A **chiptune**, also known as **chip music** or **8-bit music**, is [synthesized](http://en.wikipedia.org/wiki/Synthesizer) [electronic music](http://en.wikipedia.org/wiki/Electronic_music) produced by the [sound chips](http://en.wikipedia.org/wiki/Sound_chip) of vintage [computers](http://en.wikipedia.org/wiki/Computer),[video game consoles](http://en.wikipedia.org/wiki/Video_game_console), and [arcade machines](http://en.wikipedia.org/wiki/Arcade_game), as well as with other methods such as [emulation](http://en.wikipedia.org/wiki/Emulator).[[1]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-1) In the early 1980s, [personal computers](http://en.wikipedia.org/wiki/Personal_computer)became less expensive and more accessible than they had previously been. This led to a proliferation of outdated personal computers and game consoles that had been abandoned by consumers as they upgraded to newer machines. They were in low demand by consumers as a whole, and not difficult to find, making them a highly accessible and affordable method of creating sound or art. While it has been a mostly underground genre, chiptune has had periods of moderate popularity in the 1980s and 21st century, and has influenced the development of [electronic dance music](http://en.wikipedia.org/wiki/Electronic_dance_music).

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## Overview[[edit](http://en.wikipedia.org/w/index.php?title=Chiptune&action=edit&section=1)]

The terms "chip music", and "chiptune" refer to music made by the sound chips found within early gaming systems and [microcomputers](http://en.wikipedia.org/wiki/Microcomputer).[[2]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-2)[[3]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-3)

A [waveform generator](http://en.wikipedia.org/wiki/Waveform_generator) is a fundamental module in a sound synthesis system. A waveform generator usually produces a basic geometrical waveform with a fixed or variable [timbre](http://en.wikipedia.org/wiki/Timbre) and variable pitch. Common waveform generator configurations usually included two or three simple waveforms and often a single [pseudo-random-noise](http://en.wikipedia.org/wiki/Pseudo-random-noise) generator (PRNG). Available[waveforms](http://en.wikipedia.org/wiki/Waveform) often included [pulse wave](http://en.wikipedia.org/wiki/Pulse_wave) (whose [timbre](http://en.wikipedia.org/wiki/Timbre) can be varied by modifying the [duty cycle](http://en.wikipedia.org/wiki/Duty_cycle)), [square wave](http://en.wikipedia.org/wiki/Square_wave) (a symmetrical pulse wave producing only odd overtones), [triangle wave](http://en.wikipedia.org/wiki/Triangle_wave)(which has a fixed timbre containing only odd [harmonics](http://en.wikipedia.org/wiki/Harmonic), but is softer than a square wave), and [sawtooth wave](http://en.wikipedia.org/wiki/Sawtooth_wave) (which has a bright raspy timbre and contains odd and even harmonics). Two notable examples of systems employing this technology comprise the Game Boy and the Commodore 64. The Game Boy uses two pulse channels (switchable between 12.5%, 25%, 50% and 75% wave duty cycle), a channel for 4-bit [PCM](http://en.wikipedia.org/wiki/Pulse-code_modulation) playback, and a pseudo-random-noise generator. The Commodore 64, however, used of the [MOS Technology SID](http://en.wikipedia.org/wiki/MOS_Technology_SID) chip which offered 3 channels, each switchable between pulse, saw-tooth, triangle, and noise. Unlike the Game Boy, the pulse channels on the Commodore 64 allowed full control over wave duty cycles. The SID was a very technically advanced chip, offering many other features including ring modulation and adjustable resonance filters.[[4]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-4)

## History[[edit](http://en.wikipedia.org/w/index.php?title=Chiptune&action=edit&section=2)]

The earliest precursors to chip music can be found in the early history of [computer music](http://en.wikipedia.org/wiki/Computer_music). In 1951, the computers [CSIRAC](http://en.wikipedia.org/wiki/CSIRAC) and [Ferranti Mark 1](http://en.wikipedia.org/wiki/Ferranti_Mark_1) were used to perform real-time synthesized digital music in public.[[5]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-5) One of the earliest commercial computer music albums came from the First Philadelphia Computer Music Festival, held August 25, 1978, as part of the Personal Computing '78 show. The First Philadelphia Computer Music Festival recordings were published by Creative Computing in 1979.[[6]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-6)

### Video game origins[[edit](http://en.wikipedia.org/w/index.php?title=Chiptune&action=edit&section=3)]

*See also:* [*Video game music*](http://en.wikipedia.org/wiki/Video_game_music)

Chiptune music began to appear with the video game music produced during the [golden age of video arcade games](http://en.wikipedia.org/wiki/Golden_age_of_video_arcade_games). An early example was the opening tune in [Tomohiro Nishikado](http://en.wikipedia.org/wiki/Tomohiro_Nishikado)'s[arcade game](http://en.wikipedia.org/wiki/Arcade_game) [*Gun Fight*](http://en.wikipedia.org/wiki/Gun_Fight) (1975). The first video game to use a continuous background soundtrack was Tomohiro Nishikado's 1978 release [*Space Invaders*](http://en.wikipedia.org/wiki/Space_Invaders), which had four simple[chromatic](http://en.wikipedia.org/wiki/Diatonic_and_chromatic) descending [bass notes](http://en.wikipedia.org/wiki/Bass_note) repeating in [a loop](http://en.wikipedia.org/wiki/Music_loop), though it was dynamic and interacted with the player, increasing pace as the enemies descended on the player.[[7]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-7) The first video game to feature continuous melodic [background music](http://en.wikipedia.org/wiki/Background_music) was [*Rally-X*](http://en.wikipedia.org/wiki/Rally-X), an arcade game released by [Namco](http://en.wikipedia.org/wiki/Namco) in 1980, featuring a simple tune that repeats continuously during [gameplay](http://en.wikipedia.org/wiki/Gameplay).[[8]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-gradar2-8)It was also one of the earliest games to use a [digital-to-analog converter](http://en.wikipedia.org/wiki/Digital-to-analog_converter) to produce [sampled](http://en.wikipedia.org/wiki/Sampling_(signal_processing)) sounds.[[9]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-collins_12-9) That same year, the first video game to feature [speech synthesis](http://en.wikipedia.org/wiki/Speech_synthesis) was also released, [Sunsoft](http://en.wikipedia.org/wiki/Sunsoft)'s [shoot 'em up](http://en.wikipedia.org/wiki/Shoot_%27em_up) arcade game [*Stratovox*](http://en.wikipedia.org/wiki/Stratovox).[[8]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-gradar2-8)

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|  | [*Super Locomotive* (1982)](http://en.wikipedia.org/wiki/File:Super_Locomotive.ogg)    MENU  0:00  [Sega](http://en.wikipedia.org/wiki/Sega)'s [arcade game](http://en.wikipedia.org/wiki/Arcade_game) [*Super Locomotive*](http://en.wikipedia.org/wiki/Super_Locomotive)(1982) by Fukumura Mizunaga features a chiptune [cover version](http://en.wikipedia.org/wiki/Cover_version) of [Yellow Magic Orchestra](http://en.wikipedia.org/wiki/Yellow_Magic_Orchestra)'s [synthpop](http://en.wikipedia.org/wiki/Synthpop) hit "[Rydeen](http://en.wikipedia.org/wiki/Solid_State_Survivor)" (1979). |
| *Problems playing this file? See* [*media help*](http://en.wikipedia.org/wiki/Wikipedia:Media_help)*.* |  |

In the late 1970s, the pioneering [electronic dance](http://en.wikipedia.org/wiki/Electronic_dance_music)/[synthpop](http://en.wikipedia.org/wiki/Synthpop) group [Yellow Magic Orchestra](http://en.wikipedia.org/wiki/Yellow_Magic_Orchestra) (YMO) were using computers to produce synthesized music.[[10]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-Sarasota-10) Some of their early music, including their 1978 self-titled [debut album](http://en.wikipedia.org/wiki/Yellow_Magic_Orchestra_(album)), were [sampling](http://en.wikipedia.org/wiki/Sampling_(music)) sounds from popular arcade games such as *Space Invaders*[[11]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-wire_1996-11) and *Gun Fight*. In addition to incorporating sounds from contemporary video games into their music, the band would later have a major influence on much of the video game and chiptune music produced during the [8-bit](http://en.wikipedia.org/wiki/History_of_video_game_consoles_(third_generation))and [16-bit eras](http://en.wikipedia.org/wiki/History_of_video_game_consoles_(fourth_generation)).[[12]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-12)[[13]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-13) [Sega](http://en.wikipedia.org/wiki/Sega)'s 1982 arcade game [*Super Locomotive*](http://en.wikipedia.org/wiki/Super_Locomotive), for example, featured a chiptune [cover version](http://en.wikipedia.org/wiki/Cover_version) of YMO's "[Rydeen](http://en.wikipedia.org/wiki/Solid_State_Survivor)" (1979);[[14]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-14) several later [computer games](http://en.wikipedia.org/wiki/PC_game) also covered the song, such as *Trooper Truck* (1983) by [Rabbit Software](http://en.wikipedia.org/wiki/Rabbit_Software) as well as [*Daley Thompson's Decathlon*](http://en.wikipedia.org/wiki/Daley_Thompson%27s_Decathlon) (1984) and [*Stryker's Run*](http://en.wikipedia.org/wiki/Stryker%27s_Run) (1986) arranged by [Martin Galway](http://en.wikipedia.org/wiki/Martin_Galway).[[15]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-whosampled_covers-15) In 1984, former YMO member[Haruomi Hosono](http://en.wikipedia.org/wiki/Haruomi_Hosono) released an album produced entirely from Namco arcade game samples entitled *Video Game Music*, an early example of a chiptune record[[16]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-discogs_hosono-16) and the first video game music album.[[17]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-17) The record featured the work of Namco's chiptune composers: Toshio Kai ([*Pac-Man*](http://en.wikipedia.org/wiki/Pac-Man) in 1980), Nobuyuki Ohnogi ([*Galaga*](http://en.wikipedia.org/wiki/Galaga), [*New Rally-X*](http://en.wikipedia.org/wiki/New_Rally-X) and [*Bosconian*](http://en.wikipedia.org/wiki/Bosconian) in 1981, and [*Pole Position*](http://en.wikipedia.org/wiki/Pole_Position_(video_game)) in 1982), and Yuriko Keino ([*Dig Dug*](http://en.wikipedia.org/wiki/Dig_Dug) and [*Xevious*](http://en.wikipedia.org/wiki/Xevious) in 1982).[[18]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-vgmdb_namco-18)

### FM synthesis[[edit](http://en.wikipedia.org/w/index.php?title=Chiptune&action=edit&section=4)]

*See also:* [*Video game music*](http://en.wikipedia.org/wiki/Video_game_music)

A major advance for chip music was the introduction of [frequency modulation synthesis](http://en.wikipedia.org/wiki/Frequency_modulation_synthesis) (FM synthesis), first commercially released by [Yamaha](http://en.wikipedia.org/wiki/Yamaha) for their [digital synthesizers](http://en.wikipedia.org/wiki/Digital_synthesizer) and FM[sound chips](http://en.wikipedia.org/wiki/Sound_chip), which began appearing in arcade machines from the early 1980s.[[19]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-karen_10-1-19)[[20]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-20) By 1983, [Konami](http://en.wikipedia.org/wiki/Konami)'s arcade game [*Gyruss*](http://en.wikipedia.org/wiki/Gyruss) utilized five synthesis sound chips along with a digital-to-analog converter, which were partly used to create an electronic rendition of [J.S. Bach's](http://en.wikipedia.org/wiki/Johann_Sebastian_Bach) [*Toccata and Fugue in D minor*](http://en.wikipedia.org/wiki/Toccata_and_Fugue_in_D_minor,_BWV_565).[[21]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-21) Other arcade game composers utilizing FM synthesis at the time included Konami's [Miki Higashino](http://en.wikipedia.org/wiki/Miki_Higashino) ([*Gradius*](http://en.wikipedia.org/wiki/Gradius), [*Yie-Ar Kung Fu*](http://en.wikipedia.org/wiki/Yie-Ar_Kung_Fu), [*Teenage Mutant Ninja Turtles*](http://en.wikipedia.org/wiki/Teenage_Mutant_Ninja_Turtles_(arcade_game)))[[22]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-22) and [Sega](http://en.wikipedia.org/wiki/Sega)'s [Hiroshi Kawaguchi](http://en.wikipedia.org/wiki/Hiroshi_Kawaguchi_(composer)) ([*Space Harrier*](http://en.wikipedia.org/wiki/Space_Harrier), [*Hang-On*](http://en.wikipedia.org/wiki/Hang-On), [*Out Run*](http://en.wikipedia.org/wiki/Out_Run)).[[23]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-23)

By the early 1980s, significant improvements to [personal computer game](http://en.wikipedia.org/wiki/Personal_computer_game) music were made possible with the introduction of [digital](http://en.wikipedia.org/wiki/Digital_synthesizer) FM synthesis sound. [Yamaha](http://en.wikipedia.org/wiki/Yamaha) began manufacturing FM [synth boards](http://en.wikipedia.org/wiki/Sound_card) for Japanese computers such as the [NEC PC-8801](http://en.wikipedia.org/wiki/NEC_PC-8801) and [PC-9801](http://en.wikipedia.org/wiki/NEC_PC-9801) in the early 1980s, and by the mid-1980s, the PC-8801 and [FM-7](http://en.wikipedia.org/wiki/FM-7) had built-in FM sound. This allowed computer game music to have greater complexity than the simplistic [beeps](http://en.wikipedia.org/wiki/Beep_(sound)) from internal speakers. These FM synth boards produced a "warm and pleasant sound" that musicians such as [Yuzo Koshiro](http://en.wikipedia.org/wiki/Yuzo_Koshiro) and [Takeshi Abo](http://en.wikipedia.org/wiki/Takeshi_Abo) utilized to produce music that is still highly regarded within the chiptune community.[[24]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-hg101_retro-24) In the early 1980s, Japanese [personal computers](http://en.wikipedia.org/wiki/Personal_computer) such as the NEC PC-88 and PC-98 featured [audio programming languages](http://en.wikipedia.org/wiki/Audio_programming_language) such as [Music Macro Language](http://en.wikipedia.org/wiki/Music_Macro_Language) (MML) and [MIDI](http://en.wikipedia.org/wiki/MIDI) interfaces, which were most often used to produce video game music.[[25]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-shimazu104-25) [Fujitsu](http://en.wikipedia.org/wiki/Fujitsu) also released the *FM Sound Editor* software for the FM-7 in 1985, providing users with a user-friendly interface to create and edit synthesized music.[[26]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-26)

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|  | [*Streets of Rage 2* - "Expander" (1992)](http://en.wikipedia.org/wiki/File:Streets_of_Rage_2_-_Expander.ogg)    MENU  0:00  "Expander" from [the soundtrack](http://en.wikipedia.org/wiki/Discography_of_the_Streets_of_Rage_series) of Sega's[Mega Drive](http://en.wikipedia.org/wiki/Mega_Drive) game [*Streets of Rage 2*](http://en.wikipedia.org/wiki/Streets_of_Rage_2)(1992), composed by [Yuzo Koshiro](http://en.wikipedia.org/wiki/Yuzo_Koshiro) and Motohiro Kawashima. It features [a blend](http://en.wikipedia.org/wiki/Electro_house)of [house music](http://en.wikipedia.org/wiki/House_music) with [electro](http://en.wikipedia.org/wiki/Electro_(music)) basslines and "[trancey](http://en.wikipedia.org/wiki/Trance_music) electronic textures." |
| *Problems playing this file? See* [*media help*](http://en.wikipedia.org/wiki/Wikipedia:Media_help)*.* |  |

The widespread adoption of FM synthesis by consoles would later be one of the major advances of the [16-bit era](http://en.wikipedia.org/wiki/History_of_video_game_consoles_(fourth_generation)), by which time 16-bit arcade machines were using multiple FM synthesis chips.[[19]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-karen_10-1-19) A major chiptune composer during this period was [Yuzo Koshiro](http://en.wikipedia.org/wiki/Yuzo_Koshiro).[[27]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-santos_2006-27)Despite later advances in audio technology, he would continue to use older PC-8801 hardware to produce chiptune soundtracks for series such as [*Streets of Rage*](http://en.wikipedia.org/wiki/Streets_of_Rage_(series)) (1991–1993) and [*Etrian Odyssey*](http://en.wikipedia.org/wiki/Etrian_Odyssey) (2007 onwards).[[24]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-hg101_retro-24) His soundtrack to [*The Revenge of Shinobi*](http://en.wikipedia.org/wiki/The_Revenge_of_Shinobi)(1989) featured [house](http://en.wikipedia.org/wiki/House_music)[[28]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-greening_kotowski-28)[[29]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-29) and [progressive](http://en.wikipedia.org/wiki/Progressive_electronic_dance_music) [techno](http://en.wikipedia.org/wiki/Techno) compositions[[27]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-santos_2006-27) that fused [electronic dance music](http://en.wikipedia.org/wiki/Electronic_dance_music) with traditional [Japanese music](http://en.wikipedia.org/wiki/Music_of_Japan).[[30]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-30) [The soundtrack](http://en.wikipedia.org/wiki/Discography_of_the_Streets_of_Rage_series) for [*Streets of Rage 2*](http://en.wikipedia.org/wiki/Streets_of_Rage_2) (1992) is considered "revolutionary" and "ahead of its time" for its "[blend of](http://en.wikipedia.org/wiki/Electro_house)swaggering house [synths](http://en.wikipedia.org/wiki/Synthesizer), [dirty](http://en.wikipedia.org/wiki/Electro_house) [electro-funk](http://en.wikipedia.org/wiki/Electro_(music)) and [trancey](http://en.wikipedia.org/wiki/Trance_music) electronic textures that would feel as comfortable in a [nightclub](http://en.wikipedia.org/wiki/Nightclub) as a video game."[[31]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-31) For the soundtrack to [*Streets of Rage 3*](http://en.wikipedia.org/wiki/Streets_of_Rage_3) (1994), Koshiro created a new composition method called the "Automated Composing System" to produce "fast-beat techno like [jungle](http://en.wikipedia.org/wiki/Drum_and_bass),"[[32]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-jeff_davis-32) resulting in innovative and [experimental sounds](http://en.wikipedia.org/wiki/Experimental_music) generated automatically.[[33]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-sega_horowitz-33) Koshiro also composed chiptune soundtracks for series such as [*Dragon Slayer*](http://en.wikipedia.org/wiki/Dragon_Slayer_(series)), [*Ys*](http://en.wikipedia.org/wiki/Ys_(video_game)), [*Shinobi*](http://en.wikipedia.org/wiki/Shinobi_(series)), and [*ActRaiser*](http://en.wikipedia.org/wiki/ActRaiser). Another important FM synth composer was the late [Ryu Umemoto](http://en.wikipedia.org/wiki/Ryu_Umemoto), who composed chiptune soundtracks for various [visual novel](http://en.wikipedia.org/wiki/Visual_novel) and [shoot 'em up](http://en.wikipedia.org/wiki/Shoot_%27em_up) games.[[34]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-34)

### SID music culture[[edit](http://en.wikipedia.org/w/index.php?title=Chiptune&action=edit&section=5)]

*See also:* [*MOS Technology SID*](http://en.wikipedia.org/wiki/MOS_Technology_SID) *and* [*Demoscene*](http://en.wikipedia.org/wiki/Demoscene)





MOS 6581 and 8580 Commodore 64 SID chips.

Later on, several demo groups moved to using their own music instead of ripped game music. In 1986, [Jeroen "Red" Kimmel](http://en.wikipedia.org/w/index.php?title=Jeroen_Kimmel&action=edit&redlink=1) studied Rob Hubbard's player routine and used it for original demo songs[[35]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-35) before writing a routine of his own in 1987. Hobbyists were also writing their own dedicated music editor software, such as [Chris Hülsbeck](http://en.wikipedia.org/wiki/Chris_H%C3%BClsbeck)'s *Soundmonitor* which was released as a type-in listing in a 1986 issue of the German C-64 magazine [64'er](http://en.wikipedia.org/w/index.php?title=64%27er&action=edit&redlink=1).[[36]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-36)

The practice of SID music composition has continued seamlessly until this day in conjunction with the [Commodore 64](http://en.wikipedia.org/wiki/Commodore_64) demoscene. [The High Voltage SID Collection](http://en.wikipedia.org/wiki/The_High_Voltage_SID_Collection), a comprehensive archive of SID music, contains over 40,000 pieces of SID music.[[37]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-37)

### Tracker chiptunes[[edit](http://en.wikipedia.org/w/index.php?title=Chiptune&action=edit&section=6)]

*See also:* [*Tracker (music software)*](http://en.wikipedia.org/wiki/Tracker_(music_software))

[Commodore Amiga](http://en.wikipedia.org/wiki/Amiga) (1985), with its wavetable and sample-based sound synthesis, distanced the concept of microcomputer music away from plain chip-synthesized sounds. Amiga[tracker music software](http://en.wikipedia.org/wiki/Tracker_(music_software)), beginning from Karsten Obarski's [Ultimate Soundtracker](http://en.wikipedia.org/wiki/Ultimate_Soundtracker) (1987), inspired great numbers of computer enthusiasts to create computer music. As an offshoot of the burgeoning tracker music culture, a type of tracker music reminiscent of Commodore 64 SID music was born. This type of music came to be called "chiptunes".

Earliest examples of tracker chiptunes date back to 1989 and are attributed to the demoscene musicians 4-Mat, Baroque, [TDK](http://en.wikipedia.org/w/index.php?title=Madfiddler&action=edit&redlink=1), Turtle and Duz. Tracker chiptunes are based on very short looped waveforms which are modulated by tracker effects such as [arpeggio](http://en.wikipedia.org/wiki/Arpeggio), [vibrato](http://en.wikipedia.org/wiki/Vibrato), and [portamento](http://en.wikipedia.org/wiki/Portamento).

Musicians like Random Voice later included the technique of rapidly repeating series of offset waveforms in order to fully emulate one single SID instrument with trackers.

The small amount of sample data made tracker chiptunes far more space-efficient than most other types of tracker music, which made them appealing to size-limited demoscene demos and crack intros. Tracker chiptunes have also been commonly used in other [warez scene](http://en.wikipedia.org/wiki/Warez_scene) executables such as [keygens](http://en.wikipedia.org/wiki/Keygen).

Nowadays, the term "chiptune" is also used to cover chip music using actual chip-based synthesis, but some sources, such as the Amiga Music Preservation project, still define a chiptune specifically as a small tracker module.[[38]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-38)

### Steps toward the mainstream music world[[edit](http://en.wikipedia.org/w/index.php?title=Chiptune&action=edit&section=7)]

The heyday of chiptune music was the 1980s.[[39]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-bbc_chiptune-39) The earliest commercial chiptune records produced entirely from [sampling](http://en.wikipedia.org/wiki/Sampling_(music)) [arcade game](http://en.wikipedia.org/wiki/Arcade_game) sounds have existed since the mid-1980s, an early example being [Haruomi Hosono](http://en.wikipedia.org/wiki/Haruomi_Hosono)'s *Video Game Music* in 1984.[[16]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-discogs_hosono-16) Though entirely chiptune records were uncommon at the time, many mainstream musicians in the [pop rock](http://en.wikipedia.org/wiki/Pop_rock),[[40]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-timemag-40)[hip hop](http://en.wikipedia.org/wiki/Hip_hop_music)[[41]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-41) and [electronic music](http://en.wikipedia.org/wiki/Electronic_music)[[42]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-allmusic_electro-42) genres were sampling arcade game sounds and [bleeps](http://en.wikipedia.org/wiki/Beep_(sound)) during the [golden age of video arcade games](http://en.wikipedia.org/wiki/Golden_age_of_video_arcade_games) (late 1970s to mid-1980s), as early as [Yellow Magic Orchestra](http://en.wikipedia.org/wiki/Yellow_Magic_Orchestra)'s "[Computer Game](http://en.wikipedia.org/wiki/Yellow_Magic_Orchestra_(album))" in 1978.[[11]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-wire_1996-11) [Buckner & Garcia](http://en.wikipedia.org/wiki/Buckner_%26_Garcia)'s "[Pac-Man Fever](http://en.wikipedia.org/wiki/Pac-Man_Fever_(song))" and the [album of the same name](http://en.wikipedia.org/wiki/Pac-Man_Fever) were major hits in 1982.[[40]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-timemag-40) Arcade game sounds were one of the foundational elements of the [electro music](http://en.wikipedia.org/wiki/Electro_music) genre, which in turn inspired many other [electronic dance music](http://en.wikipedia.org/wiki/Electronic_dance_music) genres such as [techno](http://en.wikipedia.org/wiki/Techno) and [house music](http://en.wikipedia.org/wiki/House_music), which were sometimes referred to as "bleep music".[[11]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-wire_1996-11) [*Space Invaders*](http://en.wikipedia.org/wiki/Space_Invaders) inspired [Player One's "Space Invaders" (1979)](http://en.wikipedia.org/wiki/Space_Invaders_(Player_One_song)), which in turn provided the [bassline](http://en.wikipedia.org/wiki/Bassline) for [Jesse Saunders](http://en.wikipedia.org/wiki/Jesse_Saunders)' "On and On" (1984),[[43]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-43)[[44]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-bp-44) the first [Chicago house](http://en.wikipedia.org/wiki/Chicago_house) track.[[45]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-45) [Warp](http://en.wikipedia.org/wiki/Warp_(record_label))'s record "[Testone](http://en.wikipedia.org/wiki/WarpVision)" (1990) by [Sweet Exorcist](http://en.wikipedia.org/wiki/Sweet_Exorcist_(band)) sampled video game sounds from Yellow Magic Orchestra's "Computer Game" and defined Sheffield's[bleep techno](http://en.wikipedia.org/wiki/Yorkshire_Bleeps_and_Bass) scene in the early 1990s.[[46]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-sicko_brewster_76-46)

|  |  |
| --- | --- |
|  | [*Lazy Jones* - "Star Dust" (1984)](http://en.wikipedia.org/wiki/File:David_Whittaker_-_Lazy_Jones.ogg)    MENU  0:00  The [Commodore 64](http://en.wikipedia.org/wiki/Commodore_64) game [*Lazy Jones*](http://en.wikipedia.org/wiki/Lazy_Jones)(1984), composed by [David Whittaker](http://en.wikipedia.org/wiki/David_Whittaker_(video_game_composer)), was [sampled](http://en.wikipedia.org/wiki/Sampling_(music)) by [Zombie Nation](http://en.wikipedia.org/wiki/Zombie_Nation_(band))'s [techno](http://en.wikipedia.org/wiki/Techno)/ [tech house](http://en.wikipedia.org/wiki/Tech_house) hit "[Kernkraft 400](http://en.wikipedia.org/wiki/Kernkraft_400)" (1999). |
| *Problems playing this file? See* [*media help*](http://en.wikipedia.org/wiki/Wikipedia:Media_help)*.* |  |

After the 1980s, however, chiptune music began declining in popularity.[[39]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-bbc_chiptune-39) Since then, up until the 2000s, chip music was rarely performed live and the songs were nearly exclusively spread as executable programs and other computer file formats. Some of the earliest examples of record label releases of pure chip music can be found in the late 1990s.[[47]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-47) Chiptune music began gaining popularity again towards the end of the 1990s. The first [electroclash](http://en.wikipedia.org/wiki/Electroclash) record, [I-F](http://en.wikipedia.org/wiki/I-F)'s "Space Invaders Are Smoking Grass" (1997), has been described as "burbling electro in a vocodered homage to [Atari-era](http://en.wikipedia.org/wiki/Golden_age_of_arcade_video_games) hi-jinks,"[[48]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-Lynskey2002-48)

By the mid-2000s, 8-bit chip music began making a comeback in mainstream pop music, when it was used by acts such as [Beck](http://en.wikipedia.org/wiki/Beck) (for example, the 2005 song "[Girl](http://en.wikipedia.org/wiki/Girl_(Beck_song))"), [The Killers](http://en.wikipedia.org/wiki/The_Killers) (for example, the 2004 song "[On Top](http://en.wikipedia.org/wiki/Hot_Fuss)"), and particularly [The Postal Service](http://en.wikipedia.org/wiki/The_Postal_Service) in many of their songs. The low-quality digital [MIDI](http://en.wikipedia.org/wiki/MIDI) styling of early game music composers such as [Hiroshi Miyauchi](http://en.wikipedia.org/wiki/Hiroshi_Kawaguchi_(composer)) also began gaining popularity.[[49]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-49) In 2003, the [J-pop](http://en.wikipedia.org/wiki/J-pop) girl group [Perfume](http://en.wikipedia.org/wiki/Perfume_(Japanese_band)),[[50]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-nintendo_gamer-50)[[51]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-bounce_perfume-51)along with producer [Yasutaka Nakata](http://en.wikipedia.org/wiki/Yasutaka_Nakata), began producing music combining chiptunes with [synthpop](http://en.wikipedia.org/wiki/Synthpop) and [electro house](http://en.wikipedia.org/wiki/Electro_house);[[51]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-bounce_perfume-51) their breakthrough came in 2007 with [*Game*](http://en.wikipedia.org/wiki/Game_(Perfume_album)), which led to other Japanese female artists using a similar electronic style, including [Aira Mitsuki](http://en.wikipedia.org/wiki/Aira_Mitsuki), [immi](http://en.wikipedia.org/wiki/Immi), [Mizca](http://en.wikipedia.org/wiki/Masami_Mitsuoka), [SAWA](http://en.wikipedia.org/wiki/Sawa_(singer)), [Saori@destiny](http://en.wikipedia.org/wiki/Saori_at_Destiny), and [Sweet Vacation](http://en.wikipedia.org/wiki/Sweet_Vacation).[[52]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-allabout-52) Electro house producer [Deadmau5](http://en.wikipedia.org/wiki/Deadmau5) in the late 1990s, with a chiptune and demoscene movements-influenced sound. Three self-released compilations [Project 56](http://en.wikipedia.org/wiki/Project_56_(album)), [deadmau5 Circa 1998-2002](http://en.wikipedia.org/wiki/Deadmau5_Circa_1998-2002) and [A Little Oblique](http://en.wikipedia.org/wiki/A_Little_Oblique) were finished in 2006.[[53]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-53)

In 2007, the notable, entirely chiptune album [*8-Bit Operators: The Music of Kraftwerk*](http://en.wikipedia.org/wiki/8-Bit_Operators:_The_Music_of_Kraftwerk) was released on major mainstream label [Astralwerks](http://en.wikipedia.org/wiki/Astralwerks)/[EMI](http://en.wikipedia.org/wiki/EMI) Records, which included several prominent and noted chipmusicians, including Nanoloop[[54]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-54) creator Oliver Wittchow, and LittleSoundDJ[[55]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-55) creator Johan Kotlinski who appears as the artist *Role Model*. [Kraftwerk](http://en.wikipedia.org/wiki/Kraftwerk)founding member [Ralf Hütter](http://en.wikipedia.org/wiki/Ralf_H%C3%BCtter) personally selected the tracks.[[56]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-56) A vinyl 12-inch single version was released on February 24, 2007 as a precursor to the full-length CD, and reached as high as number 17[[57]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-57) on the [Billboard magazine](http://en.wikipedia.org/wiki/Billboard_(magazine)) Hot Dance Singles Sales Chart. In March 2007, the CD release reached as high as number 1 on the [*CMJ*](http://en.wikipedia.org/wiki/CMJ) *RPM* (North American college Electronic) charts.[[58]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-58)[[59]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-59) Edinburgh born electronic musician [Unicorn Kid](http://en.wikipedia.org/wiki/Unicorn_Kid) has helped further popularize chiptune, especially with the song 'True Love Fantasy' and other songs from the EP 'Tidal Rave' being played on late night radio, including on BBC Radio 1, where he played live on the Festive Festival 2011. In Canada, [Eightcubed](http://en.wikipedia.org/wiki/Eightcubed) and [Crystal Castles](http://en.wikipedia.org/wiki/Crystal_Castles_(band))helped the popularity further via the Toronto underground club scene and created a lasting impression with the music video "Heart Invaders" debuting on [MuchMusic](http://en.wikipedia.org/wiki/MuchMusic) in 2008 [[60]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-60) and the blistering single "[Alice Practice](http://en.wikipedia.org/wiki/Alice_Practice)" hitting 29th on [NME](http://en.wikipedia.org/wiki/NME) "150 Best Tracks of the Past 15 Years".[[61]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-61)

During the late 2000s, a new wave of chiptune culture took place, boosted by the release of software such as [LittleSoundDJ](http://www.littlesounddj.com/lsd) for the Game Boy. This new culture has much more emphasis on live performances and record releases than the demoscene and tracker culture, of which the new artists are often only distantly aware.[[62]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-62) In recent years, 8-bit chiptune sounds, or "video game beats", have been used by a number of mainstream pop artists. Examples in the [Western world](http://en.wikipedia.org/wiki/Western_world) include artists such as [Kesha](http://en.wikipedia.org/wiki/Kesha)[[63]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-63) (most notably in "[Tik Tok](http://en.wikipedia.org/wiki/Tik_Tok)",[[50]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-nintendo_gamer-50)[[64]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-Puls-64) the [best-selling single](http://en.wikipedia.org/wiki/List_of_best-selling_singles_worldwide) of 2010),[[65]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-ifpi10-65) [Robyn](http://en.wikipedia.org/wiki/Robyn), [Snoop Dogg](http://en.wikipedia.org/wiki/Snoop_Dogg),[[50]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-nintendo_gamer-50)[[64]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-Puls-64) [Eminem](http://en.wikipedia.org/wiki/Eminem) (for example, "Hellbound"), [Nelly Furtado](http://en.wikipedia.org/wiki/Nelly_Furtado), and [Timbaland](http://en.wikipedia.org/wiki/Timbaland) (see [Timbaland plagiarism controversy](http://en.wikipedia.org/wiki/Timbaland_plagiarism_controversy)). The influence of video game sounds can also be heard in contemporary British [electronica](http://en.wikipedia.org/wiki/Electronica) music by artists such as [Dizzee Rascal](http://en.wikipedia.org/wiki/Dizzee_Rascal) and [Kieran Hebden](http://en.wikipedia.org/wiki/Kieran_Hebden),[[66]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-guardian_ymo-66) as well as in [heavy metal](http://en.wikipedia.org/wiki/Heavy_metal_music)bands such as [DragonForce](http://en.wikipedia.org/wiki/DragonForce). [Grime](http://en.wikipedia.org/wiki/Grime_(music)) music in particular samples sawtooth wave sounds from video games which were popular in [East London](http://en.wikipedia.org/wiki/East_(London_sub_region)).[[67]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-67) [Dubstep](http://en.wikipedia.org/wiki/Dubstep) producers have also been influenced by video game chiptunes, particularly the work of [Yuzo Koshiro](http://en.wikipedia.org/wiki/Yuzo_Koshiro).[[68]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-68)[[69]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-self-titledmag-69)[[70]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-timeout_20425-70) In 2010, a [BBC](http://en.wikipedia.org/wiki/BBC) article stated that the "sights and sounds of [old-school games](http://en.wikipedia.org/wiki/Retrogaming)" (naming [*Frogger*](http://en.wikipedia.org/wiki/Frogger)and [*Donkey Kong*](http://en.wikipedia.org/wiki/Donkey_Kong) as examples) are "now becoming a part of mainstream music and culture."[[39]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-bbc_chiptune-39) [Complextro](http://en.wikipedia.org/wiki/Complextro) pioneer [Porter Robinson](http://en.wikipedia.org/wiki/Porter_Robinson) has also cited video game sounds as an influence on his style of music.[[71]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-nashville_complextro-71) He has also cited the influence of video game sounds, or chiptunes, as an influence on his style of music along with 1980s [analog synth](http://en.wikipedia.org/wiki/Analog_synthesizer) music.[[71]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-nashville_complextro-71)

## Today[[edit](http://en.wikipedia.org/w/index.php?title=Chiptune&action=edit&section=8)]

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| --- | --- |
|  | [Skip Cloud - "The Adventure Lights" (2011)](http://en.wikipedia.org/wiki/File:The_Adventure_Lights.ogg)    MENU  0:00  This is an example of a modern-day chiptune track distributed as a stand-alone music file without being a part of a video game soundtrack. |
| *Problems playing this file? See* [*media help*](http://en.wikipedia.org/wiki/Wikipedia:Media_help)*.* |  |

The chip [scene](http://en.wikipedia.org/wiki/Warez_scene) is far from dead with "[compos](http://en.wikipedia.org/wiki/Compo_(demoscene))" being held, groups releasing [music disks](http://en.wikipedia.org/wiki/Music_disk) and with the [cracktro](http://en.wikipedia.org/wiki/Crack_intro)/demo scene. New[tracker](http://en.wikipedia.org/wiki/Tracker_(music_software)) tools are making chip sounds available to less techy musicians. For example, [Little Sound DJ](http://www.littlesounddj.com/lsd) for the Game Boy has an interface designed for use in a live environment and features [MIDI](http://en.wikipedia.org/wiki/Musical_Instrument_Digital_Interface) synchronization. The [NES](http://en.wikipedia.org/wiki/Nintendo_Entertainment_System) platform has the MidiNES, a cartridge that turns the system into a full blown hardware [MIDI](http://en.wikipedia.org/wiki/Musical_Instrument_Digital_Interface) controlled synthesizer. Recently, for the [Commodore 64](http://en.wikipedia.org/wiki/Commodore_64), the Mssiah has been released, which is very similar to the MidiNES, but with greater parameter controls, sequencing, analog drum emulation, and limited sample playback. The [Commodore PET](http://en.wikipedia.org/wiki/Commodore_PET) has the [open-source](http://en.wikipedia.org/wiki/Open-source) [PetSynth](http://en.wikipedia.org/wiki/PetSynth) software, which uses the PET's [6522](http://en.wikipedia.org/wiki/6522) chip for sound, allows the computer to be played like a piano keyboard, and features many effects. On the [DOS](http://en.wikipedia.org/wiki/DOS) platform, [Fast Tracker](http://en.wikipedia.org/wiki/FastTracker_2) is one of the most famous chiptune makers because of the ability to create hand-drawn samples with the mouse. Chiptune artist [Pixelh8](http://en.wikipedia.org/wiki/Pixelh8) has also designed music software such as Music Tech[[72]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-72) for the Game Boy and the Pro Performer[[73]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-73) for the [Game Boy Advance](http://en.wikipedia.org/wiki/Game_Boy_Advance) and [Nintendo DS](http://en.wikipedia.org/wiki/Nintendo_DS) which turn both machines into real time synthesizers.

In the last couple of years, chip music has returned to modern gaming, either in full chip music style or using chip samples in the music. Games that do this in their soundtrack include[*Mega Man Battle Network*](http://en.wikipedia.org/wiki/Mega_Man_Battle_Network_(video_game)), [*Reset Generation*](http://en.wikipedia.org/wiki/Reset_Generation), [*Seiklus*](http://en.wikipedia.org/wiki/Seiklus), [*Tetris DS*](http://en.wikipedia.org/wiki/Tetris_DS), [*Sonic Rush*](http://en.wikipedia.org/wiki/Sonic_Rush), [*Scott Pilgrim vs. the World: The Game*](http://en.wikipedia.org/wiki/Scott_Pilgrim_vs._the_World:_The_Game), [*Super Meat Boy*](http://en.wikipedia.org/wiki/Super_Meat_Boy), [*Bit.Trip Saga*](http://en.wikipedia.org/wiki/Bit.Trip_Saga), [*VVVVVV*](http://en.wikipedia.org/wiki/VVVVVV), [*Super Hexagon*](http://en.wikipedia.org/wiki/Super_Hexagon), and[*Fez*](http://en.wikipedia.org/wiki/Fez_(video_game)). Furthermore, the [Electronic Frontier Foundation](http://en.wikipedia.org/wiki/Electronic_Frontier_Foundation) in December 2010 used a faux 8-bit game with an 8-bit sound track by crashfaster to demonstrate its notable legal achievements for that year.[[74]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-74)

On March 16, 2012 the [Smithsonian American Art Museum](http://en.wikipedia.org/wiki/Smithsonian_American_Art_Museum)'s "The Art of Video Games" exhibit opened featuring a chipmusic soundtrack at the entrance by artists [8 Bit Weapon](http://en.wikipedia.org/wiki/8_Bit_Weapon) &[ComputeHer](http://en.wikipedia.org/wiki/ComputeHer).8 Bit Weapon also created a track called "The art of Video Games Anthem" for the exhibit as well.[[75]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-75)

## Film[[edit](http://en.wikipedia.org/w/index.php?title=Chiptune&action=edit&section=9)]

The chiptune scene was the subject of a documentary called [*Reformat the Planet*](http://en.wikipedia.org/w/index.php?title=Reformat_the_Planet&action=edit&redlink=1) by [2 Player Productions](http://en.wikipedia.org/wiki/2_Player_Productions). This film was an official selection at the 2008 [South by Southwest](http://en.wikipedia.org/wiki/South_by_Southwest).[[76]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-76)

## Television[[edit](http://en.wikipedia.org/w/index.php?title=Chiptune&action=edit&section=10)]

There have been a number of television segments featuring chiptunes and chip music artists in the past few years. On April 11, 2005, [8 Bit Weapon](http://en.wikipedia.org/wiki/8_Bit_Weapon) played their songs "Bombs Away" and "Gameboy Rocker" on [G4](http://en.wikipedia.org/wiki/G4_(TV_channel))'s [*Attack of the Show*](http://en.wikipedia.org/wiki/Attack_of_the_Show) live broadcast Episode #5058.[[77]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-77)[[78]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-78)

Another chipmusic feature include little-scale, Dot.AY, [Ten Thousand Free Men & Their Families](http://en.wikipedia.org/wiki/Ten_Thousand_Free_Men_%26_Their_Families) and Jim Cuomo on the ABC Australia television series [Good Game](http://en.wikipedia.org/wiki/Good_Game).[[79]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-79)

Br1ght Pr1mate, a Boston-based chiptune band, performed on Fox News on July 10, 2010.[[80]](http://en.wikipedia.org/wiki/Chiptunes#cite_note-80)