Wolfgang Hagen

"beyONd RADIO" - A medium between war and digitalisation[1]

Radio is to be discussed here in an environment in which I suspect the medium to be not totally unknown. 80% of an average population of an average western European country listens to radio sametime during the day and statistically consume this most widely used medium on the average of over three hours a day. I would like to talk for much less time than that about radio without at the moment being on the radio and yet; precisely this probably misses the point. To talk about radio without being on the radio is like trying to smile while wearing a rigid mask. This should not be considered an excuse for all the speculations and sketchy insinuations which await you in the following. But at the very beginning I would like to point out to you the strange effect of mistaken identity, embarrassment, excuse and even guilt that always adheres to radio, much as if I were to have a radio jingling along next to me now during my talk, which I actually should do. And only refrain from doing because you are ill-prepared or such a pitiful Flux experiment.

"For the intensely literate population, however", says Marshall McLuhan, "radio engendered a profound unlocalizable sense of guilt that sometimes expressed itself in the fellow traveller attitude. A newly found human involvement bred anxiety and insecurity and unpredictability."[2] Guilt, fear and uncertainty. More sober contemporaries like Bert Brecht have also formulated quite similarly: "I immediately had the terrible impression about radio", he says in his text on radio theory, "that it is an unimaginably old contraption, that was long ago forgotten during the turbulences of the great flood."[3] Regarded philologically, this sentence is an excellent example of the effects of the traces military technologies left in the media. The First World War as a great flood which washed away all memory of from where this medium came. Namely, from the First World War. [4]

Johannes R. Becher:

"Sit down. Before you stands a trumpet speaker.

Just a dial. If you turn it without hesitation,

A poet from a distant city to you will speak,

Words that you otherwise never understand.

Turn the dial! Who will answer?

Whom will you reach with your magic call?

---

[1] Lecture ORF-Funkhaus, Wien and ORF-Funkhaus Innsbruck, published online in Transit, 1993.

[2] Marshall McLuhan, Understanding Media, Toronto and London 1964, p. 321

[3] Berthold Brecht, Radiolheorie, in: Gesammelte Werke, Bd. 18, Frankfurt 1967, p. 11

[4] Does guilt and its subconscious effect enter radio because radio as we know it, entertainment broadcasting, was everywhere, in Austria as in America, in England as in Germany, nothing more thon a clever recycling of abandoned military equipment? "A frivolous use of a national service", as English military officers initially said, (quoted from: Victor Egert, loc. cit., p. 23) to which the honour of the fallen heroes is still bound?

Will it be the dead heroes that send an answer?
The chirping of birds in an interval.

Turn it again and the voice dwindles,
And jubilation fills the ether.
He who feels no wonder now,
Hears not his OWN heart rejoice therein.

And you hear a man's voice near,
And he stands in the middle of your room:
Lenin speaks, the man who came and saw,
And the peoples followed in his path.

Yes in winter the nights are long,
Our log cabin lies far from the city.
Sometimes a noise still resounds from the walls,
After sleep has long since embraced us

Turn the dial! Who will tomorrow answer?
Will the dead heroes send a reply?"[5]

Franz Werfel: "The unlimited moral value of radio broadcasting consists of its ability to elevate the great majority of dull people from base bodily interests to more differentiated spiritual experiences."[6]

Karl Kraus answers laconically in his two-liner:
"Great salvation has reached the world around us:
The caretaker is now connected to the cosmos."[7]

---

[5] Quoted from Irmela Schneider (Hrg), Radio-kultur in der Weimarer Republik - Eine Dokumentation, Tübingen 1984, p. 58 ff.
The dead talk to us from the radio. It was thus whispered and rhymed from the radio, in 1925, certainly exaggerated, but as we can see today with a rather obvious truth. Wilhelm Hoffmann, a Heidegger scholar and radio director of the early audio pieces by Elisabeth Langgässer, laconieally formulated it thus at the end of the 20s: "A primary radio theme is death". (Wilhelm Hoffman, Vom Wesen des Funkspiels, in: Gerhard Hay (Hrg), Literatur und Rundfunk, Hildesheim 1975, p. 37) We find this involvement with death in the radio a last time in the "seminaires" written in the 50's by the French psychoanalyst Jacques Lacan; he turns over the lethal metaphors that come in, on, or out of the radio, once more, a final time, so to say, on its own axis. It is not we who hear more in radio than we hear, no - in radio we talk to the dead: "A radio essay is really held in a very special form of speech, as much as it is directed by an invisible speaker at an invisible mass of listeners. One can say that in the fantasy of the speaker, it is not necessarily directed at those who listen to it, but also at everyone, at the living as weil a .. at the dead." (Jacques Lacan, Freuds technische Schriften, alten 1978, p. 44)
I am saying and quoting all these things to you not because I believe that such theses will be immediately apparent to you. How should it be, in light of such an oppressively harmless frivolity as offered by our daily light programmes, that we talk of guilt or death? But as lacking in pathos, as naive and regressive today's light programming bounces along on Ö3 or Radio Bremen Vier, it should be seen that in its beginnings, the medium was understood or misunderstood to be full of pathos, cosmogenics and phantasmagorio, and it is to be explained why,for example in the 20's, almost all literati and intellectuals were captivated by this medial cosmology, and it is to be seen where the further development of radio will lead us.

[6] Viktor Egert, 50 fahre Rundfunk in Österreich, Bd.1, Wien 1974, p. 12

[7] ibid., p. 12

The pitfalls of the new medium, its scary origination out of nothingness, its undirected omnipresenee and universality foree the writers of the twenties into using earthquake-like metaphors, apoealyptic images and always toward nationalistie pride.

Once again Karl Kraus:

"Has human thought so stirred up nature
That from everything that gives off sound
She is forced to pour into mankind's deaf ear?
Which faculty measure in all-consuming pleasure
As she hears music from all the spheres
But nothing from misfortune groaning there."[8]

In these early times, radio brings the world into the house much like television does today. It brings colonialistic ersatz gratification into the horne, the polar seas as well as the Bedouins in the desert, the Negroes from Harlem, and the poor natives from the South Sea Islands. And for all that still reflects on itself like an unresolved urge that is pushed by vague powers.

The Cloak of Invisibility

If what Marshall McLuhan says is true, i.e. that each medium is covered by a cloak of invisibility to hide what it is actually used for, then this cloak does not sit well at least during the first phase of the medium in the years between the world wars from 1923 to 1939.[9] It is only too apparent that radio derives from the war.

Navy Captain Frank Conrad in Pittsburgh USA, Lieutenant Idzerda in the Netherlands, the undercover marine specialist Hans von Bredow in Germany or Oskar Czeija in the Austrian Marconi Society, - all these founding fathers of radio were either directly or indirectly involved with radio as a tool of war. In Austria it was the intact and undamaged equipment of the broadcasting tower on the Ruckerlberg near Graz which Captain Scheyerling wanted to place in the secret service- and Marconi Society-trained hands of Oskar Czeija; in Königswusterhausen, it was nothing other than Germany's central military broadcasting complex which Hans von Bredow wanted to - and did - continue to operate.

But first of all, all the old military commanders had to be convinced with great difficulty - Bredow (Urania speech) didn't have it any easier than his English or French colleagues.

---

[8] Irmelia Schneider, loc. cit., p. 37

[9] "Radio is provided with its cloak of invisibility, like any other medium. It comes to us ostensibly with person to person directness that is private and intimate, while in more urgent fact, it is really a subliminal echo chamber of magical power to touch remote and forgotten chords. All technological extensions of ourselves must be numb and subliminal, else we could not endure the leverage exerted upon us by such extension. Even more than the telephone or telegraph, radio is that extension of the central nervous system that is matched only by human speech itself." Marshall McLuhan, Understanding Media, Toronto arul London 1964, p. 322

[10] How could one convince the old military boneheads that light entertainment should now be broadcast on the communication waves previously so important in the war? The boneheads had sound reasons.

During the entire 19th century, both military and civil telegraphy was written, that is, typed by the fingers of the hand, and read from ticker tape. With telegraphy a process begins which will in the end completely undermine the world of print initiated by Gutenberg. This process moves via the simple code of Samuel F. B. Morse, who as a painter of historical scenes, had connected his code ticker to the easel in his atelier in 1837 - from where the process continues to the 1874 Remington & Sons typewriter, the hammers of which printed the 26 letter type faces onto a movable paper-carrying cylinder (a revolution in writing), and leads further to Alan Turing's universally "discrete machine" of 1937 which can record every alphabet and every imaginable algorithm on the virtual paper tape of the theoretical Turing Machine, thereby describing nothing less than the architecture of our present computer. This is one line of development: describing the evolution of telegraphy into the universal medium "computer".

Another line, from the creation of telegraphy to the electronic mass media starts in the first year of this century with the processing by bodily human ears of the ethereal signal-codes. This was Marconi's invention: the trained human being as a wireless telegraphy receiver. When the imperial army ordered the construction of the sounding spark gap transmitters in Nauen and Norddeich by Telefunken and its chief engineer Dr. Hans von Bredow starting in 1905, they caused deafening noise for kilometres throughout the countryside so that a human organ, the telegraph operator's ear, becomes an important instrument of war, and later wireless communication symbolizes the essence of timeless human conflict, as Bredow was then to remark.

The eminent importance in World War 1 of radio-telegraphy and the correspondingly trained ears is widely appreciated. Not only would the English sea blockade not have worked from the very beginning without radiotelegraphy, not only would Marconi's "All Red Cable" make England into the dominant world maritime communication power, but also on the Western Front, after the battles of Verdun and on the Somme had taken 1.7 million lives in 1916 alone, the importance of radio-telegraphy was to become the turning point of the final war years. New mechanised methods of attack with the first tanks and armoured vehicles were attempted, and co-ordinated with infantry and air support,

---

[10] "The hour of birth of broadcasting in England - to be precise, it was actually only half an hour - is considered to be the 30 minutes from 19:30 to 20:00 on the 14th of February, 1922, the "first broadcast"from the Marconi transmitter in Writtle. Dne wonders why it didn't last an hour. The reason sums absurd from today's point of view: after the responsible authorities found that such entertainment broadcasts didn't have any purpose and got in the way of serious reports, "broadcasting" (in the sense of today's radio) was pnncipally banned .... At this time France - similarly impeded by second thoughts and regulations - had already sent the first regular transmissions from the Eiffel tower into the ether for about three months. At first they were exclusively record programmes and regular weather and business reports. They were transmitted by the state post and telegraph authority."
Viktor Egert, loc. cit., p. 23/; also see: Derek Parker, Radio - The Great Years, New Abbot, London, Vancouver 1977, p. 30ff.; and the comparative presentation in: Pierre Miquel, Histoire de La radio et de la television, Paris 1972, p. 60ff.

required totally new skills from the communication troops who up to that point had simply relied on messengers and long telephone lines to provide land based reconnaissance for the artillery. In short: on all fronts of the war, the number of communication and telegraphy troops multiplied toward the end of the war.[11] An army of well over 100,000 well trained communications technicians was discharged after the First World War, - this was the foundation of the entertainment broadcasting which was to follow.

At the end of the First World War, which historically already carried the seeds for the beginning of the Second, the paradigm of war in the 20th Century changed. While up until Verdun, positional battles of mass armies and the direct confrontation of masses against masses were the norm, thereafter and up to the present day it is he that decides the fate of a war who destroys or conquers the enemy command structures: the infrastructure, the logistics, the communication lines.

At the start of the First World War the transmission of human concepts or orders had almost no role to play: "And I urgently bade Engineer Schloemilch to abstain from such unpromising experiments, since Telefunken has more important things to do than to play with telephones", declared Engineer-Officer Graf Arco for example even in 1914, as such experiments were carried out on the wavelengths of the new spark gap transmitter of Norddeich Radio.[12]

It was therefare even more important that Officer - Engineers like Schloemilch didn't neglect the human voice on the path to optimizing the human ear as a covert communication technology weapon after the war. Because this was founded precisely on the spark gap transmissions and in the manufacture of amplifiers and transmitters as one can read in von Bredow's memoirs.[13]

Whether or not low and high frequency amplifiers hooked up in series can really produce stable wave pallerns can best be shown by transmissions of the human voice and piano music. And it is therefore no surprise that it was an Inventor - Engineer and ex-NAVY Officer in America who in 1919, a year after the war, started transmitting again with stolen equipment and piano rags on Victorola records.[14]

---

[11] ... , - so also in imperial Germany. As of 1916, the "Telegraphentruppe" (telegraph corps) was renamed "Nachrichtentruppe" (information corps), ... increased to eight times its original personnel strength, and recognized as an independent military arm. (...) The "Hauptfunkstelle Königswusterhausen" (main transmission base Königswusterhausen) transmitted the daily military report; as of 1917, it broadcast wireless music programmes and readings from newspapers and books. Peter Dahl, Radio - Sozialgeschichte des Rundfunks für Sender und Empfänger, Reinbek 1983, p. 13

[12] quoted from: Otto Nairz, Aus vergangenen Tagen, in: 25 lahren Telefunken, Berlin 1928, p. 252

[13] Hans Bredow, Aus meinem Archiv, Heidelberg 1950, p. 1

[14] In order to test the - now also technically amplified - multiple reiterative Poulsen-Lorenz transmitters in Königswusterhausen, comparable testing was done, naturally with Live piano music with Engineer Gerlach on the violin. His colleague, Dr. Conrad in Pittsburgh, in contrast to Gerlach, already had his transmissions legalized in 1919.

The NAVY, responsible for all broadcasting, allotted him a calling code as if he were a ship: "KDKA 360". This was the first public American radio station.[15] Even today, U.S.American broadcasting stations are still designated by this old NAVY code. Surrounded by Terra Firma, radio broadcasting started in America as the beached Noah's Ark of the war.

The First World War starts on all fronts, in Germany and Austria as in Belgium and England with the thundering of spark gap transmitters, where Morse code signals and limited radio waves are one and the same; it ends with the quiet humming of adjustable vacuum tubes where the base carrying frequency and the Morse code signals are separated into high frequency and low frequency wave patterns. All the following wars, including those after the Second World War, are to be dominated by technologies which penetrate ever further into the electro-magnetic freguency spectrum, and this in ascending order. World War I operated in very long and long, toward the end however, also with medium and short wave bands. It is on these freguency bands that entertainment broadcasting will launch its great era world-wide.

World War II was opened by ultra short wave guided tank formations in Poland and France; by radio waves in the one metre range. This war will end, however, over the beaches of northern Germany and France in the high freguency battles between the English bomber sguadrons and German night fighters and coastal radar in the decimetre band range. The loss of the U-boat fleet and the destruction of the Reich from the air can no longer be deterred because the Nazis, blinded by ideological omnipotence, are too late in allowing research in the centimetre band, and thereby fail to provide a mobile 360o horizon radar.[16]

After World War II, what with lunar landings, the Vietnam, Falkland, Grenada and Gulf Wars, the Gigahertz battles are fought via satellites. This freguency band, below the 1 mm barrier, is now also being commercially exploited. Astra, Kopernikus, TV/SAT1 are the catchwords, digital radio and high definition TV will become the electronic consumer goods and media dominating the masses by the end of this century. And the wars fought by the western industrial nations will continue to be decided on these frequencies.[17]

---

[15] Details in: Paul Schubert, The Electric World - The Rise Of Radio, in: Amo Press, New York 1971; Susan J. Douglas, Inventing American Broadcasting 1899-1922, in: The John Hopkins University Press, Baltimore & London 1987; Robert L. Hilliard, Michael C. Keith, The Broadcast Century - A Biography Of American Broadcasting, Boston, London 1992

[16] Compare: F. Reuter, Funkmeß, Die Entwicklung und der Einsalz des RADAR- Verfahrens in Deutschland bis Ende des II. Weltkriegs, Opladen 1971

[17] Or perhaps not decided, as the example of the massacre in Bosnia presently shows: " ... there are lots of mountains around Sarajevo. The artillery stationed there hardly comes into play, but rather morlar shells. These are usually transported in school buses and ambulances. When they are fired, they stand beside orphanages and hospitals. To attack these mortar positions from the air and not to hit the wrong targets is therefore difficult .... You shouldn't forget that bunkers have heen dug deep into the mountains or that the commanders are stationed in inaccessible valleys. They hid out there during the Second and even the Firsl World War."
General Lewis Mackenzie, former UN-Commander of Sarajervo. in: Stern, Hamburg 10/93, p. 212

What we call the electronic media are from their origins and primary use just advances in the conquest of the electro-magnetic spectrum. This conquest commences with a change in the concept of war in the middle of the First World War and its end is presently unforeseeable.

The axes of this development are not purely military and seem to appeal for the first time in this century in entertainment broadcasting: innocent public radio is allowed to thrive because it indirectly furthers military research by directly causing the expansion of the electronic communication media. This double axis is the natural pivot in the careers of Oskar Czeija and Hans von Bredow.

As a navy attache and informed of top secrets, Dr. Bredow, head engineer at Telefunken, designed and built the three most important communications transmitters of the war: Nauen, Nordcleich and Königswusterhausen. At the same time he co-ordinated with Graf Areo and others research and development at the Technical- Physical Institute of the Reich on the one hand, and at Telefunken, AEG, and Siemens on the other. After the end of the war the military commissions dried up and Bredow switched chairs from receiving commissions to organising them by shifting the axis of development to the German Reichspost.[18]

Oskar Czeija, the founder of Austrian broadcasting, received not only every imaginable support from the then secretary of state Carl Vaugoin, and not only were the first broadcasting studios situated on a floor of the defence ministry, but the newly founded RA VAG (Austrian Radio Broadcasting Company) received as a gift from the military its first spark gap transmitter, which transmitted all else but pleasant sounds.

Much like Hans von Bredow .in Germany, for the following 1 1/2 decades in Austria it was Czeija who involved industry (through the manufacture of receivers), the military intelligence community (development and testing of equipment), the postal and telegraph services (through high frequency telephone interconnections for the hook-up of transmitters), and finally politics (censure and propaganda) in a completely novel project, for which at that time there was no historical, political, or medial precedent. A first primordial military - industrial - media complex is conceived, and now for the first time: with this society-embracing project which brings the wonders of the world into the living room of each Austrian for a few Schillings, the cloak of invisibility begins to descend on the medium.

Of primary interest was to cover up a birth defect of the radio project which has never completely healed even to the present day. There was now a new medium, but for what? Brecht described it thus: "It was not a case of raw materials looking for methods of production to serve a public need, but rather of methods of production fearfully looking for raw materials. One suddenly had the means to say everything to everybody but if one really thought about it, one had nothing to say. (...) This was broadcasting in its first phase

---

[18] But the Reichsamt for telegraph technology had no money and the timid attempts to rent the former military important apparatus to the Wolfschen Telegraphenbureau or the local telephone service of the firm Eildienst Ges.rn.b.H. also failed because the state couldn't order the production of the receptive end; appropriate and inexpensive radios.
compare: Hans Bredow, loc. cit., p. 15

as a substitute. As a substitute for theatre, opera, of concerts, of lectures, of light music, of local news in the press, and so forth.[19]

Brecht wasn't giving away any secrets, but rather revealed what was common sense to the radio play producers of the day: "We have a technology, but we don't have any purpose for it", says for instance Ludwig Capella, a colleague of that director of the literary department of the Viennese RAVAG, by lhe name of Dr. Hans Nüchtern, who gave Austria the very first radio drama: "Der Ackermann und der Tod" (The Ploughman and Death) 1924, based on an early modern German dialogue dealing with death and despair.

Besides countless classical renditions, Mary Stuarts, Don Carloses, primitive Fausts and so on, the subjects of death and the cosmos dominate again and again among the few original productions in the early medium. But what am I saying is: even then serious literature was scarce, - pure entertainment reigned.

Woe be to him who sees

The Radio: A wide open window for the NORAG in Germany, for the RAVAG in Auslria. A private medium invisibly interconnecting some 10,000 people with detectors and earphones. "Woe be to him who sees" headlined Egon Kisch, a journalist on top of his times, from the editing room of 1925. He is fascinated in finding out who's hands are pulling the strings here. The man in the control room is the one. He is the only one who sees: "the Master of Ceremonies in a lab coat, the Conductor (in short sleeves), the Vienna Philharmonic Orchestra (with open collars), the (aged) youthful Diva; he sees that a bathtub with a shower ... can mimic first the oeean waves, then a waterfall, and then the rowing of oars on a boat, ... while a sudden burst of rain is substituted by the shaking of peas on a tambourine. (...) He sees disinterested faces in highly emotional scenes, ugly actors in beautiful parts, ... the excited people of old Genoa murmuring "Rhabarber", wearing modern street clothing, the conspiralors, sitting bored, whispering to each other the frightful sounding secret "sixty-seven, seventy-six", alas, he sees through the entire pretence, he sees, and that is misfortune enough, he sees where others can only hear". [20]

All pretence, says Kisch, seen from the standpoint of the technician. The technician sees only data flows in the radio of 1925; and as he brings them into motion and controls them, he is the least involved with the radio broadcast. He dispenses with any sense of illusion. But, armoured with headphones, he is the manipulator of the prevailing times. He even "hears faster than he would hear directly. If for instance, distant trumpet signals

---

[19] Berthold Brecht, Loc. cit., p. 128

[20] Egon Erwin Kisch, Weh dem, der sieht!, in: Funkköpfe, Berlin 1928, p. 47/

should sound during a radio play, they will be blown in the hallway outside and the man in the control room will, after hearing them on air via Königswusterhausen, hear them again half a second later live: from the corridor, via the natural route".

This short Kisch text written in 1925 poses the primary question confronting all following theories on radio broadcasting: from which point of view are we to describe radio dramas and the radio? From this side or that side of the sound proof wall? From where we see or from where we don't see anything? From where we speak or from where we hear ourselves speak?

This cut, this break, this dividing axis permeates radio and also permeates our voice in radio, which all of a sudden sounds completely different; it dissects the connection of our heads to our throats, the "eustachian tube", when we wear headphones and speak![21]

Everyone knows the shock when he hears himself speak with headphones for the first time. But "tertium non datur", either there is no original audio information in the radio that shouldn't be considered changed or influenced by the medium; or there is only original audio information which is original even while a more or less brilliant rendition.

The history of broadcasting theory documents these rather contrasting perspectives: there is the one theory which trusts in the simple representative effect of radio and is satisfied to transplant ordinary theatre pieces onto the radio stage with a few deletions and abbreviations; and there is the other, more original and much smaller tradition which evolves from the technique of the medium itself and earns the title of Radio Art or Audio Art. A dissected tradition right up to the present day.

An early exponent of this last mentioned tradition is the producer from Frankfurt and Berlin, Karl Flesch, who produced one of the very first German radio plays in October 1924 with his "Zauberei auf dem Sender" (Magic at the Broadcasting Station). But Karl Flesch, who thematizes the radio channel in everything that he does, remains, as we know, rather isolated in the Weimar Republic. Flesch's equally visionary and technically perspicacious understanding of radio tells him that broadcasting needs something that he didn't have at the time: a separate, independent medium of storage. Radio was '"live" during the first decades, a one way channel: But the listener, according to Flesch "demands the highest perfection from his equipment; if a real event is transmitted then it should be as close to live as possible; but if radio puts on something like music or a play, then the listener can derive an artistic impression only from perfect technical precision. And this can only be achieved if the preparations include the fixation of the work on a medium, be it disc, film, or Still's steel band. (...) Where essentially is the diiference

---

[21] ... and it also permeates the theories of radio as well as all mathematical communication theories since Shannon and Weaver's, which were of course formulated a short generation later. For the process of transmission, writes Claude Shannon in his standard text for all communication technicians, "it is characteristic that certain things are added to the signal which didn't originate at the source." Claude E. Shannonl/Warren Weaver, "The Mathematical Theory of Communicalion", Urbana 1964, p.7f.
Beside input and output, or better, between transmitter and receiver, information channels always have a third element: namely the noise of the channel itseif. Simply said, in communication channels such as radio, there is no signal transmission without noise transmission. And yet the noise transmission is the basis of the signal transmission, and indivisably coupled with it. My voice is altered in this coupling, occasionally to the point of being unrecognizable.

between a dead studio broadcast (dead because the orchestra plays without an audience anel the artist lacks a response) and an identical event, the same effect when between event and effect there is a shift in time? Only during a real event is simultaneity a pre-condition of participation. But what "event" takes place in the studio.?"[22]

The godfather of German and Austrian radio was Marconi's radio-telegraphy and not Edison's peaceful phonograph. Not until 1931 did the German broadcasting studios and the RAVAG obtain very heavy wax disc machines for recording, primarily for sports and politics, but not for radio plays.[23]

And even Selenophon, an Austrian audio film process, was only used by RAVAG for League of Nations broadcasts but not employed in its own studios. Why?

The first epoch of the medium is caught up in the context of military, and this means from 1903 on, communications transmitting technological strategies. Not the technology of electro-acoustical recording, but the technology of electro-acoustical transformation: microphones and loudspeakers, amplifiers, high frequency and low frequency transmitters and receivers, base emitters and grid modulators, rectifiers, amplitude modulation and frequency modulation are from 1923 on the important themes of Bredow, Czeija, the postal service, in industry and the military.

Whereas the Telegraphone of the Dane Valdemar Poulsen, already presented in 1900 during the world exhibition in Paris and copied in the AEG laboratories in the 20's (catchword Still's steel band) is leading a meagre existence. And this, as Flesch knew, could not be due to technical standards: since Poulsen's equipment had already stored 14 long hours of debate at the Copenhagen Technical Congress in 1908 on 2500 kilometres of wire. Besides, Poulsen was not just anybody; but the famous inventor of the spark gap transmitter from the year 1903, which as Bredow enthuses could produce undampened and therefore adjustable and stable amplitudes. Bredow also never tires of pointing out that it took only three years until such spark gap transmitters could be reproduced by the Lorenz AG in Berlin for use in telegraphy and the telephone system. Poulsen-Lorenz, that was the German head start. But as far as his revolutionary invention of the magnetized audio wire is concerned, it neither gets mentioned by Bredow nor is it in demand in the industry. Only 27 years later (what an eternity) do we find a patent registered by the AEG-Engineer Pfleumer, who suggests replacing the paper-coated wire with a magnetic film.[24]

In 1934 BASF produced the first 50 kilometres of plastic based magnetic tape and AEG built the famous K1, the first tape recorder. Frequency range 50 - 10.000 Hertz,

---

[22] Hans Flesch, Zukünftige Gestaltung des Rundfunkprogramms, in: Hans Bredow, loc. cit., p. 122 Everything and nothing, one is inclined to answer with Kisch, as long as the studio only represents one link in the chain of the one-dimensional flow of data from the Johannesgasse in Vienna to the Stubenring transmitter. Flesch wants to interrupt precisely this in order to manipulate from the very start the originul signal (the wrong notes of the singers. the bloopers and fluffs, the ugly static of the narrow medium wave band) on an independent data carrier befitting radio.

[23] The very effective "Triergon-Filmton-Verfahren" (Triergon film-sound syslem), ready for use since the middle of the 20's, is not implemented by the newly forming broadcast services.

[24] Bernhard Krieg, Praxis der digitalen Audiotechnik, Miinchen 1989, p.13

noise suppression 35 Decibels, tape speed 100 cm/sec. This was without doubt fine for medium band wavelength transmissions. But it was not put into use by the transmitting studios of the Reich for next seven years.

Even the radiologist Dr. Hans FIesch, head of the Masurenallee in Berlin, was not able to equip the "Haus des Rundfunks" with recording apparatus that was already mature in technical development, but in the historical development of the media, was ahead of its time.[25] Therefore let us not reproach Oskar Czeija in Vienna for the same inability.

A long interrupted line of artistic reflection of the media itself toward today's Art Radio leads from Flesch to Vienna and also to Klaus Schöning's experimental studio in Cologne. But the fact that there is no continuity between Heidi Grundmann, Schöning and Resch, no development, but a break of a good 40 years; that one can hardly find something in Flesch's manner after Walter Rutmann's "Weekend" of 1930, can't just be attributed to ideological grounds. The conservative press called the aforementioned: "Bolshevistic sabotage".

The radio of the 20's in Germany and Austria is a one dimensional medium carrying only primary data flows because they provide a dress rehearsal for military use. Flesch is already thrown out and chased away in 1931, while Oskar Czeija is well aware of the rules to the game: with his short wave transmission wagon, numerous mobile broadcasting systems and his Selenophon he is technically on top of the times, but his media-political alliances become clear as early as 1927, when Czeija places the RAVAG directly in the service of the police and security forces during the July uprising.[26]

Original news was unknown to RAVAG; until the Nazis took power in 1938, one could only hear the censored announcements of the official government news service, which were sometimes wired directly to the broadcasting studios.

In Austria there were very few forms of radio art until the end of the RAVAG. Czeija was interested in optimizing transmissions, in covering the homeland with a radio network, and not in radio as a production and therefore art form.

Thus a radio play is transmitted from a moving train in 1930 (Vienna - Salzburg), and a little later, a transmission attempt is made from the Danube steamer "Dürnstein" from the Wachau. Transmission experiments. Both in close co-operation with General Vaugoin who in the meantime had become head of the Austrian Railways.

If progress in the medium itself should be made on this basis, then it had to lead, as we are about to see, via an hopeless metaphysical detour, directly to fascism.

---

[25] This Hans Flesch was an influential and modern man who broaght Walter Benjamin into radio; who premiered Bert Brecht's "St. Joan of the Stockyards" in Berlin; who sponsored Kurt Weil, Paul Hindemith, and Ernst Krenek while he himself as part Jew was already a main target of the hate campaign of the rabid fascist press. He was also aware of the latest ideas in psychology via the Prinzhorn circle, otherwise his daring live report series by the title of "Verirrte Mikrophone" (Disoriented Microphones) 1926 in Frankfurt and 1929 in Paris would be inexplicable; Microphones were set up spontaneously and live throughout the city, Selfthematization of the channel.

[26] compare: Viktor Egert, loc. cit., p. 93

Radio Waves and the Spiritual Stream

Enthrilled and possessed: Fritz Walter Bischoff's "Hallo Welle Erdball" (Hello Global (Radio) Wave). The Doge of original radio plays in his time, a liberal man standing very close to Flesch, the founding director of the Südwestfunk Baden-Baden (Southwest German Radio) after the war, he too tended toward idealizing pathos: "The spoken word in radio, which demands our keenest attention, today has the mission of aspiring to absolute radio art. (...) We must use youth". Bischoff continues "for our purposes, if we are to attempt to hear the greatest depths of the energies of the cosmos, which have become tools of the human voice and soul in the form of radio broadcasting."[27] Cosmogenic radio art, a deceptive metaphor, as we will see.

In the meantime the case had already been clarified by 1930: after so many Shakespeares, Ibsens, Kleists, Schillers and Goethes, finally radio art, absolute or not, came in abundance: Ernst Johannsen's "Brigadevermittlung" in Munich, Fritz Walter Bischoff's "Song" in Breslau", Friedrich Wolf's "Sos ... rao ... rao .. .foyn ... Krassin rettet Italia" in Frankfurt, as well as Bert Brecht's "Der Flug des Lindberghs" (Lindbergh's Flight), Erich Kästner's "Leben in dieser Zeit" (Life In These Times), Arno Schirokauer's "Magnetopol", and finally even Günther Eich's "Leben und Sterben des Sängers Caruso" (Life and Death of the Singer Caruso), these were original radio plays in unprecedenled qualily and quantity. Fritz Walter Bischoff was of the same opinion: "It only remains to be said", we read "that the two aforementioned directions in radio play development in German broadcasting can be clearly distinguished since 1928. The one seeks to build up the radio play from the valid contents of its poetic - dramatic expression, developing and adapting it to radio. The words, the poetry, are only means to an end for the other direction, in developing an acoustic scenery which following from film, is completely new in tempo and rhythm."[28] No contradiction, as Bischoff found, but still reason enough to lean on the cinematographic, which the literary world of the time understood as the epic techniques of close-ups and inner montages of a D. W. Griffith. In olher words to mentally combine the close-up there with the idea of the acoustical here, whereby original works and adaptations were not to be seen as contradictory, - all this was already practically oriented theory and was begging to be written up.

The legendary radio theorist Richard Kolb writes in the fall of 1930: "Radio waves are like the stream of consciousness (current of thought) which floods through the world. Each of us is connected to it, everyone can open himself to it to receive the thoughts that move the world. The infinitely free stream of consciousness meets our small, closed circle of thought, fed and charged by energies, and through the fine antenna network of our nerves, sets it vibrating .... The invisible stream of consciousness that comes from the source of all and sets the world in motion, is itself set vibrating, directed and guided by

---

[27] Fritz Walter Bischoff; Das literarische Problem im Rundfunk, in: Hans Bredow, Loc. cit., p. 140

[28] ibid.

the Creative word, that was at the beginning, and carries within the will toward enlightenment of its Creator."[29]

I am quoting from that theoretical text on radio broadcasling which, since its inception, has been more often quoted than any other. Its author: a hardened Nazi, by no means unimportant - later, under Goebbels, broadcasting director in Berlin and Munich where he was responsible for the anti-Austrian hate campaign prior to 1938. It makes one suspicious when no importanl post-war radio broadcasting theorists, neither Heinz Schwitzke nor Eugen Kurt Fischer in 1963, who apologetically place Kolb into the limelight, neither Heißenbüttel nor Friedrich Knilli in the 70's mention these facts. Why, I ask, are such dubious and deleterious paths so persistent in radio broadcasting theory?

Richard Kolb's main thesis is the voice as a bodiless entity.[30] "In the middle", he writes, "stands at every moment the giant image of man, so overwhelming that it fills out the space between heaven and earth."[31]

Lessing is forced to bear the brunt of explaining the "mouvements of the voice" to us, the nuctuations and soaring of voice tones which produce that soulful empathy in the listener: "Not the speaker in front of the microphone is Fiesko, Orest, the Monk ... , but a part of the listener himself, and the co-actors and adversaries become voices of his heart or conscience.[32] Kolb is referring to the famous original radio play by Eduard Reinacher: "Der Narr mit der Hacke" (the fool with the axe), Cologne 1930.

And then come the so often quoted statements: "The Word as creative energy can rise above the voice as a bodiless entity. No longer bound to an image or visual presence, it turns into pure energy as an expression of ... emotional perfection, ... an event in its own rite. It aims at the Source, at the dissolution of everything material, contains the timeless laws and encompasses Beginning and End. Here concepts end, and only the Poet has the Word."[33]

If this flat school teacher metaphysics, if this crazed psychologizing subjectivity in the fall of 1930 is supposed to have a purpose, then that of covering something up, and that of preparing something. What is covered up is that which radio producers may forget only at the penalty of losing touch with reality: that the radio is a technical communication medium. The Nazis - as we will see - never forgot this. And what is being prepared in this puffed up philosopher's German is the basis of an historically unique (mis)use of media, in which the aesthetics of mass military marches, parades, reports, speeches, uniformed role calls, torch light parades and radio plays will create an amalgam of barbarian propaganda in the calculated interests of fascist power. Or as Kolb says: "Entwined in the

---

[29] Richard Kolb, Das Horoskop des Hörspiels, Berlin 1932, p. 52

[30] 61

[31] 38

[32] 60

[33] 64

consciousness of the people, (the radio play) must enhance and heighten the existence of the individual".[34] Such statements are plain Goebbels-German.

"There Hitler, I Reporting"

The Minister of Propaganda, 36 years of age, is already a well versed and experienced radio producer as he notes in the infamous statement in his diary on February 11th, 1933: "The loudspeaker is an instrument of mass propaganda, whose effectiveness can not yet be estimated today. In any case, our adlersaries haven't known how to use it. All the more reason for us to learn how to implement it."[35]

At the beginning of February '33, the Nazis had dissolved parliament. They would finally seize power through winning an election. In his diaries, consisting for thousands of pages of only short sentences and orders that read like the printout of a poor mechanized speech programme, diaries that literally push aside language, containing not a single doubting thought, no deliberation, no reflection, - in these diaries, between February and March of 1933, Goebbels notes at least seven radiophonic supreme-power scenarios which forebode how the March elections are to become above all (and perhaps historically the first) media-determined elections, with the help of the Reichstag fire, the communist witch-hunt, radio and the aeroplane.

On this particular 11th of February 1933 the entire theatrical fiasco commences in the Berlin Sportpalast. Goebbels in the "off", that is: only audible to listeners on the radio, describes the scene in and around the stadium in endless preliminaries, pathetic ritardandia and time-consuming phrases which have only the simple but very effective purpose of raising the tension level.

He notes in his diary: "... It is, however, a strange feeling to suddenly stand before a dead microphone while one was previously used to speaking in front of live audiences, to become elevated by their response and to read the effect of the speech from their faces. It goes on like this for about twenty minutes and then speaks Hitler. At the end the Führer gets into a wonderful, amazing rhetorical pathos and finishes with the word "Amen!". This appears to be so natural that all the people are shaken to the core. This speech will incite an uprising of enthusiasm in the whole of Germany. The nation will be in our hands almost without struggle. The masses in the Sportpalast fall into a senseless trance. Now finally the German revolution is starting to take off."[36]

Thus the March elections are to be won through the radio. Radio plus aeroplane plus record. To enhance the omnipresence of radio - and only for this reason - Hitler and Goebbels often fly several times a day criss-cross through Germany in the following weeks up to the 5th of March. To always be elsewhere and still to be everywhere always,

---

[34] 111

[35] Elke Fröhlich (Hrg), Die Tagebücher von Joseph Goebbels. Sämmtliche Fragmente, München 1987, p. 37 ff.

[36] ibid.

just like the radio. Endless minutes of preamble, a glorified descriptive report by Goebbels, then Hitler speaking before roaring crowds, the entire show broadcast live on "Hier ist der Deutschlandsender. Hier sind alle Deutschen Sender." (Here is the German station. Here are all German stations.), recorded on wax disk and broadcast again the following day. On February 15, Stuttgart; on the 17th, Dortmund, Westfalenhalle; on the 18th, Munich; 19th Cologne; 23rd, Hannover; etc. etc. Goebbels' diary finally abbreviates this iterative radio-propaganda concept to the laconic formula: "Nachmittags nach Köln. Dort Hitler. Ich Reportage." (In the afternoon, on to Cologne. There Hitler. I commentary.)[37]

"There Hitler. I commentary". Radio is reduced to this concept by the fascist propaganda machine. The realm of radio, and Goebbels discovers this very precisely, is the axis dividing and splitting the place and space of radio. There the recording studio, as Kisch says, and here the control room. There speaking, here listening. There Hitler, here commentary. An axis that also goes through time and the concept of time: There earlier, here later: There technical and physical time, here the simulated fiction of absolute presence.[38]

No we are not dreaming: 600,000 SA - men, the population of a large city, gathered on the evening of the 8th of April, 1933 everywhere on the squares of the cities of the Reich simultaneously, to actually stand at attention in front of loudspeakers; and thereby in front of truely bodiless entities; they paraded in front of the voices of Hittler and Goebbels. 1 million people will then gather on the runway of the airport in Berlin to exalt in front of the at that time largest ever erected loudspeaker system in technical history, which, by the way, fails at the end because the transformers burn out.

The 1st of May (labour day), a radio day, starting with reports of the arrival of labour delegations in the morning, then radio dramas and radio piclures, and in the evening: Hitler's speech.

Goebbles' cunningly knew what all this was meant to achieve. This makes the difference to all previous radio theorists. We know from Goebbels speeches, which still exist in the original, that he knew the time dimension of his calculated radio

---

[37] ibid., p. 379

[38] The medial place of radio, where is it? In front of or behind the microphone? The propaganda lechnician Goebbels discovers it in-between, as expected. "There Hitler, I commentary" starts the changing axes of the radio realm into motion and thereby causes the initiation of a cognitive force lhat can stage ilself as the continued Ersatz, as the shifted supplement of an unreal omnipotence in a lechnically real form. But only by neither imaging this omnipotence nor wanting to be omnipotent itsel[, lhe unreal becomes eifeetive cognitively as a movement of omnipotence. "Omnipotence is not. It is (only) because it thinks ilself to be", says the French psychoanalyst Jacques Lacan. Radio is the chosen medium for this precarious omnipotence fantasy, which, because it is continuously dividing, is not and therefore becomes more effective. This is the long term simulation of omnipotence, the staging of reality. Jacques Lacan, Radiaphonie, in: Scillicet 2/3, 1970, p. 89

implementations exactly: simulation is a function of time or simply said, one should not be always beating the drum. [39]

Fiction and Simulation

Fiction has its home in the Fine Art of literature, a developed world of speech analogous writing. Up to the early 19th Century, there were recitations, read outloud; the quiet intimacy of the literary romanticism of Goethe, Flaubert and Dostoyevsky, read quietly, blossomed out from the single channel of the book to the mature fiction of the individual heavens of the bourgeoisie.

In this world there is a yes and no, there is affirmation and negation, the continuing game of presences and absences. That is how simply, how alphabetically and analogously things happen in the one dimensional radio news charmel, as long as there is just a speaker here and just a listener there. The negativity of the visual immediately shifts toward the affirmation of an almost cosmic fiction.

This completely changes if this channel is interrupted by the inst'ltion of recording apparatus that manipulate the analogous flow of information. And this means: when the flow of time, the time axes and the adherent spatial symmetries oE the sound events are intentionally reshuffled. The beEore and after, the simultaneous, the lengths and the cuts become calculable, and this is simulation. Simulatio is an old Roman legal concept:

---

[39] Wolfram Wessels, Trommeln für die Volksgemeinschaft, SWF 1983. - With the programme reform of 1934, practically all of the usual wordy propaganda transmissions disappeared from regular daily Reichsrundfunk programming. Because the effect of radio is never timeless or absolute. And once again: There Goebbels, here Kolb. The recording and the cut, therefore manipulation of the time axes and rhetoric shift, the simple mechanical effects of the production apparatus with which Goebbels uses the radio, Richard Kolb must deny them all. While Goebbels uses Ithe channel and plays with its time axes to simulate fantasies, Kolb has to reduce the channel back to its uni-directionality in order to hide the trick. The most influential radio broadcasting theorist of the century, Richard Kolb, thus persistently denies radio any form of pre-recording or recording, as funny as it may sound to us today. "A radio play unfolding before us is made up of such delicate spiritual vibrations - each breath can be felt - that they can't be reproduced by a record. The spiritual experience has ... its power only through immediacy, through simultaneaus experience." p. 502
Kolb has short circuited technology and semantics. Goebbels has not. Kolb declares, as a metaphysical law, that the information-technological basis of radio is always and only as a transmission medium. Goebbels uses this metaphysics as a tool of propaganda. Precisely this is the difference between fiction and simulation.

"Simulo" means: I say that something is which is not, or dissimulo: "I conceal", I negate something which is.[40]

Simulation enters the world of media as soon as one has access to machines which are able to calculate sections of reality, information and data, disassemble them into parts and then reassemble them. And not only mentally while quietly reading novels, but for real. Simulation is already created around the turn of the century in film and its sequential picture frames; the simulation effect of film is moderated by the enclosed viewing room: the cinerna, which, like the theatre, seems to uphold the fictional parameters of time and space. But film existed beyond the cinema even then - as an industrial and psychological medium from which Sigmund Freud's Psychoanalysis will draw the patterns of dream interpretation, and Frederick Winslow Taylor will derive his "time and motion studies" for the introduction of industrial assembly line production.[41]

However entertainment broadcasting long remained an analogue fiction because it had to represent a strategic disposition of military command flows, which to interrupt, to manipulate and thereby thematize was almost equal to a Bolshevistic act of sabotage.[42]

Between March and May of 1933, Goebbels placed radio, the one dimensional cosmogenic medium which allows guilt, fear and cosmogenic affects to become fictional because of its linearity, remorselessly at the service of the simulation of fascist omnipotence. Fascist radio mobilized hundreds of thousands of people, not by chance, as in Orson Welles' radio drama "War of the Worlds" five years later, but rather according to a calculated plan.

After all, at least half of the tirades which allowed the SA men to parade on streets and squares came from wax disks while Orson Welles still acted live in front of his microphone and was completely surprised the following morning to learn how thousands of listeners

---

[40] "In addition to the simple affirmation or negation:1) affirmo id quod est, and 2) nego quod non est, the intenlion of the speaker can also be expressed in the combinations: 3) affirmo quod non est, and 4) nego id quod est - four possibilities. The third and fourth intentions are especially distinguished in Latin by the verbs simulo "I simulate" (something that doesn't exist) and dissimulo "I conceal" (something that does exist)." Johannes Lohmann, Philosophie und Sprachwissenschaft, Berlin 1965, p. 274
And further: "Particularly seen in this light, the development of mathematics in the Latin based occident, especially in its crucial aspects, represents the 'Integration of negation (in the form of an operation equivalent to the 'positive' sense) in thought', and is thereby only the continuation of the aforementioned development of emphasizing the 'operational' functions of a statement which had already formally begun in the Latin language. (...) The idea of 'reality' as the object of an operative 'calculation' represents the completion of a development that first effectively appeared in the form of the classical Latin written language, and then later led to the gradual transition of the way of thinking from the status of an 'effective' to that of a consciously reflective form of speech that is finally conceptually determined to be 'judgemental' ". ibid., p. 277f

[41] Thorsten Lorenz, Der kinematographische Un-Fall der Seelenkunde, in: F.A. Kittler u.a. (Hrg), Diskursanalysen 1, Medien, Opladen 1987, p. 108f; Fredrik Winslow Taylor, The Act of Cutting Metals, 1906 (for having so insistently referred us to Taylor we remain indebted to: Alfred Sohn Rethel, Materialistische Erkenntniskritik und Vergesellschaftung der Arbeit, Berlin 1971, p. 52)

[42] At best, only the secret services were allowed to use overspeed technology, backtracking or millisecond inserts to camouflage messages. Canaris used the magnetophone for his secret codes, as is weil known.

had run in the streets in panic as the 57 minutes of a fictional invasion by men from Mars were broadcast.

For the technically so complicated Reichsrundfunkfeier (Reich broadcasting celebration) of May 1st, permeated with pre-produced record inserts and faked live takes, Goebbels left nothing to chance. The metaphysical and fictional cloak of invisibility serves Goebbels precisely for this purpose and thus the theatrical fiasco ends just as could be read months earlier in his diary: with the banning of unions and communist arrests on the following day.

The 1st of May, 1933, was a day in German broadcasting as there should never be again in radio history. The height of the phase of radio omnipotence, as I would like to call it, and at the same time, its finish. Just once again, at the beginning of the war, for the initiation of that which the Nazis had been openly and clearly aiming for, fascist media magic had to be set in motion once more. For the surprise attack on Poland, it is known that Goebbels-Hitler staged a simulated attack on the Gleiwitz transmitting station in August of 1939.[43] Two weeks later, General Guderian is steering his commanding tank deep into Polish territory and can proudly proclaim that he is the first commander in charge to command his troops and his panzer divisions directly from the battlefield.[44]

Equipped with the most modern VHF transmitters, he stays in contact with all units, the following infantry, as well as the air cover. VHF is of course not available for entertainment radio, although the very high frequency band had been technically available since the 20's as the already fired Hans Bredow, as well as the sacked Oskar Czeija could have demonstrated in RAVAG's own developmental laboratory.

Radio simulation plays only a minor röle in the final scenario of fascist power, World War II itself. What count now are the real lines of communication, - radio is again firmly in military hands and an important tool on all war fronts.

As far as the unwieldy wax record machines were concerned, it sufficed. that they could guaranty the repetition of the occasional Hitler speech. And also served to record sports broadcasts. Just as in Austria, sports broadcasts are recorded live and then run in the studio from wax records as a so-called "Stochersendung" (picker-transmission). Countless well versed technicians are occupied with "picking out" the interesting sections by picking up the tone arm at marked spots and setting it down again milliseconds later at the next marked spot.

And thus it happens that such revolutionary innovations as the introduction of tape recorders in the Reich's broadcasting system in 1941 are also just by-products of the war. In order to send the highly specialized technicians who were crucial for such a "Stochersendung" to the front, the much more user-friendly tape recorder is procured. And thus is created a professional image so weil known to us: the "cutter" on the Kl, T9,

---

[43] As much a farce as any repetition of a tragedy, Special German units disguised as polish soldiers attacked this transmitter to provide an excuse flor invading Poland and thus starting the war.

[44] compare: Heinz Guderian, Erinnerungen eines Soldaten, Heidelberg 1951, p.60

MlO, and M15 is a woman. Cutting and fine manipulations of audio material are now best served in women's hands.

The Emigration of Sounds

After the war, the most difficult handmade cross-fades become possible in mono with long scissors and pasting brush, in other words, the finest time syntheses in real information material. And this is the inheritance of the Second World War: time synthesis in information material; its sciences are called cybernetics and computer engineering, the apparatus is called radar and soon thereafter, computer. World War II leaves behind high frequency scanning technologies for the reconnaissance of fast flying objects, which in turn initiate the mathematics of anti-aircraft artillery and of the rapid calculator, leaves behind the visual medium of radar, the cathode ray tube, leaves behind the scanning and decoding machines, which provide means to recognise images and information in the nano-second range. Time Axis Manipulation - as was also done by the slow and analogue tape maschine.

With the T9 by Telefunken, 78cm/sec mono, which became available everywhere a few years after the re-introduction of the federal broadcasting system under allied control, the instrument of broadcasting became manageable. Even small reports can now be carefully produced, and thereby the question of censorship is solved almost automatically, the system of social and legal supervision of broadcasting automatically attains material fulfilment in the fact that there now exists a technically perfect instrument of production and pre-recording. Programmes whose main elements are already recorded on tape can be timed and slotted better, running the programme is easier, less complex mechanically, all connecting ideas and conceptual mechanisms which are necessary for the success of live broadcasts in all parts of the production process let themselves be formalized, simplified and institutionalised by quite simple means and measures of qualification.

Broadcasting can thus cast aside its heavy burdens during the first two decades after the war; it turns into a kind of ideal Institution of Further Education for the federally newly grouped population; there is something for everyone - the morning choir is not to be missed, as little as the obligatory school broadcast hour in the morning, the noon concert as little as the swinging melodies to the afternoon tea time dance, after the school broadcast hour is again repeated after lunch. In the early evening, an hour of politics and current affairs, then melodies for a relaxing evening, folksy entertainment, on Saturday the "who-done-it", on Tuesday the discriminating radio drama and otherwise the colourful evening, the radio magazine, the audio-variete with a touch of the exotic from around the world. Later in the evening and at night: literature, culture, essays, on Saturday the opera, and also regularly, the symphony concert.

Broadcasting as a democratic Institution of Education: If from today's perspective one reads the German or Austrian broadcasting programmes during the two decades after 1945, they seem to mirror a sane, orderly, ideal democracy of communication which radiates like an ideal ordering scheme of the times of the "Economic Miracle". The

technical basis of the sequential programming without breaks, of the pre-stabilised picture of harmony, is the quarter-inch tape recorder, which permits the pre-planning and production to a precision of centimetres, i.e. seconds, of programming for days and weeks ahead.

The dual track machine from the middle of the 50's makes the time-multiplex possible: the time phase synchronous stereo cut, accurate to about a tenth of a second. In our broadcasting studios this leads to further optimization of the total running of programming, makes stereophonic sound possible, assists in the success of high fidelity technology which lead to taking for granted a standard of signal/noise ratios lying far beyond the limits of audible perception, and thereby creates tonal quality of presence and immediacy which was previously unheard of - all this leads to an intensification of the effect of radio, which can now claim most intimately to be equally controlled as well as very close to the person. Through the spread of VHF technology, the regional borders and competences are supported and underlined; VHF frequencies have an effective radius of about 80 kilometres around the respective transmitters, so that because of the technology of transmission, the division into provinces of the former radio of greater Germany can now be considered completed, which again appears as a natural result of technical limitations.

But the restorative peacefulness in post war Germany, which had such pleasing effects not only on radio, lasted, as we know, just 20 years. Seen in the terms of the development of production technology taking place in the audio field, the oasis indeed seems programmatically dried up with the appearance of the Beatles. In 1967 they open the age of "Sergeant Pepper's Lonely Hearts Club Band" with a four track machine and six painstakingly synchronised Ampex machines, thereby helping to establish a musical breakthrough to a now dominant position, in which music is fully synthetic, that is, made of tracks laid down independently, track by track, instrument by instrument, "Lonely Heart for Lonely Heart" and then mixed by Sergeant Pepper, alias George Martin (the name of the Beatles' producer) to create a sound synthesis which could not be achieved in real time playing. As is well known, "Good Morning, Good Morning" ends with a series of animal voices. John Lennon had the idea "that the following animal should always be one which in nature could threaten or devour the previous one".'"

The multi-track time axis manipulation is a synthetic form of communication which can communicate in music with music but also wilh extramusical sources; it is to the present day the standard of all pop music productions. Therein lies a not unimportant paradox in the history of the media. At just the same time when the western industrial nations from Berkeley to Berlin are trembling through a cultural revolution on whose banners the breaking out to new forms of communication and living together are everywhere written, the same revolutionaries are in all naïveté adherents of music which is already produced by their musical idols through completely synthetic communication machines, e.g. in the multitrack system perfected by the Beatles in 1967. In multitrack production, an essential element of music, namely the simultaneity of tonal action, is dissolved and changed into random algorithms of tracks played on, over, and beside each other. A calculability takes hold, accurate to the millisecond, that arranges soundtracks, envelope patterns,

reverberation chambers, overdubs and fill-ins and in the end creates music which can not exist live through playing together.

From 2 to 4, to 8, 16, 24 and up to 48 tracks leads the path on which for example Todd Rundgren in 1974 multiplexes mass singing recorded in two different stadiums in two different cities in America onto one tape of a song, equalizing tonal pitch through a harmonizer, to consequentially announce the "Death of Rock and Roll" on his 1975 album "Initiation".

Mistakenly, as we know: since only two years later, with Punk in 1976, a new aspect of the synthetic communication machines breaks into the open. An artificial pop develops, first underground, then spreading at the beginning of the 80's, which will allow music to be made without playing an instrument, without reading notes. Since the 80's, cheaply available to ABC or Marc Almond, to Yazoo and Depeche Mode are not only pure tonal real time syntheses in the synthesizer, but also tonal real time syntheses of any random stored sounds from a variety of digital sampiers. Whereby we have arrived at the last stage of radio music and at the last stage of recording technology, Rap and HipHop, in which seconds and fractions of seconds of sampled music are sequenced in digital loops and transform into rhythmic, drumming, vibrating material which warps the original source into a sheer endless fury of speech. This is how art and speech enter the ghettos of Oakland, Harlem, or Los Angeles.

This development of radio music has bypassed radio itself. Mechanized communication technology hasn't entered our broadcasting studios at all, if one disregards the few modest multitrack studios which meanwhile exist in some larger institutions. And what for: No studio of the ARD, of the ORF or even of a private radio broadcaster can compete technically with the equipment of even a middie class pop music production studio which can in the meantime be found in every mid-sized city. We are not lacking the money, but the manpower, the necessary division of labour, and therefore access to the production equipment which is essential to pop music.[45]

Therefore: that which meanwhile represents the majority of programming on European radio stations is no longer produced in their studios. I call this the emigration of sounds out of radio. By now this trend has also reached radio drama: Numerous prize-winning radio dramas of the last years, for example Goebbels/Müllers Wolokolamskajer Chaussee were produced not in radio stations but in private studios. What does this mean?

In our networked information and communication world, radio plays an ever decreasing röle in production. It reproduces the recorded audio compositions, but hardly produces them any longer. While TV broadcasting in Europe still maintains at least a small part of the production of that which it lives from: namely of the films that it initiates and finances,

---

[45] Compare: Diedrich Diederichsen, Toaster und Selector - Sound - Recycling in der Rock musik, Unveröffentl. Typosskript 1993 - The Pop music sound engineer is more than just a technician, his position is quite different. He is a creative designer of sounds who constantly has to offer alternatives to the musicians and producers. and often enough, the sound engineer is the musical producer. Pop musicians such as Phil Collins or Bruce Springsteen, Madonna or Prince have their own studios to create their music.

radio poses a compietely different picture. Here the popular music stations play what comes out of the music industry. The problem is that precisely these programmes for the masses which are increasingly indistinguishable, enjoy the highest listener ratings, and radio programmes that offer radio in the traditional sense are ever less listened to.

beyONd RADIO

Mechanized communication doesn't produce fiction, it produces and is itself a part of simulation.

The simulations of the fin de siecle were time snippets and time syntheses of analogue material, of small picture frames, called moving pictures, Kintop. But the raw material remained picture frames, analogue recording media, at best the result of an electro-chemical process.

Now the pictures themselves are taken apart and computed, in dots or graphs, vectors and pixels and can be bent, rotated, dissolved and folded on all axes. Now audio tracks are electronically hacked and cut up to 40.000 times a second, and the amplitude and condenser values of such an audio bit in the magnitude of a 40th of a millisecond are recorded in 8 or 12 units. An unimaginably fast and unimaginably massive process called digitalization. In order to record a minute of stereo tone, voice, or sound track with regular commercial technology, a mountain of 1,6 million bits arises in my pc, which printed in book form, would arnount to an 800 page epic novel. Per minute!

All low frequency signals, be they moving, fixed, doubled, sounds, images or type characters; simply everything quantifiable can be arbitrarily encoded, digitalized and thereby simulated, regardless of whether they are rockets faster than the speed of sound, or only our obviously very slow hearing and seeing realities. Digitilization means: Only that which is quantifiable is real. An axiom that weighs heavily upon the most difficult inheritancy endowed to us by the dialectic of the enlightenment.

We are standing at the beginning of this world of digitilized simulations of everything in our regular daily and working lives. We should learn to understand that the pictures, the sounds or bits that are stored in these simulation systems, are always both values and symbols. They are therefore more than they appear: values and contents, and symbols of other values and contents simultaneously.[46]

Digitilization therefore simulates the expanding mechanized desires in our imaged, sound recorded and codified world. Digitilization is however also a product of that stage

---

[46] Digitilizalion doesn't produce romantic yearning but rather a different type of yearning (dependency): namely a fascination with the optimal in technology. Images, sounds and letters are represented by bits and bytes that eontain, e.g., the amplitude values of a sound or a spoken sentence, a series of sounds, and ean thereby serve as a starting point, as a reference or address of operations ,which have nothing to do with that which we understand as sounds and words. A memory bit in a computer is always both value and reference; stored contents and address of contents which point to other stored contents that in turn again represent both contents and addresses. CaU by reference or call by value; whoever understands these axes pointing arbitrarily in many dimensions in the digital system can also programme them.

on the path of harnessing the electromagnetic spectrum that was and remains a military strategy. Medial proliferation is the name of its present imperative. Today, the world is connected by hundreds and thousands of satellite channels that have long since solved the linear transmission problem from the beginning of our radio medium. The proliferation of communication media that are based on a simple system of codification, namely the digital; this makes every conceivable time multiplex and mechanised exchange from medium to medium possible.

The aim of the game is simply: where there is one image, to want more, where there is one sound channel, to establish further. This is what the cloak of invisibility in our media mix looks like today. This is the progress of communication in our societies since the 60's, that is at present primarily concerned with expanding the tange of exploitable frequencies, and this means in plain language: in more and more radio and TV programmes materializing. An expansion, as mentioned, that directly and immanently arises out of the mechanization of communication which first appeared in civil broadcasting in the reeording systems of the 60's and 70's, multitracking and frequency analyzing.

Its receptive counterpart among listeners and viewers is the dull desire for more, more, and yet more that presently dominates the media scene. Almost pseudo-archaic rites of a potlatch frenzy are gaining ground, while only the newest gags of an expanding simulation are bartered. In the field of electronic communication there is but one bad imperative when the door has swung open so widely: more, more, and yet more.

Thus the introduction of the commercial media in Germany (the dual system), was dictated by technical considerations, as ZDF (Second German Television) director Stolte says.[47] In Austria this is quite similar. What reasoning for this introduction should be labelled economic or cultural, when real technical simulation machines demand to be conlinuously readdressed because of their inner nature?

This process of medial expansion has hardly gotten out of control. On the contrary, it controls itself so well that no censorship could do better. Today, each of us is forced to work in systems of mechanized communication, should we choose not to follow Botho Strauss' hermit ideology, just as no musician can help but use and submit to the computer-based self-dissection of his music. And thus we are all apart of the technically forced expansion of the electronic simulation worlds.

An additional result: Electronic media operate on all transmission channels almost identically to military signal and command data flows - the Gulf war was good evidence.

---

[47] Dieter Stolte, Fernsehen am Wendepunkt, München 1992, p. 20

CNN, the satenite channel, could stay albeit at first alone - on top of the war developments because this was the first complete satellite war.[48]

The Marine Corps, the tank and artillery battalions in the sands of Desert Storm also used regular commercial Laptops and Portables to graphically illustrate their battle plans and points of attack in the course of their Air-land Battle Doctrine, and set up a network of transmission cables and satellite disks in order to destroy the follow-on forces, the enemy's second wave.[49]

This demonstrates the new quality of the military-industrial disposition of networked digital systems: the completely openly proclaimed coexistence of civil and military signal flows on one and the same channel fabric causing lhe military no qualms. Since digital information streams are no longer analogue in nature, the recipient of such messages stands before a mountain of rows of numbers, before an arbitrarily large number, which is practically impossible to decode without a decoding key. The transmission and reception of digital data streams thus also bring the Marconi Problem, namely that reception always also meant interception, to a highly practicable solution for the military. Only exorbitant super-computers would allow an enemy to reconstruct every single transmission protocol, extremely dilficult for developing countries like Irak, whose every electronic reception capability had previously been bombed for weeks, and impossible for the electronics buff of a no longer existent revolutionary labour movement.

Computer networks of this magnitude, which transmit the position of individual soldiers in real time over ten thousand kilometres to the command centres in the Pentagon via satellites and digitilization, had already been in action during "Desert Shield", the simulation phase of the Gulf War. Plans have been devised in America to also use these precise communication systems for guidance systems in police work, e.g. in the war on drugs.

Certainly beyond such direct military involvement, we stand in Germany, Austria and Europe on the threshold of the introduction of a new broadcasting system which is intended to take over control and management of important civil functions in our lives: Its name is DAB (Digital Audio Broadcasting) and it will go into wide scale testing in 1995.[50]

At first 6 stereo radio channels will be able to broadcast in co-channel transmission, which means: Digital radio can be listened to from Rosenheim to Flensburg without changing your dial. That will initially be channel 12 in the second television band, which is

---

[48] After the Vietnam disaster, the American Chief of Staff Admiral Moorer is quoted as follows: "If there is a World War III, the Winner will be the side which controls the use of the electromagnetic Spectrum". And naturally the control of global surveillance network of all trackable electromagnetic information is today, as it was 20 years ago, the job of gigantic military compater networks. But the computer itself has become a medium, at least since the introduction to the market of IBM - PCs in 1981. Today an estimated 100 million PCs are running in the World and their networking through hundreds of world-wide inter- fido- and other networks is quantitatively hardly lagging behind the military networks.

[49] Ute Bemhard / Ingo Rühman, Computer im Krieg: die elektronische Potenzmaschine, Typoskript 1991, p. 12ff.

[50] Georg Plenge, DAB - Ein neues Hörfunksystem - Stand der Entwicklung und Wege zu seiner Einführung, in: Rundfunktechnische Mitteilungen 1991, Jg. 35, Heft 2, p. 45ff.

intended for DAB across Europe. The co-channel transmission characteristics of digital communication signals should then also find their way into the VHF range.

But digital radio means: transmission is control; namely that the data package sent, which will be processed by a new generation of intelligent receivers, contains not only the audio data and values of the transmitted music and speech; but also an arbitrary number of parallel controlling signals which can allow the arbitrary separation of music from words, loud from quiet, pop from classical, radio drama from feature, news from commentary; each piece of audio information will be codifiable, and therefore the receivers of such radio transmissions are in fact small programmable computers. Whereby the end of radio is heralded, the end of the one way transmission of a source from a transmitter to a receiver.[51]

At night you leave your car's digital radio turned on in the garage, and in the morning you will discover that all the warning lights are blinking: and in the small display that such equipment has, stands: traffic hopeless today. A small printer, like taxis already have for bills, could at the same time print out a ticket for the next train, sponsored by BMW; which in turn triggered by the same channel, would already be running more often to bring all the other BMW drivers to work on time. At the train station, a nice little breakfast package and hot coffee await you courtesy of BMW's own catering company. This would be the introduction to the most harmless of all possible scenarios from the future of our western industrial nations, which incessantly advance toward transportation chaos and ecological catastrophies and need paramilitary guidance systems like DAB and others in order to not experience, like some American cities in the recent past and cities in the east today, sudden nihilistic doomsdays. New plots for coming dramas in radio art are coming out of the twilight: they are waiting to be written, and that means: to be programmed.

---

[51] It is conceivable and intended in DAB that you don't choose a station but rather press a desired category button - easy listening, radio drama, news or sports, and then the receiver will search for the desired category among the 6 or 12 or 24 stations and tune it in, consider follow-ups and automatically relay important messages. In other words digital radio is an intelligent listening guidance system as well as a refined traffic guidance system. Therefore, it is being massively financed by the industry, and therefore - consider our traffic jams - it will come and turn into a mass medium.