

Ulysses Native Format

The Ulysses Native Format (*.UNF) is a file to register data which describe loudspeaker dispersion characteristics. These files are the basis for the Ulysses calculations. They are managed in the Speaker Builder module. Currently only sound pressure levels are registered, phase relations have not been implemented yet.

The data registered in the Ulysses Native Format are shown as balloons when selecting the appropriate display.



Speaker Builder Balloon Display

The UNF data are measured in a spherical grid of 5° or 10° steps around the loudspeaker. The grid may be envisioned as the longitudinal lines of a globe. A 5° resolution results in 74 degrees of longitude with 37 measuring points each while the loudspeaker axis points to the north pole.



Ulysses Native Format measuring points



Ulysses Native Format - Ingenieurbüro für Beschallungstechnik



Basic setup for measuring loudspeaker dispersion

It is important to measure the sound pressure levels for a data balloon in the loudspeaker farfield since the simplified analysis of a loudspeaker as a point source by balloon data is valid only in the farfield. This means that measurements must be made at an adequate distance from the source.

A UNF file header consists of four lines with notes. Blocks for each of the seven octave bands from 125 to 8.000 Hz follow which register the absolute sound pressure levels in dB. The measuring points for each line result from a 180° horizontal turn, i.e. those of the first line result from a 180° horizontal rotation at 0° vertical rotation, those of the second line from a 180° horizontal rotation at 5° (or 10°) vertical rotation and so on.



Half and quarter formats

If the loudspeaker drivers are aligned symmetrically the number of measuring points can be reduced. Only half the sphere must be measured if the loudspeaker is symmetrical to its vertical axis (half format). If it is symmetrical to both its vertical and horizontal axes – like a coaxial loudspeaker is – only a quarter sphere must be

measured (quarter format). Further reductions are possible for measuring a dynamically balanced ceiling loudspeaker.

The number of lines per block is depending on format and subformat:

- **5° Full:** 72 lines with 37 columns
- **5° Half:** 37 lines with 37 columns
- 5° Quarter: 19 lines with 37 columns

10°	Full:	36 lines with 19 columns								
10°	Half:	19 lines with 19 columns								
10°	Quarter:	10 lines with 19 columns								

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1.000	(3.458	19.000	12.184	20.149	72.488	12.812	17.871	12.40	30.104	21.324	11-141	11.418	11.00	71,802	18.12
3.488	23.698	13.367	13.188	32.113	20.008	20.877	15.835	12,623	32,413	21,915	21-258	21, 568	14.223	31.62	28.38
10.498	10.00	10,045	13,189	39.121	29,495	12.845	221964	15.494	12.192	31,896	21.004	C1.575	11/00	37,100	18.64
2.588	73.608	13.218	13.384	33.126	73, 812	72.875	12.881	12.489	15.281	22.00	21.818	11.636	11.082	31.199	28.42
10.488	28.908	181,825	13.000	39,459	20.015	10.897	12.764	15.068	15-54	31.468	54-205	71,885	21,428	15,070	34.460
2.9M	0.58	11.00	17,188	72.166	72.898	12.81	12.00	17.160	77.768	31.118	71-810	11.124	11.094	11.114	11.11
1.484	22-998	11. Bd	11.000	32.462	25.416	22.868	12.68	12.485	12.400	20.322	22.068	71.886	11.AM	11.398	25.32
0.485	10.408	10.04	12.189	10.500	79.754	12.899	17.849	12,649	12,407	18.391	77.745	C1.895	11.044	11.144	11.34
1.488	73.908	13.397	13.200	32,312	72.118	73.625	12.842	12,460.	32,000	22.208	73.224	11.982	11,497	31,425	32.40
10.444	24,448	111-1011	13,000	39.09	20.001	20.000	12-964	15.589	12,494	72.404	50.994	72.005	11,980	12,100	21.55
2.488	12.498	13.070	12.184	72,358	78.225	22.897	12,814	12.174	12.474	32,497	12.312	17.745	12.600	31,428	71,46
1.4.00	23.508	78.960	11.188	33,055	20.000	20.318	10.010	15.848	15-102	12.016	20.887	20.548	12.189	122740	20.00
1.48	12.458	12.000	11.100	39.377	78.344	12.192	19.841	11,441	12,885	22.445	77.449	12.081	12.189	15,164	11.84
0.488	23-508	13.243	12.289	32.382	22.208	20.472	13.805	12.488	32.88	22.4%	20.588	12.282	12.221	32.821	25.89
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0.488	22.698	13.3**	12.288	32.398	72,216	22.997	13.844	12.486	12.895	12.916	77.993	17.942	12.191	32.891	21.49
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1. A 100	24.444	24.144	10.000	30,400	34.344	20.000	10.004	14,764	79.044	10.001	24,000	24, 214	48,285	43.474	10.00
	10.000	1.	10.100	12.00	20.000	12.000	10.000	11.180	10.00	10.001	20.004	CB. [18	20.125	00.001	49.00
1	22.648	12.040	13.453	32.664	25.344	25. 645	13.154	11.404	12.000	21.144	28.778	14.005	48.004	48.478	49.34
	10.000	10.000	10,154	40.311	22.000	10.000	15100	11,000			20.275	10,015	-00.900	00.000	49.04
1.1.1	23.488	73.000	13.18	23,404	21.843	22.544	13, 181	12.005	75.445	11,313	24.041	24.044	10.000	44.444	48.85
0.00	24.648	21.001	19.000	30.464	20.445	20.612	20.000	12.100	21.158	71.448	21.110	24.268	20.005	78.854	49.38
1.1	12 100	10.000	13,154	12,004	11.100	TT ALL	11 101	12,149	11	11 1.00	11.740	10.000	10,200	10,000	10.00
	14.808	10.008	14.198	20.004	10.444	14.811	12.988	14.185	11.490	11.114	11.000	14,600	10,101	14.131	11.11
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To create a UNF file data can be copied to a standard text file. After replacing the *.TXT extension by the *.UNF extension the file can be imported into the Speaker Builder module. It can then be saved together with an enclosure drawing as a loudspeaker file for future reference.

The illustration below shows a 5° solution quarter format measuring point position. It is the 6^{th} value (blue, 25° vertical rotation) of the 16^{th} horizontal rotation (magenta 70°).

0°	5°	10°	15°	20°	25°	30°	40°
Device Class	: Loudspeaker						
Device Name:	dV-DOSC						
Manufacturer	: L-Acoustics						
Remark:	nothing						
FREQUENCY:	125						
SPHERE SIZE:	Q						
INCREMENT:	5						
Ueff:	2.83						
IMPEDANCE:	8						
DISTANCE:	1						
73.400	73.400	73.300	73.300	73.100	73.000	72.800	72.600
73.400	73.400	73.301	73.300	73.102	73.002	72.803	72.604
73.400	73.400	73.303	73.300	73.106	73.009	72.812	72.615
73.400	73.400	73.307	73.300	73.113	73.020	72.827	72.633
73.400	73.400	73.312	73.300	73.123	73.035	72.846	72.658
73.400	73.400	73.318	73.300	73.136	73.053	72.871	72.689
73.400	73.400	73.325	73.300	73.150	73.075	72.899	72.724
73.400	73.400	73.333	73.300	73.166	73.098	72.931	72.763
73.400	73.400	73.341	73.300	73.182	73.124	72.964	72.805
73.400	73.400	73.350	73.300	73.200	73.150	72.999	72.849
73.400	73.400	73.359	73.300	73.217	73.176	73.034	72.892
73.400	73.400	73.367	73.300	73.234	73.201	73.068	72.934
73.400	73.400	73.375	73.300	73.250	73.225	73.099	72.974
73.400	73.400	73.382	73.300	73.264	73.246	73.128	73.010
73.400	73.400	73.393	73.300	73.287	73.280	73.173	73.066
73.400	73.400	73.388	73.300	73.277	73.265	73.153	73.041
73.400	73.400	73.399	73.300	73.298	73.298	73.197	73.096
73.400	73.400	73.400	73.300	73.300	73.300	73.200	73.100
FREQUENCY:	250						
SPHERE SIZE:	Q						
INCREMENT:	5						
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IMPEDANCE:	0						
DISTANCE:	1 72 400	72 200	72 100	72 000	72 700	72 200	72 000
73.400	72 400	72 201	72 102	72.900	72.700	72.300	72.000
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/3.400	/3.400	13.307	/3.120				

Measuring data in a Ulysses Native Format file



Measuring point position