

flexible points / unified transformations

Stockhausen's *Kurzwellen* and the radio environment as a musical form

Ben Taylor
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Mills College

In 1953, Karlheinz Stockhausen composed *Study I* using the sine tone as the most basic element of what we hear, its permutations the heart of infinite sounds. Of 1964's *Microphony I*, Stockhausen describes the process of amplifying a tam-tam as “like a doctor with a stethoscope listening to the body of a person” (Stockhausen, *on Music* 87). In *Kurzwellen* (“*Shortwaves*” 1968) for an ensemble with shortwave receivers, the radio is the heart of the composition, the core from which all else is derived. Two smaller radio compositions which follow - *Spiral* (1968) and *Pole* (1969) – clarify Stockhausen's intention to use the medium to create a generative environment in which sound can be received, transformed, and intuitively transcended. Furthermore, the radio is a powerful tool for Stockhausen: to expand our spectrum of wave perception, to spiritually access the simultaneous streams of humankind's collective imagination, and to organize both meta-material and the distant ensembles of *Sternklang*. In *Kurzwellen* and its successors, Stockhausen finds in the radio a source of unity and uses it conceptually to connect and ground an ensemble capable of infinite transformation.

Section I: *Kurzwellen*, *Spiral*, and *Pole*

Stockhausen assimilated the radio into his music after hearing a recording of Cornelius Cardew using it as his source for negative-band sound in a 1964 performance of *Plus/Minus* (Maconie, *Works* 162). Of the recording, Stockhausen said:

I was, in a truly unselfish sense, fascinated by it... Sound combinations that, while recognizing their use by other composers, I had personally avoided (prepared piano and radio music), were now being brought by performers into my music... The result is of a highly poetic quality... (Maconie, *Works* 163)

In 1968, Stockhausen debuted *Kurzwellen* as the exposition of his conceptual approach to radio. In this section I will describe the musical processes occurring first in *Kurzwellen*, then in *Spiral* and *Pole*.

Kurzwellen

Kurzwellen is written for an ensemble of four players each with an instrument (viola, piano, tam-tam, electronium) and a shortwave radio receiver. In the piece, one performer makes an initial radio “event” that is then listened to and transformed by the ensemble through a notation of pluses and minuses, signifying expansion or contraction of the basic parameters of music: pitch, duration, dynamic, and constellation complexity. The score, while housing three pages of directions, contains many freedoms: performers are instructed to pause for any amount of time between events, and at any time a performer may choose a new event – any sound set that has been made recently on instruments or the radio– as their new object for transformation. The performer also chooses whether the new event – newest instance of transformation – is be played on the performer's instrument or on their shortwave radio, in which case the performer scans the airwaves quietly for an event which fits the desired parameters. At times, the score instructs performers to call duets, trios, or quartets, in which groups of players play synchronously or in alternation.

The aesthetic core of *Kurzwellen* is this series of transformation and sharing of material.

Stockhausen describes,

...HOW they call and invite each other to hear together an event which wanders among them for a prolonged period of time, letting it shrink and grow, compressing and expanding it, darkening and lightening it, concentrating or playfully decorating it. (Stockhausen, *Kurzwellen* insert)

The work is amoebic and in constant flux; the whole ensemble can change on a dime as new sounds become the focus of transformation. It is specifically stated in the score that each performance of *Kurzwellen* should sound drastically different, a sign that Stockhausen was embracing indeterminacy more than he had in previous process pieces like *Stimmung*. The radio broadcasts, too, are out of Stockhausen's control. A recording from 1969 is reported to have been chosen as a final recording because of its interception of a specifically robust BBC broadcast (Stockhausen, *Kurzwellen* insert).

Morse code is a frequent contributor to the airwaves, as are talk programs and jazz.

As with most of Stockhausen's music, *Kurzwellen* contains countless traces of his prior works. The notation is a direct descendent of *Prozession*, and his instrumentation includes the tam-tam/microphone system invented for *Microphonie I* and an electronium with pure electronic tones like those in his early WDR works. The quality of accessing simultaneous streams of independent material reveals the influence of *Gruppen*, as does the shaping of sound and ability with plus/minus notation to draw positive and negative bands where music is present or taken away (Hopp 77). *Stimmung's* process-based composition structure also has a strong presence, as does the pointillism of his earliest music (here in the form of events whose constellation structures have been transformed towards the negative).

The diverse instrumentation and ambitious agenda of *Kurzwellen* sometimes lend it a quality of confusion; as a soundscape it can easily become convoluted. *Spiral* and *Pole* reconcile that difficulty, making for cleaner, clearer music.

Spiral and Pole: Differentiations

Spiral was commissioned by an American guitarist and is formally very similar to *Kurzwellen*, with a few minor changes. The score states its purpose clearly: “In *Spiral* events received by a soloist on a short-wave radio are imitated, transformed, and transcended” (Stockhausen, *Spiral* 11). It is a solo, the Stockhausen Group usually playing it on an electronic instrument such as an electronium or electrochord, both of which sound similar to a shortwave radio's high pitched receptions. The notation of *Spiral* is more developed and specific, using graphic signs in addition to pluses and minuses to indicate aspects of ornamentation, repetition, and dissection. The biggest difference is the addition of the “Spiral sign”, which is a continuous repeat meant to instigate complete transformation and transcendence of a player's current event. These bursts of personal vision separate *Spiral's* intention

from *Kurzwellen*'s; whereas *Kurzwellen*'s purpose was transformational, *Spiral*'s is transcendental.

Pole removes the spiral sign, instead differentiating itself by addressing the polarities (“poles”) omnipresent in Stockhausen's work. *Pole* is a duet that takes advantage of the clarity available in the mixture of electronic instruments (again an electronium and electrochord) with the shortwave radio, becoming a lucid expression of contrasting musical lines. The *da Capo* at the end, leading to endless repetition and variation of this contrast, makes *Pole* a defining vision of duality and reconciliation among Stockhausen's works. *Kurzwellen* may be his most ambitious, dense, and mystifying work for radio, but *Pole* stands as the clearest pronouncement of his plus/minus notation's attempt at transformation and contrast, and as a result is an energizing piece of art.

Section II: Concepts

Stockhausen was not the first composer to use the radio as an instrument. In *Imaginary Landscape No. 3* (1943) John Cage took apart a radio and attached its antenna to the head of a phonograph. In Cage's *Radio Music* (1956), up to 8 performers play the noise of the airwaves, whether they be empty or full. Both compositions see the radio as an instrument of static and distorted reception; the use is practical rather than conceptual (though the radios are wireless, *Radio Music* is to be played from one location), using the medium as a sound source and not as a musical form. Pauline Oliveros' *Echoes from the Moon* (1987) uses transmission and reception more formally, to let her play canonically with her own echoes as her improvisation is broadcast on radio waves that bounce off the moon. But Stockhausen cohesively incorporates the medium's overall nature into his works, projecting the structure of the radio onto his ensembles (Maconie, *Works* 175). The closest Cage came to using the medium as a structure might be *Telephones and Birds*, where the matter of listening through wires is formal as well as aesthetic. But in Stockhausen's search for unity he approaches the radio with great thoroughness, turning its most abstract features into practical musical systems and parameters. In this section I will explain Stockhausen's handling of the conceptual implications of the radio, from sound

spectra and reception to meta-music, simultaneity, and the radio as a musical environment.

Spectra

In masterworks *Gruppen* and *Gesang der Junglinge*, Karlheinz Stockhausen used broad serialism as a tactic to explore the full perceptual spectra of acoustic and electronic sound. *Formel* uses serialism formally to explore the point-group spectrum, *Study II* uses the 25th root of five as a ratio capable of permuting individual electronic sounds to their full textural potential. (Maconie, *Other Planets* 133). With the radio, Stockhausen's spectrums grow: higher wave frequencies come into perceptual range, and distant sounds come into earshot. He uses the radio as a tool for experiencing and understanding a region of the world's perceptual spectrum that was previously unreachable by mankind.

Stockhausen's religiosity suggests that he considered this exploration to be spiritual, desiring to experience the full range of our world and of God. In addition, his interviews indicate a relation between this religious expanse and his ideas of art's purpose. "The role of the arts is to explore the inner space of man... They are a means by which to expand his inner universe" (Stockhausen, *on Music* 32). Accessing the airwaves and transcending them through musical processes show Stockhausen further imagining new territories of inner and outer artistic perception, searching in all new spaces for that which binds. In the advanced spectra of radio, he finds this unification in a group's collective reception from a single source.

Reception

Stockhausen's concept of reception weaves through his life's work, touching on his earliest music as a student of Messiaen's musical language, into his ideas of spatialized music, his spirituality, and his thoughts on creativity and intuitive music. The opposing lines in *Kreuzspiel* voiced an interest

in polarities that converse, an idea which would develop in his studies with Messiaen and codify in *Gesang der Junglinge* (Maconie, *Other Planets* 61). As Messiaen was developing a new post-WWII musical language, Stockhausen's music became enriched with sound symbols that relate to each other symantically (Maconie, *Other Planets* 54). As conversation involves both a sending and receiving end, I believe this idea of music as a communicative environment to be one of his first uses of reception as a musical tool. *Kurzwellen* develops his linguistic approach to music by including an “alive” electronic source, one which receives on its own and can therefore be conversed with freely.

Stockhausen's understanding of reception also plays out in his use of space as a component and parameter of music. A list of Stockhausen's compositions from *Gruppen* to *Sternklang* show a steady progression of the involvement of space. Later, in *Sculptures Musicales*, Cage would create sound sculptures in space, aural objects that fill a room with their amplitude cartography and that could be travelled through by the audience. While Cage's vision (taken from Duchamp) for his work is much more local and specific, it is a similar understanding of the map of waves in space that excited Stockhausen twenty years prior and which led him to access this map via shortwave receivers. Locations also comes into play, as performances at the 1970 World's Fair in Osaka, Japan would yield much different material than those in Germany (Stockhausen, *Sternklang* insert). In addition, radio realizes a more two-sided approach to space than in his spatialized electronic works, receiving as well as broadcasting.

Stockhausen's reception is also a spiritual one. "Radio is very Old Testament. In the Old Testament, you never saw God when He spoke. He spoke directly into the mind." says DJ Joe Frank (Rice 5). When Stockhausen writes “What could be more general, more supra-personal, inclusive, universal, instantaneous, than the broadcasts that become musical material in *Kurzwellen*?” (Stockhausen, *Kurzwellen* insert) he correlates radio broadcasts to that internal spiritual source which is audible to all. Radio fits into his view of humanity's future transcendence and utopia, the projection and reception of a collective mind.

Lastly, though perhaps most importantly, Stockhausen's fascination with reception is a facet of his unrelentingly creative nature. "A creative person is always most excited when something happens that he cannot explain, something mysterious or miraculous" (Stockhausen, *on Music* 36). While some artists struggle to provoke their imaginations, he, like all great artists, is clearly flooded with gifts from that invisible source. This leads Stockhausen to latch onto what Avital Ronell in *The Telephone Book* describes of radio as "the invisibility of its method" (Ronell 418). Stockhausen states this creative reception explicitly and repeatedly:

...there are long stretches of *Hymnen* which I simply heard inside me while composing, and which I was unable to incorporate into the musical structure at the time I received them. (Stockhausen, *on Music* 135)

...when you become like what I call a radio receiver, you are no longer satisfied with expressing yourself, you are not interested in yourself at all. There is nothing really to express. Then you will be amazed at what happens to you... You become a medium. (Stockhausen, *on Music* 125)

The latter statement refers to the intuitive music *Aus den Zieben Tagen*, composed in 1969 in the midst of his radio work. In these pieces, the performer is given almost no musical material, instead instructed in various ways to channel this direct reception of sound and project it into space. Though he may have considered these intuitive pieces to be a complete break from his previous work (Stockhausen, *on Music* 114-122), they are in fact closely related to his radio works through these concepts of reception and transcendence.

Meta-music

In *Gruppen*, Stockhausen developed a kernel of visual material into a large-scale composition, using permutations of the source material to inform almost every element of the composition (Maconie, *Other Planets* 149-151). In *Prozession*, Stockhausen's past compositions become the supply of material

for transformation. *Kurzwellen* uses the shortwave radio as a meta-instrument that contains kernels of music inside itself, a self-generating version of the developmental ideas of *Gruppen* and *Prozession*. When a player scans his or her radio to imitate or transform an event, extra snippets of music pop out and become material for future events. Stockhausen makes this clear when he describes in the score of *Kurzwellen*:

In order to find a short-wave event which corresponds to the prescribed degree of change, one should first search quietly for a setting, and then begin with the event. The search (at low volume) for a suitable short-wave event – tuning from station to station – should be perceived as a characteristic quality of this composition, and should therefore always be executed carefully and musically; even **unwanted** stations should be listened to momentarily, with varying duration and loudness, before tuning to another. (Stockhausen, *Kurzwellen*)

Not only is this a form of sound collage similar to *Hymnen*, using preexisting material to create new music and the radio as a sort of infinite tape, but these “unwanted” sounds become a source of new event material. As performers listen to each other for new events, they hear passing radio outbursts and can use them as musical material for the next measures of the piece.

In *Pole*, specifically, this process is intended as a generative one, indicated by the *da Capo* mentioned earlier. *Pole* has no real ending, instead subject to infinite repeats. It becomes almost a mathematical function capable of endless variation, similar to James Tenney's algorithmic music and anticipating Brian Eno's generative ambient work. Stockhausen defined *Prozession* as the “genetic rules for the development of a music. The process goes further in *Kurzwellen*” (Stockhausen, *on Music* 114). This process works only because of the constant influx of new material; even in *Prozession*, his past works would eventually run dry, but in *Pole* the material is constantly replenished. His choice to contrast shortwave receivers with electronic instruments in *Spiral* and *Pole* highlight this intent: they sound similar when swept, but while one's tone is pure and empty, the other's is full of music and noise.

Simultaneity

As mentioned in the description of *Kurzwellen*, the piece draws strongly from *Gruppen* in its manner of accessing and overlapping simultaneous independent stream of music. However much else is at play here, especially the aesthetic of John Cage's chance containers mixed with traces of Germanic ideas of development. Cage is visible in the independence of lines and the empty pauses between events, the manner of the work as overlapping groups of durations and silences. What distinguishes *Kurzwellen* is its process of simultaneous development. Not only are events accessed from simultaneous coexisting radio streams, but each event has in it the potential to be transformed in any direction by any member of the ensemble. Events have simultaneity not only in source and line, but also in potential movement. This collective potential is only in the moment; as soon as two performers transform an event, their paths become independent again.

Environments

Kurzwellen is the first composition by Stockhausen that could be accurately described as a self-contained environment. *Gesang der Junglinge* and *Hymnen* come close aurally, being conversations not of sounds themselves but of sounds with histories and geographies. *Stimmung's* group processes and relationships are also a relevant precursor, as are *Prozession's*, though *Prozession* is not self-contained because it reaches outside of itself for material. *Kurzwellen*, on the other hand, establishes itself as a true environment, by which I mean a a group of multiple objects, each with the agency to be independent and/or with dependencies and power relationships as defined by the rules of the environment. At the time, this type of composition was found more often in postmodern dance and performance art, made prominent by the Judson Dance Theater and also the Fluxus happenings of the 1960s. In music the concept was anticipated by Cage's practice of simultaneity and since found its way into music in the form of Tudor's *Rainforest IV* (1973) – possibly the defining moment of the

environment in music – as well as John Zorn's game music and The New Complexity's use of completely independent musical voices.

In *Kurzwellen*, an instrument's process of individual transformation is its independent agency, and the derivation of material from other instruments, as well as the collective use of the same radio data, becomes the source of dependency. Each instrument's unique abilities and character become its strengths or weakness in this environment. When the piano plays fortissimo block chords in the last minutes of a 1970 recording, it is exerting its power; when the shortwave hovers whimsically over it, it is acting flighty, like a sparrow flying over a tiger. The radio's ability as a meta-instrument to insert brand new musical material in each performance make the work self-contained; with minimal markings in the score, the composition is a set of rules that give birth to new variation on familiar relationships each time it is played.

Stockhausen derives this style of composition from the radio. The radio is not a still, linear composition with one voice, and so neither should *Kurzwellen* be one. Instead the radio is an environment of simultaneous streams, leading Stockhausen to compose a piece that “is structured by the human spirit, but also forms and constantly transforms itself because of the interference of all broadcasts with one another...” (Stockhausen, *Kurzwellen* insert). He achieves this by decentralizing the composition, using the radio's active nature as the center of an environment in which sound is born and develops. This decentralization – Stockhausen composing the rules and overall structure as opposed to virtually any elements of the specific material – is most closely comparable to Cardew's Scratch Orchestra of the time, as well as Cage's indeterminate works. In addition, by turning the ensemble into a radio environment where sound is received, Stockhausen is also able to metaphorically reproduce the creative act which he frequently compares to the radio. The radio becomes the imagination, the performers listening to it as though it were Stockhausen's own mind creating the material for *Hymnen*, and then developing it into a large-scale composition.

Finally, the notion of composition as environment plays the vital role of *gestalt* or unifier in

Stockhausen's radio works. From *Kreuzspiel* to *Gruppen* to *Plus/Minus*, we see a progressively flexible handling of the essential musical object, Webern's point. To create broader variation, Stockhausen modulated the point into a group for *Gruppen* (though they were still points, just meta-points) and transformable events in *Plus/Minus* (again, still points that could be pulled apart and reshaped). In *Gruppen*, even the piece as a whole is a meta-point, derived from the same waveform that generates the mid- and micro-layers of the piece. The same could be said for *Kurzwellen*: the radio environment replaces the serial row as the unifying object. Whereas *Gruppen*'s macro-level manifestation of his core material was a wave – a sound, a point – in *Kurzwellen* the macro-level manifestation of events, objects which are now shapable and transferrable, is the environment, a singularity which has sharing and movement inside itself. As the type of transformations that *Kurzwellen*, *Spiral*, and *Pole* are capable of can transcend even the best definitions of musical *gestalt* articulated in James Tenney's thesis, *Meta-Hodos*, Stockhausen's *gestalt* demands a more vibrant and flexible musical object. This, for Stockhausen, is the radio environment.

Section III: Sternklang

On the 26th of July, the magical performance of UNLIMITED (“From the Seven Days”) – with 3 inserted versions of SPIRAL – from 7:30 pm to 1:30 am. The public came between 8 and 9 pm. Starting at about 11:15 pm the musicians began to disappear gradually, one after another, from the inner court of the museum into the surrounding parks and forests, always playing, and continuing to move until the last listener had left. (Stockhausen, *Sternklang*)

The last major influence of radio on Stockhausen that I will discuss comes in a piece that does not use the radio in its performance at all. Instead it uses radio peripherally as a means to an end. *Sternklang*, composed in 1971 but conceived in 1969 at the time he was writing *Spiral* and *Pole*, is a sign that Stockhausen recognized the wireless tendency to separate and become “part.” Of *Kurzwellen*, he wrote:

The former opposites of the old and the new, the far and the near, the familiar and the unfamiliar are dissolved. EVERYTHING is the WHOLE and SIMULTANEOUS. Tenses disappear, as will preconsciousness. (Stockhausen, *Kurzwellen* insert)

In *Sternklang* the musical source material is the stars, the grouped ensembles spread out in a park like a constellation. Wireless handsets were used to communicate between these ensembles in rehearsals to coordinate events, replaced by silent torch-bearing messengers during the actual performance.

While aurally and practically different, *Sternklang* is conceptually similar to *Kurzwellen*, *Spiral*, and *Pole*. Musical material comes from space, the air around us, and is received through the performer's senses. The material is then put through the filter of human artistry and projected back out into the world as sound. *Sternklang*'s spread out ensembles – specified to be no closer than 60 meters to each other – emphasize this dissipation. Whereas *Kurzwellen* focused on reception, *Sternklang* is the latter half of the process: projection. The enclosed surround sound of Stockhausen's electronic work is surpassed, replaced by the environmental unity and spatial participation demonstrated in the July 26th “Unlimited”/*Spiral* performance.

It is astonishing that Stockhausen's work with the radio and wirelessness caused him to anticipate site-specific dance and music. Trisha Brown's *Accumulation* (1971) and *Roof Piece* (1973), which sent dancers out onto water and roofs, respectively, were almost concurrent, but Alvin Curran's early experimentations with site-specific music would not debut until 1980. Oliveros, R. Murray Schafer, Cage, and others listened to environmental sounds as music in the decade preceding *Sternklang*, but Stockhausen's park music demonstrates a greater involvement with those sounds. Whether with the radio or in the open air, Stockhausen puts his ensembles in direct reciprocation with the world, his compositions conversing with their surroundings the same way German youths talked with sine tones in *Gesang der Junglinge*. The result is a spiritual and aesthetic confirmation of one's participatory role in space and time.

Upon inventing the radio, Guglielmo Marconi speculated that sounds did not die, only dissipated (Rice 5). In *Kurzwellen*, *Spiral*, and *Pole*, Stockhausen accesses the noise of the air, using the performers as radios to resonate the medium's information. He reveals the simultaneous streams of music that coexist in radio space and uses their events as flexible material that can be stretched apart or contracted in any parameter. Conceptually, his imitation of the radio creates an environment akin to the creative act – listening for the play of air or the imagination, and becoming a permeable body for it. In *Sternklang*, he uses this newfound wirelessness to dissipate sound once more, becoming part of the world.

And now? Into the world of extreme attainability, extreme unforeseeability, to whose limits we have trust, something extra-terrestrial must penetrate, something which cannot yet be found on any radio on earth. Let us take up the search!
(Stockhausen, *Kurzwellen* insert)

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