Therefore Equation (2) applies again for device j as the exact timing of R becomes irrelevant. The priority structure remains unaffected in case 2, as queuing is still allowed.

The effect of the modifications in the state diagram is the suppression of the pulse of 'bus available' signal which was generated in the original daisy chain at time R_k by forcing the circuit through the sequence 6–2–10–8–11 rather than 6–3–11, introducing the minimal delay required to achieve complete unambiguity.

6. Conclusions

Lockout mechanisms used in relay technology cannot be used in a bus system working at a high speed because the transmission time of the signals providing the lockout can no longer be neglected. The simple daisy chain caters for this problem in most cases, but it is still possible that a request is granted and later release is enforced. Detailed analysis showed that the delay is again dependent on the bus length. By modifying the procedure of release, making use of unused states of the circuit, it is possible to guarantee a complete lockout even under adverse timing conditions. The delay involved is always automatically adjusted by the length of the loop itself.

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Book reviews

APL/360 With Statistical Applications by K. W. Smillie, 1975; 225 pages. (*Addison-Wesley Publishing*, £4·40).

All too slowly APL is becoming at least known to the British computing community, though many potential users in other professions may not yet be aware of its potential application in their respective fields.

Now that time has elapsed for the language and the system to be seen in perspective in relation to other programming languages and to potential useful applications areas, many of the emotional attitudes previously displayed have largely disappeared. Attitudes of love or hatred for the language, of addiction to its use or its total and unevaluated rejection are slowly being replaced, in those communities where APL is available, by a more healthy attitude.

It is recognised that situations which call for the repetitive execution of stabilised programs are often unsuitable for the use of APL. On the other hand in a situation which by its nature calls for strong interaction between the user and the program during execution, in which the logic and content of the program has to be continually developed on the basis of progress of an investigation, or where the user is suitably trained to make use of a mathematical-like symbolism which facilitates the use of arrays of various ranks and sizes— then APL has little competition from existing program languages. This despite the fact that the size and nature of its operator set must be abhorrent to the purist of programming methodology because it does not encourage, though it does permit, the development of well structured, intelligible, non-pornographic programs.

Unfortunately in the UK APL is not widely or economically available to the university user (if this reviewer may grind a personal axe), though the commercial user can and has cost effectively exploited the availability of APL from several commercial vendors of the service. One would hope that statisticians, at least, should see Smillie's book and should have an opportunity to develop their knowledge and understanding of APL and to test it out sitting at a terminal. And learning it by using it they will add their voices to the already widespread clamour, to the armoury of those who wish to effectively integrate suitable computing tools into their day to day activities at universities, research and development laboratories and in other environments which call for the type of interactive usage in which APL has so widely proven itself in the USA.

Smillie is one of the pioneers of the use of APL. He first published programs in the very early days of the language availability about a decade ago. He is *the* pioneer of the use of APL by statisticians and the present paperback book clearly demonstrates his interest in the topic.

Most unfortunately the volume is based on the oldest version of the language (APL/360) which is by now outmoded by the newer developments implemented by all major manufacturers (with the exception of ICL). The newer version of the language includes file and most input/output facilities which might be considered almost essential to the statistician and other commercial users. Equally it contains a number of new and powerful operators which once they have been used make the older version look archaic. Not only are the scan and execution functions omitted by Smillie but even the domino function, the square matrix inversion operator, does not appear. Thus in a way the book hides the true power and value of the language as it now stands. Equally the set of system commands are totally incomplete in relation to any system that the potential user is likely to have access to today.

The concept of a pornographic program was previously mentioned. Professor Smillie's examples are mostly well structured, although one suspects that this is more by chance than planned. Unfortunately, however, he has totally neglected the use of labels, branching instead to actual statement numbers. One can only assume that at the time his examples were formulated the concept of labels in APL had not yet been invented. In fact his chapter on branching does not mention it. The use of actual statement numbers is one of the most certain ways to introduce errors as a program is developed and one can only conclude that the value of this book is primarily historic: a book that can be browsed through and borrowed from the library. The potential purchaser might wish to wait until Professor Smillie brings out an up-to-date second edition, and this reviewer would strongly encourage Professor Smillie to do so. APL deserves to be even more widely known and he is certainly the man to do this for statisticians.

M. M. LEHMAN (London)

A Practical Guide to Algol 68 by F. G. Pagan, 1976; 213 pages. (*John Wiley*, £7·50 cloth, £3·75 paper).

Algol 68 owes no debt to big business and has been shamefully played down by computer journalists, administrators and official bodies alike. It stands only on its merits and those of authors like Frank Pagan. Here at last is a concise, lucid and nicely printed book on the revised and final 1974 version of the language that one can unreservedly recommend to anybody. The author has performed, in a seemingly effortless way, what we know to be an extremely difficult task. His judgment on matters of emphasis and order of presentation is excellent. By stating facts clearly, avoiding fussy repetition and endowing his readers with a little gumption, he communicates the real simplicity and power of the language more clearly than ever before. Scientific programmers will find this book easy to understand, and university students should find it about right for maximum enjoyment and practical use.

P. M. WOODWARD (Malvern)