CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS
(NOTES omitted)

INSTRUMENTS

G10 MUSICAL INSTRUMENTS; ACOUSTICS
(NOTES omitted)

G10H ELECTROPHONIC MUSICAL INSTRUMENTS; INSTRUMENTS IN WHICH THE TONES ARE GENERATED BY ELECTROMECHANICAL MEANS OR ELECTRONIC GENERATORS, OR IN WHICH THE TONES ARE SYNTHESISED FROM A DATA STORE

NOTE

This subclass <u>covers</u> 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.

WARNING

{In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

1/00	**Details of electrophonic musical instruments**
1/0008	. {Associated control or indicating means}
1/0016	. . {Means for indicating which keys, frets or strings are to be actuated, e.g. using lights or leds}
1/0025	. . {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 G10H 1/26)}
1/0033	. {Recording/reproducing or transmission of music for electrophonic musical instruments}
1/0041	. . {in coded form}
1/005	. . . {on magnetic tape}
1/0058	. . . {Transmission between separate instruments or between individual components of a musical system (G10H 1/0083 takes precedence)}
1/0066	. . . . {using a MIDI interface}
1/0075	. . . . . {with translation or conversion means for unavailable commands, e.g. special tone colors}
1/0083	. . {using wireless transmission, e.g. radio, light, infrared}
1/0091	. {Means for obtaining special acoustic effects (combined with modulation G10H 1/043)}
1/02	. Means for controlling the tone frequencies, e.g. attack or decay; Means for producing special musical effects, e.g. vibratos or glissandos
1/04	. . by additional modulation
1/043	. . . Continuous modulation
1/045	. . . . by electromechanical means
1/047	. . . . by acousto-mechanical means, e.g. rotating speakers or sound deflectors
1/053	. . . during execution only {(voice controlled instruments G10H 5/005)}
1/0535	. . . . {by switches incorporating a mechanical vibrator, the envelope of the mechanical vibration being used as modulating signal}

1/055	. . . . by switches with variable impedance elements
1/0551	. . . . . {using variable capacitors}
1/0553	. . . . . {using optical or light-responsive means}
1/0555	. . . . . {using magnetic or electromagnetic means}
1/0556	. . . . . {using piezoelectric means}
1/0558	. . . . . {using variable resistors}
1/057	. . . by envelope-forming circuits
1/0575	. . . . . {using a data store from which the envelope is synthesized (tones synthesized from a data store G10H 7/00)}
1/06	. . Circuits for establishing the harmonic content of tones {, or other arrangements for changing the tone colour}
1/08	. . . by combining tones (G10H 1/14, G10H 1/16 take precedence; chord G10H 1/38)
1/10	. . . . for obtaining chorus, celeste or ensemble effects (continuous modulation G10H 1/043)
1/12	. . . by filtering complex waveforms (G10H 1/14, G10H 1/16 take precedence)
1/125	. . . . {using a digital filter}
1/14	. . . during execution {(voice controlled instruments G10H 5/005)}
1/16	. . . by non-linear elements (G10H 1/14 takes precedence)
1/18	. Selecting circuits
1/181	. . {Suppression of switching-noise}
1/182	. . {Key multiplexing (G10H 1/185 takes precedence)}
1/183	. . {Channel-assigning means for polyphonic instruments}
1/185	. . . {associated with key multiplexing}
1/186	. . . . {Microprocessor-controlled keyboard and assigning means}

1/187	. . . {using multiplexed channel processors (G10H 1/186 takes precedence)}
1/188	. . . {with means to assign more than one channel to any single key}
1/20	. . for transposition
1/22	. . for suppressing tones; Preference networks
1/24	. . for selecting plural preset register stops
1/26	. . for automatically producing a series of tones
1/28	. . . to produce arpeggios
1/30	. . . to reiteratively sound two tones
1/32	. Constructional details
1/34	. . Switch arrangements, e.g. keyboards or mechanical switches specially adapted for electrophonic musical instruments
1/342	. . . {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 G10H 3/18)}
1/344	. . . {Structural association with individual keys (electrically operated wind-actuated organs G10B 3/22)}
1/346	. . . . {Keys with an arrangement for simulating the feeling of a piano key, e.g. using counterweights, springs, cams}
1/348	. . . . {Switches actuated by parts of the body other than fingers}
1/36	. . Accompaniment arrangements
1/361	. . . {Recording/reproducing of accompaniment for use with an external source, e.g. karaoke systems}
1/363	. . . {using optical disks, e.g. CD, CD-ROM, to store accompaniment information in digital form}
1/365	. . . {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}
1/366	. . . {with means for modifying or correcting the external signal, e.g. pitch correction, reverberation, changing a singer's voice}
1/368	. . . {displaying animated or moving pictures synchronized with the music or audio part}
1/38	. . Chord
1/383	. . . {Chord detection and/or recognition, e.g. for correction, or automatic bass generation}
1/386	. . . {One-finger or one-key chord systems}
1/40	. . Rhythm
1/42	. . . comprising tone forming circuits
1/44	. Tuning means
1/46	. Volume control

3/00 Instruments in which the tones are generated by electromechanical means

3/02	. using mechanical interrupters
3/03	. using pick-up means for reading recorded waves, e.g. on rotating discs {drums, tapes or wires}
3/06	. . using photoelectric pick-up means
3/08	. . using inductive pick-up means
3/09	. . . using tapes or wires
3/10	. . using capacitive pick-up means
3/12	. 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
3/125	. . {Extracting or recognising the pitch or fundamental frequency of the picked up signal}
3/14	. . using mechanically actuated vibrators with pick-up means (G10H 3/24 takes precedence)
3/143	. . . {characterised by the use of a piezoelectric or magneto-strictive transducer}
3/146	. . . {using a membrane, e.g. a drum; Pick-up means for vibrating surfaces, e.g. housing of an instrument}
3/16	. . . using a reed
3/18	. . . using a string, e.g. electric guitar {(mechanical features G10D 1/085)}
3/181	. . . . {Details of pick-up assemblies}
3/182	. . . . {using two or more pick-up means for each string}
3/183	. . . . {in which the position of the pick-up means is adjustable}
3/185	. . . . {in which the tones are picked up through the bridge structure}
3/186	. . . . {Means for processing the signal picked up from the strings (filtering G10H 1/12)}
3/187	. . . . . {for distorting the signal, e.g. to simulate tube amplifiers (changing the tone color by non-linear elements G10H 1/16)}
3/188	. . . . . {for converting the signal to digital format (transmission using a MIDI interface G10H 1/0066)}
3/20	. . . using a tuning fork, rod or tube
3/22	. . using electromechanically actuated vibrators with pick-up means (G10H 3/24 takes precedence)
3/24	. . incorporating feedback means, e.g. acoustic
3/26	. . . using electric feedback

5/00 Instruments in which the tones are generated by means of electronic generators (G10H 7/00 takes precedence)

5/002	. {Instruments using voltage controlled oscillators and amplifiers or voltage controlled oscillators and filters, e.g. Synthesisers}
5/005	. {Voice controlled instruments}
5/007	. {Real-time simulation of G10B, G10C, G10D-type instruments using recursive or non-linear techniques, e.g. waveguide networks, recursive algorithms}
5/02	. using generation of basic tones
5/04	. . with semiconductor devices as active elements (G10H 3/10, G10H 3/12 take precedence)
5/06	. . tones generated by frequency multiplication or division of a basic tone
5/07	. . . resulting in complex waveforms
5/08	. . tones generated by heterodyning
5/10	. using generation of non-sinusoidal basic tones, e.g. saw-tooth {(G10H 5/06 takes precedence)}
5/12	. . using semiconductor devices as active elements
5/14	. using electromechanical resonators, e.g. quartz crystals, as frequency determining element {(G10H 5/02, G10H 5/08 take precedence)}
5/16	. using cathode ray tubes

7/00		**Instruments in which the tones are synthesised from a data store, e.g. computer organs**
7/002	.	{using a common processing for different operations or calculations, and a set of microinstructions (programme) to control the sequence thereof}
7/004	. .	{with one or more auxiliary processor in addition to the main processing unit}
7/006	. .	{using two or more algorithms of different types to generate tones, e.g. according to tone color or to processor workload}
7/008	.	{Means for controlling the transition from one tone waveform to another}
7/02	.	in which amplitudes at successive sample points of a tone waveform are stored in one or more memories
7/04	. .	in which amplitudes are read at varying rates, e.g. according to pitch
7/045	. . .	{using an auxiliary register or set of registers, e.g. a shift-register, in which the amplitudes are transferred before being read}
7/06	. .	in which amplitudes are read at a fixed rate, the read-out address varying stepwise by a given value, e.g. according to pitch
7/08	.	by calculating functions or polynomial approximations to evaluate amplitudes at successive sample points of a tone waveform
7/10	. .	using coefficients or parameters stored in a memory, e.g. Fourier coefficients (G10H 7/12 takes precedence)
7/105	. . .	{using Fourier coefficients}
7/12	. .	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
2210/00		**Aspects or methods of musical processing having intrinsic musical character, i.e. involving musical theory or musical parameters or relying on musical knowledge, as applied in electrophonic musical tools or instruments**
2210/005	.	Musical accompaniment, i.e. complete instrumental rhythm synthesis added to a performed melody, e.g. as output by drum machines
2210/011	. .	Fill-in added to normal accompaniment pattern
2210/015	. .	Accompaniment break, i.e. interrupting then restarting
2210/021	.	Background music, e.g. for video sequences or elevator music
2210/026	. .	for games, e.g. videogames
2210/031	.	Musical analysis, i.e. isolation, extraction or identification of musical elements or musical parameters from a raw acoustic signal or from an encoded audio signal
2210/036	. .	of musical genre, i.e. analysing the style of musical pieces, usually for selection, filtering or classification
2210/041	. .	based on mfcc [mel -frequency spectral coefficients]
2210/046	. .	for differentiation between music and non-music signals, based on the identification of musical parameters, e.g. based on tempo detection
2210/051	. .	for extraction or detection of onsets of musical sounds or notes, i.e. note attack timings

2210/056	. .	for extraction or identification of individual instrumental parts, e.g. melody, chords, bass; Identification or separation of instrumental parts by their characteristic voices or timbres
2210/061	. .	for extraction of musical phrases, isolation of musically relevant segments, e.g. musical thumbnail generation, or for temporal structure analysis of a musical piece, e.g. determination of the movement sequence of a musical work
2210/066	. .	for pitch analysis as part of wider processing for musical purposes, e.g. transcription, musical performance evaluation; Pitch recognition, e.g. in polyphonic sounds; Estimation or use of missing fundamental
2210/071	. .	for rhythm pattern analysis or rhythm style recognition
2210/076	. .	for extraction of timing, tempo; Beat detection
2210/081	. .	for automatic key or tonality recognition, e.g. using musical rules or a knowledge base
2210/086	. .	for transcription of raw audio or music data to a displayed or printed staff representation or to displayable MIDI-like note-oriented data, e.g. in pianoroll format
2210/091	. .	for performance evaluation, i.e. judging, grading or scoring the musical qualities or faithfulness of a performance, e.g. with respect to pitch, tempo or other timings of a reference performance
2210/095	.	Inter-note articulation aspects, e.g. legato or staccato
2210/101	.	Music Composition or musical creation; Tools or processes therefor
2210/105	. .	Composing aid, e.g. for supporting creation, edition or modification of a piece of music
2210/111	. .	Automatic composing, i.e. using predefined musical rules
2210/115	. . .	using a random process to generate a musical note, phrase, sequence or structure
2210/121	. . . .	using a knowledge base
2210/125	. .	Medley, i.e. linking parts of different musical pieces in one single piece, e.g. sound collage, DJ mix
2210/131	. .	Morphing, i.e. transformation of a musical piece into a new different one, e.g. remix
2210/136	. . .	Morphing interpolation, i.e. interpolating in pitch, harmony or time, tempo or rhythm, between two different musical pieces, e.g. to produce a new musical work
2210/141	. .	Riff, i.e. improvisation, e.g. repeated motif or phrase, automatically added to a piece, e.g. in real time
2210/145	. .	Composing rules, e.g. harmonic or musical rules, for use in automatic composition; Rule generation algorithms therefor
2210/151	. .	using templates, i.e. incomplete musical sections, as a basis for composing
2210/155	.	Musical effects
2210/161	. .	Note sequence effects, i.e. sensing, altering, controlling, processing or synthesising a note trigger selection or sequence, e.g. by altering trigger timing, triggered note values, adding improvisation or ornaments or also rapid repetition of the same note onset
2210/165	. . .	Humanizing effects, i.e. causing a performance to sound less machine-like, e.g. by slightly randomising pitch or tempo

2210/171	. . .	Ad-lib effects, i.e. adding a musical phrase or improvisation automatically or on player's request, e.g. one-finger triggering of a note sequence
2210/175	. . .	Fillnote, i.e. adding isolated notes or passing notes to the melody
2210/181	. . .	Gracenote, i.e. adding a different and very short ornamental note at the beginning or at the end of a melody note, e.g. appoggiatura, acciaccatura, sparsh-swar
2210/185	. . .	Arpeggio, i.e. notes played or sung in rapid sequence, one after the other, rather than ringing out simultaneously, e.g. as a chord; Generators therefor, i.e. arpeggiators; Discrete glissando effects on instruments not permitting continuous glissando, e.g. xylophone or piano, with stepwise pitch variation and on which distinct onsets due to successive note triggerings can be heard
2210/191	. . .	Tremolo, tremulando, trill or mordent effects, i.e. repeatedly alternating stepwise in pitch between two note pitches or chords, without any portamento between the two notes
2210/195	. .	Modulation effects, i.e. smooth non-discontinuous variations over a time interval, e.g. within a note, melody or musical transition, of any sound parameter, e.g. amplitude, pitch, spectral response or playback speed
2210/201	. . .	Vibrato, i.e. rapid, repetitive and smooth variation of amplitude, pitch or timbre within a note or chord
2210/205	. . . .	Amplitude vibrato, i.e. repetitive smooth loudness variation without pitch change or rapid repetition of the same note, bisbigliando, amplitude tremolo or tremulants
2210/211	. . . .	Pitch vibrato, i.e. repetitive and smooth variation in pitch, e.g. as obtainable with a whammy bar or tremolo arm on a guitar
2210/215	. . . .	Rotating vibrato, i.e. simulating rotating speakers, e.g. Leslie effect
2210/221	. . .	Glissando, i.e. pitch smoothly sliding from one note to another, e.g. gliss, glide, slide, bend, smear or sweep
2210/225	. . . .	Portamento, i.e. smooth continuously variable pitch-bend, without emphasis of each chromatic pitch during the pitch change, which only stops at the end of the pitch shift, as obtained, e.g. by a MIDI pitch wheel or trombone
2210/231	. . .	Wah-wah spectral modulation, i.e. tone color spectral glide obtained by sweeping the peak of a bandpass filter up or down in frequency, e.g. according to the position of a pedal, by automatic modulation or by voice formant detection; control devices therefor, e.g. wah pedals for electric guitars
2210/235	. . .	Flanging or phasing effects, i.e. creating time and frequency dependent constructive and destructive interferences, obtained, e.g. by using swept comb filters or a feedback loop around all-pass filters with gradually changing non-linear phase response or delays
2210/241	. . .	Scratch effects, i.e. emulating playback velocity or pitch manipulation effects normally obtained by a disc-jockey manually rotating a LP record forward and backward
2210/245	. .	Ensemble, i.e. adding one or more voices, also instrumental voices
2210/251	. . .	Chorus, i.e. automatic generation of two or more extra voices added to the melody, e.g. by a chorus effect processor or multiple voice harmonizer, to produce a chorus or unison effect, wherein individual sounds from multiple sources with roughly the same timbre converge and are perceived as one
2210/255	. . . .	Unison, i.e. two or more voices or instruments sounding substantially the same pitch, e.g. at the same time
2210/261	. . .	Duet, i.e. automatic generation of a second voice, descant or counter melody, e.g. of a second harmonically interdependent voice by a single voice harmonizer or automatic composition algorithm, e.g. for fugue, canon or round composition, which may be substantially independent in contour and rhythm
2210/265	. .	Acoustic effect simulation, i.e. volume, spatial, resonance or reverberation effects added to a musical sound, usually by appropriate filtering or delays
2210/271	. . .	Sympathetic resonance, i.e. adding harmonics simulating sympathetic resonance from other strings
2210/275	. . . .	Helmholtz resonance effect, i.e. using, exciting or emulating air resonance in a cavity
2210/281	. . .	Reverberation or echo
2210/285	. . . .	Electromechanical effectors therefor, i.e. using springs or similar electromechanical audio delay units
2210/291	. . . .	Reverberator using both direct, i.e. dry, and indirect, i.e. wet, signals or waveforms, indirect signals having sustained one or more virtual reflections
2210/295	. .	Spatial effects, musical uses of multiple audio channels, e.g. stereo
2210/301	. . .	Soundscape or sound field simulation, reproduction or control for musical purposes, e.g. surround or 3D sound; Granular synthesis
2210/305	. . . .	Source positioning in a soundscape, e.g. instrument positioning on a virtual soundstage, stereo panning or related delay or reverberation changes; Changing the stereo width of a musical source
2210/311	. .	Distortion, i.e. desired non-linear audio processing to change the tone colour, e.g. by adding harmonics or deliberately distorting the amplitude of an audio waveform
2210/315	. .	Dynamic effects for musical purposes, i.e. musical sound effects controlled by the amplitude of the time domain audio envelope, e.g. loudness-dependent tone colour or musically desired dynamic range compression or expansion

2210/321	. .	Missing fundamental, i.e. creating the psychoacoustic impression of a missing fundamental tone through synthesis of higher harmonics, e.g. to play bass notes pitched below the frequency range of reproducing speakers
2210/325	.	Musical pitch modification
2210/331	. .	Note pitch correction, i.e. modifying a note pitch or replacing it by the closest one in a given scale
2210/335	. . .	Chord correction, i.e. modifying one or several notes within a chord, e.g. to correct wrong fingering or to improve harmony
2210/341	.	Rhythm pattern selection, synthesis or composition
2210/346	. .	Pattern variations, break or fill-in
2210/351	. .	Inserting a drum roll, e.g. as pattern break
2210/356	. .	Random process used to build a rhythm pattern
2210/361	. .	Selection among a set of pre-established rhythm patterns
2210/366	. .	Random process affecting a selection among a set of pre-established patterns
2210/371	. .	Rhythm syncopation, i.e. timing offset of rhythmic stresses or accents, e.g. note extended from weak to strong beat or started before strong beat
2210/375	.	Tempo or beat alterations; Music timing control
2210/381	. .	Manual tempo setting or adjustment
2210/385	. .	Speed change, i.e. variations from preestablished tempo, tempo change, e.g. faster or slower, accelerando or ritardando, without change in pitch
2210/391	. .	Automatic tempo adjustment, correction or control
2210/395	.	Special musical scales, i.e. other than the 12-interval equally tempered scale; Special input devices therefor
2210/401	. .	Microtonal scale; i.e. continuous scale of pitches, also interval-free input devices, e.g. continuous keyboards for violin, singing voice or trombone synthesis
2210/405	. .	Honkytonk scale, for producing, e.g. a honky-tonk piano effect, i.e. with deliberately detuned notes within each octave
2210/411	. .	Railsback scale, i.e. stretched scale for piano tuning with bass keys having lower pitches and treble keys having higher pitches than foreseen by the equally tempered scale
2210/415	. .	Equally tempered scale, i.e. note tuning scale in which every pair of adjacent notes has an identical frequency ratio equal to 2 to the power 1/n if the scale has n notes per octave
2210/421	. . .	10 equal intervals per octave
2210/425	. . .	19 equal intervals per octave, offering better major thirds, far better minor thirds and overall far greater consonance than normal 12-semitone equal temperament, at the cost of a flatter fifth
2210/431	. . .	Quarter tone scale, i.e. 24 equal intervals per octave, e.g. for Arabic music
2210/435	. . .	Huygens scale, i.e. 31 equal intervals per octave, provides near-just major thirds, and provides decent matches for harmonics up to at least 13, despite a slightly less accurate fifth than the standard 12 interval equally tempered scale
2210/441	. . .	Janko scale, i.e. 41 equal intervals per octave, e.g. as used in the "tonal plexus" keyboard with 211 keys per octave arranged in 12 staggered columns, i.e. in 41 regions of 5 keys each plus 6 duplicate enharmonic keys
2210/445	. . .	45 equal intervals per octave
2210/451	. . .	Holder scale or Holdrian comma, i.e. 53 equal intervals per octave, with 31 intervals equal to an almost just perfect fifth; Keyboards therefor, e.g. "generalized keyboard" of Robert Holford Macdowall Bosanquet
2210/455	. . .	70 equal intervals per octave
2210/461	. . .	Jankovski scale or twelfth tone scale, i.e. octave divided in 72 equal intervals, e.g. moria in Byzantine music theory
2210/465	. . .	84 equal intervals per octave
2210/471	. .	Natural or just intonation scales, i.e. based on harmonics consonance such that most adjacent pitches are related by harmonically pure ratios of small integers
2210/476	. . .	Zarlino scales, e.g. octave subdivision based on the pitch ratios 9/8 + 10/9 + 16/15 + 9/8 + 10/9 + 9/8 + 16/15
2210/481	. . .	Pythagorean scale, i.e. in which the frequency relationships of all intervals should be based on the perfect fifth, with ratio 3:2
2210/486	. . .	Werckmeister scales, i.e. family of scales with 12 mostly rational intervals, e.g. for organs
2210/491	. . .	Meantone scales, i.e. in which all non-octave intervals are generated from a stack of tempered perfect fifths; and wherein, by choosing an appropriate size for major and minor thirds, the syntonic comma is tempered to unison, e.g. quarter comma meantone, syntonic comma, d'Alembert modified meantone
2210/496	. . .	Redfield scales, i.e. 12 intervals per octave, based on note ratios equal to $(2^{**}p)^*(3^{**}q)^*(5^{**}r)$ with p, q, r positive or negative integers
2210/501	. . .	Altered natural scale, i.e. 12 unequal intervals not foreseen in the above
2210/506	. . .	Danielou 53 interval scale, with note ratios equal to $(2^{**}p)(3^{**}q)(5^{**}r)$, with p, q, r positive or negative integers
2210/511	. .	Arabic scales, i.e. either double harmonic scale or major locrian scale; Vosta or zaid modes
2210/515	. .	Balinese scales, e.g. for gamelan, with instruments played in pairs and tuned slightly apart to produce interference beating ideally at a consistent speed for all pairs of notes in all registers; Balinese pentatonic scales, e.g. Balinese slendro scale, or five-tone modes of the heptatonic pelog scale, itself substantially a 7-note subset of 9-tone equal temperament
2210/521	. .	Polynesian scales
2210/525	. .	Diatonic scales, e.g. aeolian, ionian or major, dorian, locrian, lydian, mixolydian, phrygian, i.e. seven note, octave-repeating musical scales comprising five whole steps and two half steps for each octave, in which the two half steps are separated from each other by either two or three whole steps
2210/531	. .	Bluenote scale, i.e. 7-tone scale of 2+1+2+1+3+1+2 semitones

2210/535	. .	Hexatonal or hexatonic scales, i.e. six pitches or notes per octave, e.g. whole tone scale, augmented scale, Prometheus scale, blues scale
2210/541	. .	Pentatonal or pentatonic scale, i.e. five pitches or notes per octave, e.g. basic Chinese musical scale, black piano keys, Javanese gamelan slendro scale or Japanese shakuhachi flute
2210/545	. . .	Yona Nuki, i.e. a family of pentatonic scales without fourth or seventh, e.g. Hirajoshi, Iwato, Kumoi, Sino-indian [Raga Amritavarsini] used, e.g. for japanese traditional music, koto or shamisen tunings
2210/551	. . .	Okinawa pentatonic scale, i.e. Okinawan min'yo, e.g. including the half-steps omitted in the min'yo pentatonic scale used in the main japanese islands
2210/555	.	Tonality processing, involving the key in which a musical piece or melody is played
2210/561	. .	Changing the tonality within a musical piece
2210/565	. .	Manual designation or selection of a tonality
2210/571	.	Chords; Chord sequences
2210/576	. .	Chord progression
2210/581	. .	Chord inversion
2210/586	. .	Natural chords, i.e. adjustment of individual note pitches in order to generate just intonation chords
2210/591	. .	Chord with a suspended note, e.g. 2nd or 4th
2210/596	. .	Chord augmented
2210/601	. .	Chord diminished
2210/606	. .	Chord ninth, i.e. including ninth or above, e.g. 11th or 13th
2210/611	. .	Chord ninth or above, to which is added a tension note
2210/616	. .	Chord seventh, major or minor
2210/621	. .	Chord seventh dominant
2210/626	. .	Chord sixth
2220/00		**Input/output interfacing specifically adapted for electrophonic musical tools or instruments**
2220/005	.	Non-interactive screen display of musical or status data
2220/011	. .	Lyrics displays, e.g. for karaoke applications
2220/015	. .	Musical staff, tablature or score displays, e.g. for score reading during a performance
2220/021	.	Indicator, i.e. non-screen output user interfacing, e.g. visual or tactile instrument status or guidance information using lights, LEDs or seven segments displays
2220/026	. .	associated with a key or other user input device, e.g. key indicator lights
2220/031	. . .	Blinking or flashing indicator lights
2220/036	. . .	Chord indicators, e.g. displaying note fingering when several notes are to be played simultaneously as a chord
2220/041	. . .	Remote key fingering indicator, i.e. fingering shown on a display separate from the instrument itself or substantially disjoint from the keys
2220/046	. . .	Drumpad indicator, e.g. drumbeat strike indicator light on a drumpad or rim
2220/051	. . .	Fret indicator, e.g. for playing guidance on a string instrument or string instrument emulator
2220/056	. . .	Hand or finger indicator, e.g. for indicating which hand or which specific finger should be used

2220/061	. . .	LED, i.e. using a light-emitting diode as indicator
2220/066	. . . .	Colour, i.e. indications with two or more different colours
2220/071	. . .	Pedal indicator, e.g. guitar pedal status lights
2220/076	. . .	String indicator, e.g. on a stringed musical instrument for indicating which string is to be played, plucked or bowed
2220/081	. .	Beat indicator, e.g. marks or flashing LEDs to indicate tempo or beat positions
2220/086	. .	Beats per minute [BPM] indicator, i.e. displaying a tempo value, e.g. in words or as numerical value in beats per minute
2220/091	.	Graphical user interface [GUI] specifically adapted for electrophonic musical instruments, e.g. interactive musical displays, musical instrument icons or menus; Details of user interactions therewith
2220/096	. .	using a touch screen
2220/101	. .	for graphical creation, edition or control of musical data or parameters
2220/106	. . .	using icons, e.g. selecting, moving or linking icons, on-screen symbols, screen regions or segments representing musical elements or parameters
2220/111	. . . .	for graphical orchestra or soundstage control, e.g. on-screen selection or positioning of instruments in a virtual orchestra, using movable or selectable musical instrument icons
2220/116	. . .	for graphical editing of sound parameters or waveforms, e.g. by graphical interactive control of timbre, partials or envelope
2220/121	. . .	for graphical editing of a musical score, staff or tablature
2220/126	. . .	for graphical editing of individual notes, parts or phrases represented as variable length segments on a 2D or 3D representation, e.g. graphical edition of musical collage, remix files or pianoroll representations of MIDI-like files
2220/131	. . .	for abstract geometric visualisation of music, e.g. for interactive editing of musical parameters linked to abstract geometric figures
2220/135	.	Musical aspects of games or videogames; Musical instrument-shaped game input interfaces
2220/141	. .	Games on or about music, i.e. based on musical knowledge, e.g. musical multimedia quizzes
2220/145	. .	Multiplayer musical games, e.g. karaoke-like multiplayer videogames
2220/151	. .	Musical difficulty level setting or selection
2220/155	.	User input interfaces for electrophonic musical instruments
2220/161	. .	with 2D or x/y surface coordinates sensing
2220/165	. .	for string input, i.e. special characteristics in string composition or use for sensing purposes, e.g. causing the string to become its own sensor
2220/171	. . .	using electrified strings, e.g. strings carrying coded or AC signals for transducing, sustain, fret length or fingering detection
2220/175	. . .	using nonmagnetic string materials, e.g. nylon; Sensors specially adapted therefor

2220/181	. . .	by nonresonant wave interaction, i.e. string sensing using wavelengths unrelated to string resonant wavelengths, e.g. ultrasonic waves, microwave or light waves, propagated along a musical instrument string to measure its fret length, e.g. for MIDI transcription
2220/185	. .	Stick input, e.g. drumsticks with position or contact sensors
2220/191	. .	Plectrum or pick sensing, e.g. for detection of string striking or plucking
2220/195	. .	Particle energy or molecular configuration used as musical control data
2220/201	. .	for movement interpretation, i.e. capturing and recognizing a gesture or a specific kind of movement, e.g. to control a musical instrument
2220/206	. . .	Conductor baton movement detection used to adjust rhythm, tempo or expressivity of, e.g. the playback of musical pieces
2220/211	. .	for microphones, i.e. control of musical parameters either directly from microphone signals or by physically associated peripherals, e.g. karaoke control switches or rhythm sensing accelerometer within the microphone casing
2220/215	. .	using a magnetic strip on a card or sheet
2220/221	. .	Keyboards, i.e. configuration of several keys or key-like input devices relative to one another
2220/226	. . .	Whole-tone keyboards, i.e. having as many keys on the upper row as on the lower row
2220/231	. . .	Alphanumeric, used for musical purposes or with additional musical features, e.g. typewriter or pc-type keyboard reconfigured such that letters or symbols are assigned to musical notes
2220/236	. . .	representing an active musical staff or tablature, i.e. with key-like position sensing at the expected note positions on the staff
2220/241	. . .	on touchscreens, i.e. keys, frets, strings, tablature or staff displayed on a touchscreen display for note input purposes
2220/246	. . .	with reduced number of keys per octave, some notes missing
2220/251	. . .	arranged as 2D or 3D arrays; Keyboards ergonomically organised for playing chords or for transposing, e.g. Janko keyboard
2220/256	. . .	foldable or rollable, e.g. for transport
2220/261	. . .	Numeric keypad used for musical purposes, e.g. musical input via a telephone or calculator-like keyboard
2220/265	. .	Key design details; Special characteristics of individual keys of a keyboard; Key-like musical input devices, e.g. finger sensors, pedals, potentiometers, selectors
2220/271	. . .	Velocity sensing for individual keys, e.g. by placing sensors at different points along the kinematic path for individual key velocity estimation by delay measurement between adjacent sensor signals
2220/275	. . .	Switching mechanism or sensor details of individual keys, e.g. details of key contacts, hall effect or piezoelectric sensors used for key position or movement sensing purposes; Mounting thereof
2220/281	. . . .	with two contacts, switches or sensor triggering levels along the key kinematic path
2220/285	. . . .	with three contacts, switches or sensor triggering levels along the key kinematic path
2220/291	. . . .	with four or more contacts, switches or sensor triggering levels along the key kinematic path
2220/295	. . . .	Switch matrix, e.g. contact array common to several keys, the actuated keys being identified by the rows and columns in contact
2220/301	. . . . .	Fret-like switch array arrangements for guitar necks
2220/305	. . .	using a light beam to detect key, pedal or note actuation
2220/311	. . .	with controlled tactile or haptic feedback effect; output interfaces therefor
2220/315	. .	for joystick-like proportional control of musical input; Videogame input devices used for musical input or control, e.g. gamepad, joysticks
2220/321	. .	Garment sensors, i.e. musical control means with trigger surfaces or joint angle sensors, worn as a garment by the player, e.g. bracelet, intelligent clothing
2220/326	. . .	Control glove or other hand or palm-attached control device
2220/331	. . .	Ring or other finger-attached control device
2220/336	. . .	Control shoe or boot, i.e. sensor-equipped lower part of lower limb, e.g. shoe, toe ring, sock, ankle bracelet or leg control attachment
2220/341	. .	Floor sensors, e.g. platform or groundsheet with sensors to detect foot position, balance or pressure, steps, stepping rhythm, dancing movements or jumping
2220/346	. . .	Hopscotch sensing mats, i.e. including several step sensing zones, e.g. for detection of rhythmic dancing in time to background music according to stepping indications
2220/351	. .	Environmental parameters, e.g. temperature, ambient light, atmospheric pressure, humidity, used as input for musical purposes
2220/355	. . .	Geolocation input, i.e. control of musical parameters based on location or geographic position, e.g. provided by GPS, WiFi network location databases or mobile phone base station position databases
2220/361	. .	Mouth control in general, i.e. breath, mouth, teeth, tongue or lip-controlled input devices or sensors detecting, e.g. lip position, lip vibration, air pressure, air velocity, air flow or air jet angle
2220/365	. .	Bow control in general, i.e. sensors or transducers on a bow; Input interface or controlling process for emulating a bow, bowing action or generating bowing parameters, e.g. for appropriately controlling a specialised sound synthesiser
2220/371	. .	Vital parameter control, i.e. musical instrument control based on body signals, e.g. brainwaves, pulsation, temperature or perspiration; Biometric information
2220/376	. . .	using brain waves, e.g. EEG
2220/381	. . .	using glottal signals from an electroglottograph [EGG] or from a neck-worn glottis pick-up device
2220/386	. . .	using genetic information [DNA] or unique characterizing features of individuals, e.g. fingerprints, iris, facial or vocal features

2220/391	. .	Angle sensing for musical purposes, using data from a gyroscope, gyrometer or other angular velocity or angular movement sensing device
2220/395	. .	Acceleration sensing or accelerometer use, e.g. 3D movement computation by integration of accelerometer data, angle sensing with respect to the vertical, i.e. gravity sensing
2220/401	. .	3D sensing, i.e. three-dimensional (x, y, z) position or movement sensing
2220/405	. .	Beam sensing or control, i.e. input interfaces involving substantially immaterial beams, radiation, or fields of any nature, used, e.g. as a switch as in a light barrier, or as a control device, e.g. using the theremin electric field sensing principle
2220/411	. . .	Light beams
2220/415	. . . .	Infrared beams
2220/421	. . . .	Laser beams
2220/425	. . .	Radio control, i.e. input or control device involving a radio frequency signal
2220/431	. . . .	Use of microwaves
2220/435	. . .	Ultrasound, i.e. input or control device involving inaudible pressure waves, e.g. focused as a beam
2220/441	. .	Image sensing, i.e. capturing images or optical patterns for musical purposes or musical control purposes
2220/445	. . .	Bar codes or similar machine readable optical code patterns, e.g. two dimensional mesh pattern, for musical input or control purposes
2220/451	. . .	Scanner input, e.g. scanning a paper document such as a musical score for automated conversion into a musical file format
2220/455	. . .	Camera input, e.g. analyzing pictures from a video camera and using the analysis results as control data
2220/461	.	Transducers, i.e. details, positioning or use of assemblies to detect and convert mechanical vibrations or mechanical strains into an electrical signal, e.g. audio, trigger or control signal
2220/465	. .	Bridge-positioned, i.e. assembled to or attached with the bridge of a stringed musical instrument
2220/471	. . .	at bottom, i.e. transducer positioned at the bottom of the bridge, between the bridge and the body of the instrument
2220/475	. . .	on the side, i.e. picking up vibrations from a side of the bridge
2220/481	. . .	on top, i.e. transducer positioned between the strings and the bridge structure itself
2220/485	. . .	One transducer per string, e.g. 6 transducers for a 6 string guitar
2220/491	. . .	Two or more transducers per string, e.g. 8 transducers on a 4-string violin bridge
2220/495	. . .	Single bridge transducer, common to all strings
2220/501	. . .	Two or more bridge transducers, at least one transducer common to several strings
2220/505	. .	Dual coil electrodynamic string transducer, e.g. for humbucking, to cancel out parasitic magnetic fields
2220/511	. . .	Stacked, i.e. one coil on top of the other
2220/515	. . .	Staggered, i.e. two coils side by side
2220/521	. .	Hall effect transducers or similar magnetic field sensing semiconductor devices, e.g. for string vibration sensing or key movement sensing
2220/525	. .	Piezoelectric transducers for vibration sensing or vibration excitation in the audio range; Piezoelectric strain sensing, e.g. as key velocity sensor; Piezoelectric actuators, e.g. key actuation in response to a control voltage
2220/531	. . .	made of piezoelectric film
2220/535	. . . .	Piezoelectric polymer transducers, e.g. made of stretched and poled polyvinylidene difluoride [PVDF] sheets in which the molecular chains of vinylidene fluoride CH_2-CF_2 have been oriented in a preferential direction
2220/541	. . .	using piezoceramics, e.g. lead titanate [$PbTiO_3$], zinc oxide [$Zn_2 O_3$], lithium niobate [$LiNbO_3$], sodium tungstate [$NaWO_3$], bismuth ferrite [$BiFeO_3$]
2220/545	. . . .	Barium titanate piezoceramics [$BaTiO_3$]
2220/551	. . . .	using LZT or PZT [lead-zirconate-titanate] piezoceramics [$Pb[ZrxTi1-x]O3, 0=x=1$]
2220/555	. . .	Bimorph transducers, i.e. piezoelectric bending multilayer structures with one or more piezoelectric layers, e.g. piezo on metal, serial bimorph or parallel bimorph
2220/561	. .	Piezoresistive transducers, i.e. exhibiting vibration, pressure, force or movement - dependent resistance, e.g. strain gauges, carbon-doped elastomers or polymers for piezoresistive drumpads, carbon microphones
2220/565	. .	Shielding, electromagnetic or magnetic, e.g. for transducers, i.e. for controlling, orienting or suppressing magnetic fields or for preventing unintentional generation, propagation and reception of electromagnetic energy in electrophonic musical instruments, their vicinity or their interconnections

2230/00		**General physical, ergonomic or hardware implementation of electrophonic musical tools or instruments, e.g. shape or architecture**
2230/005	.	Device type or category
2230/011	. .	Hybrid piano, e.g. combined acoustic and electronic piano with complete hammer mechanism as well as key-action sensors coupled to an electronic sound generator
2230/015	. .	PDA [personal digital assistant] or palmtop computing devices used for musical purposes, e.g. portable music players, tablet computers, e-readers or smart phones in which mobile telephony functions need not be used
2230/021	. .	Mobile ringtone, i.e. generation, transmission, conversion or downloading of ringing tones or other sounds for mobile telephony; Special musical data formats or protocols therefor
2230/025	.	Computing or signal processing architecture features
2230/031	. .	Use of cache memory for electrophonic musical instrument processes, e.g. for improving processing capabilities or solving interfacing problems
2230/035	. .	Power management, i.e. specific power supply solutions for electrophonic musical instruments, e.g. auto power shut-off, energy saving designs, power conditioning, connector design, avoiding inconvenient wiring

2230/041	. .	Processor load management, i.e. adaptation or optimization of computational load or data throughput in computationally intensive musical processes to avoid overload artifacts, e.g. by deliberately suppressing less audible or less relevant tones or decreasing their complexity
2230/045	.	Special instrument [spint], i.e. mimicking the ergonomy, shape, sound or other characteristic of a specific acoustic musical instrument category
2230/051	. .	Spint theremin, i.e. mimicking electrophonic musical instruments in which tones are controlled or triggered in a touch-free manner by interaction with beams, jets or fields, e.g. theremin, air guitar, water jet controlled musical instrument, i.e. hydrolauphone
2230/055	. .	Spint toy, i.e. specifically designed for children, e.g. adapted for smaller fingers or simplified in some way; Musical instrument-shaped game input interfaces with simplified control features
2230/061	. .	Spint organ, i.e. mimicking acoustic musical instruments with pipe organ or harmonium features; Electrophonic aspects of acoustic pipe organs or harmoniums; MIDI-like control therefor
2230/065	. .	Spint piano, i.e. mimicking acoustic musical instruments with piano, cembalo or spinet features, e.g. with piano-like keyboard; Electrophonic aspects of piano-like acoustic keyboard instruments; MIDI-like control therefor
2230/071	. . .	Spint harpsichord, i.e. mimicking plucked keyboard instruments, e.g. harpsichord, virginal, muselar, spinet, clavicytherium, ottavino, archicembalo
2230/075	. .	Spint stringed, i.e. mimicking stringed instrument features, electrophonic aspects of acoustic stringed musical instruments without keyboard; MIDI-like control therefor
2230/081	. . .	Spint viola
2230/085	. . .	Spint cello
2230/091	. . .	Spint hurdygurdy, i.e. mimicking characteristics of acoustic instruments with rosined wheel rubbing against strings
2230/095	. . .	Spint zither, i.e. mimicking any neckless stringed instrument in which the strings do not extend beyond the sounding board
2230/101	. . . .	Spint koto, i.e. mimicking any traditional asian-style plucked zither with movable bridges
2230/105	. . . .	Spint dulcimer, i.e. mimicking any zither-like instrument with small hand-played mallet hammers
2230/111	. . .	Spint ukulele, i.e. mimicking any smaller guitar-like flat bridge string instruments
2230/115	. . .	Spint sitar, i.e. mimicking any long-necked plucked string instrument with a large number of additional non-playable sympathetic resonating strings or an additional gourd-like resonating chamber
2230/121	. . .	Spint mandolin, i.e. mimicking instruments of the lute family with hard sounding board, e.g. with strings arranged and tuned in pairs for tremolo playing
2230/125	. . .	Spint harp, i.e. mimicking harp-like instruments, e.g. large size concert harp, with pedal
2230/131	. . . .	Spint harp celtic, i.e. mimicking smaller sized harps without pedal, eg. celtic harp, lever harp, folk harp, Irish harp
2230/135	. . .	Spint guitar, i.e. guitar-like instruments in which the sound is not generated by vibrating strings, e.g. guitar-shaped game interfaces
2230/141	. . . .	Spint guitar drum, i.e. mimicking a guitar used at least partly as a percussion instrument
2230/145	. . . .	Spint guitar keyboard, i.e. mimicking a combination of a guitar-like instrument, with or without strings, and a piano-like keyboard, e.g. with white and black keys arranged like on a piano
2230/151	. . .	Spint banjo, i.e. mimicking a stringed instrument with a piece of plastic or animal skin stretched over a circular frame or gourd, e.g. shamisen or other skin-covered lutes
2230/155	. .	Spint wind instrument, i.e. mimicking musical wind instrument features; Electrophonic aspects of acoustic wind instruments; MIDI-like control therefor
2230/161	. . .	Spint whistle, i.e. mimicking wind instruments in which the air is split against an edge, e.g. musical whistles, three tone samba whistle, penny whistle, pea whistle; whistle-emulating mouth interfaces; MIDI control therefor, e.g. for calliope
2230/165	. . . .	Spint recorder, i.e. mimicking any end-blown whistle flute with several finger holes, e.g. recorders, xiao, kaval, shakuhachi and hocchiku flutes
2230/171	. . .	Spint brass mouthpiece, i.e. mimicking brass-like instruments equipped with a cupped mouthpiece, e.g. allowing it to be played like a brass instrument, with lip controlled sound generation as in an acoustic brass instrument; Embouchure sensor or MIDI interfaces therefor
2230/175	. . . .	Spint trumpet, i.e. mimicking cylindrical bore brass instruments, e.g. bugle
2230/181	. . . .	Spint trombone, i.e. mimicking trombones or other slide musical instruments permitting a continuous musical scale
2230/185	. . . .	Spint horn, i.e. mimicking conical bore brass instruments
2230/191	. . . . .	Spint French horn, i.e. mimicking an orchestral horn with valves for switching pipe lengths
2230/195	. . .	Spint flute, i.e. mimicking or emulating a transverse flute or air jet sensor arrangement therefor, e.g. sensing angle or lip position to trigger octave change
2230/201	. . . .	Spint piccolo, i.e. half-size transverse flute, e.g. ottavino
2230/205	. .	Spint reed, i.e. mimicking or emulating reed instruments, sensors or interfaces therefor
2230/211	. . .	Spint harmonica, i.e. mimicking mouth operated wind instruments with multiple tuned free reeds, a.k.a. harmonica, blues harp, mouth organ, pitch pipe or ChengGong
2230/215	. . . .	Spint bagpipe, i.e. mimicking instruments with enclosed reeds fed from a constant reservoir; Bagpipe-like electrophonic instrument; Midi-like interfaces therefor

2230/221	. . . .	Spint saxophone, i.e. mimicking conical bore musical instruments with single reed mouthpiece, e.g. saxophones, electrophonic emulation or interfacing aspects therefor
2230/225	. . . .	Spint oboe, i.e. mimicking double reed woodwind with conical bore, e.g. oboe
2230/231	. . . . .	Spint english horn
2230/235	. . . .	Spint bassoon, i.e. mimicking double reed low range woodwind with doubled back conical bore, e.g. bassoon
2230/241	. . . .	Spint clarinet, i.e. mimicking any member of the single reed cylindrical bore woodwind instrument family, e.g. piccolo clarinet, octocontrabass, chalumeau, hornpipes, zhaleika
2230/245	. .	Spint accordion, i.e. mimicking accordions; Electrophonic instruments with one or more typical accordion features, e.g. special accordion keyboards or bellows, electrophonic aspects of mechanical accordions, Midi-like control therefor
2230/251	. .	Spint percussion, i.e. mimicking percussion instruments; Electrophonic musical instruments with percussion instrument features; Electrophonic aspects of acoustic percussion instruments or MIDI-like control therefor
2230/255	. . .	Spint xylophone, i.e. mimicking any multi-toned percussion instrument with a multiplicity of tuned resonating bodies, regardless of their material or shape, e.g. xylophone, vibraphone, lithophone, metallophone, marimba, balafon, ranat, gamban, anklong
2230/261	. . .	Spint triangle
2230/265	. . .	Spint maracas, i.e. mimicking shells or gourds filled with seeds or dried beans, fitted with a handle, e.g. maracas, rumba shakers, shac-shacs
2230/271	. . .	Spint gong, i.e. mimicking circular flat, nippled or bowl-shaped metallic percussion instruments (G10H 2230/321 takes precedence)
2230/275	. . .	Spint drum
2230/281	. . . .	Spint drum assembly, i.e. mimicking two or more drums or drumpads assembled on a common structure, e.g. drum kit
2230/285	. . . .	Spint drum tomtom, i.e. mimicking side-mounted drums without snares, e.g. in a drumkit
2230/291	. . . .	Spint drum bass, i.e. mimicking bass drums; Pedals or interfaces therefor
2230/295	. . . .	Spint drum brush, i.e. mimicking use of a brush to generate or trigger a percussive sound
2230/301	. . . .	Spint drum rim, i.e. mimicking using or striking the rim of a drum or percussion instrument, rimshot; Interfacing aspects of the generation of different drumsound harmonic contents when a drum sensor is struck closer to the rim
2230/305	. . . .	Spint drum snare, i.e. mimicking using strands of snares made of curled metal wire, metal cable, plastic cable, or gut cords stretched across the drumhead, e.g. snare drum, side drum, military drum, field drum
2230/311	. . . .	Spint bongo
2230/315	. . . .	Spint conga
2230/321	. . .	Spint cymbal, i.e. mimicking thin center-held gong-like instruments made of copper-based alloys, e.g. ride cymbal, china cymbal, sizzle cymbal, swish cymbal, zill, i.e. finger cymbals
2230/325	. . . .	Spint cymbal crash, i.e. mimicking thin-edged cymbals designed to produce a loud, sharp "crash", either mounted on a stand and played with a drum stick, e.g. crash cymbal, or played in pairs by hand, e.g. clash cymbals
2230/331	. . . .	Spint cymbal hihat, e.g. mimicking high-hat cymbal; Details of the pedal interface, of the pedal action emulation or of the generation of the different sounds resulting from this pedal action
2230/335	. . .	Spint cyldrum [cylindrical body hit or struck on the curved surface for musical purposes, e.g. drinking glass, oil drum]
2230/341	. . .	Spint claves, i.e. mimicking a pair of thick dowels producing a bright clicking sound when struck against each other
2230/345	. . .	Spint castanets, i.e. mimicking a joined pair of concave shells held in the hand to produce clicks for rhythmic accents or a ripping or rattling sound consisting of a rapid series of clicks, e.g. castanets, cháracas, krakebs, qraqib, garagab
2230/351	. . .	Spint bell, i.e. mimicking bells, e.g. cow-bells
2230/355	. .	Spint spint, i.e. electrophonic musical instruments with features of acoustic instruments covered by G10D 17/00, electrophonic aspects of acoustic instruments covered by G10D 17/00, e.g. aeolian harps, MIDI-like control therefor
2230/361	. .	Spint mechautomatic, i.e. electrophonic musical instruments with features of traditional mechanical automatic acoustic instruments, e.g. electrophonic emulation of historic mechanical pianoroll pianos, electrophonic aspects of partly mechanical automatic acoustic instruments covered by G10F, e.g. hybrid pianos, MIDI-like control therefor
2230/365	.	Ergonomy of electrophonic musical instruments
2230/371	. .	Using hook and loop-type fastener or similar attachment to fasten detachable elements
2240/00		**Data organisation or data communication aspects, specifically adapted for electrophonic musical tools or instruments**
2240/005	.	Data structures for use in electrophonic musical devices; Data structures including musical parameters derived from musical analysis
2240/011	.	Files or data streams containing coded musical information, e.g. for transmission
2240/016	. .	File editing, i.e. modifying musical data files or streams as such
2240/021	. . .	for MIDI-like files or data streams
2240/026	. .	File encryption of specific electrophonic music instrument file or stream formats, e.g. MIDI, note oriented formats, sound banks, wavetables
2240/031	. .	File merging MIDI, i.e. merging or mixing a MIDI-like file or stream with a non-MIDI file or stream, e.g. audio or video
2240/036	. .	File multilingual, e.g. multilingual lyrics for karaoke
2240/041	. .	File watermark, i.e. embedding a hidden code in an electrophonic musical instrument file or stream for identification or authentification purposes

2240/046	. .	File format, i.e. specific or non-standard musical file format used in or adapted for electrophonic musical instruments, e.g. in wavetables
2240/051	. . .	AC3, i.e. Audio Codec 3, Dolby Digital
2240/056	. . .	MIDI or other note-oriented file format
2240/061	. . .	MP3, i.e. MPEG-1 or MPEG-2 Audio Layer III, lossy audio compression
2240/066	. . .	MPEG audio-visual compression file formats, e.g. MPEG-4 for coding of audio-visual objects
2240/071	. . .	Wave, i.e. Waveform Audio File Format, coding, e.g. uncompressed PCM audio according to the RIFF bitstream format method
2240/075	.	Musical metadata derived from musical analysis or for use in electrophonic musical instruments
2240/081	. .	Genre classification, i.e. descriptive metadata for classification or selection of musical pieces according to style
2240/085	. .	Mood, i.e. generation, detection or selection of a particular emotional content or atmosphere in a musical piece
2240/091	.	Info, i.e. juxtaposition of unrelated auxiliary information or commercial messages with or between music files
2240/095	.	Identification code, e.g. ISWC for musical works; Identification dataset
2240/101	. .	User identification
2240/105	. . .	User profile, i.e. data about the user, e.g. for user settings or user preferences
2240/111	. . .	User Password, i.e. security arrangements to prevent third party unauthorised use, e.g. password, id number, code, pin
2240/115	. .	Instrument identification, i.e. recognizing an electrophonic musical instrument, e.g. on a network, by means of a code, e.g. IMEI, serial number, or a profile describing its capabilities
2240/121	.	Musical libraries, i.e. musical databases indexed by musical parameters, wavetables, indexing schemes using musical parameters, musical rule bases or knowledge bases, e.g. for automatic composing methods
2240/125	. .	Library distribution, i.e. distributing musical pieces from a central or master library
2240/131	. .	Library retrieval, i.e. searching a database or selecting a specific musical piece, segment, pattern, rule or parameter set
2240/135	. . .	Library retrieval index, i.e. using an indexing scheme to efficiently retrieve a music piece
2240/141	. . .	Library retrieval matching, i.e. any of the steps of matching an inputted segment or phrase with musical database contents, e.g. query by humming, singing or playing; the steps may include, e.g. musical analysis of the input, musical feature extraction, query formulation, or details of the retrieval process
2240/145	. .	Sound library, i.e. involving the specific use of a musical database as a sound bank or wavetable; indexing, interfacing, protocols or processing therefor
2240/151	. .	Thumbnail, i.e. retrieving, playing or managing a short and musically relevant song preview from a library, e.g. the chorus
2240/155	. .	Library update, i.e. making or modifying a musical database using musical parameters as indices
2240/161	.	Memory and use thereof, in electrophonic musical instruments, e.g. memory map
2240/165	. .	Memory card, i.e. removable module or card for storing music data for an electrophonic musical instrument
2240/171	.	Transmission of musical instrument data, control or status information; Transmission, remote access or control of music data for electrophonic musical instruments
2240/175	. .	for jam sessions or musical collaboration through a network, e.g. for composition, ensemble playing or repeating; Compensation of network or internet delays therefor
2240/181	. .	Billing, i.e. purchasing of data contents for use with electrophonic musical instruments; Protocols therefor; Management of transmission or connection time therefor
2240/185	. .	Error prevention, detection or correction in files or streams for electrophonic musical instruments
2240/191	. . .	CRC, i.e. error detection using a cyclic redundancy check
2240/195	. . .	Reed-solomon error detection or correction, i.e. by considering the message symbols as polynomial coefficients
2240/201	. .	Physical layer or hardware aspects of transmission to or from an electrophonic musical instrument, e.g. voltage levels, bit streams, code words or symbols over a physical link connecting network nodes or instruments
2240/205	. . .	Synchronous transmission of an analog or digital signal, e.g. according to a specific intrinsic timing, or according to a separate clock
2240/211	. . .	Wireless transmission, e.g. of music parameters or control data by radio, infrared or ultrasound
2240/215	. . .	Spread spectrum, i.e. transmission on a bandwidth considerably larger than the frequency content of the original information
2240/221	. . .	Time division multiplexing, with different channels in different time slots, the data in the time slots may be in digital or analog form
2240/225	. . .	Frequency division multiplexing
2240/231	. . .	Quadrature modulation, e.g. QAM
2240/235	. . .	Pulse amplitude modulation, e.g. quantized or analog
2240/241	. . .	Telephone transmission, i.e. using twisted pair telephone lines or any type of telephone network
2240/245	. . . .	ISDN [Integrated Services Digital Network]
2240/251	. . . .	Mobile telephone transmission, i.e. transmitting, accessing or controlling music data wirelessly via a wireless or mobile telephone receiver, analogue or digital, e.g. DECT, GSM, UMTS
2240/255	. . .	Optical fibre transmission for electrophonic musical instrument purposes, e.g. hum mitigation
2240/261	. . .	Satellite transmission for musical instrument purposes, e.g. processing for mitigation of satellite transmission delays
2240/265	. . .	CATV transmission, i.e. electrophonic musical instruments connected to community antennas or cable television networks

2240/271	. . .	Serial transmission according to any one of RS-232 standards for serial binary single-ended data and control signals between a DTE and a DCE
2240/275	. . .	Musical interface to a personal computer PCI bus, "peripheral component interconnect bus"
2240/281	. .	Protocol or standard connector for transmission of analog or digital data to or from an electrophonic musical instrument
2240/285	. . .	USB, i.e. either using a USB plug as power supply or using the USB protocol to exchange data
2240/291	. . .	SCSI, i.e. Small Computer System Interface
2240/295	. . .	Packet switched network, e.g. token ring
2240/301	. . . .	Ethernet, e.g. according to IEEE 802.3
2240/305	. . . .	Internet or TCP/IP protocol use for any electrophonic musical instrument data or musical parameter transmission purposes
2240/311	. . .	MIDI transmission (G10H 2240/056 takes precedence)
2240/315	. . .	Firewire, i.e. transmission according to IEEE1394
2240/321	. . .	Bluetooth
2240/325	.	Synchronizing two or more audio tracks or files according to musical features or musical timings

2250/00		**Aspects of algorithms or signal processing methods without intrinsic musical character, yet specifically adapted for or used in electrophonic musical processing**
2250/005	.	Algorithms for electrophonic musical instruments or musical processing, e.g. for automatic composition or resource allocation
2250/011	. .	Genetic algorithms, i.e. using computational steps analogous to biological selection, recombination and mutation on an initial population of, e.g. sounds, pieces, melodies or loops to compose or otherwise generate, e.g. evolutionary music or sound synthesis
2250/015	. .	Markov chains, e.g. hidden Markov models [HMM], for musical processing, e.g. musical analysis or musical composition
2250/021	. . .	Dynamic programming, e.g. Viterbi, for finding the most likely or most desirable sequence in music analysis, processing or composition
2250/025	.	Envelope processing of music signals in, e.g. time domain, transform domain or cepstrum domain
2250/031	. .	Spectrum envelope processing
2250/035	. .	Crossfade, i.e. time domain amplitude envelope control of the transition between musical sounds or melodies, obtained for musical purposes, e.g. for ADSR tone generation, articulations, medley, remix
2250/041	.	Delay lines applied to musical processing
2250/046	. .	with intermediate taps
2250/051	. .	with variable time delay or variable length
2250/055	.	Filters for musical processing or musical effects; Filter responses, filter architecture, filter coefficients or control parameters therefor
2250/061	. .	Allpass filters
2250/065	. . .	Lattice filter, Zobel network, constant resistance filter or X-section filter, i.e. balanced symmetric all-pass bridge network filter exhibiting constant impedance over frequency
2250/071	. .	All pole filter, i.e. autoregressive [AR] filter

2250/075	. .	All zero filter, i.e. moving average [MA] filter or finite impulse response [FIR] filter
2250/081	. .	Autoregressive moving average [ARMA] filter
2250/085	. .	Butterworth filters
2250/091	. .	Chebyshev filters
2250/095	. .	Filter coefficient interpolation
2250/101	. .	Filter coefficient update; Adaptive filters, i.e. with filter coefficient calculation in real time
2250/105	. .	Comb filters
2250/111	. .	Impulse response, i.e. filters defined or specified by their temporal impulse response features, e.g. for echo or reverberation applications
2250/115	. . .	FIR impulse, e.g. for echoes or room acoustics, the shape of the impulse response is specified in particular according to delay times
2250/121	. . .	IIR impulse
2250/125	. .	Notch filters
2250/131	.	Mathematical functions for musical analysis, processing, synthesis or composition
2250/135	. .	Autocorrelation
2250/141	. .	Bessel functions, e.g. for smoothing or modulating, for FM audio synthesis or for expressing the vibration modes of a circular drum membrane
2250/145	. .	Convolution, e.g. of a music input signal with a desired impulse response to compute an output
2250/151	. .	Fuzzy logic
2250/155	. .	Graham function, i.e. mathematical description of the fluid dynamics of air flowing through a gap, where there is a given pressure differential on either side of the gap, e.g. to model air velocity in wind instruments for physical modeling sound synthesis
2250/161	. .	Logarithmic functions, scaling or conversion, e.g. to reflect human auditory perception of loudness or frequency
2250/165	. .	Polynomials, i.e. musical processing based on the use of polynomials, e.g. distortion function for tube amplifier emulation, filter coefficient calculation, polynomial approximations of waveforms, physical modeling equation solutions
2250/171	. .	Hermite polynomials
2250/175	. .	Jacobi polynomials of several variables, e.g. Heckman-Opdam polynomials, or of one variable only, e.g. hypergeometric polynomials
2250/181	. . .	Gegenbauer or ultraspherical polynomials, e.g. for harmonic analysis
2250/185	. . . .	Legendre polynomials, e.g. for the modeling of air flow dynamics in wind instruments
2250/191	. . . .	Chebyshev polynomials, e.g. to provide filter coefficients for sharp rolloff filters
2250/195	. . .	Lagrange polynomials, e.g. for polynomial interpolation or cryptography
2250/201	. .	Parabolic or second order polynomials, occurring, e.g. in vacuum tube distortion modeling or for modeling the gate voltage to drain current relationship of a JFET
2250/205	. .	Third order polynomials, occurring, e.g. in vacuum tube distortion modeling
2250/211	. .	Random number generators, pseudorandom generators, classes of functions therefor

2250/215	. .	Transforms, i.e. mathematical transforms into domains appropriate for musical signal processing, coding or compression
2250/221	. . .	Cosine transform; DCT [discrete cosine transform], e.g. for use in lossy audio compression such as MP3
2250/225	. . . .	MDCT [Modified discrete cosine transform], i.e. based on a DCT of overlapping data
2250/231	. . .	Fermat transform
2250/235	. . .	Fourier transform; Discrete Fourier Transform [DFT]; Fast Fourier Transform [FFT]
2250/241	. . .	Hadamard transform, Walsh-Hadamard transform, Hadamard-Rademacher-Walsh transform, Walsh transform, or Walsh-Fourier transform
2250/245	. . .	Hartley transform,; Discrete Hartley transform [DHT]; Fast Hartley transform [FHT]
2250/251	. . .	Wavelet transform, i.e. transform with both frequency and temporal resolution, e.g. for compression of percussion sounds; Discrete Wavelet Transform [DWT]
2250/255	. . .	Z-transform, e.g. for dealing with sampled signals, delays or digital filters
2250/261	. .	Window, i.e. apodization function or tapering function amounting to the selection and appropriate weighting of a group of samples in a digital signal within some chosen time interval, outside of which it is zero valued
2250/265	. . .	Blackman Harris window
2250/271	. . .	Chebyshev window
2250/275	. . .	Gaussian window
2250/281	. . .	Hamming window
2250/285	. . .	Hann or Hanning window
2250/291	. . .	Kaiser windows; Kaiser-Bessel Derived [KBD] windows, e.g. for MDCT
2250/295	.	Noise generation, its use, control or rejection for music processing
2250/301	. .	Pink 1/f noise or flicker noise
2250/305	. .	Noise or artifact control in electrophonic musical instruments
2250/311	.	Neural networks for electrophonic musical instruments or musical processing, e.g. for musical recognition or control, automatic composition or improvisation
2250/315	.	Sound category-dependent sound synthesis processes [Gensound] for musical use; Sound category-specific synthesis-controlling parameters or control means therefor
2250/321	. .	Gensound animals, i.e. generating animal voices or sounds
2250/325	. . .	Birds
2250/331	. . . .	Ducks
2250/335	. . . .	Sea birds, e.g. seagulls
2250/341	. . .	Cats
2250/345	. . .	Cattle, e.g. cows
2250/351	. . .	Dogs
2250/355	. . .	Elk or other animals in the Cervidae family, e.g. moose, wapiti, reindeer
2250/361	. . .	Insects, e.g. cricket
2250/365	. .	Gensound applause, e.g. handclapping; Cheering; Booing
2250/371	. .	Gensound equipment, i.e. synthesizing sounds produced by man-made devices, e.g. machines
2250/375	. . .	Harbour, i.e. sounds which are part of a harbour soundscape, e.g. ships, fog horn, buoy, bells, cranes
2250/381	. . .	Road, i.e. sounds which are part of a road, street or urban traffic soundscape, e.g. automobiles, bikes, trucks, traffic, vehicle horns, collisions
2250/385	. . .	Train, i.e. sounds which are part of a railroad soundscape, e.g. steam engines, diesel, electric, train whistles, rail wheels, railway crossing
2250/391	. .	Gensound footsteps, i.e. footsteps, kicks or tap-dancing sounds
2250/395	. .	Gensound nature
2250/401	. . .	Crowds, e.g. restaurant, waiting hall, demonstration or subway corridor at rush hour
2250/405	. . .	Fire, e.g. cracks and pops of burning wood
2250/411	. . .	Water, e.g. seashore, waves, brook, waterfall, dripping faucet
2250/415	. . .	Weather
2250/421	. . . .	Rain
2250/425	. . . .	Thunder
2250/431	. . . .	Natural aerodynamic noises, e.g. wind gust sounds, rustling leaves or beating sails
2250/435	. .	Gensound percussion, i.e. generating or synthesising the sound of a percussion instrument; Control of specific aspects of percussion sounds, e.g. harmonics, under the influence of hitting force, hitting position, settings or striking instruments such as mallet, drumstick, brush or hand
2250/441	. .	Gensound string, i.e. generating the sound of a string instrument, controlling specific features of said sound
2250/445	. . .	Bowed string instrument sound generation, controlling specific features of said sound, e.g. use of fret or bow control parameters for violin effects synthesis
2250/451	. . .	Plucked or struck string instrument sound synthesis, controlling specific features of said sound
2250/455	. .	Gensound singing voices, i.e. generation of human voices for musical applications, vocal singing sounds or intelligible words at a desired pitch or with desired vocal effects, e.g. by phoneme synthesis
2250/461	. .	Gensound wind instruments, i.e. generating or synthesising the sound of a wind instrument, controlling specific features of said sound
2250/465	. . .	Reed instrument sound synthesis, controlling specific features of said sound
2250/471	.	General musical sound synthesis principles, i.e. sound category-independent synthesis methods
2250/475	.	FM synthesis, i.e. altering the timbre of simple waveforms by frequency modulating them with frequencies also in the audio range, resulting in different-sounding tones exhibiting more complex waveforms
2250/481	.	Formant synthesis, i.e. simulating the human speech production mechanism by exciting formant resonators, e.g. mimicking vocal tract filtering as in LPC synthesis vocoders, wherein musical instruments may be used as excitation signal to the time-varying filter estimated from a singer's speech
2250/485	. .	Formant correction therefor

2250/491	. . .	Formant interpolation therefor
2250/495	. . .	Use of noise in formant synthesis
2250/501	. . .	Formant frequency shifting, sliding formants
2250/505	. .	Parcor synthesis, i.e. music synthesis using partial autocorrelation techniques, e.g. in which the impulse response of the digital filter in a parcor speech synthesizer is used as a musical signal
2250/511	. .	Physical modelling or real-time simulation of the acoustomechanical behaviour of acoustic musical instruments using, e.g. waveguides or looped delay lines
2250/515	. . .	Excitation circuits or excitation algorithms therefor
2250/521	. . .	Closed loop models therefor, e.g. with filter and delay line
2250/525	. . .	Pluridimensional array-based models therefor
2250/531	. . .	Room models, i.e. acoustic physical modelling of a room, e.g. concert hall
2250/535	. . .	Waveguide or transmission line-based models
2250/541	.	Details of musical waveform synthesis, i.e. audio waveshape processing from individual wavetable samples, independently of their origin or of the sound they represent
2250/545	. .	Aliasing, i.e. preventing, eliminating or deliberately using aliasing noise, distortions or artifacts in sampled or synthesised waveforms, e.g. by band limiting, oversampling or undersampling, respectively
2250/551	. .	Waveform approximation, e.g. piecewise approximation of sinusoidal or complex waveforms
2250/555	. . .	Piecewise linear waveform approximation
2250/561	. . .	Parabolic waveform approximation, e.g. using second order polynomials or parabolic responses
2250/565	. . .	Polynomial waveform approximation, i.e. using polynomials of third order or higher
2250/571	. .	Waveform compression, adapted for music synthesisers, sound banks or wavetables
2250/575	. . .	Adaptive MDCT-based compression, e.g. using a hybrid subband-MDCT, as in ATRAC
2250/581	. . .	Codebook-based waveform compression
2250/585	. . . .	CELP [code excited linear prediction]
2250/591	. . .	DPCM [delta pulse code modulation]
2250/595	. . . .	ADPCM [adaptive differential pulse code modulation]
2250/601	. . .	Compressed representations of spectral envelopes, e.g. LPC [linear predictive coding], LAR [log area ratios], LSP [line spectral pairs], reflection coefficients
2250/605	. . .	Dynamic range companding algorithms, e.g. "mu"-law, primarily used in the digital telephone systems of North America and Japan, or A-law as used in European digital telephone systems
2250/611	. .	Waveform decimation, i.e. integer division of the sampling rate for reducing the number of samples in a discrete-time signal, e.g. by low-pass anti-alias filtering followed by the actual downsampling
2250/615	. .	Waveform editing, i.e. setting or modifying parameters for waveform synthesis
2250/621	. .	Waveform interpolation
2250/625	. . .	Interwave interpolation, i.e. interpolating between two different waveforms, e.g. timbre or pitch or giving one waveform the shape of another while preserving its frequency or <u>vice versa</u>
2250/631	. .	Waveform resampling, i.e. sample rate conversion or sample depth conversion
2250/635	. .	Waveform resolution or sound quality selection, e.g. selection of high or low sampling rates, lossless, lossy or lossier compression algorithms
2250/641	. .	Waveform sampler, i.e. music samplers; Sampled music loop processing, wherein a loop is a sample of a performance that has been edited to repeat seamlessly without clicks or artifacts
2250/645	. .	Waveform scaling, i.e. amplitude value normalisation