Theme Features

4 Software Maintenance
Guest Editors' Introduction  Robert S. Arnold and Roger J. Martin

7 Display Strategies for Program Browsing: Concepts and Experiment
Ben Shneiderman, Philip Shafer, Roland Simon, and Linda Weldon
The new, larger display screens can improve program comprehension—if the added space is used for more effective presentation, not just more code or larger type.

16 Using Modern Design Practices to Upgrade Aging Software Systems
Robert N. Britcher and James J. Craig
Modifying 100,000 lines of 20-year-old code, IBM-FSD successfully applied its software engineering principles to modernization of the FAA's air traffic control system.

27 TMM: Software Maintenance by Transformation
Guillermo Arango, Ira Baxter, Peter Freeman, and Christopher Pidgeon
Porting an undocumented program without any source changes demonstrates the value of a transformational theory of maintenance. The theory is based on the reuse of knowledge.

41 Delocalized Plans and Program Comprehension
Stanley Letovsky and Elliot Soloway
A maintainer's understanding can go awry when it is based on purely local clues. How can we spell out the intentions behind a piece of code?

Special Features

50 An Architecture for Real-Time Software Systems
Theodore P. Baker and Gregory M. Scallon
The Rex approach to software architecture views executives as independently programmable machines that execute conventional-language application procedures as individual instructions of a higher level program.

60 Specifying Resource Allocation for the Cm* Multiprocessor
Karsten Schwan and Anita K. Jones
This mechanism is a first step toward automation. Using allocation heuristics, it compiles a programmer's high-level-language descriptions into explicit statements allocating processor and memory resources.

71 Program Design and Rhetoric
John A. Lehman
Remarkable parallels—in both problems faced and solutions developed—exist between rhetoric and program design. Could training in rhetoric improve programming skill?

Departments

74 Software Standards: Improving Software Quality and Productivity

76 Software Reviews: Logitech Modula-2/86: Review and Comparison

78 Errata: March 1986 IEEE Software

79 New Product Reviews: smARTWORK
* Traveling Sidekick * Schematic Design Tools * GTP

81 New Products

84 Product Highlights

85 Soft News: Supercomputer Access Impasse
* Japanese Software Activity * Software Engineering Workshop

89 Calendar * Call for Papers

91 Book Reviews: An Introduction to Database Systems Volume II * Concurrent Euclid, the UNIX System, and TUNIS * Advanced Programming: A Practical Course * Prolog for Programmers * LISPcraft * Practical Project Management

96 Advertiser/Product Index