

Imaginary Space - Spaces in the Imagination

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by Jonty Harrison

Abstract

Far from defining common ground in the practice of electroacoustic and computer music, varying attitudes towards 'space' actually mark out distinct musical/artistic traditions which emanate from the history of the last fifty years and which touch on our very assumptions about 'music' itself. Following a consideration of some of the historical and aesthetic issues involved, an attempt is made to offer a broad description of the spatial attributes important to composition. From a predominantly acousmatic standpoint within this survey, a plea is made for a qualitative approach to space which not only depends on the spatial behaviour of sound material per se, but which also takes account of the wider responses of listeners.

Introduction

When we speak of 'space' in electroacoustic music, it is generally assumed that we know what it is we are discussing *and* that we are all talking about the same thing. Yet it seems very clear that this is not true. The various performance practices which have emerged over the fifty year history of the medium 'performance practices largely differentiated by the manner of spatial deployment of sound in public events, the numbers of loudspeakers used, in what configuration and to what purpose' are a manifestation of a much more significant underlying attitude to musical material, structures and function. In other words, they relate directly to different understandings of what 'music' actually is.

These differences in performance practice are sometimes defined along national lines (though a division on the basis of language seems more accurate). In the French-speaking world (with some exceptions) and in a few other geographical areas, diffusion over multi-channel loudspeaker systems is the norm. But elsewhere, 'tape playback' is exactly that, the number of loudspeakers in public performance venues corresponding exactly to the number of tracks on the 'tape', as the object is the supposedly exact recreation of the piece as heard by the composer in the studio. It seems strange that the acoustic peculiarities of the public playback space itself are frequently given little consideration in this exercise. This search for repeatability, the attempt at exact replication of one 'space' within another and the relegation of the acoustic peculiarities of the playback space to, at best, a secondary question are symptomatic of something more deeply embedded, and lie in an attitude and approach to composition itself. And here we find, between the fluidity and pragmatism of diffusion and the quest for a definitive aural document, a continuation of the divisions between *musique concrète* and *elektronische Musik* as compositional practices. The purpose of this paper is to address some of the issues which affect the notion, manipulation and perception of space as a dimension of electroacoustic and computer music 'indeed as a dimension primarily liberated for composers to use by the very technology which defines these areas of music at all' with particular (but not exclusive) reference to acousmatic music.

***Vous avez dit acousmatique?*¹**

Much has been written about acousmatic music since the word (deriving from the practice of Pythagoras of lecturing from behind a curtain so that his followers could focus aurally on the content of his lecture without visual distractions) was reinvigorated by Schaeffer, refined by Bayle and regurgitated by just about everyone. Significantly, much of this writing was, and still is, in French. It is not my intention to divert this paper into a discussion of acousmatics *per se*, but some attempt must be made to arrive at an understanding of the issues involved, as they will inform some of my comments about the current topic: space.

In its most basic form, 'acousmatic' is an adjective which can be applied to music in which the source or cause of the sound is not seen. This immediately raises other questions, as the listening *situation* might well be described as acousmatic, even though what is being heard may not have been originally intended for that kind of reception ? obvious examples include muzak in restaurants or shopping malls, classical chamber music on radio or CD and most popular musics, all of which are squarely situated in the realm of musical performance, even though they are all stored on a ?fixed medium?² and are all produced using multiple takes, substantial amounts of editing and other studio adjustments. A more elaborate definition is required which specifically *does not* depend on a listener's understanding of the source or cause of the sounds heard as originating directly in ?musical? performance (whether evidenced by the presence of performers on stage or *via* recordings) and which extends to include the notion of sounds whose provenance may well not be knowable by a listener (despite what Denis Smalley calls ?source-bonding? [Smalley, 1986] ? the attempted attribution of the sounds heard to some kind of source or cause; this occurs spontaneously in the listener's mind and is characteristic of human response). Such a definition would thus encompass music which evokes situations beyond the normal remit of ?music?. As Smalley points out,

?? the acousmatic conditions of the electroacoustic medium release music from an historical bonding confined to gesture and vocal utterance as perceived *via* the stylised context of traditional instrumental/vocal music; ? in an acousmatic context the listener's aural imagination can be drawn into personal psychological realms quite different from other musics' [Smalley, 1991].

An acousmatic listening situation alone is therefore not enough to define acousmatic music; there needs also to be an acousmatic *intent* on the part of the composer. This suggests an aesthetic stance, though this should not be confused with the frequently voiced assertion that acousmatic music is a ?style?. In my view it is not, as musical outcomes may be very different, but I would readily concede that many composers generally considered to be ?acousmatic? do share certain approaches and preoccupations.

Acousmatic music on the whole continues the traditions of *musique concrète* and has inherited many of its concerns. It admits any sound as potential compositional material, frequently refers to acoustic phenomena and situations from everyday life and, most fundamentally of all, relies on *perceptual* realities rather than *conceptual* speculation to unlock the potential for musical discourse and musical structure from the inherent properties of the sound objects themselves ? and the arbiter of this process is the ear. Because of this, it is unnecessary to have a visual stimulus connected to what is heard ? in fact, it is positively detrimental to be encumbered by the visual sense (in most cases ? paradoxically, Smalley also identifies ?live acousmatic? music [Smalley, 1991]) for, without it, the listener's imagination is liberated from the constraints of the physical presence of the sound-producing body. As Francis Dhomont puts it, echoing Schaeffer, the musical process thus moves from:

'... the concrete (pure sound matter) and proceeds towards the abstract (musical structures) ? hence the name *musique concrète* ? in reverse of what takes place in instrumental writing, where one starts with concepts (abstract) and ends with a performance (concrete)' [Dhomont, 1995; 1996].

What Dhomont is effectively pointing out here is that, by definition, acousmatic music, descended from *musique concrète*, is a *qualitative* art. It springs entirely from the specific, ?concrete? qualities of the sound material used (two recordings of a violin playing G4 could be quite distinct, so their notated equivalence, the very basis of instrumental music, is no longer tenable ? hence Schaeffer's notion of the unique sound object). And, needless to say, spatial characteristics are included in the list of an object's specific qualities. Dhomont also, however, implies that most music, including much ?electronic?, ?electroacoustic? and ?computer? music, still leans strongly on instrumental thinking ? and one need look no further than MIDI protocol and Csound ?instruments? playing ?notes? from a ?score? for proof.

Organic and architectonic musical thinking

We can thus see that, unlike *musique concrète* and acousmatic music, which are concerned with *qualities* of sound material, most music has been, and continues to be, concerned with *quantities*. This is to some extent inevitable when, as Dhomont says, ?one starts with concepts? ? in order to flesh out concepts in sound, one has to be able to ?measure? how much to put where and for how long. Intervals between pitches and the durational structure of rhythm are quantitative devices, capable of precise differentiation through musical notation. Equally quantitative in nature, though less notationally precise, are dynamics. Instrumental timbre, as we know, varies wildly, from country to country, from player to player, from tessitura to tessitura of an individual player and

even within a single note. But in western notation, the main tool of quantitative differentiation in the timbral sphere has simply (and only relatively recently) been to write 'flute' in front of one stave in a score and 'trumpet' in front of another. The expressive 'trick' of composers is to combine these various quantitative materials in such a way that this essential characteristic is disguised or sublimated.

But in serialism, the dominant intellectual force in music in the third quarter of the twentieth century, quantitative thinking was taken to extremes, moving into the electronic (*sic*) studio in search of precise dynamic and timbral control (and there 'discovering' and extending into the realm of spatial organisation as well). Historically, *elektronische Musik* and its descendants (including much computer music) continue the prevailing quantitative musical paradigm. Stockhausen, for example, speaks of:

'... a hidden power of cohesion, a relatedness among the proportions: a structure. Not similar shapes in a changing light. Rather this: different shapes in a constant, all-permeating light' [Stockhausen, 1956, quoted in Wörner, 1973].

Wörner amplifies Stockhausen's position by asserting that:

'... unity is created by means of relationships between proportion and mass. The proportion existing between given elements placed in conjunction may remain identical while what is actually placed in conjunction may be constantly changing' [Wörner, 1973].

Let me paraphrase this position: sound events have no intrinsic interest; they exist only to articulate the distances between them, on the measurement of which distances rests the notion of 'musical structure'. One might cite a specific example: when, in *Telemusik*, Stockhausen uses existing sonic 'objects', it is primarily with the intention of ordering them into a 'higher unity' [Wörner, 1973] – an operation, although expressed in cosmic terms, is in fact implemented by *structural* procedures. It is, without doubt, a beautiful concept, and *Telemusik* is a strong piece, but it is actually less concerned with the intrinsic qualities of the 'objects' used than with the process of structuring the 'given elements placed in conjunction'. Boulez, predictably, goes even further by characterising the necessary nature of what 'elements' are suitable for inclusion within the field of 'composition' in the first place and, in so doing, launches an attack on the perceived concerns of *musique concrète*:

'Any sound which has too evident an affinity with the noises of everyday life', with its anecdotal connotations 'could never be integrated, since the hierarchy of composition demands material supple enough to be bent to its own ends, and neutral enough for the appearance of their characteristics to be adapted to each new function which organises them' [Boulez, 1971].

To paraphrase once more: musical structure is created by a process (composition) which is primarily the imposition of quantifiable values on (fundamentally inert) sound material.

For me, the problem with these views is that they ignore the specific characteristics of sound material (which is anything *but* inert), the uniqueness of individual sound objects. This might have been understandable when the only repeatable dimensions of musical events were pitch, duration (more or less) and dynamic (approximately). But the advent of sound recording – the single most significant event in the history of music in the twentieth century – has changed all that. Quantitative thinking is no longer the only option. The possibilities offered by the ability to record, store and manipulate unique sound objects mean that composers no longer need to be confined to models of (instrumental) compositional thinking several centuries older than serialism which, whilst proclaiming the musical year zero, in fact consolidated the tendencies of traditional thinking into the tyranny of parameterisation. In the qualitative world of acousmatic music, the specific sonic properties of individual sound objects ultimately give rise (through what Schaeffer called 'reduced listening'³) to (perceptually) related externalised structures *via* composition: an organic process of growth in which both composer and material participate. This process includes consideration of space.

Back to space

And so we return more specifically to the question of space in electroacoustic and computer music. Apart from a few historical examples, such as the late sixteenth- and early seventeenth-century antiphonal motets mainly associated with St. Mark's in Venice (where the spatial deployment of musicians was primarily a function of architecture) and the off-stage musicians in many nineteenth-century works (where spatial separation was

primarily a function of an extra-musical programme), 'space' only really emerged as a compositional issue in the second half of the twentieth century, concurrently with recording technology.

In a recent article [Harrison, 1998], I used the words 'organic' and 'architectonic' to describe what I have here characterised as 'qualitative' and 'quantitative' approaches to musical thinking, material and manifestations (including space). It is immediately apparent that it is easier to think of space architectonically than organically. Hence, space is most usually defined in terms of the *placement* of musical materials in a spatial dimension, in a way analogous to the placement of pitch on a staff or the placement of durational/rhythmic events in the framework of an underlying regular pulse (described by Trevor Wishart as a 'lattice') [Wishart, 1985; 1996]. In this way, 'intervals' can, in principle at least, be expressed spatially as readily as they can in other parameters.

In this model, echoing Boulez' comments, 'space' is *imposed* on spatially neutral material at the time of composition, thereby becoming a fixed, quantifiable part of the musical discourse, along with frequency (pitch and timbre), duration and amplitude. This may not, however, transfer easily from the compositional situation to public performance. Once captured on a fixed medium, frequency, duration and amplitude are broadly stable and repeatable between playings, no matter when, where or what the circumstances of playback. Unfortunately, space is more fragile. It is subject to an almost infinite number of variables, largely because of the acoustic differences of performance venues, but it also depends, as we have seen, on other factors, all of which lack any agreed 'standards': the number and precise configuration of loudspeakers used, the number of discrete channels in which sound is stored, national and regional performance practices, the way any 'real' sounds which might be used in the compositional process are recorded in the first place, and the individual composer's very understanding of 'space' as an aspect of composition.

In his article *Spatial Experience in Electro-acoustic Music*, Denis Smalley discusses the relationship between what he calls 'composed space' in a work and the 'listening space' in which the work is performed. Conflicts can arise between these two in the resulting 'superimposed space', but one way of dealing with these conflicts is to use multi-loudspeaker diffusion systems to create what he calls 'diffused space'. He further points out that:

'... there are many composers who remain ignorant of superimposed space and the potential of diffused space... because they possess a fixed 'image' of their music as conceived and perceived within the composed space of recorded formats' [Smalley, 1991].

Composers who consider space as a fixed, external, quantitative component of music will inevitably tend to concern themselves with the placement of objects in (compositional) space as a function of an architectonic, supposedly structural approach to sound material (this sound is 'here' and that sound is 'there?'). Historically, this approach has also made more extensive use of synthetic sounds, which are probably less likely to have significant internal spatial characteristics anyway. There is little room for manoeuvre or possibility of elaboration of spatial information in performance, the ideal situation being the exact replication of the compositional circumstances. This is typically the case of multi-track/multi-channel works.

By contrast, an organic attitude to spatial organisation at the compositional stage is characteristic of a *musique concrète*-informed acousmatic approach, which builds externalised structures from the internal properties (including spatial ones) of sound objects. The internal space of sound objects is elaborated through compositional procedures which enhance and build on such intrinsic cues, and this, in turn, is elaborated in an analogous way in the performance domain, the ultimate aim being to offer a better rendition of the character of the component objects for more members of the listening audience. This is frequently the case with stereo works, many of which are composed with diffusion in mind and many of whose composers are also experienced diffusion performers.

It is not, however, the case that all acousmatic works intended for diffusion are stereo, or that only stereo works can be diffused. When François Donato presented the GRM's 8-channel *Multiphonie* programme in Birmingham in 1998, he did not confine himself to 8 loudspeakers. He made full use of the height and depth options offered by the 30-odd channels of the BEAST sound system and combined the best aspects of diffusion with the possibilities, particularly for spatial counterpoint, offered by discrete channels. My own recent work, *Streams*, is (strange as it may seem after all I have said) an 8-channel piece. But the eight loudspeakers are positioned in the BEAST 'main eight' configuration (Distant, Main, Wide and Rear) [Harrison, 1998], which has emerged over seventeen years of presenting concerts as a basic minimum for the majority of performance venues; in all performances to date I have also been able to avail myself of additional speakers to enhance the spatial images and deliver the full impact of the piece. It is also, I freely admit, an experiment 'I could hardly

condemn multi-track composition as inevitably leading to the less appealing aspects of architectural musical and spatial thinking if I had not actually tried it out for myself. Frankly, it *does* present more problems in performance than my stereo works because I have, despite myself, a more rigid image in my mind of how it should sound! There are, however, obvious benefits of multi-channel working, especially with the advent of affordable digital multi-track machines ? so for now, the jury is still out!

Fundamentals of space

In his book *On Sonic Art*, as well as exploring numerous spatial behaviours, especially those concerned with movement within the compositional and listening spaces, Trevor Wishart proposes the notion of 'landscape'. He identifies three interdependent components:

- (1) the nature of the perceived acoustic space;
- (2) the disposition of sound objects within the space;
- (3) the recognition of individual sound objects? [Wishart, 1985; 1996].

I should like to propose here a related, but slightly different approach to space, one in which the specifics of spatial implementation spring from the qualitative evaluation of sound material (and here I declare my acousmatic allegiance), but considered within a very simple backdrop of four factors.

Firstly, the intrinsic 'musical space' of sound material has a bearing on spatial considerations. This includes: (a) spectral space (the vertical axis, embracing both pitch and timbre and which can, as we know send out strong psychological signals to the listener about 'height?); (b) temporal space (the horizontal axis; incorporating our ability to connect temporal structures with 'distance?); (c) dynamic space (the axis of amplitude, which encodes cues about the implied (physical) 'size' and/or proximity of sound objects); and (d) 'spatial' space (the position, which may be static and/or dynamic within the (recorded) soundfield ? this last point is important, for space is thereby encoded as an intrinsic part of a sound object).

Secondly, we have the notion of 'placement' of a sound object in a compositional and/or listening space. I mean this in the sense of actual perceived physical location, though it is, of course, linked to our ability in the studio to place sound in a virtual acoustic space (passing a signal through a reverberation unit, for example).

Thirdly, we have the idea of 'environment' ? that what we capture in, for example, a field recording, is not only the sound we are trying to record (a bird, a stream, a passing locomotive), but also the wider sonic context in which that target sound exists. We are thus dealing here with real, pre-existing spaces, in which other events may occur. This dimension is most likely to have a strong referential aspect, at least as much because of the totality of the environment as because of the nature of the target sound itself.

Finally, we have the realisation that whatever the composer's intentions involving the other three aspects of space, the moment of public performance is crucial; here, everything can be destroyed ? though good diffusion can also (fleetingly) improve a mediocre piece! It seems clear that the acoustic of the performing space must be taken into account in the public presentation of acousmatic music; denying the existence of this acoustic is futile, but admitting it as part of the sonic equation of the work *on that occasion* offers the creative possibility 'to sculpt the sound in the space and to sculpt the space with the sound' [Harrison, 1998], which is actually an extension of an organic compositional process.

Music has always been concerned (consciously or otherwise) with the first of these four areas, though it has rarely, and only recently, been expressed spatially (indeed, instance (d) is inseparable from the recording process), dealing instead with more readily quantifiable dimensions such as pitch and duration. The second area has, as already mentioned, appeared occasionally in the history of western music, but its significant exploration (and even the very possibility of dealing with virtual space) had to wait for twentieth century technology.

It is, however, the third area on which I should like to focus the last part of this paper, because many people would deny works which explore these aspects of sonic phenomena the label 'music' at all. Yet it is precisely in this area that 'music' has most significantly expanded its expressive resources, as reading Dhomont, Smalley and Wishart and listening to much recent French, Québécois, Belgian and British music quickly reveals. It is one of the primary features of acousmatic music, where the ability to move between and among sonic material *via* a variety of connections (spectromorphological or referential, or both simultaneously) has opened up new fields of

?meaning? beyond the normal scope of ?music? as understood traditionally (*i.e.* quantitatively). Specifically, it has introduced into the realm of music an area of meaning which is mapped out between what might be described as ?real?, ?unreal? or ?surreal? sound situations. Most western music is, almost by definition, unreal, unless one assumes that, because a symphony is ?art?, we accept a shift in reality towards the artificial because the landscape is ?musicians-playing-instruments? [Wishart, 1985;1996] (I will restrain myself from commenting on opera in this context!). A true reference in ?music? to (non-musical) ?reality? was simply not available until the advent of sound recording ? and despite the fact that, like Magritte?s *Ceci n?est pas une pipe*, what we hear in Respighi?s *Pini di Roma* is not a bird, but a gramophone recording of a bird, most listeners would accept the distinction of ?orchestra *vs.* (recording of) bird? as a quantum leap, a fundamental difference of type, rather than as the mere shift of emphasis implied by ?bird *vs.* recording of bird?. Please note also that I spoke of ?sound situations?. This is important because the idea of the listener being in a (sound) situation inevitably invokes the notion of space ? neither the sound *nor* the listener can be detached from space; sound, after all, cannot exist in a vacuum!

And here, finally, we come to the most exciting, the most thrilling notion of all and one which I never imagined, as a young composer of instrumental music (which is where and how I started!), I would be able to address ? and that is the idea that in acousmatic music, one is not dealing with ?space? in terms of sound material alone. As well as moving *sounds* in space, one is also transporting *the listener* to other listening spaces, to parallel listening universes ? and a major contributor to this fact is the ability of the acousmatic medium to conjure spatial and locational references in sound. This can sometimes be so believable that the adjective ?real? is entirely appropriate ? we have all walked on shingle beaches or heard a truck pass on a rainy night; it can also signal ?unreal? spaces, resulting from the recognition of physical impossibility of either a sound or a situation (Wishart?s ?unreal-objects/real-space? and ?real-objects/unreal-space? combinations [Wishart, 1985; 1996]); perhaps most startlingly, it can also delineate ?surreal? space, resulting from believable objects placed in equally believable but completely inappropriate acoustic spaces (Wishart?s ?real-objects/real-space? combination). For example, at one point in my 1995 work, *Unsound Objects*, we hear three sets of footsteps, one on packed snow, one on shingle and one on dry bracken: all are independently possible and aurally believable, but they are not actually possible simultaneously in the physical domain of ?real life?.

Conclusions

Clearly, I have only scratched the surface of a difficult issue which needs further work. English terminology is notoriously imprecise about space, confusing and overlapping the meanings of words which it may well be useful to disentangle and imbue with some more specific definitions in this context: ?position?, ?place?, ?placement?, ?location?, ?localisation?, ?situation? and even ?space? itself. There is also little linguistic machinery in these terms to distinguish whether we are talking about an attribute *possessed by* an object or something *imposed on* it ? and this takes us straight back into the heart of the broader qualitative/quantitative debate.

As well as ?qualitative? and ?quantitative?, I have also previously proposed ?organic? and ?architectonic? as terms which describe certain approaches to sound material and tendencies in compositional practice. Other terms also suggest themselves ? interestingly, continuing to fall into sets of binary oppositions ? but are similarly in need of refinement in the specific context of electroacoustic and computer music and a discussion of space: evolutionary/fixed (in distance or interval); natural/artificial; fluid/rigid; spontaneous/imposed; improvisatory/compository; figurative (*i.e.* referential)/abstract; integral/integrated (by administrative act). Ironically, even more problematic polarities arise if one uses adjectives commonly associated with space in everyday English: internal/external; interior/exterior; inside/outside.

Some things do seem clear, however. If ?music? is an art dependent on listening, then a qualitative, organic approach to sound material offers a new dimension. It has, in fact, been offering this for the last fifty years, but its significance has been overshadowed by the continuation of the prevailing, quantitative musical paradigm, advanced in a pseudo-scientific and therefore supposedly ?factual? guise by a highly polemical international group of composers meeting in Germany, whose many writings quickly appeared in translation ? a case of widely disseminated documentation establishing ?truth?; by contrast, Schaeffer?s *Traité des objets musicaux* still awaits translation into English. But liberation was, and continues to be, at hand in the form of sound recording, which offers composers the possibilities of seeking among the inherent qualities of unique sound objects for appropriate and organic models of musical structuring. ?Space? is a significant part of this liberation. When elaborated through the process of composition into the realm of performance practice, it has the power to transport us ? quite literally, at the speed of sound ? into other places, other situations and even, because of its

interactions with our personal memories and histories, other times. Ultimately, therefore, it can reach deep into the most inaccessible place of all: our imagination.

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¹ A collection of essays by predominantly francophone composers, edited by Annette Vande Gorne [Vande Gorne, 1991]. [back](#)

² A common French term for electroacoustic music 'on tape', *musique de support* was coined by François Bayle in *Musique acousmatique, propositions, positions* [Bayle, 1993, quoted in Dhomont, 1995, 1996]. [back](#)

³ The concept of *écoute réduite* [Schaeffer, 1966; Chion, 1983; Smalley 1986] involves the dissociation of sound object and physical cause; there is no necessary sonic link between sound objects resulting from a bowed note, a Bartók pizzicato, and a tap on the body with the finger or bow, even though they may all come from a violin, the (arbitrary) sound-producing object. Each of these examples may, however, be linked behaviourally to other sound objects from other, different (and equally irrelevant) sound-producing sources. The referential practice of much acousmatic music has modified this Schaefferian theory. [back](#)

Keynote address by Dr Jonty Harrison

Reader in Composition and Electroacoustic Music, The University of Birmingham, UK

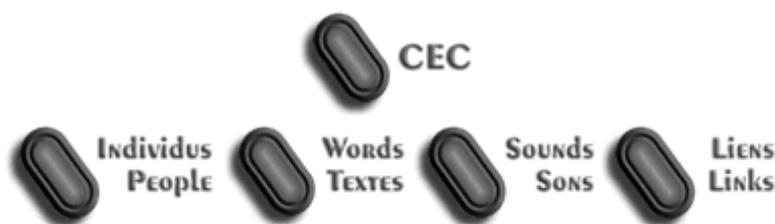
Director, Electroacoustic Music Studios & BEAST

d.j.t.harrison@bham.ac.uk

<http://www.bham.ac.uk/beast>

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Jonty Harrison
d.j.t.harrison@bham.ac.uk
<http://www.bham.ac.uk/beast>

cec@vax2.concordia.ca

CEC - Université Concordia - RF-302
7141, rue Sherbrooke ouest
Montréal, QC
H4B 1R6 CANADA
<http://cec.concordia.ca>

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