Art on air:
a profile of new radio art

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Introduction

When art is on the move, definitions become blurred. This is true for radio art too; in fact, the changes in and around radio in the course of the twentieth century have made this condition the rule rather than the exception.

Ideas about using radio in an artistic way are as old as the medium itself. But, in the last two decades of the millennium, radio has taken on a new lease of life, generating new concepts, new approaches, new claims and new questions. Not only have the traditional art genres of radio work – *Hörspiel*, feature, radio theatre, sound poetry, electronic and electroacoustic music – bred further mutations and with them a new climate of interest, but also entirely new radiogenic forms have emerged. Artists coming from the visual world have found themselves increasingly attracted by the possibility of working with sound – eventually rediscovering radio as an appropriate medium for such work. In the fields of performance art, improvised music and multimedia new concepts and forms have appeared, which have lent themselves to or have been adopted by radio. All this has turned radio once again into a focal point of cultural interest. In times when new technologies have radically challenged the prospects of all artistic forms and genres, many artists and musicians have left their traditional discourses, venturing into new realms and creating new publics, dimensions and spaces. In the course of this migration radio has been rediscovered as a fruitful field of operation. Artists have looked for new auditive formats in this relatively old medium, making innovative use of its transmission technology and crossing over from telepresentation into telecommunication. From their side, adventurous radio producers have engaged with the new stream of activities by fighting for institutional space, working to create a forum for unconventional forms and assisting artists directly to deploy radio's unique media potential.

As a result of these changes, a field of widely varying activity and experimentation has been opened up, so diverse that no one has really been able to name it or nail it down. It was in this unsettled situation that the term 'radio art' was coined – a term sufficiently vague to accommodate the vast variety of forms on offer. Radio art first referred, perhaps, to the arrival of sound in the art world, but was immediately extended to embrace all unusual radiogenic experiments in other fields. Whenever definitions were attempted, they turned out to be either pragmatic or merely itemising.[1]

However, the vagueness of the term did not diminish its practicality. On the contrary, it helped facilitate communication and exchange between producers, artists and organisers whose interest in sound and work profiles otherwise significantly differed. At the same time this terminological indistinctness was evidence of a considerable lack of critical reflection, historical awareness and self-understanding. For a field in the making this is hardly surprising. Even at the beginning of the 1990s, when the development of the sound arts was well under way, there existed very little critical, historical or theoretical writing about radio art or sonic art-forms in general. Gregory Whitehead complained in 1991 about the 'numbing absence of critical discourse' (Whitehead, 1992, p. 253) and Douglas Kahn declared in 1992 the 'study of the relationship of sound and radio to the arts … [to be] … open to a full range of investigations, including the most general' (Kahn, 1992, p. 1).

Working backwards in time – looking for the landmarks of sound art, radio, media and technology – broadcasters, theoreticians and artists alike sought reassurance in history to establish their positions. Early evidence, such as the manifestos of the Italian Futurists, the intriguing sound poetry of the Dadaists and Orson Welles's radio-theatre work seemed as welcome to them as such later manifestations as Antonin Artaud's Theatre of Body-without-Organs (Artaud, 1974; see also Weiss, 1995), Glenn Gould's *Idea of North* trisonata (Page, 1984), German *Neues Hörspiel*, electronic music and *musique concrète* and the sound experiments of John Cage[2] or Mauricio Kagel. Detected sources of reference seemed to be as manifold and various as the perspectives taken by radio art itself and they continue to expand today as new forms emerge – *sound bricolage* being a recent example. In the space of the last ten years a considerable amount of textual groundwork on radio art has been completed so that we are now able to refer to some standard anthologies[3] and a fair number of theoretical and factual contributions on specific topics and events. These are the work of producers, radio enthusiasts, artists and the occasional academic and have appeared in books,[4] magazines,[5] catalogues,[6] conference

documentation, radio publications and on the Internet[7] – mostly widely scattered and hard to locate.

In practice, sound arts emerging from various disciplines found their way into the most obvious sound medium at hand: radio, intending to utilise the magic channels for their own ends. In marginal programmes on public radio, in the small outposts of independent stations, in group projects and through the activities of enthusiastic radio mavericks, a wide range of radiogenic sound art was amassed and broadcast. All these initiatives were pluralistic and without a common aesthetic denominator and had the cumulative effect of rethinking radio in its institutional, medial and sonic aspects.

Radio: sound

In the early stages radio helped to bring into being the emancipation of sound. In the first two decades of the twentieth century and in a general atmosphere of technical invention, artistic experiment and social upheaval, an overall dissatisfaction with traditional art concepts and their inability to address changing social and cultural conditions grew steadily stronger in the artistic community, generating a craving for profound artistic change, radical statements and novel inspirations. Many of these inspirations were provided by radio. As the first solely acoustic medium in which every visual dimension was entirely absent, it found itself in a pioneer position, challenging the growing dominance of visuality characteristic of our age. Sound, once taken from its environmental context, its place of origin and means of generation, lost its self-evidence (Bruisma, 1990, p. 89) and gained an independent sonic existence in and beyond music. As a discrete entity, it became material for artistic exploration. This was made manifest in numerous texts (Luigi Russolo's *L'arte di rumori* (Russolo, 1986), in sound poetry (Kurt Schwitters, Victor Klebnikov), sound compositions (Antonio Russolo, Filippo Tommaso Marinetti), through the invention of new instruments (Luigi Russolo's *Intonarumori*) and in the incorporation of non-instrumental sounds into musical works (by Erik Satie and George Antheil) – to name but a few.

Radio engaged in this process with its own means. Through the use of audio amplification and recording and transmission technology, it proposed a new way of presenting music and speech: out of thin air. A disembodied sound reached listeners in their homes, first out of headphones and then loudspeakers. Radio also informed a new way of listening; one without direct visual references. Broadcasting speech and

music at first separately through the same channel, radio soon started to fuse them into a new form. In 1924 *Hörspiel* was born, when in *Zauberei auf dem Sender* (Radio Magic) Hans Flesch succeeded in mixing text, sound and music into a single piece, establishing therewith a genre that would find a permanent place in German Radio programming. In this way, the new medium, with its capacity for combining music, sound and text, not only created its own genres but also challenged the autonomy and aesthetic orthodoxies of each individual component.

In the mid-1960s Paul Pörtner described both his *Schallspiel* (Soundplay) and his altered situation as author thus:

> [Soundplay is] a collage of voice and sound effects taken through a series of electronic manipulations until the sound effects begin to speak, the voice to drip like water and shatter like glass ... I trade the desk of an author for the studio of the sound engineer, my new syntax is the cut, my product is recorded over microphones, mixers and filters on magnetic tape, the principle of montage creates a playful composition (*Spielwerk*) out of hundreds of particles (Paul Pörtner quoted in Kahn and Whitehead, 1992, p. 331).

This combination of music, noise and text has been an important aspect of sound development from the early days, and still is: indeed radio art has often been generalised in these terms. Listening, for instance, to the sound pieces compiled by Heiner Goebbels in the early 1980s (discussed below) or American mixology aesthetics in the 1990s, makes it abundantly clear how potent this old radio art trinity still is.

After the Second World War, studio technology advanced the process of sound exploration. Public radio found itself at the heart of this development as it established experimental recording studios all over Europe. In this way, it assisted the development of sound work in two very different directions. The *Atelier de Création Radiophonique de Radio France* gave room to Pierre Schaeffer for his experiments with *found sounds*, and in the *Studio für Elektronische Musik* at North West German Radio (NWDR – later West German Radio, WDR) Robert Beyer, Herbert Eimert and Karlheinz Stockhausen generated the sound material of their compositions wholly synthetically, exploring the possibilities of sound building inherent in the latest electronic technologies. Informed by very different aesthetic concepts and working towards very different ends, composers and engineers pushed the frontiers of sonicity through their exploration of tape manipulation, new electronic processing devices, synthetic sound generation and multichannel diffusion.

The involvement of European public radio with these two major strands of post-war composition – *musique concrète* and *elektronische*

Musik – led German composer Dieter Schnebel to claim that these kinds of music 'came out of radio art' (Schnebel, 1994, p. 5). Yet, as advanced and influential as both of these endeavours were, they still remained within the conceptual boundaries of modernist music, since they continued to insist on working with abstract sound[8] – that is, sound that refers exclusively to itself. Even though Schaeffer took to the environment to find his sonic material – his *objets sonores* – he still focused exclusively on their non-referential usage. The aesthetic compulsion to music and the fact that this pioneering work was realised under the exclusive – and at the same time restrictive – conditions of expensive studios in public institutions, marked both of these projects.

In the late 1960s and through the 1970s, experimental radio work followed its then established routes of experimental *Hörspiel*, feature and new music. In the Studio Acoustic Art at the WDR (Cologne), for instance, radio art experiments started in 1963 with experimental acoustic literature, sound poetry (*Neues Hörspiel*) later moving with a similar aesthetic over to experimental music. 'In treating language and sound effects as concrete material, it made possible the same kind of aesthetic reaction associated previously only with music.' (Cory, 1989, quoted in Lander and Lexier, 1990, p. 98).

Yet, the creative potential of radio and its studio facilities – exemplified by the work of Pierre Schaeffer, Karlheinz Stockhausen and their associates – was increasingly lost in the course of technological advancement, especially with the advent of live electronics, digital technology and home studio recording. These developments gave sound exploration its major turn, liberating artists and musicians from the restrictions of public radio institutions at a basic structural level, since sound engineers and radio producers no longer had to mediate between technology and artist, and time restrictions and the limitations of prescribed radio formats no longer applied. This last point was critically addressed by Glenn Gould in his concept of 'contrapuntal radio' (Gould, 1992, pp. 190–91), which challenged the linear structure of radio documentation.

The changed conditions of technological accessibility liberated individual work from public conventions and gave experimental sound work outside the radio an enormous boost, commencing in the early 1960s and peaking by the 1980s. People from all sorts of backgrounds who would never have had the privilege of using the facilities of public radio now became interested in working with sound. As a result, not only would the aesthetic spectrum of sound work change rapidly and fundamentally, but also many sound artists would begin to choose more intuitive and experimental ways of working than had previously been

possible, opting rather for an openness, an unfinished quality in their 'final' pieces.

Under these new circumstances an interest in sound spread widely into various areas of artistic work. While the *Hörspiel* was originally situated between literature and music, many fresh inspirations for sound art now came from the world of the visual arts. Stimulated by the cross media experiments of Fluxus and the performance arts of the 1960s, artists and musicians started to combine visual and auditive elements into sound sculptures.

Sculptors expanded their work with plastic materials towards its sonic qualities. The sonicity of glass, metal, stone and wood formed the basis for their sound pieces. They took the position that 'all objects have a sound component, a second shadow existence as a configuration of frequencies.' (Viola, 1986, p. 43). Thus the very specific sound signatures of sculptural objects and materials became a source for the exploration of the affiliation between sound texture, resonance and their natural carriers. Artists understood sound as 'matter' and sought to mould sound, by giving it a *sculptural* structure. Pieces like *Small Music* by the German artist Rolf Julius (Julius, 1994) are reminiscent of Marinetti's vision of being 'seduced by the vibration of a diamond or a flower' (Marinetti and Masnata, 1992, p. 267). Other artists would expand their sculptures by giving them a sonic dimension. Such sound sculptures – still or moving – were made either to emit sound by themselves, or to react to the actions or movements of the public.

In the second half of the 1960s artists started to venture away from the sonicity of the sculptural body or material and into space. When Max Neuhaus created one of the first sound installations, his *Drive-in Music* (1967/68), he wanted to arrange sounds in space and leave it to the listener to place them in his or her own time (Neuhaus, 1975, p. 34). Sound installations, unlike sound sculptures, work with the physical dimensions and acoustic properties of a concrete space, so it is the space that is to be experienced through sound. Consequently, they are typically site-specific. Dutch artist Paul Panhuysen, for instance, transformed spaces into instruments by installing long strings that would pick up the resonant frequencies of the room. These sound resonator installations explore the impact of sound onto space and space on sound. In Alvin Lucier's installation *Empty Vessels* (1997) six microphones, placed in the openings of six glass vessels, record the sound of the space they are in, which is then played back into the same room via six speakers – only to be immediately rerecorded together with the disturbances caused by the public and so on, creating a constantly changing sound loop.

Often sound sculptures and sound installations include the public by delegating the initiation of sound or the form of its perception on to the activity of the listener. These works would be silent until some movement or deliberate operation triggered the sound. In many of Christina Kubisch's installations visitors have to discover the sounds using headsets by moving around in electromagnetic sound fields (Kubisch, 1990, pp. 69–72). Their audio experience relies entirely on their personal activity. Depending on a dialogic relationship of audience and piece, this encounter dissolves the opposition of art/artist and recipient. A compendium of the enormous variety of forms that both sound installation and sound sculptures can take was recently assembled for the *Sonambiente Festival* in Berlin in 1996 (Akademie der Künste Berlin, 1996).

A special form of sound installation was created through radio itself by transmitting sound from one place to another, altering sonic perception of the new environment. Such transmissions can span enormous distances. The *Sound Bridges* of Bill Fontana between *Cologne and San Francisco* (1990)[9] and *Cologne and Kyoto* (1993) for instance, were realised by transcontinental broadcasting via satellite with the help of WDR (Cologne).

Sound sculpture and sound installation exemplify the merging of formerly very different and autonomous artistic disciplines and the abolition of the delimitation between the conventional temporal and spatial arts.[10] Artists started to commute between visual and audio genres. Thus the migration towards sound sculpture and sound installation occurred from various sides – music, performance and visual arts.

Not all of these works lend themselves easily to radio. Not only because of the missing visual dimension but also often by virtue of the sonic material used or the site-specificity of the sonic experience. Canadian artist Gordon Monahan came across this problem in his experiments with the doppler effect, using swinging speakers. He refers to sound effects that elude recording:

> there is a section in the piece that does deal with the particular space … That is the actual sonic impact of resonant frequency in the space to a kind of pressure-pulsation happening. When you try to record that, you get modulation on the diaphragm of the microphone. You can't get a true representation of that on the recording. (Monahan, 1987, p. 143).

Still, quite a few sound installations have a vivid sonicity that can be remixed and prepared for an exclusively auditive experience – on CD, or for that matter radio.[11]

Another contribution towards the expansion of sonicity came from inside music. Since Russolo, and later Cage, had declared the autonomy

of sound by 'using sounds not as sound effects, but as musical instruments', the way was cleared to 'make available for musical purposes any and all sounds that can be heard' (Cage, 1968, p. 4).

In recent years new developments in performance art and improvisation have depended extensively on sound. In particular, portable electronic sound technology such as turntables, samplers, effect units, tone generators and so forth – either used on their own, or together with other musical instruments – made possible an immense diversity and individuality of aesthetic approaches and stimulated a whole plethora of sonic events.

Japanese musician and performer Keiji Haino, for instance, tackles the polarity of the sound spectrum and its perception. In his performance with amplified sound on the electric guitar he exposes the audience to extreme physical volume, overstepping the pain threshold and driving the listener literally out of the room. On other occasions, however, in delicate percussion performances with body movements in the dark, an audience has to strain to follow the sound as it hovers at the limits of audibility.[12]

Many performers use spoken language, singing voice and the resonances of their bodies as sonic source material. Performing her semi-autobiographical one-woman-musical *O Little Town of East New York* (Hirsch, 1995) singer Shelly Hirsch combines all three elements into a seamless and highly individual texture. The precedent for combining sung and spoken texts was most famously set by another New York woman performer, Laurie Anderson, who also broke new ground by inventing her own electronic instruments.[13]

New technology forged an important link between traditional musical skills and the technology of sound generation and processing. The Studio for Electro-Instrumental Music (STEIM) in Amsterdam designs bespoke sound technology for performance artists. English violinist Jon Rose has been working at the interface between computer processed and instrumental sound for many years using a customised interactive *electronic bow* made by STEIM. Michel Waiswicz, on the other hand, converts body movements into sound employing electronic gloves (*The Hands*). Midi controllers, photo-electric cell devices and mini-radio transmitters are all used to trigger electronic sound systems and release pre-prepared and digitally stored sounds or, more recently, to sample live sound. Indeed many new, sometimes quite eccentric instruments have been invented and developed in the process of improvisation and performance employing recent technologies (for instance Don Buchla's *Lightning*), not to mention electronic body armour and biofeedback systems.

The use of live electronics is now well established in all kinds of new improvisation, turning this traditional field of instrumental music into a resourceful area of technologically driven sonic creativity.

But 'high tech' seems also to have heightened the interest in 'low tech'. *Sound bricolage* may be the youngest form of sound exploration. Its practitioners, often with little or no artistic background, but very interested in generating sound through technical devices, compile sonic trash and hi-fi debris in their bedrooms and home studios. German bricolagists like Bernhard Günter[14] or Boris Hegenbart, for instance, explore their fascination with microscopic audio phenomena, producing fragmented pointillist pieces. While the Swiss duo *Voice Crack* (Andy Guhl and Norbert Moslang) use everyday objects – 'cracked everyday electronics': radios, turntables, calculators, dictaphones and game machines – manipulated in novel and expressive ways, controlling them with light, body movements and their voices.[15]

As these electronic bricolages rely largely on intuition and fragmented micro-sonicity and defy structural preconception (composition), they seem to have very little in common with conventional forms of electroacoustic music. But even the latter has seemed unable to withstand change. Exposed to experiments in other fields, the general orthodoxies of the electroacoustic trade began to crumble when its self-identification through abstract sound and legitimated musical structures was undermined by referential sounds taken from natural and urban environments, or by text and 'open' structures (exemplified, for instance, in the work of Canadian composers Robert Normandeau (Normandeau, 1990) and Christian Calon (Calon, 1990; 1998)). In this field computer and sampling technology allowed not only for work with new sound material, but also new working methods – such as 'Composing by Ear'[16] or cinematic approaches[17] – as well as new forms of presentation and collaboration.

Sampling technology itself introduced a completely new aesthetic, suddenly making it possible to recycle our entire recorded history, not only providing an enormously expanded sound continuum, but also supporting work methods formerly strongly taboo in avant-garde music. After all, selecting fragments of existing recordings and 'merely' collaging or montaging them, subverts all established aesthetic concepts based on artistic originality, authenticity and material-immanent progress. Such new approaches still meet strong and disproportionate resistance, as John Oswald's[18] plunderphonic pieces – and the concept they embody – impressively confirm.

All these different developments in sonic arts were not only fuelling radio art, but radio itself was becoming a sound source or an instrument

for musical performance, and was used by many composers and performers – most famously in John Cage's *Imaginary Landscape No. 4,* where twelve radios are to be played by twenty-four players at given frequencies and volumes under the timing instructions of a conductor. In 1985 American performer Nicolas Collins made a piece by mixing samples from FM and AM transmissions at the time of the performance (Collins, 1986). This strategy of live-mixing sound directly from the ether reappeared in the 1990s, notably in the work of Robin Rimbaud (alias Scanner) who modified it for mobile phone scanners. Indeed, as early as the 1960s amongst a whole generation of improvisers and musicians, radio was in common use as a chance-driven instrument and is still fully integrated into the work of English guitarist Keith Rowe, for instance.

The extension of abstract into environmental sound not only concerned sound producers, but also opened up a number of questions about our way of listening – for instance to sounds which we might normally not listen to or simply take at face value. Canadian sound researcher and composer R. Murray Schafer explored this problem in the 1970s through his idea of soundscape – the sonic fingerprint of a place. He called for a battle against sound pollution (*Ear Cleaning*) and advocated a new way of listening (Schafer, 1977). Hildegard Westerkamp, taking up the idea of experimental listening and acoustic ecology, sought 'to make radio a place of environmental listening by broadcasting soundscapes that listeners experience in their daily lives' (Westerkamp, 1994, p. 88). This strategy was quickly adopted by sound artists all over the world who recorded the soundscapes in which they lived or which they encountered in their travels, passing on these sonic imprints to listeners everywhere.

Finally, we should not fail to mention one last soundfield which despite its long tradition has, like *Hörspiel*, proven infinitely resourceful: the sonic dimension of the human voice – and in particular the relation between speech and sound, as explored in many and varied ways since early experiments by Dadaists and Futurists with sound poetry and acoustic literature. Many of today's new approaches, for instance, defy author-centred, message-oriented concepts by mixing text-splinters of various origins from high and popular cultures, by creating an understanding of complex texts through misreadings (for example Heiner Goebbels's *Despoiled Shore* (Goebbels, 1984)) or by developing new forms of associative storytelling (Gregory Whitehead, Jackie Apple). Text and language-based soundworks also provide a strong ground for culturally and socially engaged radio work.

All these very different approaches to sound, and the enumeration here must remain sketchy and incomplete, make for a whole

encyclopaedia of unconventional aesthetics. However, these activities emerged and flourished largely outside radio. With new technologies designed for flexible and individual use, sound arts gradually developed their own independent existence outside the big institutions. And, as they challenged the conventions of the artistic fields from which they came, they needed also to build up new means and new networks of propagation. In the 1980s and 1990s, radio became an option again for many artists in their search for larger audiences. In taking these outside works in, radio now found itself in a new role, as a patron for a whole catalogue of stray sound works. It was then that the term radio art (used by Kurt Weill as long ago as 1926 (Weill, 1984)) caught on as a mode of understanding and reference between producers and sound artists from different countries and aesthetic orientation. Henceforth, radio would gather and produce works in an extremely pluralistic and open-minded way, providing them both with a forum and with wider recognition. Thus radio art became a hybrid – inclusive rather than exclusive – and consequently not to be 'determined by negation'.

It is important to note that nowadays there is hardly any Sound Art on radio that could not survive without it. Sound arts have all found themselves their own formats, modes and territories, be they on CD, the Internet, sound galleries or performance venues. And as the genres float, so do the specialisations: many sound artists now work in several different genres simultaneously. New technology with its different formats allows a piece to exist in various incarnations and perhaps as a number of somewhat different pieces. Such flexibility is linked to an artist's familiarity with different media. A piece might be produced in a home studio, offered to the radio, pressed onto CD and then integrated into a live performance, or it might begin as a sound installation with the sound element released as a CD, which is then played on the radio; so the sound realises 'other existences', independent of the original installation with its attendant visual and spatial attributes. Even complex live events or telecommunication projects with live sound-mixes may later be successfully remixed for CD – as was the case with Patrizia Jünger's Hör-promenade *Transmitter – First to Second Nature* (Jünger, 1996). In such ways pieces are in constant flux, changing shape according to the context and occasion in which they appear. It can happen that a single work exists as a stereo production, in DVD 5.1, as a concert piece, part of a video collaboration, dance performance or multimedia event.

This wide range of formats points to a crucial problem that radio encounters when attempting to present such diverse works: its own technological limitations. In a way, such technical difficulties make it all

too obvious how far – on a technological level – sound explorations have moved away from radio as a medium. New digital technology allows for greater clarity, fidelity, extreme dynamics and an ever-widening range of frequencies, providing a continually expanding field for sound artists of all provenances to experiment with. They will test the limits of audibility or even physical bearability of sound. Low-frequency effects, for instance, feature prominently – and not only in popular music. Live performances might rely on the immersion of the audience in the sound where spontaneous head movements can be vital to the final experience. Live performances with tone generators and controlled electronic feedback, for instance by Sachico M and Otomo Yoshihide, depend on such factors and are incomprehensible to radio. Such forms must always present extreme difficulties to a medium based on *distance and strict directedness*, rather than *immersion and diffusion*. Thus the essence of live soundworks which depend extensively on the acoustic qualities of the space or the active perception of individual listeners is inevitably lost when recorded or broadcast.

Sound compression on the radio reduces dynamic range. Since the aesthetic of both recorded and live sound pieces often work with drastic dynamic changes, radio is simply unable to transmit them. 'Such broadcasting shows no dynamic shadings or phrasing. It does not breathe. It has become a sound wall.' (Schafer, 1977, p. 95). Something similar is true for radio's stereo effect which cannot mediate full spectrum multichannel diffusions. This longstanding problem (one only has to think of the *Acousmonium*)[19] becomes even more evident today as we are familiarised to multichannel audio in Dolby Digital 5.1 or SDDS 7.1[20] as cinema standards – or the sound capacities of 24,000 watt in Imax-centres. Such sound deficiencies we find in other media too, for instance when sound travels through the Internet. The sound quality of Real Audio suffers even more than that of radio, because of low sampling rates and high data compression. These are reasons why 'most radio artists reject the Internet'.[21]

Well aware of the shortcomings of radio technology, sound engineers have worked for decades to overcome them by way of simulations. In fact, simulating virtual spaces has become one of the major playing fields of sound engineering. Such a fascination with virtual spaces becomes even more curious in the light of the lack of suitable real spaces for sound events. In this regard the direction pursued notably by Karlheinz Stockhausen to create new spaces for new sound work has been disappointingly neglected.

However, sound technology is moving rapidly. Digital radio will become the norm in the next few years. Artists working with sound and

radio are fully aware of the problems of reproduction involved and weigh the advantages and disadvantages of having their pieces presented in radio space. The same is true of radio art programmers and presenters. This may be one of the reasons why the latter sometimes turn their backs on the 'magic channels' and head towards spatial or live events, presenting radiophonic pieces in surround sound spaces – observatories, for instance, or set up sound galleries, such as the *Klanggalerie* of the Free Berlin Radio (SFB) – or become involved in large-scale performance events or festivals, such as ORF Kunstradio: *Ars Electronica*; WDR Studio Akustische Kunst: *Ars Acoustica*; SFB Internationale digitale Radiokunst: *Gala of the Prix Europa*; RAI Audiobox: *International Festival of Sound Experimentation*. Radio art producers constantly work in:

> Sound Spaces of Radio beyond the boundaries of radio. In the process, various media-forms of presentation are employed, for example the loudspeaker concert, the live performance, the space-sound installation, the sound film with integrated loudspeaker concert, the simultaneous radio and television broadcast, urban sound sculptures broadcast live on the radio etc. (Schöning, 1999).

They set up 'live on air, online, onsite-sound-installation',[22] art projects which take place simultaneously in different media and different spaces and deploy audiovisual intersections.

Considering all these recent developments in the relationship between sound and radio, radio art today has to be regarded as one of many sound art formats. In this respect Nicholas Zurbrugg has described the current phase of sound creativity as 'post-radiogenic' – following the pre-radiophonic and 'purely radiophonic' phases. In this third, most recent phase he defines sound art through the combination of 'sound, music, speech and image, colour and gesture in both real time and studio time in various technological broadcasts, installations and performances' (Zurbrugg, 1988). On radio, however, sound art inevitably filters through very specific institutional and media channels.

Radio: institution

As the medium radio appears in various institutional formats, radio art finds itself in various different contexts. This is especially true of Europe and Australia, where public radio still plays an important role. As a well-established institution, it has international contacts and the financial and administrative power to realise and host big events, run international competitions, hand out prizes, commission unusual or

extravagant works and organise festivals. On top of this, radio has access to a substantial and largely guaranteed listenership.

When sound art became ubiquitous, producing and presenting more and more works outside the context of radio, adventurous producers and programmers in public radio stations took note: 'independently produced audio-tapes began to emerge from the artistic community and demanded to be heard on the radio' (McLennan, 1995/96). Building on this growing interest in experimental sound and radio work in the 1960s and 1970s[23] producers initiated, at first occasional and then regular, radio presentations, covering a wide range of experimental sound art: Australia: ABC *The Listening Room* 1988; Austria: ORF *Kunstradio* 1987; Germany: WDR *Ars Acoustica* 1968 (continuously, with a changed profile) and SFB *International Digital Radio Art* 1992; Italy: RAI *Audiobox* 1982 (following *Fonosfera* 1978/79). As time passed, these special programmes became established centres of international radio art.

However, setting up such special programmes inside public radio did not proceed without encountering severe institutional problems. After all, every institution inevitably establishes a certain aesthetic profile with its own formative templates – and in most public radio stations, programming is dominated by news, information and entertainment. By presenting innovative and experimental sound works, the new radio art programmes constantly overstepped established limits and challenged the aesthetic orthodoxies of radio institutions. Although the aesthetic formats of *Hörspiel* and feature had long been recognised in public radio programming, the new radio art found itself under constant attack. Such discrimination was and is expressed through legitimisation pressure, budget cuts, being placed lowest on any institutional priority list, wholesale dismantling of perfectly viable programme structures (recently experienced in Austrian radio by ORF *Kunstradio*), erasing entire programmes (RAI *Audiobox,* September 1998) or ignoring new radio art altogether (a solution for which the British Broadcasting Co-operation is so infamous).

Things got worse when public radio was faced with competition from commercial stations, now also fighting for their listeners' favour. As broadcasters gave in to mainstream listening – renouncing their former claim to education and enlightenment and cutting budgets for experimental work – radio art became an early victim of discrimination, easily dismissed for being too élitist. Stressing the argument that radio had to 'serve' its audience, radio administration began to judge successful programming by way of ratings: applying the lowest common denominator standard of mass appeal.

In response to these developments, and particularly since in many countries radio art on public stations was not even an option, other outlets for experimental sound work were urgently required. Radio art found itself in the company of many other marginalised genres, social issues, topics and forms, discriminated against by the institutional politics of public radio and looking for alternative radio outlets. Radio guerrillas work on the outskirts of the radio landscape – at 'the low end of the radio dial' (Breitsameter, 1999) – either having to broadcast within a legally restricted transmission radius (e.g., college and community based stations in Canada, the United States and Australia) or for a limited period (stations with a Restricted Service Licence). Other radio enthusiasts opt for the underground – surfing as airwave pirates offshore[24] or on land in forbidden waters. Some exit radio altogether, finding other channels through which to distribute and exchange their works and ideas.

In all these cases radio is understood as a tool either for social and political intervention or for emphasising a cultural difference discriminated against by corporate power. In many community and college stations such a direct communicative aspect stands at the top of their agenda. Their mission is to produce radio for a specific community, take up internal issues of communal life and address their own specific concerns. Other stations deal in marginalised or ignored topics which otherwise find no place in a politically and culturally regulated broadcasting environment.[25] Here the idea of 'democratising the radio' is often evoked as a call to oppose the concept of radio as a unidirectional voice of power (however populistically packaged) in which information flows from the public station to the single listener, with no feedback facilities and no cross links between receivers. 'The horror lies in the "structure of communication" or – to say it more simply – in the material and/or immaterial cables. If one could reverse the cables, the horror would be rectified.' (Flusser, 1998, pp. 73–4). Then radio could be turned into a bi- or multi-directional instrument, a network of connections that could facilitate a telematic exchange between all participants.

The idea of a 'democratic radio', already suggested in the 1920s by Brecht (Brecht, 1993, pp. 15–17) and others, re-emerged in the 1970s in the 'free radio movement' with community stations like Radio Alice in Bologna – itself a product of the deregulation of the airwaves in Italy – which subsequently inspired independent radio initiatives all over Europe.[26] Alternative programming, community interests and the artistic use of radio can come together on such a territory. Much of American radio art with its profile of high cultural and social engagement –

contrary to art- and intellect-based European radio art[27] – fits this communicative framework very well, entering the social discourse of independent stations on grounds of content or as part of alternative, interest-bound programming. The balance between community interest and art experiments could even tip towards radio art, if the community happened to be interested in experimental sound endeavours – as we find it for instance at WLUW Chicago (the station of Loyola University) or New American Radio (New York).

Similar interests in 'free radio work' are expressed in even more informal ways, this side of or beyond official radio frequency regulations. Where regulations tolerate low frequency transmissions, this technology can become the basis for radio experiments and wider radio networking. Tetsuo Kogawa has been experimenting with low frequency transmissions in Japan since the early 1980s. He built mini-FM transmitters which can be used for 'different models of radio on college campuses, housing complexes, coffee shops and bars, stalls at street fairs, local offices' (Kogawa, 1994, p. 290), that is for microwave transmissions in urban areas. By networking these mini-stations, the covered area of communication can be expanded. Tetsuo Kagawa's concern with changing 'the nature of communication between those who speak and those who listen' takes an extreme turn when he suggests 'the same number of transmitters as receivers' (Kogawa, 1994, p. 291).

Going beyond the boundaries of national radio legislation, many pirate stations were formed around some special interest – such as styles of music or ignored social or political concerns. Many marginalised groups think it worthwhile to risk violating official airwave regulations in order to communicate with like-minded listeners or express opinions on controversial issues which would otherwise have no chance of an airing on officially censored mass media. For instance, a group of women in Galway, Ireland overcame 'their fear of being penalised for talking or singing into a microphone', because they wanted to exorcise 'the sense among woman of starvation, of never being listened to' (D'Arcy, 1990, pp. 319–23) and were finally heard via telephone links across three continents. Amsterdam radio pirates who have operated in different formats since the early 1980s started to experiment with the medium itself. Stations such as Radio Dood, later Radio Patapoe with a heady combination of very little money and a lot of time and enthusiasm, embraced an unorthodox, mixed programming, accommodating a 'carefree experimentation with sound' (Lovink, 1993, p. 115).

All these alternative broad- and narrow-casting initiatives show that there is an interest and a place for radio outside publicly imposed mass

media formats – and that radio art can be part of it. However, in order to pursue a solely art-oriented course, artists have also found ways outside official or unofficial radio institutions. In 1973 two English artists, William Furlong and Barry Barker, founded *Audio Arts* (Furlong, 1994). Conceived as a kind of sound magazine, it made use of the then growing availability of the audio cassette to produce and distribute radiophonic work. What was originally conceived as an aural documentation of the vigorous debate about the form and purpose of art, soon became a complex and comprehensive body of sound work of all kinds. Rod Summer's *VEC Audio-Exchange,* on the other hand, adopted a mail art exchange format to produce audio collages on cassette from the contributions of friends and collaborators. From 1978 to 1983 this exchange produced sixteen one-hour programmes and found a wide distribution (Summers, 1990, pp. 235–40). Other editors of sound art publications, such as those of the audio-cassette magazine *Tellus* (created in 1983 in New York City) 'perceived a need for an alternative to radio programming'[28] and made commercially available unusual recordings in the cross-over field of visuals, music, performance and spoken word.

A critique of dominant radio practice with a high emphasis on radio art was realised by independent initiatives such as *Radia 89.9FM* and *Radio Rethink* (1992 at the Banff Centre for the Arts in Canada) (Augaitis and Lander, 1994), by the English Restricted Service Licence-stations *Hearing is Believing* (Liverpool, 1995)[29] and *Resonance FM*, (London, 1998).[30] All these temporary stations with small transmission ranges set out to explore the creative dimension of radio as a medium. They presented pre-recorded audio pieces and live events, commissioning artists and musicians to create special works – and inviting theoreticians, critics, producers and artists to discuss the state of radio art under current institutional conditions. They considered radio 'as a medium for critical intervention in today's culture' (Augaitis and Lander, 1994, p. 1).

A sharp shift in independent radio activity came with the commercialisation of, and later the introduction of audio to the Internet. As technology provided an audio link through the World Wide Web, the possibility of global audio transmission became a welcome alternative to official and unofficial airwave battles. Webcasting has considerably shifted media reality. Despite shortcomings in audio technology on the net, such as time consuming downloading and even hard signal compression in *Real Audio*, making for poor sound quality, the net freed sound art at a stroke from radio-space, institutionalised formats, fixed broadcasting times, places and limited transmission ranges. It made

sound art available on a global scale, free from territorial limitations and national restrictions. Moreover, the Internet liberated radio art from any institution or collective body. In the last few years thousands of radio stations have gone online and some independent stations, like New American Radio,[31] formerly forced to offer their programmes to public networks, have switched from broad- to net-casting precisely to avoid endless problems with large and indifferent institutions.[32]

The net entwines in a single strand the media of transmission, production and reception at the level of the user. It makes it possible to present sound art, as well as to *archive* it. In public radio, sound works were produced by and for radio; they were broadcast and then stored away in radio archives, so that availability was strictly limited to the actual time of airing and the transmission range of a particular station. The establishment of *Real Audio*-archives on the net, and the presentation there of new sound art projects improves accessibility to sound works (both past and present) and on a global scale.

Downloading audio files and recording in MP3 format has made pieces of nearly CD quality universally available both for listening and as source material for further processing – whenever, wherever. The consequences for our audio landscape, institutions and property questions are unquantifiable; it is impossible to imagine or assess the eventual effect on our audio landscape. But one thing is already clear: the Web with its potential for openness, interactivity, multi-directedness and accessibility, defies the very concept of media-democracy, since its structure subverts any political idea based on majority representation.

In addition to all this one needs to consider that the Internet is not only an autonomous medium but one attached to most existing media bodies as well. Public radio stations are using it more and more as a welcome addition to their existing facilities, since the Internet is able to graft itself onto all manner of existing media and to be used by individuals and public institutions alike. Thus, formerly autonomous media become hybrids, merging with other media until they will all finally unite in an endless streaming of public and private data flying through digital channels. This hybridisation of media is already underway and will profoundly change radio, both the medium and the landscape. It will integrate the old one-way street into a multidimensional super-highway network, eventually collapsing medium and institution into one another.

Radio: medium

Understanding radio art in its media-specificity requires us to adopt a different perspective from the aesthetic, sound-centred or institutional ones we have employed so far. For this, radio has to be situated in the wider framework of contemporary electronic/digital media and their cultural effects. In this respect, radio cannot be understood merely as 'extended acoustic space' (Schafer, 1977, p. 91); rather, 'radio-space is a wave-space' (Braun, 1999, p. 4), an abstract inaccessible space which may only be entered virtually, by tuning into a given frequency. When any work of sound art is submitted to this electronic space (in other words, when broadcast) it takes on a new life, determined by the medium. Every broadcast work is thus subjected to major transformations through the technical configuration of the medium, its coding/decoding system and the properties of the audio equipment at the listener's end. Since, under these conditions, dynamics, fidelity, signal-to-noise ratio and timbre are highly variable, the work as a fixed and unalterable entity inevitably vanishes and the author of a work no longer has any influence on its final sound, or indeed what happens to it. In contrast to an acoustic or acousmatic concert hall presentation, a composer or performer giving their work up to the radio has no opportunity to create the conditions for its ideal reception, since both the technological and environmental conditions of radio listening are essentially unpredictable.

At the same time, radio-space disconnects a work, its author, performers and auditor from any common place of experience and event. This space is equally absent for all participants. Moreover, listening conditions are not fixed by the conventions of common behaviour – as would be the case in a concert hall or at any communally experienced real-time event – but are dependent on the way radio fits into a listener's daily routine. Listening may be distracted or incidental, or it may be focused but not in radio real-time (as when listening to a recording taken from a broadcast, for instance). Often, it is just one of several simultaneous activities. Thus, radio sound meets the listener on his/her own terms while 'the sound environment generated by radio merges potentially with the sound environment at a given location' (Braun, 1999, p. 5). This generates a highly fragmented perception, one that is not programmed into the work but imposed upon it by external conditions. The listener cultivates a selective form of perception characterised by non-linearity, disruptiveness and partiality, so that the same work will take on many different forms, depending on listening strategies and contexts. These tendencies in radio listening coincide with other

fragmented, pointillist forms of perception associated with various types of musical and sonic creations.[33] Indeed, many sound artists take the variability of today's sound media into consideration from the outset by producing works which are themselves fragmented and changeable, planning and realising a single work in several different versions and formats.

Since radio is not a shared space between creators (authors and performers) and audience, and lacks a commonality of experience, all direct communication is eliminated. Every radio experience rests on the distance between the component parts of a formerly integrated artistic process. Not only are artistic creation, sonic execution and listening completely separated from one another, but radio listening itself is an extremely lonely occupation, though this is usually camouflaged by the comforting and familiar voice of a presenter and the common belief in the 'listening community'. Cut off from the source as well as from each other, radio listeners have to accept whatever comes out of their speakers.[34] Here communication and information are profoundly disconnected.[35] The missing cross-links between receivers and the lack of feedback facilities underpin the authoritarian and non-communicative structure of traditional radio broadcasting. This distance between the radio components is not coincidental; it is immanent in the medium itself. Yet, under the conditions of increasing global interaction and communication, a uni-directional media structure seems to become increasingly insupportable. For this reason artists and producers continually seek ways to challenge and overcome this distant nature of radio in both directions: vertical – between producers, artists and listeners; and horizontal – between listeners or artists themselves. They promote new concepts of working in and with radio.

ORF-Kunstradio, for instance, addresses radio as part of the recent media shift by making it productive for telematic projects. Through events such as *Horizontal Radio* (1995) and *Rivers and Bridges* (1996)[36] it explored radio's capacity for global networking. By using radio in conjunction with telephone, fax, computer and the World Wide Web, the projects created an integrated electronic system, linking people in radio stations and studios across three continents in lengthy, continuous radio art sessions. Such telecommunicative events became concerned less with the 'transmission of "aesthetic" products and more with […] the creation of a network situation' (Breindl, 1997, p. 10) in which sound is transmitted immediately to be re-used as source material for some new sonic activity, a situation in which sound artists, engineers and producers can interact over long distances. Senders become receivers, and receivers senders. In reference to Marinetti's concept of *La*

Radia (Marinetti and Masnata, 1992) and his anticipation of 'a world-wide net of live radio lines' (Grundmann, 1994, p. 131), these projects occupy a special place in today's radio art landscape by stressing an aspect of radio not centred on sound. By cross-connecting radio stations, studios and now – by courtesy of the Internet – private persons on a global scale, such telematic events exceed the traditional centralised scope of national public radio by pursuing forms of bi- and multidirectional worldwide interaction. Audiences are witness to an instantaneous, simultaneous process of artistic exchange where the 'overall work … cannot be grasped, either by the active participants (artists/engineers) or by the audience at the various places' (Grundmann, 1993). These telematic initiatives suggest changes in sound art creation and perception that go beyond modernist concepts of authorship, ownership, artistic self-expression through the production of unique works and 'truthful' perception. They advocate new ways of art making – not defined by work but *process*; not through the polarisation of creator and receiver, but rather through *communication* and *interaction* between them. Once connected to other media, radio becomes part of a telecommunicative structure that is non-linear and goes way beyond simply 'reversing the cables'. These networking strategies open up new ways of genuine media *communication*.

All these changes find their ultimate expression in the Internet where all uni-directionality and hierarchical forms of communication are potentially abolished. Its network structure opens up new possibilities for communication as well as art making, since artist and listener alike are involved in the same dynamic system where 'every (artistic) act … is an open action' (Breindl, 1997, p. 9). Sound works and splinters are floating through cyberspace, changing their sonic specifications and waiting to be appropriated, sampled and transformed. This requires a wholly new self-understanding from the producers of such telematic art, since artistic as well as commercial ownership is fundamentally threatened by digital sound technology (hard disc recording, CD burners, MP3 players) and global availability. Telematic work is an offer for exchange. Artists and businesses alike will have to come to terms with these new technological and cultural facts. Moreover, despite changing the way sound art is made, the new medium also challenges the identity of sound art itself as an art exclusively for the ear: sound work will be irresistibly drawn towards visuality, since the computer screen shouts out for it.

Although the final outcome of all these technological changes is difficult to predict, an aesthetic shift is definitely underway. By way of the Internet, for example, sound work becomes a genuinely individual enterprise; it can originate in anybody's bedroom and have at the

same time a universal presence – and still be open to change and exchange. However, it remains to be seen how this polarity of active sender and passive receiver will be resolved. Obviously the Internet will not suddenly turn every passive sound consumer into an active sound producer. But decentralised networks, interconnected at all levels will provide at least the possibility for both simple reception and active engagement.

Given, on the one hand, the rapid development of digital technology and the subsequent changes in media structure and, on the other, the hybridisation and expansion of art forms and processes, the consequent cultural transformations are bound to effect radio art. Current projections range from the hope that, once new media take over radio's traditional information and entertainment functions, radio itself might be freed for experimental work, all the way to predictions of 'the end of radio'. Although history repeatedly shows that old media are not simply replaced by new ones, it is still not easy to predict what form the changes underway will eventually take. Sound art, however, seems to thrive on all these developments – its theoretical reflections constantly chased and surprised by the enormous creativities they are facing. May theory draw comfort from the fact that everything has already moved on!

Notes

1. 'RadioArt is audio art produced in or transmitted by radio' (Breitsameter, 1998).
    'RadioArt is an electroacoustic genre, which fluctuates in the indistinct realm between *Hörspiel*, new music, sound installation, soundscape, performance art and experimental pop, and which creatively and artistically handles the entire spectrum of the world of sound, the equal juxtaposition of noise, music and speech' (Breitsameter, 1999).
    '… a rare amalgam of different radio forms ranging across new music, acoustic art, environmental soundscapes, performance works, radiophonic features and documentaries' (Ravlich, 1998).
    'Acoustic Art is a melting pot of heterogeneous elements … a world of sounds and noises – from the real acoustic environment or artificially produced. And a world of speech, speech tending toward phonetic sound, inflection and music, the universality of tones … a symbiosis of these speech and noise worlds and their acoustic organisation by means of electronic technology' (Schöning, 1997).
2. Cage (1968); see also Hagen (1997).
3. Lander and Lexier (1990); Kahn and Whitehead (1992); Strauss and Mandl (1993); Augaitis and Lander (1994).
4. For example Schafer (1977) and Page (1984).

5. *Musicworks*: Radio-Phonics, 53 (1992); *Neue Zeitschrift für Musik*: Radiokunst, Heft 1 (1994); *Resonance*: Retuning Radio, **5**(2) (1997).
6. Akademie der Künste Berlin (1996).
7. http://thing.at/orfkunstradio
   http://thing.at/texte/
   http://thing.at/orfkunstradio/THEORIE
   http://tunix.is-bremen.de/~hagen/.
8. See Simon Waters's contribution to the current volume (Chapter 3).
9. The first sound bridge in the history of radio (Fontana, 1994).
10. As established in the eighteenth century (see Gotthold Ephraim Lessing, *Laokoon*, 1766) and dominating the modernist discourse ever since.
11. For instance Kubisch (1995) (CD).
12. See for instance Haino (1993) (CD).
13. For instance the Tape Bow Violin (1976) and the Viophonograph (1975), both together with Bob Bielecki.
14. For example Günter (1999) (CD).
15. Annual Festival of Experimental Music, LMC London, programme notes, 1996.
16. See Glandien, Lutz (1994) (CD).
17. Robert Normandeau, 'Cinema for the Ear', conference script (unpublished).
18. See Chris Cutler's contribution to the current volume (Chapter 4).
19. Multichannel sound diffusion system conceived by François Bayle in 1974.
20. New surround sound standards for cinema diffusion.
21. Interview with Helen Thorington, July 1998 (unpublished).
22. ORF Kunstradio, *Immersive Sound* (Bregenz, Austria, 1998).
23. By *ACR* at Radio France, *Radiophonic Workshop* at the BBC, *Studio Akustische Kunst* at WDR, Milan *Studio di Fonologia Musicale* at RAI.
24. 1960s in Europe; most famously Radio Caroline went on air off the English coast in 1983. See Strauss 1993 pp. 123–8.
25. Eco (1994). Listen also to KPFA, Caifornia and Alternative Radio, Boulder, Colorado.
26. See Guattari (1993) pp. 85–9 and Eco (1994) pp. 167–76.
27. Interview with Helen Thorington, July 1998 (unpublished).
28. Tellus: http://harvestworkss.org/tellus/.
29. See *Hearing is Believing* (1995) (CD).
30. Run by the London Musicians' Collective. See: *Resonance* (Magazine and CD) (1997) and (CD) (1998).
31. http://turbulence.org.
32. Interview with Helen Thorrington, July 1998 (unpublished).
33. See Glandien, Kersten (1997).
34. Particularly since the technology of sound art production and radio transmission are for most listeners incomprehensible which makes most of us sound-illiterate. See Flusser (1998) p. 76.
35. See Kittler (1993).
36. Sodomka/Breindl/Math/x-space, *State of Transition* (1994). The first project which incorporated the Internet as a medium of communication into the structure of a live-radio performance.

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