The Four Generations of Computers
Integrated Circuits: Third Generation Technology

Tony Nixon (commentary):
The transistor that gave life to machines in the 60s

was to be superceded by a third generation computer technology – the integrated circuit.

The ICL 2966 mainframe incorporated these new components into its design.

Tony:
Ah, now we're beginning to see something that looks a little bit like a modern computer.

Lin Jones:
Yes, we now have a visual display unit. There would have been hundreds of these connected to the computer, but actually this isn't the computer – this is all the computer.

Tony:
Ah. Everything I can see?

Lin:
Yes.

Tony:
And these look like lines of washing machines, but I'm guessing that they're not since we're not in a launderette.

Lin:
No. They're disk drives, and if you come over here we can see, I have a modern-day equivalent of a disk drive compared to the disk drive on the ICL. The drive head comes across the platens, but this one is about 200 times greater capacity in data terms than this one here.

Tony:
OK and that one will date from 2001, 2002, something like that?

Lin:
Yes, yes, it's fairly modern. You'd probably find that in a current machine.

Tony:
OK, now who used these computers, who bought them?

Lin:
Government Departments, universities and businesses.

In fact, this one belonged to Tarmac and they used it to process the records on maintenance and construction of the motorway system.

Tony:
So how was data input into the machine?

Lin:
Well apart from the display terminals that I showed you before where you would sit and type in data or load it in from the floppy, you would also enter data using an 80 column punch card.

So there would be batches of these cards and put onto the reader and read into the computer. So that's one way of getting data into the machine.

Tony:
What about data output?

Lin:
Well to print out the reports and summaries and things after the processing, it would come out on a line printer here. And I can just press the test print button …

Tony:
Oh how wonderful (printer whirrs). There we have the output.

Lin:
Right. There we have the output. Let's open this up and show you the printout.

Tony:
Oh lovely. Now this is a third generation computer (yes it is), so it had integrated circuits …

Lin:
Yes, right. Here's an example of one of the many thousands that are inside this computer.

Tony:
And this would have typically contained a couple of hundred transistors, (yes that's right) equivalents, and these would have been mounted onto circuit boards.

Lin:
That's right, yes, I have an example here.

Tony:
I can see this is very, very similar to the components that are actually on this board (yes). And there would have actually been rackfuls of these?

Lin:
Racks and racks of these.

Tony:
So what's the power consumption like.

Lin:
Well the whole of the central processing unit is 15 kilowatts.

Tony:
15 kilowatts (yes). So that's seven and a half electric fires.

Lin:
That's correct, yes.

Tony:
It's quite substantial. And where is the central processing unit?

Lin:
Well it's, it's just over here actually. It's these five cabinets along here.

Tony Nixon (commentary):
Five cabinets for a CPU still seems a long way from the processor in a laptop.

But all that would change with the arrival of the fourth generation of computers when the same amount of computing power would be condensed onto a single microchip.