Epilogue

This article was originally written two-thirds of a decade ago, and time does not stand still. Some subsequent events, outcomes, comeuppances, and fiascos deserve a wry observation or two:

- Fairchild and Data General aren't suing each other any more. Fairchild still sells 9440-series microprocessors, and DG still sells minicomputers.
- Neither company is quite as much of a key player in the industry as it was a few years back. Probably the real winners in this case were the law firms representing Fairchild and DG.
- DG also got a judge to force Digital Computer Controls (DCC), a New Jersey startup, to quit making a DG-compatible minicomputer, allegedly from liberated DG prints. The truly memorable aspect of this case was the judge's opinion that he would have found for DCC, rather than for DG, if DCC had done "a legitimate reverse engineering job." Subsequently, DG bought DCC and continues to operate it as a subsidiary.
- Two Silicon Valley congressmen, Don Edwards and Norm Mineta, got a federal law on the books in 1984 which seems to reflect much the same viewpoint as that of the New Jersey judge. Copying your competitor's silicon chip masks with a camera is a no-no, but designing your own chip from scratch to go into the same sockets isn't prohibited. So who says reinventing the wheel is always a waste of effort?
- As a group, the classical minicomputer manufacturers are losing out to hordes of newcomers whose wares revolve around high-end microprocessors. At the 16-bit level, designing minicomputers from MSI bits and pieces is a lost art, and the world is mostly split between designs using the Intel 8086 and its progeny and those using the Motorola MC68000 and its offspring, with here and there a few sockets for the Zilog Z8000 and the National NS16016. At the 32-bit level, the high-end microprocessor people are swimming across the horizon, but they haven't yet gotten close enough to the minicomputer wagon train to shoot arrows at it. The real (i.e., silicon and not just paper) 32-bit microprocessors as of this writing seem to be the Motorola MC68020, the National NS32020, and--of all things--the NCR 32. In sum, the minicomputer companies did largely win the battle of putting their second sources out of business, only to lose the war to a ragtag army of little system houses with interchangeable boards featuring common microprocessors and communicating over standard buses. So much for locking up customers forever.
- Apple Computer, which was still literally a garage shop when I was writing the original article, has become a multimillion-dollar corporation, partly through a conscious "open architecture" strategy. This encouraged other garage shops to build enhancement boards which dropped into Apples and thereby conferred upon them such goodies as faster CPUs, CPUs that could run under other operating systems, larger memories, and so forth. In a previously undreamed-of masterstroke, Apple even let some of these little companies--and also many third-party-software houses--use their corporate logo, with the result that Apples started selling like Model T Fords. The sincerest compliment of all was paid to Apple's marketing strategy by none other than IBM, which unbuttoned enough to essentially copy it! However, it now appears that Apple is becoming yet another example of a principle expounded by Ed Lee of Pro-Log Corporation at a recent IEEE meeting: "Once someone becomes successful, they stop being open." It has been reported that Apple made "an offer you can't refuse" to a certain little Silicon Valley industrial design house--one that has designed many Apple equipment cabinets--to stop doing similar work for Steve Wozniak, one of Apple's two founders, who has left the company to do his own thing.
- Although I truly believe that my observations about second-sourcing, incompatibility, standards committees, etc., are almost timeless, the arena of combat is shifting over time and CPU architectures and instruction sets are losing their central importance. When any third-party-software house can write its thing in Forth, C, Pascal, Modula-2, or some other language that excels at CPU-to-CPU transportability and object-code efficiency, something else--not a CPU instruction set--has to be used to lock up the pot of gold against marauding newcomers.
- The VMEbus, which started out as a creation of Motorola but was deliberately made "open," and which is now also officially championed by Signetics and Mostek, appears to be outdistancing various other buses which more clearly remain captive Trojan horses of the particular companies which first devised them.

And so the White Spy has won a few, and the Black Spy has won a few, and the battles still go on. As long as these battles don't gun down any companies close to your heart (or your paycheck!), or cause your very own personal computer to suddenly become a Stone Age relic, they're kind of fun to watch--like prime-time soaps, or even lots better. So stay tuned. —Chuck Hastings

publicly thank. This whole subject is at times a hot potato—people express strong opinions sharply at variance with the official positions of the organizations which pay their salaries. I have heard and appreciated many such opinions, as well as some milder ones.

So it is best that I express my appreciation in general terms, without publicly identifying all the people I am thanking!

Anyway, there are people—and even whole companies—out there sincerely trying to do the right thing. When you meet one and like their act, tell them so.

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References


Chuck Hastings has spent the last half of the 1950's as a programmer, the 1960's as a computer architect (whatever that is), the 1970's as a hardware designer specializing in superminis, and the 1980's as a product planner in the semiconductor industry. He currently works for Monolithic Memories in Santa Clara, California. He has previously been with Data General, Microcomputer Systems Corporation (now Xebec), National Semiconductor, Iter Applied Technology, Racal-Milgo, two subsidiaries of United Telecom, Control Data, Honeywell, and TRW, and has moonlighted for various big and little companies in four states. He has a BA in physics and math from Grinnell College, an MA in math from UCLA, some additional EE and computer science courses from the University of Minnesota, and an MBA from the University of Santa Clara. He has two US patents in electrooptic mass memory technology, belongs to the ACM and IEEE, and still thinks that computers are a good way to have fun and get paid for it.

Questions about this article can be directed to Hastings at Monolithic Memories, 2175 Mission College Blvd., Santa Clara, CA 95054-1592.