

CREATION OF RARE MUSICAL COMPOSITIONS DATABASE RECORDER  
ON EDISON PHONOGRAPH CYLINDERS.

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Collections of Edison phonograph cylinders are stored in the libraries and museum of Ukraine. These collections contain the records of scientific and cultural figures' speeches as well as the musical compositions of various genres pertaining to the first half of the XXth century.

The Vernadsky National Library of Ukraine is the world's foremost repository of Jewish folk music recorded on Edison wax cylinders. Comprising over one thousand cylinders with two to seven minutes of music each, the collection contains historical recording made from 1912 to 1947 in Jewish areas of the Ukraine and Belarus. These recordings represent the painstaking works of two generations of Eastern European Jewish Folklorists and chronicle the achievements of folk musicians during the Pre- and Post-Revolutionary periods of Ukrainian history.

The concept of ethnographic expeditions aimed at the collecting these valuable materials originated with the well-known Jewish folklorists and writer S. An-sky (pen-name: Shlomo Rappoport) who lived in 1863-1920. Initiated by the Jewish Historical and Ethnographic Society in St. Petersburg, and funded by patron of the arts Goratsii Ginsburg, the project saw its genesis in folkloric expedition from 1911 to 1914. Besides S. An-sky, many outstanding representatives of Jewish culture participated in this expeditions, including Julii Engel, composer and music expert (1867-1927), Zinovii Kiselhof, folklorists (1878-1939), and Solomon Judovin, artist (1892-1954), to name but a few. In 1912 and 1913, just prior to World War I, the expedition managed to explore and ethnographically examine the Volhynian and Podolian regions, than bring together and classify the enormous and invaluable collection of data.

The participants in these expeditions were able to execute recordings, on Edison wax cylinders, of various genres of traditional Jewish music: wordless chants, instrumental performances, songs and synagogal liturgies. Today, these recordings make up a virtually inexhaustible source for approaching the art and traditions of the early twentieth-century Ashkenasi Jews. The majority of these wax cylinders recordings have been preserved perfectly up to the present day, adding greatly to the value of the collection.

After the Revolution, especially in the 1920s and 1930s, the Soviet authorities seemed to adopt a rather more benevolent stance toward the eternally persecuted people, and once again, opportunities opened to the Jewish folklorists to continue the work of their predecessors. The period saw the organizations of the Cabinet for Musical Folklore of the Ethnographic Section of

the Institute for Jewish Culture in Kyiv, with phonographic archives contributed by numerous ethnographic expeditions. The expedition work had come to be regular, comprehensive and wide-ranging, primarily due to the efforts of the prominent folklorist, Moisei Beregovskii. As well, efforts toward deciphering, cataloging and archiving the voluminous research material achieved high standards. Beregovskii and his colleagues visited Kyiv and Odessa, main centers of Jewish culture in the Ukraine, as well as such diverse places of Jewish residence as Berdychiv, Sudykiv and Medzhybizh in Volhynia, Podolia and the Western Ukraine.

In 1930, the collection of the Ethnographic Section of the Institute for Jewish Culture in Kyiv was expanded with several valuable contributions. The Phonographic Archive of the Museum for Jewish History and Ethnography was transferred to Kyiv: at the same time Julli Engels' daughter presented the Institute with her father personal collection of wax cylinders.

In 1936, the Institute was transformed into the Cabinet for Jewish Culture of the Ukrainian Academy of Sciences, and in 1940, Antonina Kisselhof, daughter of the late Zinovii Kisselhof, generously donated her father's private collection of musical records to the Cabinet.

During World War II, the photographic archives of the Cabinet for Jewish Culture (as well as the holding of various other academic institutions) was evacuated to the city of Ufa in the Urals region. After the war, the archives were returned to Kyiv and, henceforth, housed at the Vernadsky National Library of the Ukraine. Unfortunately, the phonographic archives did not see the light of cultural exposure or research work for almost fifty years.

Unfortunately, Edison phonograph cylinders don't allow to repeatedly reproduce the recorded phonograms because of the soft wax surface deformation. Besides, as a result of long-term storage, the surface of the most phonograph cylinders was strongly polluted with dust particles, covered with great amount of scratches and cracks. Some samples were affected by microorganisms which strongly distorted phonograms recorded on wax cylinders.

There is only one way to do the phonograph records accessible for the wide circle of investigations, to store them for the coming generations - that is to rerecord them on the modern data carriers. Unfortunately, no one of the existing data carriers type including digital magnetic tapes, CDs, doesn't provide the guaranteed phonograms storage within decades.

Nowadays, the only way out is to record digitally, record them on the existing carriers and periodically, over 20-30 years, carry out their recording on the new carriers. This isn't too difficult at information rerecording from magnetic tapes, however, Edison cylinders phonograms rerecording needs the development of special equipment which would allow to carry out the non-destructing high quality information reading.

Our Institute proposed and carried out the interferential optomechanical method of Edison cylinders phonograms reproduction. The sound track surface provide reading is made by elliptical stylus rigidly connected with the interferometer movable prism. The interferometer prism bias is measured with  $0.01 \mu$  accuracy. The proposed pattern allow to read and record digitally the sound track profile. If necessary, you may process the recorded profile: to approximate scratches and cracks insertions on the phonograph cylinder which during subsequent differentiation would result in broadband noises emergence. Information read from the phonograph cylinder is stored both in the form of the sound track surface profile and in the form of the phonogram. To specify some fragments of the phonogram, the researcher has the possibility to carry out the surface profile analysis, to apply the more perfect methods of sound restoration.

To reduce the sound pick-up effect on the sound track the surface profile reading is carried out at the phonograph cylinder rate 25-30 times lower than information recording rate which reduces the dynamic load more than 500 times. Besides, the stylus pressure doesn't exceed 0.2g.

Using the method proposed by our Institute the equipment for Edison cylinders sound reproduction was developed and manufactured which allows to reproduce signals from Edison cylinders in the bandwidth up to 20 KHz.

We had carried out phonograms rerecording from more than 700 phonograph cylinders from Beregovsky's collection which is stored at Vernadsky National Library of Ukraine. From produced phonograms the database is formed in which, except for phonograms the original note records of musical works made up on the phonograph cylinders as well as the information about performers. We plan to do this database the part of the National Bank of Computer Information of Ukraine to which the access is open through the Internet.