Gesang der Jünglinge: History and Analysis
John Smalley, 2000

Gesang's genesis

Sometime near the end of 1954, the devoutly Catholic composer Karlheinz Stockhausen began work on a Mass for electronic sounds, which he intended to debut in Cologne Cathedral. Unfortunately, Church authorities deemed loudspeakers inappropriate for the cathedral space. Forced to rethink his plans, Stockhausen transformed his initial concept into a nonliturgical religious work. The result, *Gesang der Jünglinge*, is arguably the first real masterpiece of electronic music, a piece whose complexity and drama far surpassed anything the medium had yet produced. Indeed, the composer's unique synthesis of vocal and electronic sounds marked a quantum leap beyond the *musique concrète* techniques practiced in Paris and elsewhere.

Stockhausen's compositions typically proceed from a single governing idea. Here, the idea was to seamlessly fuse the sound of the human voice with electronically generated sounds. At West German Radio's Studio for Electronic Music, Stockhausen analyzed sung verses into their elementary phonetic components, then incorporated these sounds into a timbre continuum that ranged from pure tones (electronically generated sine waves) to white noise (electronically generated aperiodic sound).

Through his studies of phonetics and spectral analysis Stockhausen knew that sung vowels, in their overtone structures, most resemble pure tones, whereas "plosive" consonants (*b,p,t,d,k*, and *g*) resemble noises. Consonants like *n*, which are voiced, fall somewhere in between the two poles. In order to construct a smooth continuum that embraced these vocal elements, Stockhausen had to create additional elements to fill in the gaps between them. A decade earlier, such creation would have been impossible. However, using contemporary studio resources, Stockhausen generated sine wave complexes to imitate vowel-like sounds and filtered electronically generated noise to arrive at consonant-like sounds. Once the continuum had been constructed, the composer extracted from it the basic elements and groups of elements he would use in composing. To maintain maximum control over vocal timbres, Stockhausen used only one voice for this composition, the voice of a single twelve-year-old boy. The multiple recordings made of the boy's singing were then transposed, combined, and otherwise altered in accordance with *Gesang*'s compositional plan.

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Stockhausen after a performance of *Gesang der Jünglinge* in Munich, 1956.

Text and textual organization

The youths referred to in *Gesang der Jünglinge*'s title are the youths in the Bible's Book of Daniel, whom King Nebuchadnezzar threw into a fiery furnace for refusing to worship a golden idol. With amazement, the king then saw the youths, unscathed, singing praises to their God from the heart of the inferno. In *Gesang*, Stockhausen has used eleven of the verses sung by the youths, presented in a far from straightforward setting. Much is swallowed up in the roar of Stockhausen's electronic fire, but the opening words of each verse, "*Preiset den Herrn*" ("Praise ye the Lord"), can be heard recurring throughout the composition as a kind of refrain and, on a less audible level, as an element that unifies sections. *Gesang* is an explicitly religious work, and the words "*Preiset den Herrn*" are crucial to its meaning. One could say that the phrase "*Preiset den Herrn*" functions ritually, like a refrain to be repeated by the congregation, or a hesychastic prayer. Stockhausen notes that if one is familiar with the text, one needs only hear the word "preiset," and the mind will inevitably supply "den Herrn." Among other things, *Gesang* is about the intersection of memory and knowledge in prayer. The verses Stockhausen selected are as follows:

> *Preiset (Jubelt) den(m) Herrn, ihr Werke alle des Hernn—*
> *lobt ihn und über alles erhebt ihn in Ewigkeit.*
>
> *Preiset den Herrn, ihr Engel des Herrn—*

preiset den Herrn, ihr Himmel droben.

Preiset den Herrn, ihr Wasser alle, die über den Himmeln sind—
preiset den Herrn, ihr Scharen alle des Herrn.

Preiset den Herrn, Sonne und Mond—
preiset den Herrn, des Himmels Sterne.

Preiset den Herrn, aller Regen und Tau—
preiset den Herrn, alle Winde.

Preiset den Herrn, Feuer und Sommersglut—
preiset den Herrn, Kälte und starrer Winter.

Preiset den Herrn, Tau und des Regens Fall—
preiset den Herrn, Eis und Frost.

Preiset den Herrn, Reif und Schnee—
preiset den Herrn, Nächte und Tage.

Preiset den Herrn, Licht und Dunkel—
preiset den Herrn, Blitze und Wolken.

(O all ye works of the Lord—
praise (exalt) ye the Lord above all forever.

O ye angels of the Lord, praise ye the Lord—
O ye heavens, praise ye the Lord.

O all ye waters that are above heaven, praise ye the Lord—
O all ye hosts of the Lord, praise ye the Lord.

O ye sun and moon, praise ye the Lord—
O ye stars of heaven, praise ye the Lord.

O every shower and dew, praise ye the Lord—
O all ye winds, praise ye the Lord.

O ye fire and summer's heat, praise ye the Lord—
O ye cold and hard winter, praise ye the Lord.

O ye dew and fall of rain, praise ye the Lord—
O ye ice and frost, praise ye the Lord.

O ye hoar frost and snow, praise ye the Lord—
O ye nights and days, praise ye the Lord.

O ye light and darkness, praise ye the Lord—
O ye lightning and clouds, praise ye the Lord.)

The composer subjects material drawn from the biblical verses to numerous permutations which take place on several levels: word, syllable, and phoneme. Thus, if our original sequence is "*preiset den Herrn*," a different word sequence might yield "*den Herrn preiset*," a different syllable sequence "*prei- Herrn set den*," and a different phoneme sequence "*eiprs et den nHerr*."

Besides being varied sequentially, the words are often combined so as to sound simultaneously. As a result of such simple procedures, words flicker in and out of existence. Sometimes a word's meaning is dissolved; at other times, unexpected combinations cause new words to spring into being, words such as *schneewind* ("snowwind") and *feurreif* ("fireripe"), for example. Some permutations clearly alter the comprehensibility of the text more drastically than others. This means that in addition to the tone-noise continuum, a second continuum of sense-nonsense is at work.

Stockhausen's creation of an acoustic and semantic continuum was undoubtedly helped by his studies of acoustics, phonetics, and information theory with Werner Meyer-Eppler at Cologne University. In Meyer-Eppler's classes, Stockhausen and his fellow students had gained practice in breaking apart words into their elementary phonetic components and in studying intensely the acoustic properties of vowels and consonants.

Because comprehension of *Gesang*'s text, at least at certain times, is important for the meaning of the piece to be grasped, Stockhausen attempts to control this aspect as well. To this end, he developed a qualitative scale of comprehensibility, ranging from 1 (incomprehensible) to 7 (the most comprehensible). Although these values are also subjected to permutations (the first minute of *Gesang*'s music cycles through all seven degrees), there is at least one time in the piece where the words are presented clearly in their original order. There are also many other times where the alterations are minor enough to allow one to grasp the meaning of the words. The meaning, as always, is religious. As Stockhausen observes, "Whenever language emerges momentarily from the sound signals of the music, it praises God." It should be added that the verses also hold autobiographical significance for the composer. Reflecting on the time of *Gesang*'s composition, a time when he was struggling to establish his career, the composer writes that "[the period] from 1954 to 1956 was a unique time of jubilantly praising God, and I myself was 'a youth in the fiery furnace.'"

Werner Meyer-Eppler lecturing at the Institute of Phonetics and Communication Research, Bonn University, 1959.

Serialism and the form of *Gesang*

It is not only word permutations that obscure the text's meaning, but also the fact that word-sounds are inevitably surrounded by, combined with, and partially covered by other sounds. Adding to the *Gesang*'s complexity is the fact that the sung sounds, like the electronic sounds and "mixed-type" sounds, are varied serially with respect to pitch, volume, and duration. In other words, a series of discrete values is established for the parameters of pitch, volume, and duration, and these values are then distributed equally to the sounds and sound groups used in the composition. This method of composing, a method which Stockhausen helped pioneer, is known as "total serialism." In theory, no one element or value predominates in a serial composition, and one might therefore expect to be confronted with a rather static listening experience. But such is not the case with *Gesang der Jünglinge*. Guided by intuition and an unerring sense of drama, Stockhausen has used serial technique in the same way that Bach, centuries earlier had used counterpoint: as a means to profound expressive and spiritual ends.

In *Gesang*, several series were devised to organize pitch. Stockhausen has said that he used six types of scales in his piece: harmonic, subharmonic, chromatic, and three other scales that were a mixture of these. Stockhausen further states that *Gesang* consists of six sections, or "structures," and that both the number of sound elements and their manner of combination differs from structure to structure. Although the content of the structures is clearly varied, the borderlines between them are less audibly apparent. The six structures of *Gesang*, and their durations, are as follows:

I.   0'00''—1'02'' = 1'02''
II. 1'02''—2'52'' = 1'50''
III. 2'52''—5'.15.5'' = 2'23.5''
IV. 5'15.5''—6'22'' = 1'06.5''
V. 6'22''—8'40'' = 2'18''
VI. 8'40''—13'00'' = 4'20''
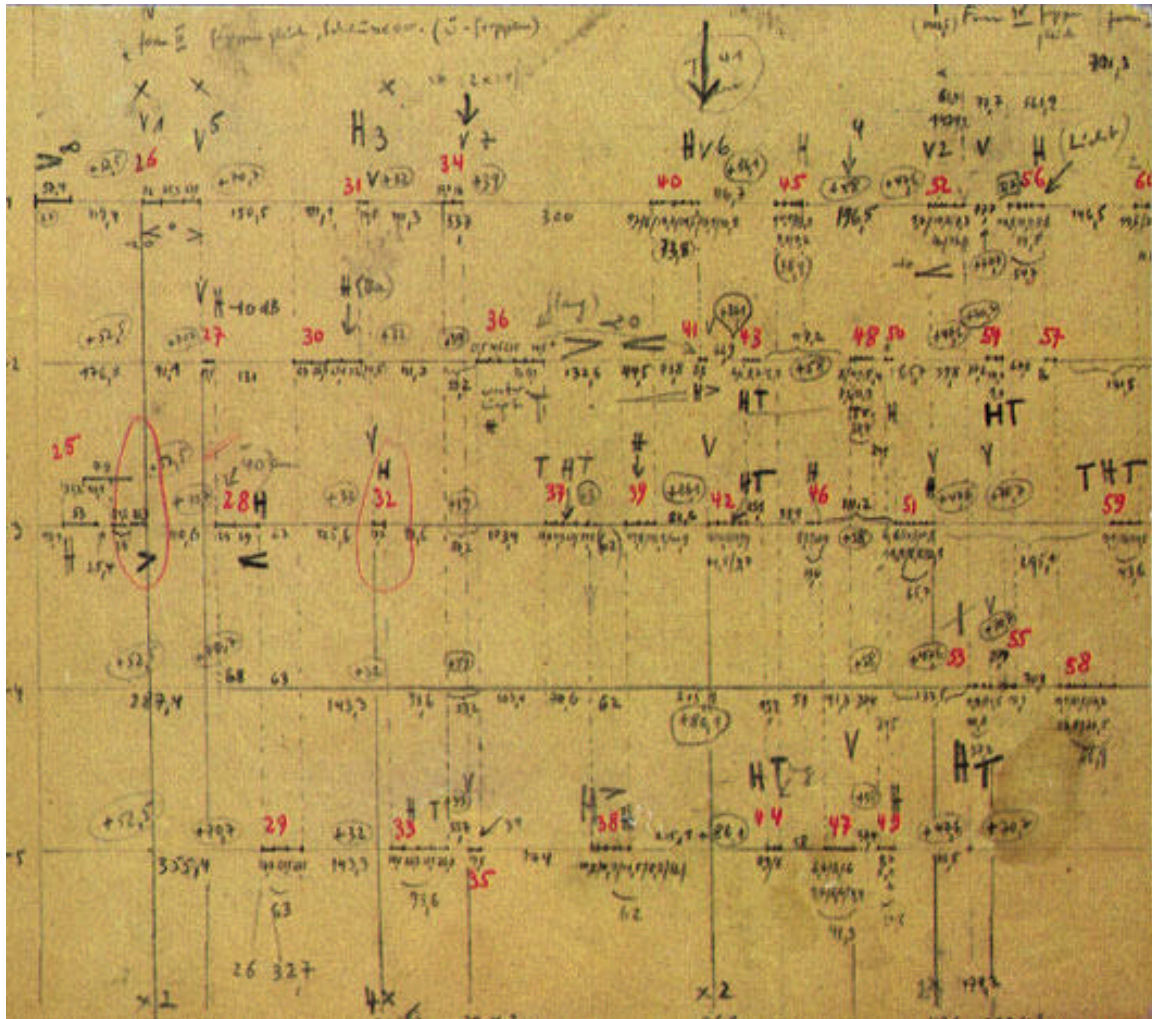
Excerpt from the manuscript of *Gesang der Jünglinge*. L₁ - L₅ indicate the layers assigned to each of the five loudspeakers. Black numbers below the horizontal lines indicate length in centimeters of sound durations (76.2 cm = 1 sec.). Red numbers indicate sound groups.

The organization of Structure VI

The many sketches that comprise *Gesang*'s manuscript were never collated by Stockhausen into a single score. Nevertheless, the composer has published certain details of his working methods. The following three examples taken from Stockhausen's notes to his CD of *Gesang* offer a glimpse into the organization of the piece's final structure.

Example 1 lists the twelve types of elements present in *Gesang*'s final structure. As we would expect, the element types span a continuum from sine waves (SC) to white noise (NO).

Example 1

Abbreviations:

SC   = Sine wave complexes (swarms of sine tones with defined frequency, duration, and dynamic, with a very complex rhythmic microstructure)
IC   = Pulse complexes (swarms of pulses as in SC)
SS   = Speech-sounds and syllables
N   = White noise filtered to about 2% width (in Hz)
I   = Single pulses with defined pitch
SV   = Synthetic vowel sounds (spectra rich in overtones, with varying formant combinations)
NO   = White noises filtered to a width of 1-6 octaves
IO   = Pulses in swarms of statistically defined density, filtered to a width of 1-6 octaves
ICh   = Chords of single pulses (pitches in whatever scale is being used)
NCh   = Chords of the 2% (in Hz) wide bands of noise (middle pitches depending on the scale used)
SCh   = Chords of sine tones
VCh   =Vocal chords (superimposition of sung sounds with distinct pitch)

Example 2 shows how these element types are further arranged into 23 element groups, A-W. As Stockhausen notes, "each type of element occurs equally often (from a statistical point of view) in the structure as a whole."

Example 2

"Methods of phonetic analysis (vowel—sine tones, consonants—noise-bands, plosives—pulses, many mixed forms) were used in the systematization of the scale of sound-elements (the integration of the speech sounds into a synthetic sound family)."

Element Groups A-W

	SC	IC	SS	N	I	SV	NO	IO	ICh	NCh	SCh	VCh
A -	SC											
B -	"	IC										
C -	"	"	SS									
D -	"	"	"	N								
E -	"	"	"	"	I							
F -	"	"	"	"	"	SV						
G -	"	"	"	"	"	"	NO					
H -	"	"	"	"	"	"	"	IO				
I -	"	"	"	"	"	"	"	"	ICh			
J -	"	"	"	"	"	"	"	"	"	NCh		
K -	"	"	"	"	"	"	"	"	"	"	SCh	
L -	"	"	"	"	"	"	"	"	"	"	"	VCh
M -		"	"	"	"	"	"	"	"	"	"	"
N -			"	"	"	"	"	"	"	"	"	"
O-				"	"	"	"	"	"	"	"	"
P -					"	"	"	"	"	"	"	"
Q -						"	"	"	"	"	"	"
R -							"	"	"	"	"	"
S -								"	"	"	"	"
T -									"	"	"	"
U -										"	"	"
V -											"	"
W -												"

Example 3 shows a "statistical structure," an event whose shifting characteristics, for reasons of complexity, can only be described statistically. This particular structure, which appears towards the end of *Gesang*, is a composite of six versions of a single sung phrase. As Stockhausen explains, "the following are serially defined: the number of the 6 layers used, the number of syllables per layer (5-10), the overall duration of the individual layers (in cm at 76.2 cm per sec.), the relative distribution of the syllable-sequences in time and the direction of their pitches, the width of the frequency-band for the complex and its overall direction of movement (933 : 767 Hz to 508 : 400 Hz), and finally the averagely predominant phonetic structure ([u], [_], [_], [e:]). With the aid of graphic diagrams and models prepared on tape (having approximate pitch and duration characteristics), the individual layers were then sung, and the

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best results superimposed. The six diagrams the boy sang from looked like this (they must be imagined as simultaneously interwoven in the subsequent *synchronization*):"

Example 3

Time: 76.2 cm per second
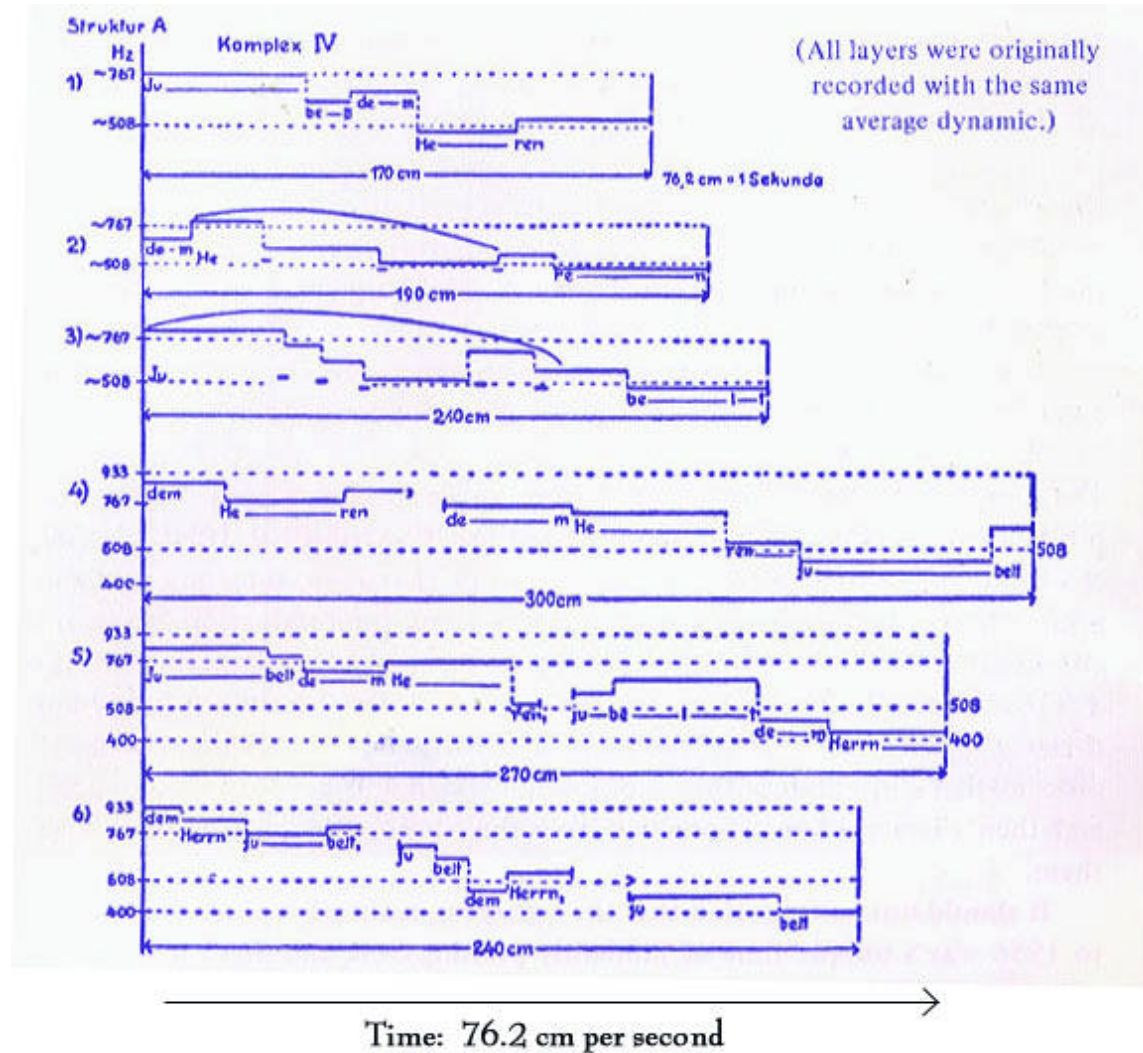
Gesang as spatial music and later developments

Gesang made history as the first electronic piece to serialize the projection of music in space. Exactly how Stockhausen applied serial techniques to the music's distribution among the loudspeakers is an extremely complicated matter that scholars have only recently begun to unravel. Suffice it to say, however, that the spatialization of *Gesang's* music is one the composition's most fascinating features, and an aspect that simply cannot be experienced from listening to the two-track recordings available on record and CD. In a true four-track performance, such as will take place at Columbia University this July, the listener will perceive the sounds moving clockwise and counterclockwise around her. Sounds approach and recede, stand still or zoom away. The spatial dimension of *Gesang* articulates its form, but more importantly, adds dynamism and drama to this enigmatic piece.

It is interesting to note that Stockhausen originally recorded *Gesang* in five channels, despite the fact that a five-track playback machine did not yet exist. For this reason, at *Gesang*'s 1956 premiere, four of the channels were played back by a four-track tape machine over four groups of speakers surrounding the audience, while the fifth track was projected by a separate machine through a fifth loudspeaker set up on stage. After the premiere, Stockhausen mixed the fifth track onto the fourth track, and most performances since then have used a copy of the four-track tape.

　　Gesang der Jünglinge's premiere in 1956 was a watershed event, and Stockhausen's electronic and spatial innovations did not go unnoticed. Other composers soon began to use electronic techniques to blur the boundaries between speech and music. Luciano Berio's 1958 *Thema* (*Omaggio a Joyce*) could be cited as an example. In pieces like *Gruppen* (1958, for three orchestras) Stockhausen himself further developed his ideas of timbre continuums and spatial projection within the domain of instrumental music. Perhaps the most surprising legacy of *Gesang* is the speed with which the world of popular music embraced certain of its techniques. Stockhausen's appearance on the cover of the Beatles record album, *Sgt. Pepper's Lonely Hearts Club Band*, is just one example of the many tributes to his enduring influence.
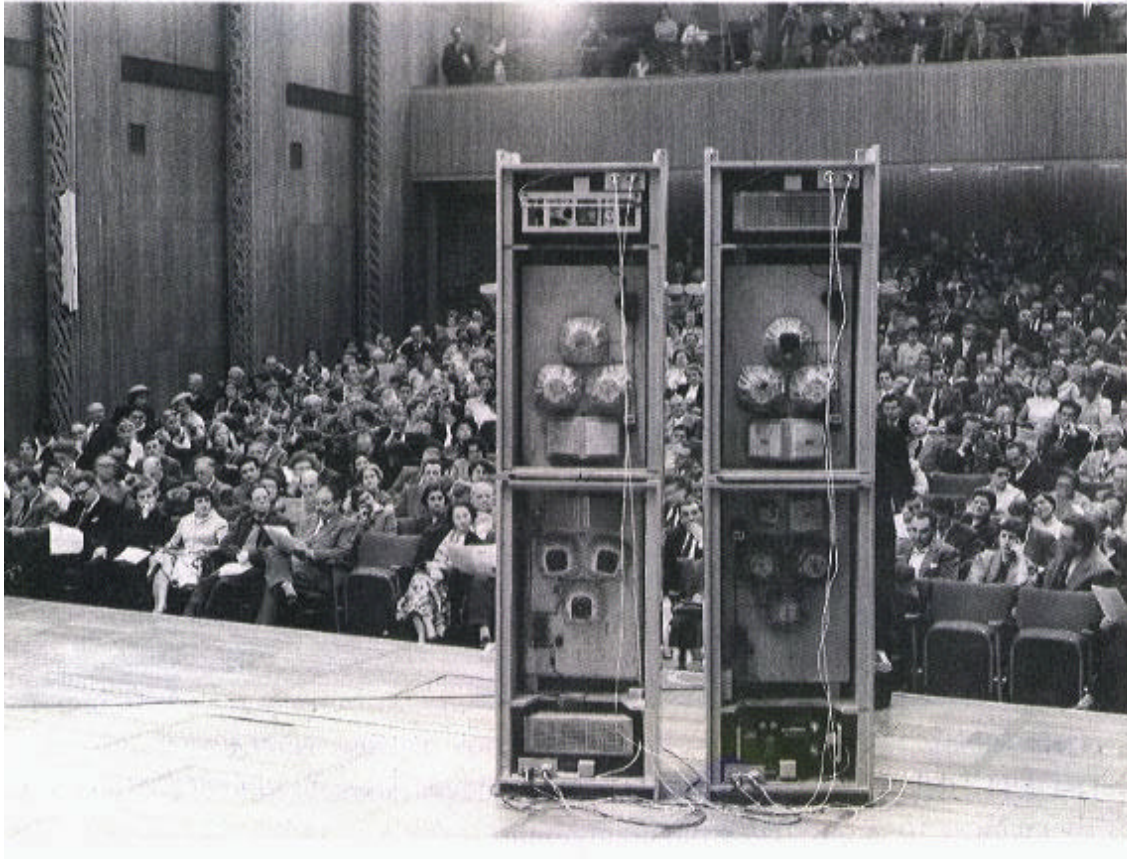
World premiere of *Gesang der Jünglinge* in the large auditorium of Cologne's West German Radio. May 30th, 1956.

Sources/suggested reading

Note: Any study of the literature on *Gesang der Jünglinge* should begin with a reading of Stockhausen's own extensive notes, published in the booklet that accompanies his *Elektronische Musik* CD. The most in-depth analysis of *Gesang*, as well as a partial reconstruction of its score, can be found in the recently published article by Pascal Decroupet and Elena Ungeheuer.

Decroupet, Pascal and Elena Ungeheuer. "Through the Sensory Looking-Glass: The Aesthetic and Serial Foundations of *Gesang der Jünglinge*." *Perspectives of New Music* 36.1 (1998): 97-142.

Heikinheimo, Seppo. "The Electronic Music of Karlheinz Stockhausen: Studies on the Esthetical and Formal Problems of its First Phase." *Acta musicologica fennica* 6 (1972): 61-103.

Kurtz, Michael. *Stockhausen: A Biography*. Trans. Richard Toop. London: Faber and Faber, 1992. 82-84.

Maconie, Robin. *The Works of Karlheinz Stockhausen*. 2nd ed. Oxford: Oxford UP, 1990. 57-61.

Stockhausen, Karlheinz. "Composing Statistically." *Stockhausen on Music*. Ed. Robin Maconie. London: Marion Boyars, 1989. 43-52.

---. "*Electronische Musik*." Booklet. *Stockhausen 3: Electronische Musik 1952-1960.* Music by Karlheinz Stockhausen. CD. Stockhausen-Verlag, 1996.

---. "Four Criteria of Electronic Music." *Stockhausen on Music*. Ed. Robin Maconie. London: Marion Boyars, 1989. 88-111.

---. ". . . how time passes. . . ." *Die Reihe* (English Edition) 3 (1959): 10-40.

---. *Texte zur elektronischen und instrumentalen Musik*. Ed. Dieter Schnebel. Cologne: Verlag M. DuMont Schauberg, 1963. Vol. 1 of *Texte zur Musik*. 10 vols. to date. 1963- .

Stockhausen teaching his *Klavierstücke* at the Salzburg *Mozarteum*, 1988.