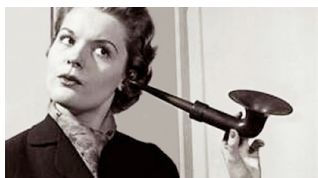


Multikanalljud



Vad är syftet med multikanal

- ✓ Skapa en rumsligt fördelad ljudbild
- ✓ Utnyttja människans binaurala hörande

Stereo fodrar skillnader mellan de två ljuden.

- ✓ Samma primärsignal
- ✓ Skillnad i tid
- ✓ Skillnad i styrka
- ✓ Summa lokalisering



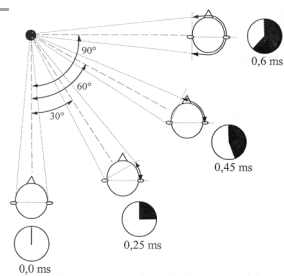
Binauralt hörande

- v Tidsskillnad
- v Nivåskillnad



Tidsskillnad

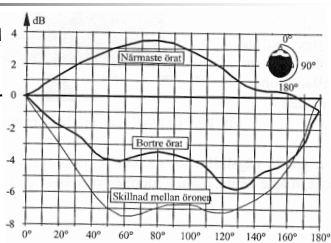
- v Våglängd
- v Period

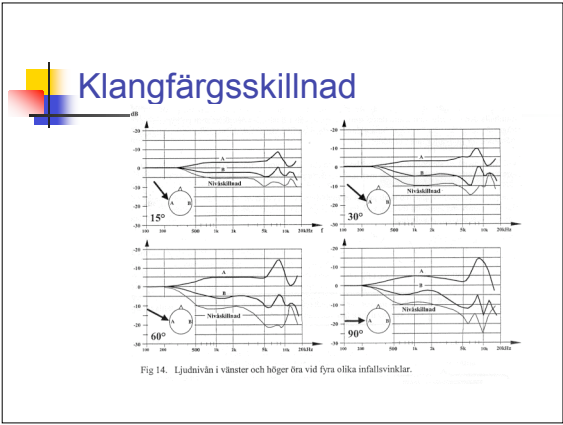


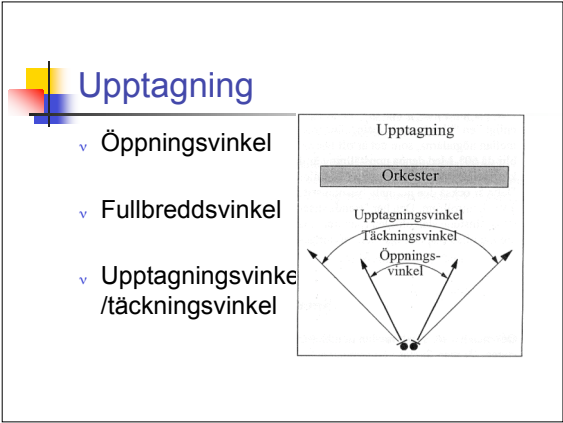


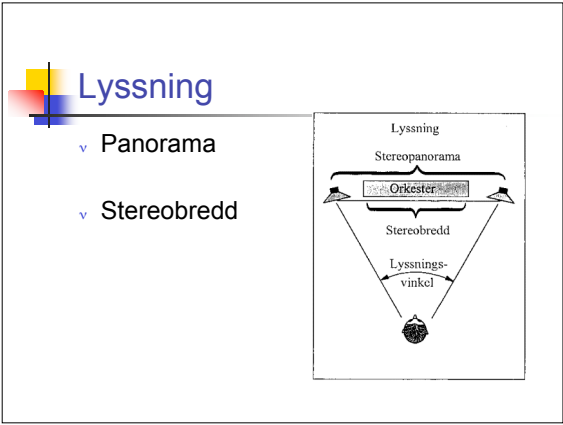
Nivåskillnad


- v Dämpnin
- v Skuggnir












Högtalarkonstruktion

- v Symmetri
- v Fasgång
- v Direktivitet



Direktivitet

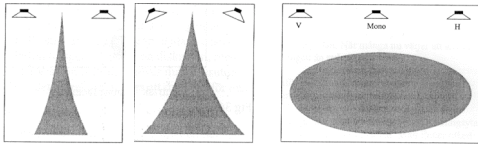
- v Ett ljud blir två
- v 7 identifierbara riktningar
- v Motfas



Maximal riktning

- v Nivåskillnad > 20 dB
- v Tidsskillnad 1 - 1,5 ms
- v Överbredd (Wideness)

Lyssningsyta

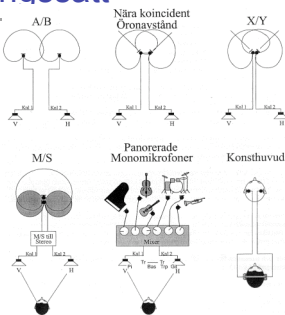


Elevationseffekten

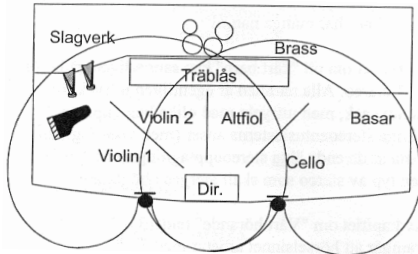
- v 45 grader ovanför huvudet
- v Pinnae - effekten

6 upptagningsätt

- v Tidsskillnad
- v Intensitets-skillnad

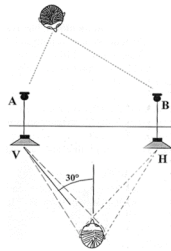


AB-stereo

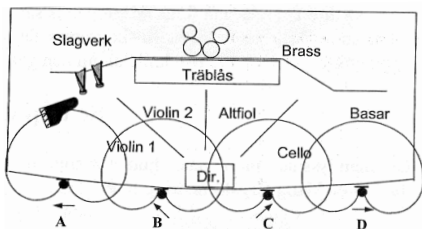


Gränsvärden för A/B stereo

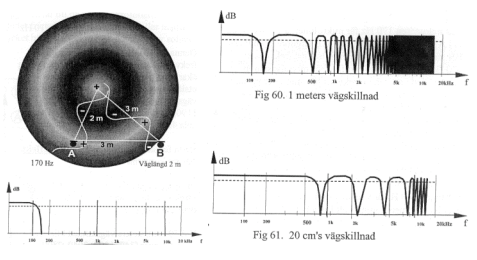
✓ Max bredd = 1,5ms



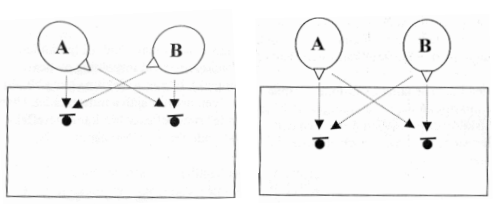
A-B-C-D stereo



Kamfiltereffekt

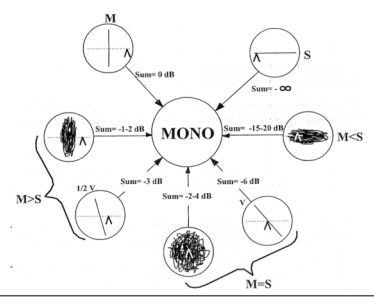


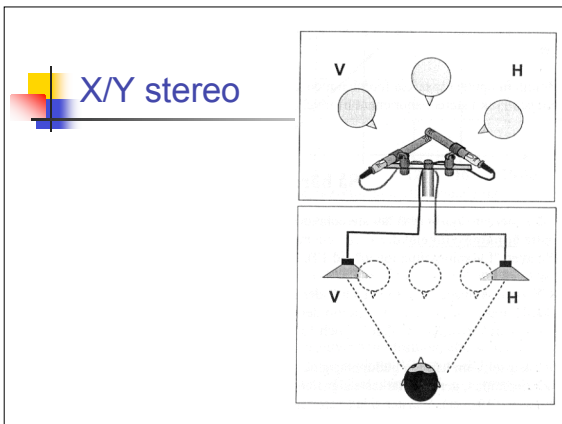
Kamfilterfall



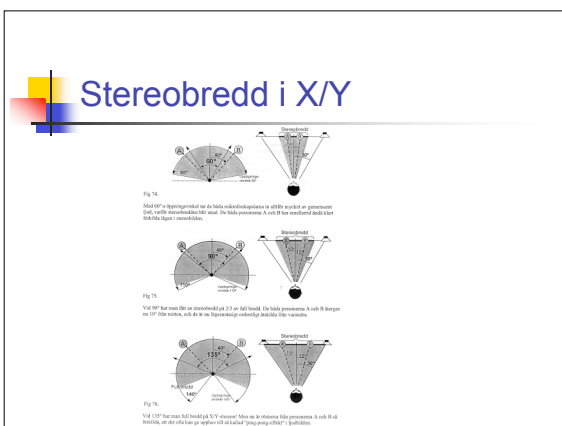
Monokompatibilitet

- v Radio
- v TV





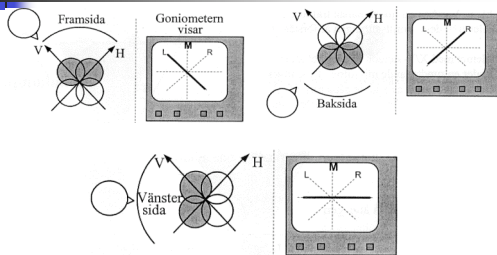




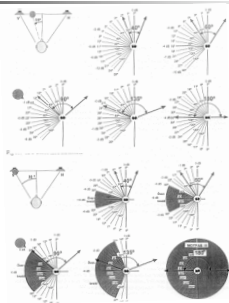
Monokompatibilitet med X/Y

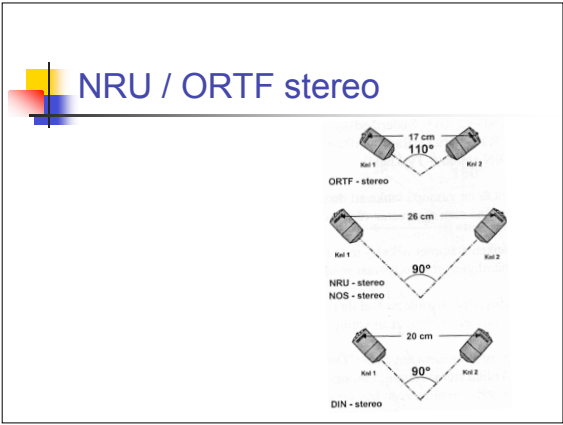
v "Ju större öppningsvinkel man använder, desto mer av rundtagande mikrofon-karaktäristik blir resultatet i mono"

Blumlein-stereo

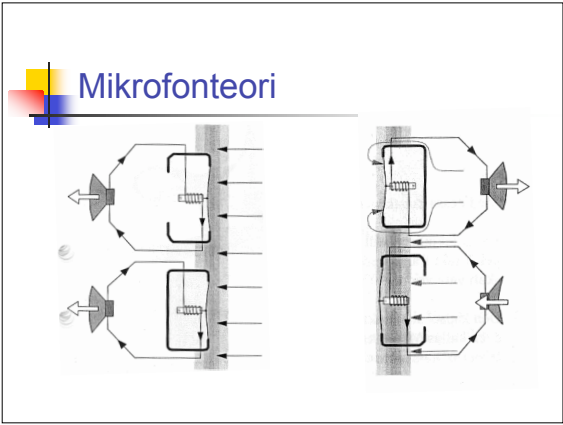


Öppningsvinklar





- ### M/S-stereo
- ✓ Bygger på intensitetsskillnader mellan höger och vänster kanal
 - ✓ M = monosignal
 - ✓ S = skillnadssignal



M/S teori

- ✓ Mono kapsel ofta kardioid
- ✓ Skillnadskapsel alltid åtta

M/S teori

M/S teori

M/S-mikrofonen sedd från ovan.

M/S teori

M/S-mikrofonen sedd från ovan.

Balansering av stereobredd

- Med M-regeln ställer man in volym
- Med S-regeln ställer man in stereobredd

Punktstereofoni

v Stereo med panorerade monomikrofoner

Multimikrofonteknik

- ✓ God separation
- ✓ Vandringsseffekt
- ✓ Kamfiltereffekt
- ✓ Skiljer sig mot "äkta" stereoupptagning



Binaural stereo

- ✓ Neumanns konsthuvud
- ✓ Kräver hörlurar vid lyssning



Transaural stereo

- ✓ Surround med två högtalare
- ✓ Linjära högtalare
- ✓ LEDE lyssningsrum

Ambiofoni

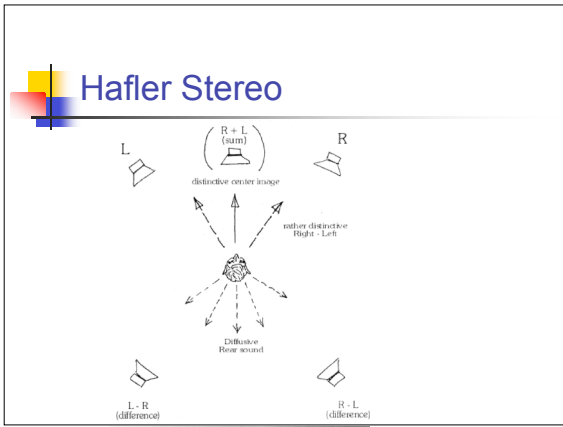
- v Stereoinspelning som reproduceras med front- och bakhögtalare

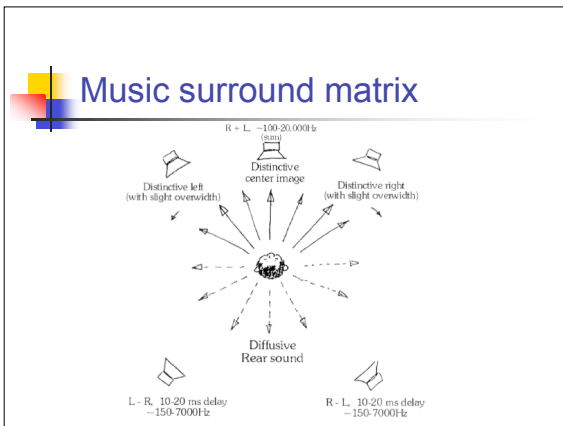
Depth stereo

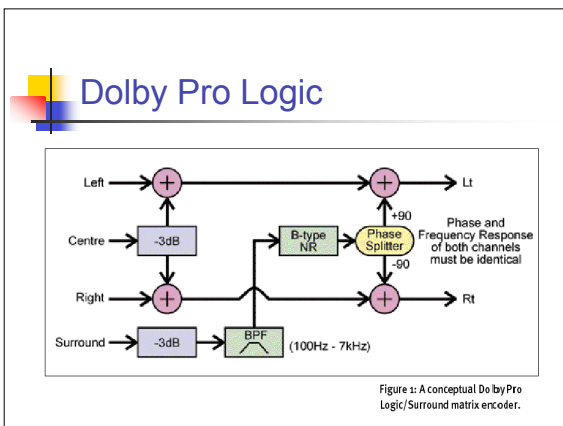
The diagram illustrates depth stereo with a central sound source. Four speakers are arranged around it: two at the top and two at the bottom. The top-left speaker is labeled 'L+R (Sum)', the top-right is 'R+L (Sum)', the bottom-left is 'L-R (Difference)', and the bottom-right is 'R-L (Difference)'. The central source is labeled 'Distinctive center' and 'Diffusive rear sound'. Dashed arrows point from the central source to each of the four speakers.

Width stereo

The diagram illustrates width stereo with a central sound source. Two speakers are on the left and two are on the right. The left speakers are labeled 'L' and 'L', and the right speakers are labeled 'R' and 'R'. The central source is labeled 'Distinctive Left' and 'Distinctive Right'. Dashed arrows point from the central source to each of the four speakers.







Diskreta kanaler 5.1

Icon	Sound Mode
□	Mono
□	Stereo
□	Dolby Surround
□	Discrete surround
□	Quad surround
□	5.1 surround

Olika format

FORMAT SPEAKERS COMMENTS

1.0	1/0	Mono.
2.0	2/0	Stereo.
2.0	3/1	The original matrixed Dolby Surround.
3.0	3/0	Used rarely, where a film soundtrack employs three front channels but no surrounds.
4.0	2/2	The classic quadraphonic arrangement intended for speakers positioned in the four corners of a square. There are a few films on DVD presented in this format, but it is most widely used with re-released quadraphonic music such as Mike Oldfield's <i>Tubular Bells</i> .
5.0	3/2	The full, modern surround sound format but without using the LFE channel. Often used in music applications.
5.1	3/2L	As above but with the extra LFE channel. Widely used for most modern film soundtracks, including the Dolby Digital and DTS systems.
6.1	3/3L	This is an arrangement with three rear surround channels plus three frontal channels, plus the LFE channel. It was a format introduced by Dolby for <i>Star Wars Episode 1 — The Phantom Menace</i> and is also referred to as EX (for Dolby-encoded material) or ES (for DTS-encoded material).
7.1	5/2L	This format is only used in large-screen cinemas and employs additional loudspeakers between the left-centre and right-centre pairs. The Sony SDDS film format uses this arrangement.
10.2	6/4LL	This is a configuration proposed by Tom Holman (of Lucasfilm and THX fame), in which two 5.1 systems are used, one at floor level and the other at ceiling level, thereby having the ability to convey height information as well as horizontal surround imaging (making the system 'periphonic').
