THE TECHNOLOGICAL INTROJECT

Friedrich Kittler between Implementation and the Incalcuable

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13. On the triple-M approach to Kittler's war (war as motor, model, and motive), see Winthrop-Young, *Kittler and the Media*, 129–42. For Kittler's portrayal of World War II in particular, see Winthrop-Young, "*De Bellis Germanicis*: Kittler, the Third Reich and the German Wars," *Cultural Politics* 11, no, 3 (2015): 361–75.

14. See Friedrich Kittler and Christoph Weinberger, "The Cold Model of Structure," *Cultural Politics* 8, no. 3 (2012): 383: "Initially, I simply took the concept [of media] from McLuhan's *Understanding Media*."

15. Siegert, "Cultural Techniques," 50.

16. Ibid., 49–50.

17. On Kittler and *ostranenie*/defamiliarization, see Geoffrey Winthrop-Young and Annie van den Oever, "Rethinking the Materiality of Technical Media: Friedrich Kittler, *Enfant Terrible* with a Rejuvenating Effect on the Parental Discipline," in *Techné/Technology: Researching Cinema and Media Technologies—Their Development, Use, and Impact*, ed. Annie van den Oever (Amsterdam: Amsterdam University Press, 2014), 234–39.

18. Friedrich Kittler, *Gramophone, Film, Typewriter*, trans. and introduced by Geoffrey Winthrop-Young and Michael Wutz (Stanford, CA: Stanford University Press, 1999), 1–2.

19. William Gibson, *Distrust That Particular Flavor* (New York: G. Putnam, 2012), 215.

20. Joseph Vogl, "Becoming-media: Galileo's Telescope," *Grey Room*, no. 29 (2007): 15–25.

21. Vogl, "Becoming-media," 16; my emphasis.

22. On the evolution of the concept of cultural techniques "after Kittler," see Bernard Dionysius Geoghegan, "After Kittler: On the Cultural Techniques of Recent German Media Theory," *Theory, Culture and Society* 30, no. 6 (2013): 66–82; Geoffrey Winthrop-Young, "Cultural Techniques: Preliminary Observations," *Theory, Culture and Society* 30, no. 6 (2013): 3–19; and Winthrop-Young, "The *Kultur* of Cultural Techniques: Conceptual Inertia and the Parasitic Materialities of Ontologization," *Cultural Politics* 10, no. 3 (2014): 376–88.

23. Siegert, "Cultural Techniques," 61.

24. Ibid., 52.

25. Vogl, "Becoming-media," 15.

26. Friedrich Kittler, *Short Cuts* (Frankfurt am Main: Zweitausendundeins, 2003), 270.

27. Friedrich Kittler and Rudolf Maresch, "Wenn die Freiheit wirklich existiert, dann soll sie doch ausbrechen," in *Am Ende vorbei*, ed. Rudolf Maresch (Vienna: Turia and Kant, 1994), 107.

28. John Armitage, "From Discourse Networks to Cultural Mathematics: An Interview with Friedrich A. Kittler," *Theory, Culture and Society* 23, nos. 7–8 (2006): 33. For a more detailed discussion of Kittler's use of recursion, see Geoffrey Winthrop-Young, "Siren Recursions," in *Kittler Now: Current Perspectives in Kittler Studies*, ed. Stephen Sale and Laura Salisbury (Cambridge, UK: Polity, 2015), 71–94.

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KITTLER ON MUSIC

Ute Holl

> But still
> The wave which
> drowned me
> is roaring in my ear and I am dreaming
> of the seabed's magnificent pearl.
> —Friedrich Hölderlin, "Der Rein"[1]

Media theory is characterized by the intimate relationship it entertains to the unknown, the concealed, the unconscious, or, simply, to zero. It is from the operations of blank spaces or intervals that media produce their effects. In many of his studies on sound, Friedrich Kittler had marked this as a ratio of signal and noise. Historically, this differential relationship is unstable, but it is constitutive for the respective production of meaning in music. In his last books on mathematics and music, however, Kittler dissolves this singular and Gestalt-inspired difference of signal and noise into incalculably many relations of sound elements as they are produced with mathematical means. Instead of a clear edge, Kittler discovers iterated and reiterated acoustical transformations, which he describes as an accessible ocean of sound. Thus, these books on music consider the fusion of both, the known and the unknown, the concealed and the unconcealed, as an immersion into Homer's mathesis, thinking in numbers, which concerns music as well as language, or love in the full extension of the term.

Supposing a tiger's leap through the ages, Kittler conceives of a return of Pythagorean universal relations of numbers in the alphanumeric logics of Turing's universal machine—or vice versa: the computer going Aeolian. In a full circle of perceptive modes between digitally configured waveforms and Sappho's lyre songs, between now and antiquity, Kittler, writing on music, simultaneously experiments with poetological and poetic forms of writing himself.

His argument on music is carried, and sometimes carried off, in the musical use of vowels, precisely syncopated by consonants, word wraps, or page breaks. In Kittler's diagnosis of the discourse network of 1900, vowels, which Hermann von Helmholtz had described as effects of physiologically produced overtones, had proved to be permutable, as any typewriter-driven letter. Thus, they could program the reader's speech physiologically, to sound out sense or nonsense, as Christian Morgenstern had demonstrated in *The Great Lalula*, chopping up language into sound and rhythm, composing text beyond hermeneutics.[2] In this, Morgenstern's poetry is contemporary to the operations of a gramophone, film, and a typewriter, performing the real, the imaginary as well as the symbolic aspects of language while largely ignoring any production of sense. Vowels and consonants operate structurally as relays of mutual distinctions. While marking the invention of the Greek vowel alphabet as the beginning of European thinking, Kittler's books on music and mathematics are composed as eulogies of vowels, switching focus from difference to presence, from a consonant's distinctions to a vowel's flow. Against all odds and semiotics of zero, against the drive of counting and the logics of signifiers, here, the vowels *A*, *E*, *I*, *O*, and *U* defy the great old Lalula of nonsense that had characterized the discourse network of 1900. Vowels in the books on music and mathematics operate independently instead of forming structural differences. Thus, these books on music turn into songbooks. They are carried away by a double entendre, strict analysis being superimposed by sounds of language as a musical machine.

What's more, the A and O and the I and U address and produce a secret *Du* of the text, an unknown listener, a lost lover or muse, shifting what is left of a reader between the logics of the visual and the aural, the eyes and the ears. Then again, this *Du* or You or U of the text obviously shares similar memories with the I. Some of these memories can be traced back to bibliographic annotations at the end of the book: haven't we all read the same things? Others again, are evoked by sounds of music and lyrics. Haven't we all listened to the same records and tapes? And some insinuate secrets, that we all are assumed to share. Readers that resist this production of singularity as communal sense perception, will, as any readers of lyrics, turn into observers and simply drop out. While Kittler's books on music and mathematics celebrate the vowel alphabet as the beginning of a European civilization, they simultaneously present it as a prehistory of a coming society which might be called ontologically saturated: the coming of the gods.[3] Therefore, the You of the books might just as well be a goddess or what the love of knowledge holds to be a deity. In shock and awe over those books on music and mathematics, friends and enemies alike diagnosed an ontological turn in Kittler's thinking. But this might just as well have been an ontological turn in understanding Kittler.

However, while obviously enforcing Graecophilia, Kittler's final texts and tapes do not differ from earlier studies on music in that they provoke a constant short-circuiting of sound and signal, technology and physis, effects of technical media and the materiality of speech. Channel noises of academic studies are short-circuited with signals to those readers who are familiar with orders of the discourse. Kittler's writings on music are writings on bodies in the presence of acoustic waves. His texts literally address the same physicalities that they are simultaneously producing with acoustical, harmonic, and rhythmical effects of language and speech. *On music* then, as referred to in the title, can be understood as in *de musica*, contemplating music. Or it can be understood as empowered by music, as in *on drugs*. Kittler's Turing-aged version of ontology is an intentional confusion of media effects.

CONFUSED PERCEPTIONS

In his studies on sound and music, Kittler has examined the histories of tuning, instrumentation and technical recording systems as well as their forms of transmission and distribution. In the context of music, he has reconstructed a history of mathematical reasoning and its implementation into technical devices as well as into physical bodies. Kittler's sound studies examine historical refigurations of senses in changing media systems and sound concepts. In his studies of ancient and modern forms of music, Kittler observes the grades to which *techne* and *episteme*, roughly translatable as art and knowledge, fuse: if both are joined in poetic thinking and technical performance, they will evoke new and unexpected forms of experience.

Probably the most important contribution to musicology and sound studies is Kittler's meticulous reconstruction of the history of calculating, analyzing, and synthesizing frequencies from early modern age to analogue and digital sound systems. In the experiments of Simon Stevin and Marin Mersenne and in the work of Andreas Werckmeister, Kittler has reconstructed an early history of frequency's logics as prehistory of nineteenth-century laboratory experiments. His texts give an account of how the results and achievements of these laboratories eventually shape the sound systems which produce twentieth-century listening cultures. Kittler has repeatedly discussed the works of Joseph Sauveur, who demonstrated that overtones are multiples of the tonic key's vibrations, calling them harmonics, and d'Alembert, who solved the mathematical equation required. Kittler traced the connections of those scientists to Gottfried Wilhelm Leibniz who first conceived of vibrations as waves, as well as to Leonhard Euler who introduced the notion of frequency as waves in time. And he had reminded modern musicology that it was Daniel Bernoulli who had explained all musical vibrations

as basically sinus waves, their overtone structures forming what is conceived of as tone colors. Thus Kittler had always linked music and mathematics.

The extended artisan's history of music which Kittler kept reconstructing is not one of inventive geniuses but evidence for the fact that there is no theory of music unless it is actually practiced in producing a sonic world. Playing, composing, and constructing instruments, listening to structures of counterpoint and experimenting with new sounds has been one and the same in all real musical procedures. Musicians according to Kittlerian media theory, have always been scientists and artisans, and implicitly, good scientists need to be at least amateur musicians. In music-making and in listening, as well as in inventing techniques for tuning and tempering, *techne* and *episteme* necessarily fuse. Also, with music-related cultural techniques, new distinctions turn up or conflate. In the face of oscillating membranes, the distinction between inside and outside of literary men needs to be reconsidered, and what has only metaphorically been referred to as the oceanic in psychoanalysis turns into a real art of moving among waves. It is here that Kittler relates to Leibniz, who first connected the sonic experience to the sound of the sea: "It is like what happens when I walk along the seashore: in hearing the roar of the sea, I hear—though without distinguishing them—the individual noises of the waves out of which that total noise is made up. Similarly, our confused perceptions are the outcome of the infinity of impressions that the whole universe makes on us."[4] Noise is the channel that relates us to divinity. And confusion is the precondition of precise and precisely human perception. The oceanic turns into a general theory and practice of confusing boundaries, in Kittler's writings explicitly in the name of love and Aphrodite.[5]

Another protagonist in Kittler's universe of wave-manipulating musicians is Jimi Hendrix, whose piece "1983 (A Merman I Should Turn to Be)" also evokes the idea of immersion into the waves, here including the grading of color, "the arctic stains from silver blue to bloody red, as our feet find the sand, and the sea is straight ahead." This merman's flight is escaping the noise of war into the sounds of the sea. However, Kittler was certainly not up to turning into a merman. And especially around 1983 he would never have traded his two legs or feet for a tail fin. The power of music, poetry, love, and dancing as well as of thinking at large depended, as Kittler has frequently shown with Friedrich Nietzsche, on the incorporation of language as metrical feet, *Versfuss*. Kittler had identified Nietzsche as a contemporary not only of Wagner but also of Helmholtz, of psychophysical laboratories. Nietzsche was the antidote of Helmholtzian *Reichsanstalten*, standardizing psychophysical transferences. Nietzsche's dictum that "aesthetics is nothing more than applied physiology"[6]—a matter of breathing, heartbeat, bloodstream, and eventually of moving, dancing, or marching, whether electrically engendered or not—is exposed as the birth or birthmark of media-theory.[7] Perceiving, *aisthesis*, is a physical matter, as in Greek *physis* or as in nineteenth-century psychophysiology out of the laboratories from Leipzig to Paris. Kittler had explored these laboratories in their technical devices and theoretical formations, hardware and software, in order to study their implementation into humans and humanities, and eventually to drive the "Geist" out of "Geisteswissenschaften." Demonstrating rhythms of speech in stepping up and down Albert-Ludwig's seminar rooms, Kittler's own body turned into a site for musical possessions, materializing the force of media through epochs of literature, from Lohenstein to Morgenstern. In rapping out what was to become the meshes of discourse network's analysis, his lectures on sound and music gathered activists of the local pirate radio stations as well as students of literature, who left their discipline in droves and disbelief to turn into media students, clueless yet of what the new theory was about. They were, however, turned on by some big beat that connected philology to electric sounds—as well as to the darkest sides of German history.

Kittler's studies on music, following Leibniz, Nietzsche, as well as Heidegger and Hendrix, conceived of musically possessed bodies not only as physiological phenomena but also as manifestations of truth. *Soundgeschichte*, "history of sound," in this sense, becomes *Seinsgeschichte*, the discovery of historical moments when poetic speech discloses the factual. In his studies on music in modernity, Kittler had analyzed instrumentation, laboratory gear, or studio technology in order to rematerialize effects that had always been attributed to the divine. Already aesthetically then, polytheism was to be favored over monotheism.

Kittler's investigations on music and mathematics in Greek antiquity reject an approach that simply demands to study the materiality of media. In *Musik und Mathematik* he invokes a basically mathematical toy, the universal model of the *tetraktys*, ten tangible elements, organized in four rows of one, two, three, and four. The order of the *tetraktys* organizes numbers as well as material objects like stones on a beach, it produces a musical order of 1:2 as octave, 2:3 as fifth, and 3:4 as perfect fourth, available as strings on a monochord or lyre. The order of the *tetraktys* describes sounds as well as cosmological harmonies and even gender relations, as Kittler demonstrates in his chapter "Im Liebesspiel," which advocates heterosexual intercourse, even if including divine participants.[8] While the Greek model of *tetraktys* refers to four rows only, the machine is potentially infinite, as Pascal would prove centuries later. It can produce potentially infinite relations. Thus, as an epistemological machine, it can visualize the transition from intervals of integers to the logics of frequencies and harmonics in music, and it demonstrates how a decimal code can construct all sorts of micro-relations and realities. In the *tetraktys*, these

relations seem ontologically ordered and simplified—mathematically, musically, gender-wise, and cosmologically. However, it is not the material elements that matter but the relations in between, the intervals, the order of the blanks, which produce the universal order. All relationships are characterized by the intimacy they entertain to the unknown, the concealed, or the unconscious. In pre-Socratic Greece, the gods entered the stage of media thinking exactly through relations imperceptibly implemented in the code.

As generations of philologists before him, Kittler had conceived of gods as events of understanding or—as Roberto Calasso quoting Karl Kerényi—as the "happening of unveiling knowledge."[9] The order of things appears but suddenly: *jäh!* Following system's theory, the presence of a god could be considered as an "Aha!" moment, indecently extended in duration.[10] A scholar of Romance languages, Kittler clearly follows a tradition from Lautréamont to Mallarmé and Baudelaire, who had, as Calasso reminds us, addressed the occurrence of the unlikely as god, particularly on occasions of love. According to Kerényi, *theoria*, "seeing as the gods do", is a feast of truth's occurrence, simultaneously marking the boundaries of human knowledge.[11] Divine *theoria* complements human understanding in referring to the unknown or unconscious implied. In the acoustic realm of music, the unknown had been included in the structure of intervals, of octave, fifth, and fourth. This changed with Leibniz, who conceived of a divine force as analyzing and then synthesizing sounds as infinite summation of sinus waves: a divine Fourier-analyzer, avant la letter, as creator of worlds. Mermaids and mermen, as Hendrix observes, can leave the world polluted by "killing noise" to live and breathe among electric waves. Only humans are bound to perceive the order of things in a constitutive state of confusion—or, on music. Theoretically, it does make a difference whether one considers oneself human, god, or merman. Media theorists however tend to waver here. Nietzsche, in a famous note to Jakob Burckhardt, remarked that he would rather have been a professor in Basel than god in charge of creating a world. Kittler, in claiming that "we are mortal in the realm of time, while immortal in the field of frequency, in the field of Fourier,"[12] can absolutely be suspected of merman-ship, and actually long before the epistemic odyssey of his last books on music and mathematics in Greece.

CONTROL ROOMS

Georg Friedrich Wilhelm Hegel in his lectures on aesthetics conceives of music as elemental power—even force (*Gewalt*)—that seizes the subject involuntarily.[13] In a laudatory speech held in honor of Brian Eno in Berlin in 1998, Kittler, quoting Hegel, refers to music as something that mounts the body,

taking possession of the legs, submitting the subject to artificial temporal orders, rather in terms of the Voudoun and its children than in terms of a philosophy of mind.[14] According to Hegel, music is the Self in time, and time is the being of the subject itself: "*die Zeit ist das Sein des Subjekts selber.*"[15] Elegantly avoiding to talk on Being and Time, Kittler continues his laudation as a frontal attack on Brian Eno, whose studios were notoriously called control rooms. He politely informs the artist— who was envied for disposing over thirty-one tape-recorders in his studio—that his devices were straight out of the hell of German Intelligence (*Nachrichtendienst*). Connecting Eno to the unconscious of his technical toys, Kittler lets him know that they were designed to survey and intercept secret communication and the movement of submarines—to simulate sounds as if in the presence of bodies, to hide human voices in the noise of transference by scrambling, slicing, and mixing material according to frequency ranges—and that they had been used in Gestapo torture chambers.[16] In this lecture, Kittler's ambivalence over the effects of acoustic electronic media becomes obvious: they promise a liberation of the linear and literal age of Gutenberg, while they are, at the same time, borne out of war zones. Beyond any Hegelian dialectic, Kittler in his laudation draws the full circle of music as mathematics from Pythagoras's secret confederation to ambient music, stating that in the ages between these two events, music had just existed as paper work, an extended arm of some administrators of the ears. Like a meteorite, he claims, Pythagoras's art of sounds had hit the presence of digital composing: "Only the digital computer offers a language for sound which is able to capture all its fractal dimensions, analytically as well as synthetically, elementary and constructive."[17] Still, it is not altogether clear whether that meteorite had actually hit Eno. Black music and Afro-American jazz are credited for having been able to take advantage of the whole range of sounds possible in historical electronic media. They were the first—after Greek antiquity—to rely on the instrumental and technical production of sounds while ignoring the detour of written scores. Apart from a slightly ethnocentric undertone, this might also have offended Brian Peter George St. John Baptiste de la Salle Eno, the pale laureate. In his allegedly laudatory speech, Kittler actually challenges Eno to discover digitally designed sounds that would emancipate physical forces beyond the logics of 0 and 1, I and U, friend or enemy. Of course he grants Eno the honor of having composed an ultra-short piece of virtually eternal music: the Windows operating system's start-up sound, devised on Eno's Apple Macintosh. Although in light of Kittler's contempt for protected modes of software and iconic desktop design in general, this might have been an insult as well. Eventually, Eno is hailed for being among the few who, with the help of computers, were able to program all the sounds of the world. As some digital

revenant of Pythagoras, Eno was justly bestowed with an honorary professorship of Berlin's University of Fine Arts. But popularity of music, as Kittler puts it in his encomium, depends upon the degree to which it dares to immerse into its own technologies.[18] The power of music, in other words, is the effect of circular causalities, connecting historical techniques to historicized bodies. Kittler's speech remains a double bind by every trick in the book: He prompts the laureate to liberate computer music as an aesthetic force in its own right by producing music that takes possession of legs and other limbs, while simultaneously pointing to its origin in military equipment, *Heeresgerät*. The master of ambivalence meets the master of ambience. The satanic twist will not have escaped the audience listening: In music, the real of history seizes its subjects, physically and beyond prospective programs of professors. In an acoustic control room, it is not the sound that is controlled but the subjects.

The laudatory speech for Brian Eno seems symptomatic of Kittler's wrestling with a technical a priori of sonic perception. His own writings on music always reveal the reverse side of his relentless analysis of media's genealogy in war's production. The liberation of bodies cannot be separated from that of the devices they are connected or hooked to. In *Rock Musik—ein Mißbrauch von Heeresgerät*, Kittler systematically traces the audio aesthetics of the Weimar postwar years to experimenting with early radio in the trenches (World War I) and remote-controlled telecommunication to its birth in devices for Blitzkrieg tanks and bombers (Word War II).[19] He also shows that pop music's genealogy in wartime inventions is no secret but openly discussed in the texts of Hendrix, the Beatles, or Roger Waters—the latter born in 1943 and addressed as a war child double of Kittler's, his semblable and brother. With Waters, as with Foucault and Bataille, Kittler always points toward the outlines of a history of madness as constant *sotto voce* not only of pop music but in fact of media theory at large.[20] A form of being off-key marks Kittler's writings on sound and music. And his texts work a bit like pop music themselves, beyond a score, to be understood only in listening to their overtone structure, homonymies, implicit references, hints, and associations in nonsemantic phonetic allusions.

Kittler's pieces on music can be read as compressed versions of his theories on communication procedures. They are acoustic doubles of his philological prose. Some variation for voice, sound, and rhythm, some *canto* seems to accompany each of his works on media history. And they include the emotional enforcement that is missing in the philologically condensed writings. A concise version of the gramophone chapter of *Gramophone, Film, Typewriter*, analyses Pink Floyd's *"Brain Damage"* as a brief history of technical orders of sound. "Der Gott der Ohren" (God of the ears) is dedicated to "Rochus und die Insel," the same Rochus who drove the car to Italy, while tape-man Azzo was

"setting the controls for the heart of the sun," with its, as Kittler demonstrates, Phrygian intro and Sala-like exit.[21] The *Insel* (island) refers to both a famous Freiburg *rendez-vous* of friends as well all sorts of islands mentioned in Kittler's sound pieces, and eventually to music itself, an "island in the ocean of noise," as it is called in his studies on music and mathematics.[22] The merman, here, is back at land. In any case, readers need to listen in order to understand. And hearing in technical configurations is attributed to divine perception, notably mediated by the Greek Pan, an order of sound notoriously overstraining human ears and minds. Reconstructing sound cultures from Edison's gramophone to radio- and stereophonics and, as state of the art of the time, Syd Barrett's Azimut Coordinator, which could space out studios or stadiums at will, Kittler argues that pop musicians—experienced in doing calypso-like things and being familiar with their apocalyptic sides—had been media theorists all along in that they reveal the technical condition of all rapping and stepping gods.

Another translation of philological thought into sonic freestyle is the 1979 essay Lullaby of Birdland, dedicated to "Mimi." This prefigures his analysis of the discourse network of 1800 as a making of civil servants (*Beamte*) out of sleepy mother's sons and condenses it into a general analysis of a cultural technique called lullaby. Connecting poetic strategies from Goethe's wanderings and Brentano's Lorelei, Kittler demonstrates how male subjects are submitted to the soft voice of a mother and thus inaugurated into the pleasures of being addressed.[23] The dark side of the matter remains. In music as in poetry, a subject is whoever is addressed but by some nameless other: "Hey you, out there on your own . . . Du, da, on the mountaintop, warte nur, balde!" Beyond *Beamtentum* there is a lot of abyss.

The mothers who are singing, in turn, will have to discover that neither tune nor words on their lips, not even their voices, are properly theirs—they are "multipurpose devices" used to constitute the imaginary of national states.[24] Romantic writers will appropriate this voice and attribute it to hamlets and bushes. Richard Wagner will implement it into the technological real of frequency composing. With the new media and during the nineteenth century, the voice returns as the telephone's, the gramophone's, or the PA system's voice, empowered by the noises of electric circuits. Thus, as media users, we are all summoned to be civil servants. Subjected to his own education, Kittler misses one analytical turn of his quite gender-critical approach. Concluding his text with Charlie "Bird" Parker's "Lullaby of Birdland" in New York's fabled jazz club, he strangely ignores the intentional confusion of sigh and lullaby which Ella Fitzgerald begins with. As in the Schillerian "ach!" it is the same sighing Kittler has German classicism (*Deutsche Dichtung*) start with.[25]

The sound of sighs and music is the masquerade of relentless forces submitting boys to the discipline of civil servants. In spite of his relentless critique, Mimi's Friedrich was one of them. Dismissing academic prose for rhythmic poetic writing then is a serious form of civil disobedience.

Music is expressing the interior perception of historical media standards as martial standardization. Precisely in sound and music, the hallucinogenic effects of mediated data processing connect man to machine, nerves to pulses, libido to power, the real to the imaginary, and war to the bodies of war-born children. Kittler's music studies pay tribute to this vital confusion. It is the midday confusion of the great Pan, whose death, as Greek *logoi* had hit the shores of Italian swamps, he mourns according to Plutarch: "Ὁ μέγας Πὰν τέθνηκε" (The great Pan is dead).[26]

Pan, who rules Kittler's studies on sound, is the god of aural aphrodisian midday pleasures under a vertical sun—the vertical sun Friedrich Nietzsche had postulated as precondition of all clear thinking in *Ecce homo*, and the same vertical sun that hit Kittler in the nude, on the shores of the famous Baggersee near Niederrimsingen, slightly on the edge of civilization and strongly out of service, where he invented a new discipline with eyes squinted against the light. For Kittler, gods are coincidences of the interior perceptive apparatus with the world perceived of as aural presence, privileging the sonic perception of presence over visual logics: "Pan, a concavity of auricular space, has always been closer to the Great Goddess than all of her desperate lovers who kept chasing her but on the field of vision."[27] And Pan according to Kittler is both, lover and epistemologist, in linking aesthetic transformation to knowledge: "Only those who have ears can change and transform, that is: learn."[28] So much for didactics.

GREEKS AGAINST MONOTHEISM

Much of Friedrich Kittler's later writing on music is already present in very early texts, even the menacing turns. Taking his cue from Wagner—as from Hölderlin and Hegel—Kittler has always implemented the force of gods in their plural into his technically informed reasoning. Also, from the beginnings of his studies on media and epistemology, he had emphasized his dislike of those media which he referred to as nomads' mobility devices—Thora, Bible, and Quran—in their rigidity of securing immutable transmissions of texts and of commandments. As systems controlling interpretation and exegeses, the scriptures exclude variations and inventions of events which are the precondition for epiphanies of a variety of gods, men and women in their polymorphic intercourse.[29] In Kittler's theory, cross-traffic between the divine and the human, as mental and physical "Aha!" expressions of truth, is a matter of media

situations. It is provided through access and free permutation of signs and signals. The invention of the vowel alphabet then was the initial opening of free access to speech, as well as to musical relations. *Logoi*, as Kittler points out referring to his teacher Johannes Lohmann, are letters, numbers, and swinging strings as operational and operable relations. In free permutation, they produce real worlds.

Poetic thinking, then, requires unlimited access to and disposal over *logoi*, or code and algorithms, plus a bit of courage traditionally denied to professors, in Basel and elsewhere. In taking *techne* and *episteme* for an inseparable practice of art as knowledge, early Greek philosophy could be credited with having launched Europe's culture of sovereign, self-determined and fearless vocalizing of material signs and signals. Speaking, or rather singing as the ancient Greeks did, is to self-responsively pursue and perform knowledge, produce it, as in poetry. *Episteme* as *Wissenschaft*, scientific thinking as free disposal over signs, maintains Kittler, would have been unthinkable in the Testaments or the Quran.[30] From his earliest texts onward, monotheism is scathed not for theological but for aesthetic, epistemic, and political reasons—for demanding allegiance instead of *jouissance* and *fröhliche Wissenschaft*.

In his final work on music and mathematics, Kittler returns to the Pre-Socratics, in a fierce battle against what he perceives of as wars of monotheistic religions which globally endanger free and independent thinking: "wir stehen in offener Feldschlacht."[31] The calling to abuse military equipment against the laws of the letter goes to all media scholars. His warning, that contemporary warriors, who put themselves and others off with promises of afterworldly delights, might eventually destroy the only world we have to live in, sounds much less paranoid today than when Kittler wrote the book.

Kittler's world view of aggressive monotheisms endangering the multitude of ancient or electronically updated Greek gods, invokes a battle between Greek literature and the Old Testament, which James Joyce had sneered at between the World Wars as a very German frontier of languages, "oystrygods gaggin fishygods!," stretching it to Aristophanes's battle of poets and their metrics: "Brékkek Kékkek" against "Ualu! Quàouauh!"[32] This battle of consonant and vowel alphabets had culminated on the eve of German fascism, mostly in exile, prominently with Erich Auerbach's *Mimesis*. And indeed Kittler is implicitly following Auerbach and explicitly Harold Innis in presuming a general "straddle" between "Athens and Jerusalem," between a possible access to language, provided by vowel scripture—the Greek form of full being—as opposed to being exposed to torn forms of existence in a Jewish tradition of thought.[33] In line with this argument, Kittler also resumes a conflict of postwar French philology, most notably between Foucault and Derrida, discussing

exclusions and inclusions of speech and scientific formations through writing systems.[34] At this point he keeps criticizing "my friend Jacques" Derrida's work.[35] To Kittler, theorizing the fissure, as Derrida did, is denying the virtues of the Greek vowel alphabet as a means of disclosing a hitherto secret knowledge of language. Arabic and Semitic consonant-based writing systems, he objects, obstruct autonomous operations in language in that the proper pronunciation of words can only be learned from a master. The Greek alphabet in turn can record spoken and sung language, even dialects (*Mundarten*), peripheral forms of speech that operate with all kinds of sounds at will. In distinguishing Greek from monotheistic scriptures, Kittler obviously ignores all modern readings of monotheistic religions, which consider the fissures as symptoms for violence at their core—as Derrida did, in a close reading of Walter Benjamin's "Critique of Violence."[36] When Kittler is linking distinctions of writing systems to theistic models, mono- against polytheistic forms of speech and speaking, he is strategically applying media theory in its fundamental relation to the unknown. In his meticulous study of different Mediterranean writing systems, he shows that vowel alphabets are connected to further cultural techniques, including musical intonations and physical forms of movement, and that they provide access to academia in the Greek sense of studies, underlining that this access was irrespective of class or gender.

Kittler's interpretation of the vowel alphabet has been criticized by historians of writing systems as well as by media theorists.[37] Also, it has been observed that he is here following much of nineteenth century philology in a very Germanic undertaking. Hölderlin's verses of patriotic reversal resonate in Kittler's Greek studies, as well as Nietzsche, arguing against the Titanism of Goethe, who had tried to force the variety of gods into a single Promethean one. Nietzsche's effort was to advance the "renaissance of Hellenic antiquity, . . . in the hope of renewing and purifying German Geist through the fiery magic of music."[38] With respect for fiery magic, Kittler's project was rather to feedback German *Geist* through integrated circuits.

With regard to Martin Heidegger, more Germanic ventures seem to be in stock. *Musik und Mathematik* in its celebration of Pre-Socratic thought could also be read as an exhaustive remembering, repeating, and working-through of Heidegger's severe criticism of Plato's idealistic division of being, as well as his rehabilitation of Aristotelian *energeia* and finally his diagnosis of the loss of reason (*Grund*) in the Latin adaption of Greek philosophy. In his 1955 programmatic Cerisy-la-Salle lecture "Was ist das—die Philosophie?" for instance, Heidegger too has his Pan and postal moment, reminding us to "open our ear, uncovering it for that which speaks to us in the transmission of the *Sein* [be(ing)] *des Seienden* [of being]."[39] But while Heidegger assumes a single philosophical ear only, Kittler

conceives of human ears in their stereophonical plural as always linked to technical devices or sound systems. Considering present alphanumerical systems and their potential to construct or—more likely today—to destroy real worlds according to numbers and letters, Kittler is comparing societies who allow for open access to codes with societies who prohibit this or reserve it for a selected few. He parallels the Platonic and later the Roman disclosure of truth to the disclosure of knowledge in the privatization of algorithms as effected by imperialistic copyright laws of the new software empires. In advocating a return to the Pre-Socratic *logos*, he is advocating the appropriation of codes.

As invention of acoustic *theoria*, literally an oxymoron, Kittler's studies of music turn out to be in consistence with the epistemology of media studies at the turn of digital rule. Just as Platonic discourse networks had reduced the great Greek alphabet to a use of words that was forced to speculate on truth as in otherworldly ideas, present copyright and ownership of source codes have reduced us to users of a foreign langue of which we only occasionally feel the effects. Kittler's final books come full circle—from present cultures of numeric data processing, controlled by software industries and national intelligences, to the Greek disclosure of an alphabet accessible to all.

Kittler follows Nietzsche's or Heidegger's Hellenic aspirations, albeit under electronic conditions. The primacy of language is preserved, but today this also means performing or programming formal languages, construing a digitally informed world by numbers. In writing on music and in writing musically, the impact of sounds as forceful operations is again placed over the exclusive hegemony of sense. "Where logos for the first time, pronounces itself as word, it is simultaneously a magic of sound."[40] Hence Kittler's excessive praise of the vowel alphabet—conceived of as both disclosure of *logoi* and access to lingual operations in speech, sound, and living bodies simultaneously. The logics of free algorithms equal an alphabet that, instead of just describing the world, produces one—or many. Hence the ambivalent appreciation of Brian Eno as composer of algorithms who could produce secular sounds and physical relationships simultaneously: a despicable move if in the service of software empires is however welcomed in the fabrication of sex, drugs, and rock and roll, or, as Kittler quotes Jacques Lacan, "jazz, dance, and libido."[41] The Greek seems quite an extendable notion. Kittler celebrates the art of immersion into music in the age of algorithmic processing as a form of recursive thinking beyond concepts of soul or mind, subject or consciousness.

It is this stance, of course, that divides the followers of "the great man himself."[42] Kittler's books on music and mathematics may be understood as a return to an eternal Greece of copulating nymphs, a return to *aletheia* as an island in the sun, with superpotent Pan-men uncovering themselves and others, ready

to make love and reproduce, while, as in Parmenides, maidens lead the way. Unhiddenness here is celebrated as a state of pure being, peppered with a bit of Black Forest *Eros*.[43] Welcome to the *Seins*-machine. This is arguably a feasible interpretation. Klaus Theweleit has quickly choked this option in a meticulous recapitulation of Greek mythology as an endless series of rapes, with motherless children abandoned in caves and on mountaintops. *Warte nur balde*.[44] The recent cult of nymphomania in media studies is probably its most boring aspect, nevertheless the only field where joint ventures of *techne* and *episteme* have been successful within the cultures of elderly Faustian academic staff. But even to Kittler, nymphs were not merely young girls, maidens, imaginable as an endless reservoir of young bachelorettes to their professors but also a terrible and scary bunch, "furchtbar."[45] The state of being possessed and drawn into something unknown then, as Calasso describes the threat of the nymphs, resembles the dawning of a new *episteme*, exploring the technical condition of existence.[46] In or on music we can consider escaping the visual primacy of theory, risking the confusion of human perception in a world of frequency machines.

It is not the simple fact of providing sounds for meaning, as in vowels, which distinguishes the Greek alphabet from others. Kittler underlines that Pre-Socratic philosophizing is based on the free permutability of letters, numbers, and musical notes, thus opening access to *Sein* at large, which makes it unique: "Letters could be translated into numbers, numbers into notes, notes back into letters—a fundamental mobility on which the singularity of European culture was based."[47] With digital coding, this culture of Pythagorean philosophy resurfaces. Deciphering *logoi* as simultaneously organizing the tension and tone of strings as well as of bodies, of sounds as well as of waves, of instruments as well as of weapons, Kittler's last project is an exercise in singing the material world electric.

SPEAKING AS THE *LOGOS* DOES

Kittler's program of poetic thinking (*dichterisch denken*) includes poetic translations from the Greek. Translating itself, in Heidegger as in Kittler, is practiced as a procedure of disclosing.[48] In *Discourse Networks*, Kittler had insisted on distinguishing translating according to sense and hermeneutic from transposing, technically transferring signal for signal. In the Greek books, he develops strange combination of both. What seems far out in Kittlerian short hand—musical mimesis as making love of the gods[49]—proves to simply be a Heideggerian translation from Heraklit: the conjunction of *philein*, making love, and *omologein*, speaking *as* the *logos* does.[50] No coincidence then that Hendrix uses the same phrasing to introduce his studio work in *Electric Ladyland*.

A supposedly Greek tradition of *poetic thinking* in combining *logoi* as mathematical ratios is, despite Heidegger, not specifically Germanic in the sense of anti-Semitic. As Hannah Arendt brings to mind, the same thought is discernable in Walter Benjamin's poetology. Arendt quotes from his letters, "that each truth has its home, its ancestral palace, in language, that this palace was built with the oldest *logoi*, and that to a truth thus founded the insights of single sciences will remain inferior."[51] Even if this ancestral palace is to be favored over a Todtnau hut, both recover, in speaking according to the *logos*, a messianic force in language, *dits ou écrit*, against the grain of obedience, monotheistic or algorithmic. Kittler on music can be read as a practice of differentiating and multiplying distinctions—even if he contests difference *as such*. Poetic or musical writing on music can be read as an attack on institutionalized forms of thought, speech, and writing, as a commitment to free, responsible, and risky speech, *parrhesia*, as Foucault claimed.[52] This is the liberating aspect of Kittler's texts on music.

In poetic thinking and speech, Kittler's books on music and mathematics analyze the logics of *logoi* while immersing in their technological feedback, eventually following Hegel's command to subject themselves to historical technologies. In listening to music and its vibrations, states Hegel, who is in this case also referring to Pythagoras, human desires can be synchronized, concerted, and harmonized according to different ratios of vibrations.[53] Hegel emphasizes the possible fusion of instrument and human soul: "in virtuous playing, the external instrument will appear as a perfectly formed and appropriated organ of the artistic soul."[54] Programming sounds, tones, and colors on alphanumerically driven machines, as Kittler actually practiced it in resistance against source code politics of an industrial military complex, is to open doors for new forms of perception. "Today's scripture can generate images or sounds precisely because the difference between letters and numbers vanishes in the digital code."[55] At the same time, these experiments risk surrendering the subject to the logics of *logoi*, in that these are operational in themselves. Doing things with *logoi* is today mostly practiced in music: "Few things in the world are more algorithmic than music."[56] While music is the strongest form of rendering speech operational, speech and speaking will only be *omologein* if it opens access to its operational systems. *Omologein* means recursive speech. As the first to actually have practiced this, Kittler discovers Sappho.

In her songs, which Kittler carefully translated, the poet Sappho refers to the sources of her speech, letters as well as numbers and the intervals of the lyre. And she declares female nature to be a letter in which vowels and consonants are distinguished so that language can be transmitted as music.[57] Sappho, then, is a true source-maiden, a nymph, in other words, who reveals the source code while

she applies it. In antiquity Kittler traces poetics of circular causal thinking which, in the age of cybernetic machines, could rescue language from being petrified in the laws and orders of symbolic systems. This is not only true for the lyrics but also for the sound of the lyre. In meticulously diversifying, investigating, and, in fact, rebuilding manifold and little-known forms of Greek tuning and scales, Kittler explored and simultaneously aimed at multiplying experience—which is of course, to multiply gods. Quoting Aristotle he states that in different tonalities (*armonai*)—mixolydian, dorian, phrygian, and so on—"we pass through the scales of our attunements: grief/happiness, gentleness/rage, repose/enthusiasm, which musically enfold and emerge, even before '*logos*' intervenes."[58] It is here that Kittler's feedback circuit between Greek gods and the alphanumerical system of the computer generates new creatures that in his ode to sexual ontology he had not really factored: The fact that relations of bodies and instruments are calculable in real numbers, in all combinations of roots and radicals, ratios and irrationalities, would imply that not only sounds can be synthesized ad libitum, but gender too, as Wendy Carlos has aptly shown. While insinuating the effects alphanumerical operations have on social relations, Kittler, hooked to a universe of nymphs, might only grudgingly have accepted that chimeras and syncretic states will form the futures of our love lives. Here, the cosmic merman is back on the position of the sorcerer's apprentice, while "Walle! Walle!" has turned into the tender movements of Wall-e, trying to seduce artificial intelligence in discretely dancing on his chain-tracked feet.

At this point, however, it is probably necessary to distinguish a feminist strand of Kittler's in his historical reconstruction of inevitable links between poetry and knowledge. Beginning with the systematic destruction and banning of Sappho's writing, which Kittler explains with the fact that the great poetess had revealed the source of her art, Kittler continues to observe the exclusion of women from philosophy during the last two thousand years, until, with the advent of the digital age, they, or rather we, have again claimed and gained access to contemporary forms of knowledge. With limitations, quotas and more or less annoying procedures, this is even true for institutions like universities, at least as Basel professors, if not as gods. But a gender line seems to emerge elsewhere: between people who speak or write musically and those who submit to a limited set of prefigured prose, between those who reveal the sources of their writing and those who conceal it. Writing musically himself, Kittler in his books demonstrates the operational effects of language as love's labor recovered. In intimately addressing a muse that is meandering between hallucinated nymph and empirical lover, between Kirke and (anagrammatically) Erika, his last texts on music are lyrical operations in their own right.

But there is also a threat to the operational effects of language. Appropriated by warlords, logics of *logoi* have ever since proved to be effective weapons. These extend from a structural similarity of bow and lyre to Turing machines as devices of destruction. In this respect, then, the volumes of *Musik und Mathematik* can also be read as a search for the last exit off the highway of occidental thinking, an exit from Europe's death drives, which is meanwhile autopiloted by commercial rule on languages and their sources. Read as critique of academic thinking or theory, Kittler on music is first and foremost defying academic fealty as *Gefolgschaft* (following). Poetic thinking is to defy commandments as well as commands, biblical or computer imposed.

RETURN TO MEDIA THEORY

Any text is a test or trap to its readers. Friedrich Kittler's books on music and mathematics may arguably be read as a return to ontology, toward a philosophical discourse of being, in terms of fixed numerical, cosmological, and gender relations. Most probably, Kittler himself would have chosen this reading, and, remembering the acid commentaries he had in stow for Foucault's later books on Greek Antiquity, it might have been a relentless critique. Likewise, Kittler's books on music may be read as a return to ontology in terms of computer science, a description of being in terms of a set of calculable relations. Current codes, then, are traced back to the ontological tetraktys of 1:2, 3:4, 4:5. From there, Kittler could be read as studying the unfolding of sonic spaces or, ontologically speaking, the opening of worlds, in their historical formations of intervals, frequencies, analogue synthesizing, or digital programming. In this reading, his books would eventually discover all those not altogether controllable consequences of signal processing such as interferences, feedback, and space distortion. In fact, all his writings on music follow this trajectory in more or less detailed and technically informed studies, expanding from the tuning of Sappho's lyre to Pink Floyd's Azimuth Coordinator topologically deforming quadrophonic spaces. Sonic devices produce sonic events. However, the interesting twist of Kittler on music is, that this story is neither linear nor technologically deterministic. The surprising discovery of Kittler on music is that feedback occurs already in the field of Pan.

Consequently, cognition in the acoustic field does not rely on diligent studies of blueprints and protocols only, but requires perceptive duration, a bit of hanging out in the midday sun, listening to the sound of crickets, in ruins of Greek theaters or in radio plays of Ingeborg Bachmann: "*nichts Schöneres unter der Sonne, als unter der Sonne zu sein*" (nothing more beautiful under the sun than being under the sun).[59] But Pan is also a relentless god and dozing off in the

open at noontime can be a risky project, specifically for Germanic types. Thus, the books on music and their sounds have unsettled some basic assumptions connected to what has institutionally been termed New German Media Theory, even causing a bit of panic in the meanwhile settled community of its scholars.

A first message of Kittler's writings on music is that we are consigned to the acoustic world with our ears as with all skin and bone, membranes and mechanics of transmission. We cannot but live in an ocean of vibrating waves. Kittler's studies on sound and music prove that any notion of a technical a priori is certainly not a matter of technical determinism; rather, it concerns the difficulty of understanding the circular logics of aesthetics as a hitch of all media studies: the fact that any technological environment which we would like to explore includes us in all our physis. Studies of sounds specifically reveal the epistemological difficulty that there is no acoustic equivalent to the blind spot, which, according to Heinz von Foerster, allows for exiting and reentering aesthetic systems. The blind spot in the visual field points toward possible second-order observance—toward an epistemological Off, albeit as blank or negative space. In sonic worlds, there is no second order. Even an epistemology of disturbance and glitch turns into an irritating positivity in the ocean of waves. Signals, disturbed or not, seduce the listener to immerse into the world of constitutively confused perception. Thus, the specific problem of technical media—that they constitutively operate subliminally, below the threshold of conscious perception—turns out to have been a problem of music and listening cultures all along. The structure of soundscapes cannot be analyzed in simply understanding the anatomy of technical media; the concavity of the ear reminds us that architectures of sound include bodies and brains as spaces of resonance.

Secondly, in sound studies specifically, the effects of aesthetical procedures are not altogether calculable. Kittler's mathematical mind conceives of complex sounds as logics of numbers, even condensing a complex phenomenon like modern music on only two basic formulas: "Modern music is based on two contradictory principles, tempering and harmonics, the linear integer multiples and exponential multiples."[60] However, the space of resonance, interferences, and feedbacks—their chain of reaction—is never completely terminable. The sonic world is a world of effects. Practices of playing and composing as well as material qualities of instruments and devices all interfere with nonlinear logics of acoustics, never fully controlling them. The production of possible sounds in an algorithmic combination of numbers is eventually infinite, and thus transcends the symbolic world of the machine. Instead of following Leibniz in attributing this infinity to a singular god, Kittler conceives of a diversified pantheon, transmitting all sorts of mental and physical states. Therefor this pantheon is not conceived of as otherworldly authority but as of presence or at least an oncoming return of this presence: *das Nahen der Götter*. It is here that Kittler is defying deconstructivist criticism of scripture and writing. It is not an inherently metaphysical stance of language itself—written, spoken, or in technically recorded abstractions—which forms a threat to political criticism, but the institutional and commercial inhibition of a free poetic access to language. For Kittler it is first and foremost academic forms of prose, written or spoken, that execute a sort of self-inflicted impotence on the basic power of language. Similarly, digitally composed music has to wrench its algorithmic mixtures from the clenches of industrially concealed source codes and copyrights.

Probably the most important aspect of Kittler on music, then, is the call for intervention. Unfortunately, the term *empowerment* is much too close to *Machtergreifung* to be feasible here. Language is a matter of elegant moves, on tail fins, track chains, or metrical feet. Words, as all sounds, are not representations but productions of new and unprecedented physical spaces. With their help, limits and constraints can be displaced. In a conversation with Peter Weibel, Kittler outlines the simple task of media theory: "Actually we would have to verify for every historical age what the options were for breaking the circuit."[61] This basically means making differences where none had been before, operating with them to engender sounds, and listen to the effects of the many elements that had not been taken into account before. Then the sea is straight ahead. Well, it's too bad that our friends, mortal in the realm of time, can't be with us today. In the realm of frequency then, they will be.

NOTES

1. "aber noch / Tost die Welle, die mich / Untergetaucht / Im Ohr mir und mir träumt / Von des Meeresgrunds köstlicher Perle." Friedrich Hölderlin, "Der Rhine II," in *Sämtliche Werke und Briefe*, vol. 1, ed. Jochen Schmidt (Frankurt am Main: Deutscher Klassiker Verlag, 1994), 723.

2. Christian Morgenstern, *The Great Lalula and Other Nonsense Rhymes* (New York: Putnam, 1969).

3. Friedrich Kittler, *Das Nahen der Götter vorbereiten*, foreword by Hans Ulrich Gumbrecht (Paderborn, Germany: Wilhelm Fink Verlag, 2011).

4. Gottfried Wilhelm Leibniz, *Principles of Nature and Grace Based on Reason*, implicitly referred to in Friedrich Kittler, *Und der Sinus wird weiterschwingen: Über Musik und Mathematik* (Cologne: Verlag der Kunsthochschule für Medien, 2012), 33.

5. Friedrich Kittler, *Musik und Mathematik*, Bd. 1, *Hellas*, Tl. 1, *Aphrodite* (Paderborn: Wilhelm Fink Verlag, 2006), 337.

6. Friedrich Nietzsche, *Nietzsche contra Wagner: Aktenstücke eines Psychologen*, in *Sämtliche Werke, Kritische Studienausgabe*, vol. 10, ed. Giorgio Colli and Mazzino Montinari (Berlin: de Gruyter, 1980).

7. Friedrich Kittler, "Der Gott der Ohren," in *Das Schwinden der Sinne*, ed. Dietmar Kamper and Christoph Wulf (Frankfurt am Main: Suhrkamp, 1984), 140–55.

8. Kittler, *Musik und Mathematik*, 1.1:283–89.

9. Karl Kerényi, *Antike Religion* (Wiesbaden: Langen Müller Verlag, 1971), 105. Also quoted by Roberto Calasso, *Die Literatur und die Götter* (München: Carl Hanser Verlag, 2003).

10. Dirk Baecker, *Form und Formen der Kommunikation* (Frankfurt am Main: Suhrkamp, 2005), 19.

11. Kerényi, *Antike Religion*, 109.

12. Kittler, *Und der Sinus*, 48: "Gott ist der große Fourier-Analytiker und ich habe ja immer gesagt, im Zeitbereich sind wir sterblich und im Frequenzbereich, im Fourierbereich, sind wir unsterblich. Denn der Sinus ist älter als Jahwes und Elohims Schöpfung. Und der Sinus wird weiterschwingen, wenn dieses Universum in Schutt und Asche gefallen ist, um es mit Horaz zu sagen."

13. G. W. F. Hegel, *The Philosophy of Fine Art* (London: Bell and Sons, 1920), 3:363: "The peculiar power of music is an *elementary* force, that is to say it lies in the element of tone, in which the art here moves. (ßß) The individual is not only carried away . . . but, viewed simply as self-conscious subject, the core and centre of his spiritual existence is interwoven with the work and himself placed in active relations with it."

14. Friedrich Kittler, "Bei Tanzmusik kommt es einem in die Beine." Lecture on the occasion of the 01-Awards 1998 to Brian Eno during the second Multimedia Forum, Berlin November 20, 1998, http://hydra.humanities.uci.edu/kittler/eno.html.

15. Hegel, *Philosophy of Fine Art*, 156.

16. See Kittler, *Musik und Mathematik*, Bd. 1, *Hellas*, Tl. 2, *Eros* (München: Fink Verlag, 2009), 219. Kittler also spared Eno the fact that the tapes for these machines were produced by IG Farben.

17. Kittler, "Tanzmusik."

18. Ibid.: "Die Musik, die wir heute ehren, lehrt andres. Sie lehrt, frei nach Hegel, daß eine Kultur nur so populär ist, wie sie sich in ihre Technologien zu verlieren getraut."

19. Friedrich Kittler, "Rock Musik—ein Mißbrauch von Heeresgerät" [1991], repr. in *Die Wahrheit der technischen Welt*, ed. Hans Ulrich Gumbrecht (Frankfurt am Main: Suhrkamp, 1984), 198–213.

20. Kittler, "Der Gott der Ohren," 146: "Thus the history of the ear in the age of its technical blastability is always already the history of madness."

21. Ibid.

22. Kittler, *Musik und Mathematik*, 1.1:60.

23. Friedrich Kittler, "Lullaby of Birdland" [1979], in *Die Wahrheit der technischen Welt. Essays zur Genealogie der Gegenwart* (Frankfurt am Main: Suhrkamp, 2013), 41–59.

24. Ibid., 48: "The soft voice of the mother is a multifunctional device." "Die sanfte Stimme der Mutter ist ein Vielzweckgerät."

25. Kittler, *Aufschreibesysteme 1800/1900*, 11. Schiller's distich "Sprache," "Spricht die Seele, so spricht, ach! Schon die Seele nicht mehr" is only implicitly quoted, relying on the education of literature students and, to no avail, on those of commissions who judge *Habilitationen* (postdoctoral theses).

26. Plutarch de defectu oraculorum ("Vom Verschwinden der Orakel"), 17 [419C].

27. Kittler, "Der Gott der Ohren," 140: "Pan, eine Wölbung des Ohrraums, war der Großen Göttin immer schon näher als all ihre verzweifelten Liebhaber, die sie nur im Sehfeld jagten."

28. Cf. Kittler, *Musik und Mathematik*, 1.2:187: "Nur die Ohren haben, können anders werden, nämlich lernen."

29. Cf. Kittler, "Rock Musik," 199.

30. Cf. Kittler, *Und der Sinus*, 14.

31. Kittler, *Musik und Mathematik*, 1.1:113.

32. James Joyce, *Finnegans Wake* (New York: Penguin, 1999), 4.

33. Friedrich Kittler, "Schrift und Bild in Bewegung," in *Short Cuts* (Frankfurt am Main: Zweitausendeins, 2002), 89–106, 90.

34. See Ute Holl, *The Moses-Complex* (Chicago: University of Chicago Press, 2017), 56–70.

35. In a summer 2010 lecture, Kittler emphasized the epithet. See Friedrich Kittler, "Götter und Schriften rund ums Mittelmeer. Transskript einer Seminarsitzung im Sommersemester 2010," in Kittler, *Technik oder Kunst? Tumult: Schriften zur Verkehrswissenschaft*, ed. Walter Seitter and Michaela Ott (Wetzlar, Germany: Büchse der Pandora, 2012), 137.

36. See Jacques Derrida, "The Force of Law: The Mystical Foundation of Authority," in *Acts of Religion* (New York: Routledge, 2002), 230–98.

37. A concise overview is given in Michaela Ott, "Philebos Erbe," in Kittler, *Technik oder Kunst?*, 91–99.

38. Friedrich Nietzsche, "Die Geburt der Tragödie aus dem Geist der Musik," in *Sämtliche Werke: Kritische Studienausgabe in 15 Bänden*, ed. Giorgio Colli and Mazzino Montinari (Berlin: de Gruyter, 1999), 1:131.

39. Martin Heidegger, *Was ist das—die Philosophie?* (Pfullingen, Germany: Neske, 1952), 34: "unser Ohr, öffnen, freimachen für das, was sich uns in der Überlieferung als Sein des Seienden zuspricht." On the difficulty of translating Heidegger, see Miles Groth, *Translating Heidegger* (New York: Humanity Books, 2004). Concerning translations of and in Heidegger, see Parvis Emad, "Heidegger and the Question of Translation. A Closer Look," in *Studia Phaenomenologica*, *Romanian Journal for Phenomenology*, vol. 10 (2010), 293–312. Emad is specifically discussing Heidegger's Cerisy-la-Salle seminar which accompanied the lecture mentioned.

40. Kittler, *Musik und Mathematik*, 1.2:65.

41. Cf. Friedrich Kittler, "Die Welt des Symbolischen—eine Welt der Maschine," in *Draculas Vermächtnis. Technische Schriften* (Leipzig: Reclam, 1993), 59. Mai Wegener has shown that Kittler here is in fact twisting a Hegelian argument of Lacan's. See Mai Wegener, "Radikalisch entkoppelt," in Kittler, *Technik oder Kunst?*, 79–82.

42. Cf. Tom McCarthy, "Kittler and the Sirens," *London Review of Books* (blog), November 9, 2001, www.lrb.co.uk/blog/author/tom-mccarthy/.

43. Cf. *"Mein liebes Seelchen!" Briefe Martin Heideggers an seine Frau Elfride 1915–1970*, ed. Gertrud Heidegger (Munich: Deutsche Verlagsanstalt, 2007), 264.

44. Cf. Klaus Theweleit, *Buch der Königstöchter. Von Göttermännern und Menschenfrauen. Mythenbildung, vorhomerisch, amerikanisch* (Frankfurt am Main: Stroemfeld/Roter Stern, 2013).

45. Friedrich Kittler, *Isolde als Sirene, Tristans Narrheit als Wahrheitsereignis* (München: Fink, 2012), 25.

46. Calasso, *Die Literatur und die Götter,* 34.

47. Kittler, "Schrift und Bild in Bewegung," 92: "Buchstaben ließen sich mithin in Zahlen, Zahlen in Noten und Noten wieder in Buchstaben übersetzen—eine fundamentale Beweglichkeit, auf der die Einmaligkeit der europäischen Kultur wahrhaft beruht hat."

48. Cf. Hans Ulrich Gumbrecht on Kittler's translations of "Folie Tristan," in Hans Ulrich Gumbrecht, "Tristans Narrheit als Wahrheitsereignis: Über zwei späte Texte von Friedrich Kittler, die Seinsgeschichte freilegen wollen," in Hans Ulrich Gumbrecht and Friedrich Kittler, *Isolde als Sirene* (Munich: Fink Verlag, 2012), 17. Translation in chapter 2 of the present volume.

49. Kittler, *Musik und Mathematik,* 1.2:127: "Götter machen Liebe vor, wir Sterblichen sie nach. Und das heist Mimesis, nichts sonst."

50. Cf. Martin Heidegger, *Der Ursprung des Kunstwerks,* 21.

51. Cf. Hannah Arendt, quoting from Walter Benjamin's letters, in Hannah Arendt, *Men in Dark Times* (San Diego, New York, London: Harcourt Brace Jovanovich, 1955), 201.

52. Michel Foucault, *Fearless Speech,* ed. by Joseph Pearson (Los Angeles: Semiotext(e), 2001).

53. Hegel, *Philosophy of Fine Art,* 385–86.

54. Ibid., 429: ". . . so erscheint in dieser Virtuosität das fremde Instrument als ein vollendet durchgebildetes eigenstes Organ der künstlerischen Seele."

55. Friedrich Kittler, "Meine Theorie ist gar nicht so lebensverbunden, um über alles zu reden. Gespräch mit Peter Weibel" [1992], in *Short Cuts,* 81: "Die Schrift von heute dagegen kann Bilder oder Töne generieren, eben weil der Unterschied zwischen Buchstaben und Zahlen im digitalen Code verschwindet."

56. Kittler, *Musik und Mathematik,* 1.2:213: "Kaum etwas ist auf der Welt ist algorithmischer als die Musik."

57. Kittler, *Musik und Mathematik,* 1.1:163. See also Jacques Derrida, *La carte postale: de Socrate à Freud et au-delà* (Paris: Flammarion 1980). I thank Erhard Schüttpelz for making me aware of the fact that Derrida here is also referring to and processing James Joyce's *Finnegans Wake.*

58. Kittler, *Musik und Mathematik,* 1.2:188

59. Ingeborg Bachmann, "To the Sun," in *Encounter* 22, no.4 (April 1964): 32.

60. Kittler, "Und der Sinus," 37: "Neuzeitliche Musik beruht auf den zwei widerprüchlichen Prinzipien der Temperierung und der Obertönigkeit, auf den Prinzipien der linear ganzzahligen Vielfachen und der exponentiellen Vielfachen, und spielt das alles, im Unterschied zu der griechischen Musik, zusammen."

61. Friedrich Kittler, "Gespräch mit Peter Weibel," 85: "Eigentlich müsste man zu jeder gegeben historischen Zeit prüfen, wie ihre Umschaltmöglichkeiten funktioniert haben."

16

THE TRACK OF THE FLY

On Hearing and Animality in the Age of Technical Media

Bernhard Siegert

> BRAIN SAYS STRANGE THINGS NOW
> —André, on a typewriter in *The Fly*

The histories of media Friedrich Kittler was interested in had never been prehistories or early histories of media; neither was he interested in the development, distribution, and blackboxing of media. He was not interested in the history of *media* but in the *history* of media. In the terms of David Wills: It is the question whether we face the media and bring them in front of us as represented objects of the world and our analysis, or whether we have them in our back, as something that moves and mobilizes us as if from behind and so technologizes ourselves.[1] Asked about his attitude toward interpretation or understanding, Kittler once said, a good interpretation for him consisted of finding the "manual" (*Handbuch*) or the algorithm that was behind or in the back of literary texts or other artworks of Western culture that officially had been ascribed to the Spirit, Nature, or the Muses. Whether he was writing on literature, music, media, or the cultural history of numbers—Kittler always had been a codebreaker. Hence, there is a basic assumption in the background of many of his writings, that the fictionality of literary characters or the ideality and generality of philosophical concepts is only a trick that intends to conceal a factual singular individual, a factual historical event, or a factual contingent desire. This had nothing to do with narrow-minded positivism. It had to do with the Nietzschean project to replace the masks of ideality, humanity, truth, or the Spirit with the historical facticity of discourses, desires, and technology.

In this sense, what follows is a history of dorsal media. There are some undisputed facts about Kittler—for example, that he preferred manipulating