

The time taken to solve a problem on an analogue computer is independent of problem length. All circuits operate in parallel, simultaneously. A typical solution might be arrived at in 20ms, and this solution can then be repeated at the rate, say, of 25 solutions per second. In human terms the solution is virtually immediate and continuous, therefore, any adjustments made to problem parameters (terms of an equation) while the computer is working will be immediately reflected in the solution readout. This rapid response allows the operator to quickly gain an insight into the workings and structure of a problem.

In contrast, digital computers perform many mathematical operations in a pre-determined and comparatively lengthy sequence, which bears little obvious relationship to the structure of the problem, but they do offer the very high degree of accuracy essential for calculations involving money or very precise data.

The computer of the future will undoubtedly combine the best of both worlds with analogue and digital equipment in hybrid form.

ANALOGUE METHODS

The statement that an aeroplane is a machine for solving sets of differential equations is not very far removed from the truth. If the aeroplane did not solve its equations correctly it would not be able to fly at all. Almost all relationships or events can be described mathematically, or in turn be represented by an analogy. A model aeroplane in a wind tunnel solves, by analogy, roughly the same equations which govern the behaviour of the real aeroplane, although in much simpler and less expensive fashion.

An analogy of a physical or mathematical process could be achieved by a system of gears, pulleys, and levers; or by the controlled flow of gases or liquids. But in the last couple of decades electronic methods of simulation and equation solving have become almost universal, because of the accuracy, availability, and adaptability of standard electronic components.

The main purpose of the analogue computer is to allow a model to be set up quickly and easily, to simulate the behaviour of a full scale system, and at

COMPUTER

By
D. BOLLEN

The Practical Electronics Analogue Computer is of flexible design. The basic equipment is UNIT "A". Computing facilities may be extended by the addition of further units: "B", "C" and "D", in accordance with user requirements. This photograph shows UNIT "A" standing on UNIT "B"

