

# EXHIBIT G

## Oberheim Instruments

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## Oberheim

"Throughout the early '70's, Oberheim Electronics [founded by Tom Oberheim] was a highly reputed manufacturer of electronic effects devices....In addition to designing and building effects boxes, Oberheim electronics was an ARP dealer for about a year and a half. Many of their early ARP customers asked about a sequencer for their synth, so Oberheim designed their DS-2, one of the first digital sequencers."

"As soon as the DS-2 was on the market, Tom Oberheim noticed that many of his customers wanted to set up a sequence, then play their synth from the keyboard at the same time that the sequence was playing back. In addition, many ARP Odyssey and Minimoog owners were looking for a way to fatten up their sound. So Tom drew up plans for a fairly simple analog voice module that could serve" both needs, the SEM (Synthesizer Expander Module). "The development of the entire Oberheim synthesizer line, right up to the present time, has been a continuous evolution that began with the SEM modules."

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## Eight-Voice



*image courtesy of Kevin Lightner*

Originally owners of the Four-Voice could expand it to up to eight SEM modules. Shown here is an example of just that. This became the first Eight-Voice.

Later Oberheim released an Eight-Voice with two keyboards, (one on top of the other: the top one, a 4-octave(C-C), 49-note, and the bottom one, a 5-octave(C-C), 61-note) and an onboard Digital Programmer which held 16 presets. Currently we have no picture of this one.

### Manufacturer:

Oberheim

### Model:

Eight-Voice

### Production period:

1974-79

### Quantity produced:

### Also:

- *Kevin Lightner's own [Oberheim Eight-Voice](#) (or is it a Sixteen-Voice?)*



[Who played this instrument?](#)



## Who Played This Instrument?

**Chick Corea**, **Dennis DeYoung** of **Styx** - used extensively on *Pieces of Eight* (1978), **Chris Franke**, **Dave Greenfield**, **Herbie Hancock**, **Chas Jankel**, **Brian Kehew** and **Roger Manning** of [The Moog Cookbook](#), **Geddy Lee** of **Rush**, **Lyle Mays**, **Patrick Moraz**, **David Palmer** of **Jethro Tull**, **Steve Porcaro**, **Tim Simenon** of **Bomb the Bass**, **Akiko Yano** of **Yellow Magic Orchestra**, **Joe Zawinul**

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## Four-Voice

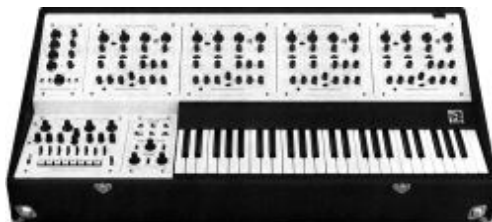


image courtesy of Kevin Lightner



### Who Played This Instrument?

**808 State, Bob Andrews, Julian Colbeck, Adrian Cook of Electrotunes, Michael Cotten of The Tubes Group, Chick Corea** - the second one one made, **Wolfgang Dauner, Rick Davies of Supertramp, Dennis DeYoung of Styx** - used extensively on Grand Illusion album (1977), **EDP** (the company, Adrian Wagner and Chriss Huggett, during the development of the Wasp), **Electronic Dream Planet, Larry Fast, Flood of Node, Michael Fonfara of Lou Reed Band, Frontline Assembly, Jan Hammer** - played with his Probe remote keyboard, **Herbie Hancock** - the third one made, **Jesse Harms of Ry Cooper Band, Micheal Hoenig, Mark Isham, Human League, Chas Jankel, Masterworks, Hideki Matsutahe, Lyle Mays of Pat Metheny band, Michael McDonald of the Doobie Brothers** - "What a Fool Believes", **Patrick Moraz, Klaus Netzle, Pink Floyd, Steve Porcaro, The Shamen, Eberhard Shoener, Tim Simonon, Tangerine Dream, Stevie Wonder** - the first one made, **Gary Wright, Joe Zawinul**

[\[Let us know\]](#) if you have any further additions to this list.]

### Manufacturer:

Oberheim

### Model:

Four-Voice

### Production period:

1974-79

### Quantity produced:

800



[Who played this instrument?](#)

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## Prommer



above photo from the collection of [Joseph Rivers](#), Audio Playground, Orlando, FL

other synths in the [Audio Playground Collection](#)

Early sample-based drum machines such as the Oberheim DMX and the [Sequential Circuits Drumtraks](#) stored their sampled sounds on EPROM (Erasable Programmable Read-Only Memories) chips. The Oberheim Prommer was designed to allow DMX owners to sample their own drum sounds and then "burn" their own EPROMS to use their samples in the DMX. The Prommer was, in effect, a monophonic sampler, its single sampled sound could even be triggered by MIDI, or via Oberheim's pre-MIDI "parallel buss". The Prommer was 8-bit and it allowed different sampling rates, depending upon the rate of the drum machine you were going to use the resulting EPROM in. It also allowed very limited editing, such as reverse, ringmod and digital bit manipulation.

### Manufacturer:

Oberheim

### Model:

Prommer

### Production period:

1983-85?

### Quantity produced:

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## Two-Voice



owner: [The New England Synthesizer Museum](#), David Hillel Wilson, Curator

other synths in the [New England Synthesizer Museum Collection](#)

The inputs and outputs of the individual modules are available on the back of each SEM, and can be brought out to the top as shown in the picture; This is a customization available from the New England Synthesizer Museum if you have a 2-Voice.----- [Dave Wilson](#)

The Oberheim Two-Voice may have started out as just an incomplete [Four Voice](#), with the space for two of its SEM voices left empty (and sold at half the price). In 1976, it seems, Oberheim built a dedicated case for their Two-Voice. The 3-octave 37-note (C-C) duophonic keyboard was originally (in the first 100 or so) a Pratt-Reed keyboard similar in design and function to the one found on the [ARP 2600](#). It had a Transpose knob rather than the switch pair as on the later models. It was labeled "16 - 8 - 4 - 2", much like the [Minimoog](#)'s octave switches. There was also a two position slider switch labeled "2nd Voice". When engaged, it did the same kind of "highest/lowest note" priority response as you would get out of the "duophonic" keyboard of the [ARP 2600](#). Later models used a keyboard which was the same mechanically, but had a different motherboard, and of course the left hand control panel was replaced with its new digital electronics they got from [E-Mu](#). Portamento can be set for either or both SEMs, along with basic pitch. The Two-Voice also offers a switch to choose which SEM plays first in duophonic mode.

Attached to the keyboard of most Two-Voices is an 8-step 2-voice sequencer (the "[Mini-Sequencer](#)") with a voltage-controlled clock and the ability to use sequencer voice 2 or the keyboard output to change the clock rate, letting you set up rhythms. Dual-concentric knobs give you control over SEQ 1 (for SEM 1) and SEQ 2 for (SEM 2). There is also a noise source and a sample-and-hold. Either SEM can be controlled by voltages from its sequencer, the sample-and-hold and keyboard voltages. Two-Voices which do not have this sequencer often have a joystick controller in its place.

[from *The A-Z of Analogue Synthesizers*, by Peter Forrest, published by [Susurreal Publishing](#), Devon, England, copyright 1994 Peter Forrest] [with help from [Joseph Swails](#) and [Dave Wilson](#)]

### Manufacturer:

Oberheim

### Model:

Two Voice (model TVS-1A)

### Production period:

1975-79

### Quantity produced:



[Who played this instrument?](#)



## Who Played This Instrument?

**Jean Micheal Jarre, Jason Faulkner** ex-member **Jelly Fish**, **Brian Kehew** and **Roger Manning** of [The Moog Cookbook](#), **Masterworks**, **Vince Clarke**, **Vangelis**

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## Xpander



*image courtesy of Kevin Lightner*

The Xpander was Oberheim's first synth product that was designed from the ground up with MIDI in mind. It was a 6-voice, multitimbral analog synthesizer with an **extremely** flexible design. Each voice or group of voices could either be assigned to respond to a specific MIDI channel (1-16), to a specific keyboard range on a specific MIDI channel, or to any of 6 CV/Gate (1volt/octave) inputs. The output of each voice could be panned separately (7-positions) in the stereo output, or accessed individually through their own separate direct output. The Xpander also had a mono (summed stereo) output.

Each voice consisted of 2 VCOs (triangle, saw, pulse, or noise, VCO2 could be synced to VCO1), a multimode VCF (low-pass, band-pass, notch-pass, high-pass and four "combination" filter modes), and 4 VCA's (in line one after each oscillator and two after the VCF). FM of VCO1 and the VCF was possible via VCO1. The filters could also be set as 1-pole (6dB/octave), 2-pole (12dB/octave), 3-pole (18dB/octave), or 4-pole (24dB/octave). All oscillators and filters could be tuned by a handy auto-tuned routine. In addition to this basic synth engine, the Xpander had a number of separate modules that could be inserted in any modulation path. These include (5) LFO's with basic waves plus sample-and-hold and random functions, 3 tracking generators, 3 ramp generators, a lag processor (does not necessarily have to be used for portamento), and 1 additional global LFO to be used with the Mod Wheel.

You could store 100 program patches and then set up an additional 100 multi-timbre setups storing any of those patches on each of the 6 voices, panning them and assigning how each voice is controlled. Patches could be dumped to cassette or via MIDI sys-exe.

### Manufacturer:

Oberheim

### Model:

Xpander

### Production period:

1984-88

### Quantity produced:

approx. 2000




[Who played this instrument?](#)



### Who Played This Instrument?

**Michael Brecker, Vince Clarke, Steve Cunningham, Electronic Dream Planet (x2),**





**Larry Fast, Baby Ford, Chris Franke of Tangerine Dream, Frontline Assembly, Front 242, Mitchell Froom, Gas Chamber Orchestra, Jan Hammer, Adam Holzman with Miles Davis on Tutu, Brian Kehew and Roger Manning of [The Moog Cookbook](#), Human League, Jam El Mar, Willard E. Love, Mark Isham, Die Krupps, Patrick Leonard, Ian Levine of Phil Da Costa, Nitzer Ebb** - used the Xpander extensively on "Big Hit" and other albums, especially for percussion sounds, **Orbital, Steve Porcaro, Propaganda, Stefan Reinert, Trent Reznor of Nine Inch Nails, Steve Roach, Shamen, Mark Shreeve, Tim Simenon, K-H Stockhausen - "Eve's Magic", Switzerland, Joe Zawinul**

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