

Bar Bartholomew—Black Star

The Arts: The first sonic virtuoso

late 1940s a French school called *musique concrète* recorded natural sounds like dogs barking or rain falling. Then came the heyday of the tape recorder. By the late '50s composers had begun to appropriate oscillators and filters from labs. Because musical sounds are incredibly complex—there are as many as 150 components in the sound of one cello note alone—giant analog synthesizers came into being that contained row upon row of these devices.

Mimic: There were disadvantages to the original analog synthesizers. They cost too much, and they were too complex; many composers fled from their awesome control panels. This problem was solved with the introduction of integrated circuits, which allowed small, inexpensive synthesizers to be built and played live in the concert hall. ARP's and Moogs (the invention of Robert Moog, page 10) proliferated like rabbits;

with their simple keyboards *anybody* could make music on them. Serious composers, meanwhile, hooked up multisynthesizer setups. Electronic music boomed.

A second major problem remained, that of the "canned" quality of the sound. Despite their complexity, the giant analog synthesizers were neither big enough nor precise enough to produce perfect musical timbres. "Composers exploited the obvious and very quickly exhausted the available sounds," says Chowning. It remained for Max Mathews of Bell Laboratories to invent a way of producing even more powerful digital, or computerized, sound. Originally developed as a telephone-testing technique, the digital process—subsequently applied to commercial digital synthesizers—scans sound waves at the rate of 40,000 to 50,000 bits per second and then reproduces any microscopic amount on command. It can be programmed to mimic any sound known to man or to produce oddities like circular sound. With the arrival in the late '70s of "real time" or instant-playback digital synthesizers, the sole remaining handicap of computer music—that composers had to wait as much as several hours to hear what they had programmed—was gone.

The attraction of musicians to electronics is not really surprising—of all the arts, music is the most mathematical. One of the earliest of the new scientist-musicians was Vladimir Ussachevsky, 70, a director emeritus of the Columbia-Princeton Electronic Music Center who helped establish electronic music in the United States. Born in China, he came to America intent on becoming an electrical engineer. Instead he switched to music and studied composition with, among others, Otto Luening at Columbia. "When the tape recorder came out I was immediately fascinated," he says. "I think the roots lie in my early interest in electricity, and in my interest in the harmonic consequences of complex

sounds." In October 1952 an uneasy audience at the Museum of Modern Art in New York witnessed one of the first concerts to include tape music—works by Ussachevsky and Luening in which there was nothing onstage but a loudspeaker. Like many of his later works, Ussachevsky's "Sonic Contours," presented at the concert, is hardly threatening. It's a delicate pastiche of gently tampered piano sounds that reflects Ussachevsky's late-romantic Russian leanings—and is, perhaps, the first lyric piece in the electronic medium. Ussachevsky and Luening subsequently collaborated on several pioneering works that combined live performers and tape.

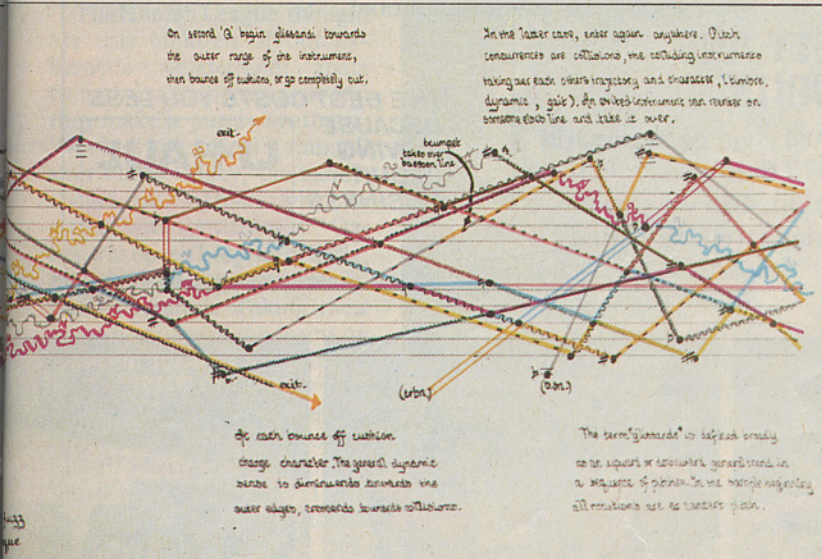
'Improvisations': In contrast to the "academic" electronic composers ensconced in their labs were the rebels like Robert Ashley and David Behrman. Strongly influenced by John Cage, whose iconoclastic "Cartridge Music" (1960) with contact microphones was the first live electronic music, they were interested from the first in video, theater and performing. By the mid-'60s, Behrman was performing on simple instruments made with transistors and resistors. His music, and that of the other Sonic Arts Union members, was much more limited than the Columbia-Princeton variety—"more like improvisations on sounds," says Behrman. But their emphasis on performance, and their more accessible-sounding music, has had a lasting effect on electronic music, most notably on the New Wave composer-performers of today.

For sheer musical flamboyance, no one can match Morton Subotnick, 49, the first sonic virtuoso. Subotnick became intrigued with tape and electronic music in 1959 after composing a *musique concrète* score for a "King Lear" in San Francisco. "But I didn't want to do electronic music in the academic

Paul Fusco

amazing sense of new territory opening up for contemporary composers

Michael Alexander



sense," he says. "I was more performance-oriented." He pooled his equipment with some fellow composers and co-founded the freewheeling San Francisco Tape Music Center. He also began working with California composer and instrument builder Donald Buchla on what they envisioned as an ideal new portable instrument.

The result was the first of Buchla's amazing Electric Music Boxes. A portable

studio-in-one, it contained everything that a composer like Subotnick needed to make highly complex music; its touch-sensitive plates controlled every variable from pitch, intensity and attack down to the duration and decay of every tone. The records Subotnick subsequently made using Buchla's instruments have an extraordinary energy and strange beauty that match their titles—"Silver Apples of the Moon" (1967), "The Wild Bull" (1968), "Side-winder" (1971). By painstakingly isolating

"inspired" bits of sound and then recording them onto a master tape, he created sounds that merge and dissolve and occasionally "explode" at the listener as if from a vast sonic distance.

Today digital synthesizer music, which is rapidly taking over the field from analog synthesizers, flourishes in two discrete worlds. In the state-of-the-art computer-music centers at Stanford, IRCAM in Paris (which Pierre Boulez modeled after Stanford) and the University of California at San

The Synth-Pop Surge

For a time this summer it was America's No. 1 single. It sounds like an old-fashioned mid-'60s hit. But wait a minute. That loopy riff with a brassy snap: no horns sound like that. And that bionic beat: man or machine? Have body snatchers invaded America's airwaves? Is this pure pop for pod people?

If you've been scratching your head over a record called "Don't You Want Me," you aren't alone. Suddenly the American rock scene is humming with the latest computer-age fad: riffs barely touched by human hands. Call it "synth-pop" or "techno-pop," the new style is cool, sleek, punch-card chic. Like disco, it's perky and bright. Like punk, it's the homemade and very democratic—anyone can play it. Above all, it's a dazzling burst of electronic effects produced by an imposing array of new-breed synthesizers, some of them remarkably cheap, others costly models that can summon, at the punch of a button, a roar of white noise or the calm, pure tones of a shepherd's pipe.

Leather Look: Leading the pack of new pop clones are two young British bands: Human League, which created "Don't You Want Me" (A&M), and Soft Cell, which recently cracked the Top Ten with "Tainted Love" (Sire). Soft Cell consists of Marc Almond and Dave Ball, two former art students from Leeds. In the late '70s, inspired by the do-it-yourself ethos of punk and a thriving local club scene, they set out to make a new kind of stripped-down dance music using cheap synthesizers. With their leather look, seedy lyrics, smoky vocals and occasional use of real instruments like the clarinet and trumpet, they don't completely fit the synth-pop mold—even their brightest jingles have a bluesy bite.

The Human League, though, are true children of our cybernetic wonderland: apart from their singing, every sound they make is purely synthetic. "We had no musical training," says Philip Oakey, the band's spokesman. "That's why we started with synthesizers." Oakey was once a hospital orderly; his original partners were computer operators. Taking their name from one of the teams on a video game, they floundered commercially until they met producer Martin Rushent, a zealot of the new microchip music. "It is the sound of the future," says Rushent. "There are no ground rules and no

limitations other than your imagination." Despite such brave talk, the style of these trendy new bands is strictly secondhand. The assembly-line sheen of "What," Soft Cell's new single, evokes Motown, with a fey wink. Says the Human League's Oakey: "What we do is write good, short, precise pop songs in the old style and then give them the gloss of high tech." Even the gloss is old hat: Donna Summer's "I Feel Love," a hit in 1977, featured a dazzling electronic score by Giorgio Moroder, the Beethoven of synth-pop.

Short Cut: What's new isn't the music—it's the electronics. With the advent of cheap computerized memory banks, commercial synthesizers have become flexible, portable and much simpler to play. Prices have plummeted. Bantamweight keyboards that can imitate a glockenspiel, "synth fuzz" or the celestial sound of violins swimming in reverb now go for as little as \$350. Escalate the price and the possibilities explode. "Emulators" will digitally record anything—from a barking dog to a grand piano—and then spit it back on command from a keyboard console. "Sequencers" will store a string of notes and let you fiddle with them at will—a short cut to orchestration used extensively by Human League. At the high end of the scale is the remarkable Synclavier, which can do virtually anything.

With so many different technical options, it's no wonder synthetic pop music now runs the gamut of styles. Vangelis, the virtuoso who scored the film "Chariots of Fire," glibly wields the latest gadgets to compose a symphony of Saran-Wrapped sounds, though like many new synth stars, he can't read music. Brian Eno, the *doyen* of Manhattan's conceptual rock scene, applies the new technology to construct minimalist tone poems.

But the most startling new sound in electronic rock belongs to a British group called New Order. While patterned noise spills from their synthesizer, the rest of the band—guitar, bass and drums—feeds its music through a computer. The lyrics are muttered matter-of-factly: "Oh you've got green eyes/Oh you've got gray eyes" (from the band's Factory Records single, "Temptation"). Techno-pop bands like Human League and Soft Cell play toe-tapping Tinkertoy music. New Order takes the same electronic tools and conjures up an altogether different mood: a trapped, abandoned, stinging sense of otherness. It's the spookiest machine-rock yet.

JIM MILLER with RITA DALLAS
in London

The Human League: Children of a cybernetic wonderland

Simon Fowler—Retna





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MUSIC

Diego, the focus is not on computers writing music but on exploring the limitless sounds they are capable of making and the way human listeners react to that sound. One leader in acoustic research is physicist-composer Jean-Claude Risset. "At first the acoustics book had just one recipe for each instrumental sound," he says. "We had to learn that sound isn't steady; it varies. It's only recently that we've been able to reproduce the sound of the human voice. We don't want to replace the voice; what's intriguing is to try and figure out how to get with a computer the emotional response you have to the sound of a singer."

But the greatest recent advance in the field has been its movement out of the labs and into the concert hall. It's no longer uncommon for a conductor to point to a sound booth and have a computer tape suddenly begin playing along with the orchestra. There are novel ways of integrating the old and new; Subotnick is currently composing a piece for the Juilliard Quartet in which a preprogrammed computer will modify the string sounds as they are made. Works like Robert Ashley's video opera "Perfect Lives (Private Parts)" blend video and electronics and live performers in a unique high-voltage hybrid.

New Violin: So far the new shift to live performance is problematic. Sophisticated instruments like the digital Synclavier are more suitable for composing and performing dense musical structures than for playing a single virtuosic solo line. "A good computer always wants to do new things, so it's hard to perform on it," says Subotnick. But the day of the first computerized Heifetz may not be far off. Max Mathews has designed a new violin, resembling a 21st-century crossbow; Buchla has invented a bodyless electric cello; Ussachevsky, now composer-in-residence at the University of Utah, has recently written a work for the Electronic Valve Instrument, designed by Nyle Steiner, which can mimic anything from a flute to an oboe to brass.

So where, in all this flurry of instrument building and sound processing, are the electronic and computer masterpieces, the Beethoven Fifth and Mahler Ninth of the medium? The answer is that there aren't any—yet. Electronic music is only 30 years old, after all, whereas traditional music has hundreds of years behind it. But it has come along at a perfect time. Just when twentieth-century music seemed hopelessly adrift between worn-out romantic conventions and esoteric serial music, electronic music appeared and offered an alternative path. It has brought with it an amazing sense of new territory opening up, of sonic worlds as yet unexplored. It may not be wishful thinking for F. Richard Moore, director of San Diego's Center for Music Experiment, to say, "The computer is to music what the telescope was to Galileo."

ANNALYN SWAN