav republics.

5.5 Author

For information in this section, we again used the monograph “Nikola Badev”. In this monograph we could find songs of which Badev himself is the author of music or lyrics. We also found names of other authors.

We have information for authors of music of 49 out of 359 songs.

Author of music	Number of songs
Nikola Badev	27
Stelios Kazandzidis	5
Nasko Djorlev	5
Gjorgji Zelchevski	2
S. Atalidis	2
Stevo Teodosievski	2
L. Manchevski	2
B. Stefanovski	1
Mate Gruevski	1
S. Tordelis	1

Nikola Badev is the author of 27 songs. This number is smaller considering the fact that digitized are same songs recorded with different orchestra, or same records digitized more times. For these songs, the authors are entered again in the data base. For example, the song “Mavrovo” from Gjorgji Zelchevski is recorded twice with different orchestra, even though Gjorgji Zelchevski is an author of one song only.

In the column for author of lyrics there are information for 19 songs.

Author of lyrics	Number of songs
Nikola Badev	11
G. Georgiev	3
B. Stefanovski	2
R. Ristevski	2
Asan Mehmedov	1

In this category the same author appears when a song is repeated.

In the column for unknown author there are 298 songs. This is expected because it is the subject of folklore.

Due to lack of information about correct names, some of the authors of music and lyrics are incomplete.

5.6 Arranger

In this category we have information about 15 songs.

Arranger	Number of songs
Nikola Badev	5
Kocho Petrovski	3
Nasko Dzorlev	3
Nikola Galevski	3
Stevo Teodosievski	1

The number of arrangements of these authors is larger. For example: knowing the style and the orchestra of Teodosievski, we believe that in every song where the music is played by the orchestra Stevo Teodosievski, the arranger of the song is Stevo Teodosievski himself. If we entered those information, the number of arrangements of Stevo Teodosievski would be 10. However, we entered the name of the arranger only in cases where we had accurate information. We again used the monograph “Nikola Badev”.

5.7 Performer

In this section, there are several categories: vocal soloist, vocal group, instrumental group and structure.

In the category “vocal soloist” Nikola Badev appears 291 times and Vaska Ilieva appears once. Vaska Ilieva as a soloist is included in this collection because of the song for Nikola Badev after his death.

In the category “vocal group” we entered the songs where Badev does not appear as a soloist.

Duets with:	Number of songs
Vaska Ilieva	27
Anka Gieva	17
Aleksandar Sarievski	4
Atina Apostolova	4
Blagoj Petrov-Karagjule	3
Dragica Nikolova	3
Esmā Redjepova	3
Roska Badeva	2
Mirvet Belovska	1
Rada Simonova	1
Suzana Badeva	1

There are three songs with Aleksandar Sarijevski and Vaska Ilieva, and one trio for which we did not have any information regarding the singers who sing together with Nikola Badev.

From the information in this category it can be figured that 70 songs in duet from this collection have been digitized. Most of these songs are duets with Vaska Ilieva and Anka Gieva, which refers that these two singers are Badev's most common assistants.

In the category "instrumental group" we entered the orchestras that had played while recording. Here are the information on this section:

Number of records with:	Number of songs
Folk Orchestra of RTS (MRTV)	143
Chalgii Orchestra of RTS (MRTV)	75
Orchestra of Folklore Instruments	51
Orchestra of Nasko Djorlev	23
Orchestra of Kocho Petrovski	16
Ensemble of Stevo Teodosievski	10
Ensemble of Dushko Radetik	4
The Small Radio Orchestra of RTS (MRTV)	4
Folklore Instruments Orchestra of Pece Atanasovski	4
Orchestra "Biljana"	3
Orchestra of Boki Miloshevik	2

Nikola Badev recorded the most songs with the orchestras of MRTV, preferably the Folk Orchestra, then the Chalgii Orchestra and the Orchestra of Folklore Instruments. The songs in Serbian language had been recorded with orchestras from Macedonia, and Macedonian songs had been recorded with the orchestras of Dushko Radetik and Boki Miloshevik.

In the section "structure" we recorded the composition of the orchestras according to our listening.

Composition	Number of songs
Acc, Vl, Cl, Fl, G, Kb	88
Acc, Vl, Cl, Fl, G, Kb, Drums	29
Acc, Vl, Vla, Cl, Fl, G, Kb, Drums	16
Acc, Tar	12
Acc, Vl, Cl, G, Kb	7
Acc, Cl, Fl, G, Kb, Tar	6
Acc, Cl, Fl, Tr, G, Kb	6
Acc, Cl, Fl, Kb, Tar	4
Acc, Cl, Fl, Tr, G, Kb, Dr	3
Acc, Cl, Tr, G, Kb	3
Acc, Vl, Cl, Fl, G, Kb, Dr	3
Acc, Vl, Cl, Fl, G, Kb, Tmb, Dr	2
Acc, Cl, Fl, G, Kb, Dr	2
Acc, Fl, G, Kb	2
Acc, Fl, G, Kb, Buziki, Organa	2
Acc, Cl, Fl, G, Kb	1
Acc, Cl, Tr, Vl, G, Kb	1
Acc, Vl, Cl, Fl, G, Kb, Tar	1
Acc, Vl, Fl, G, Kb, Drums	1
Acc	1
Acc, Fl, G	1

On this table you can see information about number of songs with certain composition of folk orchestra. Most songs are recorded with orchestra consisted of: accordion, vilone(s), clarinet, flute, guitar and contrabass (double bass). Later, when percussions and string instruments were included, especially in the Folk Orchestra of MRTV, the number of songs recorded with this structure of orchestra was enlarged.

When we were not certain for the presence of some instrument, we wrote the abbreviation of the instrument with a question mark next to it (?), or we put both instruments, for which we were not sure, in brackets.

Composition	Number of songs
Acc, Vl, Vla?, Cl, Fl, G, Kb	2
Acc, Fl, Vl, G, Kb, (Tmb?)	2
Acc, Cl, G, Kb, Dr (Tmb ili buzuki)	2
Acc, Cl, Fl?, G, Kb, Tar	2
Acc, Vl, (Vla, Vc?) Cl, Fl, G, Kb	1
Acc?, Vl, Cl, Fl, G, Kb	1
Acc?, Vl, Cl, Fl, Kb	1

Acc?, VI,(Vla,Vc?) Cl, Fl, G, Kb	1
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Within the Chalgii Orchestra the following composition appears:

Composition	Number of songs
VI, Ut, Kanun, Cl, Tar, Dr	30
VI, Ut, Kanun, Cl, Tar	28

Same as the folk orchestra, when we were not sure of the presence of some instrument, we put question mark next to the abbreviation, or in brackets we put the both possible instruments.

Composition	Number of songs
VI,Ut, Kanun ?, Cl,T ar	4
VI,Ut (or djumbush), Kanun, Cl, Tar	3
VI,Ut (djumbush), Kanun, Cl, Tar, Dr	2

In the songs recorded with folklore instruments we registered the following compositions:

Composition	Number of songs
Tmb, K, Tp	37
Bp,Tmb, K, Tp	11
Tmb, Tp	2
Tmb, K, Tp, Dr	1
Tmb, K, Tp, Tar	1
K	1
K (trio kavali)	1

From the table it is obvious that within the orchestra of folklore instruments the most common composition is: tambourine, kaval and drum.

5.8 Digitizing

Information about the process of digitizing are already given in the detailed description of the process.

5.9 Tone centres (Sound centres)

Besides the categories in the catalogue, we made a research where we registered the note centres of the digitized songs. Accurate modus of songs would be aim of another research that could answer questions about Nikola Badev's voice extent, the presence of certain modus with a certain type of orchestra, etc.

For defining a tone center we used temperate 12 tone system with average pitch of 442Hz. In this way we defined the tonal center of 359 samples.

Here are the results:

Tone center	Number of songs
D	64
G	54
F	53
E	37
C	25
Es	23
As	21
Fis	20
A	18
B	17
Cis	12
H	6

Besides these examples, we came across some songs where the tone center was distant from the regular half steps.

Tone center	Number of songs
Between E and F	4
Between G and As	4
Between Es and D	1

The reasons for this can be many:

- Rerecording from one carrier to another
- The speed of the recorded material
- The carrier condition

5.10 Meter

In this document we did not include information about the meter of the songs, as they are included in the monograph “Nikola Badev”.

5.11 Variants

In this part we recorded the variants that occurred during digitizing.

We divided the following:

- Variants with same type of orchestra
- Variants with different type of orchestra

Variants	Number of songs
Same type of orchestra	72
Different type of orchestra	20

Within “variants with same type of orchestra” we took into account songs where all samples are recorded with one type of orchestra. For example - Ah, mori Maro devojche (No. 225, 217 - Folk Orchestra of MRTV).

In this number of songs we also included the songs that we consider to be identical records but digitized twice in order to provide better sample of the song.

In the following table you can see distribution of same songs recorded with different type of orchestra.

Variants with different type of orchestra	Number of songs
Folk orchestra - folklore instruments orchestra	10
Folklore orchestra - chalgii	9
Chalgii - folklore instruments orchestra	1

In presenting the variants we included one more category: variants of same songs with different title. There are seven samples:

1. “Aleksandar Turundje” and “Crno mu bilo pishano”
2. “Despina”, “Pesna za Despina” and “Golema ridja ti chinam”
3. “Kichice bujna labodo” and “Kichice bujna golema”
4. “Mi zaplakalo seloto Vatasha” and “Vatasha”
5. “Snoshti mi dojde edno ludo mlado” and “Snoshti mi dojde ludo mlado”
6. “Ne mi go lazji Gjorgji Mareto” and “Ne mi minuvaj Gjorgji niz dvori”
7. “Ogin gori vo planina” and “Ogan gori vo seloto”

5.12 Comments

In the section “comments” we recorded three types of information:

- what carrier are digitized songs from, its type and number (for example: DAT 5; cassette Chalgii 1 etc.).
- some obvious characteristics of the songs that were noticed while digitizing (for example: it is not whole; left signal only; the signal intensity varies).
- information of the radio shows titles.

5. Conclusions

In this document we showed the process of digitizing Badev's collection.

The collection included 4 stereo tapes, 7 DAT and 87 audio cassettes.

The collection was digitized in IRAM in the period of 31 March to 15 July 2005.

For the process of digitizing we used the existing hardware and software in IRAM.

Total duration of digitized material is 26 hours 40 minutes and 6 seconds, 15,8 GB (16, 967, 689, 454 bytes).

Digitized files were in 44.1 KHz format and 16 bits.

We created catalogue in which there are 13 categories.

The catalogue enables comprehension in distribution of:

- Duration
- Title
- Starting words of the song
- Language
- Authors of music and lyrics
- Performers
- Variants
- Digitizing

We made an additional research for tone centers of the songs and we created a register of songs from the catalogue.

The final version of the catalogue will surely require additional research in order to fill in the cells where information is missing.

Digitizing this material enables longterm existence of interpretations, as well as Badev's repertoire where many beautiful songs from the macedonian traditional music can be found.