

An interview with Richard Peterson,  
president of PolyMorphic Systems.

## “I don't like noisy machines”

*Nursing the after-effects of two carafes (yes carafes) of margaritas the night before, Sandy and I spent a delightful morning with Richard Peterson, the genial but astute president and founder of PolyMorphic Systems. What follows is a loosely edited transcript of portions of our conversation.-DHA*

**Ah!:** When did Polymorphic Systems come into existence?

**Peterson:** November 1975, with our first product, an analog-to-digital board.

**Ah!:** Is that still being offered?

**Peterson:** Yes. We sell a few but it doesn't sell like our video-display board for the Altair bus, which we introduced in mid-1976.

**Ah!:** And that provided the real growth and capital base so you could produce a system of your own?

**Peterson:** Yes.

**Sandy:** Today, how many people do you have?

**Peterson:** Working here? About 20-25.

**Sandy:** Do you do everything here?

**Peterson:** Pretty much. We just moved here, actually. We've only been here about two months. We got so crowded where we were that everything was on top of everything else and we couldn't get anything done.

**Ah!:** What was your background before you got into this?

**Peterson:** I did research with a small consulting company. Mostly contract work for the Dept. of Transportation. We used computers, of course.

**Ah!:** Were you in computer science?

**Peterson:** Actually, I was in physics.

**Ah!:** Let's talk about your Poly 88 system. It looks very different from an Altair or IMSAI which has lights and

switches all over the front panel. There's just one little "on" button and a reset light. How do you toggle in a loader?

**Peterson:** Our people here were mostly interested in using computers and the lights didn't buy us anything. In fact, they just confuse people and also they add cost to the machine so we just cut them out.

Because we know where all the peripherals are (display, keyboard, cassette, etc.), we've got a thousand-byte monitor ROM which comes up when you turn the power on. It's always there, right on the CPU board. It has a loader for two formats of tape including a 2400-baud Poly tape and the 300-baud Byte format. We load files by name into the machine. You turn the machine on and type "LOAD BASIC" and it comes back and says "BASIC IS READY" and load a program in Basic.

You then refer to file names; you can store all your files contiguously on a tape and not have to search and try to find out where you are in each one.

**Ah!:** I think it's very clever, as you're loading a program on the Poly 88, to have the display tell you every 256 words that you're still loading properly.

**Peterson:** And that the check sum is right and that everything is going O.K. You don't have to wait until a long file is all loaded to know if you have a problem.

**Ah!:** Would your version of Basic run on another 8080 computer or is it specifically designed for this one?

**Peterson:** It's not really designed to work on other systems; I think it wouldn't run very well. It requires a 60-cycle real-time clock on the CPU, which is in the Poly 88. One of the commands we have in Basic is time.



Richard Peterson, president of PolyMorphic Systems, with a complete Poly 88 system (computer, keyboard, TV monitor, cassette recorder).

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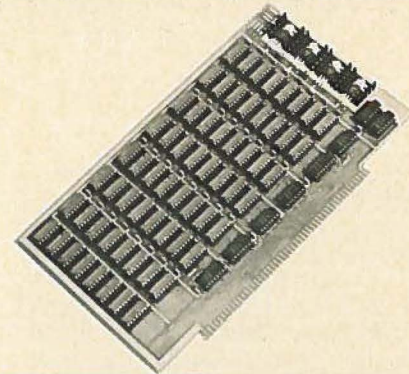
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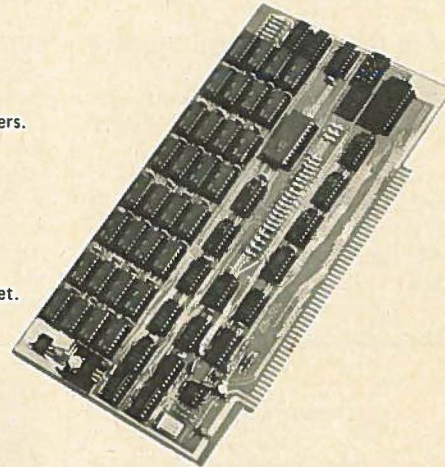
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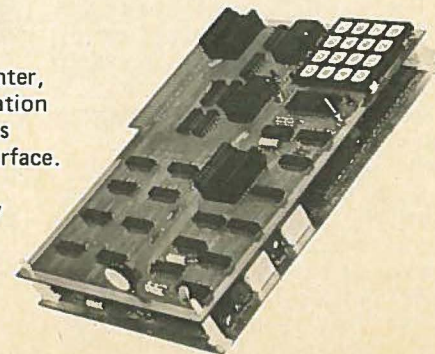
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A technician at the beginning of assembling a board.

You can just use a function called TIME; you find out how many seconds it was since the last time you called TIME and so you have a time base.

**Ahl:** That's very handy for writing games and for a lot of things; CAI, for example, where you can find out how long it took before somebody typed in their response.

**Peterson:** Sure.

Our CPU board has a lot more on it than most CPU boards; that's how we get it in such a small box. We have a 1K ROM; a small USART board to which you can connect both a cassette and a serial port, a similar small board for a printer, 512 words of RAM, vectored interrupt, and a real-time clock.

**Ahl:** What about memory? How much do you have in this system?

**Peterson:** We have two 8K static RAM boards; 16K total.

**Ahl:** Now the display picture is in memory, right?

**Peterson:** The display is contained in 1K on the video board which is just like any other memory to the processor. It's just that the memory happens to be displayed.

**Ahl:** The Poly 88 has five slots; how do you see them being used?

**Peterson:** I see this as the popular configuration for someone who wants to play with software: 1 slot, CPU; 2 slots, 8K memory each; 2 slots left over for whatever you want to do. That's really what our system is designed for. It's designed to get up and running very easily, to write program tapes and be able to distribute them to other people and that kind of thing.

**Ahl:** What kind of people do you find getting them mostly?

**Peterson:** Well, all kinds of different groups. The largest group is people who want a system in their home just to play with, and learn about.

**Sandy:** Is this system purchased already assembled, or is it sold in kit form?

**Peterson:** Yes, both kit and assembled. Customer's choice. You can start out without any memory, you can start out with just the CPU board and video board and buy your own memory and peripherals if you want.

**Ahl:** For a starter system what would the CPU, housing and power supply cost?

**Peterson:** About \$700. That includes the memory that's on the CPU board and on the video board. It doesn't include any mass memory. Everything together with 16K of memory, monitor, keyboard and cassette recorder is about \$2000. Assembled.

**Sandy:** How did you make the system so quiet? Is it because the fan isn't on?

**Peterson:** I don't like noisy machines. I don't think machines should have to be noisy. We don't have huge power supplies and huge overkill which you need with other computers. Our CPU board has everything on it that takes

four full boards in an Altair or IMSAI. So that's one of the reasons why we get away with it; it's smaller.

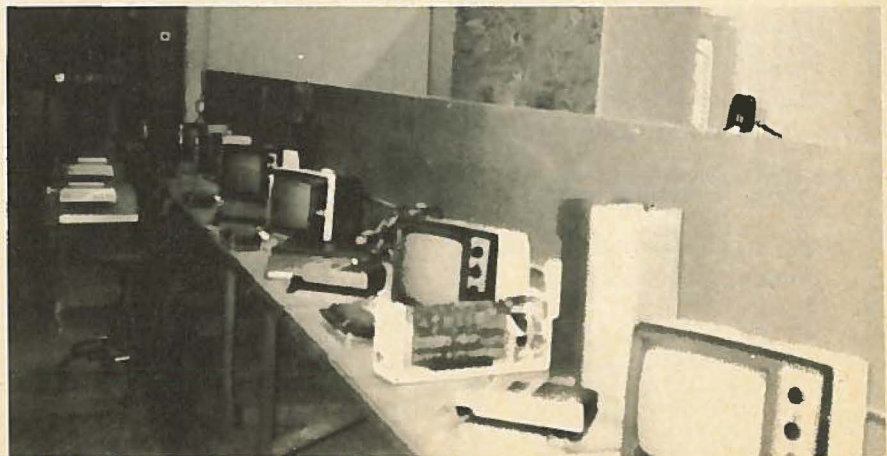
As a matter of fact we're packaging it all in a big box; the computer, a keyboard, cassette recorder, TV set, manuals — the whole kit. On the other hand, I don't feel that we're going to be able to compete terribly well with something like the Fairchild game. Those games sell for under \$200; they offer incredible things that I'm not sure even the Dazzler can compete with because of the lower resolution — at least currently. However, the Fairchild game has it, but more than that — it's cheap. We can't compete with that at all.

Our selling point is the fact that you can see the game, you can see how the game was constructed in Basic, and you know what makes this thing operate. You can understand the machine, whereas the Fairchild game and the others are just black boxes and you jam a tape (or ROM) into a slot and it takes off. You don't have any understanding, whereas this is a learning tool.

**Sandy:** You said there are lots of other applications besides games — what are some of the other things?

**Peterson:** Well, for these computers to sell they have to do things useful for people. It's like cars; you know, sixty years ago, people bought cars and showed them off but until cars were useful and they had roads to use them on they didn't sell very well. But there are a lot of useful things these machines can do today. I'm not sure using it for your home budget is useful; however, analysis of stocks and bonds — investigating whether you should do this or that requires an incredible amount of work by hand — you can say if this happens then that will happen and this is what my financial status will look like. I think too, they're certainly valuable in businesses.

**Ahl:** What about things like text editing?



Poly 88 systems are "burned in" and tested before shipping.

**Peterson:** That's a fantastic use of this machine — text editing.

**Ahl:** Do you have the software?

**Peterson:** We're developing it. I think that the weak spot right today is in the cassette. However, our floppy disc system will be out shortly. [Pub. note: it's out today.] A small floppy can fit 30 pages on it. And it's not too hard to pull one out and put another in. Also, they're easy to use, especially for people who have never used computers before.

We look also to the educational market. Our Basic has a very good error diagnostic routine that actually points to the error, not "ERROR CODE 3 IN LINE 10" or that kind of stuff. I think this is valuable in learning to use Basic. Also, most schools are already oriented to using Basic. They're not looking for a lot of assembly-language programming or loading in through front-panel switches or that kind of stuff. I would think schools would hate that kind of thing; it can cause a lot of frustration. That's what's happening with schools right now with punch cards. The kids get so frustrated just getting their cards and a printout half an hour later saying it doesn't work and then trying to find someone to explain to them what their printout means.

Also, compared to timesharing, it's great because if one kid bogs the system and does something to cause a crash it doesn't affect all the users, just

Sandy and Richard admire PolyMorphic's popcorn machine (the bag holds the puffed plastic packing pieces affectionately known in the industry as popcorn).



the one who caused it. This is a tremendous advantage.

**Sandy:** One thing I've been trying to figure out; if you're not a computer nut and you really don't want to spend a lot of time fooling around with things and trying to make a system run if something goes wrong, how do you get it serviced?

**Peterson:** You take it back to the

computer store you bought it from. I recommend you buy it from a store that's going to guarantee you that kind of support. A lot of these stores are providing good service, some are not, so — you have to be careful.

**Ahl:** You also have to be careful that the store is reasonably well financed. If you keep track of how many are opening and also how many are closing, you find they're opening at the rate of 3 a week and closing at the rate of one a week.

Where do you see the market going from here: hobbyists, education, business — what do you think it'll be in five years?

**Peterson:** There are going to be a lot of people selling business accounting systems and stuff like that. There's going to be a lot of people disappointed in that but I see these things as tools, small tools. IBM is building steamshovels; we're building camels. You know we're not making the same thing. But there are a lot of small problems that need solving. CitiBank for example, is decentralizing a lot of their gear. And they're utilizing a lot of these small computers for small problems.

But also the home user will be buying them for things we haven't even thought of today. Also hobbyists. And schools. The future is going to be fantastic in ways we don't even imagine today! ■

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