David J. COCKSEY[1]

TRANSLATING SOUND: SOVIET GUITAR ELECTRONICS

[1] PhD, Professor,
J.-F. Shampolion University Centre (Albi, France)
davidcocksey@mail.ru

Abstract

The sounds which constitute music may in themselves be considered as conveying meaning, insofar as they are a key factor in the listener's apprehension of any given work. Specific sounds, including certain types of "noise", evolve in a similar way to accents, within and sometimes beyond identifiable geographic boundaries. They may thus be viewed as a parameter in the intercultural communication of musical meaning.

The verbal and visual means by which sounds may be represented constitute both a metatext and an intersemioticity which are further complicated through translation when terms, schematics or indeed components are adapted to meet the needs of foreign users. The article addresses these questions through examples from the field of electric guitar effects and their adaptation for the Soviet market in the 1970s.

Keywords

Sound, noise, electronics, semiotics, translation, loan words, lexicology, USSR.

DOI: 10.21684/2411-197X-2016-2-4-24-34

The article published by the present author in this journal three years ago [5] suggested considering the circuitry of electronic musical instruments as a form of discourse, a non-verbal means of creating meaning through the organization of specific types of components. The text below builds on this idea by examining how the form of meaning in question transits between cultures. Since meaning can be approached from the point of view of reception or production, the latter will be the focus of this study. Production and reproduction in this context are underpinned by metatextual systems of verbal and non-verbal representation, which are further complicated when

Citation: Cocksey D. J. 2016. "Translating Sound: Soviet Guitar Electronics". Tyumen State University Herald. Humanities Research. Humanitates, vol. 2, no 4, pp. 24-34.
DOI: 10.21684/2411-197X-2016-2-4-24-34

a language transfer is involved. The translation of sound from English into Russian will enable us to illustrate these points.

Meaning in music is, in the first instance, linked to melody. Following Leonard Meyer's 1956 work *Emotion and meaning in music*, music theorists consider this meaning to derive from "subjective tension arising from uncertainty" [6] on the part of the listener concerning the transitions between notes. Like notes themselves, noise may also be viewed as a basis for composition; in 1916, the Italian futurist composer Luigio Russelo published the *Art of noises*, in which he classified sounds such as hissing, scraping and thundering with regard to their aesthetic potential [14]. Technically, most modern amplified popular music integrates noise in the form of "communicative noise" [17], i. e. intentional distortion of the instrument's signal during the amplification process. This "noise" is inherent in the notes as they are heard, and as such constitutes a second, parallel vector of meaning. It may be suggested, through an analogy with verbal discourse, that the apport of noise is similar to that of accents in oral speech [11], which influence the listener's perception of semantic content: in the words of Giles and Powerland in *Speech style and social evaluation*, we "construct impressions <…> from whatever information is available" [13]. A melody played on a lightly or heavily distorted amplified guitar will give rise to differing connotations and interpretations, in the same way as an utterance made with an RP, foreign or regional accent. Just as accents may be approached through phonology, to better understand musical noise, we may turn to electronics.

While accents can be characterized in terms of phonemes and prosody, the basic principle of instrument amplification implies considerations of clarity (or lack thereof), frequency and interval. These give rise to specific types of circuits, such as distortion, modulation and delay. Within each type, a handful of distinctive designs have, like accents, attained particular prestige among users, and have given rise to obvious reproductions and more subtle derivatives. This process occurs over time and, in the case of electronics, on an international scale. For example, one of the UK's first and foremost amplifier manufacturers, Marshall, initially produced adaptations of the American Fender Bassman [9] based on locally-sourced components (notably EL34 valves) which brought with them distinctive distortion. This particular evolution took place, broadly speaking, against a common background of Anglo-Saxon language and culture, resulting in a distinction, now commonplace among musicians, between the "American sound" (6L6-based Fender designs) and the "British sound" (EL34-based Marshall and EL84-based Vox designs).

In musical contexts, the verbal descriptor "fuzz" designates, with the aid of the onomatopoeia [z], another type of distortion. A seminal example of this effect can be heard at the beginning of the Rolling Stones' "Satisfaction". Units producing this sound were first commercialized in approximately 1965 [1], bearing self-explanatory names such as Fuzz Tone, Fuzzy, Fuzz Face, Fuzz Bug, or the less transparent Tone Bender or Distortion Booster, itself marketed as a "tone-bending unit".

Behind the diversity of the names previously mentioned, associated with various brands and cosmetic designs, there are two basic circuit models with a number

Fig. 1. Three 1960s fuzz units. The lettering on the Fuzz Tone (left) induces visual distortion

Рис. 1. Три фузз-усилителя из 1960-х. Написание на Fuzz Tone (слева) имитирует визуальное искажение

of variants[1]. The diagram on the left in Fig. 2 shows the three-transistor design characteristic of the Fuzz Tone, and the other the two-transistor design of the Fuzz Face. The name ToneBender is associated with both approaches.

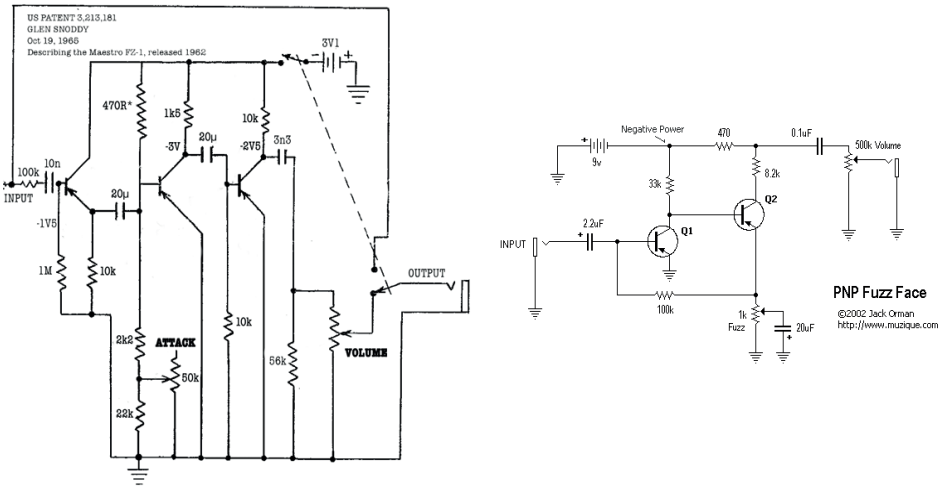

Fig. 2. Fuzz Tone (FZ-1) and Fuzz Face circuit diagrams

Рис. 2. Электрические схемы Fuzz Tone (FZ-1) и Fuzz Face

[1] In-depth technical analysis of these circuits, a research subject in itself, can be found in online resources [12; 18; 19].

Two remarks should be made at this point: firstly, the descriptive names by which the units are designated, a verbal paratext in relation to their electronic content, create a certain degree of confusion, and are of only limited use in determining the sound they are likely to produce. This information is better obtained visually from their respective schematics. Secondly, to return to the accents comparison, the derivative dimension between the circuits indicates similar but subtly different means to a given sonic end.

The Бустер (Fig. 3) pedal, made in Kazan in 1977, is housed in an angled case esthetically reminiscent of the Fuzz Tone. The name «Бустер» suggests a simple increase in volume, but is used in the same sense as on the Vox Distortion Booster, in that it is a booster *of* distortion, which might equally be called a fuzz unit. The circuit diagram, meanwhile, shows the Бустер to be a distant cousin of the three-transistor Fuzz Tone, "an original design" [4] also drawing on the two-transistor architecture. Rather than a copy, it is a variation on a theme.

In addition to circuit layout, certain individual components also contribute to characterizing sound. While resistors or capacitors of a given value are indistinguishable, transistors may be substituted within the range of certain common parameters. These parameters are typically presented as in Table 1, which shows similarities in, and differences between, some of the transistors used in the pedals previously mentioned.

This data, in particular the material and the forward current transfer ratio, make it possible to predict certain characteristics of the sound a unit is likely to produce. A further aspect of legibility is noteworthy: Russian transistors are coded by amplification factor (h_{FE}) [8] А Б В Г etc., enabling the selection of a component in a desired range and thus avoiding individual testing of an unsorted batch as with Western models. The two Russian examples in the table, those used in the Бустер, were, at the time, specific to the Soviet Union, although today they are increasingly sought-after in the West. The Dunlop Bonamassa Fuzz Face, a signature version of the classic circuit released in 2011, boasts, in the words of its manufacturer, "Hand-wired circuitry with matched NOS Russian military germanium transistors" [10]. A glance inside the pedal confirms the presence of a мп39б, the same as was used in the Бустер, a гт308б, and minor circuit changes beyond transistor substitution.

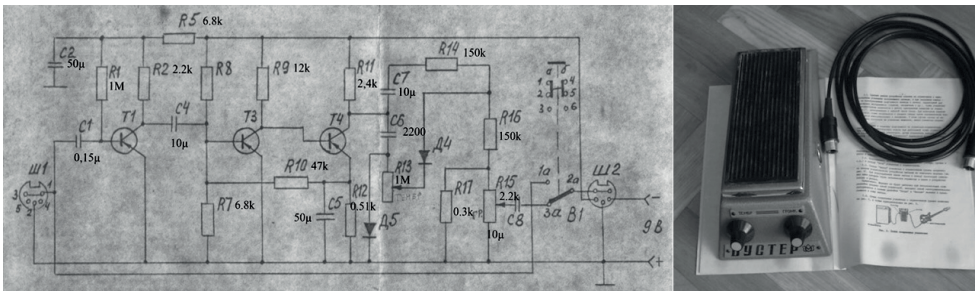

Fig. 3. Бустер and its circuit diagram

Рис. 3. Бустер и его электронная схема

Table 1

Common fuzz pedal transistor specifications

Таблица 1

Общие характеристики транзисторных педалей с фузз-эффектом

Type Designator	**OC75**	**OC44**	**2G381**	**NKT275**	**AC128**	**SFT337**	**мп39б**	**мп42б**
Material of transistor	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge
Polarity	PNP	PNP	PNP	PNP	PNP	PNP	PNP	PNP
Maximum collector power dissipation (Pc), W	0.125	0.083	0.25	0.2	1	0.15	0.15	0.2
Maximum collector-base voltage (Ucb), V	20	15	20	15	32	15	15	15
Maximum collector-emitter voltage (Uce), V	20	12	20	15	16	15	15	0
Maximum emitter-base voltage (Ueb), V	10	12	3	5	10	9	5	0
Maximum collector current (Ic max), A	0.01	0.01	0.5	0.25	1	0.1	0.15	0.15
Maximum temperature (Tj), °C	80	80	85	90	100	85	85	85
Transition frequency (ft), MHz	0.1	8	1	0.5	1	1	0.5	1
Collector capacitance (Cc), pF	50	12	50	60	200			
Forward current transfer ratio (hFE), min	55	100	75	30	45	100	20	45

Data source: http://alltransistors.com

Источник: http://alltransistors.com

While the "new old stock" argument carries weight — period parts are valued by audiophiles — globalization has resulted in an inversion of the initial paradigm. Whereas Soviet production initially took inspiration from Western musical electronics companies, the latter progressively looked to the East to perpetuate prior expertise. By the first years of the 1990s, Marshall's EL34 valves came from Czechoslovakia; when the fall of communism interrupted the supply, the company modified their designs to accommodate Russian 5881s as replacements [16]. Most valve production today takes place in Czechoslovakia, Russia and China [7].

The language of electronics extends well beyond the scope of the present paper, but it is apt to mention that circuit diagrams which represent the Russian designs mentioned here constitute in themselves an interesting example of the coexistence of semiotic codes. While the basic graphic conventions of circuit diagrams are international, a visual means of communication based on icon and symbol, verbal elements are also present. The schematic seen above in Fig. 3 uses two alphabets, the Latin for resistors (R) and capacitors (C), and the Cyrillic for штекер, трансистор, диод, and вольт, all of which, incidentally, are loan words, the first one from German and the following three from English. Transistors on Anglophone circuit diagrams are typically abbreviated not as *T* but *Q*. A further example of such cohabitation between different codes can be observed with regard to the amplification factor (h_{FE}) mentioned above. Amplification factor in Russian is expressed as h21э, an alphanumeric term using both the Latin and Cyrillic alphabets. The English abbreviation h_{FE}, "Hybrid parameter forward current gain, common emitter", is rendered in Russian by the Latin "h" designating the hybrid parameter model [3], the 2 and 1 referring to the collector and base terminals as numbered in that model, and the Cyrillic э to common emitter configuration. Rather than calque the English abbreviation, the Russian term in fact includes an abridged, conventional form of the equation to which it refers: h_{FE}=forward current gain=collector current (2) x base current (1).

The vocabulary used to designate effects, pedals and their parameters constitutes an interesting case study in the use of English loan words in Russian. The processes through which foreign words entered the Russian language in the 1970s were addressed by Victor Lychyk [15] in an article from 1994. His findings were that isolated loan words were rendered based on graphic or, increasingly, phonetic considerations. Morphological adaptation was less frequent. Calques and semi-calques were defined as "complete or partial loan-translations" of set expressions of two words or more. Lychyk also identified the spheres of science, technology and industry, and art, culture and entertainment as providing, respectively, the greatest and third greatest number of loan words. This was coherent with the findings of Morton Benson, who remarked in 1959: "Borrowings will naturally be concentrated in those spheres of activity where one nation's prestige has been high" [2]. The degree of lexicalization necessary for a foreign word to be considered a loan word is of course debatable: general press and literature surveys, technical dictionaries and specific social groups will all produce different results in this respect.

A survey of thirteen Soviet-era guitar effects units[1] yields the vocabulary presented in Table 2.

These effects units exhibit an interesting variety of lexical and traductorial solutions to the problem of designating sound, and, by the same token, of naturalizing elements of foreign culture sometimes only recently lexicalized in their source languages. The data suggests that the field of music electronics conforms to the lexical trends identified by Lychyk: it is linked both to "fashionable" popular culture and technology. Out of 35 words, 23% are Russian, 37% are of foreign origin but already present in Russian in other contexts, 9% are partial translations into Russian, and 29% are phonetic or graphic borrowings specific to this context. Only one of these undergoes slight morphological modification: "distortion" acquires a final и as «дисторши». Among these terms, one may note the instability of the Russian transliteration of "phaser" and "fuzz", and the onomatopoeic «квакер» for "wah". The semi-calques are few but interesting: «роктон» is used as a descriptive synonym for distortion, based on the style of music with which the latter is most often associated. «Синхровау» is chosen to render "auto-wah", stressing the supposed rhythmic use of the effect rather than its automaticity as in English. «Квазихор» is an unusual descriptive construction that one might be tempted to re-translate as "multi chorus" or "virtual choir". In actual fact, the unit is a flanger, which, technically, belongs to the same family of modulation circuits as the chorus. «Вибрато» is used rather than «тремоло»; in Italian or English, vibrato is generally a modulation of pitch, and tremolo, of volume. The same reversal exists in English, but for guitars rather than effects: the device for changing the pitch of guitar strings is commonly referred to as a tremolo arm, although it in fact induces vibrato.

The majority of the words (column four of the table) follow a similar process in Russian as in their source languages: they are extended to music technology after entering the language through other fields, either recently or in a more distant past. Some may have passed through intermediary languages over the centuries. For example, compressors, in the first instance, are industrial equipment used with gases, and boosters with motors. «Лидер», the name of an imposing 1982 multieffects unit, is attested in Russian political vocabulary as of at least 1959[2]. "Vibrato" has been part of Italian musical vocabulary since the 16th century, and attested in English since the mid 1800s.

In contrast, some borrowings are markedly different from their English equivalents, eschewing potential calques: «тембр» and probably «акцент» are used to translate "tone" (rather than тон or тональность). The somewhat enigmatic Клаппер turns out to be an electronic drum sound, named by analogy using the English verb "to clap" in a substantivized form absent from the source language.

The varying degrees of Russification visible in the preceding examples are characteristic of 1970s language processes. On effects units made around 1990, a shift

[1] Бустер, Квакер, Синхро-вау, Вибрато, Еффект, Еффект 2, Еффект 3, Лидер, Атлант, Элита Квазихор, Фазер 2, Компрессор-сустейнер, Клаппер.

[2] Benson, op. cit. "Booster" appears in the same article [2].

Table 2

Soviet effects vocabulary survey

Таблица 2

Наименования советских гитарных эффектов

Graphic adaptation	Phonetic adaptation	Morphological adaptation	Semi-calque	Existing Russian word of foreign origin	Russian origin
Клаппер (En. *clapper?) Фазер (En. phaser) Сустейнер (En. sustainer) Эквализер (En. equalizer)	Фас (En. fuzz) Фус (En. fuzz) Фейзер (En. phaser) Квакер (En. wah) Вау (En. wah)	Дисторши (En. distortion)	Квазихор (Lat. quasi (?), En. chorus) Роктон (En. rock, Gr. tonos) синхро-вау (Gr. ynchronos)	Атака (Fr. attaque) Акцент (Lat. accentus) Ампл[итуда] (Lat. amplitudo) Вибрато (Ital. vibrato) Баланс (Fr. balance) Бустер (En. booster) Драйв (En. drive) Еффект (Ger. effekt) Компрессор (En. compressor) Лидер (En. leader) Педаль (Lat. pes, pedis) Резонанс (Fr. resonance / Lat. reesono) Тембр (Fr. timbre) Холл (En. hall)	Яркость Глубина Громк[ость] Мягко/резко Спад Частота Чувств Задержка

towards English words in Latin characters may be observed, in accordance with Glasnost-era politics. Ironically, this shift coincided with the first use of Russian components in the production of the "British sound".

The perception of sound is no doubt subjective, but as shown above, sound itself can be objectively re-created, represented and translated. Verbal language is one among several means which, conjointly, enable this process, which occurs both

within and outside national boundaries, to some extent reflecting the geopolitical factors which also influence language. The metatext which language forms with regard to sound is sometimes a key factor in its production, sometimes a more clumsy descriptor, but ultimately there is a relationship of mutual enrichment between language — or languages — and sound.

REFERENCES

1. A Fuzz and Muff Pedal Timeline. http://www.kitrae.net/music/Fuzz_Big_Muff_Timeline.html
2. Benson M. 1959. "English Loan Words in Russian." Slavic and East European Journal, vol. 27 (New Series, vol. 3), no 3, p. 248-267.
3. Bipolar Junction Transistor — Wikipedia. https://en.wikipedia.org/wiki/Bipolar_junction_transistor#h-parameter_model
4. Booster Effect Pedal, Made in USSR. http://cheesyguitars.com/effect_soviet_booster.html
5. Cocksey D. J. 2013. "The Rhetoric of Rock: The Stylistics of Amplified Sound." Tyumen State University Herald. Philology, no 1, pp. 66-72.
6. Cox G. 2010. "On the Relationship Between Entropy and Meaning in Music: An Exploration with Recurrent Neural Networks." Proceedings of the Annual Meeting of the Cognitive Science Society.
7. Current Production Glass Electron Tubes. http://theartofsound.net/forum/showthread.php?21692-Current-production-glass-electron-tubes
8. DIY Fever — Building My Own Guitars, Amps and Pedals. "Fuzz Face Revisited." http://diy-fever.com/effects/fuzz-face-revisited
9. Doyle M. 1993. The History of Marshall: The Illustrated Story of the Sound of Rock, p. 17.
10. Dunlop Manufacturing. "Joe Bonamassa Signature Fuzz Face." http://www.jimdunlop.com/product/joe-bonamassa-fuzz-face
11. Edensor K. 2008. "French Comprehension of English Regional Accents." Travaux interdisciplinaires sur la parole et le langage, vol. 27, pp. 51-61.
12. Exploring Electronic Musical Instruments. http://www.davidmorrin.com
13. Fuzz Central -- Making the World a Fuzzier place for 5 Years. http://fuzzcentral.ssguitar.com
14. Giles H., Powesland P. F. 1975. Speech Style and Social Evaluation. London: Academic Press.
15. Luigi Russolo — Wikipedia. https://en.wikipedia.org/wiki/Luigi_Russolo#Art_of_Noises_classification_of_noise_types
16. Lychyk V. 1994. "English Borrowings in Modern Soviet Russian." Poznań Studies in Contemporary Linguistics, vol. 29, pp. 141-156.
17. Maloof R. 2004. Jim Marshall — The Father of Loud. Backbeat books.
18. Sangild T. 2004. "Noise — Three Musical Gestures — Expressionist, Introvert and Minimal Noise." Journal of Music and Meaning, vol. 2, section 4. http://www.musicandmeaning.net/issues/pdf/JMMart_2_4.pdf
19. The Guitar Effects Oriented Web Page. http://geofex.com

Дэвид Джеймс КОКСИ[1]

УДК 534.85:681.84

ПЕРЕВОД ЗВУКА: ЭЛЕКТРОНИКА СОВЕТСКИХ ГИТАР

[1] доктор философии, профессор,
Университет им. Шампольона (г. Альби, Франция)
davidcocksey@mail.ru

Аннотация

Звуки, из которых строится музыка, сами по себе могут рассматриваться как носители информации постольку, поскольку они являются ключевым фактором в понимании слушателем любого музыкального произведения. Конкретные звуки, в том числе определенные виды «шумов», эволюционируют аналогично акцентами в пределах и даже за пределами существующих географических границ. Таким образом, их можно учитывать в межкультурной коммуникации музыкального смысла.

Вербальные и визуальные средства представления звуков одновременно составляют метатекст (metatext) и интерсемиотичность (intersemioticity), которые могут быть усложнены и далее через перевод, когда термины, схематичные или действительные компоненты стараются приспособить для нужд иностранных потребителей. Данная статья рассматривает эти вопросы, используя примеры из области электрических гитарных эффектов и их адаптации для советского рынка в 1970-е гг.

Ключевые слова

Звук, шум, электроника, семиотика, перевод, заимствования, лексикология, СССР.

DOI: 10.21684/2411-197X-2016-2-4-24-34

СПИСОК ЛИТЕРАТУРЫ

1. A Fuzz and Muff Pedal Timeline. URL: http://www.kitrae.net/music/Fuzz_Big_Muff_Timeline.html

Цитирование: Кокси Д. Дж. Перевод звука: электроника советских гитар / Д. Дж. Кокси // Вестник Тюменского государственного университета. Гуманитарные исследования. Humanitates. 2016. Том 2. № 4. С. 24-34.
DOI: 10.21684/2411-197X-2016-2-4-24-34

2. Benson M. English Loan Words in Russian / M. Benson // Slavic and East European Journal. 1959. Vol. 27 (New Series. Vol. 3). No 3. Pp. 248-267.
3. Bipolar Junction Transistor // Wikipedia. URL: https://en.wikipedia.org/wiki/Bipolar_junction_transistor#h-parameter_model
4. Booster Effect Pedal, Made in USSR. URL: http://cheesyguitars.com/effect_soviet_booster.html
5. Cocksey D. J. The Rhetoric of Rock: The Stylistics of Amplified Sound / D. J. Cocksey // Tyumen State University Herald. Philology. 2013. No 1. Pp. 66-72.
6. Cox G. On the Relationship Between Entropy and Meaning in Music: An Exploration with Recurrent Neural Networks / G. Cox // Proceedings of the Annual Meeting of the Cognitive Science Society. 2010.
7. Current Production Glass Electron Tubes. URL: http://theartofsound.net/forum/showthread.php?21692-Current-production-glass-electron-tubes
8. DIY Fever — Building My Own Guitars, Amps and Pedals. “Fuzz Face Revisited”. URL: http://diy-fever.com/effects/fuzz-face-revisited
9. Doyle M. The History of Marshall: The Illustrated Story of the Sound of Rock / M. Doyle. 1993. P. 17.
10. Dunlop Manufacturing. “Joe Bonamassa Signature Fuzz Face”. URL: http://www.jimdunlop.com/product/joe-bonamassa-fuzz-face
11. Edensor K. French Comprehension of English Regional Accents / K. Edensor // Travaux interdisciplinaires sur la parole et le langage. 2008. Vol. 27. Pp. 51-61.
12. Exploring Electronic Musical Instruments. URL: http://www.davidmorrin.com
13. Fuzz Central — Making the World a Fuzzier place for 5 Years. URL: http://fuzzcentral.ssguitar.com
14. Giles H. Speech Style and Social Evaluation / H. Giles, P. F. Powesland. London: Academic Press, 1975.
15. Luigi Russolo // Wikipedia. URL: https://en.wikipedia.org/wiki/Luigi_Russolo#Art_of_Noises_classification_of_noise_types
16. Lychyk V. English Borrowings in Modern Soviet Russian / V. Lychyk // Poznań Studies in Contemporary Linguistics. 1994. Vol. 29. Pp. 141-156.
17. Maloof R. Jim Marshall — The Father of Loud / R. Maloof. Backbeat books, 2004.
18. Sangild T. Noise — Three Musical Gestures — Expressionist, Introvert and Minimal Noise / T. Sangild // Journal of Music and Meaning. 2004. Vol. 2. Section 4. URL: http://www.musicandmeaning.net/issues/pdf/JMMart_2_4.pdf
19. The Guitar Effects Oriented Web Page. URL: http://geofex.com