Research in progress

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The Architecture and Building Aids Computer Unit
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The Architecture and Building Aids Computer Unit, Strathclyde (ABACUS) — which exists within the Department of Architecture and Building Science at the University of Strathclyde — was set up three years ago to promote the effective use of computers in architecture and building design by engaging in research, teaching and consultancy.

THE RESEARCH WORK

Fifteen research workers are currently engaged on research contracts totalling about £150,000. The main themes of research include: SPACES — the development of a suite of programs for the early stages of comprehensive school design (sponsored by the Science Research Council and carried out in conjunction with a number of education authorities); PHASE — the development of an appraisal package for whole hospital design (sponsored by the SRC and carried out in conjunction with a number of regional hospital boards); and a basic study of the degree to which computers can promote the participation of building users in the design activity, again sponsored by the SRC. Other topics include computer simulation of air terminal operations, appraisal of housing layouts and the generation of the causal relationships between design and performance variables. Specific research projects relate to a central core of specialists who service them by providing basic software, interface software and application package structures (see Figure 1).

TEACHING AND COURSES

One member of the ABACUS staff is concerned exclusively with the teaching function. At undergraduate level, students become involved from the second year onwards, using existing programs in design project work. In the fourth year, a C.A.A.D. option is offered which brings students to the stage of specifying and writing small applications programs. At postgraduate level, research students and those engaged on the MSc instruction course have full access to the ABACUS hardware and software facilities. Twice yearly, a four day intensive course in C.A.A.D. is mounted for mid-career practitioners and described by the journal Building as ‘exhilarating but immensely stimulating’. This course aims to familiarise practitioners with computer systems and the range of available programs.

THE LINK NETWORK

The main interface with architectural practice is through LINK — a computer aided building design network of which ABACUS is a founder member. The function of LINK is to rationalise research effort between the member organisations and more effectively disseminate applications programs to practitioners. In Scotland, the network is based on the Univac 1108, owned and operated by the National Engineering Laboratory at East Kilbride. The Univac, with 196 k of 36-bit word storage backed by 6 tape decks and magnetic drum peripherals of 260 million character capacity, supports remote teletype and Tektronix terminals connected at speeds up to 1200 baud, over the normal post office network. The range of ABACUS programs existing on the Univac and available to practitioners throughout the UK by local dialling includes:

1. SPACES: A package for accommodation scheduling in schools

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FIGURE 1. The software packages, the users and applications.
FIGURE 2. The computer configuration used by ABACUS. It includes two Tektronix storage tubes with a Nova 820 minicomputer and will involve the use of the National Engineering Laboratory's Univac 1108.

2. SPACES 3: An appraisal package for school layout design.
3. PHASE 1: An appraisal package for hospital layout design.
4. PACE 1: A general appraisal package for built form layout.
5. STUNI: A program for generating built form layouts.
6. CASH: A suite for generating, appraising and cataloguing house design.
7. SAGE: A package to aid user participation in house design.
8. ASSIGN: A program for optimizing spatial arrangements.
10. WIND: A program for computing wind loadings on buildings.
11. HLE: A package for drawing hidden line perspectives.
12. AIR-Q: A program for simulating the operation of air terminal complexes.

Recently, with finance from the SRC and Strathclyde University, ABACUS has been able to acquire an intelligent terminal configuration based on the Nova 820 with 16 k of core store and two disc packs. Tektronix 4010 terminals, a paper tape reader/printer, a graph plotter and a tablet are being connected to the Nova which itself will be connected to the Univac at 75/1200 baud, over Post Office lines. The configuration, shown in Figure 2, is designed to allow local picture manipulation while the main mathematical modelling of built form will take place in the Univac.