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Arabian horses, that is.

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or imagined? Apples help find out.

Life Begins at Eighty
M.A.C. Gates solves another computer mystery... and more.

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FUTURE MUSIC

BY DAVID HUNTER AND RON RENNELS

Dust swirls around the interior of the sunlit tent. Portable air-conditioning units rattle and sputter like malfunctioning disk drives. Outside, the temperature is about a thousand degrees.

It's Saturday afternoon, September 4, 1982. A couple of hundred music enthusiasts and shade-seekers have jammed into the Us Festival's speaker tent to see and hear presentations by Chick Corea, Herbie Hancock, and Bob Moog. Looking cool as always, Herbie Hancock steps up to the front of the tent and gives a short, entertaining demonstration of the Fairlight digital, computer-controlled synthesizer.

As he talks about the Fairlight, the alphaSynthauri, and the Apple, Hancock's great enthusiasm for electronic music is apparent. Someone asks Hancock if this means good-bye to acoustic pianos and what we've had in the past.

To which Hancock replies, "No. We're adding to what we have. We're not giving up anything. My next album is acoustic." But what about the one after that?

Herbie Hancock, holding the Clavitar portable keyboard, and Bryan Bell, Hancock's computer maestro. Hancock is recording his new all-synthesizer album at his Beverly Hills home, the first time he's had that luxury.
Two Places at the Same Time. The recording and performing career of Herbie Hancock has been compared to the dual personality of Dr. Jekyll and Mr. Hyde—with Jekyll being the acoustic jazz side and Hyde being the funky synthesizer side. Supreme jazz pianist, revolutionary electronic keyboardist, technical innovator, Hancock has influenced many contemporary musicians, but he consistently defies classification.

In his twenty-plus years as a professional musician, Hancock has played and recorded with George Benson, Paul Desmond, George Duke, Carlos Santana, Freddie Hubbard, Chaka Khan, Joni Mitchell, Raydio, Wayne Shorter, Keith Jarrett, Quincy Jones, Stevie Wonder, Oscar Peterson, Phil Woods, and Oliver Nelson, to name a few. Rooted firmly in jazz, Hancock has built up quite a reputation as an experimenter.

When you realize that this is the same cat who jammed with Miles Davis in the sixties, cooked with Chick Corea in the seventies, composed two film soundtracks, Blow Up and Death Wish, and recorded recent funk and disco albums like Feets Don't Fail Me Now, Magic Windows, and Light Me Up, it's clear that this reputation is well earned.

Hancock's latest album is Quartet, a two-record live performance in which he plays acoustic piano. Playing with Hancock are bassist Ron Carter, drummer Tony Williams, and trumpeter Wynton Marsalis. Joe Hurn, in his review of Quartet in a recent issue of Musician, says of Hancock's performance: "Hancock emerges marvelously undamaged from any of his more commercial ventures."

A visit with Hancock in his garage-turned-recording studio—surrounded by a king's ransom worth of synthesizers, recording equipment, and computer hardware—brings the man and musician into focus. Centered inwardly, following his own mysterious muse, exploring realms that more commercially popular (and more pressured) musicians leave alone, Hancock is part artist, part devoted Buddhist, and part computer jockey.

Mr. Hands. Hancock is heavily into Apple. In fact, he's something of a fiend on the subject. Hancock's bold explorations in search of good-sounding synthesizers led him to discover Apples and the Alpha-Syntauri in the late seventies. Currently Hancock has more than a dozen different synthesizers, but he has only one brand of personal computer—Apple.

Hancock is now finishing up a solo, all-synthesizer, all-Herbie record. A Saturday afternoon is the only time to catch him at his Beverly Hills home. In the bottom-floor room of the garage/studio are all the instruments—Oberheim, Clavinet, Claviron, Yamaha, Rhodes, Alpha-Syntauri, Arp, Fairlight, Sequential Circuits, Moog, Emu, and Lynn. A half-million-dollar Trident mixing board (rented) takes up one whole wall. There is very little room to move around, but it's just enough.

Out of this fifteen-by-twenty-foot room comes music that sounds like it requires a whole orchestra to play. Drums, bass, brass, strings, keyboards, vocals—they're all there, electronically tinged but no less powerful than the real thing. And it all comes from one musician.

With the help of a custom-built computer patch bay, an Apple II, and the never-flagging assistance of sound technician and computer programmer Bryan Bell, Hancock has networked (so to speak) all his instruments together so they are playable from one keyboard. The Apple II acts as a terminal (they're currently transferring that function to the Apple III) to the system, giving Herbie easy access to the electronics of all the different instruments. This multiple-keyboard configuration allows Hancock to use any "voice" he chooses without having to reconfigure and rewire the equipment and relocate his body each time he wants a different sound.

(A voice is the sound a synthesizer makes. Monophonic synthesizers have only one voice. If you hit two keys at once, only one note comes out. An eight-voice synthesizer like the Alpha-Syntauri allows you to press eight different keys at once, blending notes as if you were playing a piano. A completely polyphonic keyboard is on which you can press all the keys at once and get all the notes.)

The Analog-to-Digital Blues. Hancock's cache of synthesizers ranges from the analog Minimoog and Arp 2600 to the digital Emu and Fairlight. Tying all these diverse machines together is a formidable task. And it's likely to continue to be a challenge as new synthesizers are introduced each year.

"Stevie Wonder has to have two of everything new that comes out," Hancock relates with a smile. "It's a game between us—to see who gets the newest things first."

Hancock has spent a lot of money over the years on his electronic music quest, and it's really just beginning to pay off. He's excited about his new album, especially because of the new instruments he's using—the Memorymoog, the Fairlight, the Rhodes Chroma, and the Yamaha GS-1. But it's taken hard work from Hancock and a host of others to get this far.

Bryan Bell has been working with Herbie Hancock since 1976. Bell's a guitarist, and he's a software and hardware engineer. Herbie's his boss, and Bell has worked wonders in pursuit of "Herbie's demand. His need. He'd ask me, 'How come it's not like this?' And Bell would be off writing Z-80 code or hand-wiring patches.

"Herbie has got to have everything. The truth is," Bell says, "no one's ever made a synthesizer with the features of next year's product." And, Bell adds, there is no industry standard for combining synthesizers, drum machines, sequencers, clocks, and all the other attendant hardware in the way Hancock wants.

There are some signs of standardization, with the MIDI multiosynthesizer controller and the Rhodes Chroma, which comes with a standard Apple interface. But in 1979, when Hancock and Bell first started to combine instruments so they could be played from one keyboard with the Apple as a terminal, it was a different story.

Monster. The first problem Bell tackled was modifying the Emu keyboard so that Hancock could control any one of his synthesizers through its sixteen channels of digital output. This involved increasing the control voltage so that the gate output reached a standard that the Oberheim synthesizer could use.

(In synthesizers, all you're ever dealing with is electricity. It comes from the wall and the synthesizer assigns a certain amount of voltage to each octave—usually one volt per octave. Hancock uses the Emu like an Apple with sixteen expansion slots, sending sequences of notes—voltage—to different synthesizers.)

In addition to modifying the Emu, Bell built a tuning device that increased or decreased the voltage coming from the Emu. This permitted each voice of all the synthesizers to be tuned independently to a standard, so any stock controller could be used. The assignment of channels to the various synthesizers was done by hardware patching. Analog engineer John Vieira of Waves Company helped Bell construct the tuning interface for this early configuration.
ed a sixteen-bit interface to allow the Apple to talk to the Z-80-based Emu and the Z-8000 master computer.

Custom FIFOs (first in, first out), basically programmable buffer chips, were required in order for the Z-8000 to handle the signals coming from the Emu. They waited “half a year” for them, says Bell. They also built an eight-bit, high-speed, bidirectional parallel port for the Z-8000. Now, the 6502 machine language could pass to the Z-8000, instructing it to send a sequence of notes to the master clock, which Bell and Vieira had built. (A clock controls the tempo of a sequence of notes. A master clock is the easiest way to make sure all the instruments play in sync.)

The voltage comes from the Emu, passes through the master clock, and ends up being played automatically on the desired keyboard.

Feets Don’t Fail Me Now. Hancock and Bell had to seek the services of electronic drum wizard Roger Linn himself to interface the Emu and his fancy drum machine, the LM-1. Then they interfaced the Clavitar and Claviron portable keyboards to the Apple, with the help of Wayne Ventis, who designed those keyboards. During a concert, Hancock just presses a key on the Clavitar, which sends a signal to the Apple, which sends a signal to the Emu, which sends a sequence of notes to a particular synthesizer.

One last piece of equipment makes Hancock’s system complete. More or less, it’s a CD player. The “automated patch bay” was custom-built by Bell and Universal Patchcord. (Patches are what allow one piece of equipment to interface with another. You use a patchcord to connect a monitor to your Apple. A particular song may require seven different instruments in a unique setup. The automated patch bay handles the configuring and reconfiguring of patches for each song.)

“It’s an ultrawank, thirty-two-channels-in, thirty-two-channels-out (in stereo), software-driven, digital switching matrix,” says Bell. “To the Apple it looks like a printer port.”

The voltage from the Emu goes through the automated patch bay and is directed to the proper instrument, in much the same way the MIDI and Garfield Electronics’ Doctor Click Rhythm Controller synchronizes several synthesizers at once.

The result of all this time and effort (four years and many long nights) is what Bell calls “the ultimate composition machine.” As such, it is contributing significantly to Hancock’s creative style.

“If I hear something in my head, I just play it on the Emu keyboard, which stores it in memory. Then I save it on floppy so I can always play it back if I want it later,” Hancock says. “If I want to make a change in the bass tracks, I just tell the program on the Apple to shift to the bass instrument. I change it, then type run, and then it plays it, so there’s never any need to write anything down. Notation is so cumbersome.”

Hancock might use the Oberheim eight-voice for cellos, the ARP 2600 for flutes, the Rhodes Chroma for the bass sounds, and so on. Each of the different synthesizers has its particular strengths and weaknesses. Variety is the name of the game. Hancock is especially fond of the Chroma, which is touch-sensitive (the harder you press a key, the louder the sound). He uses the Emu as the main keyboard because it is a digital controller for the other instruments.

New Perspective. Hancock felt the need for a master clock for controlling the tempo of many different instruments at once and for a central switching device like the automated patch bay long before anything resembling these devices was commercially available. Now the music industry is starting to wise up.

The next piece of equipment that Hancock needs for his system is still to be delivered. That’s a Lisa. The Lisa will replace the Z-8000 computer and “is very much part of the picture,” according to Bell.

Eventually programs will be written so that Hancock can use the mouse and icon-based software to move from instrument to instrument. The Lisa will combine the easy-access terminal function previously performed by the Apple II and the Apple III with the mass memory and high-speed processing of the Z-8000.

At the moment, Hancock is pursuing a fascination for light pens. The Fairlight system comes with a light pen, used to draw wave patterns. (Remember that sound is voltage that comes into the synthesizer as waves. Synthesizers normally come with oscillographs for changing the wave shape. With a light pen and a digital synthesizer like the Fairlight, you have access to a virtually unlimited range of sounds.)
Light Me Up. "The Fairlight light pen is like a big crayon," Hancock says. He's currently enthralled with the Gibson light pen. "I needed this one cat [Steve Gibson] for a project. It turns out the guy is a synthesizer freak. He knew Pat Gleeson and John Vieira. What he's doing is fantastic."

During the past three years, Hancock has become an avid user of the Apple II and, more recently, the Apple III. He's spent many fine hours working with Neil Konzen's Program Line Editor and many long battles with program listings in computer magazines.

"I enter the programs and learn from the experience. If it doesn't run, I debug it. But then is it my error or is it in the material? If it's in the program listing and the debugging doesn't work, I don't know.... You feel like you've got brain damage."

Hancock is on the leading edge of the electronic music phenomenon. He's enthusiastic about computer technology and possesses an active, inquisitive mind. He's also willing to learn about new technology and is not afraid to experiment.

Hancock's Apple III is set up on the upper floor of the garage-turned-studio. At ease, talking at the computer like it's got a personality, Hancock demonstrates his practical, business uses of the Apple III. That's right, VisiCalc.

Hancock is basically a small business (his secretary actually answers the phone "Herbie Hancock!"). Hancock has an accountant, a manager, an agency, and characters like Bryan Bell hanging around. Given such a small operation, Hancock, with a little help from the Apple, is able to keep very close tabs on the business. Hancock has developed his own VisiCalc templates for keeping track of tour and record budgets. Sometimes, like on his last tour, knowing so much only heightens the misery.

"Five big concerts fell through, canceled because of unemployment, I guess, and the economy," Hancock recalls. "First it looked like we'd lost $30,000." Hancock used VisiCalc to plug in up-to-the-minute figures in his tour template and knew the bad news long before his accountant did.

"I imagined what the accountant would say. 'We got troubles! The way we were losing a whole lot more than that. It blew my mind.'"

Free Form. "Lots of people are in music to make a profit," Hancock says. "They're after a big gross and are real serious about it."

One gets the impression that making lots of money is not always Herbie's goal in music or in life. But it takes no small amount of funds to accumulate and experiment with all that fancy equipment. Hancock is gearing up for a tour to support the new album he's working on.

Hancock believes that other hands are in a similar situation of having to tour to make money and needing to watch costs carefully. He envisions everybody using computers and sharing information on "cheap hotels and good all-night restaurants," among other things.

Hancock is just plain enthusiastic about the Apple and his ability to be in control of his business. "He'd like to see more standardization in favor of the Apple. "Look at the Chroma from Rhodes," Hancock says. "They're owned by CBS and they went with Apple. The Apple's reliability makes it perfect for taking on the road."

Hancock cites Earth, Wind, and Fire as a band that has found the Apple invaluable in several ways. The band has an impressive synthesizer setup and Bell worked its 1982 U.S. tour. The group also uses the Apple for business and for automating the pyrotechnics in its act.

Hancock has taken the Apple along on previous tours, but his goal is to be the first for the automated patch bay and the Z-8000 marquee computer. It should be quite an adventure for Hancock and Bell.

"My dream is to be able to walk into the concert hall and hear my music already playing," Hancock muses. "I'd just sit down and join in."

As it is, with the automated patch bay, Herbie will simply press a key on the Apple's keyboard before each song and all of the patches will occur automatically. Hancock uses a vocoder (which analyzes voice characteristics and uses them to control an input sound—like a synthesizer and filters it to sound like your voice) for most of his vocals, and this will be patched through the system. What is normally a hassle—physically repatching instruments for each song—Hancock and Bell won't have to worry about.

"When we go on the road we have tons of backup equipment," says Bell. "Spare Apples, spare disk drives, even an extra vocoder."

Master Telecommunicator. At home or on the road, Hancock is a frequent user of the Source. He sees big things in telecommunications. "You can send sequences of notes from one synthesizer to another, it's a different tool you send them all the way across the country."

"You know, as long as we had the same equipment, I could send sounds to Stevie Wonder by modem. Eventually you'd have a library of sounds." Herbie's getting way out there now. "You could also be playing a concert or jam sessions by modem with musicians in Florida and New York. Stay tuned."

Bell is pleased with the support he's gotten from Apple Computers. "Apple is laying the groundwork for a personal computer revolution. Getting microcomputers into the hands of someone like Herbie really makes sense."

Bell will no doubt have his hands full when Hancock's Lisa arrive. He does not call himself a "kill" programmer. "I'm bad at 6502 and Z80 machine language. I try to design the concepts and depend on Mike Larner for the machine codes."

Thrust. They say that computers are the first thing that has really excited Herbie Hancock since he discovered jazz at age seventeen.

Some people might still be mad at him for moving away from acoustic piano, even if it's only temporary, but Hancock's an innovator and he sees electronic music as a supreme challenge.

"We're not robots. Take a drum machine. There the technology taking us away from slavery."

"People say to me that I'm putting orchestras out of work and taking away jobs. You know, it is possible for a piano player to learn to play a synthesizer." Look at Hancock.

But not right now. He's busy finishing up his album, the first he's recorded at his home. It's scheduled for release later this year. If he's funky pop and dance music, with generous portions of jazz thrown in spice, then Herbie's the man with the music.