

# VLSI

DESIGN

JANUARY/FEBRUARY 1983



In VLSI design, as in life, you have to lay the groundwork if you want to succeed.



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VLSI DESIGN 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. VLSI DESIGN is unique in that it is written by and for the participants in this dynamic field. VLSI DESIGN intends to be the communication focus of a new VLSI design community, encourage its development, and help define its directions.

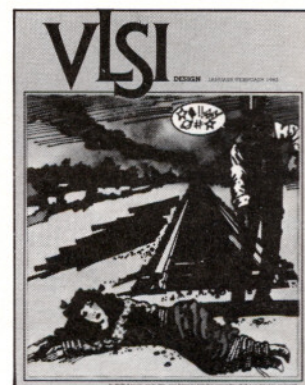
Over 21,000 copies of this issue printed.

# VLSI DESIGN

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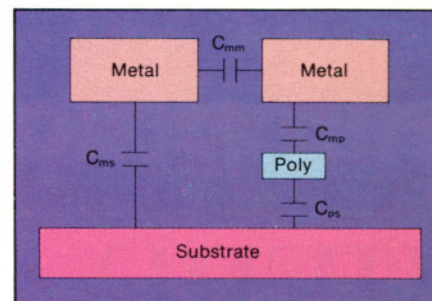
## Cover

Although the "success" implied by this issue's cover is debatable, the point is clear: Success demands that all of the pieces come together at the right time. In VLSI design, due to the rapid progress of processing technology, one must sometimes start designing chips *in anticipation* of a new process (the "groundwork") that will not be perfected until months (or even years) later. Cover illustration by Dick Cole, San Francisco, CA.

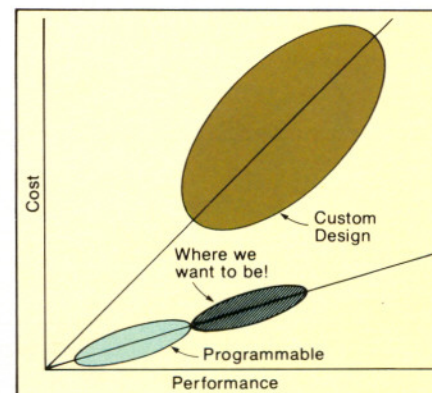


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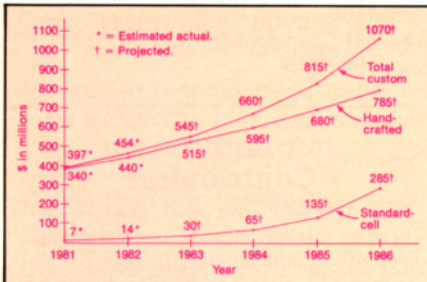
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# Articles



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## 20 VLSI in FOCUS: Designing a 32-bit CPU Chip

**Mark Canepa, Ed Weber, and Harlan Talley,**  
*Hewlett-Packard Company, Systems Technology Operation*

For the first time in print, members of the Hewlett-Packard team that designed the 450,000-transistor FOCUS CPU recount the exhilarating as well as anxious stages of its development.

## 30 Custom/Semicustom IC Industry Business Update

**Steve Szirom,** *HTE Management Resources*

The author analyzes recent activity in the custom/semicustom IC field by both established companies and recent start-ups. His survey includes market-size data and future market-size predictions.

## 40 The VLSI Connection in Two New Cooperative Research Programs

**Jerry Werner,** *Editor-in-Chief*

The *raison d'être* behind both the now-established Semiconductor Research Corporation (SRC) and the fledgling Microelectronics and Computer Technology Corporation (MCC) is to keep U.S. firms competitive with their foreign counterparts. The development and use of VLSI devices is central to both efforts.

## 52 The Results of AUSMPC 5/82

**J. Craig Mudge, Robert J. Clarke, Marcus L. Paltridge,**  
**and Robert J. Potter,** *Commonwealth Scientific and Industrial Research Organization (CSIRO), VLSI Program, Adelaide, South Australia*

The authors analyze feedback from the designers who contributed to Australia's first multi-project chip. Others involved in MPC projects may gain insights from the comparisons of predicted vs. actual chip performance.

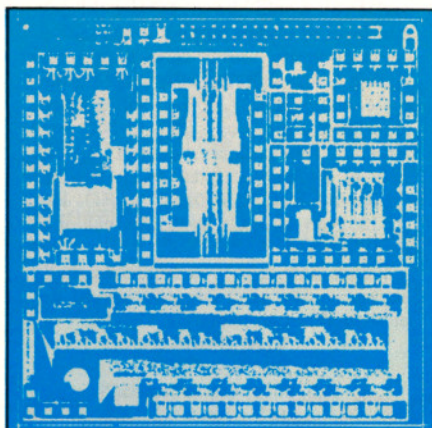
## 58 "Big Caesar" and "Little Caesar": Adventures in Modifying and Extending CAD Software

**Randy H. Katz, Joseph Moran, Umakishore Ramachandran, and Daniel Schuh,** *Computer Sciences Dept., Univ. of Wisconsin at Madison*

It's not always *that* easy to use software—that others have designed—on your own hardware.



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