

# About the PA eroll files

By *Peter Phillips*

## Overview

These notes give some background history and information about the Phillips-Ampico eroll files now available on CD-ROM.

## Background

The first “full fidelity” piano roll recordings were made in 1905, by the German company Welte and Sons. These rolls not only recorded the notes being played, but how loudly. This invention spawned a huge industry, as for the first time those that could afford it were able to have concert performances on their living room piano.

By 1915, numerous companies were producing their brand of “reproducing piano” and the rolls to go with it. The major names were Welte, Hupfeld, Duo-Art (from the Aeolian Company, who coined the term ‘Pianola’), and the American Piano Company, known as Ampico. The recordings described here are from Ampico reproducing piano rolls.

The reproducing piano industry was huge, employing thousands, and of course making recordings of virtually every famous concert pianist, as well as a host of popular pianists. It all ended with the depression, and faded away to virtual obscurity by the end of the 1930s. The legacy however is a vast number of reproducing piano rolls, covering a huge range of pianists and musical styles.

Arguments rage as to how faithful these roll recordings are. Certainly the pianists who made the rolls felt the results were authentic, often signing to this effect. But more importantly, as many enthusiasts of the reproducing piano hobby will attest, the results are as musical and entertaining as recordings made today.

## History of the eroll files

This collection of eroll files represents the culmination of over 20 years of work. In principle, each piano roll was recorded electronically to produce a computer file that would operate an Ampico through a system of my own invention. I had this operating during the early 1980s, and over the next 10 years I gathered rolls from around Australia, eventually recording nearly 1500 rolls.

As far as I know, I was the first person to make a piano play from a computer, and to make it commercially viable. Today, there are some 20 collectors in Australia who currently own, or have owned my system.



*Peter Phillips in 1979 operating his roll recording machine.*

During the 1990s, MIDI technology saw instruments such as the Disklavier and the PianoDisc become almost consumer items. As the owner of a PianoDisc, I was keen to convert my Ampico files to MIDI, so they could be played on a MIDI piano. A colleague (Ross Chapman) had the required technology, so he spent a year converting each file in real time to a range of formats.

The end result of the conversion process from the original Phillips format is now over 1430 eroll files in three formats:

- **Bar/Ann** – first released in 2001 for use with WindPlay and the PowerRoll (an electronic device that fits over the tracker bar of a piano like the Ampico).
- **e-MIDI** – so called as each hole (including the expression holes) is represented as a MIDI note. These files are similar to the Bar/Ann files, but can be played with any MIDI sequencer (eg Cakewalk) into an Ampico piano fitted with either a PowerRoll or the Gerety/Chase MIDI valve system.
- **MIDI** – for playing on any MIDI instrument or device. These files are optimised for use on a MIDI mechanical piano like the Disklavier, and also give excellent results when played through an electronic piano or computer sound card.

### **MIDI emulation**

A reproducing piano roll has the note dynamics recorded as holes that represent something to the playback system in the piano. A MIDI file stores this information as digital codes (called the *velocity*). This means the piano roll expression coding had to be converted to MIDI velocity values with a program called an *emulator*.

The process of creating MIDI files from roll scans is relatively straightforward, providing the roll scans are of good quality. An issue to consider however is the *accuracy* of the conversion process from Ampico expression to MIDI velocity values. That is, does an eroll MIDI file produce the same volume levels that would be produced if the roll is played on a well-adjusted Ampico?

Fortunately, the Ampico expression system is predictable, allowing equally predictable MIDI emulations. This is not the case with say Duo-Art rolls, where the expression system relies on its inefficiencies to give certain dynamic effects.

As mentioned, the PA MIDI files have been optimised for use on a mechanical piano, such as the Disklavier or PianoDisc. Initially I owned a PianoDisc (in a 6'6" Yamaha), replacing it in 2002 with a C7 Disklavier. Owing both types of instruments has allowed these files to be tested extensively.

### **Processing and cataloging**

Although the conversion process was completed in early 2000, there was still a lot to be done. All files needed a file name and the MIDI and e-MIDI files had to be titled so the item name would be displayed during playing. The first CD-ROM (released 2001) contained Bar/Ann files only. It was to take a further two years to fully process the MIDI and e-MIDI files.

Next came the task of cataloging the files. As these are historical, the date each roll was recorded is included (for about 85% of the listing) along with the first name of each pianist, and the real pianist behind the pseudonyms that were used.

### **The roll scans**

A singular advantage with the roll recording system we used was the ability to monitor the performance on an Ampico piano during recording. Some rolls were more demanding than others, sometimes taking considerable time to get the best possible recording.

Because the roll scanner was adjusted to play a roll directly into a mechanical piano, the roll scans therefore took into account the mechanics of the piano. That is, the points at which notes start and stop are set to give the best results, unlike optical scans where these points are determined by post processing computer software.

Piano rolls are man's first high fidelity recordings. As a piano roll is a digital recording, converting these to digital computer files means nothing is lost during the process, giving a huge range of quality music that can be played on modern pianos.

## The roll scanning machine

As shown below, the Phillips roll recording machine uses a combination of air and electronics to read the roll information.

The roll being recorded is placed in a spool box pressurised with air. Each hole in the tracker bar is connected with a tube to a small pouch, which inflates when a hole in the roll allows air through. A small metal disc sits on each pouch, which when inflated lifts the disc, allowing a radio signal to pass through, turning on an electronic device. The rest of the machine has to process the information, which it does 55-60 times a second.

This arrangement was used rather than optics, as I found too many inconsistencies occurred when rolls were “read” with light. These days, technology has solved a lot of these issues, but I still believe the best way to read a roll is the way the manufacturer intended: with air.

## The future

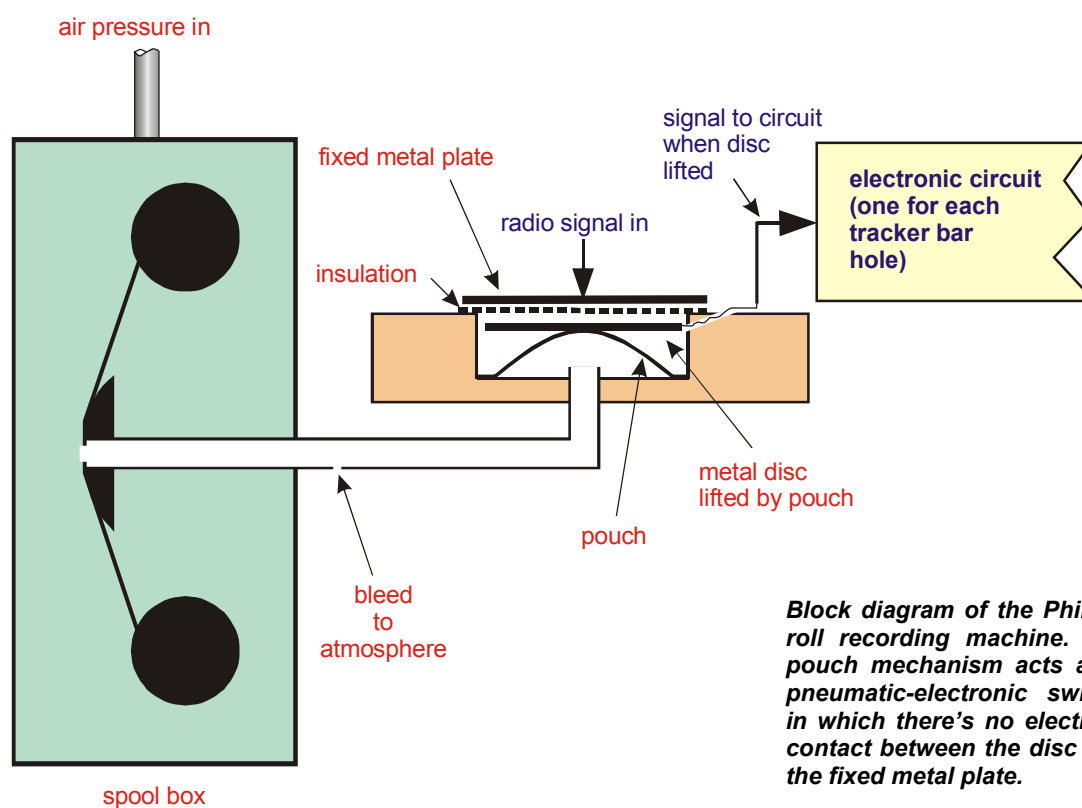
Sales of these files will allow me to continue recording more Ampico rolls. My aim is to record the entire Ampico catalog, preserving it for future generations. The fact that these files sound so good on an electric reproducing piano will ensure their survival.

As well, I hope to expand the amount of historical information included on the CD, such as notes about the music, composers and pianists.

## Further information

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**Block diagram of the Phillips roll recording machine. The pouch mechanism acts as a pneumatic-electronic switch, in which there's no electrical contact between the disc and the fixed metal plate.**