SYNCLAVIER II
It marks the end of synthesizers as you now know them

More capability than the largest synthesizers in the world from a compact portable system.

Synclavier II is the first truly portable digital system to offer limitless programmable control. Lighter than a Mini-Moog, its keyboard unit tucks under one arm. Its computer is so compact, it fits into an Anvil case less than 20 inches square. Yet Synclavier II offers more programmable and real time control than any other synthesizer in the world.

Up to 32 fully programmable voices.

Synclavier II is available with 8, 16, 24, or 32 voices. On special order, the same size keyboard that accomodates 8 to 32 voices can be made to control up to 128 voices! And the control you have over these voices goes beyond anything you've ever experienced.

A unique new partial timbre method of synthesis allows you to create sounds with unheard of accuracy. In fact, many of Synclavier II's sounds are virtually undetectable from real instruments. Everything from huge church bells to violin harmonics can be created with lifelike clarity. But Synclavier II is by no means limited to real instruments. It goes far beyond the familiar to offer you an endless universe of new sound combinations, never before possible on any synthesizer.

Synclavier II offers the ultimate in live performance control.

Synclavier II offers the most extensive array of live performance controllers ever assembled in one system: two foot pedals, six foot switches, a ribbon controller, and an optional velocity sensing keyboard!

16 track digital memory recorder.

Synclavier II is equipped with the largest and most versatile 16 track digital memory recorder available today. It's so advanced that one third of its standard features cannot be found on any other system. And, although Synclavier II's recorder uses memory instead of tape, it operates much like a 16 track tape recorder. So it's easy to understand, simple to operate.

Unlimited sound storage.

There's no limit to the number of different sounds and finished 16 track recordings that can be stored on Synclavier II's diskettes. When you recall a sound from a diskette, it's always the exact sound you stored. Nothing ever has to be reset. Even after you've stored a sound, you can recall it, modify it, and restore it, without erasing the original sound from the diskette.

You don't have to be an expert to use Synclavier II.

Over 64 sounds have been carefully preprogrammed for you, including over three dozen real instruments and over two dozen sounds unique to Synclavier II. Any of these sounds can be recalled for immediate use with just the push of a button. Once recalled, any sound can be easily modified into an endless variety of new sounds.

Synclavier II is not only easy to use, it's easy to set up. The entire Synclavier II system sets up in the studio or on stage in minutes. Heavy duty cables connect the computer to the keyboard with easily attached multi-pin connectors. A special performance table assembles quickly, holding the keyboard unit at the height of a Fender Rhodes. A diskette drive box conveniently attaches under the front edge of the table for quick loading of diskettes.

And once you've set up Synclavier II, you can forget about the computer. Synclavier II is designed so you need no access to the computer during live performance. All playing and programming functions are completely controlled from the keyboard unit. Everything you need to operate Synclavier II is located within easy reach.

Never before has any system made so much so easily accessible. Never before has any system been capable of creating such incredibly authentic sounds. Never before has any system offered a full 16 tracks of recording capability plus unlimited sound storage, and placed it all at your fingertips.

Never before has there been anything like Synclavier II.

Synclavier II is the most complete fully programmable synthesizer ever created. Designed for both live performance and studio use, it's fast, absolutely accurate, and completely drift free. It automatically tunes to A-440 when you turn it on, and remains rock steady regardless of any temperature changes.

Synclavier II is easy to operate.

Synclavier II's front panel is conveniently divided into five easily identifiable sections. From left to right they are as follows: (1) the control knob, used to make all changes in sounds, and the digital display window which reads out those changes, (2) the digital oscillators and envelope generators used for programming new sounds, (3) the 16 track digital memory recorder, (4) all special programmable keyboard controls and real time effects, (5) the control buttons for storing and recalling sounds.

You don't have to learn a digital language in order to operate Synclavier II. All programming is accomplished by using multiple select buttons and the control knob. All the select buttons on Synclavier II's front panel are labeled according to their musical function, not according to their digital function. And many of the select buttons are labeled in terms you'll already be familiar with from using analog synthesizers.

Synclavier II takes the guesswork out of programming.

A digital display window reads out the exact amount of each setting you make on the front panel. Just push the button corresponding to the control you

AVIER II

zer you'll ever need.

wish to change, and the exact amount of that control appears in the digital window. To make any changes, simply turn the silver knob.

For example, notice the 440.0 in the window pictured below. Then notice that the LED across from the word Hertz is lit. This tells you that the number in the window is measuring frequency or pitch.

To increase the pitch, turn the silver knob clockwise. To decrease the pitch, turn the knob counterclockwise. The farther you turn the knob, the faster the pitch changes. As you turn the knob, you will clearly hear the pitch change corresponding to the numbers changing in the window. When you've tuned to the desired pitch, the new number appearing in the window will be the exact frequency of your new tuning. All changes are easily made in this way.

Synclavier II's capabilities are completely expandable.

Synclavier II's fully programmable voices can be expanded from 8 to 128 voices. Its digital memory recorder can be extended from 2,000 to 15,000 notes. And no matter how large Synclavier II's capabilities get, its keyboard unit remains the same size!

Unique Partial Timbre Method

Synclavier II utilizes a unique new method of synthesis called partial timbres. A partial timbre consists of the following: (1) 24 separately adjustable harmonics, (2) a volume envelope generator, (3) a unique harmonic envelope generator, (4) a completely adjustable vibrato control, (5) a completely adjustable portamento rate, (6) many special effects.

The 8 voice system has 8 partial timbres. The 32 voice system has 32 partial timbres, and so on. Up to *four* separately adjustable partial timbres (96 harmonics) can be triggered from just one key on the keyboard to create extremely rich sounding timbres like violins, chimes, and pipe organ.

But you don't always need a lot of harmonics to create great sounds with Synclavier II. Just one sine wave can be used to create huge church bells. Less than 24 harmonics creates electric piano, electric guitar, accordian, castanets, wood block, steel drums, and a host of others, with lifelike precision.

Six function envelope generators

All envelope generators feature delay, attack, peak, initial decay, sustain, and final decay. The unique peak function enables initial decays to go up as well as down. This gives you unheard of control for brass and string attacks.

Volume envelope generators

There's a separate volume envelope generator for each voice in the Synclavier II system. A 16 voice system has 16 volume envelope generators, a 32 voice system has 32, and so on.

Delay times, lengths of attacks and decays, and the peak and sustain levels are easily adjustable over a wide control range. Delay times are variable from 0 to 10 seconds. Attack times are variable from 0 to 10 seconds. Decay times can be as long as 15 seconds, and peak and sustain levels are continuously variable from a volume of 0 to a maximum of 100.

Harmonic envelope generators

The harmonic envelope generators allow you to independently control the brightness of attacks and sustains.

Four independent vibratos

Up to four separately adjustable vibratos can be used simultaneously in one polyphonic voice. Each individual vibrato has separate controls for the following functions:

a. **wave select** - sine, triangle, sawtooth, inverted sawtooth, and square.

b. **speed** - variable from .1 hertz to 50 hertz.

c. **depth** - variable from zero to a sweep of four octaves.

d. **attack/delay time** - variable from instantaneous to 10 seconds.

Four portamento rates

Portamento is completely polyphonic. Complete chords can slide together on the keyboard. Or you can have up to four completely different portamento rates on the keyboard at the same time. They can even slide in different directions at once. Each portamento rate is variable from instantaneous to two minutes.
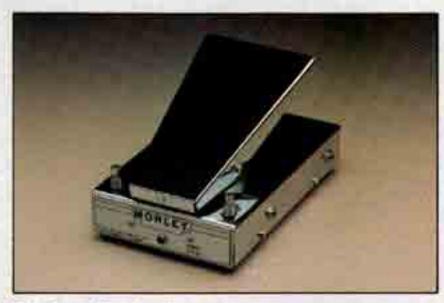
Real Time Effects

Foot Pedals (optional)

There are two separate foot pedals. One is an **overall volume pedal**, which controls the volume of every voice on the keyboard plus all 16 tracks in the recorder. The other is a **real time effects pedal.** With this pedal, you can make a Synclavier II violin go fluidly from smooth bowing, to staccato bowing, to a plucked sound, without stopping once to reprogram it. You can also switch from hard to soft mallets on percussion instruments, change the way brass bells, and even change the portamento rate as you play in real time. All changes made by the real time effects pedal are perfectly memorized by the recorder.

Foot switches

There are six separate foot switches: (1) a **sustain switch** - which operates like a piano sustain pedal, (2) a **hold switch** - which causes a note or chord being played on the keyboard to be held "on" even after your hands are removed from the keys, (3) a **portamento on/off switch**, (4) a **repeat on/off switch**, (5) an **arpeggiate on/off switch**, (6) a **punch in/punch out switch** - which enables you to punch yourself in and out during recording. All switches can be operational at the same time.

Pictured below is a foot pedal/foot switch controller manufactured by Morley specifically for Synclavier II.

Ribbon Controller

Wherever you touch your finger on the controller determines the pivot point. Moving to the right of the pivot point increases the pitch, while moving to the left decreases the pitch. In the same manner, the ribbon controller can be used to control the brightness of a sound.

Optional velocity sensing keyboard

Synclavier II's velocity sensing keyboard can be used to control the brightness, overall volume, attack times, and decay times of any note played on the keyboard.

A normal touch will usually produce no added effects. But if you quickly strike a key, you can make a note sound brighter or louder, or you can give it a more pronounced attack, or instantly add in frequency modulation to change its timbral quality.

Special Keyboard Effects

Split keyboard

This feature enables you to play one sound on the upper three octaves of the keyboard while playing a completely different sound on the lower two octaves of the keyboard.

Decay adjust

A completely adjustable control enables the decay of notes to increase as you play lower on the keyboard.

Automatic arpeggiate

When you hit a chord on the keyboard, the individual notes of that chord will automatically be sounded one after the other. The rate at which the notes are played is adjustable from 0 to 50 Hz. The arpeggiate feature can be used to create guitar strums, xylophone rolls, instrumental trills, and many other similar effects.

Automatic repeat

This feature makes any note or chord repeat over and over again as long as the key or keys are depressed on the keyboard. Its rate is adjustable from 0 to 50 Hz.

F.M. ratio

F.M. (Frequency Modulation) ratio allows you to make extremely fast changes in timbres for all voices on the keyboard. Using the F.M. ratio, you can change a sine wave into a huge bell in a few seconds. The F.M. ratio also gives you extraordinary control over the brightness of different attacks.

Chorus control

Chorus can be used to detune up to four separate partial timbres and add them to themselves to create extremely rich sounds like violin sections, chime effects, Hammond B-3 Leslie, and even echo. Chorus can also be used as a frequency divider. It can turn any note into two part harmony in just seconds.

Special Tunings

An octave ratio button allows you to immediately set up the keyboard to play whole tone scales, half tone scales, quarter tone scales, and microtones.

A scale adjust button enables you to detune one or more individual notes in a tempered scale without altering the tuning of the other notes. For example, you could tune A a little sharp and C a little flat without affecting the rest of the keyboard. This feature allows you to easily match any out of tune notes played by an instrument already recorded on tape.

16 Track Digital Memory Recorder

Synclavier II is equipped with the most complete 16 track digital memory recorder in the world. It's like having a 16 track tape recorder at your disposal.

All notes are memorized just as you play them on the keyboard. You can record up to 16 entirely different instruments, playing 16 completely different lines on 16 separate tracks, and play them all back at the same time in perfect sync or playback any combination of tracks. And on just *one* track you can record up to 32 voices all at once!

No synthesizer available today offers even half the capability of Synclavier II's digital memory recorder.

Punch in and out instantaneously without clicks or pops. Punch in can be used to correct a mistake in the middle of a recorded passage. Push the button once and the recorder starts erasing the recorded material on a given track and replacing it with whatever you play on the keyboard. To punch out, just hit the button again.

Go fast forward and reverse just as you would on a 16 track tape machine. The recorder speeds up and slows down as you jockey between the fast forward and rewind buttons.

Vary the speed without changing the pitch of any of the 16 recorded tracks.

Vary the pitch without changing the speed of any of the 16 recorded tracks.

Special Functions

A double command erase button prevents accidental erasures.

A keyboard transpose mode permits any of the 16 tracks or looped sequences to be transposed from the keyboard. In this mode, the digital memory recorder will automatically transpose up or down according to the interval you hit above or below middle C.

middle C
◄—transpose down | transpose up—►

A special loop button allows you to repeat any set of recorded notes automatically. But unlike conventional sequencers, you determine when the loop starts and how many notes will be in the loop, while the recorder is playing back. And you don't have to return to the first note of memory in order to loop. Any number of internal loops is possible.

For instance, let's say you have a musical composition consisting of sections A, B, C, and D recorded into memory. While the composition is playing back, you could loop A, then play through B, loop C, then play through D without stopping the recorder once. The possibilities for looping are endless.

A continue button enables you to break out of a loop and continue playing through the rest of the material recorded in the digital memory recorder.

Solo any track in the recorder. You can solo any number of tracks during playback *or* record. To solo a track, just push the appropriate track button.

Unique Features

A digital metronome is built right into the recorder, and can be used without taking up any of the 16 tracks. Its numerical settings operate the same as a Urei digital metronome, but it has ten times the resolution of a Urei.

Pictured below is a readout of Synclavier II's digital metronome. Notice there are two digits to the right of the decimal point.

Overdubbing on a single track is possible only with Synclavier II. You can overdub the same instrument as many times as you wish on just one track. For example, you could record 8 different melodies of flute on track #1 and 6 different melodies of celeste on track #10 and still have 14 tracks left to record on.

Bouncing down tracks is possible within Synclavier II's recorder. If the same instrument is recorded on several tracks, it can be bounced down to one.

A special sync pulse enables Synclavier II's 16 track digital memory recorder to record and play back in perfect sync with any multi-track tape machine.

Select memory timbre (SMT) allows you to instantly replace an instrument recorded on any of the 16 tracks with an entirely new instrument, playing the previous instrument's notes. For example, you could take a xylophone, playing a passage on track #6, and replace it automatically with a guitar playing the same exact notes as the xylophone, by just pushing a button!

Select keyboard timbre (SKT) allows you to change any part of an instrumental sound already recorded on a track, without rerecording it. For instance, you could make a previously recorded violin brighter, or change its attack, decays, or vibrato, without recording it over again.

Unlimited Sound Storage

With Synclavier II's diskette system, there's absolutely no limit to the number of different sounds that can be stored. Instrumental sounds, sound effects, melodies, and even entire music compositions can be easily memorized on diskettes.

You'll never again waste time fishing around on your system for a sound you can't remember how to recreate. When you create a new sound on Synclavier II, you can immediately store it on a diskette. Once stored, it can become part of a permanent library of sounds that can be recalled any time you need them.

There's no limit to the number of diskettes that can be used for sound storage with Synclavier II. When you fill up one diskette, just reach for another. But don't expect to need new diskettes very often. On just one mini-diskette you can store 64 totally different sounds or a finished 15,000 note recording.

Although the capacity of Synclavier II's diskette system is limitless, its operation is amazingly simple. Any sound can be stored or recalled with just the push of a button. It takes about two seconds.

For live performance, entire banks consisting of eight sounds each, can be recalled. Once you've recalled a bank, you can select between any of the eight sounds in that bank by pushing the appropriate timbre entry button. In most cases, selecting between these eight sounds is instantaneous.

Keyboard rear panel

A headphone output has a separate control knob that lets you adjust the volume of a headphone amplifier.

Synclavier II's other outputs are completely compatible with most analog synthesizer systems. The keyboard gate, trigger, and control voltage outputs can be used to control analog oscillators, filters, envelope generators, etc. The ribbon controller on Syn-

clavier II can also be used to control analog systems.

The jacks labeled High Pass Fc, Low Pass Fc, Band Pass Fc, and Bandwidth are programmable outputs that can be used to control the frequency centers of analog filters. The settings of these outputs are memorized by Synclavier II's computer.

The other jacks pictured on the back panel are used to connect the real time controllers to Synclavier II.

Synclavier II Specifications :

Keyboard

range - five octaves/61 keys
transposition - continuously variable over ten full octaves
split keyboard - enables you to play two completely independent sounds on the keyboard at the same time
velocity sensing - available as an option

Control voltage outputs

(the following CV outputs are analog and can be used to control most analog synthesizers)
keyboard gate
keyboard trigger
keyboard control voltage
ribbon controller

Foot switches

hold switch
repeat on/off switch
sustain switch
arpeggiate on/off switch
portamento on/off switch
punch in/out switch

Foot pedals (optional)

overall volume pedal
real time effects pedal

Keyboard cabinet

size - 35¾" long x 12" deep x 6¾" high
weight - approx. 25 lbs.
finish - hand-rubbed African mahogany

Keyboard performance table (optional)

Height - 32"
Weight - approx. 10 lbs.

Diskette system

floppy disc drives - One drive unit is standard on all Synclaviers. An auxiliary drive is available as an option.

Diskettes

type - 5¼"
storage capacity - 90 KB available
size of drive box - 3½" high x 6" wide x 12" deep
weight of drive box - approx. 7 lbs.

Synclavier II's amazing computer
Synclavier II is controlled by the most compact yet powerful computer available in any synthesizer system today. The hardware for 32 programmable voices plus a complete 16 track digital memory recorder fits into a travel case less than 19 inches square. And each additional set of 8 voices fits into the space of a shoe box.

Computer

CPU - 16 bit, 16 register, autoload, RTC
memory size - up to 128 KB
memory cycle time - 0.6 microseconds average

Computer connections

main disc drive - operates one diskette system
auxiliary disc drive - operates a dual diskette system
velocity input - controls the velocity sensing keyboard (optional)
terminal - allows you to control the computer from a data terminal

Computer outputs

studio output - +4dBm/600 ohms (Canon connector)
padded output - -20dBm (phone plug)
click track output - output of the digital metronome
external sync output - output of the special sync pulse used to drive the 16 track digital memory recorder from a tape machine

Computer inputs

external sync in - input for the external sync pulse