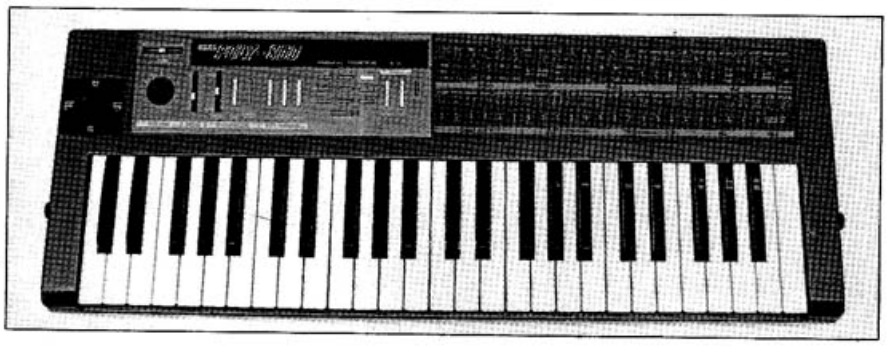
KORG POLY-800 SYNTHESIZER



NOT TOO MANY YEARS ago, the idea of an 8-voice, programmable polyphonic synthesizer for under $1,000 would have seemed like the stuff dreams are made of, but at the pace technology has been moving, what you dream about today can become a reality tomorrow. Korg's Poly-800 is an 8-voice polyphonic synthesizer that features 64 user-programmable presets, eight VCOs, a sequencer, nine 6-stage envelope generators, a separate VCA for each voice, battery power, MIDI, a built-in stereo chorus unit, and a single VCF that all the voices pass through — all for a list price of $795.00. Many of you are probably busy pinching yourselves to see if you're dreaming. You skeptics out there who are wondering just how stripped-down an 8-voice instrument has to get to cost $795.00 should read on. To be sure, corners were cut, but creatively enough that players can get their hands on some of the sounds and features typically found on instruments that cost more than twice as much, and a few extra features *not* found on those instruments.

The overall design approach is one that you'll have to get used to before you'll be able to use the instrument quickly. All of the entering of program and parameter data is done through what Korg calls their DAC (digital access control) system, a numeric keypad something like you'd find on a calculator. This system is also used on Korg's Poly-61. Information regarding the operation you're performing is presented on three 2-digit LED displays. An index of the parameters is supplied on the front panel, telling you what numbers to call up in order to edit or change any of the parameters. For example, to change the cutoff frequency of the filter, you have to enter a 2-digit number (41) that accesses this parameter, and then hit one of two switches to either increase or decrease the value in single-step increments. This approach is similar to the single incremental controller found on instruments like the Yamaha DX7 [see Keyboard Report, Oct. '83], Moog Source, Kawai SX-210 [Keyboard Report, Oct. '83], and Rhodes Chroma [Keyboard Report, Aug. '82]. However with those instruments, you had to first push a switch to tell the incremental controller which function you wished to edit, and then move the incremental control. With the Poly-800, the process is one step further removed, in that the switches that relate to each function have been replaced with numbers that you enter via the keypad. A cumbersome process, but a shaved corner that's not too difficult to deal with.

The architecture of the voices goes like this: Each has its own oscillator, VCA, and 6-stage digitally generated envelope. All eight of the voices are passed through a single lowpass VCF. This routing scheme is perhaps the single biggest limitation of the instrument. All eight voices can be controlled from the on-board digital sequencer, or via the keyboard, or via some external device connected through the MIDI (Musical Instrument Digital Interface).

The Keyboard. This is four octaves, C to C. You can assign voices to it in a few ways. There are two polyphonic modes: whole and double. Whole assigns one oscillator to each voice, giving you eight-note polyphony. Double layers two voices on top of each other, giving you 4-note capability. Since each of the oscillators can have its own 6-stage volume envelope, the timbral possibilities in four-voice mode are much greater than you might think at first. There is also a chord memory function that lets you latch chords that you then control monophonically. With this function you can put the instrument into a monophonic mode, however, the software prevents you from piling more than two oscillators on one note because of a technical limitation — Korg tells us that there was too much phase cancellation between the oscillators. You can also select either single or multiple triggering, which, it should be noted, only affects the VCF. Each of the oscillator VCAs is triggered independently, providing the illusion of having totally independent voice articulation, even though there is only one filter. You may find that four octaves is too little for a polyphonic synthesizer's keyboard, but the Poly-800 is also designed to be portable (it's light enough to strap around your neck), and a longer keyboard would get in the way in that application.

The Left-Hand Controller. A joystick is provided just above the left side of the keyboard to let you bend pitch up or down and route LFO modulation to the oscillators or the filter. The direction you have to move the joystick to get pitch-bending might seem sideways to anybody used to a wheel or a lever. Pitch-bend up is to the right and pitch-bend down is to the left. Modulation routed to the oscillators is up and modulation routed to the filter is down. This doesn't take much time to get used to. No doubt this was done to facilitate wearing the instrument around your neck, as is the fact that the joystick is positioned just above the keyboard instead of immediately to the left of the keyboard. The range of the pitch-bend can be adjusted over a range of plus or minus about a fifth (the maximum was just shy of a minor sixth on the instrument we had).

The Panel Controls. These include a combination volume/on/off control, sequencer rate, step, and start/stop switches, keyboard assignment controls, the numeric keypad, and the three LED displays. The function of most of these should be self-evident; however, the keypad requires a little explaining. The keypad is a set of 10 switches that are set up like a pocket calculator's switches, except that where zero would normally be is a switch labelled "bank hold," and where nine would be is a switch labelled prog/para for program/parameter. The latter toggles between the two functions the keypad is active for — calling up programs or setting parameters. The bank hold function is extremely useful, expecially for a data entry system like the one used here. When it's used, the first digit of the two-digit number is suspended or frozen, so you don't have to keep entering two-digit numbers to get to all the programs in a particular bank of programs. For example, say you want to call up programs 12, 15, 13, and 18, in that order. After you've entered the first program, 12, you'd hit the bank hold button. Then you'd only have to press 5, 3, and 8 to get to programs 15, 13, and 18 since the first digit — 1 in this case — is being held by the bank hold button. When the keypad is used to call up parameters (which in this instrument refers to things like the filter's cutoff, the stages of the envelope generators, the octave settings of the oscillators, and so on), bank hold is very helpful in letting you toggle back and forth between settings for particular functions. The first envelope, for example, is addressed by numbers starting with 5 — 51, 52, 53, 54, 55, 56. The second is addressed with numbers starting with 6 — 61, 62, 63, 64, 65, 66. Similarly, the oscillator controls are addressed by two-digit numbers starting with either 1 or 2, the LFO (called a Modulation Generator, or MG, by Korg), uses 8's, and so on. One of the things that might drive you nuts at first is remembering which numbers pertain to which functions. Being able to freeze one of those numbers while you're adjusting parameters that pertain to the function makes using the system much quicker and easier.

The LED indicators are used to tell you which program is called up, whether you've edited it at all, which parameter is being altered, whether the instrument is in whole or double mode, and the value of the parameter that's been called up. Numbers are used for the program, parameter, and value information, while the decimal points, or dots, in the displays are used to tell you all the other info. One of the displays will tell you the key assign mode in letters (P for polyphonic, C for chord memory, or H for hold) if you're in the program select mode. All of these things will become fairly self-evident when you sit down with the machine in front of you.

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The other function that the keypad has is for using the cassette interface. You hit different numbers to save, load, and verify the cassette data storage. Two switches next to the keypad are used to change the parameter values by moving them up or down. You can either increment values one step at a time or, by holding the switch down, step through them rapidly. The advantage to this system is that it allows Korg to put such a small price tag on the instrument — switches and pots contribute a lot to the cost of an instrument. The disadvantage is that the system takes a while to get used to. You have to constantly refer to the front panel to see which numbers relate to which functions, a disadvantage that, for most, is greatly offset by the price break it facilitates. Our only complaint about the keypad system is that the numbers are printed on the panel *below* the corresponding buttons, and we felt strongly that they should have been printed above.

The Parameters. The first of these pertain to the oscillators — labelled DCO (digitally controlled oscillator) 1 and DCO 2. The DCO 2 section controls four of the eight oscillators when the instrument is in its double mode. When the instrument is in whole mode, the DCO 2 functions are not active. Only DCO 1's functions do anything. However, DCO 2's functions will still be stored in memory, so that you can sort of get two patches for the price of one by programming DCO 2 for a layered effect and then toggling between whole and double mode.

Each oscillator gives you control over octave range (low, mid, or high) and waveform. At first glance it will look like you only get sawtooth and square waves, but in reality the waveforms are more complex, as is the system for determining your waveshape. You can turn the 16', 8', 4', and 2' harmonics of the waveforms on and off individually. The waveform parameter selects the actual levels of the harmonics. At the square wave setting, all the harmonics that are turned on will sound at an equal volume. If all the harmonics are on, you get octave doubling effects that are particularly useful for creating organ patches. If any single octave setting is on with the "square wave setting," you get a square wave. With the second or "sawtooth" setting on and all the harmonics on, you get a close approximation of a sawtooth wave.

The controls for DCO 1 and 2 are essentially the same except that DCO 2 can be detuned from DCO 1 by small increments and also in semi-tones from a unison to an octave above. The filter parameters are also pretty standard —cutoff, resonance, keyboard tracking (none, half, or full), envelope control polarity, amount of control voltage from the envelope, and single or multiple triggering. A noise source is included, as is a built-in stereo chorus that's noise-gated — helpful for when you don't want hiss from the chorus sounding when you're not playing.

The envelope generators have six stages: attack, decay, break point, slope, sustain, and release. Essentially, there are two added factors beyond what a basic ADSR will do. The break point is the level at which the decay portion of the envelope ends and the slope up or down to the sustain level begins. You can get a lot of effects out of these envelopes, the most obvious being double-strikes, where you have the effect of one attack immediately when you hit the note and another a fraction of a second later. In double mode, giving the two oscillators different envelopes can make various harmonics fade in and out as the note is sustained, which adds some nice animation to the tone.

There are three sets of envelopes, one for the VCAs that DCO 1 is routed to, one for the VCAs DCO 2 is routed to when the keyboard is in double mode, and one for the VCF and noise source. Having a separate envelope for the noise source allows you to use noise for more than just making thunderstorms. For instance, you can set the envelope and noise to imitate the chiff of a pipe organ or the breath of a flute player. The only minor gripe we had was that when you set the envelopes at very slow speeds, you can hear that they're digital, because they move in quantized steps rather than smoothly. At faster speeds, though, you'll never hear it. Of course, you can always take the approach that this is simply the sound of your instrument, turning a limitation into a strength.

The LFO, or MG as Korg calls it, only puts out a triangle wave. You can adjust its frequency and an initial delay. You can also determine the initial level of its modulation of the oscillators and filter. The joystick adds to this basic amount.

The last parameters that you can adjust have to do with MIDI. This is one of the first keyboards to include access to MIDI functions on its panel. With these controls you can select which channel (1 to 16) the instrument will receive information on, you can decide if the instrument will change programs via MIDI, and you can enable or disable an external clock for the sequencer and its start/stop function.

The Sequencer. The sequencer will hold up to 256 events, each of which can be a note, a tie, or a rest. It is programmed in single-step mode rather than in real time, and all notes are the same length unless tied to the next step to create longer notes. The switch on the back panel labelled sequencer enable/disable changes the sequencer from record mode to playback mode, which is a minor inconvenience. In order to record a new sequence, you have to reach over to the back panel. But again, by having one piece of hardware do double duty as both write protect and record on, Korg was able to save Poly-800 users a bit of money.

The Back Panel. This includes MIDI in and out jacks, an input for advancing through programs with a footswitch, to and from tape cassette interface mini-jacks and level switch, program write enable and disable switches, the sequencer write protect switch, stereo outputs, a headphone output, and an AC 9-volt adapter jack. All very handy, but we wouldn't recommend using the 9-volt AC adapter if you're going to wear the instrument around your neck, since it's the kind of adapter that you use with a pocket calculator — not the most durable thing in the world. The adapter is included, however, as are batteries (the unit will operate off of six C batteries for up to four hours). A word of caution: You only have four or five minutes to change batteries before you lose all your program and sequence information, so don't leave the batteries out if you intend to use the instrument exclusively with adapter. You need those batteries to allow your instrument to remember sequence and program data.

Dimensions. The instrument measures 31" wide, 11.25" deep, and 3.5" high. It weighs 10 lbs with batteries. The body is of high-impact plastic, the finish is gray with panel graphics screened in blues and whites.

Conclusions. You couldn't ask for a less expensive programmable instrument to do your standard-fare synthesizer sounds — organs, brass, strings, electronic pianos. If you're looking for more end-of-the-world sound effects, you'll have to dig a little deeper into the old pocketbook. Of course, there are limitations, only one filter that all the voices feed through being the most major, but for the most part, the price more than makes up for even that almost unforgivable transgression. The six-stage envelope generators and the separately enveloped noise source are highly useful functions that you won't find on instruments costing five times as much. Since the Poly-800 is battery-operated and portable, you might expect it to be competing mainly with the one-finger-plays-Mahler portables of the world, but having user-programmable presets, eight voices, layering capability, MIDI, an on-board sequencer, cassette storage of patches and sequences, and built-in stereo chorusing puts it right in there with the major leaguers. In fact, the Poly-800 may be the start of a whole new ball game. Korg, 89 Frost St., Westbury, NY 11590.