

# RE-RECORDING STANDARDS FOR PHONOGRAPH RECORDS\*

by Walter L. Welch - Audio Archives, Syracuse University

There are now several ways to record sound but this discussion will be confined to the re-recording of phonograph records, cylinder and disc, to the now most common and convenient intermediate medium, magnetic tape. The problem is how to get onto the tape with maximum fidelity the voices or music from the original records.

It may seem incongruous to us, in view of the present capabilities of record-reproduce systems, that no commonly-agreed and adequate criteria exist for assessing the relative fidelity of even the most primitive cylinders. This is because acoustical recording was both simple and direct. It began with the introduction of the improved Edison business phonograph in 1888 which employed shaveable wax cylinders.

Recording was done with a short conical horn, or a speaking tube. The listening was through stethoscopic ear tubes. Even though larger horns were later used for recording ensembles and for playback, the important fact is that ear tubes were used by all manufacturers of cylinder records--in the United States and abroad--to evaluate the faithfulness of the recordings. Therefore, in re-recording cylinders the way to employ this criterion is by recording onto tape to get the same quality from the tape as reproduced by high-quality earphone headsets.

The earliest discs were the Berliner's and by comparison these were very noisy in surface due to the way they were mastered. We have found that the early open horn Victor talking machines reproduce all of the early 7" Berliner discs, Climax and Columbia discs better than other methods. Actually, the model V Victor also was the standard instrument for which the Victor records of the early 10" and 12" diameters were designed. The "exhibition" sound-box was used, with steel needles. Medium tone steel, with the continuous taper, produces the least distortion. Electrical pick-ups may be used, but solo voices and instruments as electrically re-produced should be compared with the reproduction from a standard instrument for which the records were originally designed, when possible.

Pathé sapphire ball discs were re-recorded from master cylinders by a pantographic process. It is possible, therefore, to evaluate quality by use of ear tubes. It would be wonderful if the master cylinders had been preserved, but alas, this is not true. Many were later processed to the lateral Pathé Actuelle discs. Here a quality control is possible where copies of both the vertical and lateral discs are available. In 1920, Pathé introduced a very simple mechanical cone reproducer which would play either vertical or lateral discs of any type. Properly conditioned, the Pathé Actuelle phonograph is a useful instrument for determining proper playback quality, and for making comparisons between vertical and lateral recordings of the voices, instruments or performances.

Edison introduced the diamond disc phonograph in 1912. From 1914 to 1927, direct comparison tone tests were conducted from coast to coast

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in the United States and Canada in which well-known artists played or sang in direct comparison with their performances as reproduced by an official laboratory model Edison disc phonograph. These were enclosed in a variety of cabinet styles and were sold in sufficient quantity so that it is still not too difficult to secure one in nearly every area. It is very revealing to compare the Edison recordings of Anselmi, Bonci, Bori, Zenatello and others with their Fonotipia, Victor and Columbia recordings on other equipment. Not only is it possible to verify the quality of re-recording of Edison discs through this standard, but it is also possible to compare the disc reproduction with that of the Edison Blue Amberol cylinders, most of which were dubbed from the discs after 1915. In this way, stethoscopic analyses can also be checked against the open-air reproductions. It is notable that when Edison electrified the disc recording system in 1927, the new type records were playable with complete satisfaction upon the earlier Edison disc phonographs of 1912.

Although the lower fundamental frequencies were not completely reproduced, the voice and solo voice timbres were comparable quite completely with the same voices as had been recorded previously in the acoustical recording era. This was not true of the competing lateral disc instruments.

However, the introduction of the Orthophonic Victrola and the Columbia Viva-tonal phonographs in 1925 had provided in the larger re-entrant horn models a standard for which the Victor and Columbia records were designed for a period of more than five years. In this connection, it must be noted that the prior enclosed horn models of the acoustic era, such as the Victrola and the Columbia Grafonola, are quite worthless for evaluating sound reproduction from the corresponding makes of records, despite the photos of Caruso, Scotti and others in the monthly supplements apparently listening with pleasure to their latest releases!

After the introduction of treble pre-emphasis in the 1930's as a means of overcoming surface noise, the acoustical reproducing instruments were rendered obsolete. In the years following, a period of virtual anarchy resulted from the many companies coming into the renaissance of the phonograph industry after the depression years. Each company in the United States and abroad went its own way and adopted its own recording curves and standards. This continued well into the LP era and the almost complete lack of standard playback instruments complicated the problems.

During these years, the high fidelity movement began in England and spread to the United States. In the absence of overall criteria various manufacturers developed and sold components for high fidelity systems--still a large factor in the present market. One of the companies in the United States, McIntosh Laboratories of Binghamton, New York, made a specialty of building high-quality amplifiers and pre-amplifiers. To make it possible for consumers to know when they were getting proper reproduction from the records of various companies and periods with their custom installation, McIntosh engineers made an analysis of the recording curves of all the makes on the market and designed a flexible pre-amplifier

which would appropriately contour the reproduction curve for a particular make of record during a particular period.

In re-recording today, this work of the McIntosh engineers is still available through the information which has been preserved, even though the units then made for the purpose are no longer on the market. As more universities set up archives, and more music libraries wish to have available the fruits of the first eighty years of sound recording in the best form, the more probable it will be that McIntosh Laboratories may be induced to assist in the development of similar apparatus and standards similarly applicable to all recordings of the past, and to collaborate in the establishment of overall standards for the future.

## COMPUTER MACHINE-READABLE CATALOGING AT THE ARCHIVE OF FOLK SONG - LIBRARY OF CONGRESS\*

Summary of Feasibility Study Report

by Joseph C. Hickerson, Library of Congress

In 1966 the Library of Congress received a grant from the Council on Library Resources, Inc., for the purpose of ascertaining the economic feasibility of creating a machine-readable master catalog for the sound recording collection of the Archive of Folk Song, by means of computer technology. The specific task in the project has been to establish the kinds and forms of catalog entries which would be useful in a machine-readable master catalog, and to determine the amount and nature of work that would be required to process the entire archive.

A maximal list of data items was first compiled and listed on four separate worksheets: one for a whole collection (e.g. --Lomax, Louisiana, 1937) gives pertinent data common to all recordings in the collection; a second worksheet provides technical data on the original recording (e.g. --type, speed, etc.); a third on the performer (e.g. --ethnic and biographical data); and a fourth, the most elaborate, on each song (e.g. --title, first line, subjects, etc.). Time studies were made of the worksheet filling process, and also of abbreviated versions of the worksheets.

In order to avoid the prohibitive cost of programming a completely new format, a skeletal listing of 29 items of information was adapted to the then-existing MARC I format, permitting the running of information on five songs on the computer and producing an editing printout. The study was limited to English-language titles. The result of the time study favors the maximal listing, since the difference in time consumed between it and the abbreviated forms was not great.

Now that its feasibility has been demonstrated and its cost projected, a full catalog of the Archive is being planned. The procedure, developed during the pilot phase, will be as follows:

1. Typist fills in Collection Worksheet and passes it to folklorist-cataloger for completion.
2. Recording Worksheet filled out by typist and folklorist-cataloger.
3. Performer Worksheet filled out by technician-cataloger.