VITAL STATISTICS:

- Produced: 1969 to present (out of production for a short time in 1980)
- Total Number Made: VC53, estimated 350, Synthi A/AKS, 860
- Manufactured: EMS (Electronic Music Studios), Trandec, Vein Born, Loddon, Truro, Cornwall TR2 4NW, United Kingd
- Original Price: $3,350 (about $16,500 current)

Features:
- Two audio oscillators (0.5Hz to 50kHz, one with sawtooth and variable non-square waveforms, the other with a square wave and rising or falling ramp triangle waveforms), an LFO (0.1Hz to 50Hz, variable pulse square wave and rising or falling ramp triangle waveforms), noise generator, lowpass filter (0.5Hz), variable resistor, 2.5Hz sawtooth oscillator)
- Ring modulator, envelope shape, dual spring reverb, joystick controller, signal level control, voltage meter, dual input channels (1/4" mono, male, female, line, and CV levels), two outputs (1/4" mono, via VCS for audio or pre-VCS for CV), headphone, and scope outputs
- Custom-made amplification/synthesizer system
- Optional: 3 octave diaphonic ST2 mechanical keyboard, internal oscillator and velocity-sensitive dynamics, and 2/12 octave KS capacitive touch-plate keyboard and 320-event monophonic digital sequencer (inside Synth A lid, resulting in the AKS)

Insider Information: The VC53 is better known in the U.S. as the "Phatty," perhaps due to EMS's original origin in Putney, a suburb of London. Before Cockrell entered the scene, the Synthi A was already in use. In 1970, David Zinovieff purchased a DECs (Digital Equipment Corporation) PDP-8, the first minicomputer, and put together one of the earliest computer music systems. According to Rod Wood, who joined EMS in 1970 and currently runs the company, "At least half of EMS's very expensive computer studio where the computers were used to control prototype analog systems, not just for generating simple analog synthesis sounds, but also for sophisticated filterbank systems that could analyze sounds. David Cockrell designed a 64-channel analytic filter bank system. It was a lot like a vocoder, only it was all under computer control. The company was heavily into this kind of advanced computer research."

"There was a group of three of us," Cockrell explains. "Peter Zinovieff, myself, and Tristram Cary. They were both into avant-garde music, what you would call serious music in the classical tradition. It was toneless, and the thought the keyboard was of secondary importance. The VC53 wasn't really a keyboard instrument to start with. We sort of added the keyboard later on as an afterthought." The keyboard question was the DK2, a three-octave, diaphonic mechanical affair installed with the original synthesizer in a wooden cabinet that matched the AKS.

Portability was an afterthought as well. "VC53 was pretty awkward to carry around. Cockrell was always making sure to have it in a big briefcase: like the EMS A too. By 1971, Cockrell had squeezed VCS Electronics into an oversized briefcase and the Synth A was born. He also designed the KS, a 2-1/2-octave touch-plate keyboard with a 256-event monophonic digital sequencer.

Although Brian Eno ringer's Minimoog in this photo (very similar to the Yoga '05 Keyboard cover photo), the EMSaks in the background was also a key to his heart.

At that time, Eno to us about an interesting quirk that the AKS had developed. "If I feed a loud input signal into the amp modulator it will trigger the envelope... it's very useful, in fact when you can use the envelope to trigger any other function in the synthesizer... when I got it serviced I had to put tape over it all the time saying 'Don't service this part. Don't change this.'"

WILE MOST OF THE SYNTHESIS ATTEMPTS in the late '60s here in the United States was focused on the creations of Bob Moog and Don Buchla (and soon thereafter, those from ARP), there was only one bullgame to follow in Europe. Europe is an advanced—for 1969—computer-music studio in London came a desktop modular synthesizer known here in the States as the Putney.

Developed and marketed by EMS, the VC53—its true name, which stood for the voltage-controlled studio, attempt #3—was tiny compared with its behemoth American counterparts. Instead of dozens of jacks spread across several square feet of front panel space, the VC53 offered a tiny, square patch-panel matrix. Whereas American synthesizers were connected together using handfuls of patch cables, small pins were inserted into the VCS patch-board to route control and audio signals through the device. It was a completely custom and purpose-built system, perfect for creating the kind of music that was becoming popular at the time.

The VC53 was also a significant milestone in the history of electronic music. Its compact and portable design made it easy to move around, and its modular design allowed for a high degree of flexibility and creativity in sound design. The VC53 was a key instrument in the development of electronic music and was widely used by composers and musicians around the world.
This fit inside the Synth A ltd.
A combination of the Synth A and the KS was called the AKS.

While Cockerell did all the designing, Wood was busy with other duties. "Half of my job was to do with keeping the studio in order: tidying, lining up tape machines, sweeping up, making tape copies. The other half was actually concerned with demonstrating the equipment to quite a lot of notable pop stars who would come by and decide whether they wanted to buy something." Ready for a lot of who was who in the European rock scene? Go ahead. Robin: "Pink Floyd, the Who the organ on 'Won't Get Fooled Again' was processed with the VCS3's envelope shapes), Rock Music [Brian Eno's band], King Crimson, Tangerine Dream, Klaus Schulze, Moody Blues, Curved Air, Jean-Michel Jarre, Gong, and yes, Todd Rundgren (one of your own) used the VCS3; there's a good picture of it on the inside cover of Something/Anything. Many other groups bought EMS gear but never seemed to make use of it: Rolling Stones, Led Zeppelin, Fleetwood Mac, John Tull, and Deep Purple.

Like the American analog synthesizers of the time, EMS's oscillators tended to drift. "They were a bit dodgy onstage," Cockerell reports. "You had to keep tuning them up." Wood concurs. "They're rather temperamental with regard to tuning and pitch stability. People who used them onstage deserve a lot of credit for their bravery. If you wanted to use one with a keyboard in performance, you had to let it settle down for about half an hour before you could set the tuning. Even then, if someone were to open the door and let in cool air just before your lead solo, you could easily be in trouble. Lots of people used them live. Pink Floyd used them for quite a long time. But a lot of their stuff wasn't pitched; it was just effects. There were many applications where the machines were just used as effects generators. Jean-Michel Jarre is probably the best-known performer who still uses them. He's got six of them in a big rack."

Rock stars haven't been EMS's only supporters. "Educational people consider that the VCS3 has never been bettered as a tool for teaching people about sound processing, acoustics, and analog audio synthesis," Wood points out. "We've also got the jingle and effects professionals, broadcasters, people like that. There are younger enthusiasts who may have seen Jean Michel with his enormous array of VCS3s, and they want to make sounds like he does. We get young musicians who have listened to early Tangerine Dream stuff, when they used a lot of VCS3s. We haven't only attracted people from the pop end. There have been young people influenced by avant-garde music, acid rock, or Jean-Michel Jarre."

Of all the synths we've covered in this column, only the EMS lineup of VCS3, Synth A, and AKS is still being manufactured—albeit on a custom-order basis. In fact, they were out of production only briefly during 1990. And if you don't want to pay for a custom-built one, you can save a lot of money by ordering a factory-refurbished unit. But don't look for MIDI connections. "We were asked by the shop that markets these rack-mount Midimacs and Prophets 5 modules [Studio Electronics] to MIDI the VCS3 and put it on rack," Wood recalls. "The trouble with that is that it would take up an enormous amount of panel space. It would be a monster. None of it would be present, you have to make all the connections for the audio and control lines, and you have to modulate all its controls in real time. It seems like too much of a sweat to start tinkering with the old design. Why not just tell people to go out and buy a MIDI-to-CV converter and keep the design the same, so as not to confuse the issue? It doesn't feel right to me, having one of them in a rack. Besides, the AKS is quite handy as it is."

Not that there weren't some design changes along the way. "The most significant changes came in early '72," Wood explains. "We call them the MkI and MkII. We're still on the MkII to this day. It has a redesigned power supply, which can deliver a lot more power in order to drive the KS's monophonic digital sequencer. The original design also used a different output amplifier. On the MkII, you can trigger the envelope using an external audio signal. When the amplifier reaches a certain threshold, it triggers the envelope generator, which wasn't possible on the Midis. The patch-board matrix layout was also slightly changed. On the MkII, there were separate rows for the two oscillator waveforms: sine and sawtooth. You could route the sine wave to say, ring modulate some sounds while sending the sawtooth through the envelope generator to do something else. On the MkII, these were mixed together on one row."

According to Cockerell, there were electronic circuit changes as well. "In the first VCS3s, there weren't any integrated circuits. It was all done with transistors. That's my excuse for it not working very well."

Talk about excuses—check out Cockerell's modest explanation for bringing the VCS3 to life: "It was just a means of raising money for Zinovieff's studio."