New sounds, old technology

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Contrary to the hi-tech reputation of pop, the most innovative pop musicians often use traditional, old-fashioned equipment, ignoring the latest technological developments. Musical innovation tends to precede technological innovation rather than the other way round. This article presents a birds eye view of pop experimentalism, grouping a number of influential or otherwise interesting examples into four main categories based on the type of equipment that is subject to experimentation: (i) abusing musical instruments, (ii) abusing amplification, (iii) abusing effects and mixing equipment, and (iv) 'pop *concrète*', or experiments involving tape montage techniques. The examples suggest that technological innovation may be relatively unimportant to the most innovative and musically adventurous pop musicians. Rather, they appear to need to have established some kind of relationship with their equipment before they find radically new ways of using it. Pop experiments involve the critical use of well-established typical pop machinery. This places them in an old tradition of artistic innovation.

1. INTRODUCTION

Pop music[1] has a reputation for following new technological developments. This is no surprise, as recording technology has been essential for the development of the genre. Since the very beginning, i.e. since the recording industry became a mass industry, pop music and music technology have continuously been feeding off each other. New electric and electronic instruments are usually made and marketed for use in the pop industry. As most pop music that is heard through radio channels confirms, pop evolution seems to follow technological innovation closely. New instruments define the sounds of genres current at a particular moment. Most 'progressive rock' in the 1970s was mainly progressive because it made use of the latest state-of-the-art instruments and the biggest light shows, whereas musically, by referring to clichéd forms and sounds of classical music and blues, it was, as John Street writes, 'regressive' (Street 1986: 191). Because new technology was used in traditional ways, it added nothing new musically. Similarly, the quick succession of newly marketed drum machines in the 1980s, including the popular Roland TR-808 and the Linn drum machine, defined the drum sounds for genres such as new wave, electronic body music and acid house, but the actual sounds and drum patterns remained very similar to those developed in the 1950s and 1960s. New equipment adds only new, relatively subtle variations. Indeed, in terms of its composition methods and forms, pop music is often regarded as conservative, its ties with the latest technological developments notwithstanding. In Thomas Holme's words: 'What is interesting is that rock music is more dependent on the novelty of sound for its popularity than it is on compositional innovation.' (Holmes 1985: 156) Pop musicologist Allan Moore observes that innovation in pop music is the result of two 'alternating tendencies': musical and lyrical simplification and technological sophistication (Moore 1993: 105).

However, this gives us a limited picture of innovation in pop music. Radically innovative forms do exist, but these are exactly the opposite of progressive rock in that old, well-established technology is used in new ways. Musical innovation, in the pop world as much as in any other, relies upon the active and critical search for new production methods and composition techniques. The simple use of the latest type of sampler in an otherwise conventional production process at best results in a novelty effect; an effect that wears off quickly instead of pointing to fruitful new musical directions. It is through exploring new ways of using their equipment that pop musicians discover such directions. The Beatles' *Sgt. Pepper's Lonely Hearts Club Band* was recorded with a simple four-track recorder, yet it is generally considered as an innovative milestone in pop history. In contrast, Thomas Dolby's pioneering the Fairlight sampler in 1982 did not result in musical innovation (which says nothing about the *quality* of his music). Musically, using the Fairlight merely facilitated what could already be done with *musique concrète* techniques as early as the 1950s.

In short, instead of buying and trying every latest synthesizer, we find that experimentalist pop musicians

[1]The term 'pop music' is used here in the way that most people use it in daily conversation, as a general term that includes all genres normally headed under pop or rock, i.e. referring to all styles that have developed out of early rock 'n' roll and R&B, and/or the Tin Pan Alley show song tradition, since the 1950s. As Simon Reynolds points out, since the late 1970s the distinction between ('commercial') pop and ('progressive') rock is no longer valid (Reynolds 1990: *passim*). Even though the term 'rock' is still used to refer to styles with a certain instrumentation and attitude (see Frith 1981: 11), these styles are regarded as a part of the complex of genres that we call pop.

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often explore and abuse[2] their old equipment and instruments, sometimes discovering completely new working methods. The results of these explorations of typical pop equipment are often experimental by nature, sometimes hardly resembling what we are used to calling pop music. This music may not be the most commercially successful music generally, but in searching for new forms and styles, testing new ways of musical thinking and widening the range of expressive possibilities, it helps keeping pop music alive, diverse and unpredictable. Experimental pop music has aims and functions different from those of non-experimental forms. In using musical codes that are not well established yet, it usually lacks the mass-audience appeal and the recognisability that we expect from pop. As a result, experimental pop music is rarely heard or discussed in the mass media. Yet we often find that experimental techniques, albeit slowly, leak into the mainstream, so that experimental musicians are often more influential than they might seem.

In fact, this experimental attitude to one's material can be found in all art forms; it has always helped artists to actively contribute to developing and modernising their discipline. Through the ages, painters have experimented with paint (trying new pigments or oils, for instance) and with concepts such as perspective and light. From Cervantes to Paul Auster, novelists have abused (experimented with) their medium, language, in order to find new ways of telling stories. Such experiments are both scientific and playful, both serious and fun. A combination of experience and curiosity is necessary. What is subject to experimentation is that which is normally taken for granted. Even though new materials and products are constantly developed for artists, generally they are made in response to the artists' ideas instead of the other way round.

Below I shall discuss several categories of pop experimentation that have resulted in new forms, sounds and working methods. Some experiments have ended up in mainstream pop genres later, whereas others may never be accepted. The categories are based upon the type of equipment used for (and subject to) experimentation. It must be noted that the categories are not absolute; they overlap and each may be expanded or split into subcategories. Neither is this discussion a complete overview. These categories are only created here in order to facilitate discussing a wide range of experiments in the limited space available, thereby providing a general idea of the many possibilities of a genre that is too often judged musically conservative.

2. ABUSING MUSICAL INSTRUMENTS

Perhaps the most obvious category of using conventional equipment in new ways is that of abusing one's musical instrument. As both dilettantism and a youthful, aggressive kind of rebellion have always played an important role in pop music, at least since early rock 'n' roll, it is not surprising that the earliest forms of experimental pop fell into this category. What starts as rebellion or as a lack of dexterity may turn into innovation. As early as the 1950s we find new ways of strumming guitars, invented by blues musicians such as John Lee Hooker, who used only his left hand thumb to stop the strings. In the mid-1960s the destruction of electric guitars caused Pete Townshend and Jimi Hendrix to produce interesting new musical and ritual effects. Noise was gradually being accepted by rock musicians as a musical element that can be controlled; it was carried to new extremes some fifteen years later, as will be discussed in section 3.

But in the end the strategic possibilities of aggressive instrument abuse are quickly exhausted. Subtler methods of playing pop instruments in unusual ways result in a greater variety of new musical avenues. Some pop experimentalists, for instance, have discovered the merits of producing textures of sound instead of melodies or chords. Charles Hayward speaks of 'areas of sound, or clusters of notes' when he describes the way his former This Heat colleague Gareth Williams used to play electric organ in the late 1970s (Hayward quoted in Jones 1995: 158).

A more recent example of a band searching to find new ways of producing sounds on traditional rock instruments is U.S. Maple. Their 'songs' are structured by contrasting textures and energies rather than verses and choruses. Even their singer, Al Johnson, sings in ways that were unheard of before him, and that may sound ridiculous at first, using mainly his throat muscles to articulate words and noises.

Two interesting sub-categories of instrument abuse are the use of household objects and the search for alternative triggering devices. The musical use of household objects such as pots and pans may be nearly as old as music itself. Pop music history too has seen many inventive amateurs discovering the musical possibilities of objects such as the washboard, the wooden chest and the bottleneck. Alternative sound sources are still being explored by pop musicians. Fred Frith uses anything from toothbrushes to walkmans to strum his electric guitar, while bands with experimental leanings such as The Ex and Sonic Youth exploit the creative possibilities of screwdrivers, aluminium lids and, for instance, the tried and tested method of playing guitar with another guitar. Both Einstürzende Neubauten from Germany and the British group, Test Department, started to make a new kind of percussive 'rock' music on scrap metal objects in the early 1980s. This fitted in with a tendency

[2]The verb 'to abuse' in this article refers to using objects in ways different from how the objects were intended to be used or how they are conventionally used. The slightly strong verb reflects the fact that artistic experimentation subverts or even destroys conventions, so that (in a playful way) it may be regarded as an aggressive deed.

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that was current at the time, namely that of so-called 'industrial' musicians to look for alternative sound sources (see Voorvelt 1998: 60). Einstürzende Neubauten also wrote a new chapter in the history of the musical instrument when they used only organic materials (including meat and bones) on their 1983 LP *Zeichnungen des Patienten O.T.*

Closely related to the use of household objects is the exploration of alternative triggering devices. Since the late 1960s, many sound artists have dedicated their time to the search for new ways of triggering electronic sounds, but rarely in a pop context. Around 1972 the German group Faust must have realised that anything could trigger the sounds stored in their synthesizers. Their live shows briefly became famous for their use of pinball machines instead of keyboards.

In the 1990s, interesting new technical possibilities were offered by the Internet, such as triggering instruments from a large distance through an Internet connection. However, this is an example of a technological innovation that has not yet resulted in musical innovation. Perhaps we have to wait a few years until musicians can find their way around the Internet as they can around guitars and keyboards.

3. ABUSING AMPLIFICATION

One of the defining elements of pop music is the use of electric amplification both in a production and consumption context. Abusing amplification may result in extreme loudness, sound distortion and/or feedback effects, all of which have been added to the rock repertoire as musical elements since 1965. In this, not only Pete Townshend and Jimi Hendrix, but also the Velvet Underground have played an important part. Composition with these elements has later been both refined and taken to further extremes by what is known as industrial music (notably Throbbing Gristle, Non and Einstürzende Neubauten) and noise rock (both bands and composers mainly from the USA, e.g. Swans, Naux and Glenn Branca). Lou Reed's early feedback experiment, *Metal Machine Music* from 1975 may not have been taken seriously at the time, even causing a break with his record company RCA, but comparing it with Nurse With Wound's 1979 industrial classic, *Chance Meeting on a Dissection Table of a Sewing Machine and an Umbrella* and some of the more experimental work of The Aphex Twins or Autechre in the 1990s, suggests that Reed's record has been influential, albeit in a slow and obscure way.

Reinventing one's amplification equipment in its purest form may be heard on 'Ampnoise', a track recorded by Bruce Gilbert and Graham Lewis (members of the band Wire) on their 1980 LP *Dome*. This piece consists entirely of the normally unwanted sounds (noises and beeps) emitted by their amplifiers and effects. It may have been merely a joke, but in that case Gilbert and Lewis have managed to crack a joke that is musically and historically highly interesting. On the one hand, one hears a piece which subverts almost everything that is expected in pop music: one hears no normal instrumental or vocal sounds; it has no melody; it contains only four pitches which relate to each other microtonally; it has no pulse and no rhythmic element except for the pulsating noises from a bass amplifier and a chorus effect pedal; it has no perceivable song form; there is no reference to any extramusical concept (in lyric or title). On the other hand, 'Ampnoise' still has a clear pop element: its *raison d'être* is the pop recording studio, the noises have been produced by machines typical of pop music, and there are no signs of elaborate composition methods (formally it appears quasi-improvised and the sounds are very much left to their own devices). Pop conventions were abandoned in order to create a pop music that is solely about its own material: studio machines. To put the skeletal sounds of the studio and the processes within and among the timbres to the foreground, the listener's attention had to be drawn away from anything else. By composing a piece with what is normally avoided and fought against in pop production, Gilbert and Lewis may be said to have uncovered the soul of the pop studio. 'Ampnoise' does not sound like pop music, but is essentially pop in the way it is recorded and in the traditional equipment used. Perhaps it should be regarded more as a meta-pop music, music *about* pop production.[3]

4. ABUSING EFFECTS AND MIXING EQUIPMENT

Sound effects (reverberation, chorusing, flanging, phasing, delay-effects, compressors, expanders, etc.) have become indispensable for most pop musicians and producers. They are traditionally used to make recordings smoother and add an appropriate atmosphere. During the 1950s and 1960s, producers learned to use effects more extensively for spatial suggestions, editing, and the odd novelty joke. However, some daring studio experimenters went much further. They included George Martin (a classically trained musician and producer whose work with the Beatles has been ground-breaking) and Brian Wilson of the Beach Boys. Their abuse of studio equipment consisted mainly of stretching the overdubbing possibilities of the four-track recorder and drawing alien sounds and instruments into the pop territory. A project called the White Noise (led by a 'David Vorhaus B.Sc., Dip.Elec.') pioneered the extensive (and imaginative) use of Moog synthesizers and electronic effects in a pop context. But arguably the boldest step was taken in the early 1970s when Jamaican musicians such as King Tubby, Augustus Pablo and Lee Perry began to develop the set of studio techniques known as dub. Dub evolved

[3]A detailed analysis of 'Ampnoise' can be found in Voorvelt (1998: 115–20).

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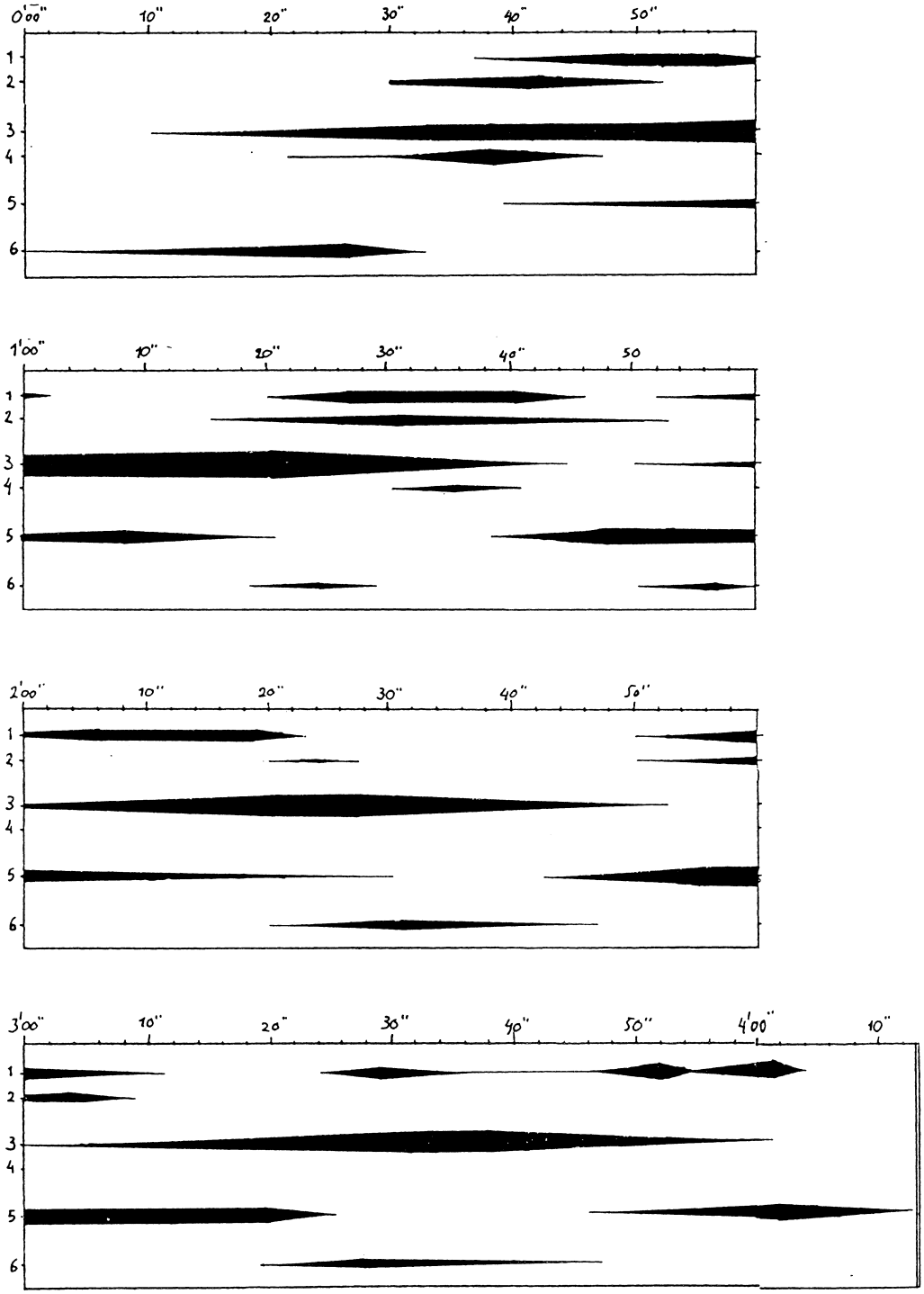


Figure 1. Graphic representation of the six best audible sounds of 'Ampnoise' fading in and out. The width of each line represents the sound's relative loudness. The sounds that can be clearly distinguished are as follows, numbered 1 to 6 according to pitch (sound 1 having the highest pitch): 1, a sinusoidal tone (b flat); 2, a nasal beep (sharper than g); 3, a high-register noise with fast amplitude fluctuation; 4, a mid-register noise with moderately fast amplitude fluctuation; 5, an undulating low sound accompanied by pink noise (most clearly perceivable pitch: flatter than f sharp); and 6, a low buzz (most clearly perceivable pitch: b).

out of the practice of making 'dubplates' – remixes of existing dance recordings. The way different tracks were remixed in terms of balance and effects became increasingly extreme. The resulting extreme contrasts and sound effects are often perceived as psychedelic or mesmerising. Dub techniques quickly leaked into other styles between 1978 and 1984, being picked up by British musicians such as Public Image Ltd and Adrian Sherwood. Musical balance could no longer be taken for granted now that all kinds of artificial spaces could be

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created. These dub techniques have also been immensely important for dance styles that evolved in the latter half of the 1980s, such as acid house and ambient. In contrast, the development of larger mixing desks and improved digital effects has had little musical effect. In essence, recording equipment is still the same as in the 1970s (only in expanded and perfected form), but different techniques have been added thanks to experimenting pioneers. The same can be said of record players, old machines that were assigned a new function when they were first used as a musical instrument by New York hip-hop DJs such as Grandmaster Flash in the late 1970s. 'Scratching' quickly became an established technique and by the 1990s virtuoso turntable players were ubiquitous.

The mixing desk has also found a new function. Structural mixing on stage (as opposed to traditional live mixing, i.e. guarding the balance and sound quality) is now a normal part of dance and trance music. Popular groups such as Underworld and The Orb re-compose their music afresh on stage using mixing equipment, loosely basing their technique upon that of the first Chicago house DJs. In short, the technique consists of fading layers of sound in and out whilst keeping the pulse constant, and manipulating these layers with filters and other effects. In a different way, such techniques were already used in the 1970s by experimentalists such as Faust, Can, Kraftwerk and Brian Eno. Extreme use of traditional analogue effects pedals has also taken the stage, through experiments by people as diverse as Jimi Hendrix (again), Robert Wyatt, Anne Gillis, Current 93 and Fred Frith.

5. 'POP *CONCRÈTE*'

'Pop *concrète*' is a non-existent term, chosen here to describe pop music that makes extensive use of techniques borrowed from *musique concrète*. These techniques, centring around tape montage, have found their way into pop since 1966, especially via the work of The Beatles, The Mothers of Invention and the Grateful Dead. The odd early experiment like John Lennon's 1968 piece, 'Revolution 9' (from *The Beatles*) aside, the use of these techniques consisted mainly of decorating an existing song with tape sounds. But soon pop musicians found out that cutting and splicing tape could be applied in more structural ways. New forms of pop music evolved that were structurally dependent upon tape operations. Two influential early bands who ventured into this territory were Faust from Germany and The Residents from San Francisco. Faust's 'Why Don't You Eat Carrots' on their self-titled debut LP (from 1971) inaugurated a completely new kind of pop music taking the form of a collage of fragments recorded by the band, electronic and feedback noises and other recordings. The structure is complex, but still easy to follow, unlike that of The Residents' debut LP, *Meet the Residents*, which might come across as a deliberate attempt to alienate or bore the listener.

A later, more refined example of the construction of new types of song forms by means of tape techniques is 'First Things First' by Art Bears (from their 1979 album *Winter Songs*). Only two and a half minutes long, the song demonstrates that through tape experiments a song form may take on meanings. In short, the lyric (based on a medieval relief in Amiens cathedral) about the two halves of a dead tree straining in opposite directions, is illustrated and given more universal, philosophical implications by the music. The song form is as symmetrical as the dead tree image, except that through tape manipulations of the main melody the symmetry is distorted: a contrast is created between *separation* and *unity* of forward and backward versions of the main melody (i.e. between those versions heard consecutively and simultaneously). The result is a *not quite symmetrical* form of contrasting episodes. This form not only highlights contrasts between separation and unity, but also between liveliness and death and between movement and stagnation. In combination with other 'separation' manipulations, of pitch and rhythm for instance, this structure comments upon the symbolic implications of the dead tree and the possibility of its bringing forth new life on several levels.[4]

Perhaps the most radical of song form constructors are the American group Biota (formerly the Mnemonists). They have developed and formalised their own unique method of composition through recording (see Sharp 1986: 30–2). Basically, this method consists of recording the musicians improvising in several combinations, after which material is selected by means of a democratic process (in which the group attempts to avoid compromises), based on a concept that was discussed beforehand. Mixing and editing of the tape fragments is done in several stages. The results are rather complex, labyrinthine structures that consist of many layers of music providing continually changing perspectives.

Tape techniques have not only been used to construct new types of song form, but also to dissolve song form. The secret weapon is the tape loop. Not that dissolving the song form is impossible without the tape loop, as songs were already beginning to lose their clear sectional form through being based on riffs (short melodic and rhythmic motifs repeated over and over again). But building songs on tape loops, as Cabaret Voltaire and This Heat started to do in the mid-1970s, took the idea a step further. One advantage was that any sound could be used as the basis, and another was that loops provide repetition, pulse and rhythm. So a song could be based upon any sound, including spoken fragments or machine sounds, while at the same time remaining danceable and easy to follow. Pop music could now be made out of

[4]A detailed analysis of 'First Things First' can be found in Voorvelt (1998: 99–108).

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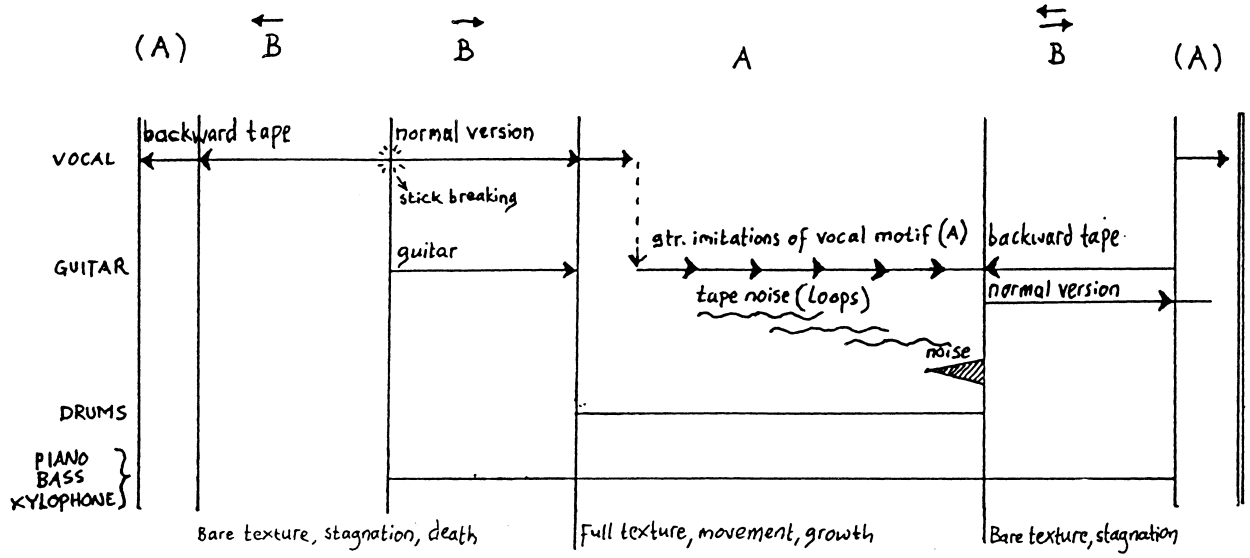


Figure 2. Form and instrumentation of 'First Things First'. Arrows indicate the 'direction' (forward or backward) of the main melody.

any combination of sounds without losing too much of its accessible nature. Dance music and *musique concrète* merged in Cabaret Voltaire's music. They were one of the most successful exponents of the post-punk wave of experimental pop that came out of Britain between 1977 and 1983, and their influence, as well as that of Kraftwerk and Tangerine Dream (who based their music on synthesizer riffs), is audible in dance music of the 1990s. In most dance styles, song form has largely disappeared. Loops (digital loops mostly, but these are still essentially the same as tape loops) and the way they are mixed and combined with other sounds, melodies and drum breaks, characterise end-of-the-century dance music. Verses and choruses are no longer essential, even in mainstream pop music. Even though modern acts such as Underworld or the Orb use computers, samples and digital effects, in essence they inherit their methods from early experimentalists with their primitive analogue equipment. Generally, musical innovation came first, whereas technological innovation only made the process easier. However, in the meantime the sampler has also inspired new types of experimentation in the work of John Oswald, John Wall and Negativland. Their methods involve the use of existing material, including other musicians' music, in order to create new pieces. These methods have proven to be controversial to a high degree, redefining originality and necessitating fierce discussions about copyright law, as explained in Chris Cutler's extensive article on what John Oswald has coined 'plunderphonics' (Cutler 1995).

6. A FINAL WORD ON ABUSE AND INSPIRATION

Brian Eno is one of the few famous pop experimentalists, both sniggered at for his intellectualism and admired for his musical innovations. He invented ambient music and contributed much to the development of mainstream pop production through his work with David Bowie, Talking Heads and U2. Ever since his role in Roxy Music he has had the reputation of an intellectual hi-tech wizard. To put it simply, Eno = synthesizers. But in fact his approach to technology has always been 'low-tech' (see Eno and Mills 1986: 97). He built his studio as if it were a large musical instrument, mainly by rewiring the old equipment he assembled during the 1970s. He does buy new machines occasionally, but according to Eno only old and well-used equipment can really come to life and inspire new ideas, for instance, through faults that develop:

> I never get my instruments serviced, so they start to become a little bit more idiosyncratic, and I also use a lot of auxiliary equipment, which I also don't get serviced. Now this sounds flippant, this not getting things serviced. I actually do get things serviced sometimes, but a lot of the faults that develop are rather interesting, so I leave those alone. (Brian Eno quoted in Tamm 1995: 69)

Unlike keyboard soloists such as Vangelis, Jean-Michel Jarre or Rick Wakeman, who tend to surround themselves with large numbers of state-of-the-art synthesizers only to create mostly conventional music with electronic sounds, Eno deliberately limits his material and is inspired by the way a machine (and his relationship with it) may develop. He savours unpredictability. In contrast to the hi-tech fetishism that characterises so much pop music, such a low-tech approach to twentieth-century technology is found again and again in the most innovative forms. In all categories discussed above, the equipment used is well established. Whether they use old synthesizers, tape recorders, guitars, delay effects or metal lids, musicians keep finding new strategies for creating

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music with the material they know so well, thereby criticising what is taken for granted in pop.

Technological innovation may well be overrated in pop music. The newest instruments seem to mean little when it comes to musical innovation; it is the musicians that count, their creative solutions, and the relationships they build with their equipment. Newly marketed machines generally serve to facilitate what musicians already do, not to provide new composition methods. These are discovered later, when the already ageing machine is ready for abuse.

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