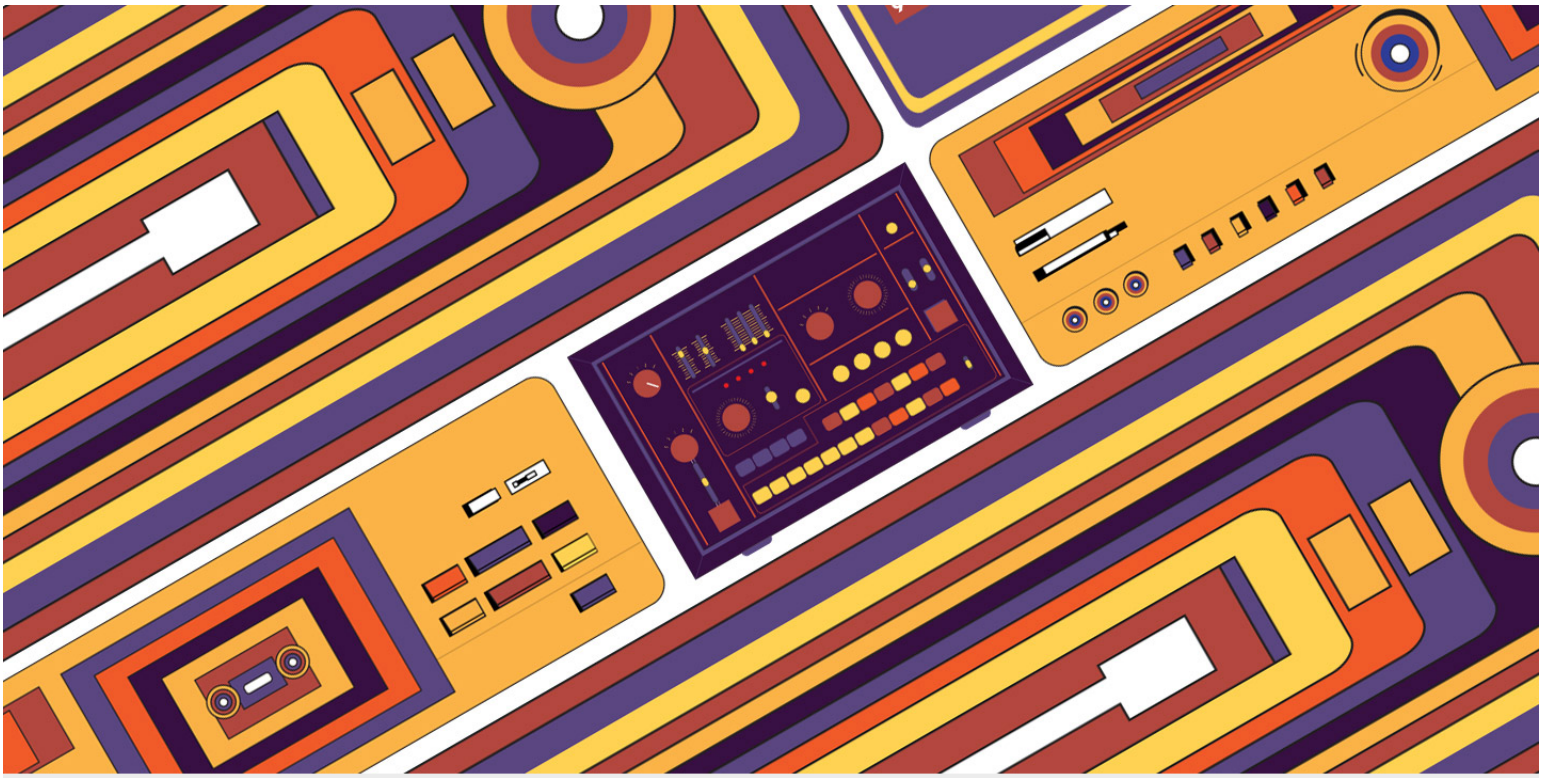
Music Technology of the 1970s: A Timeline

Mind-warping synthesizers! The Walkman! Karaoke! Looking back at the ’70s innovations that shaped how people created and listened to music throughout the decade and beyond.



Illustrations by Jojo Sounthone

by **Marc Hogan**
Senior Staff Writer

LISTS & GUIDES

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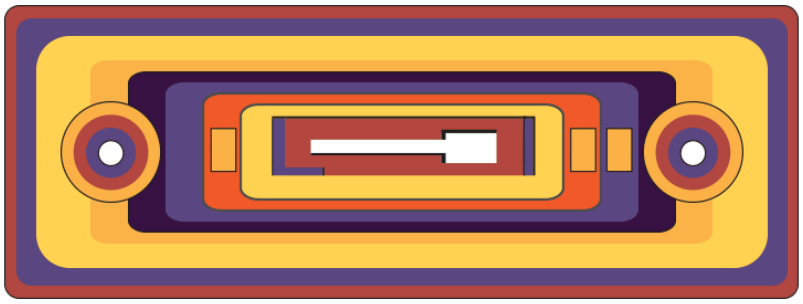
The history of music is inseparable from the history of technology. From the first primitive percussion instruments, catgut strings, and animal horns, to Thomas Edison's phonograph and the jukebox, how we listen and create has evolved with the tools of the times.

By the 1950s and 1960s, the technological conditions were ripe for the birth of popular music as it's often idealized today, with AM and FM radio going mainstream, vinyl records supplanting the earlier shellac format, and multi-track recording developments clearing the way for late-'60s studio

experimentation. But in many ways, it was the 1970s marked the dawn of the modern era in music technology, applying and refining the developments of earlier decades while also laying the foundations of the techniques and styles that would follow. If it exists today, there's a good chance it could be considered '70s retro.

The first half of the decade could be seen as an extension of the '60s, as previously invented gadgets—multi-track and cassette tapes, synths and vocoders, car stereos and wah-wah pedals—continued to be honed. Eventually, though, new technological advances set the stage for CDs, pocket-sized digital music players, and even entire genres, like hip-hop and techno, which would reverberate well into the 21st century.



1970

24-Track Recording

Multi-track recording, which offers the ability to record multiple performances separately and at different times, reached new levels of complexity in the ’70s. As late as 1966, the Beatles recorded *Revolver* on a four-track machine; they didn’t use eight-track recording until 1968. By 1970, 16 tracks were starting to become standard, and 24-track machines arrived. Throughout the

decade and into the ’80s, 24-tracks would be the rule, not the exception. New York studio the Record Plant went 24-track in 1970, reportedly becoming the first to employ a machine made by MCI, whose gear was later used by AC/DC, Queen, Led Zeppelin, and other ’70s giants.

Hi-Fi Cassette Decks

The “compact cassette,” as it was called, dates to 1962, though this format trailed in music sales behind the similarly portable 8-track cartridge deep into the ’70s. Audio company Dolby developed its Dolby B noise reduction system in 1968, and the first cassette players using the technology—from Advent, Fisher, and Harman Kardon—debuted in 1970. Billed as a way to make the humble cassette

sound as good as bulkier vinyl albums, the new decks helped to popularize the format. By the early ’80s, U.S. sales of albums on tape were beating vinyl LPs.

Car Tape Decks

Along with higher-fidelity technology, another reason for tapes’ gradual ascent was the automobile market, which was initially dominated by 8-tracks. In late 1970, Detroit automakers started installing cassette players in some of their new models, taking advantage of features including “compactness, rewind and fast forward, recording capability and automatic reverse,” per one contemporary report. Generations could now listen to their own mixtapes while breezing down the

highway. Cassette decks would come factory-installed on at least some new automobiles all the way up until 2011.

Quad-8

Even with cassettes on the rise, the venerable 8-track wasn't going down without a fight. In the spring of 1970, RCA introduced quadraphonic 8-track cartridges, or Quad-8. Compatible with existing stereo 8-track players, Quad-8 offered four channels of sound—similar to a surround sound experience. This type of immersive sonic idea was having a moment around this time, from Pink Floyd's quadraphonic 1967 live concert to the Who's 1973 album *Quadrophenia*. Quad-8 failed to

catch on, but surviving cartridges from Floyd, Creedence Clearwater Revival, and even Lou Reed's infamous *Metal Machine Music* have been known to fetch tidy sums on eBay. The 8-track faded away, of course, but remains indelibly associated with the '70s in popular memory.

Portable Synthesizers

In the late '60s, Robert Moog pioneered the use of synthesized sounds in music with the innovation of his influential Moog synth. In 1970, he introduced the Minimoog, which was touted to be "the size of an electric office typewriter." The compact instrument stopped being produced in 1981, but it can be

heard on records by Parliament-Funkadelic, Kraftwerk, Gary Numan, Bob Marley, Michael Jackson, Dr. Dre, Devo, and more. Other companies soon followed suit with their own portable synths, such as the ARP Odyssey, which was used by Herbie Hancock, Kraftwerk, and Yellow Magic Orchestra. In 2016, the classic Minimoog Model D returned to production.

Fender Rhodes Stage Piano

Inventor Harold Rhodes introduced his Fender Rhodes electric piano in 1965, but it wasn't until 1970 that musicians could buy the more easily transportable Stage Piano model. From there, the bright Rhodes tone became omnipresent

during the decade, heard all over records by Stevie Wonder, Herbie Hancock, the Doors, and Steely Dan. By the ’90s, neo-soul artists like D’Angelo and Erykah Badu revived the instrument’s signature warm sound, which still looms large on recent records by artists including Floating Points and BADBADNOTGOOD.

Mellotron

Originally developed in 1963 in the UK, the Mellotron was an early type of sampler keyboard that produced its sounds using prerecorded tape loops. Sonically, it also added a bit of an eerie flutter, as heard in the introduction to the Beatles’ 1967 single “Strawberry Fields Forever.” The

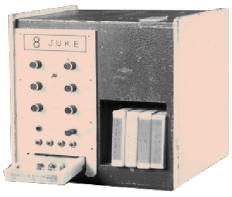
most common Mellotron, the lighter-weight Model 400, arrived in 1970, and the instrument spread throughout the decade to bands like Genesis and Tangerine Dream. Better technology overtook the Mellotron, but Oasis and Radiohead brought it back into focus in late ’90s. Now, there’s an app for that.

Large-Scale Live Sound

In 1965, when the Beatles performed at New York’s Shea Stadium, their music went through the same public address system used by the ballpark announcer; little wonder they quit touring afterward. After that, though, various innovations helped boost live sound. But it was a Grateful Dead show on February 2, 1970, at the Fox Theater in St. Louis,

Missouri, that's credited with birthing large-scale live sound systems as they came to be known. When the Dead's touring sound mixer (and '60s LSD pioneer) Augustus Owsley Stanley III was arrested after a show in New Orleans, the Fox put Jerry Garcia in touch with nearby audio guru Bob Heil, and the massive sound system he delivered led the Dead to take him and his gear on tour. Heil went on to hand-build systems for the Who and others, and concertgoers grew accustomed to actually being able to hear a band's music onstage.

1971



Karaoke

It’s almost hard to believe that karaoke didn’t just always exist. But it too had to be invented, and Japan’s Daisuke Inoue is generally credited for doing just that. As the legend goes, Inoue was working a nightclub, accompanying businessmen who wanted to sing, when one executive asked him to come along and back

up his warbling on an out-of-town trip. Inoue couldn't leave his regular gig, so he shared a tape of his instrumental. Later that year, Inoue built the first machines for karaoke, which translates to "empty orchestra." The relationship between music fans and the songs they love has never been quite the same since.

Vocoders as Musical Instruments

The vocoder—essentially, a synthesizer that analyzes speech and electronically recreates it—has a long and fascinating history that dates back to Bell Labs in 1928 and runs through World War II. As early as 1967, the vocoder could be heard in song on Alvin Lucier's "North American Time Capsule," though

it's doubtful how many listeners would have discovered it. Wendy Carlos, an early proponent of the Moog synthesizer with her 1968 LP *Switched-On Bach*, later worked with Moog on a prototype vocoder. Carlos' use of a Beethoven vocoder in the soundtrack to Stanley Kubrick's 1971 film *A Clockwork Orange*, accompanying scenes of record-shopping, a fast-paced orgy, and cruelty, introduced the vocoder's musical capabilities to a wide audience. Not to be confused with the similar but distinct "talk box," which applies speech sounds to an instrument rather than a synth, the vocoder would feature in the next decade on music by acts like Kraftwerk, Electric Light Orchestra, Giorgio Moroder, and Pink Floyd. By the '80s, Phil Collins and Neil Young were getting in on the act. Despite the proliferation of the different but like-minded Auto-Tune effect heard on Cher's

“Believe” or T-Pain’s hits, groups like Daft Punk have kept the vocoder sound alive well into the 21st century.

Wah-Wah Gets Funky

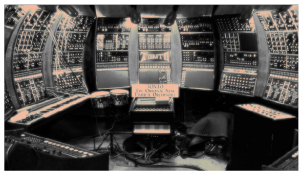
The musical idea behind the wah-wah pedal, which changes the tone of an electric guitar’s signal, is as old as the trumpet and trombone mutes it was meant to emulate. The pedal, however, achieves this crying tone electronically. Although Chet Atkins and others had experimented with similar devices, the modern wah pedal arose in 1966, somewhat by mistake, thanks to engineer Brad Plunkett and California’s Thomas Organ Company. In the late-’60s the pedal was associated with psychedelia

via famous records by Jimi Hendrix and Cream, but Hendrix's percussive use of the wah effect on 1967's "Little Miss Lover" pointed another way forward. The guitarist Charlie Pitts popularized the now-familiar "wacka-wacka" technique for "wah" on Isaac Hayes' Academy Award-winning "Theme from Shaft," and this funkier wah style only spread from there. Plus, no account of the wah in the '70s would be complete without acknowledging Miles Davis' embrace of it, including for his own trumpet, on albums like 1971's *Live Evil*, 1972's *On the Corner*, and 1975's *Agharta*.

Digital Delay

The early '70s was also when the music industry

could begin to dream up its digital future. In 1971, Massachusetts-based Lexicon produced its Delta T-101 digital delay line, later described as “a significant breakthrough—the seminal product of what would within a decade become a digital industry.” By 1978, the same company introduced an early digital reverb system. Though nostalgia remains for the old analog ways, these developments foreshadowed how digital signal processing, whether with computers or increasingly elaborate effects pedals, would redesign the sound of the decades to come.



TONTO

In the late ’60s, Malcolm Cecil and Robert Margouleff

amassed and integrated a variety of different synths to create what they called The Original New Timbral Orchestra, or TONTO—"one of the first synthesizers capable of producing many tone colors with different voices simultaneously," according to Calgary's National Music Centre, which acquired TONTO in 2013. In 1971, the public got to hear TONTO for the first time on Cecil and Margouleff's debut LP under the name Tonto's Expanding Head Band. It wouldn't be the last: TONTO featured on classic Stevie Wonder's '70s albums like *Music of My Mind*, *Talking Book*, and *Innervisions*, as well as on records by Quincy Jones, the Isley Brothers, and Gil Scott-Heron, who put TONTO on the cover of his *1980* LP. The machine also appeared in Brian de Palma's cult classic 1974 movie *Phantom of the Paradise*, which later proved to be a formative inspiration for Guy-

Manuel de Homem-Christo and Thomas Bangalter, aka Daft Punk.

1972

King Tubby's Mixing Desk

In the '60s, a former electronics repairman in Jamaica named Osbourne Ruddock formed a sound system, dubbed King Tubby's Hi-Fi, which rose to prominence amid a culture where DJ setups took precedence over live performances. King Tubby also had a small studio at his home in Kingston, where he would dramatically remix four-track recordings that were brought to him—inventing dub in the process. In 1972, producer Bunny Lee set up King Tubby's purchase of an old MCI mixing desk, which gave him access to the high-pass filter,

reverb, and delay that would help dub inspire post-punk, hip-hop, and techno.

Mu-Tron III

This fixture of funk started with a simple idea: a product that could make synthesizer-like sounds using various electric instruments. When New Jersey's Musitronics Corp. launched the resulting effects pedal, Mu-Tron III, in 1972, the device led to a new class of "envelope filter" or "auto-wah" pedals. As the latter name implies, the Mu-Tron III is a relative of the wah-wah effect, applying a "vowel-like" sound to whatever tones are being played. But this particular gear is most famous for its ties to Stevie Wonder, who used it on his

clavinet for *Innervisions*' "Higher Ground"—and even endorsed the pedal in an ad.

"Dry-as-a-Bone Sound"

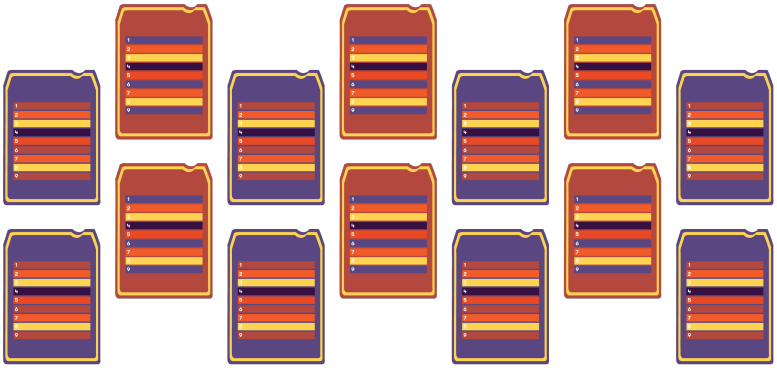
Once more tracks were available in the studio, recording engineers found new ways to use them. Many started to put microphones close to instruments, rather than capturing full-room sound, and sequestered musicians in separate rooms. "They wanted to eliminate leakage, so that every track was a discrete puzzle piece that they could swap in and out of the final mix or run through various processors to shape the sound," as Greg Milner writes in his history of recording, *Perfecting Sound Forever*. This "dry" sound was most common on records by West Coast groups like the Eagles and Steely Dan, but it's

also evident in the straightforward rock of AC/DC or ZZ Top.

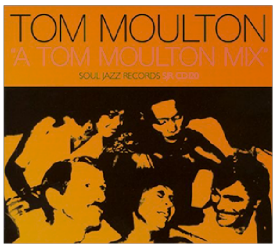
1973

The Heil Talk Box

Bob Heil, the same speaker wizard who reinvented live sound for the Grateful Dead and the Who, also popularized the talk box, a gadget that lets musicians essentially run the sound of their voices through their instruments (to quote "The Simpsons," "Man, that guy's guitar is talking!"). He first built his talk box for Joe Walsh in the early '70s, then gave the commercial version to Peter Frampton as a Christmas gift. Frampton's use of it on his blockbuster album *Frampton Comes Alive!* linked him to the device forevermore.



1974



The 12" Dance Single

A “Tom Moulton Mix” is a certificate of quality on ’70s disco singles. But the hugely influential producer also effectively invented the format on which those songs are pressed. According to lore, Moulton was cutting an acetate reference disc—a type of one-off test pressing—for Al Downing’s “I’ll Be Holding On,” when the mastering engineer, José Rodriguez, ran out of blank 7"

discs. Reports differ on whether the acetate Rodriguez used instead was 12 inches or, less poetically, 10 inches. Either way, Moulton thought it would look better if Rodriguez spread the grooves out across the entire record, which had the side effect of creating a massive sound that was ideal for club DJs. The 12" single quickly became the norm for dance music, but Moulton's place in music history would already have been assured: He's also widely considered the father of the extended dance remix and the continuous dance mix.

1975

Polymoog

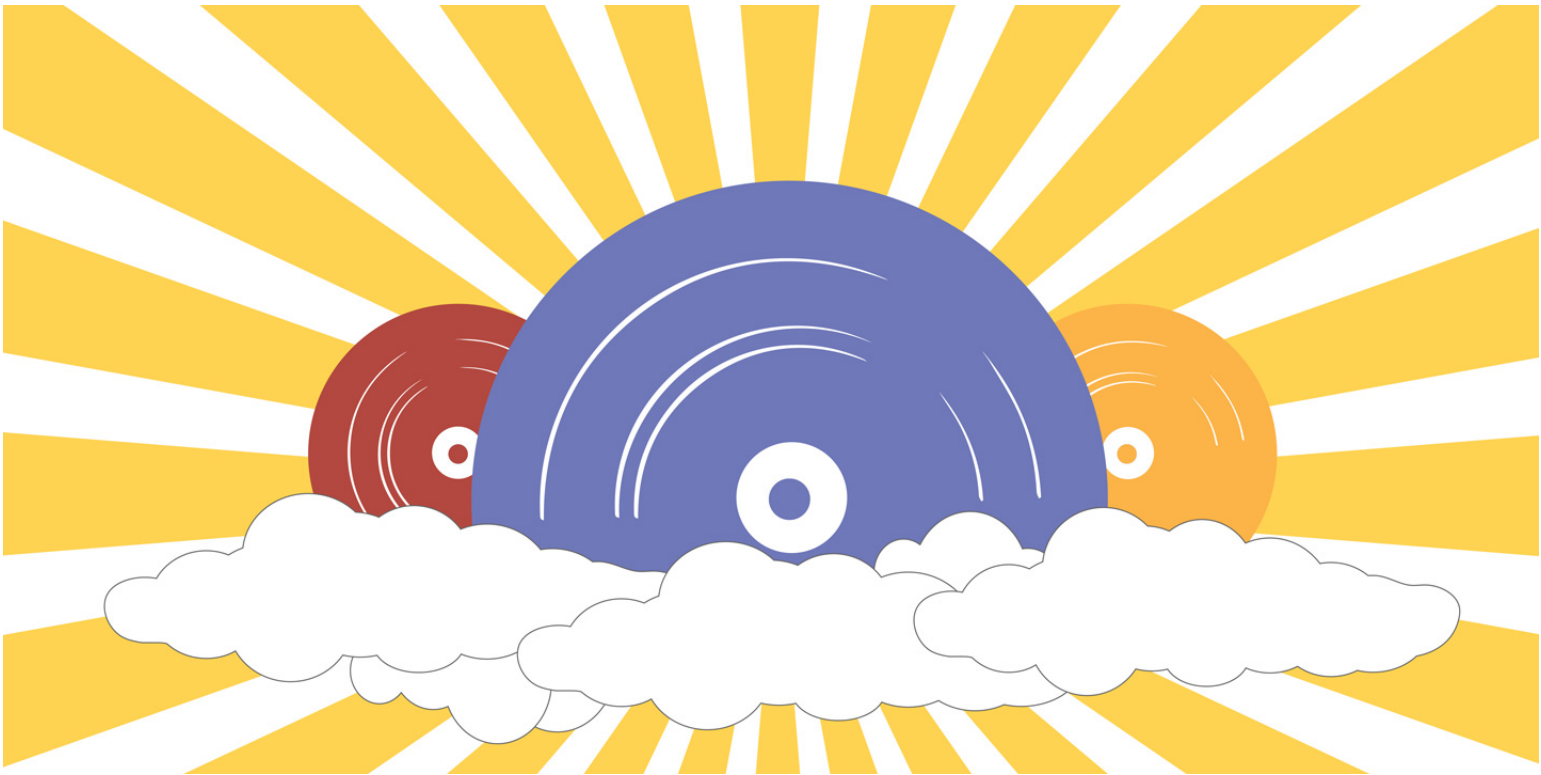
As synthesizers got more portable in the early '70s, they still generally couldn't play more than one or two notes at a time. But in 1975, Moog

introduced the Polymoog, an early polyphonic synth with 71 keys that eventually earned its place in synth-pop history by featuring prominently on Gary Numan's 1979 hit "Cars." The Polymoog also appeared a year earlier in the string-like tones on Blondie's "Heart of Glass." Other polyphonic synths took over later in the decade, including the Yamaha CS-80 (1976), Oberheim's Polyphonic and OBX, Sequential Circuits' Prophet-5, and Roland's Jupiter 4. The credits to Prince's debut LP, 1978's *For You*, cite a "Ms. Poly Moog."

Component Car Stereos

As drivers got used to listening to their favorite music on car cassette decks, an opening

emerged for more expensive car speaker systems. Pioneer Electronics claims to have debuted the first component car stereo system in 1975. A component system separates the woofers (midrange frequencies) and tweeters (treble frequencies), ideally resulting in better sound. Subwoofers, with their rattling low-end, were a logical next step.



1976

The VCR

Musical short films are about as old as movies with sound, so it's only fitting that the rise of music videos coincided with the rise of home video. In 1976, JVC rolled out the first VHS-based video cassette recorder, the JVC HR-3300. As music videos gained popularity after the launch of MTV in 1981, viewers could not only record their favorite music to check out later, but also buy pre-recorded VHS tapes featuring video stars. And many did: *Moonwalker*, a 1989 Michael Jackson video compilation, went multi-platinum, and 1983's *Making Michael Jackson's Thriller*—the first music video to top top *Billboard*'s video sales chart—logged eight weeks at #1. DVDs followed, of course, and now YouTube has mostly rendered those old VHS tapes obsolete, but the basic technology for most

people to watch music videos began here.

1977

Synclavier

By the late ’70s, new types of synthesizers were evolving at a breathtaking rate. Developed at Dartmouth and introduced in 1977 by the newly formed New England Digital Corporation, the Synclavier was an early digital synthesizer that grew increasingly sophisticated into the ’80s, with digital sampling and other features meant to achieve a cohesive “tapeless studio.” Over the next decade, the Synclavier would loom large on hits by a veritable who’s who of the era’s big acts, including a gong preset that bangs at the start of *Thriller*’s “Beat It.”

Commercial Digital Recording

The technology behind digital audio recording, like the vocoder, dated back to World War II. And as digital alternatives to analog began developing in other areas of music production, digital recording also arose as a possibility. As early as 1971, Japanese electronics company Denon was making early digital recordings that saw commercial release. The Sony PCM-1, regarded as the first commercially available digital recording system, arrived in 1977, using a home VCR as a storage medium. The same year brought the first digitally recorded U.S. albums for commercial release. By 1979, Ry Cooder would release a digitally recorded pop album, *Bop Till You Drop*, and Stevie Wonder

went digital with *Stevie Wonder's Journey Through "The Secret Life of Plants."*

The Modern Stratocaster

Although Fender's signature Stratocaster guitar —made famous by Jimi Hendrix— was more popular than ever before in the '70s, "the new ones weren't nearly as good as the older ones," according to an article on Fender's own website. On top of that, Fender continued to make minor cosmetic tweaks to the Strat. In 1977, 23 years after the Stratocaster first hit the market, Fender went so far as to swap out the old three-position pickup selector switch for a five-position switch, a design overhaul that endures to this day. Though

this particular change merely acknowledged how guitarists were using the instrument anyway, it roughly coincided with the advent of a vintage guitar market.

The Power Station

Plenty of producers and musicians questioned the arid, close-mic'd '70s production style. New Jersey native Tony Bongiovi, who got his start at age 17 working for Motown, had in idea. He envisioned a studio that would have Motown-like ambience and allow musicians to play in the same room together while avoiding too much overlap between mics. By the time Bongiovi opened the Power Station, in an old midtown Manhattan ConEd plant, he was an established producer who'd worked with Gloria Gaynor, Al Downing,

the Ramones, and Talking Heads. The studio's purposefully live-like setting led to vibrant, resounding records including Chic's *C'est Chic* and *Risque*, Bruce Springsteen's *The River* and *Born in the U.S.A.*, David Bowie's *Let's Dance*, and Madonna's *Like a Virgin*.

Pink Floyd's Flying Pigs

While Bob Heil had been breaking ground for large-scale live sound at U.S. concerts, Pink Floyd had put on similarly pioneering UK shows, dating back to their first quadraphonic gig in 1967. The band had been similarly busy with the visual aspect of their performances, from psychedelic light shows to pyrotechnics and giant inflatables. But nothing

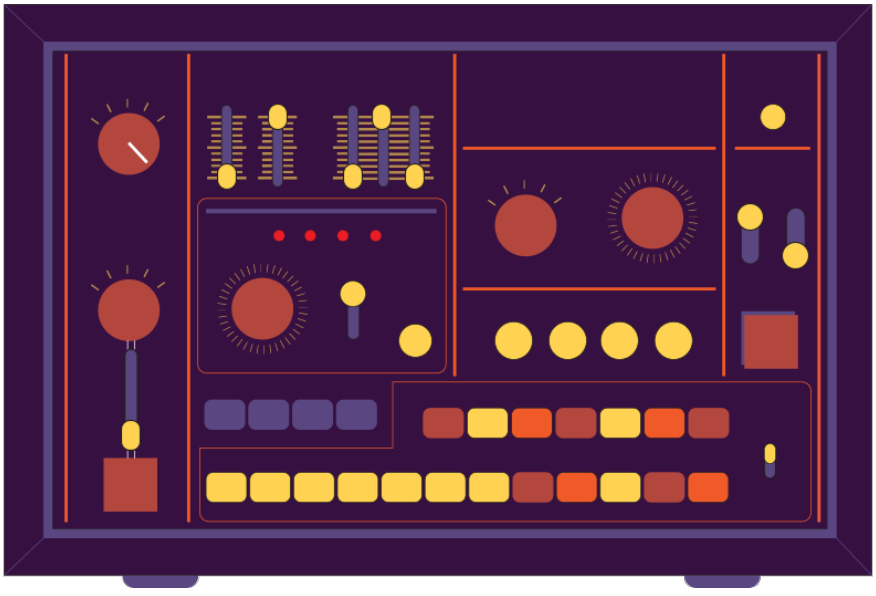
remains so synonymous with the band's '70s spectacle though as the oversized inflatable pigs introduced during their tour for 1977's *Animals*. It typified a more general turn toward pyrotechnics, balloons, and props popularized in '70s concerts by bands like Queen and Kiss.

Roland MC-8

Microcomposer

As synthesizers blossomed in complexity, some started to incorporate the features of primitive computers. In 1978, Japanese electronic instrument maker Roland's MC-8 Microcomposer, though manufactured only in small numbers, hinted at the power

microchips would have on music. This instrument used an Intel 8080A 8-bit microprocessor and 16KB of random access memory—plus a calculator-like keypad. One of the first users was Ryuichi Sakamoto and his Yellow Magic Orchestra; other early adopters were Landscape's Richard James Burgess and John Walters, who went on to lend their synth wizardry to revered '80s albums by Kate Bush.



1978

FM Radio Dominance

FM radio broadcasts go back to the 1930s, and by the end of the ’60s, they became known for freeform and progressive sounds, which led into the album-oriented rock (AOR) format. FM meant higher fidelity and less static, a boon for actively listening to music. It’s difficult to pinpoint exactly when FM overtook AM in North America, but a commonly noted turning point is 1978, when FM stations first accounted for a majority of the top 10 stations in the top 50 market.

Roland CR-78 Drum Machine

Preset drum machines, which offered only factory-programmed patterns, had been around since the ’60s. And as programming

drum machines arose in the ’70s, Roland’s CR-78, launched in 1978, caught on with acts like Blondie. The most famous drum machines, such as the Roland TR-808 and the Linn LM-1 Drum Computer, wouldn’t arrive until 1980.

The Townhouse

The Power Station in the New York wasn’t the only studio bringing back a sense of live room ambience as the ’70s became the ’80s. In 1978, Virgin Records mogul Richard Branson built a London studio called the Townhouse, which consisted of one traditionally sound-proofed room and a separate space decked out with reverberant stone slabs. The Townhouse bought one of the first consoles

built by a then-small British company called Solid State Logic. In 1980, Townhouse engineer Hugh Padgham was working on Peter Gabriel's third solo album when he discovered a quirk of the SSL console that produced a huge, crashing sound from drummer Phil Collins. Padgham soon co-produced Collins' 1981 hit "In the Air Tonight," and that mix of the SSL's compression, a CR78 drum machine, and Townhouse's unique studio gave birth to the soon-ubiquitous '80s gated drum sound.

1979

Fairlight CMI

Introduced in 1979, the Fairlight Computer Musical Instrument was more than just another digital synthesizer. It was also a digital sampler. By the 1990s

and 2000s, the same functionality would be available on a cheap home computer, but back then it was enough for the Fairlight to be adopted far and wide. Led Zeppelin's John Paul Jones reportedly bought the first CMI, followed by the likes of Kate Bush, Trevor Horn, Stevie Wonder, Herbie Hancock, Jann Hammer, and Joni Mitchell. The liner notes to Phil Collins' *No Jacket Required*, in 1985, state, "There is no Fairlight on this record"; in other words, the horns you hear on the album are performed, not sampled. The CMI's success made that something to brag about.

Tascam Portastudio

It's important to note that the spread

of umpteen-track recording in the ’70s was limited to proper recording studios. But Tascam made reel-to-reel tape machines and mixers for musicians recording at home. In 1979, the company made home recording more available than ever before with the Tascam Portastudio, considered the first four-track recorder using standard cassette tapes. Today, recording is easy on a phone or a computer, but the immediacy of the Portastudio and other machines soon led to their use by not only Bruce Springsteen, on his 1982 album *Nebraska*, but also indie rockers like Guided by Voices and Panda Bear, rappers from Wu-Tang Clan to Madlib, and far beyond.

Sony Walkman

As the ’70s progressed, listeners couldn’t yet conveniently bring their music with them, as it’s so easy to take for granted today. Then, in 1979, the original Sony Walkman went on sale in Japan, changing the culture of music listening. After being replaced by portable CD players, the iPod, and smartphones, Sony resurrected the Walkman brand last year as, what else, a high-end digital audio device.

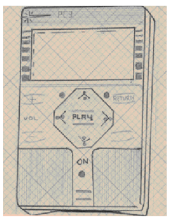
Technics SL-1200MK2 Turntable

In 1970, Japanese electronics brand Panasonic introduced the Technics SP-10, the first direct-drive turntable, which

means the platter for the records sits directly on top of the motor as opposed to being attached to the motor via an elastic belt. Two years later, the SL-1200 line debuted. It wasn't until 1979, though, that the iconic Technics SL-1200MK2, with sliding pitch adjustment and all the other features that endeared it to DJs, finally arrived. The advertisements read: "Tough enough to take the disco beat." Beyond disco, the "wheels of steel" caught on with pioneering hip-hop DJs; Grandmaster Flash's Technics deck is now in the Smithsonian. Though Panasonic discontinued the original Technics turntable line in 2010, it recently revived the Technics 1200 as—déjà vu?—a high-end model.

Compact Discs

“Perfect sound forever” was just around the corner. In 1977, Sony and other manufacturers showed off prototypes for digital audio discs at the Tokyo Audio Fair. But at that point, they were about the size of a vinyl LP. On March 8, 1979, Dutch company Philips first demonstrated its smaller, 11.5 cm-diameter compact disc prototype to journalists. A 1979 *Newsweek* report was prescient: “The real boom won’t begin until total digital systems and components invade the home—probably sometime in the mid-1980s. Then, a digital playback device will employ a tiny laser to ‘read’ a digital recording…” Downloads—let alone streaming—weren’t yet a glimmer in the industry’s eye. Except…



Early Concept for an iPod

In 1979, a British inventor named Kane Kramer reportedly came up with the idea for a portable, memory chip-based digital music player that would be the size of a cigarette packet. He envisioned recordings being kept on a main server and distributed to record stores via telephone line. His pitch to investors cited “immediacy of delivery,” “no physical inventory and therefore no production costs,” and “instant micro-billing, handled centrally.” The patent lapsed, as Kramer later explained to *The Guardian*. But even before the ’70s were over, he had uncannily predicted much of what Apple would unveil, with great fanfare, in the early 2000s. The future was already looking retro.