Continued from p.3

losophy, and the error philosophy is remarkable.

Chapters on Core, GKS and GKS-3D, and IGES provide a reasonable summary of these standards. However, GKS-3D has changed greatly since 1984. Implementers take note!

Chapter 4 (PHIGS) says that PHIGS and GKS are competitive. But PHIGS provides a modeling system in addition to the viewing system provided by GKS-3D. The underlying viewing systems of the two standards are remarkably similar; there is at least a 90 percent overlap in functionality between GKS-3D and PHIGS. Furthermore, features that are different, such as PHIGS structures and the archive file, are modeling generalizations of comparable GKS features—namely, GKS segments and metafiles. The PHIGS document, too, has changed a lot since 1984.

The chapters on CGM and CGI, like the other sections, suffer from a lack of timely information. More information about the CGM bindings would be useful. Differences between the CGI and CGM primitives are not deliberate, as implied by the tables in Chapter 7. Rather, they reflect Van Deusen's having reviewed different and unsynchronized drafts of the CGI and CGM. In fact, by design, all the nonfile structure elements of the CGM are contained in the CGI, with the same syntax and semantics, and the current drafts are synchronized. (A proper statement about the relationship between the CGI and the CGM should be made somewhere.)

Minor flaws abound and give misleading impressions. For example, page 6-2 states, "A CGM can contain any number of pictures to be processed in sequence. Each picture must be preceded, however, by a new set of picture descriptor elements." Not so! Pictures are randomly accessible; that's why each picture is preceded by a new set of picture descriptor elements.

Chapter 8 continues to provide instances of opinion presented as indisputable fact. Page 8-6 states, "... NAPLPS is now being considered or has been implemented as an interface for devices that go far beyond the original intent of the NAPLPS standard: videotex and teletext terminals." On the contrary, to the best of my knowledge, videotex and teletext services, including the terminals, were *always* the target market for NAPLPS—certainly not the general graphics-device market.

This chapter is also misleading in emphasis. Several pages are used to describe the character-coded syntax of the NAPLPS command set. Yet nowhere does it mention that the CGM also has a standardized syntax based on a character-coded syntax and that it follows coding principles developed in part by the same committee that developed NAPLPS. Thus page 8-6 mentions the virtues of this syntax used by NAPLPS without noting that they also apply to CGM.

In sum, this handbook sets an ambitious goal for itself but unfortunately fails to achieve it. The fault, in my opinion, belongs only in part to the editor. The draft standards were simply changing too fast between 1984 and 1986 for anyone to expect to compare and contrast them all. However, because the editor does not have firsthand knowledge of the standards committee's deliberations, the lack of timeliness is compounded by numerous inaccuracies and false impressions. Consequently, I cannot recommend the book in its present form.

Many of the flaws could be avoided by increased editorial attention to separating fact from interpretation and by having the next edition reviewed by knowledgeable standards participants. Then, perhaps, a 1987 edition available early in 1987 could be of value to the concerned observer who does not have the time or inclination to participate in the shaping of graphics standards.

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Editor's note: The August 1986 issue of IEEE CG&A *provides an extensive update on the various graphics standards.*