

## G10H

### ELECTROPHONIC MUSICAL INSTRUMENTS (electronic circuits in general H03)

#### Definition statement

*This subclass/group covers:*

- Artistic processing of music, i.e. musical processing involving alterations in harmony, timbre, texture, melody, rhythm or expressivity
- Assisted or automated music creation, synchronisation or interpretation, e.g. automatic composing, interactive music displays, karaoke, instrument karaoke, musical accompaniment, musical aspects of videogames
- Music analysis or synthesis
- electrophonic musical instruments, mechanical details, components or accessories for use in electrophonic musical instruments
- Input/output devices therefor, e.g. electric guitar transducers, synthesiser keyboards
- Control, communications or data organization therefor, e.g. effect pedals for guitars, internet jamming protocols, MIDI, wavetables, rhythm or harmony metadata.

#### Relationship between large subject matter areas

[G10L](#) Speech analysis or synthesis; speech recognition; speech or voice processing; speech or audio coding or decoding should systematically be considered as a function place for voice processing or audio coding applications, [G10H](#) being an application place for voice processing or audio coding with a musical application, e.g. melodic or rhythmic analysis of a singing voice, electrophonic musical instrument control, special encoding of audio sounds for synthesiser wavetables.

The classification of voice processing as speech processing [G10L](#) or electrophonic musical instruments [G10H](#) is therefore highly dependent on the primary vocal intent of the signal to be processed, i.e. communication of meaning, a.k.a. speech ([G10L](#)) or musical, e.g. singing.

If the primary vocal intent is musical, e.g. singing, then the nature, musical or not, of the voice processing, i.e. the result to be achieved, determines whether a [G10H](#) classification is appropriate.

Examples:

- Recognition of sung words, i.e. meaning extraction: consider [G10L 15/00](#) speech recognition
- Musical melodic transcription (or transposition) of the sung words, e.g. to a

musical score by extraction of note pitches or musical rhythm information: consider [G10H](#) .

Musical voice processing must be systematically classified in [G10H](#), but [G10L](#) should be considered for the vocal processing aspects of musical voice processing.

Musical games, musical rhythm games such as dance games, musical aspects of videogames e.g. game background music changes, synchronisation between image and musical events, must systematically receive a classification of their musical aspects in [G10H](#). [A63F 13/00](#) should be considered for the gaming aspects of such games.

## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |                              |
|--|------------------------------|
| Basic electronic circuitry   | <a href="#">H03</a>          |
| Game rules or game display appearance  | <a href="#">A63F</a>         |
| Audio or sound effects for videogames  | <a href="#">A63F 13/00</a>   |
| Metronomes   | <a href="#">G04F 5/02</a>    |
| Electrical digital data processing   | <a href="#">G06F</a>         |
| Digital computing or data processing equipment or methods, specially adapted for information retrieval of audio data   | <a href="#">G06F 17/3074</a> |
| Security arrangements for protecting computers or computer systems against unauthorised activity   | <a href="#">G06F 21/00</a>   |
| Teaching music per se  | <a href="#">G09B 15/00</a>   |
| Acoustic, i.e. non-electronic, musical instruments   | <a href="#">G10B-G10F</a>    |
| Keyboard improvements also suitable for acoustic pianos, e.g. counterweights; mechanical details of electronic piano keyboards also mechanically driving hammers | <a href="#">G10C 3/12</a>    |

|  |                            |
|--|----------------------------|
| Stringed musical instruments; wind-actuated musical instruments; accordions or concertinas; percussion musical instruments; musical instruments not otherwise provided for e.g. mechanical details or accessories of electronic musical instruments, corresponding to a suitable acoustic instrument type, e.g. whammy bar for electric guitars, bodies of electric guitars, | <a href="#">G10D</a>       |
| Aids for music; Supports for musical instruments; Other auxiliary devices or accessories for music or musical instruments  | <a href="#">G10G</a>       |
| Sound producing devices  | <a href="#">G10K</a>       |
| Speech analysis or synthesis; speech recognition; speech or voice processing; speech or audio coding or decoding   | <a href="#">G10L</a>       |
| Speech or audio signal analysis-synthesis techniques for redundancy reduction in general, e.g. in vocoders ; Coding or decoding of speech or audio signals in general, using source filter models or psychoacoustic analysis   | <a href="#">G10L 19/00</a> |
| Information storage based on relative movement between record carrier and transducer   | <a href="#">G11B</a>       |
| Signal processing not specific to the method of recording or reproducing; Circuits therefore   | <a href="#">G11B 20/00</a> |
| Music playlists, music indexing  | <a href="#">G11B 27/00</a> |
| Amplifiers   | <a href="#">H03F</a>       |
| Gain control in amplifiers or frequency changers   | <a href="#">H03G 3/00</a>  |
| Tone controls or bandwidth control in  | <a href="#">H03G 5/00</a>  |

|  |                                |
|--|--------------------------------|
| amplifiers   |                                |
| Arrangements for broadcast applications with a direct linking to broadcast information or broadcast space-time; Broadcast-related systems, e.g. sound mixing   | <a href="#">H04H 60/04</a>     |
| Details of transducers, loudspeaker or microphones   | <a href="#">H04R 1/00</a>      |
| Stereophonic systems, e.g. 3D sound field processing   | <a href="#">H04S</a>           |
| Pitch and rhythm extraction in videogames, substantially similar to <a href="#">G10H 2210/066</a> ("for pitch analysis"), <a href="#">G10H 2210/076</a> ("tempo analysis"), <a href="#">G10H 2210/091</a> ("performance evaluation") with <a href="#">G10H 2220/135</a> ("games"), also related to <a href="#">G10H 1/366</a> voice modification | <a href="#">A63F 2300/6072</a> |
| Music games  | <a href="#">A63F 2300/8047</a> |

### Special rules of classification within this subclass

Classification of invention information and additional information is obligatory,

Classifying additional information is obligatory even if the main invention does not belong to this subclass.

Indexing Code symbols of the type [G10H 2210/00](#) - [G10H 2210/626](#) to [G10H 2250/00](#) - [G10H 2250/645](#) represent information mostly orthogonal to ECLA groups and should be systematically used to classify information relevant to the main described concepts and ideas, although it need not be invention information. The number of Indexing Code symbols assigned to a document is not limited.

It is considered acceptable to allocate three or four ECLA classes to a particular document if needed.

### Glossary of terms

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

|                    |   |
|--------------------|---|
| Musical instrument | "tool", "device" , "process" or "protocol" for performing some musical task involving electrophonic signals, e.g. musical parameters  |
| Music              | A n art form whose medium is sound and silence. Its common elements are pitch (which governs melody and harmony), rhythm (and its associated concepts tempo, meter, and articulation), dynamics, and the sonic qualities of timbre and texture.Music (including singing, the vocalized form of music) is distinguished from speech by its particular and deliberate emphasis on the above common elements, especially rhythm and melody.By contrast, speech is distinguished from music by its particular and deliberate emphasis on conveying meaning: Speech is the vocalized form of human communication |
| Musical            | Generally employed in a restrictive limiting sense with respect to speech, general audio and sound, i.e. implying an intentional and artistic main focus at least by the performer on at least one of harmony, melody, rhythm, timbre, or expressivity. Even though one person's music may be noise to another, music is a performing art, and musical character is defined by the mere artistic intent of the performer  |
| Musical content    | Set of musical parameters.  |
| Musical parameters | Constituent element of "musical content" as defined above. Musical parameters include e.g. pitch, rhythm, timbre, texture, expressivity or dynamics.  |
| MIDI               | MIDI stands for Musical Instrument Digital Interface and refers to a note oriented music file and transmission format. Many variations and improvements of this note oriented   |

|                    |   |
|--------------------|---|
|                    | format exist. The use of the acronym MIDI should be broadly interpreted as also referring to any note oriented format for transmission or recording.  |
| Performance        | has three meanings in this field : -in a first meaning, it is an event in which a performer or group of (typically human) performers behave in a particular way (e.g. in their manner of singing or performing music) for another group of people. -in a second meaning it refers to a metric quantifying how well an entity (human, device, or process) deals with a specific aspect of a specific (not necessarily musical, e.g. mflops for a DSP processor in a synthesiser) task- in a third, narrower meaning, it is meant as the strict intersection of the above two meanings, i.e. quantifying the closeness of a performer's performance to a predetermined musical or singing reference i |
| Karaoke            | (translation from the Japanese: "empty orchestra"; synonyms: KTV, Noraebang) Karaoke refers to singing into a microphone by amateur performers along e.g. recorded music or a music video, often with a lyrics display or with performance evaluation   |
| Instrument karaoke | Playing a predetermined melody on a musical instrument or a musical instrument interface, often with score following along with recorded or synthesised accompaniment, often with means for evaluating or scoring the quality of the performance  |
| Rhythm             | Regular recurrence or pattern in time, associated concepts: meter, tempo, articulation and beat:  |
| Expressivity       | Musical properties which cannot be properly described by notions of harmony, rhythm, pitch, timbre or   |

|                  |   |
|------------------|---|
|                  | <p>texture, and which are linked to a particular manner of execution of a musical piece, e.g. indications of mood, e.g. "dolce", or to corresponding note execution parameters such as vibrato or legato, some of which can be coded in communications protocols such as MIDI e.g. expressivity controller.</p>   |
| <p>Polyphony</p> | <p>Ability of a synthesiser to simultaneously generate a limited number of unrelated melodic lines, Polyphony is conventionally quantified as the number of available "voices": a sound-generating device with six voices may be described as being, for example, six-voice polyphonic Each melodic line or simultaneous note requires one resource entity (for example a block of electronic hardware or a time-slot in a Digital Signal Processor program) capable of generating a single tone, and this is what is known as one "voice"</p>  |
| <p>Voice</p>     | <p>Has several important meanings in this field :- Resource entity (hardware, time slot) needed to generate a single tone or a single melodic line, in the context of polyphony. The term is generic, and is not meant to imply that the line should necessarily be vocal in character, instead referring to instrumentation or simply to register. This field-specific meaning of "voice" is relevant for <a href="#">G10H 1/18</a> selecting circuits; it is further defined in the definition of "polyphony" and in that of "part" - Sounds generated by vocal chords (e.g. human vocal folds) or synthetic versions thereof, e.g.: - as the medium of speech to communicate meaning; - for artistic musical purposes, e.g. with greater emphasis on melody or rhythm, as in singing, chorus, descant; or - for instrument control purposes (e.g. <a href="#">G10H 5/005</a> voice controlled instruments)</p> |

|              |   |
|--------------|---|
| Speech       | Definite vocal sounds that form words to express thoughts and ideas   |
| Part         | In addition to the usual meaning, a piece of a whole, a part has three more precise meanings in a musical sense:- A part is a strand or melody of music played by an individual instrument or voice (or group of identical instruments or voices) within a larger work. In the context of polyphonic composition the term voice may be used instead of part to denote a single melodic line or textural layer. This field-specific meaning is very commonly used in connection with MIDI - A part also refers to the separate printed or manuscript copies of the music for each individual instrument in an ensemble or orchestra, as distinct from the score, which holds the music for all the instruments.- A part in great Highland Bagpipe music is a musical strain or sentence. Usually each part consists of four phrases, either one or two bars long. Several sentences combine to produce a paragraph or complete work or tune. |
| Audio signal | An audio signal is a representation of sound, usually electrical, in analog, digital or coded form, without restriction as to the category of sound being represented, e.g. speech, music, noise, The category of sound being represented, e.g. speech, music or noise, is primarily defined with respect to the features of the audio signal and with respect to the main intent of the source or performer. This category, as defined in this glossary, is very relevant for proper classification  |

**Details of electrophonic musical instruments (keyboards applicable also to other musical instruments G10B, G10C; arrangements for producing a reverberation or echo sound G10K15/08)**

**Definition statement**

*This subclass/group covers:*

Details of electrophonic musical instruments, electrophonic musical tools, electrophonic musical data or electrophonic musical processing.

**References relevant to classification in this group**

*This subclass/group does not cover:*

|  |                            |
|--|----------------------------|
| Electrophonic musical instrument processor architecture  | <a href="#">G10H 7/002</a> |
| Instruments in which the tones are generated by electromechanical means  | <a href="#">G10H 3/00</a>  |
| Voice controlled electrophonic musical instruments   | <a href="#">G10H 5/005</a> |
| Instruments in which the tones are generated by means of electronic generators   | <a href="#">G10H 5/00</a>  |
| Real-time simulation of <a href="#">G10B</a> , <a href="#">G10C</a> , <a href="#">G10D</a> -type instruments using recursive or non-linear techniques, e.g. waveguide networks, recursive algorithms | <a href="#">G10H 5/007</a> |
| Sample based waveform production processes from data store samples in electrophonic musical instruments  | <a href="#">G10H 7/02</a>  |
| Functions based waveform production processes with parameters stored in data store in electrophonic musical instruments  | <a href="#">G10H 7/08</a>  |

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|  |                            |
|--|----------------------------|
| Keyboards applicable also to other musical instruments   | <a href="#">G10B,G10C</a>  |
| Arrangements for producing a reverberation or echo sound | <a href="#">G10K 15/08</a> |

### Special rules of classification within this group

Documents dealing with details of musical instruments and which do not contain features corresponding to a subgroup of [G10H 1/00](#) shall be classified in [G10H 1/00](#) and appropriate Indexing Code [G10H 2210/00](#) to [G10H 2250/645](#).

### Synonyms and Keywords

In patent documents the following words or abbreviations are often used:

|                 |   |
|-----------------|---|
| ADSR            | Attack Decay Sustain Release, an approach to note synthesis and note envelope control |
| IR              | Impulse response or Infrared, depending on context                                    |
| FIR             | Finite impulse response   |
| IIR             | Infinite impulse response   |
| Spint           | Special Instrument, instrument with unusual features                                  |
| PCM             | pulse code modulation   |
| WAV             | Waveform audio file format  |
| ADPCM           | Adaptive Differential Pulse Code Modulation   |
| CELP            | Code excited linear prediction, used for audio coding                                 |
| MP3, AC3, ATRAC | various audio compression formats   |

|          |   |
|----------|---|
| RFID     | radio frequency identification                              |
| LFO      | low frequency oscillator                                    |
| VCF      | Voltage controlled filter (see <a href="#">G10H 5/002</a> ) |
| CRC      | Cyclical redundancy check                                   |
| LZT      | lead zirconate (piezoelectric sensors)                      |
| PDA      | personal digital assistant, tablet computer                 |
| GSM      | time division multiplexed mobile telephony standard         |
| 3D       | three dimensional   |
| DFT      | discrete fourier transform                                  |
| DCT      | discrete cosine transform                                   |
| FFT      | fast fourier transform                                      |
| IFFT     | inverse fast fourier transform                              |
| Mplay    | multiplayer   |
| Velocity | volume of a note  |

## **G10H 1/0008**

**[N: Associated control or indicating means (teaching of music per se G09B15/00)]**

### **Definition statement**

*This subclass/group covers:*

Producing, processing or displaying musical information, status information or musical parameters, e.g. for information of the user or as control parameters, e.g. for controlling electrophonic musical instruments, indexing or retrieving musical data from musical databases.

Musical analysis of audio or music signals; extraction of musical parameters.

User interfaces for musicians, such as specialised displays.

Control of electrophonic musical instruments: This group is appropriate for classifying control details which are not otherwise provided for in all other groups in [G10H 1/00](#).

Music databases relying on musical parameters which are the result of musical analysis, relate to composing or synthesis, e.g. wavetables or sound banks, include note oriented data, or are otherwise specifically meant for use by a device classified in electrophonic musical instruments.

### Relationship between large subject matter areas

Audio data information retrieval, indexing or data structures relating to audio waveform synthesis should be classified in [G10H 7/02](#) - [G10H 7/12](#), e.g. audio sample libraries such as synthesiser wavetables, [G10H 7/02](#).

General purpose audio data information retrieval using content features or bibliographical data associated with the audio data, e.g. libraries of PCM or MP3 audio files not indexed with musical parameters, and not used for composition or synthesis: [G06F 17/3074](#).

### References relevant to classification in this group

*This subclass/group does not cover:*

|                                       |                           |
|---------------------------------------|---------------------------|
| Means for the representation of music | <a href="#">G10G 1/00</a> |
|---------------------------------------|---------------------------|

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |                              |
|--|------------------------------|
| Information retrieval of audio data  | <a href="#">G06F 17/3074</a> |
| Teaching of music per se   | <a href="#">G09B 15/00</a>   |
| Chord or note indicators, fixed or adjustable, for keyboard of fingerboards  | <a href="#">G10G 1/02</a>    |
| (musical transmission parameters, protocols, transmission or storage formats or encoding for transmission or storage | <a href="#">G10H 1/0033</a>  |

## Special rules of classification within this group

Audio data information retrieval, indexing or data structures should be classified in [G10H 1/0008](#) (if the invention is the index, index extraction or data structure) or [G10H 1/0041](#) (if the nature of the stored musical data or associated metadata is important, e.g. different piano note samples at different playing loudnesses for a piano synthesiser) whenever they rely on musical parameters such as pitch, dynamics, harmony, timbre, texture, melody, rhythm or expressivity.

Audio data information retrieval, indexing or data structures relating to composing, e.g. musical collage, medley, should be classified in [G10H 1/0025](#), along with musical rule bases, and databases of music fragments suitable for composing, organised according to a certain composing logic.

Libraries relating only to specific electrophonic musical instruments such as synthesisers, libraries generated or organized or managed by a music sampler, or libraries specifically organised or indexed to facilitate musical composing [G10H 2210/101](#) ("composing"), [G10H 2240/121](#) ("library").

## G10H 1/0033

**[N: Recording/reproducing or transmission of music for electrophonic musical instruments (of accompaniment G10H1/361)]**

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |                               |
|--|-------------------------------|
| Recording/reproducing of accompaniment for use with an external source, e.g. karaoke systems | <a href="#">G10H 1/361</a>    |
| Recording or reproducing of audio signals using Pulse Code Modulation [PCM]                  | <a href="#">G11B 20/10527</a> |

## G10H 1/0041

**[N: in coded form (see also G10H7/002)]**

### Definition statement

*This subclass/group covers:*

Musical content recording, reproducing or storage or corresponding data formats or data structures, in coded form e.g. PCM, MP3, ADPCM; also

corresponding metadata contents in cases the metadata includes musical parameters (transmission of musical contents [G10H 1/0058](#), wireless transmission [G10H 1/0083](#)).

Musical data structures used for recording, e.g. in musical libraries such as wavetables or song fragments indexed with musical parameters such as tempo, chord, genre, for remix composing applications.

## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Instruments in which the tones are digitally synthesised from a data store using a common processing for different operations or calculations and a programme to control the sequence thereof | <a href="#">G10H 7/002</a> |
|---|----------------------------|

## Special rules of classification within this group

The indication of additional groups in [G10H 2240/121](#) for further definition of the musical library or [G10H 2240/075](#) metadata should be given if appropriate. Also an indication of intended processes in [G10H 2210/00](#) or [G10H 2250/00](#), if applicable, should be given.

## G10H 1/0058

**[N: Transmission between separate instruments or between individual components of a musical system (G10H1/0083 takes precedence)]**

### Definition statement

*This subclass/group covers:*

Modes of transmission or transmission protocols, e.g. MIDI to or from an electrophonic musical instrument.

Any transmission, also when it is not music per se, even if it only represents control data or transmission of network information for electrophonic musical instruments: e.g. latency data transmission for music jamming over the internet (see also [G10H 2240/175](#) ("transmission jams")), [S10H 241/281](#) transmission protocols specially used for musical instruments.

### References relevant to classification in this group

*This subclass/group does not cover:*

|   |                             |
|---|-----------------------------|
| Transmission between separate instruments or between individual components of a musical system using wireless transmission, e.g. radio, light, infrared | <a href="#">G10H 1/0083</a> |
|---|-----------------------------|

## G10H 1/0083

[N: using wireless transmission, e.g. radio, light, infrared]

### Special rules of classification within this group

Whenever a wireless aspect is important for an electrophonic musical instrument, then it should be coded here (ignore the hierarchy), regardless of whether music or other control data is transmitted.

## G10H 1/0091

[N: Means for obtaining special acoustic effects (combined with modulation G10H1/043)]

### Definition statement

*This subclass/group covers:*

Musical effects not otherwise provided for, e.g. DJ scratch effects.

### References relevant to classification in this group

*This subclass/group does not cover:*

|   |                            |
|---|----------------------------|
| Aspects of games using an electronically generated display having two or more dimensions, e.g. 3D sound effects in virtual videogame spaces | <a href="#">A63F 13/00</a> |
| Means for controlling the tone frequencies, e.g. attack, decay;<br>Means for producing special musical effects, e.g. vibrato, glissando     | <a href="#">G10H 1/02</a>  |
| Means for controlling the tone frequencies by additional continuous modulation  | <a href="#">G10H 1/043</a> |
| Circuits for establishing the harmonic content of tones, by combining tones,  | <a href="#">G10H 1/10</a>  |

|   |                            |
|---|----------------------------|
| for obtaining chorus, celeste or ensemble effects   |                            |
| Means for processing the signal picked up from the strings, for distorting the signal, e.g. to simulate tube amplifiers | <a href="#">G10H 3/187</a> |
| Arrangements for producing a reverberation or echo sound  | <a href="#">G10K 15/08</a> |

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |                             |
|---|-----------------------------|
| Stereophonic Systems, e.g. Electronic adaptation of multi-channel audio signals to reverberation of the listening space                                       | <a href="#">H04S 7/00E6</a> |
| Accompaniment arrangements: Chord   | <a href="#">G10H 1/38</a>   |
| Editing; Indexing; Addressing; Timing or synchronising; Monitoring; Measuring tape travel: reproducing continuously a part of the information, i.e. repeating | <a href="#">G11B 27/005</a> |

### Special rules of classification within this group

Classification [G10H 1/0091](#) should also be assigned whenever details of turntable-like DJ interfaces covered by [G11B 27/005](#) go beyond mere mechanical details of the turntable and include details about the generation of audio control signals, e.g. MIDI, or real-time audio signal processing details specifically for providing the DJ scratch effect.

Indexing Codes of the Indexing Code main group [G10H 2210/155](#) ("effect") shall be assigned to define effect types.

### **G10H 1/02**

**Means for controlling the tone frequencies, e.g. attack, decay;**  
**Means for producing special musical effects, e.g. vibrato,**

## **glissando [N: (for instruments using voltage controlled oscillators and amplifiers or voltage controlled oscillators and filters G10H5/002)]**

### **Definition statement**

*This subclass/group covers:*

The time dependent control of:

- Amplitude modulation of musical signal in general, e.g. envelope, dynamics, ADSR,

-Pitch modulation of a musical signal in general, e.g. glissando, vibrato.

The control of tone colour modulation of musical signal (e.g. spectral contents, timbre variation, filtering).

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Instruments using voltage controlled oscillators and amplifiers or voltage controlled oscillators and filters | <a href="#">G10H 5/002</a> |
|---|----------------------------|

### **Glossary of terms**

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

|               |  |
|---------------|--|
| ADSR          | denotes a form of envelope used for synthesizing a tone which is split into four time segments: Attack, Decay, Sustain, Release. An ADSR envelope is defined by an attack time, decay time, sustain level and release time |
| Attack time   | is the time taken for initial run-up of level from nil to peak, beginning when the key is first pressed  |
| Decay time    | is the time taken for the subsequent run down from the attack level to the designated sustain level  |
| Sustain level | is the level during the main sequence of the sound's duration, until the key is released   |

|              |   |
|--------------|---|
| Release time | is the time taken for the level to decay from the sustain level to zero after the key is released |
|--------------|---|

## G10H 1/047

**by acousto-mechanical means, e.g. rotating speakers or sound deflectors**

### Definition statement

*This subclass/group covers:*

Continuous modulation by acousto-mechanical means.

Electronic or computer simulations of the effect of such acousto-mechanical means, e.g. Leslie effect.

## G10H 1/055

**by switches with variable impedance elements**

### Definition statement

*This subclass/group covers:*

Electric or mechanical switches or analogue control elements with variable impedance for controlling electrophonic musical instruments or computer music interfaces.

Analogue variable impedance elements, e.g. strain gauge, potentiometer, variable inductor, as used in electrophonic musical instruments, regardless of its control effects.

Indexing Codes [G10H 2220/275](#) (input key switch) and [G10H 2220/561](#) (transducer resistor) represent additional aspects which should be considered for finer classification.

## G10H 1/06

**Circuits for establishing the harmonic content of tones, [N: or other arrangements for changing the tone colour]**

### References relevant to classification in this group

*This subclass/group does not cover:*

|  |                           |
|--|---------------------------|
| Time-dependent modulation of amplitude or pitch parameters | <a href="#">G10H 1/04</a> |
|--|---------------------------|

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## G10H 1/16

by non-linear elements (G10H1/14 takes precedence;  
generation of non-sinusoidal basic tones G10H5/10)

### References relevant to classification in this subclass

*This subclass/group does not cover:*

|  |                           |
|--|---------------------------|
| Circuits for establishing the harmonic content of tones during execution | <a href="#">G10H 1/14</a> |
|--|---------------------------|

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |                           |
|--|---------------------------|
| Generation of non-sinusoidal basic tones | <a href="#">G10H 5/10</a> |
|--|---------------------------|

### Special rules of classification within this group

If the nonlinear element e.g. semiconductor such as JFET or diode, is used for voluntary distortion of existing audio waveforms for musical purposes, then [G10H 3/187](#) should be assigned as well, irrespective of whether it is used with a string instrument or not.

## G10H 1/22

for suppressing tones; Preference networks

### Definition statement

*This subclass/group covers:*

Selecting which notes or voices to suppress from polyphonic music, e.g. to alleviate the effects of insufficient hardware capabilities or to save processing power.

Also covers deliberately simplifying polyphony or melody, suppressing notes for correcting errors in music signal transmission (e.g. frozen notes due to a missing note-off command).

### Special rules of classification within this group

When applicable, also classify in Indexing Code group [G10H 2230/041](#) if processor load is important, for mobile telephones see Indexing Code group [G10H 2230/021](#) for mobile ringtones.

## **G10H 1/24**

### **for selecting plural preset register stops**

#### **Definition statement**

*This subclass/group covers:*

Details specifically dealing with relevant aspects of selection of different tone colours or instrument voices, e.g. piano, violin, trumpet.

## **G10H 1/26**

### **for automatically producing a series of tones (musical toys A63H5/00)**

#### **Definition statement**

*This subclass/group covers:*

Automatically producing a predetermined and unchangeable sequence of musical tones upon initial triggering, specifically dealing with musical parameters.

Circuits for musical cards or the like, algorithmically producing a pre-programmed, unchangeable melody, e.g. from a coded sequence of tones in a ROM.

#### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|  |                           |
|--|---------------------------|
| Musical or noise- producing devices for additional toy effects other than acoustical | <a href="#">A63H 5/00</a> |
|--|---------------------------|

## **G10H 1/32**

### **Constructional details**

#### **Definition statement**

*This subclass/group covers:*

Mechanical details of electrophonic musical instruments, where such mechanical details are not otherwise provided for.

This includes for example:

- Details of the body, frame, casing, electronic keyboard cover lid,
- Ergonomic details such as shape of its body, position of its connectors,
- Portability aspects, shoulder straps,
- Power supply arrangements,
- Unusual details of the appearance of the electrophonic instrument.

### Special rules of classification within this group

Indexing Codes under [G10H 2230/00](#) provide additional subdivisions for indexing features of constructional details.

Indexing Code symbol under [G10H 2230/045](#) relating to "spint" (special instrument) shall be used for classifying electrophonic instruments according to their similarity to, or improvement to, a specific conventional acoustic instrument type, shape, usage, characteristic feature, sound signature or overall character in combination with [G10H 1/32](#) if mechanical constructional details are involved and if a suitable special instrument category is listed as Indexing Code.

### G10H 1/34

**Switch arrangements, e.g. keyboards or mechanical switches peculiar to electrophonic musical instruments ([N: G10H1/055 takes precedence]; keyboards applicable also to other musical instruments G10B, G10C)**

#### Definition statement

*This subclass/group covers:*

Constructional details at keyboard level or key level, mechanisms linked to individual keys or keyboards.

Key-like user input controls for electrophonic musical instruments, e.g. pedals, touchscreen active zones, not only including mechanical switches with contacts, but also switches in a generalised sense, e.g. light barriers, even with continuously varying output.

#### References relevant to classification in this subclass

*This subclass/group does not cover:*

|  |                            |
|--|----------------------------|
| Controlling tone frequencies by continuous modulation by switches with variable impedance elements | <a href="#">G10H 1/055</a> |
|--|----------------------------|

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## Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |   |
|--|---|
| Keyboards applicable to acoustic instruments | <a href="#">G10B</a> , <a href="#">G10C</a> |
|--|---|

## Special rules of classification within this group

[G10H 1/34](#) should be used when the arrangement of multiple keys with respect to one another is ergonomically or musically important (whole keyboard features).

[G10H 1/344](#), [G10H 1/346](#) or [G10H 1/348](#) should be restricted to constructional details at key level, e.g. mechanisms linked to individual keys, whole keyboard arrangements should be classified in [G10H 1/34](#) or [G10H 1/342](#).

Indexing Codes provide additional subdivision: see [G10H 2220/265](#) ("input key"), [G10H 2220/221](#) ("input keyboard"); for continuous keyboards see [G10H 2210/401](#) ("scale microtonal").

Processing information on key actuation: see key multiplexing [G10H 1/182](#).

## G10H 1/36

### Accompaniment arrangements

#### Definition statement

*This subclass/group covers:*

Accompaniment systems, e.g. karaoke.

[G10H 1/361](#) also includes instrument karaoke, in which the performer does not sing to recorded music but is expected to play a specific melody on an instrument in synchrony with recorded music.

## Informative references

Attention is drawn to the following places, which may be of interest for search:

|                          |                              |
|--------------------------|------------------------------|
| Teaching of music per se | <a href="#">G09B 15/00</a> . |
|--------------------------|------------------------------|

## Special rules of classification within this group

Whenever accompaniment systems unrelated to karaoke are allocated in [G10H 1/361](#) or subgroups thereof, Indexing Code [G10H 2210/005](#) (“accompaniment”) should be assigned if applicable.

karaoke systems per se should be classified in [G10H 1/361](#) and subgroups, but not in [G10H 1/36](#).

The JPO classifies karaoke in FI and IPC [G10K 15/04](#), with a detailed cross-indexing in FT 5D108. Search in those fields is necessary for any complete search involving karaoke.

## G10H 1/368

**[N: displaying animated or moving pictures synchronized with the music or audio part]**

### Definition statement

*This subclass/group covers:*

Features specific to synchronisation of musical parameters to moving images, musical accompaniment of slide shows, background music dependence on videogame environment or videogame character actions.

Features specific to karaoke synchronized with animated pictures (karaoke lyrics [G10H 1/0008](#), [G10H 2220/011](#) display lyrics).

Musical games where user actions on musical parameters are expected to be synchronized to music and video, e.g. rhythmic hopscotch type games such as Dance Revolution.

Generation of artistic images related to music parameters (informative musical displays [G10H 1/0008](#)).

## G10H 1/40

**Rhythm (metronomes G04F5/02)**

### Definition statement

*This subclass/group covers:*

Analysis of rhythmic information such as tempo, timing, e.g. of onsets, beat.

Processing of rhythmic information for processing music, such as selecting music from a database, music composition.

Generation of rhythmic information for use in electrophonic musical instruments: e.g. timing control, timing processing, timing classification, timing synchronisation, timing encoding of musical data, synthesis of rhythmic

information.

Display of rhythmic information in music such as tempo, timing, beat, onsets.

## References relevant to classification in this group

*This subclass/group does not cover:*

|                                     |                            |
|-------------------------------------|----------------------------|
| Synchronisation of music with video | <a href="#">G10H 1/368</a> |
|-------------------------------------|----------------------------|

## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |                              |
|--|------------------------------|
| Training appliances or apparatus for special sports: for running, jogging or speed-walking | <a href="#">A63B 69/0028</a> |
| Metronomes   | <a href="#">G04F 5/02</a>    |
| Modification of at least one characteristic of speech waves: time compression or expansion | <a href="#">G10L 21/04</a>   |

## Special rules of classification within this group

Beat or rhythm synchronisation of two successive pieces, e.g. in remix, also consider [G10H 7/008](#) in addition to [G10H 1/40](#).

For rhythms selected according to exercising or body rhythms, also consider [A63B 69/00](#) in addition to [G10H 1/40](#).

For databases with tempo or rhythm indexing, please consider a dual classification in [G06F 17/3074](#) and [G10H 1/0041](#) in addition to [G10H 1/40](#).

## G10H 1/46

### Volume control

#### Definition statement

*This subclass/group covers:*

Volume control specifically provided in electrophonic musical instruments: e.g. MIDI volume control, MIDI velocity controller, volume control for electric guitars, for musical keyboards.

## G10H 3/00

### Instruments in which the tones are generated by electromechanical means

#### Definition statement

*This subclass/group covers:*

Instruments in which a mechanically moving part is caused to move at the frequency of the generated note, and in which this movement is sensed by a movement sensor other than a microphone.

Details of movement transducers therefor, e.g. magnetic guitar pick-up;

Instrument-specific adaptations for contact microphones.

Audio signal processing specially adapted for further musical processing of signals from said transducers or for musical parameter extraction.

Percussion synthesis or drumpad triggers, even if the mechanically moving part is non-resonant, i.e. does not have a frequency of oscillation, see in particular [G10H 3/146](#).

#### References relevant to classification in this group

*This subclass/group does not cover:*

|   |   |
|---|---|
| Microphones or loudspeakers   | <a href="#">H04R</a> ;                                |
| Loudspeaker enclosures:   | <a href="#">H04R 1/02</a> , <a href="#">H04R 1/28</a> |
| Special adaptations for use as contact microphones, e.g. on musical instrument, on stethoscope  | <a href="#">H04R 1/46</a>                             |
| Loudspeaker enclosure specifically adapted to a musical instrument and interacting with musically, structurally or ergonomically relevant parts of the musical instrument | <a href="#">G10H 1/32</a>                             |
| Acoustic musical instruments equipped with microphones or microphone e.g. microphone positioning on specific acoustic instruments; musical instruments                    | <a href="#">G10C-G10F</a>                             |

## G10H 3/125

**[N: Extracting or recognising the pitch or fundamental frequency of the picked up signal]**

### Definition statement

*This subclass/group covers:*

Any pitch analysis for musical parameter extraction of an audio signal not specifically using a mechanical resonant generator.

This includes: note extraction, score transcription, performance evaluation e.g. of karaoke singing, pitch processing for query by humming.

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |                            |
|--|----------------------------|
| Pitch determination of speech signals in general | <a href="#">G10L 11/04</a> |
|--|----------------------------|

Special rules of classification within this group

Relevant Indexing Codes under [G10H 2210/031](#) ("analysis") must be assigned.

Additional classification under [G10H 1/40](#), e.g. associated beat or note onset timing analysis or [G10H 1/0008](#), e.g. other types of musical analysis is frequent.

Database retrieval based on pitch queries, classified both in [G10H](#) (e.g. [G10H 3/12](#), [G10H 1/0008](#), [G10H 1/0041](#) if the emphasis is on the pitch analysis algorithm, the type of indexing, or the data structure or metadata organisation of the musical parameters derived from pitch analysis) and [G06F 17/3074](#).

## G10H 3/146

**[N: using a membrane, e.g. a drum; Pick-up means for vibrating surfaces, e.g. housing of an instrument]**

### Definition statement

*This subclass/group covers:*

Electronic drums (see also Indexing Code [G10H 2230/275](#) ("spint drums"));

Vibration sensors sensing the vibrations of instrument bodies, also of guitars or other stringed instruments.

## Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |                               |
|--|-------------------------------|
| Guitars used as percussion instruments | <a href="#">G10H 2230/141</a> |
|--|-------------------------------|

## Special rules of classification within this group

This group is also appropriate for classifying anything related to percussion synthesis, even if not using a membrane or a vibrating surface, e.g. optically triggered drum sounds drum triggers, non-resonant drumpads, sensors therefor.

It is essential in this group to assign enough classification symbols to be able to quickly retrieve the specific type of percussion, e.g. a hihat pedal typically would be coded here, in [G10H 1/348](#), and in the Indexing Code [G10H 2250/435](#) ("Gensound percussion") and especially in the relevant subdivisions of Indexing Code [G10H 2230/251](#) ("Spint percussion"), e.g. [G10H 2230/331](#) ("Spint cymbal hihat").

## G10H 5/00

### Instruments in which the tones are generated by means of electronic generators (G10H7/00 takes precedence)

#### Definition statement

*This subclass/group covers:*

Generation of musical tones by analogue electronic circuits.

Voice controlled instruments, even if the voice processing is performed by computer, and even if the output tone is synthesised from a data store.

Physical modelling of acoustic instruments, e.g. implemented by appropriate software.

Simulation of analogue circuits using digital means.

## References relevant to classification in this group

*This subclass/group does not cover:*

|  |                           |
|--|---------------------------|
| Instruments in which the tones are synthesised from a data store, e.g. computer organs | <a href="#">G10H 7/00</a> |
|--|---------------------------|

## G10H 5/005

### [N: Voice controlled instruments]

#### Definition statement

*This subclass/group covers:*

Electroponic musical instruments in which the output sound is controlled by processing the human voice or glottal signals of the performer in order to control parameters of the output audio signals, e.g. a trumpet sound, controlled by voice.

This is the correct classification for voice-controlled instruments even if the musical voice processing is performed by computer, and even if the output tone is synthesised from a data store under the control of the processed voice signals.

#### References relevant to classification in this group

*This subclass/group does not cover:*

|   |                            |
|---|----------------------------|
| Recording/reproducing of accompaniment for use with an external source, e.g. karaoke systems: with means for modifying or correcting the external signal, e.g. pitch correction, reverberation, changing a singer's voice | <a href="#">G10H 1/366</a> |
|---|----------------------------|

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |   |
|--|---|
| Mere pitch determination of a musical or singing signal                        | <a href="#">G10H 3/125</a>  |
| Musical analysis of a singing voice signal, including other aspects than pitch | <a href="#">G10H 1/0008</a> , <a href="#">G10H 2210/031</a><br>analysis |
| Pitch determination of speech signal in general                                | <a href="#">G10L 11/04</a>  |

## G10H 5/007

**[N: Real-time simulation of G10B, G10C, G10D-type instruments using recursive or non-linear techniques, e.g. waveguide networks, recursive algorithms (establishing the harmonic content of tones by non-linear elements G10H1/16; synthesising waveforms using a recursive algorithm G10H7/12)]**

### **Definition statement**

*This subclass/group covers:*

Physical modelling of acoustic instruments implemented by digital or analogue means (e.g. using computer based simulation).

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |                           |
|---|---------------------------|
| Establishing the harmonic content of tones by non-linear elements | <a href="#">G10H 1/16</a> |
| Synthesising waveforms using a recursive algorithm                | <a href="#">G10H 7/12</a> |

## **G10H 7/00**

**Instruments in which the tones are synthesised from a data store, e.g. computer organs (synthesis of acoustic waves not specific to musical instruments G10K15/02, G10L)**

### **Definition statement**

*This subclass/group covers:*

Computer architecture, computing hardware or waveform computation schemes specific to digital music synthesis.

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |   |
|---|---|
| Synthesis of acoustic waves not specific to musical instruments | <a href="#">G10K 15/02</a> , <a href="#">G10L</a> |
|---|---|

### **Special rules of classification within this group**

The [G10H 7/00](#) main group is to be used to classify specific details of:

- Music synthesiser architecture;
- Musical signal processor architecture for musical analysis or musical processing (see narrow definition of "musical") in the glossary;
- Processor load management or waveform processing not otherwise provided by sub-groups of [G10H 1/18](#) or [G10H 1/02](#) respectively;
- For all sub-groups of [G10H 7/00](#), Indexing Codes under [G10H 2230/00](#) ("hardware, shape or architecture aspects") and [G10H 2240/00](#) ("data or communications aspects") provide an orthogonal scheme for indexing features of sub-groups of [G10H 7/00](#);
- As the [G10H 7/00](#) groups are very imprecise regarding actual function, if there are relevant classes in [G10H 1/00](#), [G10H 3/00](#) or [G10H 5/007](#) or [G10H 5/005](#), or corresponding Indexing Codes, they should be systematically assigned in addition to the [G10H 7/00](#) symbols.

## **G10H 7/008**

**[N: Means for controlling the transition from one tone waveform to another (glissando or legato per se G10H1/02)]**

### **Definition statement**

*This subclass/group covers:*

Transition processing or controlling from one tone or music waveform to another, or from one music segment or music piece to another; means therefor.

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|                            |                           |
|----------------------------|---------------------------|
| Glissando or legato per se | <a href="#">G10H 1/02</a> |
|----------------------------|---------------------------|

### **Special rules of classification within this group**

Documents classified here should be given Indexing Codes under [G10H 2210/101](#) ("composing"; e.g. [G10H 2210/125](#) ("composing medley")), [G10H 2250/00](#) (e.g. [G10H 2250/035](#) ("crossfade")) or [G10H 2250/541](#) ("waveform").

## **G10H 7/02**

**in which amplitudes at successive sample points of a tone**

**waveform are stored in one or more memories**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |                               |
|---|-------------------------------|
| Recording or reproducing of audio signals using Pulse Code Modulation [PCM] | <a href="#">G11B 20/10527</a> |
|---|-------------------------------|

**Special rules of classification within this group**

Documents classified here should be given Indexing Codes under [G10H 2250/541](#) ("waveform").