APS tests computer system for publishing operations

With 50% of the articles in the December issue of *Physical Review B* prepared by computer-assisted photocomposition, the Society's venture into the assessment of computer technology as the primary tool in editorial and publication operations is well under way. The experiment, authorized by the Council of The American Physical Society in 1976 and managed by Peter Adams, editor of *Physical Review B*, has been undertaken by Stuart Kern, Margaret Judd and others on the staff of the APS editorial office at Brookhaven National Laboratory, using programs originally developed by the Computing Science Research Center at Bell Laboratories. Some of the AIP publications staff are now also involved with the production phase of the test.

Bell Laboratories' UNIX system (a trade/service mark of the Bell System) allows the phototypesetting of straight text and the far more difficult material containing mathematical expressions. The experiment was undertaken to determine the technical and economic feasibility of producing articles under actual production conditions and to improve the processing of manuscripts.

UNIX, a general-purpose, multi-user interactive program written for the DEC PDP 11 computer, is able to serve many users doing different tasks, provides easily used files and possesses a large number of subsystems. Another advantage of the system is the ease with which additional programs can be written in its compiler language. Users enter data that can be immediately displayed on cathode-ray tube terminals with keyboards; previously stored data are retrievable through these terminals or alternatively through teletype terminals.

Present status. The first article prepared by this process appeared in the April issue of *Physical Review B:* Over 100 articles have now been prepared. Articles beginning on pages 1001, 1025, 1032, 1109 and 1197 of the August issue were UNIX-composed and conform very closely with the typography and style established for the journal.

The photocomposition programs have been proven capable of generating camera-ready pages of text, tables and complicated mathematical expressions. The text is displayed on a Tektronix 4014 terminal appearing as a two-column page showing accurate positions of the text (including unusual symbols), equations, figure captions, spaces for figures, etc. Corrections can be made through the terminals before the manuscript is photocomposed.

Processing manuscripts by computer. Text is entered into the system through teletypes with visual displays. Camera-ready pages can be generated directly from the computer's memory.

The staff has measured the relative ease of learning the manuscript input language to determine the rate at which material can be processed compared to present typewriter composition techniques in use at APS and AIP, and has compared methods for correcting text material after proofreading. They are evaluating different type styles that are available for use with the phototypesetter, seeking to match them with the specific styles established by the journals. The staff is also developing additional programs to make more effective use of this new method of production.

The computer-support system being developed to handle editorial processing functions is also an on-line, interactive system providing access to a current referee file containing records on all of the nearly 9000 referees available to the journals. Reporting current workload, any actions taken by other staff members and the referee's area of specialization, the file works in conjunction with a "manuscript flow control" file that contains information on the exact status of manuscripts submitted to the journals. Key information has to be inserted only once in either file, which can be used jointly or separately to generate standard forms and letters automatically, thus reducing considerably the time taken to process manuscripts.

Evaluation. The system being tested at Brookhaven is essentially a prototype of an editorial processing center in which all of the publishing activities of a variety of journals of differing size, publication frequency and editorial requirements can be handled by a single facility. During the eight months that have elapsed since the project began, the staff has become familiar with both the UNIX system and photocomposition requirements in great detail. They report that mathematical material can be processed about 50% faster than has been possible using conventional, typewriter composition methods and that the processing of straight text is measurably faster. Program changes necessary to adjust the photocomposer operation—the aesthetically pleasing placement of characters in relation to each other—are under way and programs are being written to simplify correction techniques. A final decision about its use for full journal production will be made by the APS Council upon the conclusion of this phase of the operations.

The *Physical Review* and *Physical Review Letters* publish much of the world's primary physics research for The American Physical Society. The journals handle approximately six thousand papers annually, of which about 3300 are published. About 2200 manuscripts are under active consideration at any one time. The journals are published weekly, semi-monthly or monthly with a total annual production of over 30 000 pages.