

# RAL

## DESIGN & DISCOVERY

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**RUTHERFORD APPLETON LABORATORY**  
SCIENCE AND ENGINEERING RESEARCH COUNCIL

## Distributed Computing Services Division

### Informatics Department

#### Background

Informatics Department is made up of four Divisions. Three of them use computers for engineering and research, whilst the fourth - Distributed Computing Services Division - provides services for them and for the research workers in Universities whom we support.

Before getting into the details of what we do you may be wondering about some of the words used so far. Informatics comes from the French word *informatique* which means Information Technology, which in turn means using computers to obtain, store, mess about with and write reports on *information*. Information itself is a rather vague idea but it is basically anything which can be stored in a computer. For example, a TV picture is made up of 625 rows each containing about 400 sets of three dots - one red, one green and one blue. If you use a number to say how bright each dot is and have some way of saying where it is on the screen you can store a picture. Or think about any book you have read. It was made up of letters, numbers and punctuation, perhaps with drawings and maths as well. About 256 alphanumeric characters are all you need, but you may also want different sizes, bold or italic, and different shapes of letters - what printers call fonts. All this information can be stored in a computer and printed as and when you want it. All you have to do is decide what you want to say! This leaflet, and most of the others you have collected, was prepared on a computer.

There are two common ideas about what computers look like. Older people probably think of rows of gleaming cabinets with lights flashing and tapes whizzing round, locked away in an air-conditioned room. On the other hand, younger people probably think of a keyboard with a

joystick and some kind of gun plugged into a TV set with a cassette recorder nearby. We think of computers as something in between - almost as small as a Personal Computer and almost as powerful as a mainframe. We call them *Engineering Workstations*. However, that is only part of the story.

Our staff know that they can't have everything they might want sitting in their office all the time. Provided it is available when they want it, as quickly as if it really was in their office, then they don't care where it really is. This is called a *distributed system* - the bits are spread around the site and linked together with high speed telephone lines to form a network of computers each providing the services which it is best at. One of the companies we buy computers from has a slogan which sums it up exactly - "the network is the computer".

#### The Work of DCS Division

SERC is responsible for research in Universities. British Industry is also carrying out related research, but this is the responsibility of the Department of Trade and Industry. Recently the two organisations decided to pool their efforts into a Joint Framework for Information Technology. We provide some help for this organisation, mainly making sure that each research project is monitored by somebody who knows what they are supposed to be doing but who is not a part of the project. Several members of the Department also act as monitoring officers.

One of our main activities is making engineers aware of what is happening in Information Technology and teaching them how best to make use of the most recent developments. This involves organising conferences, workshops, seminars, colloquia and so on. We publish



newsletters which are sent out to several thousand people and provide other non-technical services to members of the Department - arranging contracts, buying equipment, keeping records and so on.

We also provide more technical services. For example we spend a lot of time looking at new computers, trying them out and letting people know how good (or bad) they really are. These results are published in reports like the ones you find in the magazine **Which**. Many people would not buy anything without consulting the **Which** report first.

We run the computing service for the rest of the Department. As described earlier this is a distributed system of around a hundred computers from eight different suppliers. You can get some idea of what it looks like from the diagram. As well as keeping it going we help our users to make the most of it and concentrate on providing

them with the tools to write documents and draw pictures. One of the more difficult problems we face is how to put words and pictures together in one document when they come from different places originally, in such a way that they can be understood by lots of different computers.

Linking computers together produces many problems, only some of which can be solved at the moment. One of the difficult issues is how to find out what information is available across the world - modern computer links, just like international telephones, spread world wide.

Unfortunately you still have to know which route to use not just your destination. Links of more than a few miles tend to be rather slow (or very, very expensive) so care has to be taken to do things in clever ways to avoid sending useless information. When distances up to a mile or so are considered then high speed links are commonplace and the problem is how best to make use of them to get the best out of the machines which are thus connected. There are many challenging problems in this area.

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### Schematic diagram of the Informatics Local Area Network

