

# LAMBDA

The Magazine of VLSI Design  
First Quarter 1981



Mike Shenon

There's more to a silicon foundry  
than meets the eye.



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LAMBDA was founded to explore, expand, and define the interrelations between very-large-scale integrated circuits (VLSI) and computer architecture, design strategies, costs, and aids, as well as the electronics industry as a whole. LAMBDA is unique in that it is written by and for the participants in this dynamic field. LAMBDA intends to be the communications focus of a new VLSI design community, encourage its development, and help define its directions.

# LAMBDA

Volume II, No. 1  
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## Cover

The concept of the silicon foundry is much discussed, but little understood. This issue's feature article explores the technical and economic issues relating to foundries, from the points of view of both users and vendors. The cover illustration, showing the internal workings of a typical silicon foundry, is by Mike Shenon.



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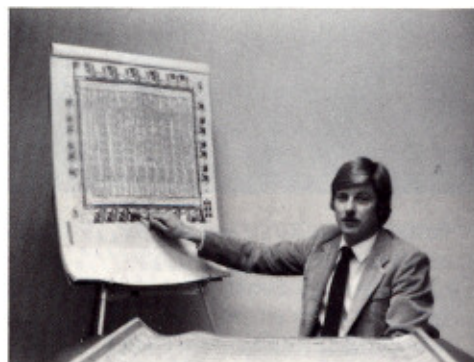
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Telle Whitney, *California Institute of Technology*

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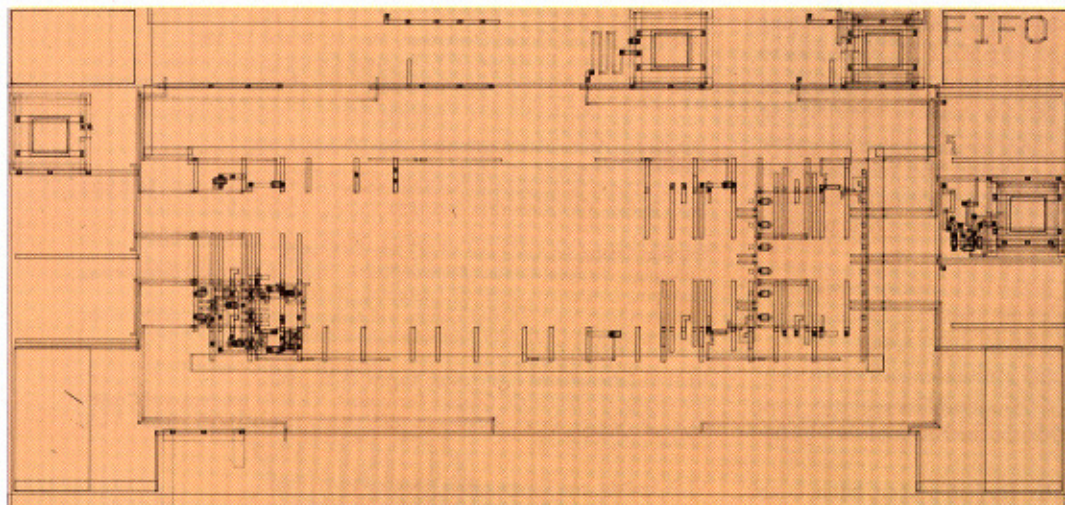
### 54 Simplified Design Rules for VLSI Layouts

Richard F. Lyon, *Xerox Palo Alto Research Center*

A set of scalable rules lets VLSI designs track technological improvements, and also helps simplify the interface to silicon foundries.



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## From the Publisher

**T**he field of "rolling your own silicon" is certainly expanding rapidly, and LAMBDA is expanding with it. More and more people are defining one or more layers of the silicon in their products, and LAMBDA will continue to serve this trend-setting group of designers. Although we generally devote our editorial coverage to issues directly related to design, the issue of how and where to get your designs fabricated is a vital link in the total process.

Our feature article on silicon foundries addresses this issue. As more and more designers go knocking on doors, looking for wafer fabrication (as the growth rate of the industry indicates they will do and are doing), we are starting to see changes in the structure of the designer-fabricator interface. Current interactions tend to require a great deal of time and involve many people, largely because of the lack of standardization. There seems to be a growing trend toward standards and toward "automation" of that interface. Standard design rules, process control monitors (PCMs), and data formats are especially suitable for chips which don't strain the limits of current processing technology. With the rapid advance in this processing technology, there are more and more applications which can be served by this class of chips. However, there is still great disagreement on just how close a designer can stay to the process-technology frontier while using standardized rules and formats. This "silicon-foundry" article looks at some companies that currently serve the field, and at others which will do so soon. We highlight proposed interface standards for the silicon-foundry industry, along with the meaning of the name.

In our continuing coverage of gate arrays, we thought it important to augment vendor-oriented stories with accounts of the experiences of users of these devices. In this issue, we highlight the experiences of a delighted user. We're sure that some readers have had less-than-successful experiences, and we'd like to hear from you as well. We would be especially happy to hear *why* you had a bad experience, and how others might avoid the same problems. We welcome your contributions.

We founded this magazine as a *forum* for discussion, not as a pulpit to preach from. So, do take the time to express your views. We often get verbal feedback (much of it complimentary, some of it not) but we would certainly appreciate it if you would take the time to put your thoughts on paper for others to share. For example, we would like to know what type of articles you would most like to see. Specifically, how do you feel about research-oriented articles vs. articles dealing with proven ideas or systems? Write to us!

Our staff is expanding . . . again! I'm delighted to welcome Sherry Rushing as our new Circulation Manager. She will be responsible for all subscriber-related activities. At the same time, I'm disappointed to report that after a year of highly valued service as Editor-in-Chief of LAMBDA, Jim Rowson has decided to "retire" to the position of consulting editor. Jim worked with LAMBDA from the day the magazine was conceived (he even suggested the name). Those of you who have headed a start-up operation of any kind can appreciate a colleague who does not need persuading that the cause is worthy or the idea sound, and just does what needs to be done. I'm happy to say he will remain a valuable contributor in his new role as consulting editor.



*Douglas G. Fairbairn*

—Douglas G. Fairbairn  
Publisher