



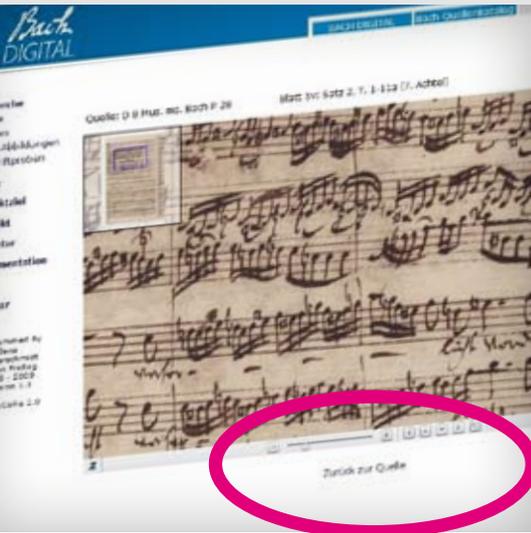
The Staatsbibliothek zu Berlin is one of Germany's largest research libraries

Facsimile Quality for Research Purposes

Musicologists and others passionate about Johann Sebastian Bach have long dreamed of easily accessing the great composer's original scores and other handwritten manuscripts. Then came the extraordinary project called 'Bach Digital', www.bach-digital.org, which is supported by the Deutsche Forschungsgemeinschaft (DFG), to bring together in a single digital library all the hundreds of original manuscripts of the great German composer, and to make them freely available online. Achieving high-resolution scans constituted one of the major challenges of the project. Much like Bach's music, the scans had to have 'extraordinary perfection'.

“Our benchmark for quality was the faithful reproduction of the historical originals”

Andreas Mälck, head of the Staatsbibliothek's Department of Preservation and Digitisation



High-resolution scans by Zeutschel OS 14000 make visible the tiniest detail of notes and handwritings

The importance of digitisation

Since the performance of a particular piece of music can vary greatly from individual to individual, musicologists believe it is important for people to be able to view the original handwritten score exactly as the composer set it down in notes. Bach himself believed that the score offered the only reliable means of truly recognising musical perfection.

By preserving the originals, you can therefore not only marvel at the extraordinary perfection of Bach's genius, but also admire the artistry of his calligraphy. In addition, the originals often offer a fascinating insight into the way Bach composed his music. For example, when the quality of resolution is high and the reproduction very fine, you can, by enlarging a digital copy, even see corrections and changes that Bach and others made.

The Staatsbibliothek zu Berlin – Preußischer Kulturbesitz (Berlin State Library - Prussian Cultural Heritage), provides safekeeping to about eighty percent of Bach's surviving handwritten works, fragments and scores. A further ten percent are in the possession of the Sächsische Landesbibliothek (Saxon State Library) and the Staats- und Universitätsbibliothek Dresden (National and University Library at Dresden), as well as the Stiftung Bach-Archiv at Leipzig (Bach Archive Leipzig Foundation).

Given the historic importance of the original handwritten Bach manuscripts, the process to physically preserve the delicate sheets of paper was initiated in the late nineties, using a com-

plex manual process. These physically restored handwritten manuscripts were then put onto black-and-white microfilm.

New user benefits are generated as a result of the digitisation process. This includes more comprehensive research possibilities as well as access independent of place and time. The quality of the high-resolution digital copies is also substantially greater compared with the fiches.

'The Bach Digital project not only reunites separated works virtually, it relieves the workload of the libraries that own them and, most importantly, goes easy on the handwritten manuscripts themselves,' explains Dr Martina Rebmann, head of the Music Department at the Staatsbibliothek zu Berlin.

Extraordinary perfection for Bach

All preconditions for implementing the digitisation project were favourable. A database of sources, for example, already exists with comprehensive metadata and a wide range of research possibilities. This database is now being supplemented with images of the handwritten manuscripts.

But expectations of quality have been high, and not only because in a musical score the reproduction must be very precise. 'The tiniest detail, even a small difference in stroke, must be clearly visible,' Dr Rebmann stressed. Andreas Mälck pointed out that repeating the scanning process was not an option given the historical importance of the material and the cost in terms of personnel and logistics. The

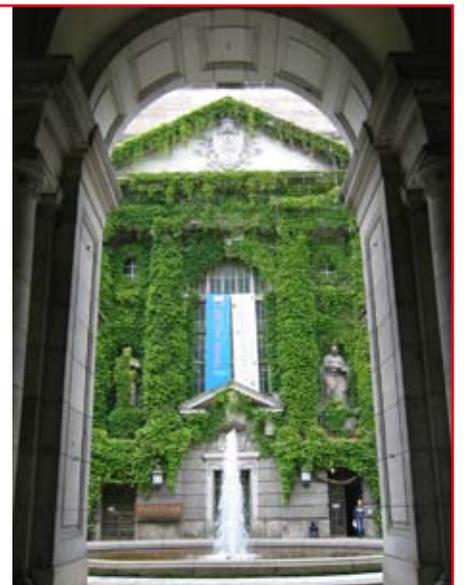
Staatsbibliothek zu Berlin

The Staatsbibliothek zu Berlin – Preußischer Kulturbesitz (Berlin State Library - Prussian Cultural Heritage) is one of Germany's most important research libraries and forms an international hub for literature and literary works. The 350-year old Staatsbibliothek has over 10.7 million volumes, and an additional 2.2 million printed works of which many are resources

in special collections, including occidental and oriental handwritten manuscripts, music manuscripts, maps and historical periodicals. An increasing number of databases and other electronic resources are continuously being added to generate user benefits.

www.staatsbibliothek-berlin.de

The Staatsbibliothek is a centre for national and international literature



**Manuscript of Bach's Saint
John Passion, BWV 245**

scanning had to be correct the first time, every time,' he insisted.

Responsible for the scanning process was MIK Center GmbH, a solution provider for scanning and microfilm services. For several months, an A1 version of the Zeutschel OS 14000 was set up by MIK for several months in the Staatsbibliothek zu Berlin. Knowing the delicate state of the documents, an especially gentle digitisation process was used. This meant no UV/IR radiation during the scanning process and no thermal loading of originals. With all this care, the optical resolution that resulted was a fairly exceptional 600 dpi with 24-bit colour depth. The image quality that was defined also required very finely nuanced colour reproduction because, as Andreas Mälck explained, the original paper differed in quality and specific properties, thereby preventing the use of standard colour profiles.

To ensure precise colours, the digitisation team decided to measure the paper tone using a spectrophotometer, and then edited the colour profile based on the results. The process was slow, but paid off at the end: 'Today we are delivering facsimile quality', said Andreas Mälck. He praised the close collaboration between the scanner manufacturer and service provider who had made a crucial contribution to creating the correct colours tones.

Extraordinary care and precision

Precision and care were the two key words guiding the entire process of digitisation. Every day, from the moment the manuscripts were obtained from the vault of the Library - and then with all due precautions taken to a windowless, secured scanning room - to the time they were returned, great care was taken and precision aimed for in every tiny detail. Whether it was the information that had to be provided with each file name, or checking digital data for image quality, or feeding digital copies into the data network of the Staatsbibliothek, or later dispatching them on hard disks to the University Computer Centre at Leipzig, no detail was overlooked. Of course, providing special training on conservation to scanning operators at the start of the program helped. Every day about 250 pages were processed.



The entire scanning process took about five months. Given the high resolution of 600 dpi, the total volume of data eventually amounted to four terabytes. Dr Rebmann pronounced herself satisfied with the productivity of the scanning process as well as the image quality, which she termed quite 'extraordinary'.

Extraordinary new interpretations

Even after the digitisation work has been completed, processing of the digital data will still take some time. This process is being supported by a musicologist who will supplement and extend the metadata.

By the time the Bach Digital project is completed, which is scheduled in 2011, more than 20,000 pages from 697 manuscripts, musical scores and other handwritten works of Bach will be available on the Net. Already some of these are available online at www.bachdigital.de. There are plans to add digital copies, early prints and other sources relevant to Bach's compositions, as well as material relating to his sons (three of whom were musicians) and other members of the Bach family.

Bach Digital, say the enthusiasts, will provide them with incredible opportunities to delve deep into Bach's music. Agrees Dr Rebmann, 'Bach Digital will enable new musicological questions to be posed and encourage a re-interpretation of the works of Johann Sebastian Bach. As a result, fresh impetus will be given to various areas of research on Bach.'

The Zeutschel Bookscanner series Omniscan 14000

Millions of books, maps and files are lost every year because they are mislaid or totally ruined. With the disappearance of these valuable cultural assets we normally also lose the information they contain – forever. What that means for the future of human society cannot be expressed simply in figures. Therefore libraries and archives are not giving up on their efforts to preserve this cultural heritage for future generations.

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Document access – like being there



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