

moog

a film by Hans Fjellestad

A Plexifilm Release



PRESS CONTACT:

Gabriele Caroti at 718.643.7300 x7 or gab@plexifilm.com



Credits

with

[in order of appearance]

Bob Moog, Keith Emerson, Money Mark, Mix Master Mike, Walter Sear, Gershon Kingsley,
Jean Jacques Perrey, Luke Vibert, Paul D. Miller, DJ Logic, Bernie Worrell, Rick Wakeman,
Herb Deutsch, Pamela Kurstin, Stereolab, Tino Corp., Charlie Clouser

written and directed by Hans Fjellestad

produced by Ryan Page and Hans Fjellestad

executive producers Gary Hustwit and Keith York

associate producer Adriana Trujillo

cinematography Elia Lyssy and Dan Kozman

additional cinematography Ryan Copeland, Greg Pope and Isao Yonezawa

opening title animation by Fizzy Eye

edited by Hans Fjellestad

assistant editor Adriana Trujillo

featuring music by

Baiyon, Suzanne Ciani, The Album Leaf, Keith Emerson, DJ Spooky,
Plastiq Phantom, Charlie Clouser, Jean Jacques Perrey, Luke Vibert, Pete Devriese,
Tortoise, Money Mark, Woody Jackson, Mix Master Mike, Stereolab, Edd Kalehoff,
Gershon Kingsley, 33, Bernie Worrell, DJ Logic, Rick Wakeman, Roger O'Donnell,
Doug McKechnie, Herb Deutsch, Meat Beat Manifesto, Psilonaut, The Moog Cookbook,
Pamelia Kurstin, Bostich, Bob Moog, Tino Corp., Electric Skychurch

A Plexifilm Release of a ZU33 Production in association with

Keyboard Magazine, KPBS, Spruce Street Forum

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U.S.A. • 2004 • 70 minutes • Not Rated

Color/Black & White • 1.66:1 • Super 16 mm/Digital Betacam • Dolby SR

www.moogmovie.com

Soundtrack available on Hollywood Records



About the film

Moog, a documentary about Robert Moog, inventor of the modern synthesizer, is a portrait of the legendary figure in music and technology and his ideas about creativity, design, interactivity, spirituality and his collaborations with musicians over the years. *Moog* was directed by Hans Fjellestad and produced by Ryan Page who collaborated on *Frontier Life* (2002), a film about Tijuana, Mexico, and its burgeoning electronic dance music scene.

Permanently changing the face of music, the “Moog synthesizer” went from being the centerpiece of a late-60s craze—appearing on records with such titles as *Spotlight on the Moog*, *Moog Power*, *Music to Moog By*, *Country Moog*, *Moog Indigo*, *Exotic Moog* and culminating with the commercial success of Wendy Carlos’s *Switched-on Bach*—to an indispensable instrument for progressive rock bands like Emerson, Lake & Palmer and Yes to predating the electronic dance music movement of today. Inventive contemporary music owes much more to the Moog synthesizer and its copies than the Fender Stratocaster or Gibson Les Paul electric guitars. The “Moog” name has introduced electronic music technology into the public consciousness.

Generations of musicians have made such strong emotional connections with the electronics of a Moog synthesizer that the inventor himself has reached cult hero status. He has the unwavering respect and admiration of performers, inventors and fans worldwide. Robert Moog has become a character within an unfolding “American maverick inventor” mythology and has forever altered the creative process of music making.

Born in 1934, Robert Moog has been inventing and building electronic musical instruments for nearly half a century. From building and selling theremin kits in the mid-50s, Moog invented and built the first “modular” synthesizer with Herbert Deutsch in 1964. Still active in his workshop in rural North Carolina, Moog continues to shape musical culture with some of the most inspiring instruments ever created.

Moog was shot on location in Asheville, New York, Los Angeles, San Francisco, Tokyo and London and features live performances by Keith Emerson, Money Mark & Mix Master Mike, Jean-Jacques Perrey & Luke Vibert, DJ Logic, Bernie Worrell, Rick Wakeman, Pamela Kurstin, Stereolab and Tino Corp. with Charlie Clouser.



Robert Moog biography

It was 50 years ago today...

What would the world of modern music be like without the inventions of Bob Moog? One answer would be: very boring. Bob Moog's namesake analog synthesizers have affected popular music in ways he might not have expected back in 1954, when he began building theremins with his father. But 50 years later, Bob's musical instruments have catapulted so many styles of music into the future, and his contributions to both players and technicians grow even more profound in retrospect.

Where would rap and hip hop be if groups like Parliament and Funkadelic hadn't used Moog keyboards? Where would rock and roll be if groups from Yes to Edgar Winter hadn't used Moog keyboards? Would jazz music have branched off into fusion without Herbie Hancock and Chick Corea using Moog keyboards? And would classical music have enjoyed such resurgence without Wendy Carlos and her modular Moog synthesizer? The questions are hypothetical, of course, because synthesizers have infiltrated every style of music, and so many companies have tried to recreate that analog sound. But above all the copycats and spin-offs, it always comes back to one name: Moog.

After ten years of making theremins, providing unearthly sounds to science fiction movies and avant-garde musicians, Bob Moog met experimental composer Herbert Deutsch, whose search for electronic sounds inspired Bob to create the first Moog Modular. Though Bob took on the project just for fun, when he premiered it at the Audio Engineering Society Convention in October of 1964 the response was immediate and Bob started taking orders on the spot. By the time he got a graduate degree (PhD in Engineering Physics) in the summer of 1965, the R. A. Moog Co. had delivered several modular synthesizer systems, mostly to academic and experimental composers. But it would be a few years later when public awareness of Moog synthesizers would leap ahead beneath the nimble fingers of Wendy Carlos.

Carlos' renowned album *Switched-On Bach* was released on Columbia Records at the end of 1968, achieving immediate success. The album went on to sell over a million copies, creating a sharp demand for Moog modular synthesizers throughout 1969 and early 1970. Many "switched-on" records were produced during that period, some of which did become popular. By the end of 1970, the now incorporated R. A. Moog Inc. introduced the Minimoog, a compact performance synthesizer based on the technology of Moog modular products, enabling keyboardists to take the Moog on the road. And that began a decade of music that would be forever altered by the Minimoog and its incomparable sounds.

R. A. Moog Inc. officially changed to Moog Music in 1971 and became a division of the now defunct Norlin Music in 1973. Moog synthesizers were widely used by professional musicians and the "Sound of the Moog" became an integral part of our musical culture. The list of songs is far too long to print here, but from rock to R&B, from jazz to classical music, the Moog sounds were everywhere.

At the end of 1977, Bob left Moog Music and founded Big Briar for the purpose of developing and building electronic musical instruments with novel player interfaces. Actual Moog keyboards were made for the better part of the next decade by Norlin Music, but with the heart



and soul of Moog gone, Moog keyboards ceased production by 1986. Though gone from his namesake company, Bob's interest in synthesizers and instruments could not be quelled. From 1978 to 1992, Bob operated Big Briar on a small scale and kept building custom instruments. He was also representing Synton, a Dutch manufacturer of modular equipment, and providing consultation services to other music technology manufacturers. In addition, Bob served as Kurzweil Music Systems' Vice President of New Product Research from 1984 through 1989, and taught music technology courses at the University of North Carolina at Asheville from 1989 to 1992. However, Moog keyboards and the music they graced began a cult following amongst players and aficionados, and Bob's inventions never quite left the spotlight. Interestingly, it was his original theremin that was to enjoy an early 90's renaissance.

In response to the rise in interest, Bob designed the Series 91 theremins in 1991, and Big Briar produced them for the next five years. In 1996, Bob wrote a do-it-yourself theremin article, which was published in *Electronic Musician* magazine. The design formed the technical basis for the Etherwave theremin, which Big Briar/Moog Music has built and sold continuously since then. Finally, in 2002 Bob resurrected his namesake analog synthesizer, designing the new Minimoog Voyager for a new generation of Moog players.

Last year, Bob reclaimed the right to use the Moog Music and Minimoog trademarks, and immediately changed the name of Big Briar to Moog Music Inc. Moog Music's latest invention is the Moog PianoBar. Developed by Donald Buchla, a long-time colleague of Bob's and a renowned electronic musical instrument designer in his own right, the PianoBar fits onto any acoustic piano and enables the player to use the piano's keyboard to control electronically generated sounds.

In short, the past 50 years have been an adventurous time in music, and Bob Moog's contributions become ever-important and evident in retrospect. His dedication to the craft of making instruments is as legendary as the instruments themselves, and Bob has helped make possible the creation of some of the most important music of the 20th century and beyond.



Director's Statement by Hans Fjellestad

I first touched a Moog synthesizer when I was eight. It was a Minimoog model D that was part of an interactive exhibit at a museum in San Diego. I fell in love with not only the sound but the feel of it, the weighty knobs and switches. I made a connection.

Many have made similar connections with Moog instruments—the inventor himself is a much beloved cult hero—so the prospect of making a feature documentary on Bob Moog was daunting. This subject matter is sacred ground in the minds of Moog fans. I certainly wanted to respect Moog aficionados but I also wanted to translate Moog culture into a language others could understand.

Developing the project with producer Ryan Page, we decided early on that we weren't interested in taking a conventional approach to the Moog story. The film does not track the history of electronic music. It is not a chronological history of the synthesizer. No archive still photos, no narration. *Moog* is focused on the man today, in his own words.

After researching and developing the project for over a year, we began production Summer 2003. Fittingly, we shot the godfather of analog synthesis on film (Super 16mm) instead of digital video. I spent time with Bob in Asheville, Hollywood, New York and Tokyo. We talked about the nature of creativity and mystical notions about the interaction between man and machine (reminiscent of Nikola Tesla). And his collaborations with musicians.

Of course, to include every musician influenced by and influential on the Moog synthesizer would not be realistic. But clearly there are central figures: Keith Emerson, Sun Ra, Stevie Wonder, Rick Wakeman, Herbie Hancock, Jan Hammer, Tomita, Kraftwerk, Tangerine Dream, Dick Hyman, Wendy Carlos and the list goes on... an extensive and impossible roster.

And equally untenable for this film would be a survey of technological and design advances by other synthesizer pioneers like Leon Theremin, Raymond Scott, Don Buchla, Thaddeus Cahill, Harald Bode and Hugh LeCaine, all of whom have had significant impact on Moog and each deserves a film to themselves—only Theremin has one as far as I know.

We did make numerous attempts to recruit Wendy Carlos for this project, but she refused to be involved at all. She even threatened to sue. I had discovered *Switched-On Bach* at 12, and at the time it really had an important effect on my world, so her harsh rejections were especially disappointing. But I was very gratified by the enthusiasm of our cast members.

But in the end, it is Moog's voice that is the narrative. Members of the cast are featured in performance or in conversation with Bob, but only he speaks one on one with the camera. Bob is always the reference point and I think this is how we get a unique look into his head. And that was more important to me than attempting to make *the* comprehensive film about all things Moog. That task might be better suited to a musicologist, historian or social anthropologist, which I am not.

Bob Moog embodies the archetypal American maverick inventor. The independent explorer charting new territory. The mad scientist. The cowboy poet. I'm interested in that mythology—for the parts that turn out to be true and for the parts that turn out not to be true. Ultimately that is what this film is about.



Robert Moog by Frank Houston

His invention had an extraordinary impact on how musicians create, and radically changed the way music is made.

In the 1920s a Russian inventor named Leon Theremin unveiled the first purely electronic instrument. You played the theremin by waving your hands in the vicinity of two metal rods, controlling pitch and volume, that were attached to a nondescript wooden cabinet. Between the strange arm motions and the instrument's invisible machinations, the theremin's overall effect in performance was theatrical and mysterious.

But like the 200-ton telharmonium, the world's first mechanical music synthesizer (invented by Thaddeus Cahill around 1900), the theremin was difficult to play. It soon disappeared behind the curtain, relegated to cheap performances in B-grade alien-invasion movies. In 1955, four years after the theremin's eerily weepy sound was employed in *The Day the Earth Stood Still*, RCA introduced the first modern synthesizer. The machine made sounds by manipulating electrical waves to denote timbre, pitch and volume. Like early computers, it filled a room and was tended by men in lab coats.

A few years later Robert Moog, a graduate student in physics at Cornell University, published a magazine article explaining how to build a theremin, offering do-it-yourself kits for \$49.95. Orders poured in, and Moog sold 1,000 that year. "We had \$13,000 in the bank," he recalled recently, "a humongous cache of wealth for a graduate student back then!" The windfall enabled a career that helped bring electronic music out of the realm of novelty acts and university labs. A decade after the first RCA machine, Moog introduced the first widely adopted electronic instrument -- the synthesizer that bears his name.

When Moog (rhymes with "vogue") unveiled the Moog music synthesizer in 1965, his engineering skills combined with a bit of business luck to radically change the way music was made. Synthesizers went from being computers to instruments that could be found in any music store. The flowering of rock music may have come via Leo Fender, Les Paul and the Gibson Guitar Co., but the innovative music of the early 21st century owes far more to Moog and his imitators and successors.

on the smarter, more introverted members of their tribe: "I was the class brain," he recalled in one of several e-mail interviews. "I knew I was smarter than they were, so they felt compelled to beat me up periodically to keep me in my place." He spent a lot of time with his father, who liked to dabble in electronics, and started his own electronics projects. He built his first theremin with the help of a hobby-magazine article at age 14. "I was hooked," he recalled. Five years later, Moog published his own do-it-yourself theremin article.

Moog's mother, meanwhile, gave him piano lessons and made him practice hours every day in the hope that he'd become a concert pianist, "klopping" him if he "didn't practice right." He found refuge in New York's prestigious Bronx High School of Science, where he "actually had some friends who were as nerdy as I was." Later, at Queens College, Moog finally developed what he called "a medical-minimum amount of social grace," and even started dating.



After getting some exposure to the liberal arts at Columbia University's Engineering School, Moog began graduate education in the engineering physics department of Cornell University. He took eight years to get his Ph.D., largely because of his part-time hobby: building theremins and other electronic instruments. The degree came in 1965, a year after Moog launched his synthesizer business.

Moog built his synthesizer in 1964 after a composer told him about the need for user-friendly electronic instruments utilizing new solid-state technology. The Moog was modular: You used patch cords to select your waveform (the sound's timbre) and frequency (pitch), and plugged in the interface -- a keyboard, instead of the binary code on paper that had defined the first RCAs. Moog's engineering wizardry did the rest.

Significantly, Moog's was the first synthesizer to use attack-decay-sustain-release (ADSR) envelopes, set with four different knobs, which control the qualities of a sound's onset, intensity and fade. Like many of his designs, Moog's envelope generators became a basic component of later synthesizers. The sound was monophonic -- one note at a time -- but that was enough, since studio recording techniques could create whole orchestras from single notes by the late 1960s.

RCA synthesizers, intended for an elite market of labs financed by universities and record companies, had cost \$100,000 and up. In 1967 the new Moog sold for \$11,000. It wasn't the only synthesizer around; many experts also commend Donald Buchla's modular synthesizer, built around the same time. But the Moog became prized for its utility and elegance, making Moog the name that brought synthesized music to the masses.

"I remember seeing it as a teenager and thinking, 'I gotta get my hands on it,'" says Jeffrey Hass, director of the University of Indiana's Center for Electronic and Computer Music. "I wasn't alone. It had a tremendous impact on many people and brought electronic music to many composers, both popular and academic."

The synthesizer also boasted the voltage-controlled lowpass filter that came to be known as the Moog filter, capable of making a variety of full horn, string and vocal timbres. The filter was patented in 1968, much to the envy of the competition, who "ate their hearts out," Moog says. They "all came up with voltage-controlled lowpass filters, but most of them sounded like shit, if I do say so myself."

The Moog's biggest break came in 1969, when musician Walter (now Wendy) Carlos had a huge, Grammy-winning hit with *Switched-on Bach*, popularizing electronic music with Moog-made renditions of Johann Sebastian Bach. Canadian pianist and Bach interpreter Glenn Gould said that Carlos' Fourth Brandenburg Concerto was "the finest performance of any of the Brandenburgs—live, canned or intuited—that I've ever heard."

The Beatles introduced a new Moog in the majestic "Because," on *Abbey Road*, the last album they recorded. The instrument was somehow perfectly suited to the layered, atmospheric vocals and John Lennon's ethereal lyrics. In 1971, Carlos brought the Moog to cinema, scoring Stanley Kubrick's *A Clockwork Orange* with electronic Beethoven whose gleeful perversity helped lend the movie its malevolent sheen.



Still, these were products of studio recording. It took musicians with a talent for excess—such as keyboardist Keith Emerson—to tote the enormous Moog setup, a towering box of electronics, onto the stage for live shows. Ever mindful of utility, Moog next introduced the portable, performance-minded Minimoog. Rock-oriented musicians like Jan Hammer showed that the synthesizer could be used as an expressive lead instrument. Jazzers like Josef Zawinul used the instrument to “add new colors to the traditional sound world of jazz,” says Doug Keislar, editor of the *Computer Music Journal*.

“It was really the advent of the Minimoog that saw synthesizers take off,” Keislar says. “The Minimoog showed that there was a significant market for portable, cheaper synthesizers.” Or as Moog put it, in typically dry fashion, “By 1974 or so, having a Minimoog would make it a lot easier to get a job playing the local Ramada Inn.”

The Minimoog became the gold standard. “He hit it so right, everyone realized that was the way to do it. So everyone did it more or less the same,” says Joel Chadabe, author of *Electric Sound: The Past and Promise of Electronic Music*, who has known Moog since 1965. “Underlying all this was a basic quality. The sound of his instruments was really good.”

A century after Thomas Edison reproduced the first recorded sound, the synthesizer began to spread into musical genres from the avant-garde to jazz. In 1977, the instrument took a central role in emerging forms of electronic music, with Donna Summer’s hit dance single, “I Feel Love,” created almost entirely on Moog synthesizers, and German band Kraftwerk’s *Trans Europe Express*, an album of purely technological music.

“The spirit of the times was very exciting,” says Chadabe, who also serves as president of the Electronic Music Foundation. “You could start a basement business and really have an impact. Later on the real businessmen came in with their accountants and financial planning and a lot of capital, and the business matured.”

Moog admits he didn’t have much of a head for the business end; his main goal has always been creating useful technology. “My transition from scientist to entrepreneur?” he asked in an e-mail. “Some would say that I still haven’t made that transition,” he joked. “I suddenly found myself in a growing business and I didn’t know how to run it,” Moog wrote of his early days. “I didn’t know anything at all about business back then. I didn’t know what a balance sheet was. I didn’t know what cash flow was. So the business survived as long as it grew, but as soon as a contraction occurred, I ran out of money.”

In quick fashion, Moog’s family business was bought out. The Micromoog was the last synthesizer created by Moog to bear his name. After musical instrument manufacturer Norlin took over his company, including synthesizer design, Moog spent the rest of his days at the company designing guitar effects, guitar amplifiers “and similar small electronic stuff.” He left Moog Music in 1977, blaming corporate politics for his departure.

When the Polymoog went into production in 1976, Moog says, “reliability-wise it was a disaster.” It had been created by Norlin’s new head of synthesizer design, David Luce. And why did Luce design synthesizers for Norlin while the man they were named for “was assigned to the technological provinces”? Just like his school days in Queens, Moog says, it came down to



social skills: “Luce liked to go out and drink and socialize with the Norlin brass, and I didn’t, or maybe couldn’t.”

The first digital synthesizer, the Synclavier, had come along in 1975. Digital sound synthesis, invented in the 1950s, became an affordable and popular technology in the 1980s. Soon digital sampling, computers and MIDI (musical instrument digital interface) standardization swept through electronic music, transforming the landscape. While the 1960s and 1970s were the heyday of analog synthesis, a sound many musicians still prefer, computer-synthesized sound now had the technological edge.

Moog largely eschewed the digital music revolution, though he had played a part in it. In 1978 he moved to North Carolina to launch Big Briar Productions and began making effects modules and control devices for electronic instruments. One of the first projects was an attempt to create a keyboard instrument that could be played as expressively as a violin. At the International Computer Music Conference in 1982, he introduced the multiple-touch-sensitive keyboard, developed with John Eaton of Indiana University. In addition to responding to the downward motion of a key, the keyboard also sensed the horizontal position of the finger playing it, opening up new dynamic possibilities.

Later, at the behest of artists, he made a flat touch-plate interface. “Artist feedback drove all my development work,” he recalls, listing examples dating from the beginning of his career: “The first synthesizers I made were in response to what [composer] Herb Deutsch wanted. The now-famous Moog filter was suggested by several musicians. The so-called ADSR envelope, which is now a basic element in all contemporary synthesizers and programmable keyboard instruments, was originally specified in 1965 by Vladimir Ussachevsky, then head of the Columbia Princeton Electronic Music Center. The point is that I don’t design stuff for myself. I’m a toolmaker. I design things that other people want to use.”

While Moog’s Big Briar inventions have not had the sensational impact of the first Moog synths, they are creative, futuristic visions of alternative methods for playing electronic instruments. “Unfortunately, the trend is toward user interfaces that are simpler, not more complex. Most people don’t care enough about the increased possibilities for expression to sacrifice years of their lives mastering an instrument,” says Keislar. “They want to press a button and hear music come out. As a result, such systems are probably destined to remain experimental, even if elegant.”

Big Briar also makes effects modules such as the “moogerfooger,” which mimics analog synthesizer timbres, one of which (Big Briar Moogerfooger Model MF101 Lowpass Filter) is based on the Moog filter. In 1997 Moog came out with a theremin (the Ethervox) based on the electronic instrument from the 1920s but featuring both a MIDI interface and a sound module that can re-create a theremin performance from MIDI data.

Reflecting on the waves of synthesizers and musical innovation that followed in the Moog’s wake, the inventor says the instrument “has introduced a vast array of new timbres and textures to the available palette of musical sound” and fostered what he calls “sound design.” Much of contemporary music, Moog points out, “has as much to do with sculpting complex, slowly evolving sounds as it does with ‘playing’ fixed-timbre musical sounds.” Moog’s quotation marks underscore the plasticity of the concept.



While some have credited Moog with helping to foment a “democratization of music,” he will hear none of it. That societal shift came about thanks to “cheesy Casio and Yamaha keyboards that sold for \$100 to \$500” and were “small and portable and battery-powered, so you could take them to a party or to the beach,” he says. “I see these devices as being on a branch of music technology that is completely separate from the analog synthesizers of the 1970s.”

His newest project is an “interactive piano” that manages to be both newfangled and old-fashioned. Designed with David Van Koevering, who helped to market the first Moogs, it is housed in the fine finished wood of a concert piano, but instead of strings under the lid, there is only a speaker. A touch screen the size of a laptop’s takes the place of sheet music. The piano has 128 sounds, including a digitally sampled Steinway grand, and 256 tracks for recording. It will transcribe any composition onto the screen as fast as you can play it. Connect to the Web and download MIDI files to play along with in a kind of instrumental karaoke. Hook up a CD burner and make copies of your symphony, or print it on sheet music for that authentic touch. Its educational software is far more forgiving than was Moog’s mother.

Institutions as varied as the University of Miami and the New York Islanders use the \$8,000 (and up) piano. But unlike Moog’s synthesizers, the instrument is aimed more at musical tradition than musical innovation. “Before the radio and the phonograph, people made their own music, for themselves and for each other,” Moog says. “People regularly got together to sing, play [music] and dance with each other. Now, most of the music is recorded, and a lot of that is listened to by solitary people, isolated from their surroundings by headphones.” Moog hopes that in the near future, “people will get tired of being in their own little boxes, and they’ll come to understand that they would be a lot happier if there were more social music making in their lives.”

These days, Moog is accorded the respect and admiration of a great American inventor. In the fall of 1994, when the excellent documentary *Theremin: An Electronic Odyssey* had its debut at the New York Film Festival, Moog was greeted by warm applause when he was recognized in the audience by the film’s director, Steven Martin, during a post-screening Q&A. If most musically inclined people have some familiarity with the Moog, that’s because Moog became a de facto leader when it came to introducing electronic music technology into the public consciousness.

Moog also helped forever alter the creative process of music making. It’s easy to forget that music was once an elite art, the province of those who could liberate the scrawl of notes on a page through specialized and sometimes highly technical mechanical expertise. Today, Danny Elfman, who composed the scores for the *Batman* movies, *The Simpsons* and countless other productions, has an advantage Beethoven and Mozart probably never dreamed possible: creating full orchestration with technology instead of sheet music.

For Moog, it all goes back to his initial, sustaining fascination with the theremin: “Leon Theremin’s original designs are elegant, ingenious and effective. As electronics goes, the theremin is very simple. But there are so many subtleties hidden in the details of the design. It’s like a great sonnet, or a painting, or a speech, that is perfectly done on more than one level.” The statement equally applies to Moog’s own marvel of engineering.

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About the Filmmakers

Hans Fjellestad is a filmmaker and musician currently based in California. He has presented his work in the US, Canada, Europe, Japan, Mexico and Brazil. Recent appearances include the Karlovy Vary International Film Festival, Calgary International Film Festival, The Roxy Praha, Queen Elizabeth Hall London, MEXartes Festival Berlin, São Paulo International Short Film Festival, Yokohama Jazz Promenade, Shinjuku Pit Inn Tokyo, RAS Gallery Barcelona, Sound Unseen Film & Music Festival, D.U.M.B.O. Arts Center Brooklyn, Morelia Festival de Arte Alternativo, Northwest Electroacoustic Music Festival, Northwest Film Forum, Big Sur Experimental Music Festival, San Antonio Cinefestival, Centro Cultural de Tijuana and Museum of Contemporary Art San Diego. Fjellestad has performed and recorded with many legendary players in the international experimental music scene and is a founding member of the Trummerflora Collective.

Fjellestad and producer **Ryan Page** began collaborating on music oriented film projects in 2000, and subsequently formed the production company ZU33.

Their critically acclaimed debut feature, *Frontier Life* (2002), explored the contemporary electronic music scene in Tijuana, Mexico. *Frontier Life* has screened extensively in the U.S., Canada and Mexico with support from the National Endowment for the Arts, Museum of Contemporary Art San Diego, Oregon Arts Council, Centro Cultural de Tijuana and El Consejo Nacional para la Cultura y las Artes. The film is distributed by Third World Newsreel.

Page also produced the *Moog* film soundtrack, released on Hollywood Records, and recently co-produced actor Crispin Glover's bizzaro underground feature *What Is It?* (2003).



Moog Chronology

Year	Company	Owner	Location	Event
1953	RAMCO	Moog	Flushing	Design first Moog Theremin.
1954	R.A.Moog Co.	Moog	Flushing	Produce vacuum tube Theremins and Theremin kits.
1961			Ithaca	Produce transistorized Theremins and Theremin kits.
1963			Trumansburg	Move to Trumansburg, NY. Meet Herb Deutsch and plan subsequent meetings.
1964				Invite Deutsch to work together in Trumansburg. Collaborate with Deutsch on development of synthesizer. Produce first synthesizer.
1965				Produce synthesizer modules and customized modular systems. Composers gather for summer workshop and concert at the factory.
1967				Begin quarterly publication of "Electronic Music Review". Establish Modular System models 1, 2, 3. Produce Demo Record: "Moog 900 Series Electronic Music Systems".
1968	R.A.Moog Inc.	Moog	Trumansburg	Re-define Modular System models 1, 2, 3. Carlos' "Switched on Bach" released.
1969				Modular system sales peak. Begin development of performance synthesizer (Minimoog). Deutsch concert: "Jazz in the Garden".
1970				Produce Minimoog A,B,C prototypes. Release Minimoog model "D". VanKoevering establishes market.
1971	Moog Musonics	Waytena	Williamsville	Sale of company, move to Williamsville in November. Last Minimoog shipped from Trumansburg serial number 1210.
1972	Moog Music Inc.	Waytena	Williamsville	Release Sonic 6, Satellite, Modular system "12", "921" Oscillators. VanKoevering joins company as VP Marketing.
1973				Dave Luce joins company and begins development of polyphonic synthesizer.
1974				Release Micromoog.
1975	Moog Music Div of Norlin	Norlin	Williamsville	Sale of company. Minimoog production stops at s/n 6920. Release Taurus and Polymoog.
1976			Cheektowaga	Move to Cheektowaga, Walden Ave.
1977				Bob Moog leaves the company. Re-start Minimoog production.
1978	Big Briar Productions	Moog	Asheville, NC	Begins making effects modules and control devices for electronic instruments.
1982-2001				Introduces many inventions: 1982, the multiple-touch-sensitive keyboard, developed with John Eaton of Indiana University at the International Computer Music Conference; the Moogerfooger, which mimics analog synthesizer timbres and based on the Moog filter; in 1997 releases theremin (the Ethervox) featuring both a MIDI interface and a sound module that can re-create a theremin performance from MIDI data.
2002	Moog Music	Moog	Asheville, NC	Robert Moog obtains rights to the Moog Music name. Producing Theremins in Asheville, NC, he changes his company name from "Big Briar" to "Moog Music" and continues to design and manufacture electronic music instrumentation.

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Some records that feature the Moog

- Air, Moon Safari (Virgin, 1998)
Bass, Sid, Moog España (RCA, 1969)
Baxter, Les, Moog Rock (Crescendo, 1977?)
Beach Boys, Pet Sounds (Capitol, 1966)
The Beatles, Sergeant Pepper (Parlophone, 1967)
Beaver, Paul, and Bernie Krause, The Nonesuch Guide to Electronic Music (Elektra, 1968)
Bley, Paul, The Paul Bley Synthesizer Show (Milestone, 1970)
Byrds, The Notorious Byrd Brothers (Columbia, 1968)
Captain Beefheart and the Magic Band, Safe as Milk (Buddha, 1967)
Can, Tago Mago (Mute, 1971)
Carlos, Walter, Switched-On Bach (Columbia, 1968)
Cream, Disraeli Gears (Atco, 1967)
Denny, Martin, Exotic Moog (Liberty, 1969)
The Doors, Strange Days (Elektra, 1967)
Emerson, Lake and Palmer, Emerson, Lake and Palmer (Atlantic, 1971)
Electric Light Orchestra, Eldorado (Jet, 1974)
Eno, Brian, Music for Airports (EG, 1978)
Fripp, Robert, and Brian Eno, No Pussyfooting (Island, 1973)
Garson, Mort, Zodiac Cosmic Sounds (Elektra, 1967)
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Jarre, Jean-Michel, Oxygene (Polydor, 1977)
Kazdin, Andrew, and Thomas Z. Shepard, Everything You Always Wanted to Hear on the Moog (Columbia, 1971)
Kingsley, Gershon, First Moog Quartet (Audiofidelity, 1969)
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Light, Enoch, Spaced Out (Project 3, 1969)
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Montenegro, Hugo, Moog Power (RCA, 1969)
Moody Blues, Days of Future Passed (Decca, 1967)
Moroder, Giorgio, From Here To Eternity (Casablanca, 1977)
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Oliveros, Pauline, Alien Bog Beautiful Soop (Pogus, 1997)
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Subotnick, Morton, Silver Apples of the Moon (Nonesuch, 1967)
Summer, Donna, I Remember Yesterday (Casablanca, 1977)
Sun Ra, My Brother the Wind (Variety, 1969)
Tangerine Dream, Alpha Centauri (Ear, 1971)
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Tonto's Expanding Headband, Zero Time (Embryo, 1971)
Trythall, Gil, Nashville Gold Switched-On Moog (Athena, 1969)
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Who, Who's Next (Decca, 1971)
Williams, Mason, The Mason Williams Ear Show (Warner, 1968)
Wonder, Stevie, Innervisions (Motown, 1973)
Yes, Fragile (Atlantic, 1972)
Zappa, Frank, Uncle Meat (Verve, 1967)



The First Moog Synthesizer by Herbert A. Deutsch

“What is that thing?” inquired the customs officer at the Rainbow Bridge, a routine checkpoint between the United States and Canada. It was July 1965, Robert Moog and I were traveling from Trumansburg, New York - a quiet village on the western shore of Cayuga Lake - to Toronto. The customs officer was pointing to a prototype Moog synthesizer resting on the back seat of Moog’s old Volkswagen. The cabinet full of modules (two oscillators, two voltage controlled amplifiers, and an envelope generator) had no keyboard and no other device that could readily identify it as a musical instrument. We were heading for the University of Toronto where Professor Gustave Ciamaga and his students of electronic music composition eagerly awaited us and the use of the new instrument. Internal dissension was simmering in Canada and customs officials were on the lookout for people smuggling weapons across the border. Two other officers came up and escorted us to a nearby parking area. Then we and the prototype synthesizer were taken into the Canadian customs office for questioning.

We tried to explain that this was an electronic musical instrument that would bring a different sound to traditional music and inspire whole new areas of composition.

“It will affect both classical and popular music,” we explained enthusiastically. But the skeptical customs officers expressed only disbelief. They forbid us to enter Canada with the instrument and would not permit us to take it back to the United States. Then, in a manner befitting a television situation comedy, a young French-speaking customs official suddenly entered. He listened to our story and exclaimed, “Oh! Musique concrète - musique électronique - je comprends.” He signed our customs slip and we were off. Chuckling as we sped down the highway, we began to recall the early days, when the Moog synthesizer was a figment of the imagination.

Robert Moog and I had met at the 1963 New York State School Music Association Convention at the Eastman School of Music in Rochester. Moog and his wife Shirleigh were living in a Trumansburg farmhouse. She taught school while Robert began work on his doctorate in engineering at Cornell University. During this time, he was constantly exploring ways of combining his love of music with his skills in electronics. In addition, Moog was supplementing their income by building and selling theremins in kit form. Invented in 1921 by Leon Theremin, a Russian physicist, this electronic musical instrument is identified by its strange and plaintive tones and by the fact that it is never touched by the player, who waves his or her hands in front or alongside it to change pitch and loudness. Selling theremin kits was hardly a booming business since few people knew about theremins, and even fewer clamored to buy or build one. Nevertheless, Moog found an outlet for his kits through Walter Sear, a New York City composer and tuba-designer. He suggested that Moog attend the convention where we met. We discussed the theremin briefly, and at much longer length we spoke of other musical instruments, some already existing and others only imagined.

Robert Moog returned to Trumansburg and along with other activities, continued to think about electronic musical instruments. In January 1964, he attended a concert in Greenwich Village, which he credits with influencing the development of the Moog. The concert was held at Jason Seely’s studio. Now a professor of Fine Arts at Cornell University, Seely is an artist



who is noted for transforming automobile bumpers into sculpture. An example of his work, Equestrian Figure, is exhibited at the Empire State Plaza in Albany. The concert featured electronic music accompanied by a small ensemble of musicians including a percussionist who played with sticks and mallets upon a Seley sculpture. Most of the compositions were quite unusual for 1964. Probably the first complete, evening-long program of avant garde electronic music that Moog had heard, this concert provided a focal point for his well thought out ideas. The requirements for an actual instrument began to crystallize very quickly thereafter.

Six months after the Greenwich Village concert, a small research grant from Hofstra University in Hempstead, Long Island enabled Moog and me to devote our time to concentrated daily experimentation on electronic musical instruments. I camped at Taughannok Falls, a State Park near Trumansburg, and we worked in his cellar. By the end of one week, Moog had designed the basic modules of an electronic music synthesizer. He worked on the basis of earlier experiments of other people and explored new areas. Music "synthesis" -- the combining of the elements of music (pitch, tone color, duration, loudness contour, and timbral contour) by a single instrument which enables the composer or performer to shape each element as he wishes -- had already been done electronically. The avant garde composer Edgar Varese, another New Yorker, although born and raised in France, incorporated the use of electronically synthesized sounds in his compositions during the early 1950's. And in 1937, Harald Bode, now a Tonawanda, New York resident, invented a synthesizer-like instrument in Germany. This instrument was the model for many of Moog's early thoughts about his synthesizer. Moog's particular contributions were in the employment of solid state devices controlled by the use of discreet D.C. voltage changes and in the design of filter architecture. His designs are responsible for both the reduced size of circuits and the distinctive sounds of today's synthesizers. The Moog filter design is as unique to the sounds of a synthesizer as the Steinway steel frame is to the sound of a piano.

The following year, 1965, the first prototype instruments were built. One of these prototypes, the property of the author, is presently on loan to Hofstra University. The other was the synthesizer we brought to Professor Ciamaga at Toronto University, where the instrument still is today. Just after the trip to Canada, things began to move quickly.

A dozen musicians gathered at a workshop in Trumansburg in the summer of 1965 to use the new instruments during a three-week period. By this time the R.A. Moog Company had been formed and Moog had a few assistants. These sessions provided valuable information about the sound and design of the instrument. Soon actual orders to buy the synthesizer began to appear. Alwin Nikolais, a New York City composer and choreographer placed the first order for a Moog synthesizer in 1965. Having composed his own scores using sounds rather than traditional dance music for the Nikolais Dance Theater, he immediately appreciated the possibilities of the Moog instrument.

(an article appearing in NAHO, Fall 1981 / New York State Museum / The State Education Department)



Interview with Herbert A. Deutsch (October 2003, February 2004)

Your meetings with Bob Moog in 1964 resulted in the development of the first Moog synthesizer. When was the first meeting, how did it come about and what do you remember about it?

Herb Deutsch: The first actual meeting took place in November 1963 at a NY State School Music Assn. Allstate conference at the Eastman School in Rochester. Bob was there selling theremins and theremin kits and when I told him that I had assembled a Melodia he and I began talking about the future of electronic instruments and I invited him to an electronic music concert being planned for February 1964 in sculptor Jason Seley's NY studio.

Do you recall any interesting stories from those meetings? Where were they held?

Too many to put down. The first meeting lasted at least three hours in Rochester. After my February concert, Bob and I (with wives) went out to eat and talked about the possibility of a "small and affordable music synthesizer"

At the time you must have known you were onto something big. Did you have any idea how significant your work really was, or how it might impact the future of music?

At the time I was actually still thinking primarily as a composer and at first we were probably more interested in the potential expansion of the musical aural universe than we were of its effect upon the broader musical community. In fact when Bob questioned me on whether the instrument should have a regular keyboard (Vladimir Ussachevsky had suggested to him that it should not) I told Bob "I think a keyboard is a good idea, after all, having a piano did not stop Schoenberg from developing twelve-tone music and putting a keyboard on the synthesizer would certainly make it a more sale-able product!!"

Regarding electronic music instrumentation, and Moog synthesizers in particular, can you speculate on how differently things might have developed if your collaboration with Bob hadn't happened?

People have accused me of modesty, but actually I think that someone else would have been in the same place and gotten to a similar point within a short time. It was a direction that fit into the history of technology and its inevitable link with the arts.

Several composers gathered in Trumansburg in the summer of 1965. The meeting culminated in an afternoon concert at the Moog plant on August 28. Other than the concert program [see next page], there doesn't seem to be any surviving information about this event. Can you describe it? How was it received?

I should have a recording of that concert. It was played for a very small audience, primarily the families and friends of the 12 participants. My own piece, "A Little Night Music, The Ithaca Journal, August 6, 1965" was released in 1990 on a cassette recording called *From Moog to Mac* and will be part of a retrospective CD to be shortly available.



A CONCERT OF ELECTRONIC MUSIC
AND MUSIQUE CONCRETE

AUGUST 28, 1965

4 PM

The R. A. MOOG CO.
TRUMANSBURG, N. Y.

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|---------------------|----------------------------------|
| 1. Margaret Fairlie | Sculpture-Bird Collage |
| 2. Franklin Morris | Concrete Piece
Study |
| 3. J. Donald Robb | Passacaglia and Gigue |
| 4. Kathryn Perry | Approach, Statement, and Retreat |
| 5. John Myhill | This Is It |

INTERMISSION

- | | |
|---------------------|--------------------------------|
| 1. Robert Ceely | Coition |
| 2. Arthur Hunkins | Variations on a Concrete Theme |
| 3. Richard Robinson | Fluted Columns |
| 4. Herbert Deutsch | A Little Night Music • 1965 |