introducing...

the mini moog model d

Here it is! A compact, moderately priced electronic music synthesizer designed and built especially for live performance by R. A. Moog, Inc., leading manufacturer of new electronic musical instruments for nearly two decades. The Mini Moog is not merely another sound modifier built to enhance the sound of other instruments, although it can perform this function and many more. It is not another electronic organ with added gimmicks for creating special effects. It is a completely new musical instrument, designed from the bottom up with today's performing musician in mind, and making accessible for the first time a vast range of sound possibilities which had hitherto been available only to experimental composers with an involved knowledge of studio techniques. The Mini Moog incorporates the basic synthesizer functions, so widely in demand by avant-garde, jazz, rock, and pop musicians familiar with the new sounds of electronic music, in an inexpensive, lightweight, portable package designed to be easily set up and played.

The most popular and useful types of sound generators, sound modifiers, and control devices to be found on our large studio model Moog synthesizers are all incorporated in the Mini Moog. Sound generators include three oscillators, producing pitched tones over the entire range of human hearing with several different waveforms, a noise source for producing pitchless sound, and a microphone/accessory amplifier through which sounds from other sources may be introduced into the Mini. Sound modifiers include a wide-range voltage-controlled lowpass filter and a voltage-controlled amplifier, each with its own contour generator. Control devices include a full-size 44-note keyboard and two special slide controllers for touch-sensitive modulation of the tone.

These basic functions make immediately accessible a vast realm of new musical material. Because all component circuits in the Mini Moog are independent of one another, the musician is able to combine them in a variety of ways. Thus rather than being tied down to a limited set of sounds or effects, he is really free to explore all the basic aspects of musical sonority, setting, shaping, and modulating each aspect of the tone color to suit his own tastes. The Mini Moog for the first time places the control of many parameters of sound literally at the fingertips of the creative and imaginative musician.

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Any sound source, recorded or live, instrumental, vocal, or "concrete," may be fed into the Mini through its external input and subsequently filtered or otherwise modified. The output of the Mini may be fed into any amplifier/speaker system, monitored on headphones, or put directly on tape for later use.

A detailed knowledge of electronics is not necessary to set up and play the Mini Moog. After spending a few hours becoming acquainted with the instrument and experimenting with each of the controls, the musician will begin to develop his own individual technique for using the Mini. By first experimenting with familiar sounds, he will begin to see the broader capabilities of the instrument for exploring unfamiliar sound material in a systematic way. Here, for example, are some elementary procedures by which simple, recognizable sounds may be set up:

1. To set up a melodic solo voice, one or two Oscillator tones are selected as the raw sound material (panel controls 5,6,7). Oscillator 3 may be disconnected from control of the Keyboard (8) and used to modulate the first two Oscillators' pitches (3,4). For example, set to a LO range frequency of about 6 pulses/sec. (5,6) and using a triangular waveform, it produces a vibrato which can be introduced in varying amounts by the Modulation slider (32).
2. The waveforms from Oscillators 1 and 2 are next put through the Mixer (10), where their relative volumes are adjusted (9).
3. The sound is then shaped, first by the Filter, then by the Amplifier (Loudness Contour). Contour controls on the Amplifier (21-23), together with the various Filter controls (15-20), determine the quality of the resulting tone.
4. Sustained tones can be produced by setting the Filter and Amplifier contour controls for relatively fast attack, medium decay, and close to full sustain level. A flute-like sound can be set up using triangular waveforms, with Filter contour turned off (17). String-like sonorities can be produced with sawtooth waveforms and a small amount of Filter contour. A horn-like sound can be set up using rectangular waveforms and a medium amount of Filter contour. In addition, a variety of sounds can be created using wide, slow Filter sweeps, Filter modulation by Oscillator 3 (13), injection of noise into the sound mix (10), or modulation with noise (3,4,13,32).
5. Non-sustained or percussive tones can be produced by setting Filter and Amplifier contour controls for rapid attack, varying speed of decay, and low sustain level. A plucked string sound employs sawtooth or rectangular waveforms with a large amount of Filter contour. Cymbal-like sounds use pure white noise (12) with Filter opened wide (15) and extremely short attack time on Loudness Contour. Drum-like sounds involve mixing several low sawtooth or rectangular waveforms, with low Filter cutoff frequency (15) and a large amount of Filter contour. To create a bell-like sound, the Oscillators are combined to form a bell-like chord, and a small amount of Filter contour is used.

With its unique arrangement of basic synthesizer components, its ability to accept a wide variety of accessories, and its all-around versatility in adapting to any sound system or performance situation, the Mini Moog is the ideal instrument for the exploration of the frontiers of the musical art of the seventies.

Basic Mini Moog Features

SOUND GENERATORS
An OSCILLATOR BANK of three nearly identical oscillators, each generating six varieties of periodic waveforms, produces the pitched sounds on the Mini, while a Noise Source, generating two varieties of random waveforms, produces pitchless sounds.

MIXER
Any mixture of source signals from the Oscillator Bank, Noise Source, and External Input can be obtained with the five switches and five volume controls located here.

SOUND MODIFIERS
There are two sound modifiers, each with its own Contour Generator. The FILTER emphasizes some overtones and attenuates others. The AMPLIFIER's controls regulate the loudness/time contour of each sound.

CONTROLLERS
A Modulation Mix of Oscillator 3 and the Noise Source can be used to vary pitch and/or brightness. Other controllers on the instrument—Keyboard, Sliders, Pushbuttons—are permanently connected to the circuit function they are intended to control.

Rear Connector Strip

All connections are made at the rear of the instrument. Phone jacks are used for audio and control signal connections; multi-pin plugs are used for power connections. The Connector Strip includes:

3 EXTERNAL CONTROL INPUT JACKS for controlling pitch, volume, and filter by means of foot pedals, joystick controllers, ribbon controllers, sequencers, etc.

EXTERNAL TRIGGER INPUT SOCKET for triggering Filter and Amplifier Contour Generators.

MIC PREAMP INPUT JACK for connecting microphone or other external sound source to be fed into the Mini.

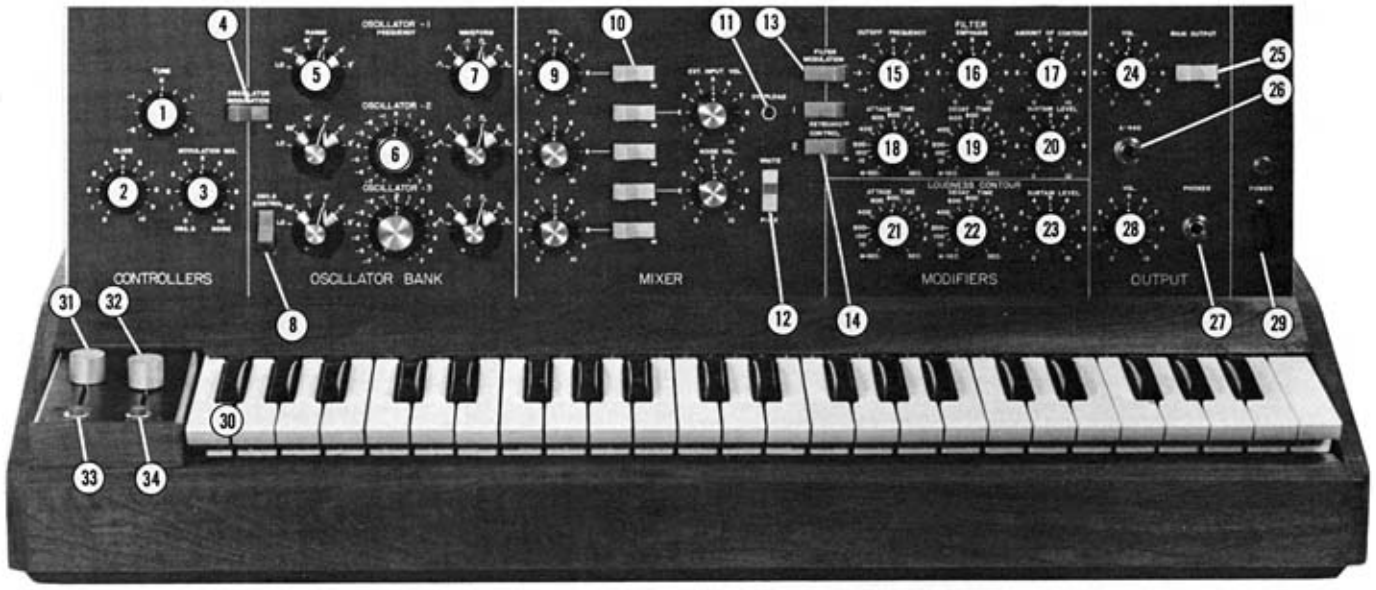
MAIN OUTPUT JACK through which the final audio signal passes. Connections to sound systems and tape recorders are made here.

2 D. C. POWER SOCKETS for connections to foot pedals and other external controllers to be run off the Mini's power supply.

A.C. POWER CORD

Solid State Circuitry

All circuitry is solid state, and is mounted on conveniently removable printed circuit cards located immediately behind the Front Panel.



Individual Control Functions

1 TUNE
The entire Mini Moog is tuned up with this control. It has a range of several semitones, so that the musician can tune to any standard pitch.

2 GLIDE
Determines the speed or amount of portamento between pitches on Keyboard. At rapid speed, discrete notes are heard, while at a slower speed, tones glide audibly from note to note.

3 MODULATION MIX
Determines the proportion of random signal (Noise) and periodic signal (from Oscillator 3) to be used in modulating or varying the Oscillators' pitches and/or the Filter's cutoff frequency.

4 OSCILLATOR MODULATION SWITCH
Applies signal from Modulation Mix to vary Oscillators' pitches.

5 RANGE
These six-position switches select the frequency range for each Oscillator.. Five ranges an octave apart (2', 4', 8', 16', 32') plus a LO range (slow pulses for modulation or rhythm).

6 FREQUENCY
Fine-tuning controls for Oscillators 2 and 3 which enable their pitches to be set at any distance from that of Oscillator 1.

7 WAVEFORM
These six-position switches select the overtone spectrum (waveform) of the signal generated by each Oscillator.

8 OSCILLATOR 3 CONTROL SWITCH
Enables Oscillator 3 to be disconnected from keyboard and modulation control in order to act as a wide-range fixed oscillator.

9 VOLUME
These five controls adjust the relative intensities of the three Oscillators, Noise Source, and External Input.

10 MIXER SWITCHES
Instantly connect or disconnect any of the five sound sources.

11 OVERLOAD LIGHT
Lights briefly at the peaks of a strong External Input signal, enabling the musician to conveniently set the External Input Volume control.

12 NOISE QUALITY SWITCH
Gives the musician a choice of white (high pitched) or pink (low pitched) random noise.

13 FILTER MODULATION SWITCH
Applies signal from Modulation Mix to control the Filter.

14 KEYBOARD CONTROL SWITCHES
Apply various portions of the keyboard control signal (0, 1/3, 2/3, entire signal) to control the Filter.

15 CUTOFF FREQUENCY
This control varies the Filter's cutoff frequency throughout the range of human hearing. Frequencies below the cutoff are passed, while frequencies above are attenuated.

16 EMPHASIS
Introduces a resonance at the cutoff frequency, enabling the musician to create vowel-like and other musically adaptable sounds.

17 AMOUNT OF CONTOUR
Determines the magnitude of the contour signal (from Filter contour controls) applied to sweep the Filter.

18, 19, 20 FILTER CONTOUR CONTROLS:
ATTACK TIME, DECAY TIME, and SUSTAIN LEVEL controls shape the brightness contour applied to sweep the Filter each time a key is depressed and held. Overall length of contour is variable from a fraction of a second to half a minute.

21, 22, 23 LOUDNESS CONTOUR CONTROLS:
ATTACK TIME, DECAY TIME, and SUSTAIN LEVEL controls shape the loudness/time contour, or envelope, of each note struck on the Keyboard in a manner analogous to Filter's contour controls.

24, 25 MAIN OUTPUT CONTROLS:
Volume of final sound signal may be adjusted, and the signal itself may be turned on and off, by this VOLUME control and ON/OFF switch.

26 A-440
An "electronic tuning fork," or constant tone, for use in tuning the instrument (and other instruments in the ensemble) up to standard pitch.

27, 28 HEADPHONE AMPLIFIER
In addition to the Main Output, a separate HEADPHONE OUTPUT jack, with its own VOLUME control, is available for quiet practice, or for tuning or setting up sounds during performance

29 POWER ON/OFF SWITCH
Turns the entire instrument on or off. Pilot light is on when the power is on.

30 KEYBOARD
A full-size 3 ½ - octave organ keyboard is used as the main pitch-determining control device on the Mini. The musician plays the Keyboard with his right hand while manipulating control knobs, switches, sliders, and pushbuttons with his left.

31, 32 SLIDERS
Two manually operated slide controllers.

PITCH slider varies or bends the pitch of individual notes a semitone up or down for vibrato and other expressive nuances.

MODULATION slider injects an amount of the Modulation Mix signal to the Oscillators and/or Filter, as determined by the setting of the Modulation switches.

33, 34 PUSHBUTTONS
Two thumb-operated "doorbell" switches.

GLIDE button injects portamento between pitches. The amount of portamento is determined by the setting of the Glide Control.

DECAY button allows the sound to fade slowly after key has been lifted. The duration of this final decay is determined by the setting of the Loudness Contour's Decay Time control.

Case and Front Panel

The Model D Mini Moog is housed in an attractive walnut case, with clean, simple lines. The Front Panel is hinged, and folds down flush with the case for easy carrying. The performer may operate the Mini with Front Panel in either up or down position.

R. A. Moog, Inc. built its first synthesizer components in 1964. At that time, the electronic music synthesizer was a cumbersome laboratory curiosity, virtually unknown to the music listening public. Today, the Moog synthesizer has proven its indispensability through its widespread acceptance. Moog synthesizers are in use in hundreds of studios maintained by universities, recording companies, and private composers throughout the world. Dozens of successful recordings, film scores, and concert pieces have been realized on Moog synthesizers. The basic synthesizer concept as developed by R. A. Moog, Inc., as well as a large number of technological innovations, have literally revolutionized the contemporary musical scene, and have been instrumental in bringing electronic music into the mainstream of popular listening.

In designing the Mini Moog, R. A. Moog engineers talked with hundreds of musicians to find out what they wanted in a performance synthesizer. Many prototypes were built over the past two years, and tried out by musicians in actual live-performance situations. Mini Moog circuitry is a combination of our time-proven and reliable designs with the latest developments in technology and electronic components.

The result is an instrument which is applicable to studio composition as much as to live performance, to elementary and high school music education as much as to university instruction, to the demands of commercial music as much as to the needs of the experimental avant garde. The Mini Moog offers a truly unique combination of versatility, playability, convenience, and reliability at an eminently reasonable price.

MINI MOOG SPECIFICATIONS

SOUND SOURCES
NO. OF SOUND SOURCES: 5 (3 Oscillators, 1 Noise Source, 1 External Input/Microphone Preamp).
OSCILLATOR FREQUENCY: 0.1 to 20,000 Hz. (cycles/second) in six overlapping ranges.
SHORT TERM OSCILLATOR STABILITY: ±1%
OSCILLATOR WAVEFORM OUTPUTS: Triangular, Sawtooth, Triangular-Sawtooth Mix (Osc. 1 & 2 only), Reverse Sawtooth (Osc. 3 only), 3 widths of Rectangular.
NOISE SOURCE OUTPUTS: White or Pink random waveforms.
PREAMPLIFIER INPUT: 10 millivolts minimum; 2 volts maximum.
PREAMP INPUT IMPEDANCE: 100K ohms or greater.

FILTER
FILTER CHARACTERISTIC: Wide-range lowpass filter with variable-height resonant peak at cutoff frequency, and 24 dB/octave cutoff slope.
RANGE OF CUTOFF FREQUENCY: Continuously variable from 40 Hz. to 20 KHz. (9 octaves).

VOLTAGE-CONTROLLED AMPLIFIERS
NUMBER OF AMPLIFIERS: 2 (one controlled only by its Contour Generator; the other controlled by optional external controller).
DYNAMIC RANGE OF EACH AMPLIFIER: 80 dB.

CONTOUR GENERATORS
NUMBER OF CONTOUR GENERATORS: 2 (one controlling Filter through an attenuator; the other controlling the first Voltage-Controlled Amplifier).
RANGE OF ATTACK TIME: 10 milliseconds to 10 seconds
RANGE OF DECAY TIME: 10 milliseconds to 10 seconds.
RANGE OF SUSTAIN LEVEL: 0 to 100% of contour peak.
WIDTH OF SWEEP OF FILTER BY ITS CONTOUR GENERATOR: Continuously variable from 0 to 4 octaves.

AUDIO SIGNAL OUTPUTS
HIGH LEVEL OUTPUT: 0.5 volts typical, with 3K ohms nominal output impedance.
LOW LEVEL OUTPUT: 15 millivolts typical, with 1K ohm output impedance.
HEADPHONE OUTPUT: 0.3 volts maximum, into standard 8-ohm stereo headphones.

CONTROLLERS
KEYBOARD FUNCTION: Permanently connected to (a.) control Oscillators 1 & 2, and (b.) trigger Contour Generators. Keyboard may be switched to control Oscillator 3 and Filter.
DESCRIPTION OF KEYBOARD: Standard 44-key (3½-octave) organ keyboard. Only lowest key depressed has effect in controlling Oscillators and Filter. Contour Generators are activated whenever a single key is depressed.
RATE OF KEYBOARD GLIDE: Continuously variable from 1 millisecond to 1 second/octave.
PITCH SLIDER RANGE: 3 semitones minimum.
MODULATION INJECTION SLIDER RANGE: 0 to 1½ octaves.

CONTROL & POWER CONNECTIONS
EXTERNAL PITCH CONTROL INPUT CHARACTERISTIC: 1 volt change produces 1 octave frequency change, ±2%.
EXTERNAL FILTER CONTROL INPUT: 1 volt change produces 1 octave change in cutoff frequency, ±5%.
EXTERNAL AMPLIFIER CONTROL INPUT: Linear control voltage/gain relationship. Gain range spanned by 0-4 volts.
EXTERNAL TRIGGER INPUT: Switch-closing activates both Contour Generators.
AUXILIARY D.C. POWER SOCKET: +10 volts and −10 volts @ 50 milliamps.

DIMENSIONS & WEIGHT
OVERALL SIZE (with Front Panel down): 28¼" wide, 16" deep, 5½" high.
NET WEIGHT: 28 lbs.
SHIPPING WEIGHT: 45 lbs.

POWER REQUIREMENTS
100-135 volts, 50-60 Hz., 10 watts maximum.

Specifications subject to change.

For Further Information Write Sales Department, R. A. Moog, Inc., Trumansburg, N. Y. 14886 or Phone (607) 387-6101