General Magic Reveals RISC Strategy

Architecture-Independent "Intercode" to Support Portability

by Michael Slater

General Magic's "red herring," the prospectus that the SEC requires prior to a public stock offering, reveals that development work is under way to replace the existing 68349-based Magic Cap personal communicator design with a more highly integrated RISC-based implementation. It does not, however, name the architecture.

Switching architectures could create a major disruption for what little application base exists for the platform. The prospectus reveals two efforts aimed at smoothing this discontinuity. The company has contracted with an outside firm to create a software tool capable of translating existing applications to the new architecture. The long-term solution, however, is an intermediate language called intercode. Application programs would be compiled into intercode, and future Magic Cap devices would then either translate or interpret this intercode, making programs processor independent.

Apple's Newton also implements a processor-independent software strategy. Newton's approach is to provide a scripting language, called NewtonScript, that is essentially an encoded, custom high-level language. Intercode, on the other hand, appears to be more like an abstract machine language. Unlike NewtonScript, it will not be directly visible to the programmer, allowing applications to be developed in any language.

In the past, such efforts have had poor performance; indeed, the prospectus warns that "certain microprocessors, such as the Motorola 68349, may not be able to execute intercode-based packages because of performance limitations." This raises the prospect that first-generation Magic Cap devices could require 68000 binary programs, while future devices will use intercode programs, leaving the early devices nearly orphaned.

The prospectus warns that if intercode is not ready by the time second-generation Magic Cap devices are ready, software developers may have to provide multiple binary versions "based on the number of microprocessors supporting the second-generation hardware reference design." This suggests that more than one architecture may be used. Sony, the first company to ship a Magic Cap device, is using the MIPS architecture throughout its consumer product lines. The prospectus also names Toshiba, a MIPS licensee, as having entered into a recent contract to provide ASICs to General Magic; Toshiba's new R3900 ASIC core *(see **090205.PDF**)* looks like a good match to General Magic's needs. Motorola, the second company to produce a Magic Cap device, is deeply committed to PowerPC and is developing new PowerPC implementations specifically for PDAs *(see **090203.PDF**)*.

General Magic is still struggling to ship the Windows and Macintosh versions of Magic Cap. The Windows version, in particular, is seen as critical for increasing interest in Magic Cap. The prospectus notes that it does not expect intercode to be available in time for the shipment of the Windows version, raising questions about how Magic Cap application packages will support the Windows environment.

The prospectus lists Apple, Matsushita, Mitsubishi, Motorola, Philips, and Sony as licensees of Magic Cap, but notes that the company does not expect either Apple or Philips to develop a Magic Cap device. Others, however, including Fujitsu, Northern Telecom, Oki, Sanyo, and Toshiba, have not yet licensed the software but have entered into evaluation agreements or made investments and are expected by General Magic to develop Magic Cap devices.

Limited Role for First Generation

Prospectus documents are always daunting in their tone, due to legal disclosure requirements, but the concerns raised in this one seem significant. It paints a bleak picture for first-generation Magic Cap devices, noting that the company expects only one other unnamed licensee, in addition to the two already shipping, to ship products based on the first-generation design. Furthermore, the company notes that "the AT&T PersonaLink network currently has limited functionality, consisting primarily of electronic-mail capabilities. Partly as a result, the Company believes that the sales of first generation Magic Cap–based products will not be significant and that these products will mostly be of interest to early adopters of technology who are willing to pay relatively high prices and accept limited performance and functionality." It must be painful to have to be so blunt.

General Magic has more than $40 million in cash and short-term investments and expects to raise $52 million in its public offering, but it expects no significant income in 1995, believes it will take until at least 1997 to become profitable, and anticipates requiring more capital in the future. Whether the company ultimately succeeds or fails, its founders will be amply rewarded—as long as the stock price holds up long enough for them to liquidate some of their paper wealth. With 1.6 to 2.1 million shares each (worth more than $20 million at the offering price), Marc Porat, Andy Hertzfeld, and Bill Atkinson should do very well indeed. ♦

