ECLA EUROPEAN CLASSIFICATION

G10H ELECTROPHONIC MUSICAL INSTRUMENTS (electronic circuits in general H03)

Note
This subclass covers musical instruments in which individual notes are constituted as electric oscillations under the control of a performer and the oscillations are converted to sound-vibrations by a loud-speaker or equivalent instrument.

G10H1/00 **Details of electrophonic musical instruments** (keyboards applicable also to other musical instruments G10B, G10C; arrangements for producing a reverberation or echo sound G10K15/08)

G10H1/00M . [N: Associated control or indicating means (teaching of music per se G09B15/00)]
G10H1/00M2 . . [N: Means for indicating which keys, frets or strings are to be actuated, e.g. using lights or leds] [N0007]
G10H1/00M5 . . [N: Automatic or semi-automatic music composition, e.g. producing random music, applying rules from music theory or modifying a musical piece (automatically producing a series of tones G10H1/26)] [N0007]

G10H1/00R . [N: Recording/reproducing or transmission of music for electrophonic musical instruments (of accompaniment G10H1/36K)] [C9803]
G10H1/00R2 . . [N: in coded form (see also G10H7/00C)]
G10H1/00R2B . . . [N: on magnetic tape]
G10H1/00R2C . . . [N: Transmission between separate instruments or between individual components of a musical system (G10H1/00R3 takes precedence)] [C9803]
G10H1/00R2C2 . . . . [N: using a MIDI interface]
G10H1/00R2C2T . . . . . [N: with translation or conversion means for unvailable commands, e.g. special tone colors] [N9811]
G10H1/00R3 . . [N: using wireless transmission, e.g. radio, light, infrared] [N9803]

G10H1/00S . [N: Means for obtaining special acoustic effects (combined with modulation G10H1/043)]

G10H1/02 . 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 G10H5/00B)]
G10H1/04 . . by additional modulation
G10H1/043 . . . Continuous modulation
G10H1/045 . . . . by electromechanical means
G10H1/047 . . . . by acousto-mechanical means, e.g. rotating speakers or sound deflectors
G10H1/053 . . . during execution only [N: (voice controlled instruments G10H5/00C)]
G10H1/053B . . . . [N: by switches incorporating a mechanical vibrator, the envelope of the mechanical vibration being used as modulating signal]
G10H1/055 . . . . by switches with variable impedance elements
G10H1/055C . . . . . [N: using variable capacitors]

G10H1/055L . . . . . [N: using optical or light-responsive means]
G10H1/055M . . . . . [N: using magnetic or electromagnetic means]
G10H1/055P . . . . . [N: using piezo-electric means]
G10H1/055R . . . . . [N: using variable resistors]
G10H1/057 . . . . by envelope-forming circuits
G10H1/057B . . . . . [N: using a data store from which the envelope is synthesized (tones synthesized from a data store G10H7/00)]
G10H1/06 . . Circuits for establishing the harmonic content of tones, [N: or other arrangements for changing the tone colour]
G10H1/08 . . . by combining tones (G10H1/14, G10H1/16 take precedence; chord G10H1/38; analysis or synthesis of sound waves per se G10L)
G10H1/10 . . . . for obtaining chorus, celeste or ensemble effects (continuous modulation G10H1/043)
G10H1/12 . . . by filtering complex waveforms (G10H1/14, G10H1/16 take precedence)
G10H1/12D . . . . [N: using a digital filter (digital filters per se H03H17/02)]
G10H1/14 . . . during execution (modulation during execution G10H1/053; [N: voice controlled instruments G10H5/00C])
G10H1/16 . . . by non-linear elements (G10H1/14 takes precedence; generation of non-sinusoidal basic tones G10H5/10)

G10H1/18 . Selecting circuits
G10H1/18B . . [N: Suppression of switching-noise]
G10H1/18C . . [N: Key multiplexing (G10H1/18D2 takes precedence)]
G10H1/18D . . [N: Channel-assigning means for polyphonic instruments]
G10H1/18D2 . . . [N: associated with key multiplexing]
G10H1/18D2B . . . . [N: Microprocessor-controlled keyboard and assigning means]
G10H1/18D3 . . . [N: using multiplexed channel processors (G10H1/18D2B takes precedence)]
G10H1/18D4 . . . [N: with means to assign more than one channel to any single key]
G10H1/20 . . for transposition
G10H1/22 . . for suppressing tones; Preference networks
G10H1/24 . . for selecting plural preset register stops
G10H1/26 . . for automatically producing a series of tones (musical toys A63H5/00)
G10H1/28 . . . to produce arpeggios
G10H1/30 . . . to reiteratively sound two tones

G10H1/32 . Constructional details
G10H1/34 . . 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)
G10H1/34B . . . [N: for guitar-like instruments with or without strings and with a neck on which switches or string-fret contacts are used to detect the notes being played (electric guitars in which the tones are generated by the vibration of strings G10H3/18)]
G10H1/34C . . . [N: Structural association with individual keys (electrically operated wind-actuated organs G10B3/22)] [N9511]
G10H1/34C2 . . . . [N: Keys with an arrangement for simulating the feeling of a piano key, e.g. using counterweights, springs, cams] [N9511]

G10H1/34C3 . . . . [N: Switches actuated by parts of the body other than the fingers (pedals or pedal mechanisms for wind-actuated organs G10B3/14, for pianos G10C3/26)] [N9511]

G10H1/36 . Accompaniment arrangements

G10H1/36K . . [N: Recording/reproducing of accompaniment for use with an external source, e.g. karaoke systems] [N9803]

G10H1/36K2 . . . [N: using optical disks, e.g. CD, CD-ROM, to store accompaniment information in digital form (recording/reproducing by optical means G11B7/00)] [N9803]

G10H1/36K3 . . . [N: the accompaniment information being stored on a host computer and transmitted to a reproducing terminal by means of a network, e.g. public telephone lines] [N9803]

G10H1/36K5 . . . [N: with means for modifying or correcting the external signal, e.g. pitch correction, reverberation, changing a singer`s voice] [N9803]

G10H1/36K7 . . . [N: displaying animated or moving pictures synchronized with the music or audio part] [N9803]

G10H1/38 . . Chord

G10H1/38B . . . [N: Chord detection and/or recognition, e.g. for correction, or automatic bass generation]

G10H1/38C . . . [N: One-finger or one-key chord systems]

G10H1/40 . . Rhythm (metronomes G04F5/02)

G10H1/42 . . . comprising tone forming circuits

G10H1/44 . Tuning means

G10H1/46 . Volume control

G10H3/00 Instruments in which the tones are generated by electromechanical means

G10H3/02 . using mechanical interrupters

G10H3/03 . using pick-up means for reading recorded waves, e.g. on rotating discs [N: drums, tapes or wires]

G10H3/06 . . using photoelectric pick-up means

G10H3/08 . . using inductive pick-up means

G10H3/09 . . . using tapes or wires

G10H3/10 . . using capacitative pick-up means

G10H3/12 . using mechanical resonant generators, e.g. strings or percussive instruments, the tones of which are picked up by electromechanical transducers, the electrical signals being further manipulated or amplified and subsequently converted to sound by a loudspeaker or equivalent instrument

G10H3/12B . . [N: Extracting or recognising the pitch or fundamental frequency of the picked up signal] [N9612]

G10H3/14 . . using mechanically actuated vibrators with pick-up means (G10H3/24 takes precedence)

G10H3/14B . . . [N: characterised by the use of a piezo-electric or magneto-strictive transducer (piezo-electric or magnetostrictive loudspeakers for mechanical vibrations B06B, G10K; piezo-electric or magneto-strictive transducers or microphones H04R15/00, H04R17/00)]

G10H3/14D . . . [N: using a membrane, e.g. a drum; Pick-up means for vibrating surfaces, e.g. housing of an instrument]

G10H3/16 . . . using a reed

G10H3/18 . . . using a string, e.g. electric guitar [N: mechanical features G10D1/08B]

G10H3/18B . . . . [N: Details of pick-up assemblies]

G10H3/18C . . . . [N: using two or more pick-up means for each string]

G10H3/18D . . . . [N: in which the position of the pick-up means is adjustable]

G10H3/18E . . . . [N: in which the tones are picked up through the bridge structure]

G10H3/18P . . . . [N: Means for processing the signal picked up from the strings (filtering G10H1/12)] [N9811]

G10H3/18P2 . . . . . [N: for distorting the signal, e.g. to simulate tube amplifiers (changing the tone color by non-linear elements G10H1/16)] [N9811]

G10H3/18P3 . . . . . [N: for converting the signal to digital format (transmission using a MIDI interface G10H1/00R2C2)] [N9811]

G10H3/20 . . . using a tuning fork, rod or tube

G10H3/22 . . using electromechanically actuated vibrators with pick-up means (G10H3/24 takes precedence)

G10H3/24 . . incorporating feed-back means, e.g. acoustic

G10H3/26 . . . using electric feed-back

G10H5/00 **Instruments in which the tones are generated by means of electronic generators** (G10H7/00 takes precedence)

G10H5/00B . [N: Instruments using voltage controlled oscillators and amplifiers or voltage controlled oscillators and filters, e.g. Synthesisers]

G10H5/00C . [N: Voice controlled instruments]

G10H5/00S . [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)]

G10H5/02 . using generation of basic tones

G10H5/04 . . with semiconductor devices as active elements (G10H3/10, G10H3/12 take precedence)

G10H5/06 . . tones generated by frequency multiplication or division of a basic tone

G10H5/07 . . . resulting in complex waveforms

G10H5/08 . . tones generated by heterodyning

G10H5/10 . using generation of non-sinusoidal basic tones, e.g. saw-tooth [N: G10H5/06 takes precedence]

G10H5/12 . . using semiconductor devices as active elements

G10H5/14 . using electromechanical resonator, e.g. quartz crystal, as frequency determining element [N: G10H5/02, G10H5/08 take precedence]

G10H5/16 . using cathode ray tube

G10H7/00 **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)

G10H7/00C . [N: using a common processing for different operations or calculations, and a set of micro-instructions (programme) to control the sequence thereof]

G10H7/00C2 . . [N: with one or more auxiliary processor in addition to the main processing unit] [N9811]

G10H7/00C3 . . [N: using two or more algorithms of different types to generate tones, e.g. according to tone color or to processor workload] [N9811]

G10H7/00T . [N: Means for controlling the transition from one tone waveform to another (glissando or legato per se G10H1/02)]

G10H7/02 . in which amplitudes at successive sample points of a tone waveform are stored in one or more memories

G10H7/04 . . in which amplitudes are read at varying rates, e.g. according to pitch

G10H7/04B . . . [N: using an auxiliary register or set of registers, e.g. a shift-register, in which the amplitudes are transferred before being read]

G10H7/06 . . in which amplitudes are read at a fixed rate, the read-out address varying stepwise by a given value, e.g. according to pitch

G10H7/08 . by calculating functions or polynomial approximations to evaluate amplitudes at successive sample points of a tone waveform

G10H7/10 . . using coefficients or parameters stored in a memory, e.g. Fourier coefficients (G10H7/12 takes precedence)

G10H7/10B . . . [N: using Fourier coefficients]

G10H7/12 . . by means of a recursive algorithm using one or more sets of parameters stored in a memory and the calculated amplitudes of one or more preceding sample points