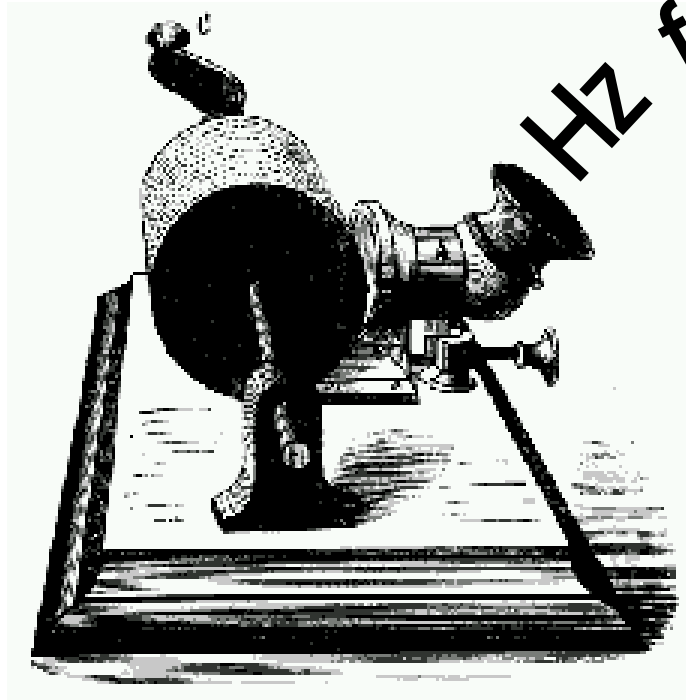
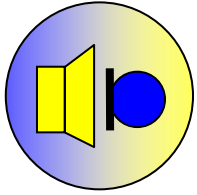


Ljudteknik 5p

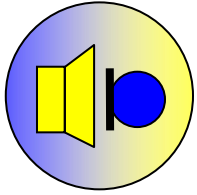


Hz from scratch



Volym, panorering och tonkontroll

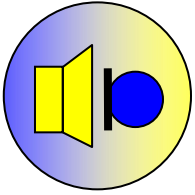
- Innehåll
 - Mono, stereo, surround lyssning
 - Introduktion till boken
 - Volym
 - Panorering
 - Tonkontroll (Eq)



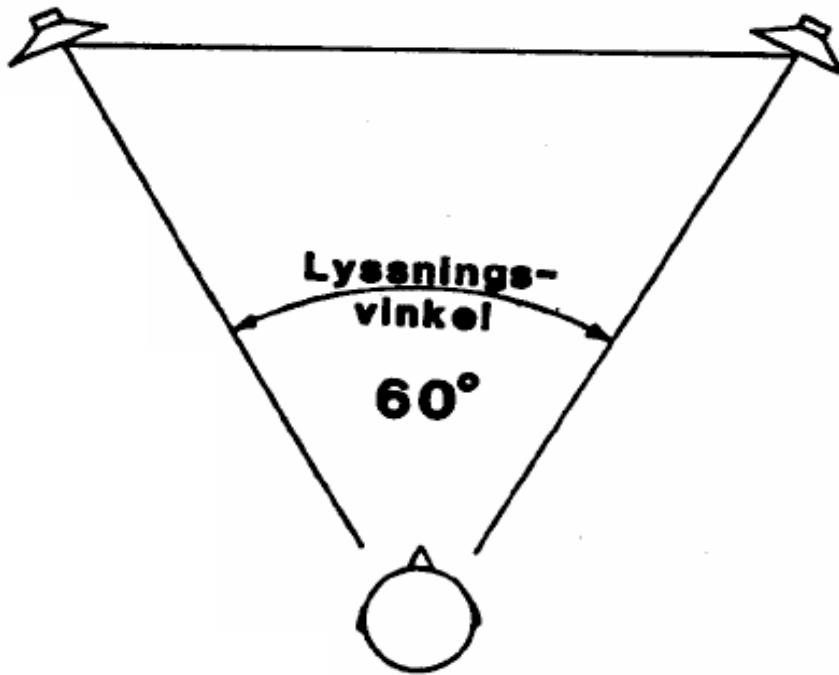
Mono



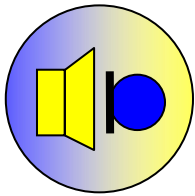
- En högtalare för lyssning, enklare applikationer
 - Medhörning live
 - Bärbar radio ex vid badstranden



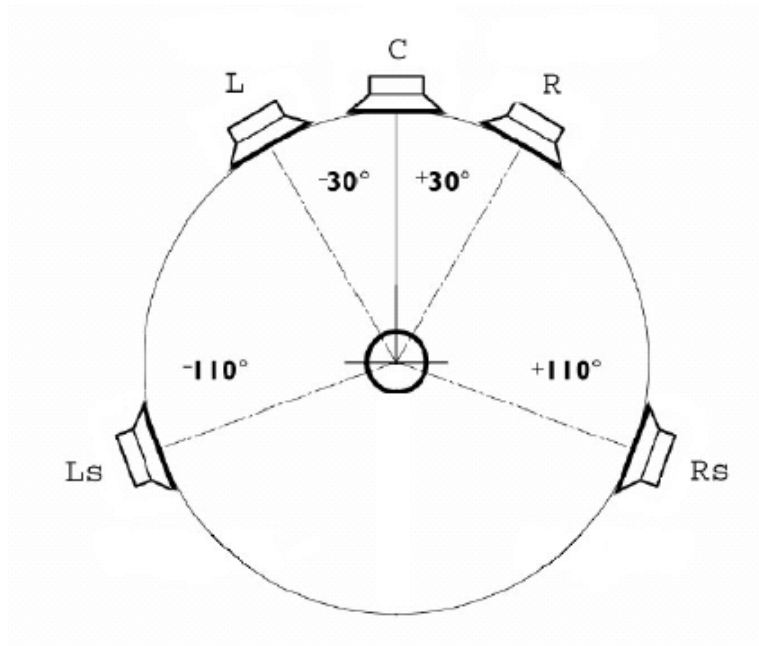
stereo



- Två högtalare
- Har varit det vanligaste sättet att spela av musik hemma sedan 70-talet
 - Inför riktning och ökad djupkänsla i lyssning jmf med mono

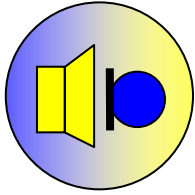


Surround



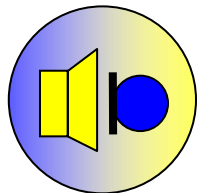
Figur 1: 5.1 systemet enligt ITU standarden.

- Exempel på placering av högtalare enligt "5.1" standarden. (saknas sub.-bas)
 - Omsluter lyssnaren vilket ger en ny dimension för lyssnaren jmf med stereo
 - Två strategier i mixningen
 - Direkt/ambiens
L C R innehåller instrument
Ls Rs rumsklang
 - Direkt-överallt
Källor panoreras till alla högt.

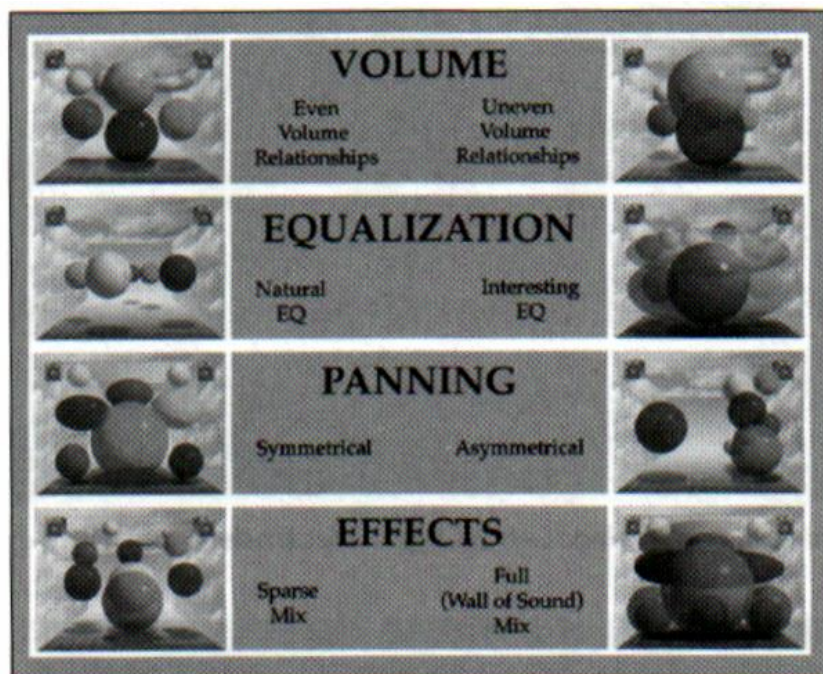


Surround

- Värdering av surround vid lyssning
 - Naturlighet
 - Närvaro
 - Omslutenhet av ambiens
 - Omslutenhet av källor
 - Rumsljud
 - Transparens
 - Bredd
 - Avstånd mellan källor
 - Djup
 - Storlek på källor
 - Huvudintryck

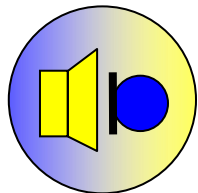


Introduktion till boken

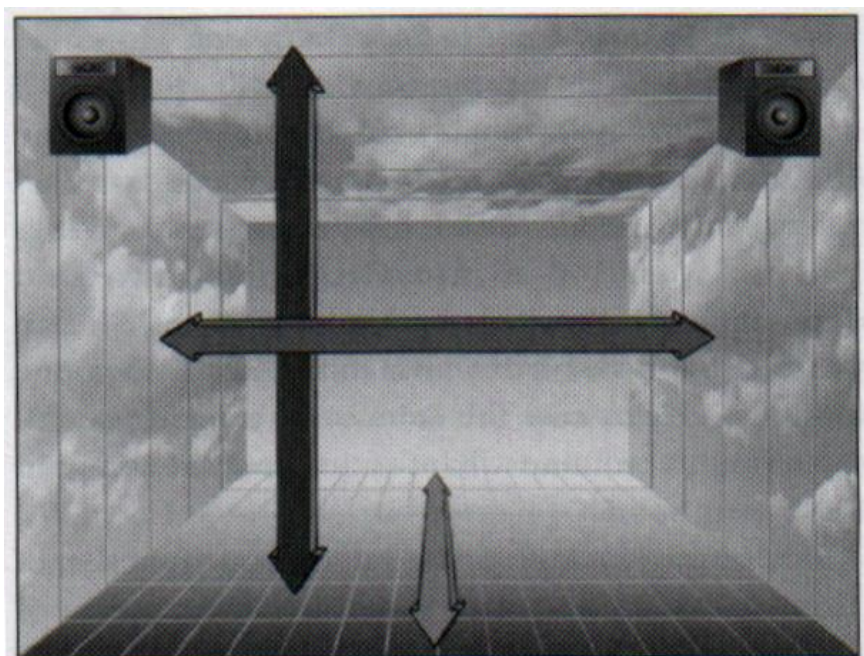


Visual 7. Dynamics Created With Studio Equipment

- Volym
- Tonkontroll (Eq)
- Panorering
- Effekter ex Reverb, Delay etc

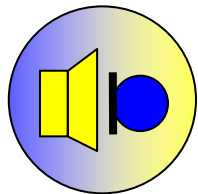


Introduktion till boken

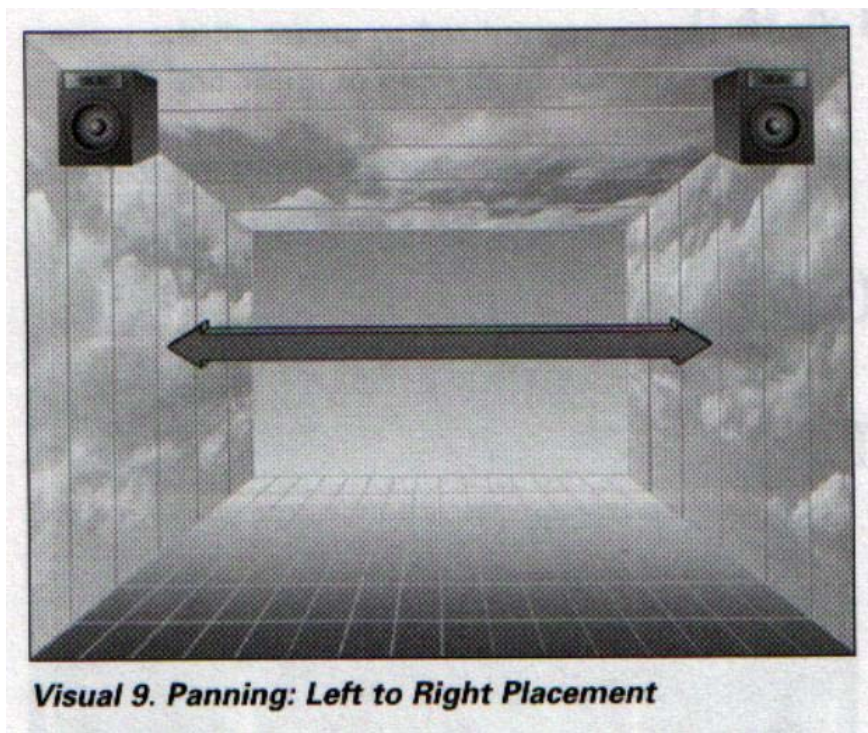


Visual 8. Sound to Visuals: X, Y, Z Axes

- Djup, bredd och klang i en ljudbild

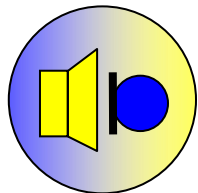


Introduktion till boken

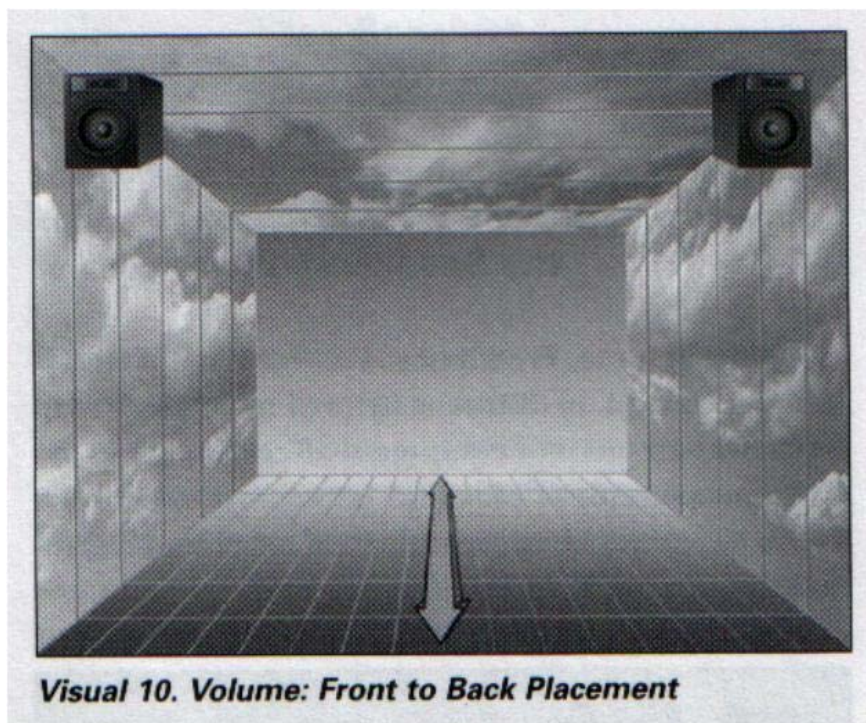


Visual 9. Panning: Left to Right Placement

- Panorering

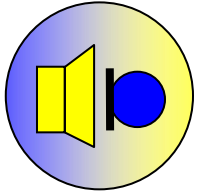


Introduktion till boken

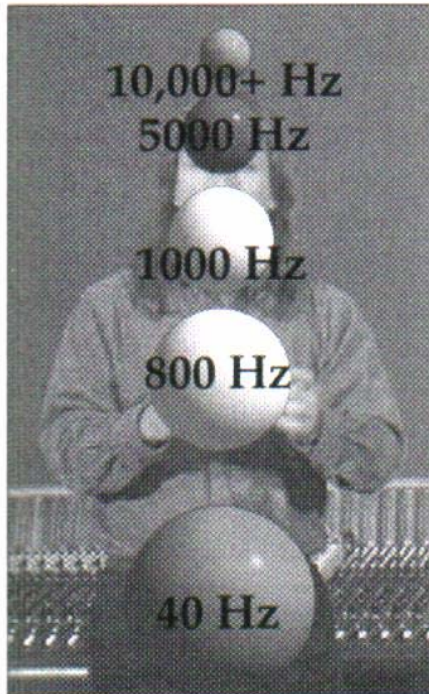


Visual 10. Volume: Front to Back Placement

- Volymen används som ett verktyg att skapa ett djup i ljudbilden

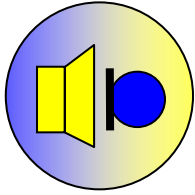


Introduktion till boken

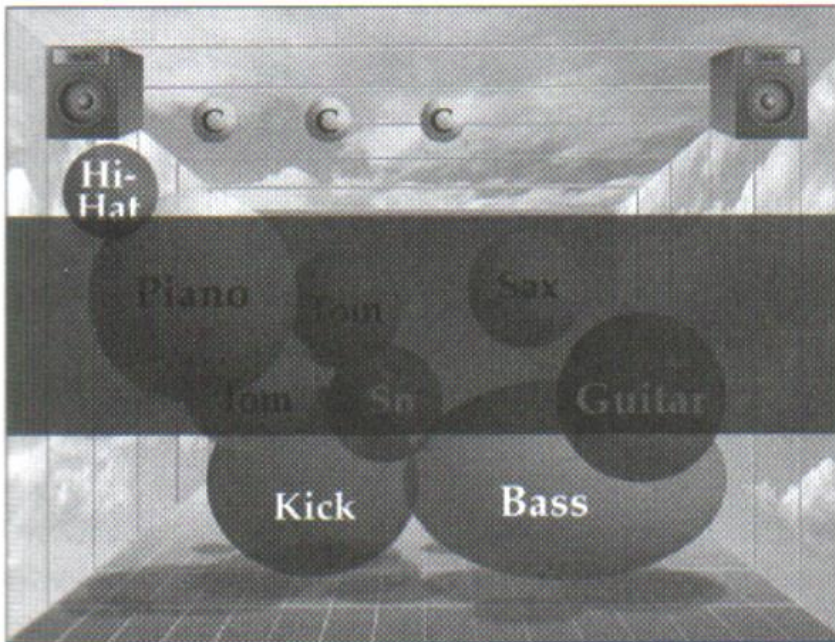


Visual 12.
Frequencies in the human ear

- Klangfärg återges som olika stora sfärer i höjdlid

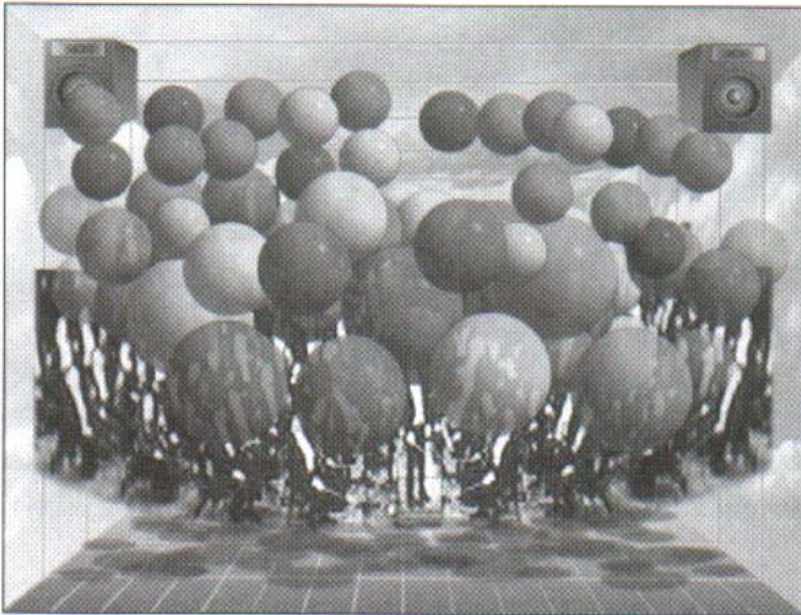
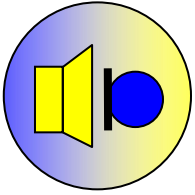


Introduktion till boken



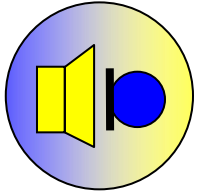
Visual 13. Song With Highs and Lows Highlighted

- Sång med Bas och diskant markerade

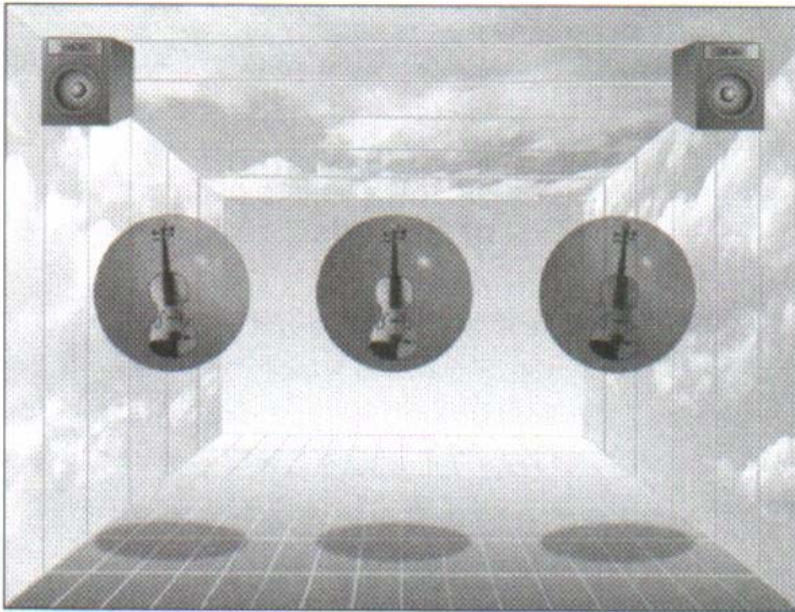


Visual 20. Large Orchestra Crowded Between Speakers
(see color Visual 20C)

- En tät mix, allt utrymme i ljudbilden är ockuperat

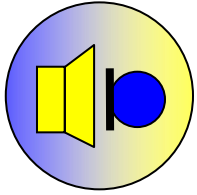


Introduktion till boken

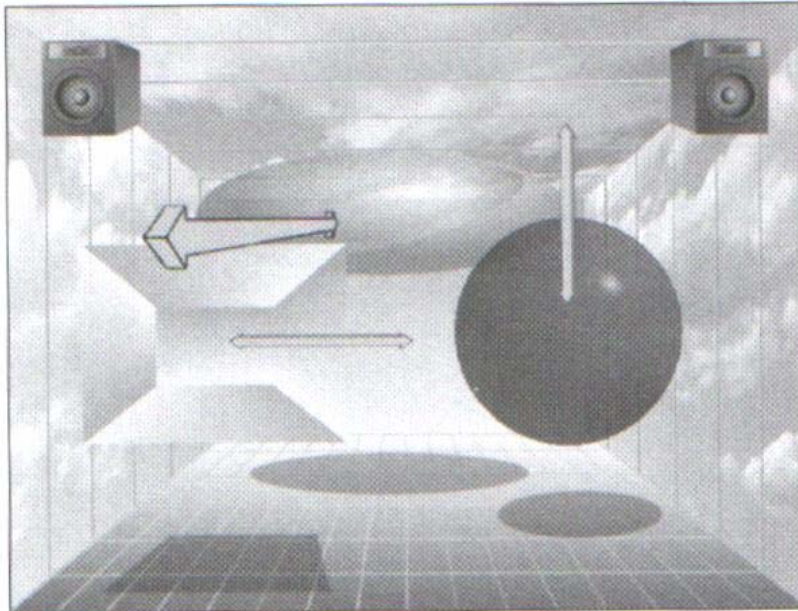


*Visual 21. 3 Violins With Plenty of Space in Between
(see color Visual 21C)*

- Tre violiner väl separerade, gles mix

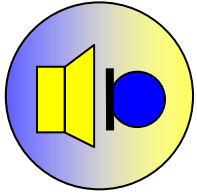


Introduktion till boken

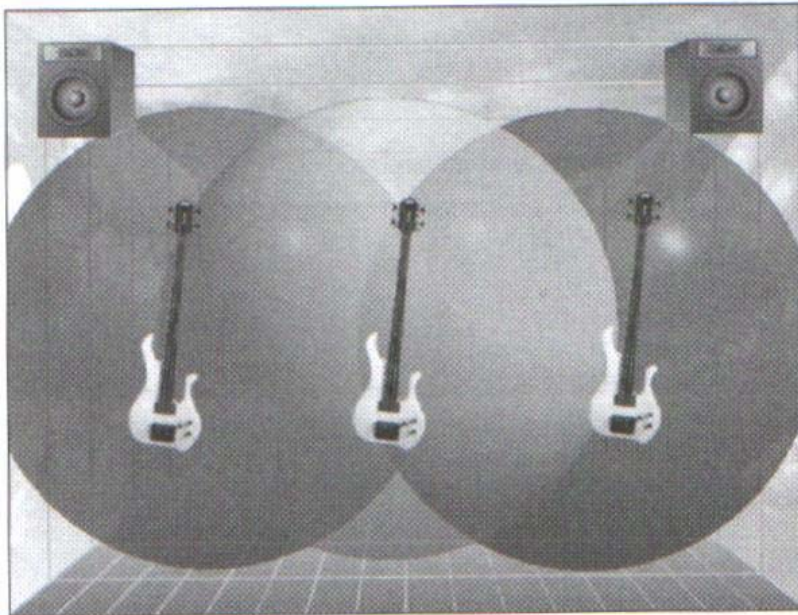


*Visual 22. Movement of Sounds With Volume,
Panning, EQ*

- Förflyttning av ljud i ljudbilden med Volym, Panorering, och Eq

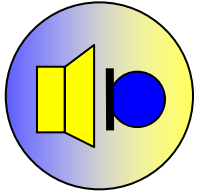


Introduktion till boken

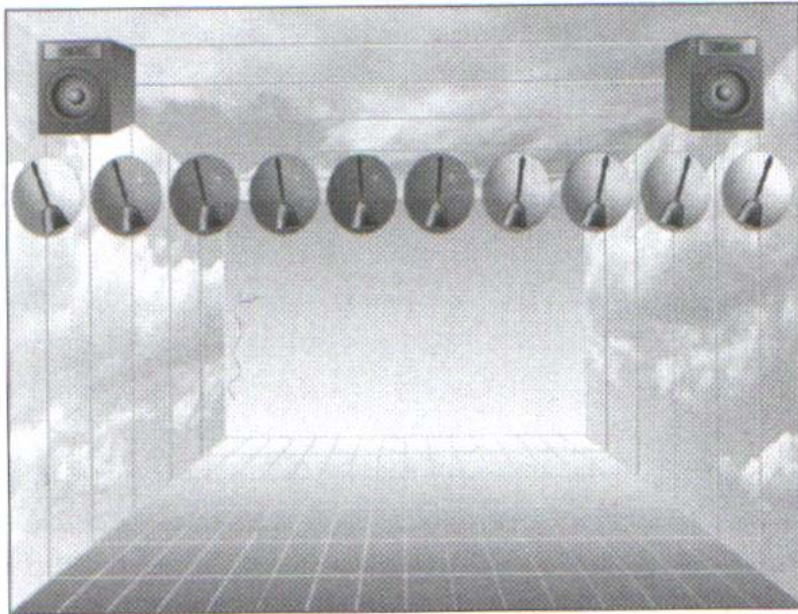


Visual 24. Mud City

- Tre Elbasar tar stort utrymme i ljudbilden och överlappen gör att de inte går att särskilja

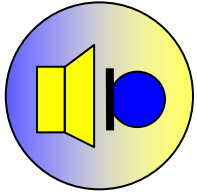


Introduktion till boken

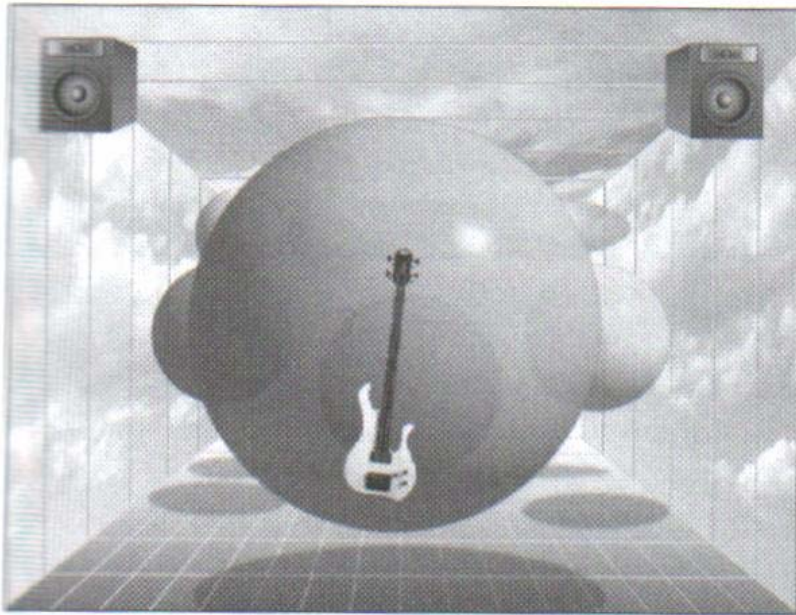


Visual 25. 10 Bells Playing at Same Time

- Diskant rika instrument är lättare att särskilja i ljudbilden.

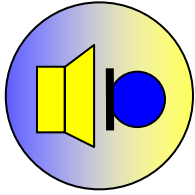


Introduktion till boken

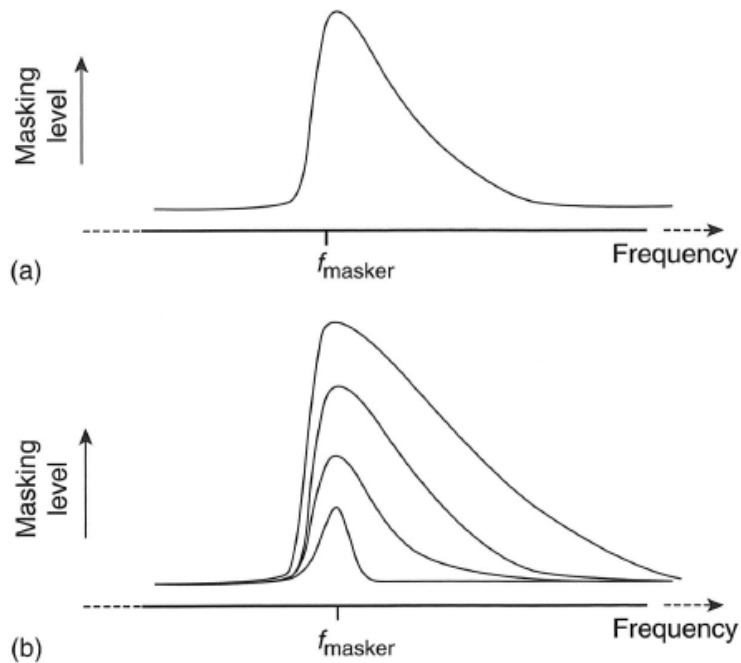


Visual 26. Loud Bass Guitar Masking Rest of Mix

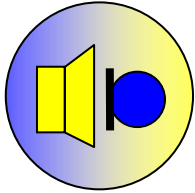
- Hög elbas maskerar resten av mixen



Introduktion till boken

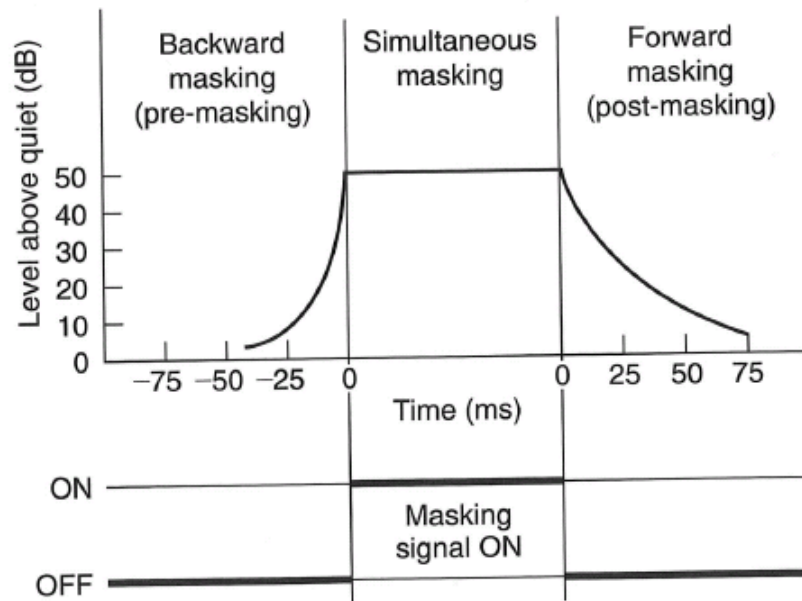


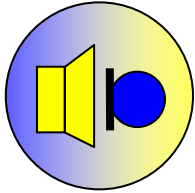
- Maskeringseffekten
- Ljudkällor (lägre frekvenser) med tillräcklig ljudstyrka maskerar även källor med högre frekvens innehåll



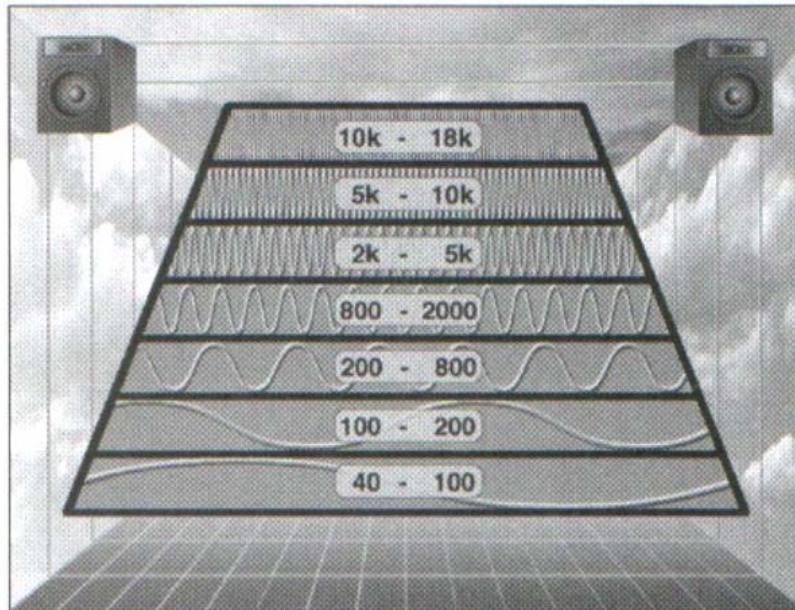
Introduktion till boken

- Maskning ur en tidsaspekt



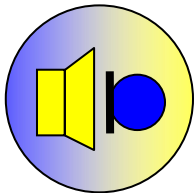


Introduktion till boken

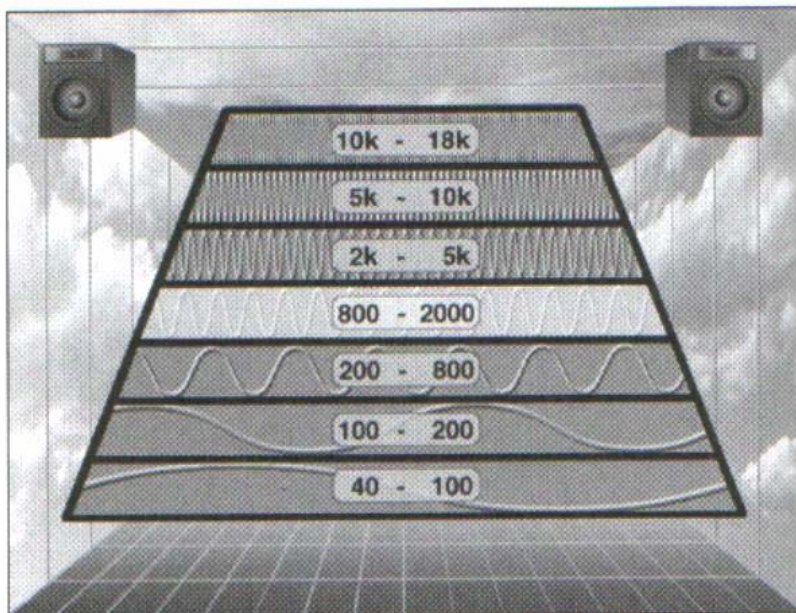


Visual 68. Virtual Mixer Graphic EQ

- Viktiga frekvensband åskådliggörs som grafisk EQ

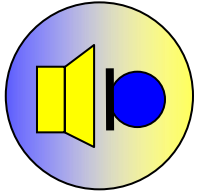


Introduktion till boken

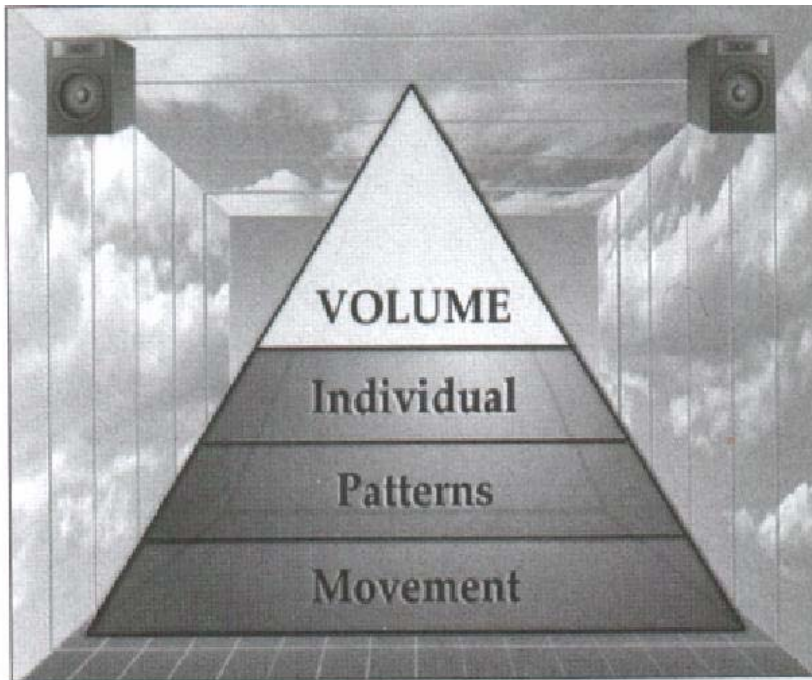


Visual 69. 1000Hz Boost

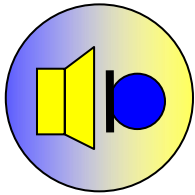
- Ökning av 1000 Hz



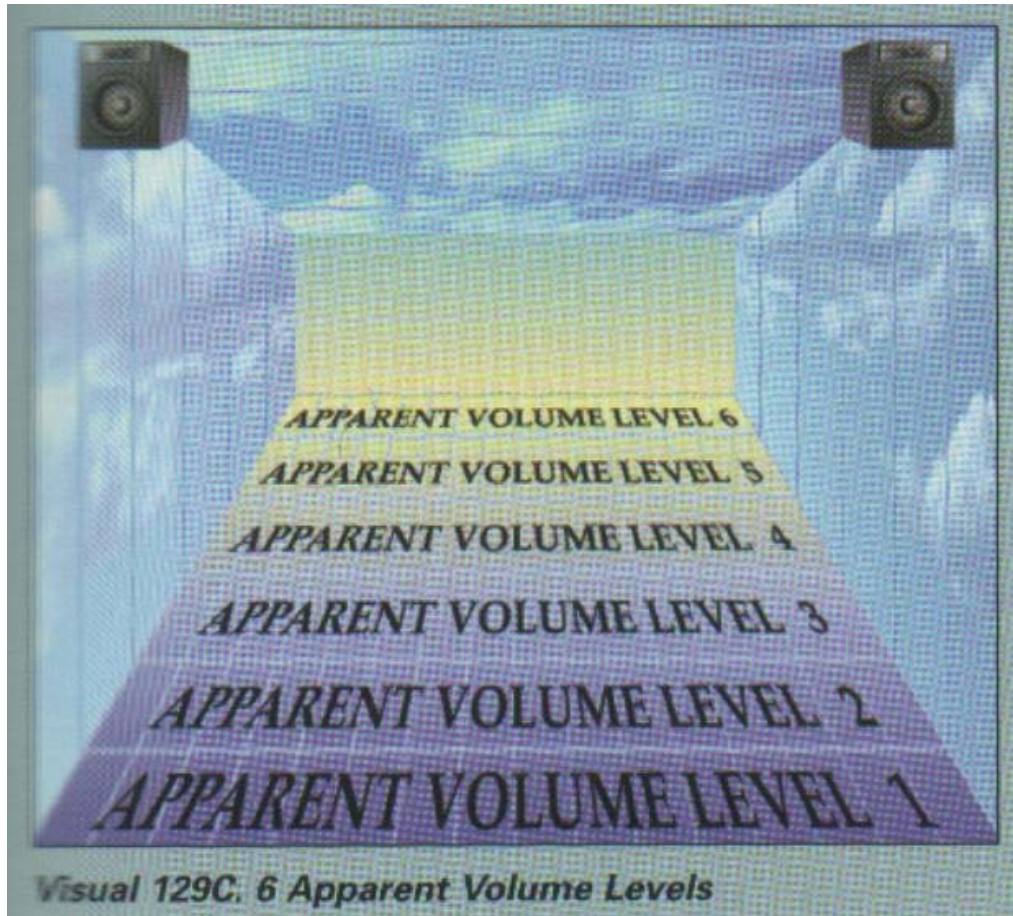
Volym



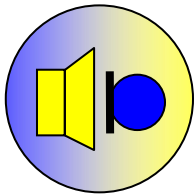
- Individuell ljudnivå relativt övriga
- Stora nivå variationer i låten, eller mer jämn nivå, beror på musikstil.
- Fading in och ut, ändra nivå på enskilda instrument eller grupper av instrument i en låt
- Förutom Faders används även kompressor, expander (kommer senare)



Volym

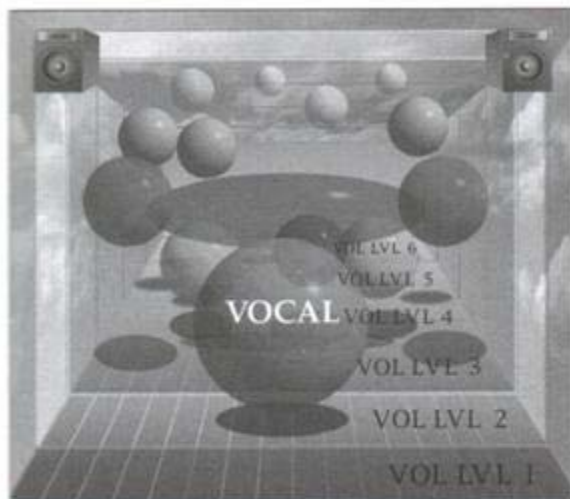


1	2	3
Alarm Clocks	Lead Vocals	Main Rhythm
Explosions	Lead Inst's	Lead Vocal
Primal Screams	Boom	Toms
	Horn Blasts	Snare (Dance)
	Symph Blasts	Kick (Metal)
		Hi-Hat (Jazz)
		Loud Effects
4	5	6
Rhythm Beds	Effects	Whispers
Chordal Pads	Kick (Jazz)	Talking
Drums (Jazz)	Hums	Noises
Bckgrd Vocals	Bckgrd Vocals	Doubling
Strings		
Reverb		

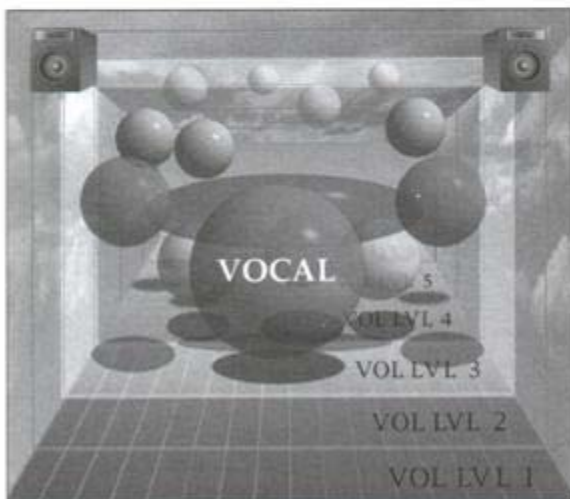


Volym

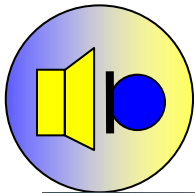
- Sång placeras ofta i Nivå 2 eller 3



Visual 136. Apparent Volume Level 2 Vocals (see color)



Visual 137. Apparent Volume Level 3 Vocals



Volym

Visual 166C. Big Band Mix

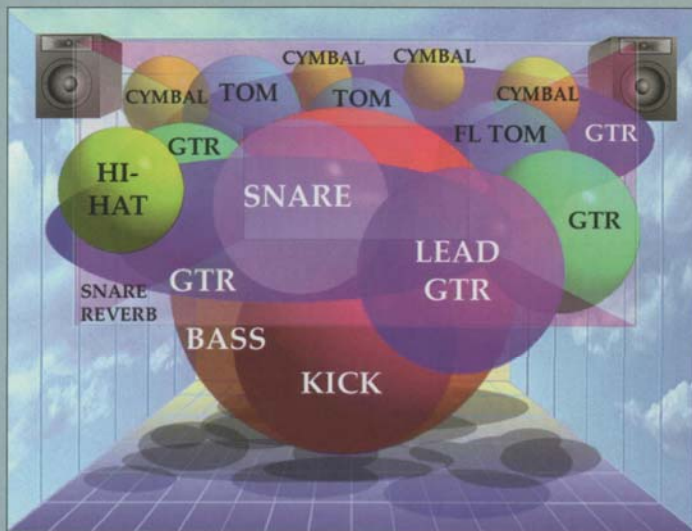
A very clean and clear mix. It's typical for the vocal to be extremely loud. The horns are loud compared to the rest of the band. The hi-hat is sometimes right out front, while the piano, the guitar, the snare, the bass, and especially the kick are often quite low in volume.



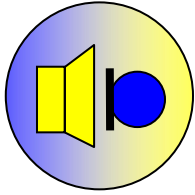
- Exempel på en mix med relativt stora nivåvariationer

Visual 167C. Heavy Metal Mix

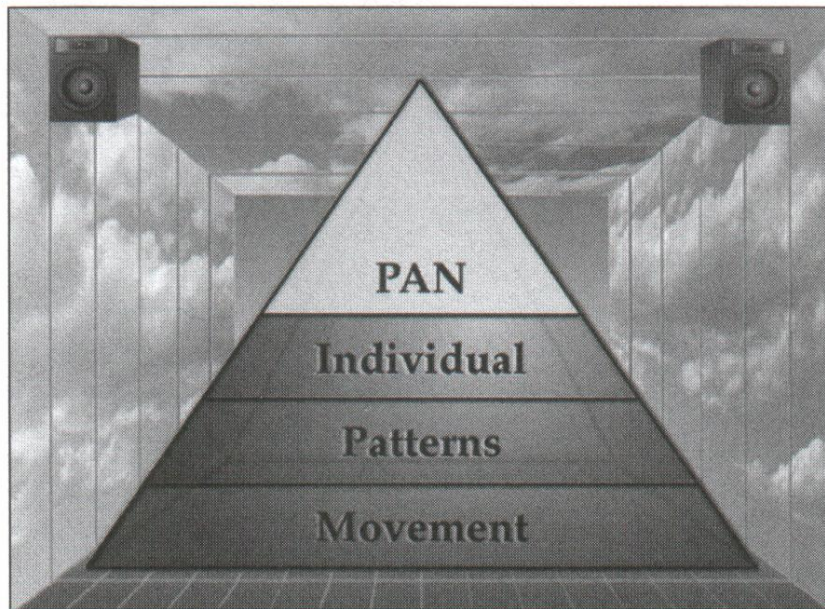
A very full arrangement and mix. Note the clarity of the low end (kick and bass), even though it is an extremely busy mix. The hi-hat, the snare, and especially the lead guitar are right out front. Note the multiple guitar parts with a few panned in stereo. The reverb is present but not so loud that it muddies everything. There isn't much room left for effects unless there is a breakdown section in the song. The overall effect is a massive, powerful wall of sound.



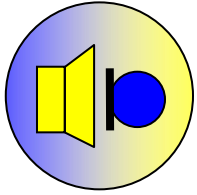
- Hård rock med relativt små skillnader i ljudnivå , (wall of sound)



Panorering



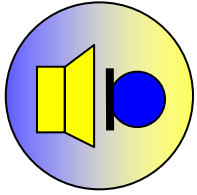
- Panorering relativt övriga instrument
- Mönstret på panoreringen styrs av musikstilen
 - Naturlig
 - Symmetrisk, asymmetrisk
 - Överlapp eller åtskild
- Svepa instrumenten H/V



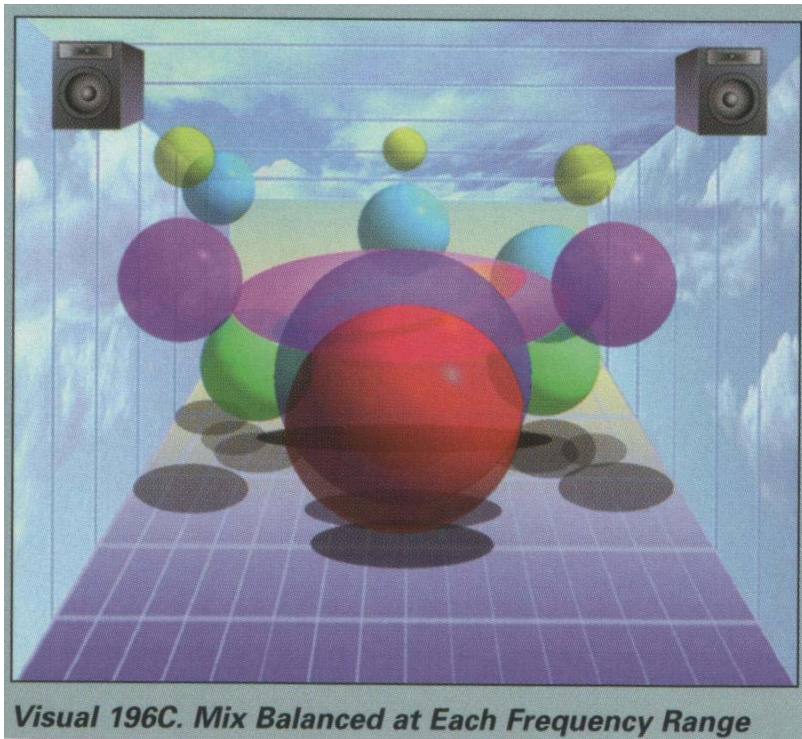
Panorering

- Naturlig panorering



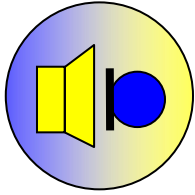


Panorering

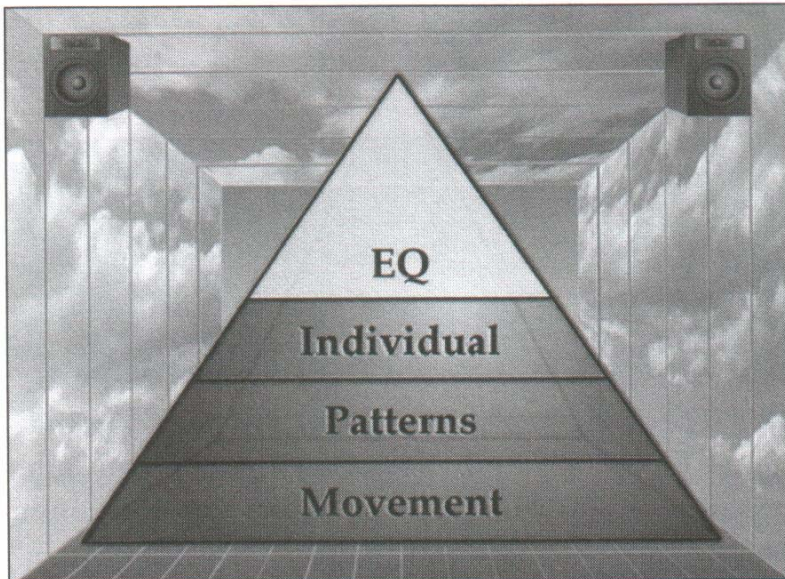


Visual 196C. Mix Balanced at Each Frequency Range

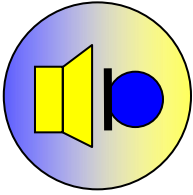
- Symmetrisk panorering



Eq



- Varje enskilt instrument
 - Mikrofonvalet inverkar
 - Musikstilen avgör
- Allt sammantaget
 - Enskilda eq injusteringar kan ge en dramatisk förändring när hela materialet avlyssnas. Olika musikstilar kräver sina inställningar
- Utföra eq ändring på ett eller flera instrument på ett visst ställe i låten



Eq

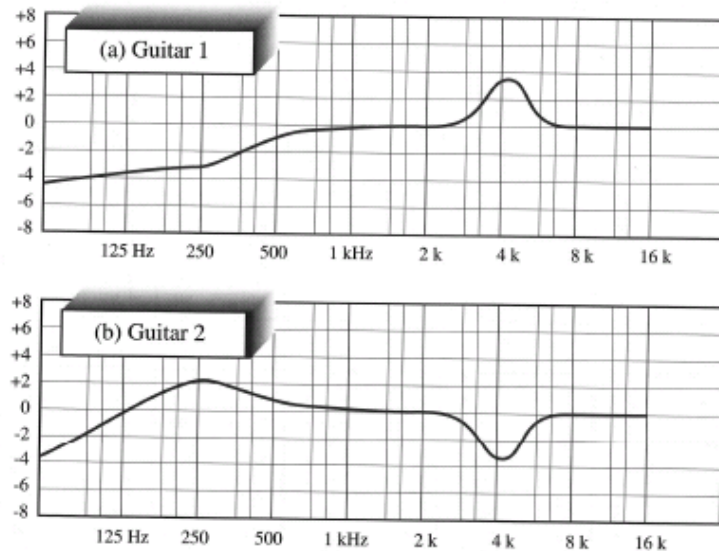
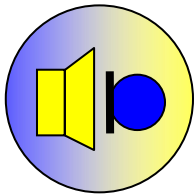


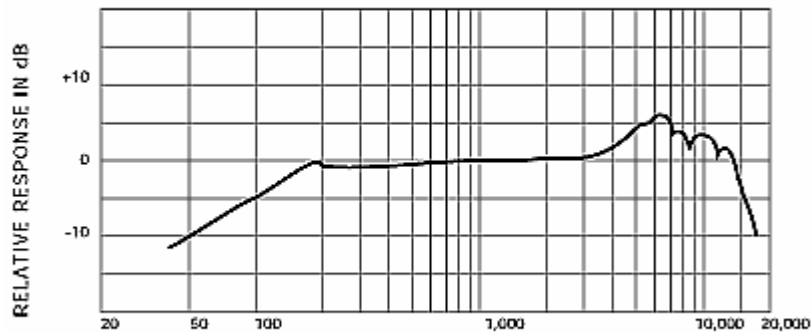
Figure 7.6 Minimize frequency overlap

- Minska överlapp mellan två instrument genom att förändra Eq
- Klanglig balans och klarhet
 - Gitarr 1
 - Öka kring 4 kHz
 - Gitarr 2
 - Minska kring 4 kHz
 - Öka kring 250 Hz

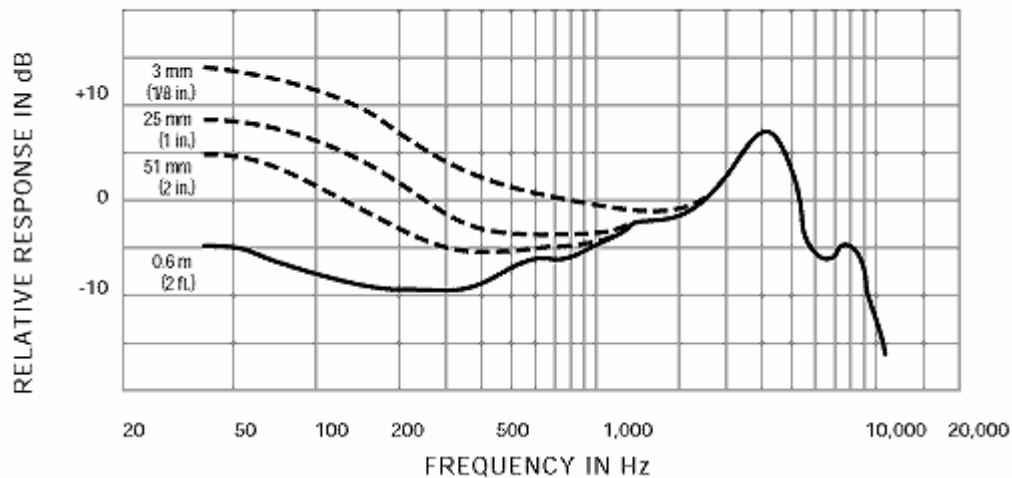


Eq

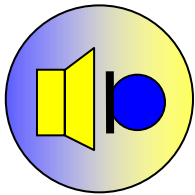
Shure SM57



Shure Beta 52

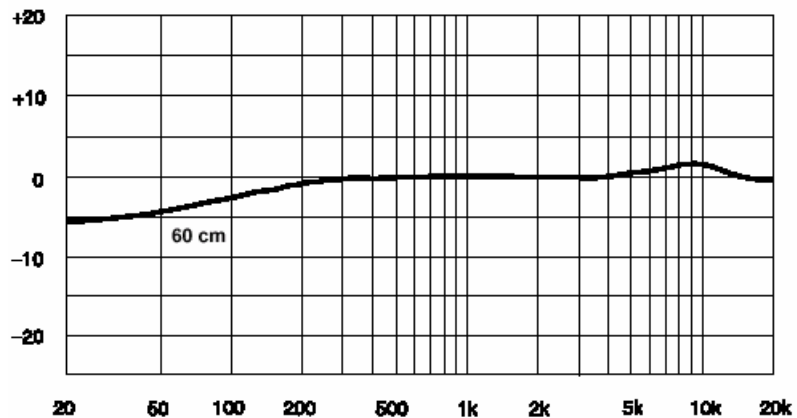


- Mikrofonvalet
 - SM57 (Sång, virvel, instrument)
 - Beta 52 (Baskagge, elbas)

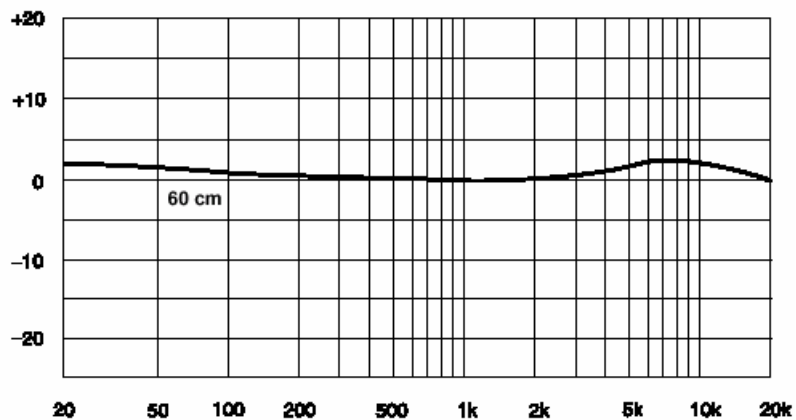


Eq

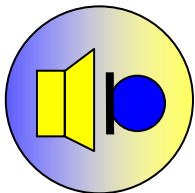
Shure KSM141 Cardioid Response



Shure KSM141 Omnidirectional Response



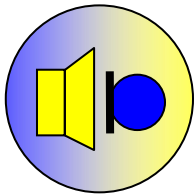
- Mikrofonvalet
 - Kondensator mikrofon KSM 141



Eq

- Instrument-frekvensområde
Inverkan

Frequency	40-100	100-200	200-800	800-1000	1000-5000	5000-8000	8000-12,000
SOUNDS							
BASS	Bottom	Roundness	Muddiness	Body on Small Speakers	Presence	High End	Hiss
KICK	Bottom	Roundness	Muddiness			High End	Hiss
SNARE	X	Fullness	Muddiness			Presence	X
TOMS		Fullness	Muddiness		Presence Irritation	High End	X
FLOOR TOMS	Bottom	Fullness	Muddiness		Presence		X
HI-HAT	X		Muddiness		Irritation	Clarity/ Crispness	Shimmer/ Sizzle
CYMBALS			Bleed				
VOICE	Rumble	Fullness	Muddiness		Presence Irritation Telephone	Clarity/ Crispness Sibilance-6K	Sparkle/ Hiss
PIANO	Bottom	Fullness	Muddiness	Muddiness	Presence	Clarity/	Harmonics
HARP		Pedal Noise			Twanginess	Crispness	
ELECTRIC GUITAR	X	Fullness Crunch	Muddiness Roundness		Cut/Shred Irritation	Crispness Thinness	Hiss
ACOUSTIC GUITAR	X	Fullness	Muddiness			Clarity/ Crispness	Sparkle
ORGAN	Bottom	Fullness	Muddiness			Clarity/ Crispness	
STRINGS	Bottom	Fullness	Muddiness		Irritation Digital Sound	Clarity/ Crispness	Sparkle
HORNS	X	Fullness	Muddiness	Roundness		Clarity/ Crispness	
CONGA	Boominess	Fullness				Clarity/ Crispness	
HARMONICA	X	Fullness			Irritation	Clarity/ Crispness	X



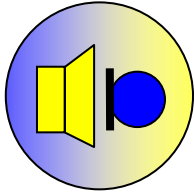
Eq

- Snabb EQ-inställningar

Freq.	HH	Kick	Snare	Overheads	Toms
High Highs (10-12k)	+3			+3	
Highs (5-8k)		+5	+7		+6
Low Mids (200-400)	-9	-10		-6	-6
Lows (40-60)		+2			

Freq.	Bass	Dist Guitar	Clean Guitar	Acoustic Guitar	Piano	Vocals
High Highs (10-12k)				+4		
Highs (5-8k)			+3	+3	+3	+2
Mids (1-3k)	+5	+3				
Lo Mids (200-400)	-3			-5	-5	
Lows (40-60)	+2					

Chart 5. Common Quick General EQ



EQ

40-200 <u>Bass</u>	200-800 <u>Low Mids</u>	800-5K <u>Mids</u>	5-8K <u>Highs</u>	8-12K <u>Super Highs</u>
Fullness	Body	Presence	Presence	Presence
Boomin'	Robustness	Projected	Airy	Crispness
Ballsy	Warmth	Forward	Bright	Sparkling
Punchy	Crunchy	Intelligible	Brilliant	Screamin'
Powerful	Fat	Articulate	Live	Sharp
Thumpin'			Clear	
Solid			Smooth	
Thick			Crisp	
Round				
Beefy				
Bad!!				
<u>Too Much</u>	<u>Too Much</u>	<u>Too Much</u>	<u>Too Much</u>	<u>Too Much</u>
Heavy	Muddy	Hornlike	Tinny	Crisp
Boomy	Tubby	Phonelike	Steely	Sizzly
Rumbly	Barrelly	Honky	Metallic	Searing
		Bathroomy	Strident	Glare
		Boxy	Cutting	Glassy
		Woody	Piercing	
		Nasal	Shrill	
		Chunky	Screamin'	
		Woofy		
		Edgy		
<u>Not Enough</u>	<u>Not Enough</u>	<u>Not Enough</u>	<u>Not Enough</u>	<u>Not Enough</u>
Thin	Distant	Veiled	Dull	Flat
Anemic	Hollow	Covered	Dead	Cheap
Wimpy	Disembodied	Muffled	Dark	

- Terminologi och slanguttryck för olika frekvensområden