

INTERNATIONAL DOCUMENTATION OF ELECTROACOUSTIC MUSIC: EMDOKU

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Abstract: The main aim of the database is to function as a work of reference, to mediate access to electroacoustic music, to obtain information about the original work, to locate the holding archive, to loan the medium out, to receive additional documents, to perform the work in public, and last but not least, to hear the piece via a safe login. The present database has been tenaciously developed over the past 25 years in international cooperation with many institutions, composers and researchers all over the world. Finally, the entire structure of the database system was optimised. The database is directed first and foremost at music researchers, composers, and the staff of numerous studios worldwide. Through these individuals and groups, it is hoped that ever-widening contact will be established with music producers and organisers, with editors of publishing houses, radio stations, newspapers, with libraries and training centres, and with all other interested parties the world over.

1. INTRODUCTION

We first need to ask ourselves: **what is electroacoustic music?**

Definition: **electroacoustic music is music for or with loudspeakers / transducers.**

This refers to:

- *Tonbandmusic*, acousmatic music, electronic music, *musique concrète*, field recordings, tape music, computer music, radiophonic art, sound art, sound installations, live electronics, etc.
- It includes **performance genres** and **locations** such as concert halls, radio, modern dance, theatre, film, installations and the Internet.
- EM is **performed** with “normal” musical instruments as well as synthesizers, *Klangumformer*, spatial sound control systems, MIDI, etc.; it is also performed by desktop orchestras, actors, narrators, robots, puppets, etc.

EMDoku was created because electroacoustic music [EM for short] found itself in the exceptional position of attracting very little attention. People distrusted a genre that seemed to be more concerned with engineering, physics and IT than music. As a consequence of these doubts, very little EM was – and is – represented in university libraries. Finding this situation unsatisfactory, in 1987 we decided to set up an archive ourselves, managing our own database. However, in going it alone we ignored standards such as the German “RAK-Musik” regulations on cataloguing, for none of us, myself included, were librarians.

Note 1: RAK regulations ≈ **Regeln für die Alphabetische Katalogisierung**
are to be replaced in 2015 by RDA ≈ **Resource Description and Access**.

Note 2: GND data (**Gemeinsame NormDatei**) recently started being included in EMDoku; see: <http://swb.bsz-bw.de/DB=2.104/SET=13/TTL=81/LNG=EN/>

Right from the start, my motivation in developing EMDoku was not merely to create a library, but rather to document EM in general: which EM works actually exist, unrelated to whether they have been published and available on a consumer medium. It was clear to me that works of music are only incorporated into libraries when they are “tangible” and available on a physical, commercial format; if the format is inappropriate or if the original is a sound file the work is excluded as a result!

Professional media are generally incompatible with consumer standards, particularly with regards to multi-channel works. When the first digitalisation wave kicked off in 1988 with the release of an affordable CD burner, of course it was based on the premise of an “audio CD”: in **stereo** format and a maximum 79 minutes long. This meant that there was no provision for multi-track versions.

To sum up: the CD “premise” and associated consumer standards force libraries to reject professional media formats as well as professional playback devices and multi-channel monitoring systems.

Looking ahead to the future, we already surmise that not only analogue records and cassettes, but also audio CDs and even DVDs will soon disappear from libraries. The next wave of digitalisation will replace physical media with non-physical digital reproductions, saved on NAS (network attached storage) or clouds. Libraries will be forced to give up their focus on physical media and adapt to computer related formats.

This upcoming transformation is a gigantic logistical and financial challenge. However, more encouragingly, my expectation is that multi-channel EM will finally come into its own.

2. GENERAL INFORMATION ON EMDOKU

The file **EMDoku1.fmp12** (size approx. 740 MB) concerns **data** and **metadata**.

Data: image, audio, text, zip, pdf and any other data files that are saved directly in “containers” or are simply references to data files saved on large NAS systems.

Metadata contain descriptions / features of data, but not the actual data; these metadata form the main content and are the really valuable aspect of EMDoku:

- ≈ 31,100 works of electroacoustic music, created between 1901 and 2014
- ≈ 10,900 data records from the TU archive (LP, analogue & digital volumes, CD, DVD, HD, etc.)
- 708 works from the ZKM-IDEAMA (Internationales Digitales Elektroakustisches Musik-Archiv, ZKM Karlsruhe ≈ <http://mediaartbase.de/handle/10858/7037>)
- 1,382 data records from the archive of the Inventionen festival (complete programmes) <http://www.inventionen.de>
- ≈ 6,100 data records on composers, which are used relationally by the other databases within the system

The metadata of EMDoku are presented in numerous layouts according to diverse criteria:

- Tabular overviews for many data records
- Thematically adjusted tables, e.g. for labels, studios, line-ups
- For statistical representations (line-ups, annual statistics) see: <http://www.emdoku.de/Vorwort-D.html#Jahresstatistik>
- Detailed or simplified representations according to the access permissions
- Representation according to screen size (≈ smartphone) etc.

The main purpose of EMDoku is to **procure access** and **research** to all electroacoustic works, as far as this is possible. That comprises:

- Comprehensive information on the work itself
- Availability in archives or public libraries where the work can be heard or loaned
- References to performances (premieres) and labels / publishers
- Corresponding or additional documentation:
composers' and artists' biographies, studio information, musical scores, performance instructions, etc.
- Performance information: in addition to line-up, these include loudspeaker equipment, audio / stage / light / projection technical specifications, microphones, custom-built hardware, etc.

In contrast to libraries, the organisation of the EMDoku database is “**work oriented**”. That means ONE data record describes ONE work with a unique serial number instead of ONE medium: if a work is available in a number of media, there is more than one reference in the same data record for that work.

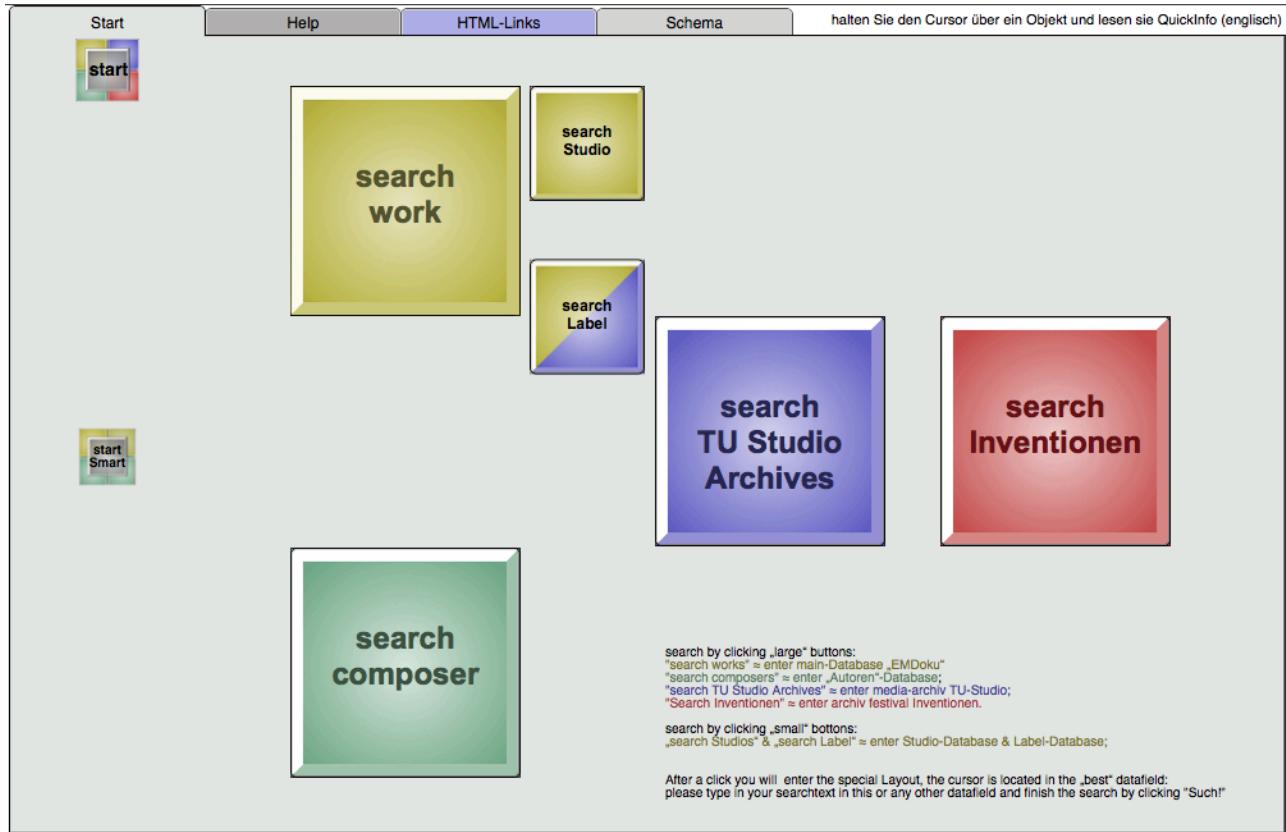
The FileMaker database is currently hosted on a FileMaker server in Bregenz, Austria, with the costs covered by the Deutsche Gesellschaft für EM: <http://www.degem.de>

Internet access:

- With a standard web browser http://176.28.45.96/fmi/iwp/res/iwp_auth.html
A link can also be found at <http://www.emdoku.de>
- Via “FileMaker-Network” <fmnet://176.28.45.96/EMDoku1>
Requirement: installation of the FileMaker Pro app on the client computer.

3. BRIEF DESCRIPTION

After opening the database we arrive at the home page: smartphone users use the app “FileMaker Go” and are taken to an adapted “smart layout”. Users with a larger screen are taken to the “start” layout:



The small multi-coloured “start” button is present in every layout; it always takes us back to the “start” page.

And it is at this point that we notice an important aid to orientation which is universally valid within the database system, but which unfortunately cannot be illustrated here: **colour coding**. Greenish-yellow always stands for data from the table of works (which can be accessed by clicking the “search work” button); green represents relational data extracted from the composer table (the “search composer” button); blue designates data from the TU archive (“search TU Studio Archives”); red marks data from the Inventionen archive (“search Inventionen”). We will not be dealing with the other buttons and menus (“Help” etc.).

A standard database query may well involve searching for a work within the table of works: we just click on the yellow “search work” button and a new window opens which is glaringly different from what we are used to when conducting Internet searches. Instead of a request to “Enter in the search box” or “Choose a genre”, etc. we use a **search screen** containing all the fields of the chosen layout (the first layout for “search work” after the start page is all Info net), and enter one or more search strings as desired:

EMDoku : Information about a single electroacoustic work

Gast-Zugang

Studio	country	SN	hold your Cursor on any yellow edged object and read english QuickInfo				
surname	firstname	DECEM	<- Zahlen = Wort-Mengen				
Schaeffer			Notes	Bio	Bio local	Bio Details1	WebViewLabel
Regie / Coproducer / Choreograph							
Realisation / Assistenz							
Titel Symp							
Sub-Titel							
Function	year	var_dur duration mm:ss	trackextra				
var musicians ins solo	Wörter						
nr. performer	nr. diff. instruments						
Comments							
Commission							
Premiere							
Publisher							
Prize							
Source			URL Home-db	go!			
Labels Anzahl	Labels		URL Composer	go!			
			URL_Label	go!			

Entering a search string of “Schaeffer” in the “surname” field and “Symp” in the “Titel” field, we receive two results (an unambiguous search assumes that three parameters have been entered: the composer’s surname, first name and title of work). In addition to Boguslaw Schaeffer’s *Electronic Symphony*, one of the most famous early musique concrète works is returned, *Symphonie pour un homme seul* by Pierre Schaeffer and Pierre Henry.

EMDoku : Information about a single electroacoustic work

Gast-Zugang

Studio	country	SN	hold your Cursor on any yellow edged object and read english QuickInfo					
1	fr	7037	1198 252 339 727 <- Zahlen = Wort-Mengen					
surname	firstname	1910 - 1995	Notes	Bio	Bio local	Bio Details1	WebViewLabel	
Schaeffer	Pierre	1927						
Henry	Pierre							
Regie / Coproducer / Choreograph	Maurice Bejart							
Realisation / Assistenz								
Titel Symphonie pour un homme seul								
Sub-Titel Prosopopée 1 Partita M...								
Function	year	duration mm:ss	trackextra					
C B	1950/66	21:10	tracks	1 / 2 /				
?	instrumentation							
Comments	Version 1 22 Titel (46:00) Version 2 11 Titel (ohne Zeitangabe) Version balet 11 Titel (Théâtre des Champs-Elysées 31.7.1955) Revision (P. Henry) stereo 1966 mit 12 Titeln, 21:10							
Commission								
Premiere	18.3.1950: Ecole Normale de Musique, Paris (mono)							
Publisher								
Prize								
Source	Catalogue GRM 1948 - 1986		URL Autoren	http://brahms.ircam.fr				
Labels Anzahl	Labels		URL_StudComp	http://brahms.ircam.fr/works/work/9062/				
10	INA C 1007 / PHI 6521021 / DTL 93090 / DUC 3 / INA G 6027/6029 / Thomson 320 C 102 / DUC 9 / DTL 93121 / PHI		URL_Label	http://www.qobuz.com/label/ina-grm/telechargement-ecoute-albums				

The layout visited first of all is intended for **guest users**; all visible fields (including the administration fields) are accessible **without a password**.

We can see the 20 most important specifications of an electroacoustic work:

surname, first name, studio and country, realised / assisted by,
title, function, year, duration, tracks, instrumentation, comments,
notes (placed in what is termed a “register”)
commission, premiere, prize, composer’s biography, dates of birth and death, URL, label

Changing to the more comprehensive layout of the “alle Infos” table of works (which requires a password to be entered at the login stage and is thus not accessible to guests) presents further data fields and administrative aids:

start	Such- modus	Suoh!	search @ Autoren	EMDoku	Hillsfeld	E M doku							
GRM Liste													
1 Studios Zahl 2 S Nr 7037		INA + GRM 1 Regie/coproducer/ Choreograph Maurice Bejart		fr 010 1198 252 727 110 1177		Notes Bio 123 Details 1 Bio1 Pic/Container Notes Inv URL Autor URL_StudComp							
<p>Realisation/Assistant</p> <p>surname 2 surname geb gest firstname</p> <table border="1"> <tr> <td>1 Schaeffer</td> <td>1910 - 1995</td> <td>Pierre</td> </tr> <tr> <td>Henry</td> <td>1927</td> <td>Pierre</td> </tr> </table> <p>surname alle Zahl 2</p> <p>Titel Subtitel Symphonie pour un homme seul Prosopopée 1 Partita</p> <p>year 1950/66 duration 21:10 code 1 code 2 code tracksZahl 1 / 2 /</p> <p>Function C B ?</p> <p>ins Folge</p> <p>Comments Version 1 22 Titel (46:00) Version 2 11 Titel (ohne Zeitangabe) Version baleït 11 Titel (Théâtre des Champs-Elysées 31.7.1955) Revision (P. Henry) stereo 1966 mit 12 Titeln 21:10</p> <p>Commission</p> <p>Premiere 18.3.1950 Ecole Normale de Musique, Paris (mono) 1966 Halles Baltard Paris (rev. stereo)</p> <p>Publisher</p> <p>Prize</p> <p>Label 10 INA C 1007 PHI 6521021 DTL 93090 DUC 3 INA G 6027/6029 X INA - GRM Paris Philips INA - GRM Paris</p> <p>Source Catalogue GRM 1948 - 1986 erstellt 18.08.1993 geändert 27.09.2012 erstellt_neu geändert_neu 21.09.2014 19:31:57 Uhr</p>								1 Schaeffer	1910 - 1995	Pierre	Henry	1927	Pierre
1 Schaeffer	1910 - 1995	Pierre											
Henry	1927	Pierre											
<p>Nicht zu Unrecht können "Symphonie pour un homme seul" und "Vestiges d'Orphée" als die beiden freilien "Klassiker" der musique concrète gelten.</p> <p>PIERRE HENRY / PIERRE SCHAEFFER: Symphonie pour un homme seul Vestiges d'Orphée</p> <p>Andranger, Notes 11.09.2014 13:21:07 Uhr</p> <table border="1"> <tr> <td>go! http://brahms.ircam.fr</td> <td>Autoren</td> </tr> <tr> <td>go! http://brahms.ircam.fr/works/work/9062/</td> <td>StduCom</td> </tr> <tr> <td>go! http://www.qobuz.com/label/ina-grm/telechargement-ecoute-albums</td> <td>Label</td> </tr> </table> <p>Notes Anzahl Absätze 34 Notes Anzahl Wörter 1198 Bio Anzahl Wörter 339</p> <p>Labelanalyse1 INA C PHI DTL DUC</p> <p>Name Label-DB Philips</p>								go! http://brahms.ircam.fr	Autoren	go! http://brahms.ircam.fr/works/work/9062/	StduCom	go! http://www.qobuz.com/label/ina-grm/telechargement-ecoute-albums	Label
go! http://brahms.ircam.fr	Autoren												
go! http://brahms.ircam.fr/works/work/9062/	StduCom												
go! http://www.qobuz.com/label/ina-grm/telechargement-ecoute-albums	Label												
<p>number of works Audiothek 1</p> <p>Relation zur Audiothek</p> <p>number works lended 1</p> <p>Medien-Nr. Medien-Label Autorename Title lend</p> <p>CD-5 / CD-75 / CD 2035 / INA C 1000 INA C Schaeffer Symphonie pour un homme seul Prosopopée I, Partita, X</p> <p>Name Vorname Henry Pierre</p> <p>number of works Inventionen 1</p> <p>Relation zum Inventionen-Archiv</p> <p>Premiere_Inventionen Commission_Inventionen Konzertdatum Konzertort Inventionen</p> <p>8.3.1986 Ackerstraße 1986 2008</p> <p>other pieces by Composer 1</p> <p>16 dessins animés de Sim 32:00 1962 mark</p> <p>2 dessins animés 1962 1972 mark</p> <p>Adhésions pour Daphné 40:00 1964 mark_Label</p> <p>Anamorphoses</p> <p>Antagonism 6:23 1996 Identität IDEAMA</p> <p>Antiphonie 3:00 1951 Identität IDEAMA</p> <p>Apocalypse de Jean 1968</p> <p>Arcane 1955</p> <p>Arrangement pour Georges 50:00 1959</p> <p>Astrologie 1953</p> <p>Pierre/Schaeffer/Symphonie pour un</p>													

For example, we can see (in the lower section of the image) whether the current work is in the TU archive (the classification numbers CD-5 / CD-75, etc. are listed together with the label code) or the Inventionen archive or IDEAMA.

Certain fields are notable by comparison with and in contrast to traditional instrumental music:

1. **Realisation / assistance:** for instance, in the data record *Gesang der Jünglinge* by Karlheinz Stockhausen (next image), Gottfried Michael Koenig and David C. Johnson are listed
 2. **Studio:** this generally refers to an institution which pays the production costs; this specification will be used much less in the future as participants increasingly use their own platforms
 3. **Function:** on the right is the complete extract from the **Index** with all functions appearing in EMDOku. *Symphonie pour un homme seul* is identified with "C B" ≈ concert and modern dance (choreographed by Maurice Bejart), while *Gesang der Jünglinge* is listed as "C" ≈ concert:

The screenshot shows a data entry form for a musical work. The fields include:

- Studios Zahl:** WDR SEM
- SNr:** 16235
- Realisation/Assistent:** Gottfried Michael Koenig, David C. Johnson
- surname Z:** Stockhausen (with a note: 1)
- geb gest:** 1928 - 2007
- surname alle Zahl:** 1
- Titel:** Gesang der Jünglinge
- Subtitel:** (empty)
- year:** 1955-56
- duration:** 13:14
- Function:** C (fixed)
- var musicians:** var (Demo?)
- nr. performer:** 6
- nr. diff. instruments:** 6
- Wörter:** 9
- oder:** (checkboxes)
- tracksZahl:** (checkboxes)
- Ins Folge:** p, synt.
- comments:** Funkausstellung 1932 mit Kommentaren von Leithäuser
- 6:** (checkbox)

The right side of the interface shows a sidebar with various categories: AV, B, Bildspel, C, D, Demo, F, game, I, Internet, MTh, O, P, R, Radio, SA, score, Sn, Th, TV. The "Index" tab is selected at the top right.

4. **Instrumentation:** a historic document on the 1932 Funkausstellung (an annual electronics exhibition in Berlin) reveals instruments such as an “elektrisches Orchester”, “MTR” ≈ Mixturtrautonium, and “OMa” ≈ Ondes Martenot, etc.

The screenshot shows a data entry form for the 1932 Funkausstellung. The fields include:

- Titel:** Funkausstellung 1932
- Subtitel:** Neobechstein, Hellertion, El. Orchester, Theremin, Martenot
- year:** 1932
- duration:** (empty)
- Function:** Demo (fixed)
- var musicians:** var (checkbox)
- nr. performer:** 6
- nr. diff. instruments:** 6
- Wörter:** 9
- oder:** (checkboxes)
- tracksZahl:** (checkboxes)
- Ins Folge:** p, synt.
- comments:** Funkausstellung 1932 mit Kommentaren von Leithäuser
- 6:** (checkbox)

5. In the data record 28530 the appropriate identifiers for the Dublin Core Metadata Initiative (**DCMI** ≈ <http://dublincore.org/>) have been added in order to show the correspondence to the EMDoku fields. Many classifications are unsatisfactory; it is difficult to associate even a completely “normal” parameter such as “tracks” with the “dc” terms: “dc.type.2” and “dc.type2.extra” (this shows us that a discussion is still outstanding on the contents and designations of fields in library databases):

6. Tracks: instead of a single field for “tracks” we can see several. Why is this?

Taking “tracks” as an example I would like to show that a field as simple as this can actually have a complicated setting: in the example *Symphonie pour un homme seul*, all that is displayed for “tracks” is 1 / 2.



There is a mono version and a stereo version (revised in 1966); how this came about is explained in the “notes”.

(Source of GRM work 010: *Catalogue GRM 1948–1986, La Revue Musicale*, Paris, 1986)

Sometimes, however, the situation is more complicated:

1	Studios Zahl	1	NHK Tokyo	jp	
	SNr	1			
4715					
Realisation/Assistant			Regie/coproducer/ Choreograph		
surname Z	surname		geb gest	firstname	
1	Eloy		1938	Jean-Claude	
surname alle Zahl					
1					
Titel	Gaku-No-Michi				
Subtitel	Pachinko Tokyo				
year	1977/78	duration	218:00	4	+ 2 + 2
var duration			oder		
fixed	fix	Function		oder	
	C	?		oder	
Ins Folge					?
comments	film without images, for elec and concrete sounds". digital copies 1994; rev. version1 2001; rev. version2 2006 Music used also for the films „Le Japon insolite“ (F. Reichenbach 1981) and „Enter the void“ (G. Noé 2010)				
36					
Commission					
Premiere	11.1.1979 (complete P)	Salle Wagram together with Festival d'Automne à Paris			

357 302

Notes Bio 123 De

New bilingual publication English-French
ISBN 978-2-919133-01-7;
118 pages including pictures from NHK-s

Durations:

"Pachinko"	30 ... 55 min
"Tokyo"	48 ... 50 min
"Fushiki-e"	75 ... 78 min
"Mokuso"	3 ... 20 min or i
"Bambutsu-no-Ryûdo"	33 ... 43 min
"Kaiso"	= 40 min
"Han"	15 ... infinite

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Digipack 4 x CDs (HT 01-02-03-04)

Aenderung_Notes 22.09.2014 18:38:0

Example 2: in the work *Gaku-No-Michi* by Jean-Claude Eloy we read “4+2+2”

(Source: *hors territoires* 2011, ISBN 978-2-919133-01-7):

Eloy uses **three** Magnetophons during the performance, which has an immense length of ≈ 218 minutes: one four-track and two stereo machines. He produced a number of magnetic volumes of what in 1977 was the maximum possible length, namely 35 minutes, allowing him to cross-fade variably from one section to the next; for instance, he states (see “notes”) that there is a period of between 30 and 55 minutes for the first part, “Pachinko”.

Titel	castalie				
Subtitel					
year	2008	duration	10:35	8	+ 8 + 8
var duration			oder	WFS	
fixed	fix	Function		oder	
	C	?		oder	
Ins Folge					?
comments	Akusmonium + Klangdom + WFS				
3					
Commission	Inventionen 2008				
Premiere	31.7.2008	TU-Hauptgebäude WellenFeld Berlin			
Publisher					
Prize	Mention Bourges 2009, catégorie œuvre d'esthétique à programme 1. prize at „Black & White“ Porto (Portugal)				
Label	1	ed. RZ 3006 „Musik für mehr“			

Example 3: *castalie* by Gilles Gobeil. Here we can see “8+8+8 /WFS/5”; this refers to three 8-channel levels of sound diffusion (for Inventionen 2008): one level is projected by TU-Wellenfeld via 832 loudspeakers, the other two 8-channel levels are directed to the GRM acousmonium (\approx loudspeaker orchestra with approximately 40 loudspeakers) and the TU-Klangdom (26 loudspeakers). Moreover, the composer has created a 5.0 surround sound version, so that the work can also be played in less sophisticated conditions; in the “Label” section we discover that *castalie* appeared on the DVD number 3006 by Edition RZ bearing the slogan “Music für mehr als einen Lautsprecher” (Music for more than one loudspeaker).

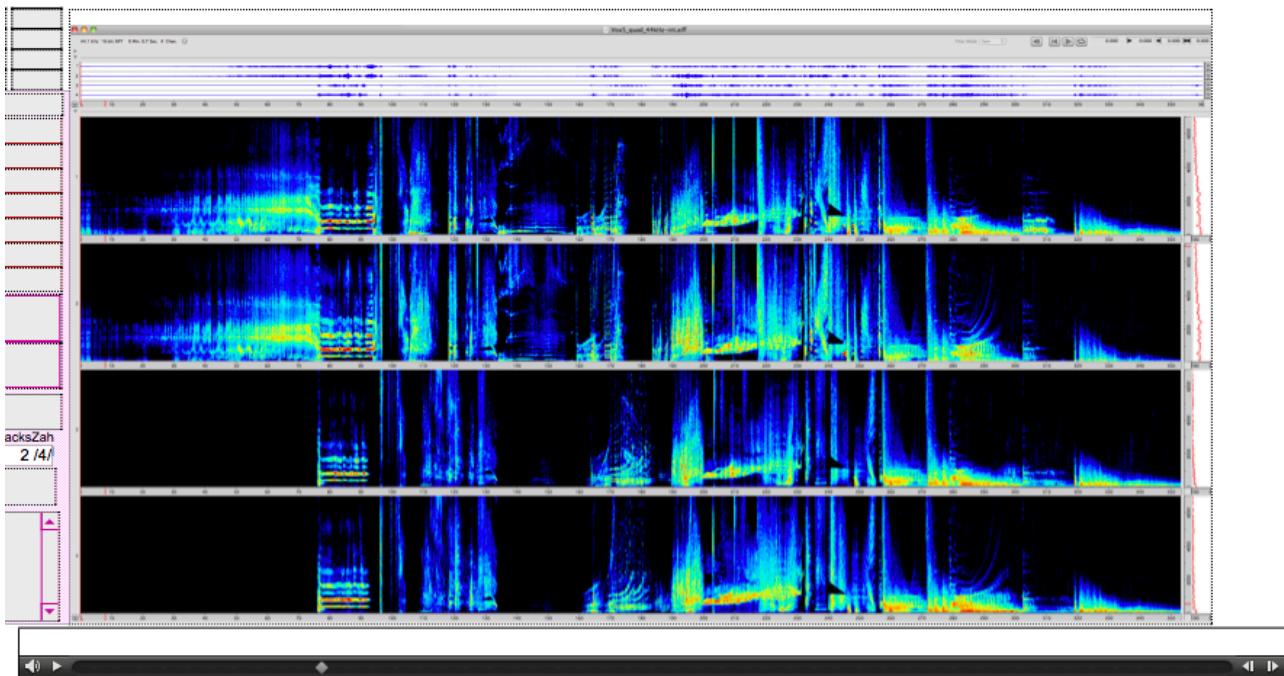
The complete circuit diagram showing the complex positioning of loudspeakers for the performance of *castalie* can be found at http://www.inventionen.de/Inventionen_08/Bilder/H104_all.gif or in the register “Pic/Container” of this data record.

This example of the deceptively simple-sounding “tracks” field clearly illustrates the way that historical contexts can potentially lead to misunderstandings if they cannot be interpreted correctly at a later point. This applies, of course, to all data fields, which in certain cases could always contain complex information that is liable to be misunderstood.

This situation can be prevented by entering suitable data in “notes” or “Pic/Container”:

- Detailed programme notes, performance instructions; audio scores, scans (of labels on audio tape reel boxes, etc.), URLs with further details
- Sketches for the correct loudspeaker positions with audio channels clearly attributed
- Line-up, musical instruments used; features of the performance location, production, equipment
- Precise description of software, availability of Patchdata for MaxMSP, SuperCollider, etc.
- Technical devices, necessary hardware for audio and video projection, cabling
- Synchronisations, schedules, etc.

A final example might suggest how a work can be communicated in a comprehensive and comprehensible manner with visual and audio data: *Vox 5* by Trevor Wishart, created in 1986 at IRCAM Paris, quadraphonic:



The image (saved in “Pic/Container”) shows the four multi-coloured sonograms of the audio tracks below the volume graph, produced using the IRCAM application “Audiosculpt”: the intensity of the signal distribution in time → and frequency ↑ has a **three-dimensional** effect thanks to its graduated brightness and colour; at the bottom the music cursor moves synchronously to the image in a typical QuickTime bar (the associated sound file is played out from a further container).

Ideally every work would be represented by a sonogram, but that would involve a substantial amount of work.

4. THE OUTLOOK & WISH LIST FOR THE FUTURE

- Rules for the RDA library cataloguing system must be revised and adapted to computer related media formats so that they are appropriate for EM
- A category for EM should be set up by the dnb (Deutsche National Bibliothek)
- Further relational networks of studios, publishers and individuals should be integrated
- Deliberations are ongoing about how EMDoku is to be continued, and by whom
- An awareness of the importance of archiving EM generally needs to be extended in order to preserve the compatibility of historical hardware and software

- I would love students to become familiar with the original multi-channel works in addition to the stereo versions (why should students be denied access to the original quadrophonic version of Stockhausen's *Gesang der Jünglinge*?); this would require appealingly designed, professionally equipped listening stations to be set up in enclosed booths, providing more facilities than any student has at home
- Moreover, I wish that EM works produced at a university by students or staff could at least be available at that university's own library, even if they are not accessible on CD