

JAMES TENNEY (1934–2006)

SPECTRUM PIECES

THE BARTON WORKSHOP

JAMES FULKERSON, FRANK DENYER, CO-DIRECTORS

80692-2 [2 CDs]

DISC 1 (TT: 64:27)

1. *Spectrum 1* (1995) 15:04

Marieke Keser, violin; Gertjan Loot, trumpet; John Anderson, bass clarinet; Tobias Liebezeit, percussion I; Paula Chico Martinez, percussion II; Nora Mulder, piano; Stefan Pliquet, bass

2. *Spectrum 2* (1995) 14:55

Jos Zwaanenburg, flute; Alexander van Eerdewyk, cor anglais; John Anderson, clarinet; James Aylward, bassoon; Emmanouil Ventouras, horn

3. *Spectrum 3* (1995) 18:04

Ned McGowan, flute; Jos Zwaanenburg, bass flute; Eduardo Olloqui, oboe; Alexander van Eerdewyk, cor anglais; John Anderson, clarinet, bass clarinet; Ymke Broers, alto saxophone; Krijn van Arnhem, bassoon; Joeri de Vente, horn; Reijer Dorresteyn, trumpet; Koen Kaptijn, trombone; Arne Visser, tuba; Tobias Liebezeit, percussion; Mirjam Rietberg, harp; Frank Denyer, piano; Marieke Keser, violin 1; Boris M. Visser, violin 2; Max Knigge, viola; Anne Magda de Geus, cello; Stefan Pliquet, bass

4. *Spectrum 4* (1995) 16:05

Marieke Keser, violin; Francesca Thompson, alto recorder; Tobias Liebezeit, vibraphone; Martin Kaaij, guitar; Nora Mulder, piano; John Anderson, bass clarinet; Koen Kaptijn, trombone; Stefan Pliquet, bass

DISC 2 (TT: 62:01)

1. *Spectrum 5* (1995) 16:02

Jos Zwaanenburg, flute; Eduardo Olloqui, oboe; John Anderson, bass clarinet; Krijn van Arnhem, bassoon; Tobias Liebezeit, vibraphone/percussion; Mirjam Rietberg, harp; Frank Denyer, piano; Max Knigge, viola

2. *Spectrum 6* (2001) 15:04

Jos Zwaanenburg, flute; John Anderson, clarinet; Tobias Liebezeit, percussion; Frank Denyer, piano; Marieke Keser, violin; Anne Magda de Geus, cello

3. *Spectrum 7* (2001) 15:44

Jos Zwaanenburg, flute; Anne Magda de Geus, cello; Nora Mulder, piano; and tape delay system

4. *Spectrum 8* (2001) 14:53

Manuel Visser, viola obbligato; Jos Zwaanenburg, flute; John Anderson, clarinet; Tobias Liebezeit, percussion; Frank Denyer, piano; Marieke Keser, violin; Anne Magda de Geus, cello

8' 00"

Flute

Oboe

Bass Clarinet

Bassoon

Vibraphone

Harp

Piano

Viola

Cello

C' Bass

8' 30"

Flute

Oboe

Bass Clarinet

Bassoon

Vibraphone

Harp

Piano

Viola

Cello

C' Bass

9' 00"

This musical score page contains measures 8'00'' to 9'00''. It is a full orchestral score with the following instruments: Flute, Oboe, Bass Clarinet, Bassoon, Vibraphone, Harp, Piano, Viola, Cello, and C' Bass. The score is written in 2/4 time and includes various dynamics such as *mf*, *mp*, *f*, *ff*, and *mp*. There are also articulation marks like accents and slurs. The key signature has one flat (B-flat). The score is divided into three systems, each starting with a time signature of 2/4. The first system starts at 8'00'', the second at 8'30'', and the third at 9'00''. The instruments are arranged in a standard orchestral layout, with woodwinds and strings on the left and percussion on the right.

James Tenney (1934–2006) was one of the most versatile figures in contemporary American music. Apart from creating a large, wide-ranging, and fascinating body of compositions, more than a hundred of them, he was one of the key music theorists of the late twentieth century, a fine pianist who played Chopin with the same sensitivity and passion as he played Ives or Cage, a pioneer in computer music, and a gifted and influential teacher. All these endeavors were unified by his unflagging intelligence, good humor, and unquenchable thirst to understand the world around him and to share that understanding with others. His enthusiasm for music was infectious, and the inspiration of his work and thought shows no sign of diminishing.

This CD set offers complete recordings of one of the most important of Tenney's later sets of pieces—*Spectrum Pieces 1–8*, the first five of which were written in Toronto in 1995 and the last three in 2001, after he moved to Valencia, California, to teach at the California Institute of the Arts. Lasting more than two hours in total, they offer a summation of much of Tenney's compositional practice and at the same time break open new and fertile territory that he had regrettably little time to explore in subsequent compositions. The eight works were not intended to be listened to sequentially or as a whole set, nor need they be; Tenney thought of them as a “family” of pieces, with certain shared features, not as a cycle.

The overall title, *Spectrum*—so characteristic a title that it is hard to believe he had not used it until the mid-nineties—has multiple meanings. One of the most immediately obvious is in reference to the harmonic series, the array of partials contained within the vibration of a single musical tone. The harmonic series, much studied by physicists and musicians alike, presents a spectrum of relationships between the component pitches of a complex tone, ranging from those close to the fundamental (the pitch we hear most prominently when listening to a note on an instrument or voice) to distant, high partials that are usually not directly audible and yet are evidently present, as can be seen when the tone is put through a spectrum analyzer or similar piece of software. Tenney became fascinated by the harmonic series in the early 1970s, partly as an outgrowth of his well-developed interest in psychoacoustics and the mechanisms of aural perception, and also for its musical potential—the pitches of the series depart from the tempered pitches of the piano and offer a host of new, and often highly complex, harmonic and melodic possibilities. The pitch worlds of the eight *Spectrum* pieces are each built on a single harmonic series, which provides a structural underpinning and gives a unifying element to each piece.

The use of a single harmonic series as the basis of an entire composition was a recurrent feature of Tenney's output by the time he began the *Spectrum* series in 1995. Earlier examples include *Spectral CANON for CONLON Nancarrow* for retuned player piano (1974), *Saxony* for one or more saxophones and delay system (1978), and *Voice(s)* for voice(s), variable ensemble and delay system (1984); these works use a set of pitches analogous to the first twenty-four partials of the harmonic series (or, in *Saxony*, the first thirty-two). In these works the essential similarity of pitch material—a harmonic series that is “revealed” one pitch at a time, from lowest to highest—yields a rich diversity of surface textures, so that each of these pieces sounds distinctly different from any other. (A modified, though closely related, approach was taken by Tenney in *Critical Band* for variable ensemble in 1988, a work that augments its central pitch reservoir—intervals derived from a harmonic series on A—with a set of supplementary pitch classes derived by the ancient Greek concept of *harmonic mean*.) For all the evident success of these works, which still sound fresh and exciting today, by the early 1990s Tenney was ready to try a somewhat different approach to the harmonic series. In a conversation in 1994 he told me that he was bothered by a repeated criticism of his harmonic series-derived works, that they were, as he put it, “too sweet”; that the presence of the familiar building-blocks of tonal harmony in the lower intervals of the series (the octave, perfect fifth, perfect fourth,

and major third) evoked all manner of perceptual ghosts of tonal music in the major key whose presence he wanted to exorcise from future works. This may explain, in part, why the eight pieces of the *Spectrum* series are, in general, more challenging to the listener than some of his earlier works; certainly it would be a rare listener who would consider them “too sweet.”

In this regard, a pivotal work in Tenney’s output is *In a Large, Open Space*, composed toward the end of his sabbatical year in Berlin in 1993–94. This piece—indeterminate both in instrumentation and in overall duration, and in that sense as much an installation as a concert piece—uses the first thirty-two partials of a harmonic series on F, which are considered as “available pitches” to be used by the players who select freely from any of those that lie within the range of their instrument. The simple but crucial difference between this work and Tenney’s earlier harmonic series pieces is that the entire pitch collection is used all the time, rather than the partials being introduced in strict sequence from low to high. The lower partials therefore have no necessary prominence in the texture, nor are they continuously present; the effect of this is to free the music from its quasi-tonal anchor (the fundamental of the series) and to yield a perceptually more complex harmonic fabric, in which microtonally dense simultaneities from the upper reaches of the series can occasionally dominate the aural surface. This basic approach to pitch usage is followed in the *Spectrum* series as well.

The *Spectrum* pieces are chamber works, each for a differently constituted ensemble. The smallest, *Spectrum 7*, is for only three players, though with optional delay system (which, if used, gives the impression of a much larger ensemble); and the largest, *Spectrum 3*, is for a small chamber orchestra of twenty musicians. The specific instrumentation of each piece was determined largely by the constitution of the various ensembles for which the eight pieces were written. The first two were Canadian commissions, the first for seven instruments (for Arraymusic) and the second for the five players of Toronto’s 5th Species Wind Quintet. *Spectrum 3* was written for Germany’s Ensemble Modern and *Spectrum 4*, for eight musicians, for Holland’s Maarten Altena Ensemble. *Spectrum 5* was written in December 1995 for ten players of the contemporary music ensemble of the California Institute of the Arts, but received its actual premiere by Champ d’Action in Brussels. Some five-and-a-half years later, when Tenney produced the sixth work in the series, it was a further Canadian commission, this time for six musicians from the Continuum Ensemble. *Spectrum 7*, for flute, cello and piano, was a commission from the Wolpe Trio from Essen, Germany, and *Spectrum 8* from that country’s Ensemble Recherche; this last piece is for viola and six instruments, a scoring that brings to mind the second of Morton Feldman’s *The Viola in My Life* pieces (although the actual music is very different).

All eight works of the *Spectrum* series have important things in common. Firstly, they are all approximately the same length, either fifteen or sixteen minutes (with *Spectrum 3* being a little longer at eighteen minutes). This suggests the visual art practice of painting in series, with the eight pieces metaphorically resembling a series of more or less equally-sized canvasses. All, as previously mentioned, are built on the pitch resources of a single harmonic series (on F, in the case of *Spectrum 1* and *Spectra 3–8*; *Spectrum 2*, uniquely, uses a series on B-flat); here though, as with the earlier *In a Large, Open Space*, the actual fundamental of the series is not always easy to determine by listening. All the pieces are written in a time-space notation where one line of music on the page lasts exactly 30 seconds; each player must therefore be able to see a stopwatch to judge these timings exactly. (None of the pieces require a conductor.) Furthermore, all the pieces were composed algorithmically, with the aid of a computer program written by Tenney himself that determined all aspects of the music; this will be discussed in more detail below.

All the pieces are intended to be played with the tuning of intervals matching as closely as possible the exact sizes of the intervals of the harmonic series. Tenney does not resort in these works to the nearest equal-tempered approximations of the ideal pitches, a practice often found in the spectral music of his European contemporaries Gérard Grisey and Tristan Murail. This has a number of practical consequences for the performers. The piano must be retuned for *Spectra 1* and *3-8*, as must the harp for *Spectra 3* and *5*. The acoustic guitar, which appears in *Spectrum 4*, has its open strings retuned to selected partials of a series on F. All the pitches for the woodwind, brass, and strings are notated in conventional staff notation but with cents deviations from the nearest tempered pitch written above every single note. (A *cent* is a logarithmic measure of pitch; there are 1200 cents in the octave, so one equal-tempered semitone equals 100 cents.) A flute player, for example, sitting down to play the opening of *Spectrum 8*, encounters an opening five-note phrase in which the first note, A, must be played 14 cents lower than its tempered “norm”; the second, D, 59 cents lower than the norm (more than a quartertone); the third, C-sharp, 27 cents lower; the fourth, B, 49 cents lower; only the fifth, F, is its normal, tempered self. These intonational difficulties at first seem rather daunting, though they get less so the more one works on the piece. In the scores Tenney helpfully suggests that “an electronic tuning device (with microphone input) will be very useful, if not absolutely essential, in both rehearsal and performance.”

Beyond its involvement with the harmonic series, the music of the *Spectrum* series is conceived throughout in terms of various perceptual spectra, in which the activity in a particular musical parameter happens at varying points along a scale (or, more precisely, a continuum) of values from one extreme to another. One straightforward example of this is in terms of dynamics: Tenney calculated different dynamic shapes for each of the eight pieces, some relatively simple, others more complex. The images below show graphs of the dynamic shapes of the present recordings of *Spectrum 3* (Figure 1), *Spectrum 4* (Figure 2) and *Spectrum 6* (Figure 3). The curve of *Spectrum 3* is calibrated to peak dynamically at the Golden Section, which occurs just before the 10-minute mark in its overall duration of eighteen minutes, and is thus a typical example of what Tenney called a “swell” form, in which the temporal density and loudness of all the parts first increases then decreases throughout the piece. (*Spectrum 5* is a similar example.) *Spectrum 4* is equally simple in overall contour although different, with a gradual increase in loudness through its second half, the piece ending at its loudest point, as though abruptly cut off.

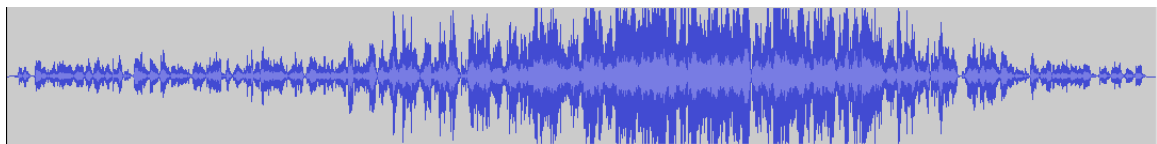


Figure 1: Dynamic graph of Tenney, *Spectrum 3*: Time is shown along the horizontal axis, intensity (loudness) along the vertical axis.



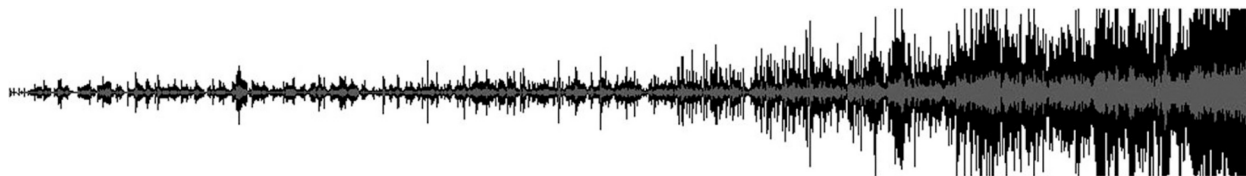


Figure 2: Dynamic graph of Tenney, *Spectrum 4*

A more complex example is *Spectrum 6*, the graph of which (Figure 3) looks at first like a succession of swells. Robert A. Wannamaker has, however, shown in his analysis of the work that the overall dynamic image is a result of the interaction of the two groups of instruments into which Tenney divides the ensemble (flute, bass clarinet, piano; and percussion, violin, cello). Each group follows its own dynamic curve, simple in itself but “out of phase” with that of the other group. So, group 1 starts *mf* and gets quieter throughout the first minute, whereas group 2 begins *pp* and grows to *mf* at the same point group 1 reaches *pp*. This creates a continual state of dynamic interplay, or counterpoint, between the two groups, which is maintained throughout, with a final convergence of dynamic levels (at *ff*) at the very end of the piece.

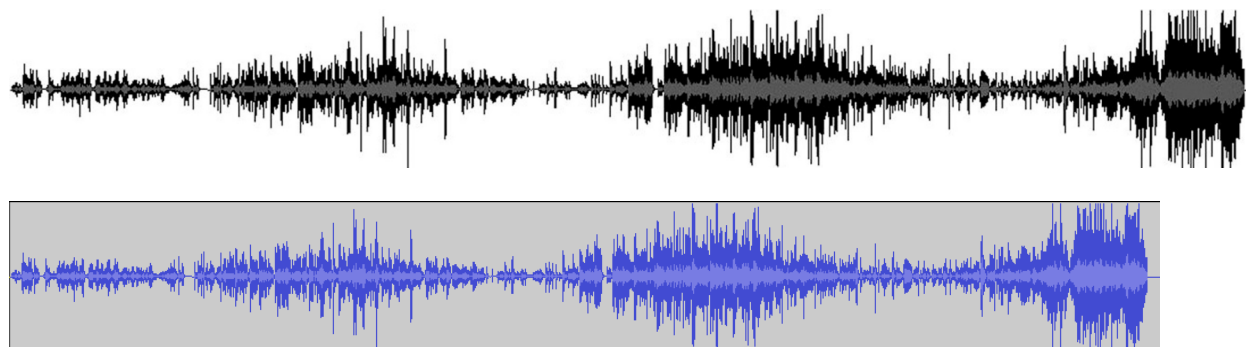


Figure 3: Dynamic graph of Tenney, *Spectrum 6*

The algorithmic determination of the music of the *Spectrum* series operates at many other levels as well as that of overall contour. At the most basic level, Tenney used the computer to determine the duration and content of the *clangs* that form the building-blocks of the music. A *clang* was defined by Tenney in his early theoretical study *META+HODOS* (1961) as “a sound or sound-configuration which is perceived as a primary musical unit or aural gestalt” (Tenney 1986: 26). Roughly equivalent to a *phrase*, a *clang* consists of one or more *elements*, and may be a single note or sound (even an unpitched one), an extended melodic phrase, or anything in between, as long as it coheres into a perceptual unit in the listener’s mind. At the most basic level the *Spectrum* pieces consist of sequences of clangs in continual, and generally unsynchronized, counterpoint between the musicians of the ensemble. The shorter the clangs the more pointillistic the overall texture of the music tends to be. The opening of *Spectrum 1*, for example, offers a moderately active texture with two, three, four, or five-note clangs in the percussion (pitched and unpitched), piano, trumpet, bass clarinet, violin, and double bass. As listeners we can simply enjoy the sounds “for themselves,” as Tenney’s friend John Cage encouraged us to do, but it can be an equally enjoyable experience to try to follow these distinct instrumental colors as they weave their curious, gentle, melodic lines without dramatic incident or any sense of goal-oriented motion. *Spectrum 2*, in contrast, begins *pp* with long notes in all five wind instruments that begin progressively to change (after about three minutes) to shorter note-values, so that by the middle of the piece the rhythm of events is fairly rapid. In all these cases Tenney used the computer to determine such things as the duration of the individual clangs, the number of elements per clang, its dynamic, and so on. The algorithms he devised all implement stochastic

(constrained random) processes to determine the overall parametric profiles of the clangs. The clangs are combined into *sequences*, which are perceptually coherent entities on, as it were, the next level up—longer passages of music that connect together within the overall macro-form of the composition. With familiarity it becomes increasingly possible to perceive these clangs and sequences as we listen, sometimes quite easily, whereas at other times aural comprehension seems just beyond reach, making it fun to listen again. As a whole, the *Spectrum* pieces offer examples of a way of working characteristic of one part of Tenney's output: the computer is employed to give an unpredictability to the material at a local level, so that note-to-note choices are made by the program rather than the composer (albeit within precise parameters set by him), yet the overall shape and character of the compositions remain “hand-made” and expressive of aesthetic decisions and judgments of their composer.

Two of the *Spectrum* pieces deserve special mention as, in a sense, the least characteristic members of the set. The recording of *Spectrum 7* included here employs the optional delay system that Tenney suggested as a possibility to enhance the otherwise quite sparse texture of flute, cello, and piano. The wave of repetitions of all the clangs of the piece, with notes and phrases being repeated approximately every five seconds, more quietly each time, links *Spectrum 7* back to Tenney's tape delay works of the 1970s and 1980s—pieces like *Saxony*, *Glissade*, or *Voices*, which have something of the flavor of early minimalism despite their rather different musical content. In *Spectrum 7* one of the effects of the (here digital) delay system is to emphasize the F fundamental as the lowest pitch of the texture, making it at times more possible to hear the harmonic relationships of the other pitches to the fundamental as we can in the earlier harmonic series works. *Spectrum 3* is different again in being for twenty players, essentially a small chamber orchestra. This work has a similar overall trajectory to *Spectrum 2*, the opening long tones gradually giving way to somewhat faster-moving material before returning back to longer tones at the end; yet here the texture is fuller, almost lush in places, the wind section in particular (including the deep tones of bass flute, cor anglais, bass clarinet, and alto saxophone as well as the regular woodwind complement) creating a sensuous texture that links the piece sonically to the ravishing orchestral work *Diapason* that Tenney composed the following year. Here, Tenney's highly individual compositional techniques are linked with a beautifully judged, almost Romantic orchestral sound in a new and satisfying symbiosis. The *Spectrum* series as a whole offers many such happy alliances. Collectively they form a body of work in which many of Tenney's musical and theoretical preoccupations converge, interact, and yield music of deep fascination and strange beauty.

—Bob Gilmore, Amsterdam, July 2009

Bob Gilmore is a musicologist and keyboard player born in Northern Ireland and currently based in Amsterdam. He teaches contemporary music at Brunel University in London.

The Barton Workshop is an Amsterdam-based ensemble founded in 1989 by the American composer-trumpetist James Fulkerson. The workshop primarily creates “composer portrait” concerts, usually in collaboration with the composers, providing either an overview or an in-depth representation of a chosen composer's work. The Barton Workshop has collaborated with such composers as Alvin Lucier, Christian Wolff, Nicolas Collins, Steve Lacy, Philip Corner, Hyo-shin Na, and Frank Denyer, giving world and European premieres of works by all of the above plus Galina Ustvolskaya, Henryk Gorecki, Ernstalbrecht Stiebler, James Fulkerson, Jerry Hunt, and others. They have made important multi-disc recordings of Morton Feldman, John Cage, Christian Wolff, Alvin Lucier, Philip Corner, and James Tenney in addition to single-disc recordings of Jerry Hunt, Galina Ustvolskaya, James Drew, Fulkerson, Denyer, Tenney, Wolff, Cage, and Feldman.

<http://www.bartonworkshop.org/>

SELECTED DISCOGRAPHY

Bridge & Flocking. T. Bächli, G. Schneider, E. Radermacher, M. Werder, pianos. hat ART 6193.
Critical Band. Relâche Ensemble. Mode 22.
Forms 1–4. MusikFabrik. hat[now]ART 2-127.
Melody, Ergodicity and Indeterminacy. The Barton Workshop, James Fulkerson and Frank Denyer, directors. Mode Records 185.
Music for Violin and Piano. M. Sabat, violin; S. Clarke, piano. hat[now]ART 120.
Postal Pieces. The Barton Workshop, James Fulkerson, music director. New World Records 80612-2 [2CDs].
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Design: Jim Fox

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The Barton Workshop

Jos Zwaanenburg, Ned McGowan, flute, bass flute; Eduardo Olloqui, oboe; Alexander van Eerdewyk, cor anglais; John Anderson, clarinet, bass clarinet; Ymke Broers, alto saxophone; Krijn van Arnhem, James Aylward, bassoon; Joeri de Vente, Emmanouil Ventouras, horn; Reijer Dorresteyn, Gertjan Loot, trumpet; Koen Kaptijn, trombone; Arne Visser, tuba; Tobias Liebezeit, Paula Chico Martinez, percussion; Frank Denyer, Nora Mulder, piano; Mirjam Rietberg, harp; Martin Kaaij, guitar; Marieke Keser, Boris M. Visser, violin; Max Knigge, Manuel Visser, viola; Anne Magda de Geus, cello; Stefan Pliquet, bass

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