

### Primitives

All primitives previously mentioned can be selected to be the subject of monitoring. In addition the start of a slice by an executive program is also included as a pseudo-primitive called ENTER.

### Activities

These may be selected in terms of complete subsystems or individual activities within a subsystem.

### Queues

A queue can be selected in terms of its main store address or other suitable reference number or identifier. Since this may not be readily available a special facility (see ALLQS option below) is included to obtain this information.

The three selector fields above ensure that a selected primitive must be called from within a selected activity and, if it has a control queue parameter, must operate on a selected queue before recording can take place.

Monitor data is gathered in a special circular buffer and various commands are provided for overall control. Input to the buffer can be switched on and off as required. Output from the buffer can be arranged to give a snapshot of immediate past events or to provide as complete a continuous

record of events as is possible within the limitations of buffer and output capacity.

Certain optional extra items of data can be recorded if desired: TIME—The time of occurrence of each event.

SLICE—The duration of each slice.

LOCATION—The address associated with each event (i.e. the point of call of a primitive or the location to which an executive program transfers control).

ALLQS—This allows a user to override the queue selection mechanism and this produces a record containing queue addresses, reference numbers or identifiers which can be used subsequently to select the control queues of particular interest. The monitor facility is an important aid during the initial stages of implementation of a MASCOT system when it can verify the correct operation of the executive programs and primitive procedures. In an established system it can be used during the implementation and test of access procedures and interrupt control subsystems. It can also provide valuable timing information at all stages of a test program. The MASCOT monitor can be enhanced by arranging for other forms of online test aid to write their information in the monitor output buffer, so allowing the production of a single time sequence record for a wide range of preselected events.

### References

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## Book reviews

*Microcomputer Architectures*, edited by J. D. Nicoud, J. Wilmink and R. Zaks, 1978; 283 pages. Proceedings of Euromicro, 1977. (North-Holland, \$40.00)

The proceedings of a 1977 conference on 'Microcomputer architecture' might sound a little dated, and this would indeed be the case for those seeking details of the most recent products. Most of the systems discussed make use of the established eight bit processors. The chosen papers are, however, respectable contributions concerned with the solution of specific problems in original and improved ways. Many of the problems are not new, or specific to microprocessor systems, but will remain topical for some years yet.

The selection panel appear to have struck a good balance between the highly theoretical studies and the systems and applications areas. The most interesting central themes are multimicroprocessor configurations, shared bus structures, synchronisation and speed limitations; shared memories; fault tolerant systems and reliability. Applications areas include data communications systems, graphics, automatic control and signal processing.

Some papers are not strictly concerned with microcomputers, viz 'A modular microprogrammable pipeline signal processor in ECL-technology', but these infiltrators are of high quality. The hardware designers get good coverage, with bus standards, programmable logic arrays, languages for logic design and simulation of central processors. With only two papers devoted to programming languages, and many of those on cross assemblers in the reject pile, the selection panel clearly felt that there was little progress to report in this area. They did accept a very good paper describing a universal cross assembler, which must be of commercial value.

In all, 31 papers were presented at this truly European affair, with only one from Britain! If this reflects our true position, then I urge you all to buy this, and many other books on microcomputers. At \$40.00 you may prefer to buy another 8080 just in case they ever come back into fashion.

I would echo the panel chairman's comments, that insufficient research and development is reported on programming tools and languages. The large number of systems being written in BASIC and Assembler gives little satisfaction to those who struggled to provide current high level languages in the face of the same scepticism in their day as that voiced by the current wave.

This book is for the departmental libraries of those actively involved with microcomputer research and development.

I. P. PAGE (Uxbridge)

*Information Representation and Manipulation in a Computer* 2nd edition by E. S. Page and L. B. Wilson, 1979; 271 pages. (CUP, £10.00; £3.95 paper)

This is the welcome second edition of a now well established introductory text on data structures, brought up to date and somewhat expanded. Starting with a section on the various data representations—including data compression and error detection and correction—the authors continue with chapters on the basic data structure of arrays, linear lists and trees and finish with a short chapter each on searching and sorting. Lots of exercises with solutions or suggestions given, and each chapter has its own bibliography. At £3.95 in soft cover, it would be difficult to find better value for hard-up students.

ARTHUR S. RADFORD (Leicester)