President's Message

Frederick T. Andrews

One of the biggest attractions at ComSoc-sponsored conferences in recent years has been ISDN. Any session, workshop, or meeting with ISDN in the title is almost certain to draw an over-capacity crowd, whether the content is related to services, architecture, standards, field trials, or deployment plans. Clearly, many are thirsting for all the information they can obtain on this strategy for the evolution of public and private networks, so that they can sort out their ideas and decide how the strategy impacts them. I am extremely pleased that ComSoc has provided major forums for the exchange of such information.

Without claiming any great and unique insight, I can say that it was clear to me as early as 1962 that there was great future potential in integrating voice and data in the then infant digital transmission systems. Having struggled with achieving only 2400 BPS over 3 kHz voice channels using data modems, the notion of 64 kb/s over the equivalent of a voice channel had a great deal of appeal. Of course, at that time digital systems were far from ubiquitous and digital time division switching didn't exist. The most that could be hoped for was the ability to provide private lines on routes where digital facilities just happened to exist for the support of voice traffic.

A lot has happened since 1962. The deployment of both digital transmission and switching has gone ahead full speed driven to a large extent by sheer economics in providing existing kinds of service. Part of the motivation came from expected improvements in quality of service resulting from the inherent advantage of digital systems, which by their very nature do not accumulate the traditional impairments, such as distortion and noise, over distance. It is most heartening that the quality improvements expected have been confirmed by subjective tests and modeling studies reported by Tom Spang of Bellcore at a recent symposium held in St. Louis.

While communications engineers were pursuing the dual goals of lower costs and better quality through the deployment of digital systems, they knew that there had to be the potential for new service configurations as well. It was also clear that with all the participants involved in providing global communications, new service configurations which exploited the evolving network of digital equipment and facilities voice service would not just happen. Some very foresighted individuals and telephone administrations pushed for the involvement of the CCITT in the strategic planning issues in the 60s. Obviously, the crude concepts of that time have been greatly refined, and the general descriptor Integrated Services Digital Network (ISDN) has emerged to embrace this work.

Major attention has been devoted to the definition of the missing access link to make possible end-to-end digital connections on a ubiquitous common user basis. The definition of basic access (2B+D) and primary access (23B+D) is recognized as only a beginning of what must be done, so that the full potential of digital technology will be available to meet customer service needs.

I was present at a meeting recently when the marketing VP for an exchange carrier was asked how he intended to market ISDN. He was firm in his statement that he did not intend to market ISDN, but rather performance improvements and reductions in cost of existing services and those new services which met real customer needs. He quite correctly perceives new network technology as a means to an end, not a goal in itself.

The real challenge in the deployment of network technology is in having service capabilities available when the service demand materializes. In the past, this meant accommodating forecasts of network terminations and traffic volumes with enough detail and accuracy to permit network planning and engineering. Were we to continue down the path of engineering and administering different facilities for each different service, the service provisioning process would soon become unmanageable. In fact, there are those who say the process is already unmanageable in urban centers faced with all the communications demands of sophisticated customers. Were we not to develop a more integrated approach, the prospect of achieving reasonable costs of maintenance and repair would also be grim.

Continued on p. 59

Book Reviews

Optoelectronic Switching Systems in Telecommunications and Computers,—Herbert A. Elion and V. N. Morozov. New York and Basel: Marcel Dekker, Inc., 238 pp., 1984.

E. M. Healy, *Reviewer*

This book explores the basic engineering considerations of optical switching and its application to telecommunications. To my knowledge, it is the first book in print which directly addresses optical switching and its future impact on communications networks. Divided into two distinct parts, each part is written exclusively by one of the authors. The two parts are bound by an excellent introduction by Nobel laureate N. Basov. The book seems to be an ironic reflection of the current regulated separation of telecommunications and computers. Ironic in the sense that the book demonstrates the unavoidable technological marriage of the two disciplines.

In the first part, Optoelectronic Switching Systems in Telecommunications, Dr. Elion discusses the fundamentals of switching, network architecture, optoelectronic hardware and traffic theory. The second part, Optoelectronic Processors, is equally well written. Dr. Morozov presents the basic functions of any computer, then the special characteristics of optoelectronic processors and special problems of design are thoroughly developed.

The book is technically geared toward a senior electrical engineering level. A fair amount of time is spent reviewing basic concepts needed to understand the subject. Many of the concepts in the book are only developed in text and seldom expanded into equation form. I would have preferred a stronger mathematical foundation for the book. While not written as an academic text, it could possibly be used for a broad systems level course.

Drs. Elion and Morozov do a good job of covering such a broad range of topics on a relatively technical level. The authors present a thorough comparison of optoelectronic digital processors and light sources. They explore the physical limits of optical technology. Throughout the book there is an emphasis on design considerations such as minimizing power and components and maximizing throughput. I have mixed feelings about the company-specific references and product comparison tables used throughout the book. Some are already outdated, but others are handy "ball park" references. While someone doing photonic research will probably find nothing new in this volume there are many people working with fiber optic systems today who are interested in the practical approach taken in the book. The minor problems with the text are far outweighed by the practical value of the book in a technology that is rapidly developing. Overall, the book is useful and has already become a handy reference in my work. I highly recommend it to anyone with responsibility for switching or fiber optic systems.

Book Reviews express the opinions of the reviewer and not necessarily those of IEEE COMMUNICATIONS MAGAZINE or its Editors. Anyone wishing to express a different opinion should write to the Editor.

Pres. Msg. cont.'d from p. 5

The challenge for communications engineers and ComSoc is to channel our energies on network technologies to solve these problems. What has been done so far under the banner of ISDN is a start. Were ISDN to accomplish no more than to embrace the majority of today's public and private services in a single integrated network solution it would be worthwhile. The potential to do much more in satisfying as yet unarticulated and unquantified demands is there. If we don't get on with the process of standards development for future high-speed data and video capabilities, the goal of universal information services will never be achieved. I sincerely hope and expect that ComSoc will play an important role as a catalyst for early completion of that work.